Beamlib

3.1.1

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Chapter 1

Beamlib

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1.1 Introduction

The Beamlib C++ class library provides a system portable base library for developing real-time and other applications with multi-processor and multi-host support. It was initially started in the late 1980?s to add Smalltalk like constructions/components to the emerging C++ language for use within Beam for real-time data processing and embedded system uses. Over the years it has been extended as needed to support wildly differing projects.

The Beamlib system has the following features:

- Simple Object Orientated development.
- Simple class library for Strings, Lists, Arrays, Dictionaries, Network access etc.
- Support for multi-threaded applications with Mutex Objects etc.
- Usable from C++ and Python with wrapper.
- IDL based object creation tool allows easy creation of C++ and Python objects from IDL language with RPC access across networks.
- IDL provides the ability to create SQL database schema automatically.
- Database access that allows Objects to be stored.
- BOAP (Beam Object Access Protocol) provides a simple, low overhead protocol, that allows access to remote objects using an RPC mechanism.

- Database access via a layer that allows simultaineous access to different database systems including MYSQL and BEAM BDEV native object database.
- Simple HTTP/HTML WEB service support for application embedding.

The Beamlib class library can be installed from the following RPM packages:

- beamlib-lib: Runtime shared libraries.
- beamlib-utils: Runtime tools.
- beamlib-devel: Development include files and shared and static libraries.
- beamlib-doc: Documentation.

1.2 Components

The Beamlib system is split into the following libraries:

- Base: This is the base class library containing the base 'C++' classes.
- Http: This provides HTTP/HTML classes
- Widgets: This provides Qt widgets to be used on top of the standard Qt widgets.
- Gui1: This provides a simple GUI library for embedded systems.

The Beamlib system uses a few utilitry programs:

- bidl: This provides an IDL description file to C++ class generator.HTTP/HTML classes
- boapns: This provides a BOAP name server providing a name top object mapping system
- boapnsc: This provides a BOAP name server client for testing

For an overview and usage details please see the BeamlibApiManual.

1.3 and License

Beam Ltd holds the copyright of the Beamlib library. We provide it under the GNU GPLv3 General Public License version 3.0 open source licence for use by others, see LICENSE_GPLv3.txt. For projects Beam Ltd is involved in with our clients and for commercial use the software is available under other licenses including the LGPL license. Contact Beam Ltd for details.

1.4 API Examples

1.5 Examples

Some simple client examples are listed below:

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 3

Hierarchical Index

3.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 4

Class Index

4.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 5

File Index

5.1 File List

Here is a list of all files with brief descriptions:

Chapter 6

Namespace Documentation

6.1 Boapns Namespace Reference

Classes

- class BoapEntry
- class Boapns

Variables

- const BUInt32 apiVersion = 0

6.1.1 Variable Documentation

6.1.1.1 apiVersion

```
const BUInt32 Boapns::apiVersion = 0
```

Chapter 7

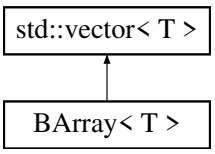
Class Documentation

7.1 BArray< T > Class Template Reference

Template based Array class.

`#include <BArray.h>`

Inheritance diagram for BArray< T >:



Public Types

- typedef int(* SortFunc) (T &a, T &b)
  Prototype for sorting function.

Public Member Functions

- BArray ()
- BArray (BSize size, T value=T())
- BArray (const BArray &array)
- BUInt number () const
- void append (const T &value)
- void append (const BArray< T > &array)
- void insert (BUInt pos, const T &value)
- void del (BUInt pos, BUInt num=1)
- T & rear ()
- void sort ()

7.1.1 Detailed Description

template<class T>
class BArray< T >

Template based Array class.

The BArray class is a simple contiguous in memory list of objects. It is used to store an ordered list of any type/class of objects. It is based on the Standard C++ library vector class and has all of the functionality of that class.

7.1.2 Member Typedef Documentation

7.1.2.1 SortFunc

```
template<class T >
typedef int(* BArray< T >::SortFunc) (T &a, T &b)
```

Prototype for sorting function.

7.1.3 Constructor & Destructor Documentation

7.1.3.1 BArray() [1/3]

```
template<class T >
BArray< T >::BArray ( )  [inline]
```

7.1.3.2 BArray() [2/3]

```
template<class T >
BArray< T >::BArray (
            BSize size,
            T value = T() )  [inline]
```

7.1.3.3 BArray() [3/3]

```
template<class T >
BArray< T >::BArray (
            const BArray< T > & array )  [inline]
```

7.1.4 Member Function Documentation

7.1.4.1 number()

```
template<class T >
BUInt BArray< T >::number ( ) const  [inline]
```

7.1.4.2 append() [1/2]

```
template<class T >
void BArray< T >::append (
            const T & value )  [inline]
```

7.1.4.3 append() [2/2]

```
template<class T >
void BArray< T >::append (
            const BArray< T > & array )
```

7.1.4.4 insert()

```
template<class T >
void BArray< T >::insert (
            BUInt pos,
            const T & value )  [inline]
```

7.1.4.5 del()

```
template<class T >
void BArray< T >::del (
            BUInt pos,
            BUInt num = 1 )  [inline]
```

7.1.4.6 rear()

```
template<class T >
T & BArray< T >::rear ( )  [inline]
```

7.1.4.7 sort()

```
template<class T >
void BArray< T >::sort ( )  [inline]
```

The documentation for this class was generated from the following file:

- BArray.h

7.2 BAtomic< Type > Class Template Reference

BAtomic class increments/decrements different integer types.

```
#include <BAtomic.h>
```

Public Member Functions

- BAtomic (Type value=0)
- Type getValue () const
- Type add (long value)
- Type operator++ (int)
- Type operator++ ()
- Type operator-- (int)
- Type operator-- ()
- operator Type () const

7.2.1 Detailed Description

template<class Type>
class BAtomic< Type >

BAtomic class increments/decrements different integer types.

7.2.2 Constructor & Destructor Documentation

7.2.2.1 BAtomic()

```
template<class Type >
BAtomic< Type >::BAtomic (
            Type value = 0 )  [inline]
```

7.2.3 Member Function Documentation

7.2.3.1 getValue()

```
template<class Type >
Type BAtomic< Type >::getValue ( ) const  [inline]
```

7.2.3.2 add()

```
template<class Type >
Type BAtomic< Type >::add (
            long value )  [inline]
```

7.2.3.3 operator++() [1/2]

```
template<class Type >
Type BAtomic< Type >::operator++ (
            int  )  [inline]
```

7.2.3.4 operator++() [2/2]

```
template<class Type >
Type BAtomic< Type >::operator++ ( )  [inline]
```

7.2.3.5 operator--() [1/2]

```
template<class Type >
Type BAtomic< Type >::operator-- (
            int  )  [inline]
```

7.2.3.6 operator--() [2/2]

```
template<class Type >
Type BAtomic< Type >::operator-- ( )  [inline]
```

7.2.3.7 operator Type()

```
template<class Type >
BAtomic< Type >::operator Type ( ) const  [inline]
```

The documentation for this class was generated from the following file:

- BAtomic.h

7.3 BAtomicCount Class Reference

BAtomicCount class.

```
#include <BAtomicCount.h>
```

Public Member Functions

- BAtomicCount (long value=0)
- long getValue () const
- long add (long value)
- long operator++ (int)
- long operator++ ()
- long operator-- (int)
- long operator-- ()
- operator long () const

7.3.1 Detailed Description

BAtomicCount class.

7.3.2 Constructor & Destructor Documentation

7.3.2.1 BAtomicCount()

```
BAtomicCount::BAtomicCount (
            long value = 0 )  [inline]
```

7.3.3 Member Function Documentation

7.3.3.1 getValue()

```
long BAtomicCount::getValue ( ) const  [inline]
```

7.3.3.2 add()

```
long BAtomicCount::add (
            long value )  [inline]
```

7.3.3.3 operator++() [1/2]

```
long BAtomicCount::operator++ (
            int  )  [inline]
```

7.3.3.4 operator++() [2/2]

```
long BAtomicCount::operator++ ( )  [inline]
```

7.3.3.5 operator--() [1/2]

```
long BAtomicCount::operator-- (
            int  )  [inline]
```

7.3.3.6 operator--() [2/2]

```
long BAtomicCount::operator-- ( )  [inline]
```

7.3.3.7 operator long()

```
BAtomicCount::operator long ( ) const  [inline]
```

The documentation for this class was generated from the following file:

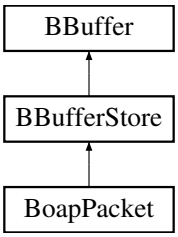
- BAtomicCount.h

7.4 BBuffer Class Reference

Create and manipulate a variable sized byte data buffer.

```
#include <BBuffer.h>
```

Inheritance diagram for BBuffer:



Public Member Functions

- BBuffer (BUInt size=0)
- ~BBuffer ()
- int setSize (BUInt32 size)

  Sets the bufer size.
- int setData (const void *data, BUInt32 size)

  Sets buffer data resized to contain the data.
- int writeData (BUInt32 pos, const void *data, BUInt32 size)

  Writes data into buffer from offset pos.
- char * data ()

  The data.
- BUInt32 size ()

  Size of the buffer in bytes.
- int resize (BUInt32 size)

  Alternative to setSize()

Protected Attributes

- BUInt32 odataSize
- char * odata
- BUInt32 osize

7.4.1 Detailed Description

Create and manipulate a variable sized byte data buffer.

7.4.2 Constructor & Destructor Documentation

7.4.2.1 BBuffer()

```
BBuffer::BBuffer (
            BUInt size = 0 )
```

7.4.2.2 ~BBuffer()

```
BBuffer::~BBuffer ( )
```

7.4.3 Member Function Documentation

7.4.3.1 setSize()

```
int BBuffer::setSize (
            BUInt32 size )
```

Sets the bufer size.

7.4.3.2 setData()

```
int BBuffer::setData (
            const void * data,
            BUInt32 size )
```

Sets buffer data resized to contain the data.

7.4.3.3 writeData()

```
int BBuffer::writeData (
            BUInt32 pos,
            const void * data,
            BUInt32 size )
```

Writes data into buffer from offset pos.

7.4.3.4 data()

```
char * BBuffer::data ( )
```

The data.

7.4.3.5 size()

```
BUInt32 BBuffer::size ( )
```

Size of the buffer in bytes.

7.4.3.6 resize()

```
int BBuffer::resize (
            BUInt32 size )  [inline]
```

Alternative to setSize()

7.4.4 Member Data Documentation

7.4.4.1 odataSize

```
BUInt32 BBuffer::odataSize  [protected]
```

7.4.4.2 odata

```
char* BBuffer::odata  [protected]
```

7.4.4.3 osize

```
BUInt32 BBuffer::osize  [protected]
```

The documentation for this class was generated from the following files:

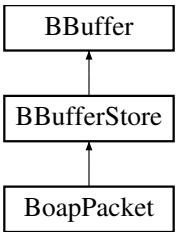
- BBuffer.h
- BBuffer.cpp

7.5 BBufferStore Class Reference

Create and manipulate a variable sized byte data buffer. Has functions to store and retrieve basic and extended types/classes in the binary buffer.

```
#include <BBuffer.h>
```

Inheritance diagram for BBufferStore:



Public Member Functions

- BBufferStore (BUInt size=0, int swapBytes=BBigEndian)
- ~BBufferStore ()
- BUInt32 getPos ()
- void setPos (BUInt32 pos)
- BString getHexString ()
- void setHexString (BString s)
- int push (BInt8 v)
- int push (BUInt8 v)
- int push (BInt16 v)
- int push (BUInt16 v)
- int push (BInt32 v)
- int push (BUInt32 v)
- int push (BInt64 v)
- int push (BUInt64 v)
- int push (BFloat32 v)
- int push (BFloat64 v)
- int push (const BString &v)
- int push (const BError &v)
- int push (const BTimeStamp &v)
- int push (const BComplex &v)
- int push (BUInt32 nBytes, const void *data, const char *swapType="1")
- int pop (BInt8 &v)
- int pop (BUInt8 &v)

- int pop (BInt16 &v)
- int pop (BUInt16 &v)
- int pop (BInt32 &v)
- int pop (BUInt32 &v)
- int pop (BInt64 &v)
- int pop (BUInt64 &v)
- int pop (BFloat32 &v)
- int pop (BFloat64 &v)
- int pop (BString &v)
- int pop (BError &v)
- int pop (BTimeStamp &v)
- int pop (BComplex &v)
- int pop (BUInt32 nBytes, void *data, const char *swapType="1")

Protected Attributes

- BUInt32 opos
- int oswapBytes

7.5.1 Detailed Description

Create and manipulate a variable sized byte data buffer. Has functions to store and retrieve basic and extended types/classes in the binary buffer.

7.5.2 Constructor & Destructor Documentation

7.5.2.1 BBufferStore()

```
BBufferStore::BBufferStore (
            BUInt size = 0,
            int swapBytes = BBigEndian )
```

7.5.2.2 ~BBufferStore()

```
BBufferStore::~BBufferStore ( )
```

7.5.3 Member Function Documentation

7.5.3.1 getPos()

```
BUInt32 BBufferStore::getPos ( )
```

7.5.3.2 setPos()

```
void BBufferStore::setPos (
            BUInt32 pos )
```

7.5.3.3 getHexString()

```
BString BBufferStore::getHexString ( )
```

7.5.3.4 setHexString()

```
void BBufferStore::setHexString (
            BString s )
```

7.5.3.5 push() [1/15]

```
int BBufferStore::push (
            BInt8 v )
```

7.5.3.6 push() [2/15]

```
int BBufferStore::push (
            BUInt8 v )
```

7.5.3.7 push() [3/15]

```
int BBufferStore::push (
            BInt16 v )
```

7.5.3.8 push() [4/15]

```
int BBufferStore::push (
            BUInt16 v )
```

7.5.3.9 push() [5/15]

```
int BBufferStore::push (
            BInt32 v )
```

7.5.3.10 push() [6/15]

```
int BBufferStore::push (
            BUInt32 v )
```

7.5.3.11 push() [7/15]

```
int BBufferStore::push (
            BInt64 v )
```

7.5.3.12 push() [8/15]

```
int BBufferStore::push (
            BUInt64 v )
```

7.5.3.13 push() [9/15]

```
int BBufferStore::push (
            BFloat32 v )
```

7.5.3.14 push() [10/15]

```
int BBufferStore::push (
            BFloat64 v )
```

7.5.3.15 push() [11/15]

```
int BBufferStore::push (
            const BString & v )
```

7.5.3.16 push() [12/15]

```
int BBufferStore::push (
            const BError & v )
```

7.5.3.17 push() [13/15]

```
int BBufferStore::push (
            const BTimeStamp & v )
```

7.5.3.18 push() [14/15]

```
int BBufferStore::push (
            const BComplex & v )
```

7.5.3.19 push() [15/15]

```
int BBufferStore::push (
            BUInt32 nBytes,
            const void * data,
            const char * swapType = "1" )
```

7.5.3.20 pop() [1/15]

```
int BBufferStore::pop (
            BInt8 & v )
```

7.5.3.21 pop() [2/15]

```
int BBufferStore::pop (
            BUInt8 & v )
```

7.5.3.22 pop() [3/15]

```
int BBufferStore::pop (
            BInt16 & v )
```

7.5.3.23 pop() [4/15]

```
int BBufferStore::pop (
            BUInt16 & v )
```

7.5.3.24 pop() [5/15]

```
int BBufferStore::pop (
            BInt32 & v )
```

7.5.3.25 pop() [6/15]

```
int BBufferStore::pop (
            BUInt32 & v )
```

7.5.3.26 pop() [7/15]

```
int BBufferStore::pop (
            BInt64 & v )
```

7.5.3.27 pop() [8/15]

```
int BBufferStore::pop (
            BUInt64 & v )
```

7.5.3.28 pop() [9/15]

```
int BBufferStore::pop (
            BFloat32 & v )
```

7.5.3.29 pop() [10/15]

```
int BBufferStore::pop (
            BFloat64 & v )
```

7.5.3.30 pop() [11/15]

```
int BBufferStore::pop (
            BString & v )
```

7.5.3.31 pop() [12/15]

```
int BBufferStore::pop (
            BError & v )
```

7.5.3.32 pop() [13/15]

```
int BBufferStore::pop (
            BTimeStamp & v )
```

7.5.3.33 pop() [14/15]

```
int BBufferStore::pop (
            BComplex & v )
```

7.5.3.34 pop() [15/15]

```
int BBufferStore::pop (
            BUInt32 nBytes,
            void * data,
            const char * swapType = "1" )
```

7.5.4 Member Data Documentation

7.5.4.1 opos

```
BUInt32 BBufferStore::opos  [protected]
```

7.5.4.2 oswapBytes

```
int BBufferStore::oswapBytes  [protected]
```

The documentation for this class was generated from the following files:

- BBuffer.h
- BBuffer.cpp

7.6 BComms Class Reference

A base class for communications classes having a generic API.

`#include <BComms.h>`

Public Types

- enum Flush { FlushRead , FlushWrite , FlushReadWrite }

Public Member Functions

- BComms ()
- virtual ~BComms ()
- virtual BError init ()
- virtual void close ()
- virtual const char * name ()

  The name of this interface.
- virtual BUInt32 byteRate ()

  The byte rate of this interface.
- virtual BError setPacketMode (Bool packetMode)

  Set packet mode.
- virtual Bool packetMode ()

  Device is in packet mode.
- virtual BError setTimeout (BTimeout timeoutUs)

  Set communication timeout.
- virtual BError connect (const char *resource)

  Create a connection.
- virtual Bool isConnected ()
- virtual BError disconnect ()

  Disconnect.
- virtual void flush (Flush flush)
- virtual BUInt writeAvailable ()
- virtual BError write (const void *data, BUInt32 nBytes, BUInt32 &nTrans)=0
- virtual BError writeChunks (const BDataChunk *chunks, BUInt nChunks, BUInt32 &nTrans)
- virtual BUInt readAvailable ()
- virtual BError read (void *data, BUInt32 num, BUInt32 &nTrans)=0
- virtual BError wait (BUInt32 eventSet, BTimeout timeoutUs=BTimeoutForever, BUInt32 num=1)
- virtual void eventQueue (BEventQueue *eventQueue, BUInt32 event, BUInt32 eventSet, BUInt num=1)
- virtual void eventEnable (Bool on)

  Enable events to be sent.

Protected Attributes

- Bool oconnected
- Bool opacketMode
- BTimeout otimeout
- BEventQueue * oeventQueue
- Bool oeventEnabled
- BUInt32 oevent
- BUInt32 oeventSet
- BUInt oeventNum

7.6.1 Detailed Description

A base class for communications classes having a generic API.

7.6.2 Member Enumeration Documentation

7.6.2.1 Flush

```
enum BComms::Flush
```

Enumerator

FlushRead	
FlushWrite	
FlushReadWrite	

7.6.3 Constructor & Destructor Documentation

7.6.3.1 BComms()

```
BComms::BComms ( )
```

7.6.3.2 ~BComms()

```
BComms::~BComms ( )  [virtual]
```

7.6.4 Member Function Documentation

7.6.4.1 init()

```
BError BComms::init ( )  [virtual]
```

7.6.4.2 close()

```
void BComms::close ( )  [virtual]
```

7.6.4.3 name()

```
const char * BComms::name ( )  [virtual]
```

The name of this interface.

7.6.4.4 byteRate()

```
BUInt32 BComms::byteRate ( )  [virtual]
```

The byte rate of this interface.

7.6.4.5 setPacketMode()

```
BError BComms::setPacketMode (
            Bool packetMode )  [virtual]
```

Set packet mode.

7.6.4.6 packetMode()

```
Bool BComms::packetMode ( )  [virtual]
```

Device is in packet mode.

7.6.4.7 setTimeout()

```
BError BComms::setTimeout (
            BTimeout timeoutUs )  [virtual]
```

Set communication timeout.

7.6.4.8 connect()

```
BError BComms::connect (
            const char * resource )  [virtual]
```

Create a connection.

7.6.4.9 isConnected()

```
Bool BComms::isConnected ( )  [virtual]
```

7.6.4.10 disconnect()

```
BError BComms::disconnect ( )  [virtual]
```

Disconnect.

7.6.4.11 flush()

```
void BComms::flush (
            Flush flush )  [virtual]
```

7.6.4.12 writeAvailable()

```
BUInt BComms::writeAvailable ( )  [virtual]
```

7.6.4.13 write()

```
virtual BError BComms::write (
            const void * data,
            BUInt32 nBytes,
            BUInt32 & nTrans )  [pure virtual]
```

7.6.4.14 writeChunks()

```
BError BComms::writeChunks (
            const BDataChunk * chunks,
            BUInt nChunks,
            BUInt32 & nTrans )  [virtual]
```

7.6.4.15 readAvailable()

```
BUInt BComms::readAvailable ( )  [virtual]
```

7.6.4.16 read()

```
virtual BError BComms::read (
            void * data,
            BUInt32 num,
            BUInt32 & nTrans )  [pure virtual]
```

7.6.4.17 wait()

```
BError BComms::wait (
            BUInt32 eventSet,
            BTimeout timeoutUs = BTimeoutForever,
            BUInt32 num = 1 )  [virtual]
```

7.6.4.18 eventQueue()

```
void BComms::eventQueue (
            BEventQueue * eventQueue,
            BUInt32 event,
            BUInt32 eventSet,
            BUInt num = 1 )  [virtual]
```

7.6.4.19 eventEnable()

```
void BComms::eventEnable (
            Bool on )  [virtual]
```

Enable events to be sent.

7.6.5 Member Data Documentation

7.6.5.1 oconnected

```
Bool BComms::oconnected  [protected]
```

7.6.5.2 opacketMode

```
Bool BComms::opacketMode  [protected]
```

7.6.5.3 otimeout

```
BTimeout BComms::otimeout  [protected]
```

7.6.5.4 oeventQueue

```
BEventQueue* BComms::oeventQueue  [protected]
```

7.6.5.5 oeventEnabled

```
Bool BComms::oeventEnabled  [protected]
```

7.6.5.6 oevent

```
BUInt32 BComms::oevent  [protected]
```

7.6.5.7 oeventSet

```
BUInt32 BComms::oeventSet  [protected]
```

7.6.5.8 oeventNum

```
BUInt BComms::oeventNum  [protected]
```

The documentation for this class was generated from the following files:

- BComms.h
- BComms.cpp

7.7 BCond Class Reference

Thread safe conditional variable.

```
#include <BCond.h>
```

Public Member Functions

- BCond ()
- ~BCond ()
- int signal ()
- int wait ()
- int timedWait (int timeOutUs)

7.7.1 Detailed Description

Thread safe conditional variable.

7.7.2 Constructor & Destructor Documentation

7.7.2.1 BCond()

```
BCond::BCond ( )
```

7.7.2.2 ~BCond()

```
BCond::~BCond ( )
```

7.7.3 Member Function Documentation

7.7.3.1 signal()

```
int BCond::signal ( )
```

7.7.3.2 wait()

```
int BCond::wait ( )
```

7.7.3.3 timedWait()

```
int BCond::timedWait (
            int timeOutUs )
```

The documentation for this class was generated from the following files:

- BCond.h
- BCond.cpp

7.8 BCondBool Class Reference

Thread conditional boolean.

```
#include <BCondInt.h>
```

Public Member Functions

- BCondBool ()
- ~BCondBool ()
- int set ()
  Set value. Wakes waiting.
- int clear ()
  Clear Value.
- int value ()
  Current value.
- int wait ()
  Wait until value is true.
- int timedWait (int timeOutUs)
  Wait until set, with timeout.
- operator int ()

7.8.1 Detailed Description

Thread conditional boolean.

7.8.2 Constructor & Destructor Documentation

7.8.2.1 BCondBool()

```
BCondBool::BCondBool ( )
```

7.8.2.2 ~BCondBool()

```
BCondBool::~BCondBool ( )
```

7.8.3 Member Function Documentation

7.8.3.1 set()

```
int BCondBool::set ( )
```

Set value. Wakes waiting.

7.8.3.2 clear()

```
int BCondBool::clear ( )
```

Clear Value.

7.8.3.3 value()

```
int BCondBool::value ( )
```

Current value.

7.8.3.4 wait()

```
int BCondBool::wait ( )
```

Wait until value is true.

7.8.3.5 timedWait()

```
int BCondBool::timedWait (
            int timeOutUs )
```

Wait until set, with timeout.

7.8.3.6 operator int()

```
BCondBool::operator int ( )  [inline]
```

The documentation for this class was generated from the following files:

- BCondInt.h
- BCondInt.cpp

7.9 BCondInt Class Reference

Thread conditional value.

`#include <BCondInt.h>`

Public Member Functions

- BCondInt ()
- ~BCondInt ()
- void setValue (BInt value)

  Set the value. Wakes waiting.
- BInt value () const

  Current value.
- BInt increment (BInt v=1)

  Increment. Wakes waiting.
- BInt decrement (BInt v=1)

  Decrement. Wakes waiting.
- Bool waitMoreThanOrEqual (BInt v, Bool decrement=0, BTimeout timeoutUs=BTimeoutForever)

  Wait until value is at least the value given.
- Bool waitLessThanOrEqual (BInt v, Bool increment=0, BTimeout timeoutUs=BTimeoutForever)

  Wait until value is equal to or below the value given.
- Bool waitLessThan (BInt v, BTimeout timeoutUs=BTimeoutForever)

  Wait until value is equal to or below the value given.
- void operator+= (int v)

  Add to value. Wakes waiting.
- void operator-= (int v)

  Subtract from value. Wakes waiting.
- void operator++ (int)

  Increment value. Wakes waiting.
- void operator-- (int)

  Decrement value. Wakes waiting.

7.9.1 Detailed Description

Thread conditional value.

7.9.2 Constructor & Destructor Documentation

7.9.2.1 BCondInt()

```
BCondInt::BCondInt ( )
```

7.9.2.2 ~BCondInt()

```
BCondInt::~BCondInt ( )
```

7.9.3 Member Function Documentation

7.9.3.1 setValue()

```
void BCondInt::setValue (
            BInt value )
```

Set the value. Wakes waiting.

7.9.3.2 value()

```
BInt BCondInt::value ( ) const
```

Current value.

7.9.3.3 increment()

```
BInt BCondInt::increment (
            BInt v = 1 )
```

Increment. Wakes waiting.

7.9.3.4 decrement()

```
BInt BCondInt::decrement (
            BInt v = 1 )
```

Decrement. Wakes waiting.

7.9.3.5 waitMoreThanOrEqual()

```
Bool BCondInt::waitMoreThanOrEqual (
            BInt v,
            Bool decrement = 0,
            BTimeout timeoutUs = BTimeoutForever )
```

Wait until value is at least the value given.

7.9.3.6 waitLessThanOrEqual()

```
Bool BCondInt::waitLessThanOrEqual (
            BInt v,
            Bool increment = 0,
            BTimeout timeoutUs = BTimeoutForever )
```

Wait until value is equal to or below the value given.

7.9.3.7 waitLessThan()

```
Bool BCondInt::waitLessThan (
            BInt v,
            BTimeout timeoutUs = BTimeoutForever )
```

Wait until value is equal to or below the value given.

7.9.3.8 operator+=()

```
void BCondInt::operator+= (
            int v )  [inline]
```

Add to value. Wakes waiting.

7.9.3.9 operator-=()

```
void BCondInt::operator-= (
            int v )  [inline]
```

Subtract from value. Wakes waiting.

7.9.3.10 operator++()

```
void BCondInt::operator++ (
            int  )  [inline]
```

Increment value. Wakes waiting.

7.9.3.11 operator--()

```
void BCondInt::operator-- (
            int  )  [inline]
```

Decrement value. Wakes waiting.

The documentation for this class was generated from the following files:

- BCondInt.h
- BCondInt.cpp

7.10 BCondResource Class Reference

Resource lock.

`#include <BCondInt.h>`

Public Member Functions

- BCondResource ()
- ~BCondResource ()
- int lock (uint32_t timeOutUs=0)

  Lock the resource, will wait for all usage to be 0.
- int unlock ()

  Unlock the resource.
- int start (uint32_t timeOutUs=0)

  Start using the resource.
- int end ()

  Finish using the resource.
- int locked ()
- int inUse ()

7.10.1 Detailed Description

Resource lock.

7.10.2 Constructor & Destructor Documentation

7.10.2.1 BCondResource()

```
BCondResource::BCondResource ( )
```

7.10.2.2 ~BCondResource()

```
BCondResource::~BCondResource ( )
```

7.10.3 Member Function Documentation

7.10.3.1 lock()

```
int BCondResource::lock (
            uint32_t timeOutUs = 0 )
```

Lock the resource, will wait for all usage to be 0.

7.10.3.2 unlock()

```
int BCondResource::unlock ( )
```

Unlock the resource.

7.10.3.3 start()

```
int BCondResource::start (
            uint32_t timeOutUs = 0 )
```

Start using the resource.

7.10.3.4 end()

```
int BCondResource::end ( )
```

Finish using the resource.

7.10.3.5 locked()

```
int BCondResource::locked ( )
```

7.10.3.6 inUse()

```
int BCondResource::inUse ( )
```

The documentation for this class was generated from the following files:

- BCondInt.h
- BCondInt.cpp

7.11 BCondValue Class Reference

Thread conditional value.

```
#include <BCondInt.h>
```

Public Member Functions

- BCondValue ()
- ~BCondValue ()
- void setValue (int value)

  Set the value. Wakes waiting.
- int value ()

  Current value.
- int increment (int v=1)

  Increment. Wakes waiting.
- int decrement (int v=1)

  Decrement. Wakes waiting.
- int waitMoreThanOrEqual (int v, int decrement=0, int timeOutUs=0)

  Wait until value is at least the value given.
- int waitLessThanOrEqual (int v, int increment=0, int timeOutUs=0)

  Wait until value is equal to or below the value given.
- int waitLessThan (int v, int timeOutUs=0)

  Wait until value is equal to or below the value given.
- void operator+= (int v)

  Add to value. Wakes waiting.
- void operator-= (int v)

  Subtract from value. Wakes waiting.
- void operator++ (int)

  Increment value. Wakes waiting.
- void operator-- (int)

  Decrement value. Wakes waiting.

7.11.1 Detailed Description

Thread conditional value.

7.11.2 Constructor & Destructor Documentation

7.11.2.1 BCondValue()

```
BCondValue::BCondValue ( )
```

7.11.2.2 ~BCondValue()

```
BCondValue::~BCondValue ( )
```

7.11.3 Member Function Documentation

7.11.3.1 setValue()

```
void BCondValue::setValue (
            int value )
```

Set the value. Wakes waiting.

7.11.3.2 value()

```
int BCondValue::value ( )
```

Current value.

7.11.3.3 increment()

```
int BCondValue::increment (
            int v = 1 )
```

Increment. Wakes waiting.

7.11.3.4 decrement()

```
int BCondValue::decrement (
            int v = 1 )
```

Decrement. Wakes waiting.

7.11.3.5 waitMoreThanOrEqual()

```
int BCondValue::waitMoreThanOrEqual (
            int v,
            int decrement = 0,
            int timeOutUs = 0 )
```

Wait until value is at least the value given.

7.11.3.6 waitLessThanOrEqual()

```
int BCondValue::waitLessThanOrEqual (
            int v,
            int increment = 0,
            int timeOutUs = 0 )
```

Wait until value is equal to or below the value given.

7.11.3.7 waitLessThan()

```
int BCondValue::waitLessThan (
            int v,
            int timeOutUs = 0 )
```

Wait until value is equal to or below the value given.

7.11.3.8 operator+=()

```
void BCondValue::operator+= (
            int v )  [inline]
```

Add to value. Wakes waiting.

7.11.3.9 operator-=()

```
void BCondValue::operator-= (
            int v )  [inline]
```

Subtract from value. Wakes waiting.

7.11.3.10 operator++()

```
void BCondValue::operator++ (
            int  )  [inline]
```

Increment value. Wakes waiting.

7.11.3.11 operator--()

```
void BCondValue::operator-- (
            int  )  [inline]
```

Decrement value. Wakes waiting.

The documentation for this class was generated from the following files:

- BCondInt.h
- BCondInt.cpp

7.12 BCondWrap Class Reference

Thread conditional unsigned 32 bit integer value that can wrap around.

```
#include <BCondInt.h>
```

Public Member Functions

- BCondWrap ()
- ~BCondWrap ()
- void setValue (uint32_t value)

  Set the value. Wakes waiting.
- uint32_t value ()

  Current value.
- uint32_t increment (uint32_t v=1)

  Increment. Wakes waiting.
- uint32_t decrement (uint32_t v=1)

  Decrement. Wakes waiting.
- int waitMoreThanOrEqual (uint32_t v, uint32_t decrement=0, uint32_t timeOutUs=0)

  Wait until value is at least the value given.
- int waitLessThanOrEqual (uint32_t v, uint32_t increment=0, uint32_t timeOutUs=0)

  Wait until value is equal to or below the value given.
- int waitLessThan (uint32_t v, uint32_t timeOutUs=0)

  Wait until value is equal to or below the value given.
- void operator+= (int v)

  Add to value. Wakes waiting.
- void operator-= (int v)

  Subtract from value. Wakes waiting.
- void operator++ (int)

  Increment value. Wakes waiting.
- void operator-- (int)

  Decrement value. Wakes waiting.

7.12.1 Detailed Description

Thread conditional unsigned 32 bit integer value that can wrap around.

7.12.2 Constructor & Destructor Documentation

7.12.2.1 BCondWrap()

```
BCondWrap::BCondWrap ( )
```

7.12.2.2 ~BCondWrap()

```
BCondWrap::~BCondWrap ( )
```

7.12.3 Member Function Documentation

7.12.3.1 setValue()

```
void BCondWrap::setValue (
            uint32_t value )
```

Set the value. Wakes waiting.

7.12.3.2 value()

```
uint32_t BCondWrap::value ( )
```

Current value.

7.12.3.3 increment()

```
uint32_t BCondWrap::increment (
            uint32_t v = 1 )
```

Increment. Wakes waiting.

7.12.3.4 decrement()

```
uint32_t BCondWrap::decrement (
            uint32_t v = 1 )
```

Decrement. Wakes waiting.

7.12.3.5 waitMoreThanOrEqual()

```
int BCondWrap::waitMoreThanOrEqual (
            uint32_t v,
            uint32_t decrement = 0,
            uint32_t timeOutUs = 0 )
```

Wait until value is at least the value given.

7.12.3.6 waitLessThanOrEqual()

```
int BCondWrap::waitLessThanOrEqual (
            uint32_t v,
            uint32_t increment = 0,
            uint32_t timeOutUs = 0 )
```

Wait until value is equal to or below the value given.

7.12.3.7 waitLessThan()

```
int BCondWrap::waitLessThan (
            uint32_t v,
            uint32_t timeOutUs = 0 )
```

Wait until value is equal to or below the value given.

7.12.3.8 operator+=()

```
void BCondWrap::operator+= (
            int v )  [inline]
```

Add to value. Wakes waiting.

7.12.3.9 operator-=()

```
void BCondWrap::operator-= (
            int v )  [inline]
```

Subtract from value. Wakes waiting.

7.12.3.10 operator++()

```
void BCondWrap::operator++ (
            int  )  [inline]
```

Increment value. Wakes waiting.

7.12.3.11 operator--()

```
void BCondWrap::operator-- (
            int  )  [inline]
```

Decrement value. Wakes waiting.

The documentation for this class was generated from the following files:

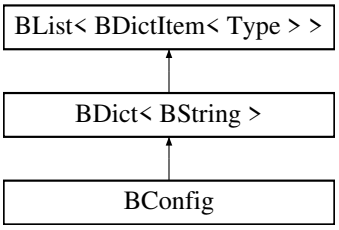
- BCondInt.h
- BCondInt.cpp

7.13 BConfig Class Reference

This class implements the configuration file access.

```
#include <BConfig.h>
```

Inheritance diagram for BConfig:



Public Member Functions

- BError open (BString fileName, BString mode="r")
- void close ()
- BError read ()
- BError write ()
- BString findValue (BString name)
- BString fileName ()

Additional Inherited Members

7.13.1 Detailed Description

This class implements the configuration file access.

7.13.2 Member Function Documentation

7.13.2.1 open()

```
BError BConfig::open (
            BString fileName,
            BString mode = "r" )
```

7.13.2.2 close()

```
void BConfig::close ( )
```

7.13.2.3 read()

```
BError BConfig::read ( )
```

7.13.2.4 write()

```
BError BConfig::write ( )
```

7.13.2.5 findValue()

```
BString BConfig::findValue (
            BString name )
```

7.13.2.6 fileName()

```
BString BConfig::fileName ( )
```

The documentation for this class was generated from the following files:

- BConfig.h
- BConfig.cpp

7.14 BDataChunk Class Reference

A chunk of data allowing writes of multiple chunks of segmented data.

```
#include <BTypes.h>
```

Public Member Functions

- BDataChunk (void *data=0, BUInt size=0)

Public Attributes

- void * data
- BUInt size

7.14.1 Detailed Description

A chunk of data allowing writes of multiple chunks of segmented data.

7.14.2 Constructor & Destructor Documentation

7.14.2.1 BDataChunk()

```
BDataChunk::BDataChunk (
            void * data = 0,
            BUInt size = 0 )  [inline]
```

7.14.3 Member Data Documentation

7.14.3.1 data

```
void* BDataChunk::data
```

7.14.3.2 size

```
BUInt BDataChunk::size
```

The documentation for this class was generated from the following file:

- BTypes.h

7.15 BDate Class Reference

This class store a UTC calendar date as a year and a year's day.

`#include <BDate.h>`

Public Member Functions

- BDate (int year=0, int month=1, int day=1)
- BDate (BString str)
- ~BDate ()
- void clear ()

  Clear the date/time.
- void setFirst ()

  Set the first date available.
- void setLast ()

  Set the last date available.
- void set (time_t time)

  Set time using Unix time (seconds from 1970-01-01)
- void set (int year=0, int month=1, int day=1)
- void setYDay (int year=0, int yday=0)
- void setNow ()

  Set the timeStamp to now.
- int year ()
- int yday ()
- int month ()
- int day ()
- void getDate (int &year, int &mon, int &day)
- BString getString ()

  Get the time as an ISO date/time string.
- BString getStringFormatted (BString format)

  Gets the time in a string form as per the format. Format syntax as per strftime()
- BError setString (BString str)

  Set the time from an ISO date/time.
- int isSet ()

  Check if the date has been set.
- int compare (const BDate &date) const

  Compare two dates.
- operator BString ()
- int operator== (const BDate &date) const
- int operator!= (const BDate &date) const
- int operator> (const BDate &date) const
- int operator>= (const BDate &date) const
- int operator< (const BDate &date) const
- int operator<= (const BDate &date) const

Static Public Member Functions

- static int isLeap (int year)
- static int daysInMonth (int year, int month)

Public Attributes

- uint16_t oyear

  Year (0 .. 65535)
- uint16_t oyday

  Day in year (0 .. 365)

7.15.1 Detailed Description

This class store a UTC calendar date as a year and a year's day.

The BDate class stores a calendar date wit a year and day in the year components. It provides functions to set this date from a string and convert the data to a string as well as BDate comparison functions.

7.15.2 Constructor & Destructor Documentation

7.15.2.1 BDate() [1/2]

```
BDate::BDate (
            int year = 0,
            int month = 1,
            int day = 1 )
```

7.15.2.2 BDate() [2/2]

```
BDate::BDate (
            BString str )
```

7.15.2.3 ~BDate()

```
BDate::~BDate ( )
```

7.15.3 Member Function Documentation

7.15.3.1 clear()

```
void BDate::clear ( )
```

Clear the date/time.

7.15.3.2 setFirst()

```
void BDate::setFirst ( )
```

Set the first date available.

7.15.3.3 setLast()

```
void BDate::setLast ( )
```

Set the last date available.

7.15.3.4 set() [1/2]

```
void BDate::set (
            time_t time )
```

Set time using Unix time (seconds from 1970-01-01)

7.15.3.5 set() [2/2]

```
void BDate::set (
            int year = 0,
            int month = 1,
            int day = 1 )
```

7.15.3.6 setYDay()

```
void BDate::setYDay (
            int year = 0,
            int yday = 0 )
```

7.15.3.7 setNow()

```
void BDate::setNow ( )
```

Set the timeStamp to now.

7.15.3.8 year()

```
int BDate::year ( )
```

7.15.3.9 yday()

```
int BDate::yday ( )
```

7.15.3.10 month()

```
int BDate::month ( )
```

7.15.3.11 day()

```
int BDate::day ( )
```

7.15.3.12 getDate()

```
void BDate::getDate (
             int & year,
             int & mon,
             int & day )
```

7.15.3.13 getString()

```
BString BDate::getString ( )
```

Get the time as an ISO date/time string.

7.15.3.14 getStringFormatted()

```
BString BDate::getStringFormatted (
            BString format )
```

Gets the time in a string form as per the format. Format syntax as per strftime()

7.15.3.15 setString()

```
BError BDate::setString (
            BString str )
```

Set the time from an ISO date/time.

7.15.3.16 isSet()

```
int BDate::isSet ( )  [inline]
```

Check if the date has been set.

7.15.3.17 compare()

```
int BDate::compare (
            const BDate & date ) const
```

Compare two dates.

7.15.3.18 operator BString()

```
BDate::operator BString ( )  [inline]
```

7.15.3.19 operator==()

```
int BDate::operator== (
            const BDate & date ) const  [inline]
```

7.15.3.20 operator"!=()

```
int BDate::operator!= (
            const BDate & date ) const  [inline]
```

7.15.3.21 operator>()

```
int BDate::operator> (
            const BDate & date ) const  [inline]
```

7.15.3.22 operator>=()

```
int BDate::operator>= (
            const BDate & date ) const  [inline]
```

7.15.3.23 operator<()

```
int BDate::operator< (
            const BDate & date ) const  [inline]
```

7.15.3.24 operator<=()

```
int BDate::operator<= (
            const BDate & date ) const  [inline]
```

7.15.3.25 isLeap()

```
int BDate::isLeap (
            int year )  [static]
```

7.15.3.26 daysInMonth()

```
int BDate::daysInMonth (
            int year,
            int month )  [static]
```

7.15.4 Member Data Documentation

7.15.4.1 oyear

`uint16_t BDate::oyear`

Year (0 .. 65535)

7.15.4.2 oyday

`uint16_t BDate::oyday`

Day in year (0 .. 365)

The documentation for this class was generated from the following files:

- BDate.h
- BDate.cpp

7.16 BDebugBacktrace Class Reference

Backtrace on crash class.

`#include <BDebug.h>`

Public Member Functions

- BDebugBacktrace ()
- ~BDebugBacktrace ()
- void dumpBacktraceStdout (char *comment)
- int dumpBacktraceFile (char *fileName, char *comment)
- void dumpBacktraceSyslog (char *comment)
- void dumpBacktrace (char *strBuf, int strBufLen, char *comment)

7.16.1 Detailed Description

Backtrace on crash class.

7.16.2 Constructor & Destructor Documentation

7.16.2.1 BDebugBacktrace()

```
BDebugBacktrace::BDebugBacktrace ( )
```

7.16.2.2 ~BDebugBacktrace()

```
BDebugBacktrace::~BDebugBacktrace ( )
```

7.16.3 Member Function Documentation

7.16.3.1 dumpBacktraceStdout()

```
void BDebugBacktrace::dumpBacktraceStdout (
            char * comment )
```

7.16.3.2 dumpBacktraceFile()

```
int BDebugBacktrace::dumpBacktraceFile (
            char * fileName,
            char * comment )
```

7.16.3.3 dumpBacktraceSyslog()

```
void BDebugBacktrace::dumpBacktraceSyslog (
            char * comment )
```

7.16.3.4 dumpBacktrace()

```
void BDebugBacktrace::dumpBacktrace (
            char * strBuf,
            int strBufLen,
            char * comment )
```

The documentation for this class was generated from the following file:

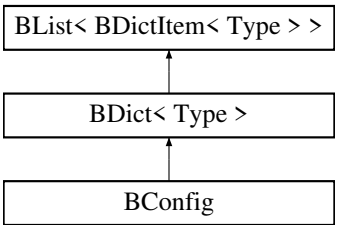
- BDebug.h

7.17 BDict< Type > Class Template Reference

Dictionary list class using templates.

`#include <BDict.h>`

Inheritance diagram for BDict< Type >:



Public Types

- typedef BIter iterator

Public Member Functions

- BDict (int hashSize=100)
- BDict (const BDict< Type > &dict)
- int hasKey (const BString &k) const
- BString key (const BIter &i) const
- void clear ()

  Clear the list.
- void insert (BIter &i, const BDictItem< Type > &item)
- void append (const BDictItem< Type > &item)
- void append (const BDict< Type > &dict)
- void del (const BString &k)
- void del (BIter &i)

  Delete specified item.
- BIter find (const BString &k) const
- Type & operator[ ] (const BString &i)
- const Type & operator[ ] (const BString &i) const
- Type & operator[ ] (const BIter &i)
- const Type & operator[ ] (const BIter &i) const
- Type & operator[ ] (int i)
- const Type & operator[ ] (int i) const
- BDict< Type > operator+ (const BDict< Type > &dict) const
- BDict< Type > & operator= (const BDict< Type > &dict)
- void hashPrint ()

Additional Inherited Members

7.17.1 Detailed Description

template<class Type>
class BDict< Type >

Dictionary list class using templates.

7.17.2 Member Typedef Documentation

7.17.2.1 iterator

```
template<class Type >
typedef BIter BDict< Type >::iterator
```

7.17.3 Constructor & Destructor Documentation

7.17.3.1 BDict() [1/2]

```
template<class Type >
BDict< Type >::BDict (
            int hashSize = 100 )
```

7.17.3.2 BDict() [2/2]

```
template<class Type >
BDict< Type >::BDict (
            const BDict< Type > & dict )
```

7.17.4 Member Function Documentation

7.17.4.1 hasKey()

```
template<class Type >
int BDict< Type >::hasKey (
            const BString & k ) const
```

7.17.4.2 key()

```
template<class Type >
BString BDict< Type >::key (
            const BIter & i ) const
```

7.17.4.3 clear()

```
template<class Type >
void BDict< Type >::clear  [virtual]
```

Clear the list.

Reimplemented from BList< BDictItem< Type > >.

7.17.4.4 insert()

```
template<class Type >
void BDict< Type >::insert (
            BIter & i,
            const BDictItem< Type > & item )
```

7.17.4.5 append() [1/2]

```
template<class Type >
void BDict< Type >::append (
            const BDictItem< Type > & item )
```

7.17.4.6 append() [2/2]

```
template<class Type >
void BDict< Type >::append (
            const BDict< Type > & dict )
```

7.17.4.7 del() [1/2]

```
template<class Type >
void BDict< Type >::del (
            const BString & k )
```

7.17.4.8 del() [2/2]

```
template<class Type >
void BDict< Type >::del (
            BIter & i )  [virtual]
```

Delete specified item.

Reimplemented from BList< BDictItem< Type > >.

7.17.4.9 find()

```
template<class Type >
BIter BDict< Type >::find (
            const BString & k ) const
```

7.17.4.10 operator[]() [1/6]

```
template<class Type >
Type & BDict< Type >::operator[] (
            const BString & i )
```

7.17.4.11 operator[]() [2/6]

```
template<class Type >
const Type & BDict< Type >::operator[] (
            const BString & i ) const
```

7.17.4.12 operator[]() [3/6]

```
template<class Type >
Type & BDict< Type >::operator[] (
            const BIter & i )
```

7.17.4.13 operator[]() [4/6]

```
template<class Type >
const Type & BDict< Type >::operator[] (
            const BIter & i ) const
```

7.17.4.14 operator[]() [5/6]

```
template<class Type >
Type & BDict< Type >::operator[] (
            int i )
```

7.17.4.15 operator[]() [6/6]

```
template<class Type >
const Type & BDict< Type >::operator[] (
            int i ) const
```

7.17.4.16 operator+()

```
template<class Type >
BDict< Type > BDict< Type >::operator+ (
            const BDict< Type > & dict ) const
```

7.17.4.17 operator=()

```
template<class Type >
BDict< Type > & BDict< Type >::operator= (
            const BDict< Type > & dict )
```

7.17.4.18 hashPrint()

```
template<class Type >
void BDict< Type >::hashPrint
```

The documentation for this class was generated from the following file:

- BDict.h

7.18 BDictItem< Type > Class Template Reference

Template based Dictionary classes item.

```
#include <BDict.h>
```

Public Member Functions

- BDictItem (BString k="", Type v=Type())

Public Attributes

- BString key
- Type value

7.18.1 Detailed Description

template<class Type>
class BDictItem< Type >

Template based Dictionary classes item.

7.18.2 Constructor & Destructor Documentation

7.18.2.1 BDictItem()

```
template<class Type >
BDictItem< Type >::BDictItem (
            BString k = "",
            Type v = Type() )  [inline]
```

7.18.3 Member Data Documentation

7.18.3.1 key

```
template<class Type >
BString BDictItem< Type >::key
```

7.18.3.2 value

```
template<class Type >
Type BDictItem< Type >::value
```

The documentation for this class was generated from the following file:

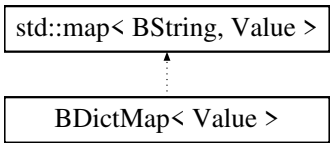
- BDict.h

7.19 BDictMap< Value > Class Template Reference

Mapped Dictionary class.

`#include <BDictMap.h>`

Inheritance diagram for BDictMap< Value >:



Public Types

- typedef BDictMap< Value >::iterator iterator

Public Member Functions

- void clear ()
- int hasKey (const BString &k)
- BString key (iterator &i)
- unsigned int size ()
- void start (iterator &i)
- int isEnd (iterator &i)
- void next (iterator &i)
- void del (const iterator &i)
- void del (const BString &k)
- Value & operator[ ] (iterator &i)
- Value & operator[ ] (const BString &i)

7.19.1 Detailed Description

template<typename Value>
class BDictMap< Value >

Mapped Dictionary class.

This is based on the Standard C++ library map class and has all of the functionality of that class.

7.19.2 Member Typedef Documentation

7.19.2.1 iterator

```
template<typename Value >
typedef BDictMap<Value>::iterator BDictMap< Value >::iterator
```

7.19.3 Member Function Documentation

7.19.3.1 clear()

```
template<typename Value >
void BDictMap< Value >::clear ( )  [inline]
```

7.19.3.2 hasKey()

```
template<typename Value >
int BDictMap< Value >::hasKey (
            const BString & k )  [inline]
```

7.19.3.3 key()

```
template<typename Value >
BString BDictMap< Value >::key (
            iterator & i )  [inline]
```

7.19.3.4 size()

```
template<typename Value >
unsigned int BDictMap< Value >::size ( )  [inline]
```

7.19.3.5 start()

```
template<typename Value >
void BDictMap< Value >::start (
            iterator & i )  [inline]
```

7.19.3.6 isEnd()

```
template<typename Value >
int BDictMap< Value >::isEnd (
            iterator & i )  [inline]
```

7.19.3.7 next()

```
template<typename Value >
void BDictMap< Value >::next (
            iterator & i )  [inline]
```

7.19.3.8 del() [1/2]

```
template<typename Value >
void BDictMap< Value >::del (
            const iterator & i )  [inline]
```

7.19.3.9 del() [2/2]

```
template<typename Value >
void BDictMap< Value >::del (
            const BString & k )  [inline]
```

7.19.3.10 operator[]() [1/2]

```
template<typename Value >
Value & BDictMap< Value >::operator[] (
            iterator & i )  [inline]
```

7.19.3.11 operator[]() [2/2]

```
template<typename Value >
Value & BDictMap< Value >::operator[] (
            const BString & i )  [inline]
```

The documentation for this class was generated from the following file:

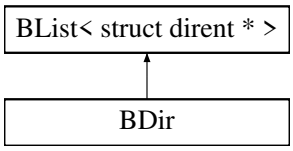
- BDictMap.h

7.20 BDir Class Reference

File system directory class.

`#include <BDir.h>`

Inheritance diagram for BDir:



Public Member Functions

- BDir ()
- BDir (BString name)
- ~BDir ()
- BError open (BString name)

  Reads named directory.
- BError error ()

  Current value of error.
- BError read ()

  read/re-reads directory
- void clear ()

  Clears list.
- void setWild (BString wild)

  Set wildcard filter string used on read.
- void setSort (int on)

  Set alpha sort on/off.
- BString entryName (BIter i)

  Get filename.
- struct stat entryStat (BIter i)

  Get file stats.
- struct stat64 entryStat64 (BIter i)

  Get file stats 64.

Additional Inherited Members

7.20.1 Detailed Description

File system directory class.

7.20.2 Constructor & Destructor Documentation

7.20.2.1 BDir() [1/2]

```
BDir::BDir ( )
```

7.20.2.2 BDir() [2/2]

```
BDir::BDir (
            BString name )
```

7.20.2.3 ~BDir()

```
BDir::~BDir ( )
```

7.20.3 Member Function Documentation

7.20.3.1 open()

```
BError BDir::open (
            BString name )
```

Reads named directory.

7.20.3.2 error()

```
BError BDir::error ( )
```

Current value of error.

7.20.3.3 read()

```
BError BDir::read ( )
```

read/re-reads directory

7.20.3.4 clear()

```
void BDir::clear ( )  [virtual]
```

Clears list.

Reimplemented from BList< struct dirent * >.

7.20.3.5 setWild()

```
void BDir::setWild (
            BString wild )
```

Set wildcard filter string used on read.

7.20.3.6 setSort()

```
void BDir::setSort (
            int on )
```

Set alpha sort on/off.

7.20.3.7 entryName()

```
BString BDir::entryName (
            BIter i )
```

Get filename.

7.20.3.8 entryStat()

```
struct stat BDir::entryStat (
            BIter i )
```

Get file stats.

7.20.3.9 entryStat64()

```
struct stat64 BDir::entryStat64 (
            BIter i )
```

Get file stats 64.

The documentation for this class was generated from the following files:

- BDir.h
- BDir.cpp

7.21 BDuration Class Reference

Stores and manipulates a time to the nearest microsecond and a maximum of 24 hours.

`#include <BDuration.h>`

Public Member Functions

- BDuration (int hour=0, int minute=0, int second=0, int microsecond=0)
- BDuration (BString str)
- ~BDuration ()
- void clear ()

  Clear the duration.
- void set (int hour=0, int minute=0, int second=0, int microsecond=0)
- void addMilliSeconds (int64_t milliSeconds)

  Add the given number of milli seconds.
- void addMicroSeconds (int64_t microSeconds)

  Add the given number of micro seconds.
- void addSeconds (int seconds)

  Add the given number of seconds.
- uint32_t getSeconds ()

  Get number of seconds.
- uint64_t getMicroSeconds ()

  Get number of micro seconds.
- int hour ()
- int minute ()
- int second ()
- int microSecond ()
- BString getString ()

  Get the time as an ISO date/time string.
- BError setString (BString time)

  Set the time from an ISO date/time.

7.21.1 Detailed Description

Stores and manipulates a time to the nearest microsecond and a maximum of 24 hours.

7.21.2 Constructor & Destructor Documentation

7.21.2.1 BDuration() [1/2]

```
BDuration::BDuration (
            int hour = 0,
            int minute = 0,
            int second = 0,
            int microsecond = 0 )
```

7.21.2.2 BDuration() [2/2]

```
BDuration::BDuration (
            BString str )
```

7.21.2.3 ~BDuration()

```
BDuration::~BDuration ( )
```

7.21.3 Member Function Documentation

7.21.3.1 clear()

```
void BDuration::clear ( )
```

Clear the duration.

7.21.3.2 set()

```
void BDuration::set (
            int hour = 0,
            int minute = 0,
            int second = 0,
            int microsecond = 0 )
```

7.21.3.3 addMilliSeconds()

```
void BDuration::addMilliSeconds (
            int64_t milliSeconds )
```

Add the given number of milli seconds.

7.21.3.4 addMicroSeconds()

```
void BDuration::addMicroSeconds (
            int64_t microSeconds )
```

Add the given number of micro seconds.

7.21.3.5 addSeconds()

```
void BDuration::addSeconds (
            int seconds )
```

Add the given number of seconds.

7.21.3.6 getSeconds()

```
uint32_t BDuration::getSeconds ( )
```

Get number of seconds.

7.21.3.7 getMicroSeconds()

```
uint64_t BDuration::getMicroSeconds ( )
```

Get number of micro seconds.

7.21.3.8 hour()

```
int BDuration::hour ( )
```

7.21.3.9 minute()

```
int BDuration::minute ( )
```

7.21.3.10 second()

```
int BDuration::second ( )
```

7.21.3.11 microSecond()

```
int BDuration::microSecond ( )
```

7.21.3.12 getString()

```
BString BDuration::getString ( )
```

Get the time as an ISO date/time string.

7.21.3.13 setString()

```
BError BDuration::setString (
            BString time )
```

Set the time from an ISO date/time.

The documentation for this class was generated from the following files:

- BDuration.h
- BDuration.cpp

7.22 BEntry Class Reference

Manipulate a name value pair.

```
#include <BEntry.h>
```

Public Member Functions

- BEntry ()
- BEntry (BString name, BString value)

  Set name and value.
- BEntry (BString line)

  Set name and value from white space deliminated string.
- BString getName ()

  Get the name.
- BString getValue ()

  Get the value.
- void setLine (BString line)

  Set name and value from white space deliminated string.
- void setName (BString name)

  Set the name.
- void setValue (BString value)

  Set the value.
- BString line ()

  Return name and value as padded single string.
- void print ()

  Print name and value.

7.22.1 Detailed Description

Manipulate a name value pair.

7.22.2 Constructor & Destructor Documentation

7.22.2.1 BEntry() [1/3]

```
BEntry::BEntry ( )
```

7.22.2.2 BEntry() [2/3]

```
BEntry::BEntry (
            BString name,
            BString value )
```

Set name and value.

7.22.2.3 BEntry() [3/3]

```
BEntry::BEntry (
            BString line )
```

Set name and value from white space deliminated string.

7.22.3 Member Function Documentation

7.22.3.1 getName()

```
BString BEntry::getName ( )
```

Get the name.

7.22.3.2 getValue()

```
BString BEntry::getValue ( )
```

Get the value.

7.22.3.3 setLine()

```
void BEntry::setLine (
            BString line )
```

Set name and value from white space deliminated string.

7.22.3.4 setName()

```
void BEntry::setName (
            BString name )
```

Set the name.

7.22.3.5 setValue()

```
void BEntry::setValue (
            BString value )
```

Set the value.

7.22.3.6 line()

```
BString BEntry::line ( )
```

Return name and value as padded single string.

7.22.3.7 print()

```
void BEntry::print ( )
```

Print name and value.

The documentation for this class was generated from the following files:

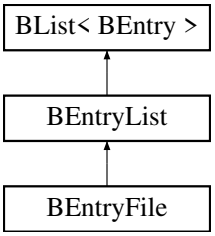
- BEntry.h
- BEntry.cpp

7.23 BEntryFile Class Reference

A file based list of string name/value pairs.

```
#include <BEntry.h>
```

Inheritance diagram for BEntryFile:



Public Member Functions

- BEntryFile ()
- BEntryFile (BString filename)

  Opens entryfile.
- ~BEntryFile ()
- int open (BString filename)

  Opens entryfile.
- int read ()

  Reads entry file and builds list.
- int write ()

  Writes list to entryfile.
- int writeList (BEntryList &l)

  Writes specified list to file.
- void clear ()

  Clears current list.
- BString filename ()

  Returns the filename.

Additional Inherited Members

7.23.1 Detailed Description

A file based list of string name/value pairs.

7.23.2 Constructor & Destructor Documentation

7.23.2.1 BEntryFile() [1/2]

```
BEntryFile::BEntryFile ( )
```

7.23.2.2 BEntryFile() [2/2]

```
BEntryFile::BEntryFile (
            BString filename )
```

Opens entryfile.

7.23.2.3 ~BEntryFile()

```
BEntryFile::~BEntryFile ( )
```

7.23.3 Member Function Documentation

7.23.3.1 open()

```
int BEntryFile::open (
            BString filename )
```

Opens entryfile.

7.23.3.2 read()

```
int BEntryFile::read ( )
```

Reads entry file and builds list.

7.23.3.3 write()

```
int BEntryFile::write ( )
```

Writes list to entryfile.

7.23.3.4 writeList()

```
int BEntryFile::writeList (
            BEntryList & l )
```

Writes specified list to file.

7.23.3.5 clear()

```
void BEntryFile::clear ( )  [virtual]
```

Clears current list.

Reimplemented from BEntryList.

7.23.3.6 filename()

```
BString BEntryFile::filename ( )
```

Returns the filename.

The documentation for this class was generated from the following files:

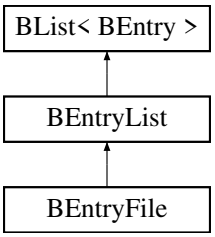
- BEntry.h
- BEntry.cpp

7.24 BEntryList Class Reference

List of Entries. Where each entry is a name value pair.

`#include <BEntry.h>`

Inheritance diagram for BEntryList:



Public Member Functions

- BEntryList ()
- int isSet (BString name)

  1 if name is in list and value is set
- BEntry * find (BString name)

  Returns entry if name is found otherwise NULL.
- BString findValue (BString name)

  Returns value of name. Returns "" if name not found.
- int setValue (BString name, BString value)

  Set the value of name. Returns 0 if name not found.
- int setValueRaw (BString name, BString value)

  Raw setting of value without looking up existing entry.
- void deleteEntry (BString name)

  Deletes the entry.
- void print ()

  Print list.
- BString getString ()

  Return list as string. Each Entry padded and on a new line.
- void insert (BIter &i, const BEntry &item)
- void del (BIter &i)

  Delete specified item.
- void clear ()

  Clear the list.
- BEntryList & operator= (const BEntryList &l)

Additional Inherited Members

7.24.1 Detailed Description

List of Entries. Where each entry is a name value pair.

7.24.2 Constructor & Destructor Documentation

7.24.2.1 BEntryList()

```
BEntryList::BEntryList ( )
```

7.24.3 Member Function Documentation

7.24.3.1 isSet()

```
int BEntryList::isSet (
            BString name )
```

1 if name is in list and value is set

7.24.3.2 find()

```
BEntry * BEntryList::find (
            BString name )
```

Returns entry if name is found otherwise NULL.

7.24.3.3 findValue()

```
BString BEntryList::findValue (
            BString name )
```

Returns value of name. Returns "" if name not found.

7.24.3.4 setValue()

```
int BEntryList::setValue (
            BString name,
            BString value )
```

Set the value of name. Returns 0 if name not found.

7.24.3.5 setValueRaw()

```
int BEntryList::setValueRaw (
            BString name,
            BString value )
```

Raw setting of value without looking up existing entry.

7.24.3.6 deleteEntry()

```
void BEntryList::deleteEntry (
            BString name )
```

Deletes the entry.

7.24.3.7 print()

```
void BEntryList::print ( )
```

Print list.

7.24.3.8 getString()

```
BString BEntryList::getString ( )
```

Return list as string. Each Entry padded and on a new line.

7.24.3.9 insert()

```
void BEntryList::insert (
            BIter & i,
            const BEntry & item )
```

7.24.3.10 del()

```
void BEntryList::del (
            BIter & i )  [virtual]
```

Delete specified item.

Reimplemented from BList< BEntry >.

7.24.3.11 clear()

```
void BEntryList::clear ( )  [virtual]
```

Clear the list.

Reimplemented from BList< BEntry >.

Reimplemented in BEntryFile.

7.24.3.12 operator=()

```
BEntryList & BEntryList::operator= (
            const BEntryList & l )
```

The documentation for this class was generated from the following files:

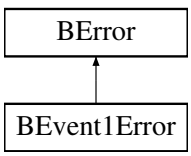
- BEntry.h
- BEntry.cpp

7.25 BError Class Reference

Error return class. This class is used to return the error status from a function. It encapsulates an integer error number and a string.

```
#include <BError.h>
```

Inheritance diagram for BError:



Public Member Functions

- BError (int errNo=ErrorOk, BString errStr="")
  Create object.
- BError (BString errStr)
  Create with error set and error string.
- BError copy ()
  Return an independant copy.
- BError & set (int errNo, BString errStr="")
  Set error number and message.
- BError & clear ()
  Clear the error.
- BError & setError (BString errStr="")
  Set error type ERROR with optional message.
- BString getString () const
  Get error message.
- int getNumber () const
  Get The error number.
- int num () const
  Get The error number.
- const char * str () const
  Return a char string.*
- int getErrorNo () const
  Get The error number.
- operator int () const
  Return error number.

7.25.1 Detailed Description

Error return class. This class is used to return the error status from a function. It encapsulates an integer error number and a string.

An error number of ErrorOk (0) indicates no error, a value of ErrorMisc (1) indicates some error and a value of ErrorWarning (2) indiactes a warning. Specific error numbers are defeined in BErrorNum. System low level errors (errno) are defined by negativer values. Specific application errors are those above the value 64.

7.25.2 Constructor & Destructor Documentation

7.25.2.1 BError() [1/2]

```
BError::BError (
            int errNo = ErrorOk,
            BString errStr = "" )
```

Create object.

7.25.2.2 BError() [2/2]

```
BError::BError (
            BString errStr )
```

Create with error set and error string.

7.25.3 Member Function Documentation

7.25.3.1 copy()

```
BError BError::copy ( )
```

Return an independant copy.

7.25.3.2 set()

```
BError & BError::set (
            int errNo,
            BString errStr = "" )
```

Set error number and message.

7.25.3.3 clear()

```
BError & BError::clear ( )
```

Clear the error.

7.25.3.4 setError()

```
BError & BError::setError (
            BString errStr = "" )
```

Set error type ERROR with optional message.

7.25.3.5 getString()

```
BString BError::getString ( ) const
```

Get error message.

7.25.3.6 getNumber()

```
int BError::getNumber ( ) const
```

Get The error number.

7.25.3.7 num()

```
int BError::num ( ) const
```

Get The error number.

7.25.3.8 str()

```
const char * BError::str ( ) const
```

Return a char* string.

7.25.3.9 getErrorNo()

```
int BError::getErrorNo ( ) const
```

Get The error number.

7.25.3.10 operator int()

```
BError::operator int ( ) const  [inline]
```

Return error number.

The documentation for this class was generated from the following files:

- BError.h
- BError.cpp

7.26 BErrorTime Class Reference

Error return class with time field.

`#include <BErrorTime.h>`

Public Types

- enum Type { None = 0 , Error = 1 }

Public Member Functions

- BErrorTime (int errNo=None, BTimeStamp errTime=BTimeStamp(), BString errStr="")
  Create object.
- BErrorTime & set (int errNo, BTimeStamp errTime=BTimeStamp(), BString errStr="")
  Set error number and message.
- BErrorTime & clear ()
  Clear the error.
- int getErrorNo () const
  Get The error number.
- BTimeStamp getTime () const
  Get time.
- BString getString () const
  Get error message.
- BErrorTime copy ()
  Return an independant copy.
- operator int () const
  Return error number.

7.26.1 Detailed Description

Error return class with time field.

This provides an alternative to the standard BError return type for errors but includes BTimeStamp information.

7.26.2 Member Enumeration Documentation

7.26.2.1 Type

`enum BErrorTime::Type`

Enumerator

None	
Error	

7.26.3 Constructor & Destructor Documentation

7.26.3.1 BErrorTime()

```
BErrorTime::BErrorTime (
            int errNo = None,
            BTimeStamp errTime = BTimeStamp(),
            BString errStr = "" )
```

Create object.

7.26.4 Member Function Documentation

7.26.4.1 set()

```
BErrorTime & BErrorTime::set (
            int errNo,
            BTimeStamp errTime = BTimeStamp(),
            BString errStr = "" )
```

Set error number and message.

7.26.4.2 clear()

```
BErrorTime & BErrorTime::clear ( )
```

Clear the error.

7.26.4.3 getErrorNo()

```
int BErrorTime::getErrorNo ( ) const
```

Get The error number.

7.26.4.4 getTime()

```
BTimeStamp BErrorTime::getTime ( ) const
```

Get time.

7.26.4.5 getString()

```
BString BErrorTime::getString ( ) const
```

Get error message.

7.26.4.6 copy()

```
BErrorTime BErrorTime::copy ( )
```

Return an independant copy.

7.26.4.7 operator int()

```
BErrorTime::operator int ( ) const
```

Return error number.

The documentation for this class was generated from the following files:

- BErrorTime.h
- BErrorTime.cpp

7.27 BEvent Class Reference

An event description class.

```
#include <BEvent.h>
```

Public Member Functions

- BEvent (BUInt32 type=BEventTypeNone, BUInt32 arg=0)
- BUInt32 type ()
- BUInt32 arg ()

7.27.1 Detailed Description

An event description class.

7.27.2 Constructor & Destructor Documentation

7.27.2.1 BEvent()

```
BEvent::BEvent (
            BUInt32 type = BEventTypeNone,
            BUInt32 arg = 0 )
```

7.27.3 Member Function Documentation

7.27.3.1 type()

```
BUInt32 BEvent::type ( )
```

7.27.3.2 arg()

```
BUInt32 BEvent::arg ( )
```

The documentation for this class was generated from the following files:

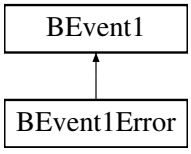
- BEvent.h
- BEvent.cpp

7.28 BEvent1 Class Reference

This class provides a base class for all event objects that can be sent over the events interface.

```
#include <BEvent1.h>
```

Inheritance diagram for BEvent1:



Public Member Functions

- BEvent1 (uint32_t type)
- virtual ~BEvent1 ()
- uint32_t getType ()
- virtual BError getBinary (void *data, uint32_t &size)
- virtual BError setBinary (void *data, uint32_t &size)

7.28.1 Detailed Description

This class provides a base class for all event objects that can be sent over the events interface.

7.28.2 Constructor & Destructor Documentation

7.28.2.1 BEvent1()

```
BEvent1::BEvent1 (
            uint32_t type )
```

7.28.2.2 ~BEvent1()

```
BEvent1::~BEvent1 ( )  [virtual]
```

7.28.3 Member Function Documentation

7.28.3.1 getType()

```
uint32_t BEvent1::getType ( )
```

7.28.3.2 getBinary()

```
BError BEvent1::getBinary (
            void * data,
            uint32_t & size )  [virtual]
```

Reimplemented in BEvent1Error.

7.28.3.3 setBinary()

```
BError BEvent1::setBinary (
            void * data,
            uint32_t & size )  [virtual]
```

Reimplemented in BEvent1Error.

The documentation for this class was generated from the following files:

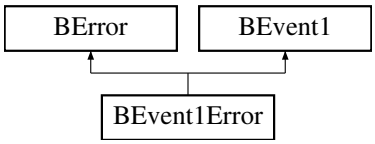
- BEvent1.h
- BEvent1.cpp

7.29 BEvent1Error Class Reference

This class provides a class to send a BError event.

```
#include <BEvent1.h>
```

Inheritance diagram for BEvent1Error:



Public Member Functions

- BEvent1Error (int errNo=ErrorOk, BString errStr="")
- BError getBinary (void *data, uint32_t &size)
- BError setBinary (void *data, uint32_t &size)

7.29.1 Detailed Description

This class provides a class to send a BError event.

7.29.2 Constructor & Destructor Documentation

7.29.2.1 BEvent1Error()

```
BEvent1Error::BEvent1Error (
            int errNo = ErrorOk,
            BString errStr = "" )
```

7.29.3 Member Function Documentation

7.29.3.1 getBinary()

```
BError BEvent1Error::getBinary (
            void * data,
            uint32_t & size )  [virtual]
```

Reimplemented from BEvent1.

7.29.3.2 setBinary()

```
BError BEvent1Error::setBinary (
            void * data,
            uint32_t & size )  [virtual]
```

Reimplemented from BEvent1.

The documentation for this class was generated from the following files:

- BEvent1.h
- BEvent1.cpp

7.30 BEvent1Int Class Reference

This class provides an interface for sending simple integer events via a file descriptor. This allows threads to send events that can be picked up by the poll system call.

```
#include <BEvent1.h>
```

Public Member Functions

- BEvent1Int ()
- ~BEvent1Int ()
- void clear ()

  Clear events pending.
- BError sendEvent (int event)

  Send an event.
- BError getEvent (int &event, int timeOutUs=-1)

  Receive the event.
- int getFd ()

7.30.1 Detailed Description

This class provides an interface for sending simple integer events via a file descriptor. This allows threads to send events that can be picked up by the poll system call.

7.30.2 Constructor & Destructor Documentation

7.30.2.1 BEvent1Int()

```
BEvent1Int::BEvent1Int ( )
```

7.30.2.2 ~BEvent1Int()

```
BEvent1Int::~BEvent1Int ( )
```

7.30.3 Member Function Documentation

7.30.3.1 clear()

```
void BEvent1Int::clear ( )
```

Clear events pending.

7.30.3.2 sendEvent()

```
BError BEvent1Int::sendEvent (
            int event )
```

Send an event.

7.30.3.3 getEvent()

```
BError BEvent1Int::getEvent (
            int & event,
            int timeOutUs = -1 )
```

Receive the event.

7.30.3.4 getFd()

```
int BEvent1Int::getFd ( )
```

The documentation for this class was generated from the following files:

- BEvent1.h
- BEvent1.cpp

7.31 BEvent1Pipe Class Reference

This class provides a base interface for sending events via a pipe. This allows threads to send events that can be picked up by the poll system call.

```
#include <BEvent1.h>
```

Public Member Functions

- BEvent1Pipe ()
- ~BEvent1Pipe ()
- void clear ()

  Clear events pending.
- BError sendEvent (BEvent1 *event)

  Send an event.
- BError getEvent (BEvent1 *event, int timeOutUs=-1)

  Receive the event.
- int getReceiveFd ()

  returns the receive file descriptor for the poll system call

7.31.1 Detailed Description

This class provides a base interface for sending events via a pipe. This allows threads to send events that can be picked up by the poll system call.

7.31.2 Constructor & Destructor Documentation

7.31.2.1 BEvent1Pipe()

```
BEvent1Pipe::BEvent1Pipe ( )
```

7.31.2.2 ~BEvent1Pipe()

```
BEvent1Pipe::~BEvent1Pipe ( )
```

7.31.3 Member Function Documentation

7.31.3.1 clear()

```
void BEvent1Pipe::clear ( )
```

Clear events pending.

7.31.3.2 sendEvent()

```
BError BEvent1Pipe::sendEvent (
            BEvent1 * event )
```

Send an event.

7.31.3.3 getEvent()

```
BError BEvent1Pipe::getEvent (
            BEvent1 * event,
            int timeOutUs = -1 )
```

Receive the event.

7.31.3.4 getReceiveFd()

```
int BEvent1Pipe::getReceiveFd ( )
```

returns the receive file descriptor for the poll system call

The documentation for this class was generated from the following files:

- BEvent1.h
- BEvent1.cpp

7.32 BEventPipe Class Reference

This class provides an interface for sending simple integer events via a pipe file descriptor.

`#include <BEvent.h>`

Public Member Functions

- BEventPipe ()
- ~BEventPipe ()
- void clear ()

  Clear events pending.
- int getFd ()
- BUInt writeAvailable () const
- BError write (const BEvent &event, BTimeout timeout=BTimeoutForever)

  Append an item onto the queue.
- BUInt readAvailable () const
- BError read (BEvent &event, BTimeout timeout=BTimeoutForever)

  Get an item from the queue.

7.32.1 Detailed Description

This class provides an interface for sending simple integer events via a pipe file descriptor.

7.32.2 Constructor & Destructor Documentation

7.32.2.1 BEventPipe()

`BEventPipe::BEventPipe ( )`

7.32.2.2 ~BEventPipe()

`BEventPipe::~BEventPipe ( )`

7.32.3 Member Function Documentation

7.32.3.1 clear()

```
void BEventPipe::clear ( )
```

Clear events pending.

7.32.3.2 getFd()

```
int BEventPipe::getFd ( )
```

7.32.3.3 writeAvailable()

```
BUInt BEventPipe::writeAvailable ( ) const
```

7.32.3.4 write()

```
BError BEventPipe::write (
            const BEvent & event,
            BTimeout timeout = BTimeoutForever )
```

Append an item onto the queue.

7.32.3.5 readAvailable()

```
BUInt BEventPipe::readAvailable ( ) const
```

7.32.3.6 read()

```
BError BEventPipe::read (
            BEvent & event,
            BTimeout timeout = BTimeoutForever )
```

Get an item from the queue.

The documentation for this class was generated from the following files:

- BEvent.h
- BEvent.cpp

7.33 BFifo< Type > Class Template Reference

A template first in first out data buffer to store any object types.

`#include <BFifo.h>`

Public Member Functions

- BFifo (BUInt size)
- ~BFifo ()
- void clear ()
- BUInt size ()

  Returns fifo size.
- BError resize (BUInt size)

  Resize FIFO, clears it as well.
- BError rebase ()

  Rebases fifo so read pointer is at zero moving memory as needed.
- BUInt writeAvailable ()

  How many items that can be written.
- BUInt writeAvailableChunk ()

  How many items that can be written in a chunk.
- BError write (const Type v)

  Write a single item.
- BError write (const Type *data, BUInt num)

  Write a set of items. Can only write a maximum of writeAvailableChunk() to save going beyond end of FIFO buffer.
- Type * writeData ()

  Returns a pointer to the data.
- Type * writeData (BUInt &num)

  Returns a pointer to the data and how many can be written in a chunk.
- void writeDone (BUInt num)

  Indicates when write is complete.
- void writeBackup (BUInt num)

  Backup, remove num items at end of fifo. Careful, make sure read is not already happening.
- BUInt readAvailable ()

  How many items are available to read.
- BUInt readAvailableChunk ()

  How many items are available to read in a chunk.
- Type read ()

  Read one item.
- BError read (Type *data, BUInt num)

  Read a set of items.
- Type * readData ()

  Returns a pointer to the data.
- Type * readData (BUInt &num)

  Returns a pointer to the data and how many can be read in a chunk.
- void readDone (BUInt num)
- Type readPos (BUInt pos)

  Read item at given offset from current read position.
- void writePos (BUInt pos, const Type &v)

  Write item at given offset from current read position.
- Type & operator[ ] (int pos)

  Direct access to read samples in buffer.

Protected Attributes

- BUInt osize

  The size of the FIFO.
- Type * odata

  FIFO memory buffer.
- volatile BUInt owritePos

  The write pointer.
- volatile BUInt oreadPos

  The read pointer.

7.33.1 Detailed Description

template<class Type>
class BFifo< Type >

A template first in first out data buffer to store any object types.

This class stores data in a ring buffer. It can store up to (size - 1) items. It has separate read and write pointers. These are thread safe. Note the read and write routines do not bounds check the Fifo. You have to use readAvailable()/writeAvailable() functions to check how much can be read/written before performing the reads or writes.

7.33.2 Constructor & Destructor Documentation

7.33.2.1 BFifo()

```
template<class Type >
BFifo< Type >::BFifo (
            BUInt size )
```

7.33.2.2 ~BFifo()

```
template<class Type >
BFifo< Type >::~BFifo ( )
```

7.33.3 Member Function Documentation

7.33.3.1 clear()

```
template<class Type >
void BFifo< Type >::clear ( )
```

7.33.3.2 size()

```
template<class Type >
BUInt BFifo< Type >::size ( )
```

Returns fifo size.

7.33.3.3 resize()

```
template<class Type >
BError BFifo< Type >::resize (
            BUInt size )
```

Resize FIFO, clears it as well.

7.33.3.4 rebase()

```
template<class Type >
BError BFifo< Type >::rebase ( )
```

Rebases fifo so read pointer is at zero moving memory as needed.

7.33.3.5 writeAvailable()

```
template<class Type >
BUInt BFifo< Type >::writeAvailable ( )
```

How many items that can be written.

7.33.3.6 writeAvailableChunk()

```
template<class Type >
BUInt BFifo< Type >::writeAvailableChunk ( )
```

How many items that can be written in a chunk.

7.33.3.7 write() [1/2]

```
template<class Type >
BError BFifo< Type >::write (
            const Type v )
```

Write a single item.

7.33.3.8 write() [2/2]

```
template<class Type >
BError BFifo< Type >::write (
            const Type * data,
            BUInt num )
```

Write a set of items. Can only write a maximum of writeAvailableChunk() to save going beyond end of FIFO buffer.

7.33.3.9 writeData() [1/2]

```
template<class Type >
Type * BFifo< Type >::writeData ( )
```

Returns a pointer to the data.

7.33.3.10 writeData() [2/2]

```
template<class Type >
Type * BFifo< Type >::writeData (
            BUInt & num )
```

Returns a pointer to the data and how many can be written in a chunk.

7.33.3.11 writeDone()

```
template<class Type >
void BFifo< Type >::writeDone (
            BUInt num )
```

Indicates when write is complete.

7.33.3.12 writeBackup()

```
template<class Type >
void BFifo< Type >::writeBackup (
            BUInt num )
```

Backup, remove num items at end of fifo. Careful, make sure read is not already happening.

7.33.3.13 readAvailable()

```
template<class Type >
BUInt BFifo< Type >::readAvailable ( )
```

How many items are available to read.

7.33.3.14 readAvailableChunk()

```
template<class Type >
BUInt BFifo< Type >::readAvailableChunk ( )
```

How many items are available to read in a chunk.

7.33.3.15 read() [1/2]

```
template<class Type >
Type BFifo< Type >::read ( )
```

Read one item.

7.33.3.16 read() [2/2]

```
template<class Type >
BError BFifo< Type >::read (
            Type * data,
            BUInt num )
```

Read a set of items.

7.33.3.17 readData() [1/2]

```
template<class Type >
Type * BFifo< Type >::readData ( )
```

Returns a pointer to the data.

7.33.3.18 readData() [2/2]

```
template<class Type >
Type * BFifo< Type >::readData (
            BUInt & num )
```

Returns a pointer to the data and how many can be read in a chunk.

7.33.3.19 readDone()

```
template<class Type >
void BFifo< Type >::readDone (
            BUInt num )
```

7.33.3.20 readPos()

```
template<class Type >
Type BFifo< Type >::readPos (
            BUInt pos )
```

Read item at given offset from current read position.

7.33.3.21 writePos()

```
template<class Type >
void BFifo< Type >::writePos (
            BUInt pos,
            const Type & v )
```

Write item at given offset from current read position.

7.33.3.22 operator[]()

```
template<class Type >
Type & BFifo< Type >::operator[] (
            int pos )
```

Direct access to read samples in buffer.

7.33.4 Member Data Documentation

7.33.4.1 osize

```
template<class Type >
BUInt BFifo< Type >::osize  [protected]
```

The size of the FIFO.

7.33.4.2 odata

```
template<class Type >
Type* BFifo< Type >::odata  [protected]
```

FIFO memory buffer.

7.33.4.3 owritePos

```
template<class Type >
volatile BUInt BFifo< Type >::owritePos  [protected]
```

The write pointer.

7.33.4.4 oreadPos

```
template<class Type >
volatile BUInt BFifo< Type >::oreadPos  [protected]
```

The read pointer.

The documentation for this class was generated from the following file:

- BFifo.h

7.34 BFifoCirc< Type > Class Template Reference

This class implements a thread safe FIFO buffer using a binary sized circular memory.

`#include <BFifoCirc.h>`

Public Types

- enum { defaultSize = 1024 }

Public Member Functions

- BFifoCirc (uint32_t size=defaultSize)
- ~BFifoCirc ()
- uint32_t size ()

  Return the buffers actual size.
- void clear ()

  Clear all of the data in the buffer.
- uint32_t writeAvailable ()

  Returns the space available to write.
- BError writeWaitAvailable (uint32_t numFifoSamples)

  Wait for the given number of samples.
- BError write (const Type *data, uint32_t numFifoSamples)

  Writes the data to the buffer. Blocks until complete.
- Type * writeData ()

  Return a pointer to the current start of the buffer.
- void writeDone (uint32_t numFifoSamples)

  Update the write pointer.
- uint32_t readAvailable ()

  Returns the number of bytes of data available.
- BError readWaitAvailable (uint32_t numFifoSamples)

  Wait for given number of samples.
- BError read (Type *data, uint32_t numFifoSamples)
- Type * readData ()

  Pointer to raw data.
- BError readDone (uint32_t numFifoSamples)

  Updates read pointer.
- Type & operator[ ] (int pos)

  Direct access to read samples in buffer.

Protected Member Functions

- BError mapCircularBuffer (uint32_t size)
- void unmapCircularBuffer ()

Protected Attributes

- BMutex olock
- uint32_t ovmSize
- uint32_t osize
- Type * odata
- BFifoCircPos owritePos

  Current write position.
- BCondValue owriteNumFifoSamples

  The number of samples in the FIFO.
- BFifoCircPos oreadPos

  Current read position.

7.34.1 Detailed Description

template<class Type>
class BFifoCirc< Type >

This class implements a thread safe FIFO buffer using a binary sized circular memory.

This class stores data in a ring buffer where the actual buffer is circular. It can store up to (size - 1) items. It has separate read and write pointers. These are thread safe. Note the read and write routines do not bounds check the Fifo. You have to use readAvailable()/writeAvailable() functions to check how much can be read/written before performing the reads or writes. The CPU's MMU is used to create a binary sized memory area that wrapps around on itself.

7.34.2 Member Enumeration Documentation

7.34.2.1 anonymous enum

```
template<class Type >
anonymous enum
```

Enumerator

defaultSize	

7.34.3 Constructor & Destructor Documentation

7.34.3.1 BFifoCirc()

```
template<class Type >
BFifoCirc< Type >::BFifoCirc (
            uint32_t size = defaultSize )
```

7.34.3.2 ~BFifoCirc()

```
template<class Type >
BFifoCirc< Type >::~BFifoCirc ( )
```

7.34.4 Member Function Documentation

7.34.4.1 size()

```
template<class Type >
uint32_t BFifoCirc< Type >::size ( )
```

Return the buffers actual size.

7.34.4.2 clear()

```
template<class Type >
void BFifoCirc< Type >::clear ( )
```

Clear all of the data in the buffer.

7.34.4.3 writeAvailable()

```
template<class Type >
uint32_t BFifoCirc< Type >::writeAvailable ( )
```

Returns the space available to write.

7.34.4.4 writeWaitAvailable()

```
template<class Type >
BError BFifoCirc< Type >::writeWaitAvailable (
            uint32_t numFifoSamples )
```

Wait for the given number of samples.

7.34.4.5 write()

```
template<class Type >
BError BFifoCirc< Type >::write (
            const Type * data,
            uint32_t numFifoSamples )
```

Writes the data to the buffer. Blocks until complete.

7.34.4.6 writeData()

```
template<class Type >
Type * BFifoCirc< Type >::writeData ( )
```

Return a pointer to the current start of the buffer.

7.34.4.7 writeDone()

```
template<class Type >
void BFifoCirc< Type >::writeDone (
            uint32_t numFifoSamples )
```

Update the write pointer.

7.34.4.8 readAvailable()

```
template<class Type >
uint32_t BFifoCirc< Type >::readAvailable ( )
```

Returns the number of bytes of data available.

7.34.4.9 readWaitAvailable()

```
template<class Type >
BError BFifoCirc< Type >::readWaitAvailable (
            uint32_t numFifoSamples )
```

Wait for given number of samples.

7.34.4.10 read()

```
template<class Type >
BError BFifoCirc< Type >::read (
            Type * data,
            uint32_t numFifoSamples )
```

7.34.4.11 readData()

```
template<class Type >
Type * BFifoCirc< Type >::readData ( )
```

Pointer to raw data.

7.34.4.12 readDone()

```
template<class Type >
BError BFifoCirc< Type >::readDone (
            uint32_t numFifoSamples )
```

Updates read pointer.

7.34.4.13 operator[]()

```
template<class Type >
Type & BFifoCirc< Type >::operator[] (
            int pos )
```

Direct access to read samples in buffer.

7.34.4.14 mapCircularBuffer()

```
template<class Type >
BError BFifoCirc< Type >::mapCircularBuffer (
            uint32_t size )  [protected]
```

7.34.4.15 unmapCircularBuffer()

```
template<class Type >
void BFifoCirc< Type >::unmapCircularBuffer ( )  [protected]
```

7.34.5 Member Data Documentation

7.34.5.1 olock

```
template<class Type >
BMutex BFifoCirc< Type >::olock  [protected]
```

7.34.5.2 ovmSize

```
template<class Type >
uint32_t BFifoCirc< Type >::ovmSize  [protected]
```

7.34.5.3 osize

```
template<class Type >
uint32_t BFifoCirc< Type >::osize  [protected]
```

7.34.5.4 odata

```
template<class Type >
Type* BFifoCirc< Type >::odata  [protected]
```

7.34.5.5 owritePos

```
template<class Type >
BFifoCircPos BFifoCirc< Type >::owritePos  [protected]
```

Current write position.

7.34.5.6 owriteNumFifoSamples

```
template<class Type >
BCondValue BFifoCirc< Type >::owriteNumFifoSamples  [protected]
```

The number of samples in the FIFO.

7.34.5.7 oreadPos

```
template<class Type >
BFifoCircPos BFifoCirc< Type >::oreadPos  [protected]
```

Current read position.

The documentation for this class was generated from the following file:

- BFifoCirc.h

7.35 BFifoCircPos Class Reference

This class implements a pointer into the Fifo's circular buffer.

```
#include <BFifoCirc.h>
```

Public Member Functions

- BFifoCircPos (uint32_t size)
- void setSize (uint32_t size)
- void set (uint32_t pos)

  Sets the position.
- uint32_t pos ()

  The current position.
- void increment (uint32_t numFifoSamples)

  Increment the pointer by the given value.
- uint32_t difference (const BFifoCircPos &pos)

  Return the difference between the two pointers.
- operator int ()
- void operator+= (uint32_t numFifoSamples)
- int operator== (const BFifoCircPos &pos)
- int operator!= (const BFifoCircPos &pos)

7.35.1 Detailed Description

This class implements a pointer into the Fifo's circular buffer.

7.35.2 Constructor & Destructor Documentation

7.35.2.1 BFifoCircPos()

```
BFifoCircPos::BFifoCircPos (
            uint32_t size )
```

7.35.3 Member Function Documentation

7.35.3.1 setSize()

```
void BFifoCircPos::setSize (
            uint32_t size )
```

7.35.3.2 set()

```
void BFifoCircPos::set (
            uint32_t pos )
```

Sets the position.

7.35.3.3 pos()

```
uint32_t BFifoCircPos::pos ( )
```

The current position.

7.35.3.4 increment()

```
void BFifoCircPos::increment (
            uint32_t numFifoSamples )
```

Increment the pointer by the given value.

7.35.3.5 difference()

```
uint32_t BFifoCircPos::difference (
            const BFifoCircPos & pos )
```

Return the difference between the two pointers.

7.35.3.6 operator int()

```
BFifoCircPos::operator int ( )
```

7.35.3.7 operator+=()

```
void BFifoCircPos::operator+= (
            uint32_t numFifoSamples )
```

7.35.3.8 operator==()

```
int BFifoCircPos::operator== (
            const BFifoCircPos & pos )
```

7.35.3.9 operator"!=()

```
int BFifoCircPos::operator!= (
            const BFifoCircPos & pos )
```

The documentation for this class was generated from the following files:

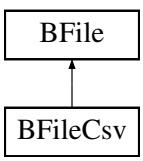
- BFifoCirc.h
- BFifoCirc.cpp

7.36 BFile Class Reference

File operations class.

```
#include <BFile.h>
```

Inheritance diagram for BFile:



Public Member Functions

- BFile ()
- BFile (const BFile &file)

  Create opened specified file.
- ~BFile ()
- BError open (BString name, BString mode)

  Open file.
- BError open (FILE *file)

  Assign object to opened file handle.
- BError open (int fd, BString mode)

  Assign object to opened file descriptor.
- BError openTemp (BString name, BString mode)

  Open a tempory file with the given name prefix.
- BError close ()

  Close file.
- int isOpen ()

  Returns 1 if the file is open.
- int isEnd ()

  Returns 1 if at the end of the file, 0 otherwise.
- FILE * getFd ()

  File descriptor.
- BUInt64 length ()

  File size in bytes.
- int setVBuf (char *buf, int mode, size_t size)

  Set stream buffering options.
- int read (void *buf, int nbytes)

  Read from file.
- int readString (BString &str)

  Read string. (ref fgets)
- char * fgets (char *buf, size_t size)
- int write (const void *buf, int nbytes)

  Write to file.
- int writeString (const BString &str)

  Write string to file.
- int seek (BUInt64 pos)

  Set seek position.
- BUInt64 position ()

  The files position.
- int printf (const char *fmt,...)

  Formated print into the file.
- BError truncate ()

  Truncate the file.
- BError flush ()

  Flush the file.
- BString fileName ()

  Return file name.
- BFile & operator= (const BFile &file)

7.36.1 Detailed Description

File operations class.

7.36.2 Constructor & Destructor Documentation

7.36.2.1 BFile() [1/2]

```
BFile::BFile ( )
```

7.36.2.2 BFile() [2/2]

```
BFile::BFile (
            const BFile & file )
```

Create opened specified file.

7.36.2.3 ~BFile()

```
BFile::~BFile ( )
```

7.36.3 Member Function Documentation

7.36.3.1 open() [1/3]

```
BError BFile::open (
            BString name,
            BString mode )
```

Open file.

7.36.3.2 open() [2/3]

```
BError BFile::open (
            FILE * file )
```

Assign object to opened file handle.

7.36.3.3 open() [3/3]

```
BError BFile::open (
            int fd,
            BString mode )
```

Assign object to opened file descriptor.

7.36.3.4 openTemp()

```
BError BFile::openTemp (
            BString name,
            BString mode )
```

Open a tempory file with the given name prefix.

7.36.3.5 close()

```
BError BFile::close ( )
```

Close file.

7.36.3.6 isOpen()

```
int BFile::isOpen ( )
```

Returns 1 if the file is open.

7.36.3.7 isEnd()

```
int BFile::isEnd ( )
```

Returns 1 if at the end of the file, 0 otherwise.

7.36.3.8 getFd()

```
FILE * BFile::getFd ( )
```

File descriptor.

7.36.3.9 length()

```
BUInt64 BFile::length ( )
```

File size in bytes.

7.36.3.10 setVBuf()

```
int BFile::setVBuf (
            char * buf,
            int mode,
            size_t size )
```

Set stream buffering options.

7.36.3.11 read()

```
int BFile::read (
            void * buf,
            int nbytes )
```

Read from file.

7.36.3.12 readString()

```
int BFile::readString (
            BString & str )
```

Read string. (ref fgets)

7.36.3.13 fgets()

```
char * BFile::fgets (
            char * buf,
            size_t size )
```

7.36.3.14 write()

```
int BFile::write (
            const void * buf,
            int nbytes )
```

Write to file.

7.36.3.15 writeString()

```
int BFile::writeString (
            const BString & str )
```

Write string to file.

7.36.3.16 seek()

```
int BFile::seek (
            BUInt64 pos )
```

Set seek position.

7.36.3.17 position()

```
BUInt64 BFile::position ( )
```

The files position.

7.36.3.18 printf()

```
int BFile::printf (
            const char * fmt,
             ...  )
```

Formated print into the file.

7.36.3.19 truncate()

```
BError BFile::truncate ( )
```

Truncate the file.

7.36.3.20 flush()

```
BError BFile::flush ( )
```

Flush the file.

7.36.3.21 fileName()

```
BString BFile::fileName ( )
```

Return file name.

7.36.3.22 operator=()

```
BFile & BFile::operator= (
            const BFile & file )
```

The documentation for this class was generated from the following files:

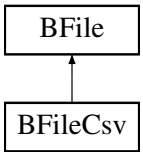
- BFile.h
- BFile.cpp

7.37 BFileCsv Class Reference

A class to read and write CSV formatted files.

```
#include <BFileCsv.h>
```

Inheritance diagram for BFileCsv:



Public Member Functions

- BFileCsv (char separator=';')
- BError readCsv (BStringList &csvList)
- BError writeCsv (BStringList &csvList)

7.37.1 Detailed Description

A class to read and write CSV formatted files.

7.37.2 Constructor & Destructor Documentation

7.37.2.1 BFileCsv()

```
BFileCsv::BFileCsv (
            char separator = ';' )
```

7.37.3 Member Function Documentation

7.37.3.1 readCsv()

```
BError BFileCsv::readCsv (
            BStringList & csvList )
```

7.37.3.2 writeCsv()

```
BError BFileCsv::writeCsv (
            BStringList & csvList )
```

The documentation for this class was generated from the following files:

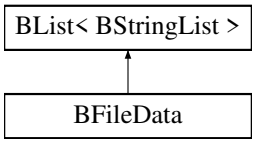
- BFileCsv.h
- BFileCsv.cpp

7.38 BFileData Class Reference

A class to implement a data storage file.

`#include <BFileData.h>`

Inheritance diagram for BFileData:



Public Member Functions

- BError open (BString filename)
- BError getNextId (int &id)
- BError find (int id, BStringList &csvList)
- BError write (int id, BStringList &csvList)
- BError del (int id)

Additional Inherited Members

7.38.1 Detailed Description

A class to implement a data storage file.

7.38.2 Member Function Documentation

7.38.2.1 open()

```
BError BFileData::open (
            BString filename )
```

7.38.2.2 getNextId()

```
BError BFileData::getNextId (
            int & id )
```

7.38.2.3 find()

```
BError BFileData::find (
            int id,
            BStringList & csvList )
```

7.38.2.4 write()

```
BError BFileData::write (
            int id,
            BStringList & csvList )
```

7.38.2.5 del()

```
BError BFileData::del (
            int id )
```

The documentation for this class was generated from the following files:

- BFileData.h
- BFileData.cpp

7.39 BFirmwareFileHeader Struct Reference

`#include <BFirmware.h>`

Public Attributes

- BUInt32 magic
- BUInt32 itemType
- BUInt32 fileLength
- BUInt32 checksum
- BUInt32 platform
- BUInt32 format
- BUInt32 numSegments
- BUInt32 startAddress
- BUInt8 ver0
- BUInt8 ver1
- BUInt8 ver2
- BUInt8 ver3
- BUInt32 special [7]

7.39.1 Member Data Documentation

7.39.1.1 magic

```
BUInt32 BFirmwareFileHeader::magic
```

7.39.1.2 itemType

```
BUInt32 BFirmwareFileHeader::itemType
```

7.39.1.3 fileLength

```
BUInt32 BFirmwareFileHeader::fileLength
```

7.39.1.4 checksum

```
BUInt32 BFirmwareFileHeader::checksum
```

7.39.1.5 platform

```
BUInt32 BFirmwareFileHeader::platform
```

7.39.1.6 format

```
BUInt32 BFirmwareFileHeader::format
```

7.39.1.7 numSegments

```
BUInt32 BFirmwareFileHeader::numSegments
```

7.39.1.8 startAddress

```
BUInt32 BFirmwareFileHeader::startAddress
```

7.39.1.9 ver0

```
BUInt8 BFirmwareFileHeader::ver0
```

7.39.1.10 ver1

```
BUInt8 BFirmwareFileHeader::ver1
```

7.39.1.11 ver2

```
BUInt8 BFirmwareFileHeader::ver2
```

7.39.1.12 ver3

```
BUInt8 BFirmwareFileHeader::ver3
```

7.39.1.13 special

```
BUInt32 BFirmwareFileHeader::special[7]
```

The documentation for this struct was generated from the following file:

- BFirmware.h

7.40 BFirmwareInfo Struct Reference

```
#include <BFirmware.h>
```

Public Attributes

- BUInt32 magic
- BUInt32 length
- BUInt32 checksum
- BUInt8 type
- BUInt8 ver0
- BUInt8 ver1
- BUInt8 ver2

7.40.1 Member Data Documentation

7.40.1.1 magic

```
BUInt32 BFirmwareInfo::magic
```

7.40.1.2 length

```
BUInt32 BFirmwareInfo::length
```

7.40.1.3 checksum

```
BUInt32 BFirmwareInfo::checksum
```

7.40.1.4 type

```
BUInt8 BFirmwareInfo::type
```

7.40.1.5 ver0

```
BUInt8 BFirmwareInfo::ver0
```

7.40.1.6 ver1

```
BUInt8 BFirmwareInfo::ver1
```

7.40.1.7 ver2

```
BUInt8 BFirmwareInfo::ver2
```

The documentation for this struct was generated from the following file:

- BFirmware.h

7.41 BFirmwareSegHeader Struct Reference

```
#include <BFirmware.h>
```

Public Attributes

- BUInt32 magic
- BUInt32 itemType
- BUInt32 fileLength
- BUInt32 checksum
- BUInt32 platform
- BUInt32 format
- BUInt32 dataLength
- BUInt32 address
- BUInt32 length
- BUInt32 special [7]

7.41.1 Member Data Documentation

7.41.1.1 magic

```
BUInt32 BFirmwareSegHeader::magic
```

7.41.1.2 itemType

```
BUInt32 BFirmwareSegHeader::itemType
```

7.41.1.3 fileLength

```
BUInt32 BFirmwareSegHeader::fileLength
```

7.41.1.4 checksum

```
BUInt32 BFirmwareSegHeader::checksum
```

7.41.1.5 platform

```
BUInt32 BFirmwareSegHeader::platform
```

7.41.1.6 format

```
BUInt32 BFirmwareSegHeader::format
```

7.41.1.7 dataLength

```
BUInt32 BFirmwareSegHeader::dataLength
```

7.41.1.8 address

```
BUInt32 BFirmwareSegHeader::address
```

7.41.1.9 length

```
BUInt32 BFirmwareSegHeader::length
```

7.41.1.10 special

```
BUInt32 BFirmwareSegHeader::special[7]
```

The documentation for this struct was generated from the following file:

- BFirmware.h

7.42 BIter Class Reference

Iterator for BLists.

```
#include <BList.h>
```

Public Member Functions

- BIter (BNode *i=0)
- operator BNode * ()
- int operator== (const BIter &i)
- int valid ()

7.42.1 Detailed Description

Iterator for BLists.

7.42.2 Constructor & Destructor Documentation

7.42.2.1 BIter()

```
BIter::BIter (
            BNode * i = 0 )  [inline]
```

7.42.3 Member Function Documentation

7.42.3.1 operator BNode *()

```
BIter::operator BNode * ( )  [inline]
```

7.42.3.2 operator==()

```
int BIter::operator== (
            const BIter & i )  [inline]
```

7.42.3.3 valid()

```
int BIter::valid ( )  [inline]
```

The documentation for this class was generated from the following file:

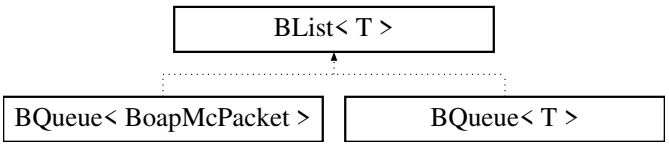
- BList.h

7.43 BList< T > Class Template Reference

Template based list class.

`#include <BList.h>`

Inheritance diagram for BList< T >:



Classes

- class Node

  A BList internal Node.

Public Types

- typedef int(* SortFunc) (T &a, T &b)

  Prototype for sorting function.

Public Member Functions

- BList ()
- BList (const BList< T > &l)
- virtual ~BList ()
- void start (BIter &i) const

  Iterator to start of list.
- BIter begin () const

  Iterator for start of list.
- BIter end () const

  Iterator for end of list.
- BIter end (BIter &i) const

  Iterator for end of list.
- void next (BIter &i) const

  Iterator for next item in list.
- void prev (BIter &i)

  Iterator for previous item in list.
- BIter goTo (int pos) const

  Iterator for pos item in list.
- int position (BIter i)

  Postition in list item with iterator i.
- unsigned int number () const

  Number of items in list.
- unsigned int size () const

  Number of items in list.
- int isStart (BIter &i) const

  True if iterator refers to first item.
- int isEnd (BIter &i) const

  True if iterator refers to last item.
- T & front ()

  Get first item in list.
- T & rear ()

  Get last item in list.
- T & get (BIter i)

  Get item specified by iterator in list.
- const T & get (BIter i) const

  Get item specified by iterator in list.
- void append (const T &item)

  Append item to list.
- virtual void insert (BIter &i, const T &item)

  Insert item before item.
- void insertAfter (BIter &i, const T &item)

  Insert item after item.
- virtual void clear ()

  Clear the list.
- virtual void del (BIter &i)

  Delete specified item.
- void deleteLast ()

  Delete last item.
- void deleteFirst ()

  Delete fisrt item.

- void push (const T &i)

  Push item onto list.
- T pop ()

  Pop item from list deleteing item.
- void queueAdd (const T &i)

  Add item to end of list.
- T queueGet ()

  Get item from front of list deleteing item.
- void append (const BList< T > &l)

  Append list to list.
- int has (const T &i) const

  Checks if the item is in the list.
- void swap (BIter i1, BIter i2)

  Swap two items in list.
- void sort ()

  Sort list based on get(i) values.
- void sort (SortFunc func)

  Sort list based on Sort func.
- BList< T > & operator= (const BList< T > &l)
- T & operator[ ] (int i)
- const T & operator[ ] (int i) const
- T & operator[ ] (BIter i)
- const T & operator[ ] (const BIter &i) const
- BList< T > operator+ (const BList< T > &l) const

Protected Member Functions

- virtual Node * nodeGet (BIter i)
- virtual const Node * nodeGet (BIter i) const
- virtual Node * nodeCreate (const T &item)

Protected Attributes

- Node * onodes
- unsigned int olength

7.43.1 Detailed Description

template<class T>
class BList< T >

Template based list class.

The BList class is a simple doubly linked list of objects. It is used to store an ordered list of any type/class of objects. The class provides a simple iteration system to allow easy navigation through the list. You can access objects stored in the list with the get() function or the [] operator. The list supports stack functions push() and pop() and queueing functions such as queueAdd() and queueGet(). There is a macro BListLoop(list, itterator) that provides a concise way to iterate over a lists objects.

7.43.2 Member Typedef Documentation

7.43.2.1 SortFunc

```
template<class T >
typedef int(* BList< T >::SortFunc) (T &a, T &b)
```

Prototype for sorting function.

7.43.3 Constructor & Destructor Documentation

7.43.3.1 BList() [1/2]

```
template<class T >
BList< T >::BList
```

7.43.3.2 BList() [2/2]

```
template<class T >
BList< T >::BList (
            const BList< T > & l )
```

7.43.3.3 ~BList()

```
template<class T >
BList< T >::~BList  [virtual]
```

7.43.4 Member Function Documentation

7.43.4.1 start()

```
template<class T >
void BList< T >::start (
            BIter & i ) const
```

Iterator to start of list.

7.43.4.2 begin()

```
template<class T >
BIter BList< T >::begin
```

Iterator for start of list.

7.43.4.3 end() [1/2]

```
template<class T >
BIter BList< T >::end
```

Iterator for end of list.

7.43.4.4 end() [2/2]

```
template<class T >
BIter BList< T >::end (
            BIter & i ) const
```

Iterator for end of list.

7.43.4.5 next()

```
template<class T >
void BList< T >::next (
            BIter & i ) const
```

Iterator for next item in list.

7.43.4.6 prev()

```
template<class T >
void BList< T >::prev (
            BIter & i )
```

Iterator for previous item in list.

7.43.4.7 goTo()

```
template<class T >
BIter BList< T >::goTo (
            int pos ) const
```

Iterator for pos item in list.

7.43.4.8 position()

```
template<class T >
int BList< T >::position (
            BIter i )
```

Postition in list item with iterator i.

7.43.4.9 number()

```
template<class T >
unsigned int BList< T >::number
```

Number of items in list.

7.43.4.10 size()

```
template<class T >
unsigned int BList< T >::size
```

Number of items in list.

7.43.4.11 isStart()

```
template<class T >
int BList< T >::isStart (
            BIter & i ) const
```

True if iterator refers to first item.

7.43.4.12 isEnd()

```
template<class T >
int BList< T >::isEnd (
            BIter & i ) const
```

True if iterator refers to last item.

7.43.4.13 front()

```
template<class T >
T & BList< T >::front
```

Get first item in list.

7.43.4.14 rear()

```
template<class T >
T & BList< T >::rear
```

Get last item in list.

7.43.4.15 get() [1/2]

```
template<class T >
T & BList< T >::get (
            BIter i )
```

Get item specified by iterator in list.

7.43.4.16 get() [2/2]

```
template<class T >
const T & BList< T >::get (
            BIter i ) const
```

Get item specified by iterator in list.

7.43.4.17 append() [1/2]

```
template<class T >
void BList< T >::append (
            const T & item )
```

Append item to list.

7.43.4.18 insert()

```
template<class T >
void BList< T >::insert (
            BIter & i,
            const T & item )  [virtual]
```

Insert item before item.

7.43.4.19 insertAfter()

```
template<class T >
void BList< T >::insertAfter (
            BIter & i,
            const T & item )
```

Insert item after item.

7.43.4.20 clear()

```
template<class T >
void BList< T >::clear  [virtual]
```

Clear the list.

Reimplemented in BDict< Type >, BDir, BEntryList, BEntryFile, BQueue< T >, and BQueue< BoapMcPacket >.

7.43.4.21 del()

```
template<class T >
void BList< T >::del (
            BIter & i )  [virtual]
```

Delete specified item.

Reimplemented in BDict< Type >, and BEntryList.

7.43.4.22 deleteLast()

```
template<class T >
void BList< T >::deleteLast
```

Delete last item.

7.43.4.23 deleteFirst()

```
template<class T >
void BList< T >::deleteFirst
```

Delete fisrt item.

7.43.4.24 push()

```
template<class T >
void BList< T >::push (
            const T & i )
```

Push item onto list.

7.43.4.25 pop()

```
template<class T >
T BList< T >::pop
```

Pop item from list deleteing item.

7.43.4.26 queueAdd()

```
template<class T >
void BList< T >::queueAdd (
            const T & i )
```

Add item to end of list.

7.43.4.27 queueGet()

```
template<class T >
T BList< T >::queueGet
```

Get item from front of list deleteing item.

7.43.4.28 append() [2/2]

```
template<class T >
void BList< T >::append (
            const BList< T > & l )
```

Append list to list.

7.43.4.29 has()

```
template<class T >
int BList< T >::has (
            const T & i ) const
```

Checks if the item is in the list.

7.43.4.30 swap()

```
template<class T >
void BList< T >::swap (
            BIter i1,
            BIter i2 )
```

Swap two items in list.

7.43.4.31 sort() [1/2]

```
template<class T >
void BList< T >::sort
```

Sort list based on get(i) values.

7.43.4.32 sort() [2/2]

```
template<class T >
void BList< T >::sort (
            SortFunc func )
```

Sort list based on Sort func.

7.43.4.33 operator=()

```
template<class T >
BList< T > & BList< T >::operator= (
            const BList< T > & l )
```

7.43.4.34 operator[]() [1/4]

```
template<class T >
T & BList< T >::operator[] (
            int i )
```

7.43.4.35 operator[]() [2/4]

```
template<class T >
const T & BList< T >::operator[] (
            int i ) const
```

7.43.4.36 operator[]() [3/4]

```
template<class T >
T & BList< T >::operator[] (
            BIter i )
```

7.43.4.37 operator[]() [4/4]

```
template<class T >
const T & BList< T >::operator[] (
            const BIter & i ) const
```

7.43.4.38 operator+()

```
template<class T >
BList< T > BList< T >::operator+ (
            const BList< T > & l ) const
```

7.43.4.39 nodeGet() [1/2]

```
template<class T >
BList< T >::Node * BList< T >::nodeGet (
            BIter i )  [protected], [virtual]
```

7.43.4.40 nodeGet() [2/2]

```
template<class T >
const BList< T >::Node * BList< T >::nodeGet (
            BIter i ) const  [protected], [virtual]
```

7.43.4.41 nodeCreate()

```
template<class T >
BList< T >::Node * BList< T >::nodeCreate (
            const T & item )  [protected], [virtual]
```

7.43.5 Member Data Documentation

7.43.5.1 onodes

```
template<class T >
Node* BList< T >::onodes  [protected]
```

7.43.5.2 olength

```
template<class T >
unsigned int BList< T >::olength  [protected]
```

The documentation for this class was generated from the following files:

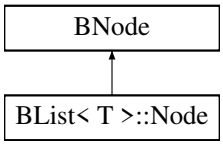
- BList.h
- BList_func.h

7.44 BList< T >::Node Class Reference

A BList internal Node.

`#include <BList.h>`

Inheritance diagram for BList< T >::Node:



Public Member Functions

- Node (const T &i)

Public Attributes

- T item

7.44.1 Detailed Description

template<class T>
class BList< T >::Node

A BList internal Node.

7.44.2 Constructor & Destructor Documentation

7.44.2.1 Node()

```
template<class T >
BList< T >::Node::Node (
            const T & i )  [inline]
```

7.44.3 Member Data Documentation

7.44.3.1 item

```
template<class T >
T BList< T >::Node::item
```

The documentation for this class was generated from the following file:

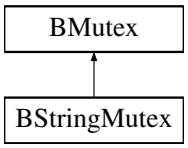
- BList.h

7.45 BMutex Class Reference

Mutex class. Note these are recursive Mutexes and so you need to make sure the number of unlocks equals the number of locks.

`#include <BMutex.h>`

Inheritance diagram for BMutex:



Public Types

- enum Type { Normal , Recursive }

Public Member Functions

- BMutex (Type type=Normal)
- BMutex (const BMutex &mutex)
- ~BMutex ()
- int lock ()

  Set lock, wait as necessary.
- int timedLock (int timeoutUs)

  Set lock, wait as necessary but timeout after given time.
- int unlock ()

  Unlock the lock.
- int tryLock ()

  Test the lock.
- BMutex & operator= (const BMutex &mutex)

7.45.1 Detailed Description

Mutex class. Note these are recursive Mutexes and so you need to make sure the number of unlocks equals the number of locks.

7.45.2 Member Enumeration Documentation

7.45.2.1 Type

```
enum BMutex::Type
```

Enumerator

Normal	
Recursive	

7.45.3 Constructor & Destructor Documentation

7.45.3.1 BMutex() [1/2]

```
BMutex::BMutex (
            Type type = Normal )
```

7.45.3.2 BMutex() [2/2]

```
BMutex::BMutex (
            const BMutex & mutex )
```

7.45.3.3 ~BMutex()

```
BMutex::~BMutex ( )
```

7.45.4 Member Function Documentation

7.45.4.1 lock()

```
int BMutex::lock ( )
```

Set lock, wait as necessary.

7.45.4.2 timedLock()

```
int BMutex::timedLock (
            int timeoutUs )
```

Set lock, wait as necessary but timeout after given time.

7.45.4.3 unlock()

```
int BMutex::unlock ( )
```

Unlock the lock.

7.45.4.4 tryLock()

```
int BMutex::tryLock ( )
```

Test the lock.

7.45.4.5 operator=()

```
BMutex & BMutex::operator= (
            const BMutex & mutex )
```

The documentation for this class was generated from the following files:

- BMutex.h
- BMutex.cpp

7.46 BMutexLock Class Reference

Mutex class that removes the lock on deletion and so is useful to lock data in a function call.

```
#include <BMutex.h>
```

Public Member Functions

- BMutexLock (BMutex &lock, int doLock=0)
- ~BMutexLock ()
- int lock ()
- int unlock ()

7.46.1 Detailed Description

Mutex class that removes the lock on deletion and so is useful to lock data in a function call.

7.46.2 Constructor & Destructor Documentation

7.46.2.1 BMutexLock()

```
BMutexLock::BMutexLock (
            BMutex & lock,
            int doLock = 0 )  [inline]
```

7.46.2.2 ~BMutexLock()

```
BMutexLock::~BMutexLock ( )  [inline]
```

7.46.3 Member Function Documentation

7.46.3.1 lock()

```
int BMutexLock::lock ( )  [inline]
```

7.46.3.2 unlock()

```
int BMutexLock::unlock ( )  [inline]
```

The documentation for this class was generated from the following file:

- BMutex.h

7.47 BMysql Class Reference

A class to provide access to a MySQL database.

```
#include <BMysql.h>
```

Public Member Functions

- BMysql ()
- ~BMysql ()
- BError open (BString hostName, BString dataBase, BString userName, BString password)
- void close ()
- BError get (BString table, BString where, BDictString &fields)
- BError insert (BString table, BDictString fields, BUInt32 *id=0)
- BError update (BString table, BUInt32 id, BDictString fields)
- BError del (BString table, BUInt32 id)

  Delete record from table.
- BError flush ()

  Flush all data to disk.
- BString escapeString (BString str)

  Escapes special characters in the string.
- BError query (BString cmd, BList< BDictString > &result)
- MYSQL & db ()
- void setDebug (int debug)

7.47.1 Detailed Description

A class to provide access to a MySQL database.

7.47.2 Constructor & Destructor Documentation

7.47.2.1 BMysql()

```
BMysql::BMysql ( )
```

7.47.2.2 ~BMysql()

```
BMysql::~BMysql ( )
```

7.47.3 Member Function Documentation

7.47.3.1 open()

```
BError BMysql::open (
            BString hostName,
            BString dataBase,
            BString userName,
            BString password )
```

7.47.3.2 close()

```
void BMysql::close ( )
```

7.47.3.3 get()

```
BError BMysql::get (
            BString table,
            BString where,
            BDictString & fields )
```

7.47.3.4 insert()

```
BError BMysql::insert (
            BString table,
            BDictString fields,
            BUInt32 * id = 0 )
```

7.47.3.5 update()

```
BError BMysql::update (
            BString table,
            BUInt32 id,
            BDictString fields )
```

7.47.3.6 del()

```
BError BMysql::del (
            BString table,
            BUInt32 id )
```

Delete record from table.

7.47.3.7 flush()

```
BError BMysql::flush ( )
```

Flush all data to disk.

7.47.3.8 escapeString()

```
BString BMysql::escapeString (
            BString str )
```

Escapes special characters in the string.

7.47.3.9 query()

```
BError BMysql::query (
            BString cmd,
            BList< BDictString > & result )
```

7.47.3.10 db()

```
MYSQL & BMysql::db ( )
```

7.47.3.11 setDebug()

```
void BMysql::setDebug (
            int debug )
```

The documentation for this class was generated from the following files:

- BMysql.h
- BMysql.cpp

7.48 BNameValue< T > Class Template Reference

A simple, templated, name/value pair.

```
#include <BNameValue.h>
```

Public Member Functions

- BNameValue ()
- BNameValue (BString name, const T &value)
- BString getName ()
- T & getValue ()

7.48.1 Detailed Description

template<class T>
class BNameValue< T >

A simple, templated, name/value pair.

7.48.2 Constructor & Destructor Documentation

7.48.2.1 BNameValue() [1/2]

```
template<class T >
BNameValue< T >::BNameValue ( )  [inline]
```

7.48.2.2 BNameValue() [2/2]

```
template<class T >
BNameValue< T >::BNameValue (
            BString name,
            const T & value )  [inline]
```

7.48.3 Member Function Documentation

7.48.3.1 getName()

```
template<class T >
BString BNameValue< T >::getName ( )  [inline]
```

7.48.3.2 getValue()

```
template<class T >
T & BNameValue< T >::getValue ( )  [inline]
```

The documentation for this class was generated from the following file:

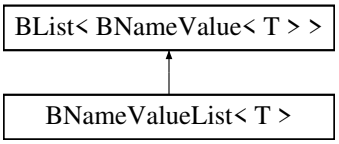
- BNameValue.h

7.49 BNameValueList< T > Class Template Reference

A simple, templated, name/value pair list.

`#include <BNameValue.h>`

Inheritance diagram for BNameValueList< T >:



Public Member Functions

- T * find (BString name)
- BIter findPos (BString name)

Additional Inherited Members

7.49.1 Detailed Description

template<class T>
class BNameValueList< T >

A simple, templated, name/value pair list.

7.49.2 Member Function Documentation

7.49.2.1 find()

```
template<class T >
T * BNameValueList< T >::find (
            BString name )  [inline]
```

7.49.2.2 findPos()

```
template<class T >
BIter BNameValueList< T >::findPos (
            BString name )  [inline]
```

The documentation for this class was generated from the following file:

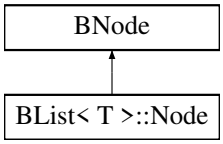
- BNameValue.h

7.50 BNode Class Reference

A BList entry's node.

```
#include <BList.h>
```

Inheritance diagram for BNode:



Public Member Functions

- BNode ()

Public Attributes

- BNode * next
- BNode * prev

7.50.1 Detailed Description

A BList entry's node.

7.50.2 Constructor & Destructor Documentation

7.50.2.1 BNode()

```
BNode::BNode ( )  [inline]
```

7.50.3 Member Data Documentation

7.50.3.1 next

```
BNode* BNode::next
```

7.50.3.2 prev

```
BNode* BNode::prev
```

The documentation for this class was generated from the following file:

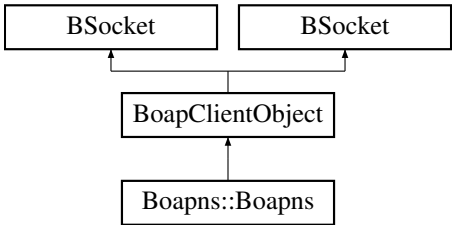
- BList.h

7.51 BoapClientObject Class Reference

Base for all Boap client objects.

`#include <Boap.h>`

Inheritance diagram for BoapClientObject:



Public Member Functions

- BoapClientObject (BString name="")
- virtual ~BoapClientObject ()
- BUInt32 apiVersion ()

  Returns the API version.
- BError connectService (BString name)

  Connects to the named service.
- BError disconnectService ()

  Disconnects from the named service.
- BString getServiceName ()

  Get the name of the service.
- BError ping (BUInt32 &apiVersion)

  Pings the connection and finds the remotes version number.
- BError setConnectionPriority (BoapPriority priority)

  Sets the connection priority.
- void setMaxLength (BUInt32 maxLength)

  Sets the maximum packet length.
- void setTimeout (int timeout)

  Sets the timeout in micro seconds. -1 is wait indefinitely.
- BoapClientObject (BString name)
- BError connectService (BString name)

Protected Member Functions

- BError pingLocked (BUInt32 &apiVersion)
- BError checkApiVersion ()
- BError performCall (BoapPacket &tx, BoapPacket &rx)

  Performs a RPC call to the named service.
- BError performSend (BoapPacket &tx)

  Performs a send to the named service.
- BError performRecv (BoapPacket &rx)

  Performs a receive.
- virtual BError handleReconnect (BError err)

  Handle a reconnect performing autorisaztion if required.
- BError performSend (BoapPacket &tx)
- BError performRecv (BoapPacket &rx)
- BError performCall (BoapPacket &tx, BoapPacket &rx)

Protected Attributes

- BString oname
- BUInt32 oapiVersion
- BoapPriority opriority
- BoapService oservice
- int oconnected
- BUInt32 omaxLength
- BoapPacket otx
- BoapPacket orx
- BMutex olock
- int otimeout
- int oreconnect

  Handle an automatic reconnect on timeout.

Additional Inherited Members

7.51.1 Detailed Description

Base for all Boap client objects.

7.51.2 Constructor & Destructor Documentation

7.51.2.1 BoapClientObject() [1/2]

```
BoapClientObject::BoapClientObject (
            BString name = "" )
```

7.51.2.2 ~BoapClientObject()

```
BoapClientObject::~BoapClientObject ( )  [virtual]
```

7.51.2.3 BoapClientObject() [2/2]

```
BoapClientObject::BoapClientObject (
            BString name )
```

7.51.3 Member Function Documentation

7.51.3.1 apiVersion()

```
BUInt32 BoapClientObject::apiVersion ( )
```

Returns the API version.

7.51.3.2 connectService() [1/2]

```
BError BoapClientObject::connectService (
            BString name )
```

Connects to the named service.

7.51.3.3 disconnectService()

```
BError BoapClientObject::disconnectService ( )
```

Disconnects from the named service.

7.51.3.4 getServiceName()

```
BString BoapClientObject::getServiceName ( )
```

Get the name of the service.

7.51.3.5 ping()

```
BError BoapClientObject::ping (
            BUInt32 & apiVersion )
```

Pings the connection and finds the remotes version number.

7.51.3.6 setConnectionPriority()

```
BError BoapClientObject::setConnectionPriority (
            BoapPriority priority )
```

Sets the connection priority.

7.51.3.7 setMaxLength()

```
void BoapClientObject::setMaxLength (
            BUInt32 maxLength )
```

Sets the maximum packet length.

7.51.3.8 setTimeout()

```
void BoapClientObject::setTimeout (
            int timeout )
```

Sets the timeout in micro seconds. -1 is wait indefinitely.

7.51.3.9 pingLocked()

```
BError BoapClientObject::pingLocked (
            BUInt32 & apiVersion )  [protected]
```

7.51.3.10 checkApiVersion()

```
BError BoapClientObject::checkApiVersion ( )  [protected]
```

7.51.3.11 performCall() [1/2]

```
BError BoapClientObject::performCall (
            BoapPacket & tx,
            BoapPacket & rx )  [protected]
```

Performs a RPC call to the named service.

7.51.3.12 performSend() [1/2]

```
BError BoapClientObject::performSend (
            BoapPacket & tx )  [protected]
```

Performs a send to the named service.

7.51.3.13 performRecv() [1/2]

```
BError BoapClientObject::performRecv (
            BoapPacket & rx )  [protected]
```

Performs a receive.

7.51.3.14 handleReconnect()

```
BError BoapClientObject::handleReconnect (
            BError err )  [protected], [virtual]
```

Handle a reconnect performing autorisaztion if required.

7.51.3.15 connectService() [2/2]

```
BError BoapClientObject::connectService (
            BString name )
```

7.51.3.16 performSend() [2/2]

```
BError BoapClientObject::performSend (
            BoapPacket & tx )  [protected]
```

7.51.3.17 performRecv() [2/2]

```
BError BoapClientObject::performRecv (
            BoapPacket & rx )  [protected]
```

7.51.3.18 performCall() [2/2]

```
BError BoapClientObject::performCall (
            BoapPacket & tx,
            BoapPacket & rx )  [protected]
```

7.51.4 Member Data Documentation

7.51.4.1 oname

```
BString BoapClientObject::oname  [protected]
```

7.51.4.2 oapiVersion

```
BUInt32 BoapClientObject::oapiVersion  [protected]
```

7.51.4.3 opriority

```
BoapPriority BoapClientObject::opriority  [protected]
```

7.51.4.4 oservice

```
BoapService BoapClientObject::oservice  [protected]
```

7.51.4.5 oconnected

```
int BoapClientObject::oconnected  [protected]
```

7.51.4.6 omaxLength

```
BUInt32 BoapClientObject::omaxLength  [protected]
```

7.51.4.7 otx

```
BoapPacket BoapClientObject::otx  [protected]
```

7.51.4.8 orx

```
BoapPacket BoapClientObject::orx  [protected]
```

7.51.4.9 olock

```
BMutex BoapClientObject::olock  [protected]
```

7.51.4.10 otimeout

```
int BoapClientObject::otimeout  [protected]
```

7.51.4.11 oreconnect

```
int BoapClientObject::oreconnect  [protected]
```

Handle an automatic reconnect on timeout.

The documentation for this class was generated from the following files:

- Boap.h
- BoapSimple.h
- Boap.cpp
- BoapSimple.cc

7.52 BoapFuncEntry Class Reference

Boap service function.

```
#include <Boap.h>
```

Public Member Functions

- BoapFuncEntry (int cmd, BoapFunc func)
- BoapFuncEntry (int cmd, BoapFunc func)

Public Attributes

- BUInt32 ocmd
- BoapFunc ofunc
- UInt32 ocmd

7.52.1 Detailed Description

Boap service function.

7.52.2 Constructor & Destructor Documentation

7.52.2.1 BoapFuncEntry() [1/2]

```
BoapFuncEntry::BoapFuncEntry (
            int cmd,
            BoapFunc func )
```

7.52.2.2 BoapFuncEntry() [2/2]

```
BoapFuncEntry::BoapFuncEntry (
            int cmd,
            BoapFunc func )
```

7.52.3 Member Data Documentation

7.52.3.1 ocmd [1/2]

```
BUInt32 BoapFuncEntry::ocmd
```

7.52.3.2 ofunc

```
BoapFunc BoapFuncEntry::ofunc
```

7.52.3.3 ocmd [2/2]

```
UInt32 BoapFuncEntry::ocmd
```

The documentation for this class was generated from the following files:

- Boap.h
- BoapSimple.h
- Boap.cpp
- BoapSimple.cc

7.53 BoapMc1Comms Class Reference

`#include <BoapMc1.h>`

Public Member Functions

- BoapMc1Comms (Bool threaded=0, BUInt reqSize=512)
- virtual ~BoapMc1Comms ()
- void setCommsMode (Bool halfDuplex)

  Sets half duplex mode.
- void setComms (BComms &comms)

  Sets the communications interface to use.
- void setComms (BComms *comms)

  Sets the communications interface to use.
- void setAddress (BUInt16 addressTo, BUInt16 addressFrom)

  Sets the to and from addresses.
- BUInt32 getApiVersion ()

  Returns the API version.
- BUInt32 setTimeout (BUInt32 timeoutUs)

  Sets the call timeout returning the current value.
- virtual BError validate ()

  Validate the request.
- BoapMc1Packet * packetRx ()

  Returns a reference to the current RX packet.
- virtual BError processRx ()

  Process any RX packets queuing them as needed.

Protected Member Functions

- virtual BError processRequests ()

  Check and process any requests.
- virtual BError processRequest ()

  Check and process any request.
- BError packetTx (BDataChunk *chunks, BUInt nChunks, BUInt16 waitCmdReply)
- BError packetRxData (void *data, BUInt nBytes)
- BError packetRxEnd ()

Protected Attributes

- Bool othreaded

  Threaded operation.
- BUInt32 oreqSize

  The maximum request size.
- BMutex olockCall

  Lock for RPC calls. Only one at a time.
- BMutex olockTx

  Lock for TX.
- BComms * ocomms
- BUInt32 oapiVersion

- Bool ohalfDuplex

  Half duplex mode.
- BUInt32 otimeout

  The timeout in us for calls.
- BUInt16 oaddressTo
- BUInt16 oaddressFrom
- BoapMc1Packet opacketRxBase
- BoapMc1Packet * opacketRx

  The RX packet.
- BoapMc1Packet opacketTxBase
- BoapMc1Packet * opacketTx

  The TX packet.
- BUInt opacketRpcCmd

  Waiting for RPC reply to cmd.
- BSemaphore opacketRpcSema

  Wait RPC reply semaphore.
- BSemaphore opacketRpcDoneSema

  Wait RPC complete semaphore.
- BoapMc1Error oerror

  The call return error;.

7.53.1 Constructor & Destructor Documentation

7.53.1.1 BoapMc1Comms()

```
BoapMc1Comms::BoapMc1Comms (
            Bool threaded = 0,
            BUInt reqSize = 512 )
```

7.53.1.2 ~BoapMc1Comms()

```
BoapMc1Comms::~BoapMc1Comms ( )  [virtual]
```

7.53.2 Member Function Documentation

7.53.2.1 setCommsMode()

```
void BoapMc1Comms::setCommsMode (
            Bool halfDuplex )
```

Sets half duplex mode.

7.53.2.2 setComms() [1/2]

```
void BoapMc1Comms::setComms (
            BComms & comms )
```

Sets the communications interface to use.

7.53.2.3 setComms() [2/2]

```
void BoapMc1Comms::setComms (
            BComms * comms )
```

Sets the communications interface to use.

7.53.2.4 setAddress()

```
void BoapMc1Comms::setAddress (
            BUInt16 addressTo,
            BUInt16 addressFrom )
```

Sets the to and from addresses.

7.53.2.5 getApiVersion()

```
BUInt32 BoapMc1Comms::getApiVersion ( )
```

Returns the API version.

7.53.2.6 setTimeout()

```
BUInt32 BoapMc1Comms::setTimeout (
            BUInt32 timeoutUs )
```

Sets the call timeout returning the current value.

7.53.2.7 validate()

```
BError BoapMc1Comms::validate ( )  [virtual]
```

Validate the request.

7.53.2.8 packetRx()

```
BoapMc1Packet * BoapMc1Comms::packetRx ( )
```

Returns a reference to the current RX packet.

7.53.2.9 processRx()

```
BError BoapMc1Comms::processRx ( )  [virtual]
```

Process any RX packets queuing them as needed.

7.53.2.10 processRequests()

```
BError BoapMc1Comms::processRequests ( )  [protected], [virtual]
```

Check and process any requests.

7.53.2.11 processRequest()

```
BError BoapMc1Comms::processRequest ( )  [protected], [virtual]
```

Check and process any request.

7.53.2.12 packetTx()

```
BError BoapMc1Comms::packetTx (
            BDataChunk * chunks,
            BUInt nChunks,
            BUInt16 waitCmdReply )  [protected]
```

7.53.2.13 packetRxData()

```
BError BoapMc1Comms::packetRxData (
            void * data,
            BUInt nBytes )  [protected]
```

7.53.2.14 packetRxEnd()

```
BError BoapMc1Comms::packetRxEnd ( )  [protected]
```

7.53.3 Member Data Documentation

7.53.3.1 othreaded

```
Bool BoapMc1Comms::othreaded  [protected]
```

Threaded operation.

7.53.3.2 oreqSize

```
BUInt32 BoapMc1Comms::oreqSize  [protected]
```

The maximum request size.

7.53.3.3 olockCall

```
BMutex BoapMc1Comms::olockCall  [protected]
```

Lock for RPC calls. Only one at a time.

7.53.3.4 olockTx

```
BMutex BoapMc1Comms::olockTx  [protected]
```

Lock for TX.

7.53.3.5 ocomms

```
BComms* BoapMc1Comms::ocomms  [protected]
```

7.53.3.6 oapiVersion

```
BUInt32 BoapMc1Comms::oapiVersion  [protected]
```

7.53.3.7 ohalfDuplex

```
Bool BoapMc1Comms::ohalfDuplex  [protected]
```

Half duplex mode.

7.53.3.8 otimeout

```
BUInt32 BoapMc1Comms::otimeout  [protected]
```

The timeout in us for calls.

7.53.3.9 oaddressTo

```
BUInt16 BoapMc1Comms::oaddressTo  [protected]
```

7.53.3.10 oaddressFrom

```
BUInt16 BoapMc1Comms::oaddressFrom  [protected]
```

7.53.3.11 opacketRxBase

```
BoapMc1Packet BoapMc1Comms::opacketRxBase  [protected]
```

7.53.3.12 opacketRx

```
BoapMc1Packet* BoapMc1Comms::opacketRx  [protected]
```

The RX packet.

7.53.3.13 opacketTxBase

```
BoapMc1Packet BoapMc1Comms::opacketTxBase  [protected]
```

7.53.3.14 opacketTx

```
BoapMc1Packet* BoapMc1Comms::opacketTx  [protected]
```

The TX packet.

7.53.3.15 opacketRpcCmd

```
BUInt BoapMc1Comms::opacketRpcCmd  [protected]
```

Waiting for RPC reply to cmd.

7.53.3.16 opacketRpcSema

```
BSemaphore BoapMc1Comms::opacketRpcSema  [protected]
```

Wait RPC reply semaphore.

7.53.3.17 opacketRpcDoneSema

```
BSemaphore BoapMc1Comms::opacketRpcDoneSema  [protected]
```

Wait RPC complete semaphore.

7.53.3.18 oerror

```
BoapMc1Error BoapMc1Comms::oerror  [protected]
```

The call return error;.

The documentation for this class was generated from the following files:

- BoapMc1.h
- BoapMc1.cpp

7.54 BoapMc1Error Struct Reference

`#include <BoapMc1.h>`

Public Attributes

- BInt16 number
  The error number.
- char string [32]
  The error string.

7.54.1 Member Data Documentation

7.54.1.1 number

`BInt16 BoapMc1Error::number`

The error number.

7.54.1.2 string

`char BoapMc1Error::string[32]`

The error string.

The documentation for this struct was generated from the following file:

- BoapMc1.h

7.55 BoapMc1Packet Class Reference

`#include <BoapMc1.h>`

Public Attributes

- BoapMc1PacketHead head
- char data [8]

7.55.1 Member Data Documentation

7.55.1.1 head

```
BoapMc1PacketHead BoapMc1Packet::head
```

7.55.1.2 data

```
char BoapMc1Packet::data[8]
```

The documentation for this class was generated from the following file:

- BoapMc1.h

7.56 BoapMc1PacketHead Struct Reference

```
#include <BoapMc1.h>
```

Public Attributes

- BUInt16 magic

  Packet magic pattern.
- BUInt16 length

  Total packet length including the header.
- BUInt16 addressTo

  Address to send to.
- BUInt16 addressFrom

  Address packet is from.
- BUInt16 cmd

  The RPC command or reply number.
- BInt16 error

  Error number.
- BUInt32 checksum

  Packet checksum, when used.

7.56.1 Member Data Documentation

7.56.1.1 magic

```
BUInt16 BoapMc1PacketHead::magic
```

Packet magic pattern.

7.56.1.2 length

```
BUInt16 BoapMc1PacketHead::length
```

Total packet length including the header.

7.56.1.3 addressTo

```
BUInt16 BoapMc1PacketHead::addressTo
```

Address to send to.

7.56.1.4 addressFrom

```
BUInt16 BoapMc1PacketHead::addressFrom
```

Address packet is from.

7.56.1.5 cmd

```
BUInt16 BoapMc1PacketHead::cmd
```

The RPC command or reply number.

7.56.1.6 error

```
BInt16 BoapMc1PacketHead::error
```

Error number.

7.56.1.7 checksum

```
BUInt32 BoapMc1PacketHead::checksum
```

Packet checksum, when used.

The documentation for this struct was generated from the following file:

- BoapMc1.h

7.57 BoapMcClientObject Class Reference

```
#include <BoapMc.h>
```

Public Member Functions

- BoapMcClientObject (BComms &comms)
- virtual ~BoapMcClientObject ()
- void setAddress (BUInt8 addressTo, BUInt8 addressFrom)
- BUInt32 getApiVersion ()

  Returns the API version.

Protected Member Functions

- BError performCall ()

  Performs a RPC call to the named service.
- BError performSend ()

  Performs a send to the named service.
- BError performRecv ()

  Performs a receive.

Protected Attributes

- BUInt32 oapiVersion
- BComms & ocomms
- BUInt8 oaddressTo
- BUInt8 oaddressFrom
- BoapMcPacket opacket

7.57.1 Constructor & Destructor Documentation

7.57.1.1 BoapMcClientObject()

```
BoapMcClientObject::BoapMcClientObject (
            BComms & comms )
```

7.57.1.2 ~BoapMcClientObject()

```
BoapMcClientObject::~BoapMcClientObject ( )  [virtual]
```

7.57.2 Member Function Documentation

7.57.2.1 setAddress()

```
void BoapMcClientObject::setAddress (
            BUInt8 addressTo,
            BUInt8 addressFrom )
```

7.57.2.2 getApiVersion()

```
BUInt32 BoapMcClientObject::getApiVersion ( )
```

Returns the API version.

7.57.2.3 performCall()

```
BError BoapMcClientObject::performCall ( )  [protected]
```

Performs a RPC call to the named service.

7.57.2.4 performSend()

```
BError BoapMcClientObject::performSend ( )  [protected]
```

Performs a send to the named service.

7.57.2.5 performRecv()

```
BError BoapMcClientObject::performRecv ( )  [protected]
```

Performs a receive.

7.57.3 Member Data Documentation

7.57.3.1 oapiVersion

```
BUInt32 BoapMcClientObject::oapiVersion  [protected]
```

7.57.3.2 ocomms

```
BComms& BoapMcClientObject::ocomms  [protected]
```

7.57.3.3 oaddressTo

```
BUInt8 BoapMcClientObject::oaddressTo  [protected]
```

7.57.3.4 oaddressFrom

```
BUInt8 BoapMcClientObject::oaddressFrom  [protected]
```

7.57.3.5 opacket

```
BoapMcPacket BoapMcClientObject::opacket  [protected]
```

The documentation for this class was generated from the following files:

- BoapMc.h
- BoapMc.cpp

7.58 BoapMcComms Class Reference

`#include <BoapMc.h>`

Public Member Functions

- BoapMcComms (Bool threaded=0, BUInt rxQueueSize=4)
- virtual ~BoapMcComms ()
- void setCommsMode (Bool slave, BUInt txQueueSize)

  Sets slave mode.
- void setComms (BComms &comms)

  Sets the communications interface to use.
- void setComms (BComms *comms)

  Sets the communications interface to use.
- void setAddress (BUInt8 addressTo, BUInt8 addressFrom)

  Sets the to and from addresses.
- BUInt32 getApiVersion ()

  Returns the API version.
- BUInt32 setTimeout (BUInt32 timeoutUs)

  Sets the call timeout returning the current value.
- virtual BError processRx (BTimeout timeoutUs=BTimeoutForever)

  Process any RX packets queuing them as needed.
- virtual BError processRequests (BTimeout timeoutUs=BTimeoutForever)

  Check and process all requests.
- virtual BError processRequest (BTimeout timeoutUs=BTimeoutForever)

  Check and process any request.
- virtual BError processPacket (BoapMcPacket &rx, BoapMcPacket &tx)

  Process a recieved packet.

Protected Member Functions

- BError performCall ()

  Performs a RPC call to the remote side.
- BError performSend ()

  Performs a RPC send to the remote side.
- BError packetSend (BoapMcPacket &packet)

  Receives a packet.
- BError packetRecv (BoapMcPacket &packet)

  Receives a packet.

Protected Attributes

- Bool othreaded
- BMutex olockCall

  Lock for RPC calls. Only one at a time.
- BMutex olockTx

  Lock for TX.
- BComms * ocomms
- BUInt32 oapiVersion
- Bool oslave

  Set slave mode.
- BUInt32 otimeout

  The timeout in us for calls.
- BUInt8 oaddressTo
- BUInt8 oaddressFrom
- BoapMcPacket opacket

  Packet RX buffer.
- BoapMcPacket opacketTx

  Packet TX buffer for calls.
- BoapMcPacket opacketRx

  Packet RX buffer for calls.
- BSemaphore opacketRxSema

  Wait RX semaphore.
- BoapMcPacket opacketReqTx

  Packet TX buffer for requests.
- BoapMcPacket opacketReqRx

  Packet RX buffer for requests.
- BQueue< BoapMcPacket > opacketReqQueue

  Packet RX buffer queue for requests.
- BFifo< BoapMcPacket > opacketTxQueue

  Packet TX Queue.
- BSemaphoreCount opacketTxQueueWriteNum

  Packet TX Queue number.
- BSemaphore opacketTxSema

  Wait for TX semaphore.

7.58.1 Constructor & Destructor Documentation

7.58.1.1 BoapMcComms()

```
BoapMcComms::BoapMcComms (
            Bool threaded = 0,
            BUInt rxQueueSize = 4 )
```

7.58.1.2 ~BoapMcComms()

```
BoapMcComms::~BoapMcComms ( )  [virtual]
```

7.58.2 Member Function Documentation

7.58.2.1 setCommsMode()

```
void BoapMcComms::setCommsMode (
            Bool slave,
            BUInt txQueueSize )
```

Sets slave mode.

7.58.2.2 setComms() [1/2]

```
void BoapMcComms::setComms (
            BComms & comms )
```

Sets the communications interface to use.

7.58.2.3 setComms() [2/2]

```
void BoapMcComms::setComms (
            BComms * comms )
```

Sets the communications interface to use.

7.58.2.4 setAddress()

```
void BoapMcComms::setAddress (
            BUInt8 addressTo,
            BUInt8 addressFrom )
```

Sets the to and from addresses.

7.58.2.5 getApiVersion()

```
BUInt32 BoapMcComms::getApiVersion ( )
```

Returns the API version.

7.58.2.6 setTimeout()

```
BUInt32 BoapMcComms::setTimeout (
            BUInt32 timeoutUs )
```

Sets the call timeout returning the current value.

7.58.2.7 processRx()

```
BError BoapMcComms::processRx (
            BTimeout timeoutUs = BTimeoutForever )  [virtual]
```

Process any RX packets queuing them as needed.

!!! This should wait on comms for timeoutUs !!!

7.58.2.8 processRequests()

```
BError BoapMcComms::processRequests (
            BTimeout timeoutUs = BTimeoutForever )  [virtual]
```

Check and process all requests.

7.58.2.9 processRequest()

```
BError BoapMcComms::processRequest (
            BTimeout timeoutUs = BTimeoutForever )  [virtual]
```

Check and process any request.

7.58.2.10 processPacket()

```
BError BoapMcComms::processPacket (
            BoapMcPacket & rx,
            BoapMcPacket & tx )  [virtual]
```

Process a recieved packet.

7.58.2.11 performCall()

```
BError BoapMcComms::performCall ( )  [protected]
```

Performs a RPC call to the remote side.

7.58.2.12 performSend()

```
BError BoapMcComms::performSend ( )  [protected]
```

Performs a RPC send to the remote side.

7.58.2.13 packetSend()

```
BError BoapMcComms::packetSend (
            BoapMcPacket & packet )  [protected]
```

Receives a packet.

7.58.2.14 packetRecv()

```
BError BoapMcComms::packetRecv (
            BoapMcPacket & packet )  [protected]
```

Receives a packet.

7.58.3 Member Data Documentation

7.58.3.1 othreaded

```
Bool BoapMcComms::othreaded  [protected]
```

7.58.3.2 olockCall

```
BMutex BoapMcComms::olockCall  [protected]
```

Lock for RPC calls. Only one at a time.

7.58.3.3 olockTx

```
BMutex BoapMcComms::olockTx  [protected]
```

Lock for TX.

7.58.3.4 ocomms

```
BComms* BoapMcComms::ocomms  [protected]
```

7.58.3.5 oapiVersion

```
BUInt32 BoapMcComms::oapiVersion  [protected]
```

7.58.3.6 oslave

```
Bool BoapMcComms::oslave  [protected]
```

Set slave mode.

7.58.3.7 otimeout

```
BUInt32 BoapMcComms::otimeout  [protected]
```

The timeout in us for calls.

7.58.3.8 oaddressTo

```
BUInt8 BoapMcComms::oaddressTo  [protected]
```

7.58.3.9 oaddressFrom

```
BUInt8 BoapMcComms::oaddressFrom  [protected]
```

7.58.3.10 opacket

```
BoapMcPacket BoapMcComms::opacket  [protected]
```

Packet RX buffer.

7.58.3.11 opacketTx

```
BoapMcPacket BoapMcComms::opacketTx  [protected]
```

Packet TX buffer for calls.

7.58.3.12 opacketRx

```
BoapMcPacket BoapMcComms::opacketRx  [protected]
```

Packet RX buffer for calls.

7.58.3.13 opacketRxSema

```
BSemaphore BoapMcComms::opacketRxSema  [protected]
```

Wait RX semaphore.

7.58.3.14 opacketReqTx

```
BoapMcPacket BoapMcComms::opacketReqTx  [protected]
```

Packet TX buffer for requests.

7.58.3.15 opacketReqRx

```
BoapMcPacket BoapMcComms::opacketReqRx  [protected]
```

Packet RX buffer for requests.

7.58.3.16 opacketReqQueue

```
BQueue<BoapMcPacket> BoapMcComms::opacketReqQueue  [protected]
```

Packet RX buffer queue for requests.

7.58.3.17 opacketTxQueue

```
BFifo<BoapMcPacket> BoapMcComms::opacketTxQueue  [protected]
```

Packet TX Queue.

7.58.3.18 opacketTxQueueWriteNum

```
BSemaphoreCount BoapMcComms::opacketTxQueueWriteNum  [protected]
```

Packet TX Queue number.

7.58.3.19 opacketTxSema

```
BSemaphore BoapMcComms::opacketTxSema  [protected]
```

Wait for TX semaphore.

The documentation for this class was generated from the following files:

- BoapMc.h
- BoapMc.cpp

7.59 BoapMcPacket Class Reference

```
#include <BoapMc.h>
```

Public Attributes

- BoapMcPacketHead head
- char data [256 - sizeof(BoapMcPacketHead)]

7.59.1 Member Data Documentation

7.59.1.1 head

```
BoapMcPacketHead BoapMcPacket::head
```

7.59.1.2 data

```
char BoapMcPacket::data[256 - sizeof(BoapMcPacketHead)]
```

The documentation for this class was generated from the following file:

- BoapMc.h

7.60 BoapMcPacketHead Struct Reference

```
#include <BoapMc.h>
```

Public Attributes

- BUInt8 length
- BUInt8 addressTo
- BUInt8 addressFrom
- BUInt8 cmd
- BUInt16 error
- BUInt16 checksum

7.60.1 Member Data Documentation

7.60.1.1 length

```
BUInt8 BoapMcPacketHead::length
```

7.60.1.2 addressTo

```
BUInt8 BoapMcPacketHead::addressTo
```

7.60.1.3 addressFrom

```
BUInt8 BoapMcPacketHead::addressFrom
```

7.60.1.4 cmd

```
BUInt8 BoapMcPacketHead::cmd
```

7.60.1.5 error

```
BUInt16 BoapMcPacketHead::error
```

7.60.1.6 checksum

```
BUInt16 BoapMcPacketHead::checksum
```

The documentation for this struct was generated from the following file:

- BoapMc.h

7.61 BoapMcServiceObject Class Reference

```
#include <BoapMc.h>
```

Public Member Functions

- BoapMcServiceObject ()
- virtual ~BoapMcServiceObject ()
- virtual BError process (BoapMcPacket &rx, BoapMcPacket &tx)
- virtual BError processEvent (BoapMcPacket &rx)

Protected Member Functions

- BError sendEvent (BoapMcPacket &tx)

Protected Attributes

- BUInt32 oapiVersion

7.61.1 Constructor & Destructor Documentation

7.61.1.1 BoapMcServiceObject()

```
BoapMcServiceObject::BoapMcServiceObject ( )
```

7.61.1.2 ~BoapMcServiceObject()

```
BoapMcServiceObject::~BoapMcServiceObject ( )  [virtual]
```

7.61.2 Member Function Documentation

7.61.2.1 process()

```
BError BoapMcServiceObject::process (
            BoapMcPacket & rx,
            BoapMcPacket & tx )  [virtual]
```

7.61.2.2 processEvent()

```
BError BoapMcServiceObject::processEvent (
            BoapMcPacket & rx )  [virtual]
```

7.61.2.3 sendEvent()

```
BError BoapMcServiceObject::sendEvent (
            BoapMcPacket & tx )  [protected]
```

7.61.3 Member Data Documentation

7.61.3.1 oapiVersion

```
BUInt32 BoapMcServiceObject::oapiVersion  [protected]
```

The documentation for this class was generated from the following files:

- BoapMc.h
- BoapMc.cpp

7.62 BoapMcSignalObject Class Reference

```
#include <BoapMc.h>
```

Public Member Functions

- BoapMcSignalObject (BComms &comms)

Protected Member Functions

- BError performSend (BoapMcPacket &tx)

Protected Attributes

- BComms & ocomms

7.62.1 Constructor & Destructor Documentation

7.62.1.1 BoapMcSignalObject()

```
BoapMcSignalObject::BoapMcSignalObject (
            BComms & comms )
```

7.62.2 Member Function Documentation

7.62.2.1 performSend()

```
BError BoapMcSignalObject::performSend (
            BoapMcPacket & tx )  [protected]
```

7.62.3 Member Data Documentation

7.62.3.1 ocomms

```
BComms& BoapMcSignalObject::ocomms  [protected]
```

The documentation for this class was generated from the following files:

- BoapMc.h
- BoapMc.cpp

7.63 Boapns::BoapEntry Class Reference

```
#include <BoapnsD.h>
```

Public Member Functions

- BoapEntry (BString name=BString(), BString hostName=BString(), BList< BString > addressList=BList< BString >(), BUInt32 port=0, BUInt32 service=0)

Public Attributes

- BString name
- BString hostName
- BList< BString > addressList
- BUInt32 port
- BUInt32 service

7.63.1 Constructor & Destructor Documentation

7.63.1.1 BoapEntry()

```
Boapns::BoapEntry::BoapEntry (
            BString name = BString(),
            BString hostName = BString(),
            BList< BString > addressList = BList<BString >(),
            BUInt32 port = 0,
            BUInt32 service = 0 )
```

7.63.2 Member Data Documentation

7.63.2.1 name

```
BString Boapns::BoapEntry::name
```

7.63.2.2 hostName

```
BString Boapns::BoapEntry::hostName
```

7.63.2.3 addressList

```
BList<BString > Boapns::BoapEntry::addressList
```

7.63.2.4 port

```
BUInt32 Boapns::BoapEntry::port
```

7.63.2.5 service

```
BUInt32 Boapns::BoapEntry::service
```

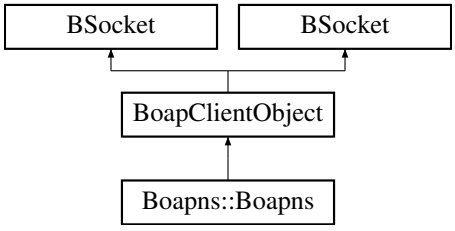
The documentation for this class was generated from the following files:

- BoapnsD.h
- BoapnsD.cpp

7.64 Boapns::Boapns Class Reference

```
#include <BoapnsC.h>
```

Inheritance diagram for Boapns::Boapns:



Public Member Functions

- Boapns (BString name="")
- BError getVersion (BString &version)

  Get the Boapns version.
- BError getEntryList (BList< BoapEntry > &entryList)
- BError getEntry (BString name, BoapEntry &entry)
- BError addEntry (BoapEntry entry)
- BError delEntry (BString name)
- BError getNewName (BString &name)

Additional Inherited Members

7.64.1 Constructor & Destructor Documentation

7.64.1.1 Boapns()

```
Boapns::Boapns::Boapns (
            BString name = "" )
```

7.64.2 Member Function Documentation

7.64.2.1 getVersion()

```
BError Boapns::Boapns::getVersion (
            BString & version )
```

Get the Boapns version.

7.64.2.2 getEntryList()

```
BError Boapns::Boapns::getEntryList (
            BList< BoapEntry > & entryList )
```

7.64.2.3 getEntry()

```
BError Boapns::Boapns::getEntry (
            BString name,
            BoapEntry & entry )
```

7.64.2.4 addEntry()

```
BError Boapns::Boapns::addEntry (
            BoapEntry entry )
```

7.64.2.5 delEntry()

```
BError Boapns::Boapns::delEntry (
            BString name )
```

7.64.2.6 getNewName()

```
BError Boapns::Boapns::getNewName (
            BString & name )
```

The documentation for this class was generated from the following files:

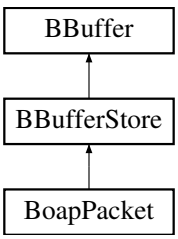
- BoapnsC.h
- BoapnsC.cpp

7.65 BoapPacket Class Reference

Boap packet.

`#include <Boap.h>`

Inheritance diagram for BoapPacket:



Public Member Functions

- BoapPacket ()
- ~BoapPacket ()
- BUInt32 getCmd ()
- int peekHead (BoapPacketHead &head)
- int pushHead (BoapPacketHead &head)
- int popHead (BoapPacketHead &head)
- void updateHead ()
- BoapPacket ()
- ~BoapPacket ()
- int resize (int size)
- BError setData (void *data, int nbytes)
- int nbytes ()
- char * data ()
- int pushHead (BoapPacketHead &head)
- int push (Int8 v)
- int push (UInt8 v)
- int push (Int16 v)
- int push (UInt16 v)
- int push (Int32 v)
- int push (UInt32 v)
- int push (BString &v)
- int push (Double v)
- int push (BError &v)
- int push (UInt32 nBytes, const void *data)
- int popHead (BoapPacketHead &head)
- int pop (Int8 &v)
- int pop (UInt8 &v)
- int pop (Int16 &v)
- int pop (UInt16 &v)
- int pop (Int32 &v)
- int pop (UInt32 &v)
- int pop (BString &v)
- int pop (Double &v)
- int pop (BError &v)
- int pop (UInt32 nBytes, void *data)

Additional Inherited Members

7.65.1 Detailed Description

Boap packet.

7.65.2 Constructor & Destructor Documentation

7.65.2.1 BoapPacket() [1/2]

```
BoapPacket::BoapPacket ( )
```

7.65.2.2 ~BoapPacket() [1/2]

```
BoapPacket::~BoapPacket ( )
```

7.65.2.3 BoapPacket() [2/2]

```
BoapPacket::BoapPacket ( )
```

7.65.2.4 ~BoapPacket() [2/2]

```
BoapPacket::~BoapPacket ( )
```

7.65.3 Member Function Documentation

7.65.3.1 getCmd()

```
BUInt32 BoapPacket::getCmd ( )
```

7.65.3.2 peekHead()

```
int BoapPacket::peekHead (
            BoapPacketHead & head )
```

7.65.3.3 pushHead() [1/2]

```
int BoapPacket::pushHead (
            BoapPacketHead & head )
```

7.65.3.4 popHead() [1/2]

```
int BoapPacket::popHead (
            BoapPacketHead & head )
```

7.65.3.5 updateHead()

```
void BoapPacket::updateHead ( )
```

7.65.3.6 resize()

```
int BoapPacket::resize (
            int size )
```

7.65.3.7 setData()

```
BError BoapPacket::setData (
            void * data,
            int nbytes )
```

7.65.3.8 nbytes()

```
int BoapPacket::nbytes ( )
```

7.65.3.9 data()

```
char * BoapPacket::data ( )
```

7.65.3.10 pushHead() [2/2]

```
int BoapPacket::pushHead (
            BoapPacketHead & head )
```

7.65.3.11 push() [1/10]

```
int BoapPacket::push (
            Int8 v )
```

7.65.3.12 push() [2/10]

```
int BoapPacket::push (
            UInt8 v )
```

7.65.3.13 push() [3/10]

```
int BoapPacket::push (
            Int16 v )
```

7.65.3.14 push() [4/10]

```
int BoapPacket::push (
            UInt16 v )
```

7.65.3.15 push() [5/10]

```
int BoapPacket::push (
            Int32 v )
```

7.65.3.16 push() [6/10]

```
int BoapPacket::push (
            UInt32 v )
```

7.65.3.17 push() [7/10]

```
int BoapPacket::push (
            BString & v )
```

7.65.3.18 push() [8/10]

```
int BoapPacket::push (
            Double v )
```

7.65.3.19 push() [9/10]

```
int BoapPacket::push (
            BError & v )
```

7.65.3.20 push() [10/10]

```
int BoapPacket::push (
            UInt32 nBytes,
            const void * data )
```

7.65.3.21 popHead() [2/2]

```
int BoapPacket::popHead (
            BoapPacketHead & head )
```

7.65.3.22 pop() [1/10]

```
int BoapPacket::pop (
            Int8 & v )
```

7.65.3.23 pop() [2/10]

```
int BoapPacket::pop (
            UInt8 & v )
```

7.65.3.24 pop() [3/10]

```
int BoapPacket::pop (
            Int16 & v )
```

7.65.3.25 pop() [4/10]

```
int BoapPacket::pop (
            UInt16 & v )
```

7.65.3.26 pop() [5/10]

```
int BoapPacket::pop (
            Int32 & v )
```

7.65.3.27 pop() [6/10]

```
int BoapPacket::pop (
            UInt32 & v )
```

7.65.3.28 pop() [7/10]

```
int BoapPacket::pop (
            BString & v )
```

7.65.3.29 pop() [8/10]

```
int BoapPacket::pop (
            Double & v )
```

7.65.3.30 pop() [9/10]

```
int BoapPacket::pop (
            BError & v )
```

7.65.3.31 pop() [10/10]

```
int BoapPacket::pop (
            UInt32 nBytes,
            void * data )
```

The documentation for this class was generated from the following files:

- Boap.h
- BoapSimple.h
- Boap.cpp
- BoapSimple.cc

7.66 BoapPacketHead Struct Reference

Boap packet header.

```
#include <Boap.h>
```

Public Attributes

- BUInt32 type
- BUInt32 length
- BUInt32 service
- BUInt32 cmd
- UInt32 length
- BoapType type
- BoapService service
- UInt32 cmd
- UInt32 reserved [12]

7.66.1 Detailed Description

Boap packet header.

7.66.2 Member Data Documentation

7.66.2.1 type [1/2]

```
BUInt32 BoapPacketHead::type
```

7.66.2.2 length [1/2]

```
BUInt32 BoapPacketHead::length
```

7.66.2.3 service [1/2]

```
BUInt32 BoapPacketHead::service
```

7.66.2.4 cmd [1/2]

```
BUInt32 BoapPacketHead::cmd
```

7.66.2.5 length [2/2]

```
UInt32 BoapPacketHead::length
```

7.66.2.6 type [2/2]

```
BoapType BoapPacketHead::type
```

7.66.2.7 service [2/2]

```
BoapService BoapPacketHead::service
```

7.66.2.8 cmd [2/2]

```
UInt32 BoapPacketHead::cmd
```

7.66.2.9 reserved

```
UInt32 BoapPacketHead::reserved[12]
```

The documentation for this struct was generated from the following files:

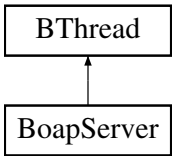
- Boap.h
- BoapSimple.h

7.67 BoapServer Class Reference

Boap server.

```
#include <Boap.h>
```

Inheritance diagram for BoapServer:



Public Types

- enum { NOTHREADS =0 , THREADED =1 }

Public Member Functions

- BoapServer ()
- virtual ~BoapServer ()
- virtual BError init (BString boapNsHost="", int port=0, int threaded=0, int isBoapns=0)
- virtual BError run (int inThread=0)
- virtual BError process (BoapServerConnection *conn, BoapPacket &rx, BoapPacket &tx)
- virtual BError processEvent (BoapPacket &rx)
- virtual BError addObject (BoapServiceObject *object)
- virtual BError sendEvent (BoapPacket &tx)
- virtual BError processEvent (int fd)
- virtual void clientGone (BoapServerConnection *client)
- BSocket & getSocket ()
- BSocket & getEventSocket ()
- BString getHostName ()
- int getConnectionsNumber ()
- void closeConnections ()
- virtual BoapServerConnection * newConnection (int fd, BSocketAddressINET address)
- BoapServer ()
- BError init (int boapNs=0)
- BError run ()
- BError processEvent (BoapPacket &rx)
- BError addObject (BoapServiceObject *object)
- BError process (int fd)
- BError sendEvent (BoapPacket &tx)
- BSocket & getSocket ()
- BSocket & getEventSocket ()
- BError processEvent (int fd)
- BString getHostName ()

Public Attributes

- BUInt64 onumOperations

Protected Member Functions

- void * function ()

Protected Attributes

- BMutex olock
- int othreaded
- int oisBoapns
- Boapns::Boapns * oboapns
- BList< BoapServerConnection * > oclients
- BEvent1Int oclientGoneEvent
- BList< BoapServiceEntry > oservices
- BPoll opoll
- BSocket onet
- BSocket onetEvent
- BSocketAddressINET onetEventAddress
- BString ohostName

7.67.1 Detailed Description

Boap server.

7.67.2 Member Enumeration Documentation

7.67.2.1 anonymous enum

```
anonymous enum
```

Enumerator

NOTHREADS	
THREADED	

7.67.3 Constructor & Destructor Documentation

7.67.3.1 BoapServer() [1/2]

```
BoapServer::BoapServer ( )
```

7.67.3.2 ~BoapServer()

```
BoapServer::~BoapServer ( )  [virtual]
```

7.67.3.3 BoapServer() [2/2]

```
BoapServer::BoapServer ( )
```

7.67.4 Member Function Documentation

7.67.4.1 init() [1/2]

```
BError BoapServer::init (
            BString boapNsHost = "",
            int port = 0,
            int threaded = 0,
            int isBoapns = 0 )  [virtual]
```

7.67.4.2 run() [1/2]

```
BError BoapServer::run (
            int inThread = 0 )  [virtual]
```

7.67.4.3 process() [1/2]

```
BError BoapServer::process (
            BoapServerConnection * conn,
            BoapPacket & rx,
            BoapPacket & tx )  [virtual]
```

7.67.4.4 processEvent() [1/4]

```
BError BoapServer::processEvent (
            BoapPacket & rx )  [virtual]
```

7.67.4.5 addObject() [1/2]

```
BError BoapServer::addObject (
            BoapServiceObject * object )  [virtual]
```

7.67.4.6 sendEvent() [1/2]

```
BError BoapServer::sendEvent (
            BoapPacket & tx )  [virtual]
```

7.67.4.7 processEvent() [2/4]

```
BError BoapServer::processEvent (
            int fd )  [virtual]
```

7.67.4.8 clientGone()

```
void BoapServer::clientGone (
            BoapServerConnection * client )  [virtual]
```

7.67.4.9 getSocket() [1/2]

```
BSocket & BoapServer::getSocket ( )
```

7.67.4.10 getEventSocket() [1/2]

```
BSocket & BoapServer::getEventSocket ( )
```

7.67.4.11 getHostName() [1/2]

```
BString BoapServer::getHostName ( )
```

7.67.4.12 getConnectionsNumber()

```
int BoapServer::getConnectionsNumber ( )
```

7.67.4.13 closeConnections()

```
void BoapServer::closeConnections ( )
```

7.67.4.14 newConnection()

```
BoapServerConnection * BoapServer::newConnection (
            int fd,
            BSocketAddressINET address )  [virtual]
```

7.67.4.15 function()

```
void * BoapServer::function ( )  [protected], [virtual]
```

Reimplemented from BThread.

7.67.4.16 init() [2/2]

```
BError BoapServer::init (
            int boapNs = 0 )
```

7.67.4.17 run() [2/2]

```
BError BoapServer::run ( )
```

7.67.4.18 processEvent() [3/4]

```
BError BoapServer::processEvent (
            BoapPacket & rx )
```

7.67.4.19 addObject() [2/2]

```
BError BoapServer::addObject (
            BoapServiceObject * object )
```

7.67.4.20 process() [2/2]

```
BError BoapServer::process (
            int fd )
```

7.67.4.21 sendEvent() [2/2]

```
BError BoapServer::sendEvent (
            BoapPacket & tx )
```

7.67.4.22 getSocket() [2/2]

```
BSocket & BoapServer::getSocket ( )
```

7.67.4.23 getEventSocket() [2/2]

```
BSocket & BoapServer::getEventSocket ( )
```

7.67.4.24 processEvent() [4/4]

```
BError BoapServer::processEvent (
            int fd )
```

7.67.4.25 getHostName() [2/2]

```
BString BoapServer::getHostName ( )
```

7.67.5 Member Data Documentation

7.67.5.1 olock

```
BMutex BoapServer::olock  [protected]
```

7.67.5.2 othreaded

```
int BoapServer::othreaded  [protected]
```

7.67.5.3 oisBoapns

```
int BoapServer::oisBoapns  [protected]
```

7.67.5.4 oboapns

```
Boapns::Boapns* BoapServer::oboapns  [protected]
```

7.67.5.5 oclients

```
BList<BoapServerConnection*> BoapServer::oclients  [protected]
```

7.67.5.6 oclientGoneEvent

```
BEvent1Int BoapServer::oclientGoneEvent  [protected]
```

7.67.5.7 oservices

```
BList< BoapServiceEntry > BoapServer::oservices  [protected]
```

7.67.5.8 opoll

```
BPoll BoapServer::opoll  [protected]
```

7.67.5.9 onet

```
BSocket BoapServer::onet  [protected]
```

7.67.5.10 onetEvent

```
BSocket BoapServer::onetEvent  [protected]
```

7.67.5.11 onetEventAddress

```
BSocketAddressINET BoapServer::onetEventAddress  [protected]
```

7.67.5.12 ohostName

```
BString BoapServer::ohostName  [protected]
```

7.67.5.13 onumOperations

```
BUInt64 BoapServer::onumOperations
```

The documentation for this class was generated from the following files:

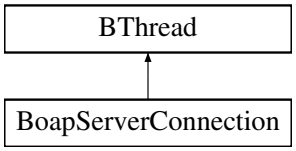
- Boap.h
- BoapSimple.h
- Boap.cpp
- BoapSimple.cc

7.68 BoapServerConnection Class Reference

Boap server connection.

`#include <Boap.h>`

Inheritance diagram for BoapServerConnection:



Public Member Functions

- BoapServerConnection (BoapServer &boapServer, int fd)
- virtual ~BoapServerConnection ()
- virtual BError init ()

  Initialise connection.
- virtual BError process ()
- virtual BSocket & getSocket ()
- virtual void setMaxLength (BUInt32 maxLength)
- virtual BError getHead (BoapPacketHead &head)
- virtual BError validate ()

  Validate the connection.

7.68.1 Detailed Description

Boap server connection.

7.68.2 Constructor & Destructor Documentation

7.68.2.1 BoapServerConnection()

```
BoapServerConnection::BoapServerConnection (
            BoapServer & boapServer,
            int fd )
```

7.68.2.2 ~BoapServerConnection()

```
BoapServerConnection::~BoapServerConnection ( )  [virtual]
```

7.68.3 Member Function Documentation

7.68.3.1 init()

```
BError BoapServerConnection::init ( )  [virtual]
```

Initialise connection.

7.68.3.2 process()

```
BError BoapServerConnection::process ( )  [virtual]
```

7.68.3.3 getSocket()

```
BSocket & BoapServerConnection::getSocket ( )  [virtual]
```

7.68.3.4 setMaxLength()

```
void BoapServerConnection::setMaxLength (
            BUInt32 maxLength )  [virtual]
```

7.68.3.5 getHead()

```
BError BoapServerConnection::getHead (
            BoapPacketHead & head )  [virtual]
```

7.68.3.6 validate()

```
BError BoapServerConnection::validate ( )  [virtual]
```

Validate the connection.

The documentation for this class was generated from the following files:

- Boap.h
- Boap.cpp

7.69 BoapServiceEntry Class Reference

Boap server single service entry.

`#include <Boap.h>`

Public Member Functions

- BoapServiceEntry (BoapService service=0, BoapServiceObject *object=0)
- BoapServiceEntry (BoapService service=0, BoapServiceObject *object=0)

Public Attributes

- BoapService oservice
- BoapServiceObject * oobject

7.69.1 Detailed Description

Boap server single service entry.

7.69.2 Constructor & Destructor Documentation

7.69.2.1 BoapServiceEntry() [1/2]

```
BoapServiceEntry::BoapServiceEntry (
            BoapService service = 0,
            BoapServiceObject * object = 0 )  [inline]
```

7.69.2.2 BoapServiceEntry() [2/2]

```
BoapServiceEntry::BoapServiceEntry (
            BoapService service = 0,
            BoapServiceObject * object = 0 )  [inline]
```

7.69.3 Member Data Documentation

7.69.3.1 oservice

```
BoapService BoapServiceEntry::oservice
```

7.69.3.2 oobject

```
BoapServiceObject * BoapServiceEntry::oobject
```

The documentation for this class was generated from the following files:

- Boap.h
- BoapSimple.h

7.70 BoapServiceObject Class Reference

Boap service object.

```
#include <Boap.h>
```

Public Member Functions

- BoapServiceObject (BoapServer &server, BString name="")
- virtual ~BoapServiceObject ()
- BError setName (BString name)
- BError sendEvent (BString signalName, BInt32 arg)
- virtual BError processEvent (BString objectName, BString name, BInt32 arg)
- BString name ()
- BUInt32 apiVersion ()

  Returns the API version.
- BError doPing (BoapServerConnection *conn, BoapPacket &rx, BoapPacket &tx)
- BError doConnectionPriority (BoapServerConnection *conn, BoapPacket &rx, BoapPacket &tx)
- BError process (BoapServerConnection *conn, BoapPacket &rx, BoapPacket &tx)
- virtual BError processEvent (BoapPacket &rx)
- BoapServiceObject (BoapServer &server, BString name)
- virtual ~BoapServiceObject ()
- BError sendEvent (BString signalName, Int32 arg)
- virtual BError processEvent (BString objectName, BString name, Int32 arg)
- BString name ()
- BError process (BoapPacket &rx, BoapPacket &tx)
- virtual BError processEvent (BoapPacket &rx)

Protected Member Functions

- BError sendEvent (BoapPacket &tx)
- BError sendEvent (BoapPacket &tx)

Protected Attributes

- BoapServer & oserver
- BString oname
- BUInt32 oapiVersion
- BList< BoapFuncEntry > ofuncList

7.70.1 Detailed Description

Boap service object.

7.70.2 Constructor & Destructor Documentation

7.70.2.1 BoapServiceObject() [1/2]

```
BoapServiceObject::BoapServiceObject (
            BoapServer & server,
            BString name = "" )
```

7.70.2.2 ~BoapServiceObject() [1/2]

```
BoapServiceObject::~BoapServiceObject ( )  [virtual]
```

7.70.2.3 BoapServiceObject() [2/2]

```
BoapServiceObject::BoapServiceObject (
            BoapServer & server,
            BString name )
```

7.70.2.4 ~BoapServiceObject() [2/2]

```
virtual BoapServiceObject::~BoapServiceObject ( )  [virtual]
```

7.70.3 Member Function Documentation

7.70.3.1 setName()

```
BError BoapServiceObject::setName (
            BString name )
```

7.70.3.2 sendEvent() [1/4]

```
BError BoapServiceObject::sendEvent (
            BString signalName,
            BInt32 arg )
```

7.70.3.3 processEvent() [1/4]

```
BError BoapServiceObject::processEvent (
            BString objectName,
            BString name,
            BInt32 arg )  [virtual]
```

7.70.3.4 name() [1/2]

```
BString BoapServiceObject::name ( )
```

7.70.3.5 apiVersion()

```
BUInt32 BoapServiceObject::apiVersion ( )
```

Returns the API version.

7.70.3.6 doPing()

```
BError BoapServiceObject::doPing (
            BoapServerConnection * conn,
            BoapPacket & rx,
            BoapPacket & tx )
```

7.70.3.7 doConnectionPriority()

```
BError BoapServiceObject::doConnectionPriority (
            BoapServerConnection * conn,
            BoapPacket & rx,
            BoapPacket & tx )
```

7.70.3.8 process() [1/2]

```
BError BoapServiceObject::process (
            BoapServerConnection * conn,
            BoapPacket & rx,
            BoapPacket & tx )
```

7.70.3.9 processEvent() [2/4]

```
BError BoapServiceObject::processEvent (
            BoapPacket & rx )  [virtual]
```

7.70.3.10 sendEvent() [2/4]

```
BError BoapServiceObject::sendEvent (
            BoapPacket & tx )  [protected]
```

7.70.3.11 sendEvent() [3/4]

```
BError BoapServiceObject::sendEvent (
            BString signalName,
            Int32 arg )
```

7.70.3.12 processEvent() [3/4]

```
virtual BError BoapServiceObject::processEvent (
            BString objectName,
            BString name,
            Int32 arg )  [virtual]
```

7.70.3.13 name() [2/2]

```
BString BoapServiceObject::name ( )
```

7.70.3.14 process() [2/2]

```
BError BoapServiceObject::process (
            BoapPacket & rx,
            BoapPacket & tx )
```

7.70.3.15 processEvent() [4/4]

```
virtual BError BoapServiceObject::processEvent (
            BoapPacket & rx )  [virtual]
```

7.70.3.16 sendEvent() [4/4]

```
BError BoapServiceObject::sendEvent (
            BoapPacket & tx )  [protected]
```

7.70.4 Member Data Documentation

7.70.4.1 oserver

```
BoapServer & BoapServiceObject::oserver  [protected]
```

7.70.4.2 oname

```
BString BoapServiceObject::oname  [protected]
```

7.70.4.3 oapiVersion

```
BUInt32 BoapServiceObject::oapiVersion  [protected]
```

7.70.4.4 ofuncList

```
BList< BoapFuncEntry > BoapServiceObject::ofuncList  [protected]
```

The documentation for this class was generated from the following files:

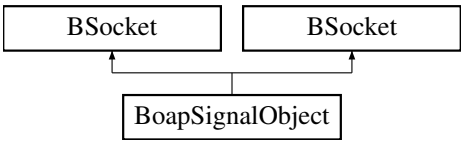
- Boap.h
- BoapSimple.h
- Boap.cpp
- BoapSimple.cc

7.71 BoapSignalObject Class Reference

A Boap object to send signals using an RPC mechanism.

```
#include <Boap.h>
```

Inheritance diagram for BoapSignalObject:



Public Member Functions

- BoapSignalObject ()
- BoapSignalObject ()

Protected Member Functions

- BError performSend (BoapPacket &tx)
- BError performSend (BoapPacket &tx)

Protected Attributes

- BoapPacket otx
- BoapPacket orx

Additional Inherited Members

7.71.1 Detailed Description

A Boap object to send signals using an RPC mechanism.

7.71.2 Constructor & Destructor Documentation

7.71.2.1 BoapSignalObject() [1/2]

```
BoapSignalObject::BoapSignalObject ( )
```

7.71.2.2 BoapSignalObject() [2/2]

```
BoapSignalObject::BoapSignalObject ( )
```

7.71.3 Member Function Documentation

7.71.3.1 performSend() [1/2]

```
BError BoapSignalObject::performSend (
            BoapPacket & tx )  [protected]
```

7.71.3.2 performSend() [2/2]

```
BError BoapSignalObject::performSend (
            BoapPacket & tx )  [protected]
```

7.71.4 Member Data Documentation

7.71.4.1 otx

```
BoapPacket BoapSignalObject::otx  [protected]
```

7.71.4.2 orx

```
BoapPacket BoapSignalObject::orx  [protected]
```

The documentation for this class was generated from the following files:

- Boap.h
- BoapSimple.h
- Boap.cpp
- BoapSimple.cc

7.72 BObj Class Reference

A generic object base class that has runtime definable data feilds.

```
#include <BObj.h>
```

Public Member Functions

- BObj ()
- virtual ~BObj ()
- virtual const char * getType () const
- virtual const BObjMember * getMembers () const
- virtual BError getMembers (BDictString &members)
- virtual BError getMember (BString name, BString &value)
- virtual BError setMembers (BDictString &members)
- virtual BError setMember (BString name, BString value)
- virtual void membersPrint () const

  Prints out members.
- virtual BString getDebugString ()

  Returns contents as a debug string.

7.72.1 Detailed Description

A generic object base class that has runtime definable data feilds.

7.72.2 Constructor & Destructor Documentation

7.72.2.1 BObj()

```
BObj::BObj ( )
```

7.72.2.2 ~BObj()

```
BObj::~BObj ( )  [virtual]
```

7.72.3 Member Function Documentation

7.72.3.1 getType()

```
const char * BObj::getType ( ) const  [virtual]
```

7.72.3.2 getMembers() [1/2]

```
const BObjMember * BObj::getMembers ( ) const  [virtual]
```

7.72.3.3 getMembers() [2/2]

```
BError BObj::getMembers (
            BDictString & members )  [virtual]
```

7.72.3.4 getMember()

```
BError BObj::getMember (
            BString name,
            BString & value )  [virtual]
```

7.72.3.5 setMembers()

```
BError BObj::setMembers (
            BDictString & members )  [virtual]
```

7.72.3.6 setMember()

```
BError BObj::setMember (
            BString name,
            BString value )  [virtual]
```

7.72.3.7 membersPrint()

```
void BObj::membersPrint ( ) const  [virtual]
```

Prints out members.

7.72.3.8 getDebugString()

```
BString BObj::getDebugString ( )  [virtual]
```

Returns contents as a debug string.

The documentation for this class was generated from the following files:

- BObj.h
- BObj.cpp

7.73 BObjMember Struct Reference

A structure to define a member of a generic BObj.

```
#include <BTypes.h>
```

Public Attributes

- BType type
- BTypeComp typeComp
- BUInt16 dataOffset
- BUInt16 size
- const char * typeName
- const char * name

7.73.1 Detailed Description

A structure to define a member of a generic BObj.

7.73.2 Member Data Documentation

7.73.2.1 type

```
BType BObjMember::type
```

7.73.2.2 typeComp

```
BTypeComp BObjMember::typeComp
```

7.73.2.3 dataOffset

```
BUInt16 BObjMember::dataOffset
```

7.73.2.4 size

```
BUInt16 BObjMember::size
```

7.73.2.5 typeName

```
const char* BObjMember::typeName
```

7.73.2.6 name

```
const char* BObjMember::name
```

The documentation for this struct was generated from the following file:

- BTypes.h

7.74 BPoll Class Reference

This class provides an interface for polling a number of file descriptors. It uses round robin polling.

`#include <BPoll.h>`

Public Types

- typedef struct pollfd PollFd

Public Member Functions

- BPoll ()
- ~BPoll ()
- void append (int fd, int events=POLLIN|POLLERR|POLLHUP|POLLNVAL)

  Append a file descriptor to polling list.
- void delFd (int fd)

  Remove a file descriptor from polling list.
- BError doPoll (int &fd, int timeoutUs=-1)

  Perform polling operation.
- BError doPollEvents (int &fd, int &events, int timeoutUs=-1)

  Perform polling operation and return events.
- int getPollFdsNum ()
- PollFd * getPollFds ()
- void clear ()

7.74.1 Detailed Description

This class provides an interface for polling a number of file descriptors. It uses round robin polling.

7.74.2 Member Typedef Documentation

7.74.2.1 PollFd

`typedef struct pollfd BPoll::PollFd`

7.74.3 Constructor & Destructor Documentation

7.74.3.1 BPoll()

```
BPoll::BPoll ( )
```

7.74.3.2 ~BPoll()

```
BPoll::~BPoll ( )
```

7.74.4 Member Function Documentation

7.74.4.1 append()

```
void BPoll::append (
            int fd,
            int events = POLLIN|POLLERR|POLLHUP|POLLNVAL )
```

Append a file descriptor to polling list.

7.74.4.2 delFd()

```
void BPoll::delFd (
            int fd )
```

Remove a file descriptor from polling list.

7.74.4.3 doPoll()

```
BError BPoll::doPoll (
            int & fd,
            int timeoutUs = -1 )
```

Perform polling operation.

7.74.4.4 doPollEvents()

```
BError BPoll::doPollEvents (
            int & fd,
            int & events,
            int timeoutUs = -1 )
```

Perform polling operation and return events.

7.74.4.5 getPollFdsNum()

```
int BPoll::getPollFdsNum ( )
```

7.74.4.6 getPollFds()

```
BPoll::PollFd * BPoll::getPollFds ( )
```

7.74.4.7 clear()

```
void BPoll::clear ( )
```

The documentation for this class was generated from the following files:

- BPoll.h
- BPoll.cpp

7.75 BProc Class Reference

Implements system process manager.

```
#include <BProc.h>
```

Public Member Functions

- BProc ()
- ~BProc ()
- BError usePipes (Bool fileIn, Bool fileOut, Bool fileErr)

  Enable IO pipes for the processes standard file descriptors.
- BError runForeground (BString cmd, BStringList argList=BStringList(), int *status=0, int timeoutMs=-1)

  Run the program in the foreground with optional status return value and timeout.
- BError runBackground (BString cmd, BStringList argList=BStringList())

  Run the program in the background.
- int getPid ()

  Return the process ID of the program.
- int getFd (int cmdFd)

  Return the stdin - 0, stdout - 1 or stderr -2 file descriptor pipes to send or receive data to/from the process.
- BError wait (int &status, int timeoutMs=-1)

  Wait for the process to complete. The programs exist status is returned in status. The call will block unless the timeoutMs value is given.
- BError kill (int sig=SIGTERM)

  Kill the process by sending it a signal.
- void finish ()

  Tidy up when finised (closes all pipes).

7.75.1 Detailed Description

Implements system process manager.

BProc class. This class is used to run programs on the system.

A system program can be run either in the forground where the run function will block or in the background. In both cases the full path of the program is provided in the cmd argument and a set of optional program arguments is provided in the argList argument. The processes arg0 value is set to the programs file name.

When run in the foreground with runForeground() function, the user can supply an int pointer to return the programs exit status and a timeout in ms to wait for the process to complete. By default the timeout of -1 means the function will wait forever. If the status pointer is NULL, then the programs return status will be returned in the BError return value otherwise the return BError will be set to an appropriate error status.

When run in the background with runBackground() function, the parenet process can wait for completion using the wait() call. The wait() call will return the programs exit status or an error. The exit staus value is the same as the normal wait() system call.

The processes standard 0, 1, 2 file descriptors can be overriden with IO pipes using the usePipes() function. If any of these pipes are enabled, then the getFd() function will return the parant processe's file descriptor for writing or reading data from the processe's standard file descriptors. The usePipes() function should be called before each run call.

7.75.2 Constructor & Destructor Documentation

7.75.2.1 BProc()

```
BProc::BProc ( )
```

7.75.2.2 ~BProc()

```
BProc::~BProc ( )
```

7.75.3 Member Function Documentation

7.75.3.1 usePipes()

```
BError BProc::usePipes (
            Bool fileIn,
            Bool fileOut,
            Bool fileErr )
```

Enable IO pipes for the processes standard file descriptors.

7.75.3.2 runForeground()

```
BError BProc::runForeground (
            BString cmd,
            BStringList argList = BStringList(),
            int * status = 0,
            int timeoutMs = -1 )
```

Run the program in the foreground with optional status return value and timeout.

7.75.3.3 runBackground()

```
BError BProc::runBackground (
            BString cmd,
            BStringList argList = BStringList() )
```

Run the program in the background.

7.75.3.4 getPid()

```
int BProc::getPid ( )
```

Return the process ID of the program.

7.75.3.5 getFd()

```
int BProc::getFd (
            int cmdFd )
```

Return the stdin - 0, stdout - 1 or stderr -2 file descriptor pipes to send or receive data to/from the process.

7.75.3.6 wait()

```
BError BProc::wait (
            int & status,
            int timeoutMs = -1 )
```

Wait for the process to complete. The programs exist status is returned in status. The call will block unless the timeoutMs value is given.

7.75.3.7 kill()

```
BError BProc::kill (
            int sig = SIGTERM )
```

Kill the process by sending it a signal.

7.75.3.8 finish()

```
void BProc::finish ( )
```

Tidy up when finised (closes all pipes).

The documentation for this class was generated from the following files:

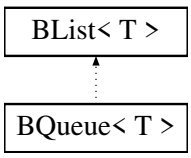
- BProc.h
- BProc.cpp

7.76 BQueue< T > Class Template Reference

Provides a thread save queue of objects that can be used to communicate between threads.

`#include <BQueue.h>`

Inheritance diagram for BQueue< T >:



Public Member Functions

- BQueue (BUInt size)
- ~BQueue ()
- void clear ()

  Clear the queue.
- BUInt writeAvailable () const
- BError write (const T &v, BTimeout timeout=BTimeoutForever)

  Append an item onto the queue.
- BUInt readAvailable () const
- BError read (T &v, BTimeout timeout=BTimeoutForever)

  Get an item from the queue.

7.76.1 Detailed Description

template<class T>
class BQueue< T >

Provides a thread save queue of objects that can be used to communicate between threads.

7.76.2 Constructor & Destructor Documentation

7.76.2.1 BQueue()

```
template<class T >
BQueue< T >::BQueue (
            BUInt size )
```

7.76.2.2 ~BQueue()

```
template<class T >
BQueue< T >::~BQueue
```

7.76.3 Member Function Documentation

7.76.3.1 clear()

```
template<class T >
void BQueue< T >::clear  [virtual]
```

Clear the queue.

Reimplemented from BList< T >.

7.76.3.2 writeAvailable()

```
template<class T >
BUInt BQueue< T >::writeAvailable
```

7.76.3.3 write()

```
template<class T >
BError BQueue< T >::write (
            const T & v,
            BTimeout timeout = BTimeoutForever )
```

Append an item onto the queue.

7.76.3.4 readAvailable()

```
template<class T >
BUInt BQueue< T >::readAvailable
```

7.76.3.5 read()

```
template<class T >
BError BQueue< T >::read (
            T & v,
            BTimeout timeout = BTimeoutForever )
```

Get an item from the queue.

The documentation for this class was generated from the following file:

- BQueue.h

7.77 BRefData Class Reference

A pointer to a variable sized data area with reference counting so the data areas can be shared.

`#include <BRefData.h>`

Public Member Functions

- BRefData ()
- BRefData (int len)
- BRefData (const BRefData &refData)
- ~BRefData ()
- BRefData * copy ()

  Create a copy of this reference for writing, if necessary

- BRefData * addRef ()

  Increment the reference counter.
- int deleteRef ()

  Decrement the reference counter.
- char * data ()

  Return the raw data pointer.
- int len ()

  Return the length in bytes.
- BRefData & operator= (const BRefData &refData)
- void setLen (int len)

  Set the length in bytes. Note should only be used if orefCount = 1.

7.77.1 Detailed Description

A pointer to a variable sized data area with reference counting so the data areas can be shared.

This is Thread safe to a degree. The reference counting is protected. However, setLen() is not and should be protected at a higher level.

7.77.2 Constructor & Destructor Documentation

7.77.2.1 BRefData() [1/3]

```
BRefData::BRefData ( )
```

7.77.2.2 BRefData() [2/3]

```
BRefData::BRefData (
            int len )
```

7.77.2.3 BRefData() [3/3]

```
BRefData::BRefData (
            const BRefData & refData )
```

7.77.2.4 ~BRefData()

```
BRefData::~BRefData ( )
```

7.77.3 Member Function Documentation

7.77.3.1 copy()

```
BRefData * BRefData::copy ( )
```

Create a copy of this reference for writing, if necessary

7.77.3.2 addRef()

```
BRefData * BRefData::addRef ( )
```

Increment the reference counter.

7.77.3.3 deleteRef()

```
int BRefData::deleteRef ( )
```

Decrement the reference counter.

7.77.3.4 data()

```
char * BRefData::data ( )  [inline]
```

Return the raw data pointer.

7.77.3.5 len()

```
int BRefData::len ( )  [inline]
```

Return the length in bytes.

7.77.3.6 operator=()

```
BRefData & BRefData::operator= (
            const BRefData & refData )
```

7.77.3.7 setLen()

```
void BRefData::setLen (
            int len )
```

Set the length in bytes. Note should only be used if orefCount = 1.

The documentation for this class was generated from the following files:

- BRefData.h
- BRefData.cpp

7.78 BRtc Class Reference

Realtime clock for access to the systems real time battery backed up time hardware.

```
#include <BRtc.h>
```

Public Member Functions

- BRtc ()
- ~BRtc ()
- BError init (int rate)

  Setup interrupt rate.
- void wait (int delayUs)

  Wait specified uS.

7.78.1 Detailed Description

Realtime clock for access to the systems real time battery backed up time hardware.

7.78.2 Constructor & Destructor Documentation

7.78.2.1 BRtc()

```
BRtc::BRtc ( )
```

7.78.2.2 ~BRtc()

```
BRtc::~BRtc ( )
```

7.78.3 Member Function Documentation

7.78.3.1 init()

```
BError BRtc::init (
            int rate )
```

Setup interrupt rate.

7.78.3.2 wait()

```
void BRtc::wait (
            int delayUs )
```

Wait specified uS.

The documentation for this class was generated from the following files:

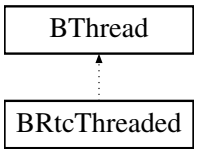
- BRtc.h
- BRtc.cpp

7.79 BRtcThreaded Class Reference

A thread safe class to access to the systems real time battery backed up time hardware.

`#include <BRtc.h>`

Inheritance diagram for BRtcThreaded:



Public Member Functions

- BRtcThreaded ()
- ~BRtcThreaded ()
- BError init (int rate)

  Setup interrupt rate.
- void wait (int delayUs)

  Wait specified uS.

7.79.1 Detailed Description

A thread safe class to access to the systems real time battery backed up time hardware.

7.79.2 Constructor & Destructor Documentation

7.79.2.1 BRtcThreaded()

```
BRtcThreaded::BRtcThreaded ( )
```

7.79.2.2 ~BRtcThreaded()

```
BRtcThreaded::~BRtcThreaded ( )
```

7.79.3 Member Function Documentation

7.79.3.1 init()

```
BError BRtcThreaded::init (
            int rate )
```

Setup interrupt rate.

7.79.3.2 wait()

```
void BRtcThreaded::wait (
            int delayUs )
```

Wait specified uS.

The documentation for this class was generated from the following files:

- BRtc.h
- BRtc.cpp

7.80 BRWLock Class Reference

Thread read-write lock.

`#include <BRWLock.h>`

Public Member Functions

- BRWLock ()
- BRWLock (const BRWLock &rwlock)
- ~BRWLock ()
- int rdLock ()
  Set lock, wait if necessary.
- int tryRdLock ()
  Test the lock.
- int wrLock ()
  Set lock, wait if necessary.
- int tryWrLock ()
  Test the lock.
- int unlock ()
  Unlock the lock.
- BRWLock & operator= (const BRWLock &rwlock)

7.80.1 Detailed Description

Thread read-write lock.

7.80.2 Constructor & Destructor Documentation

7.80.2.1 BRWLock() [1/2]

```
BRWLock::BRWLock ( )
```

7.80.2.2 BRWLock() [2/2]

```
BRWLock::BRWLock (
            const BRWLock & rwlock )
```

7.80.2.3 ~BRWLock()

```
BRWLock::~BRWLock ( )
```

7.80.3 Member Function Documentation

7.80.3.1 rdLock()

```
int BRWLock::rdLock ( )
```

Set lock, wait if necessary.

7.80.3.2 tryRdLock()

```
int BRWLock::tryRdLock ( )
```

Test the lock.

7.80.3.3 wrLock()

```
int BRWLock::wrLock ( )
```

Set lock, wait if necessary.

7.80.3.4 tryWrLock()

```
int BRWLock::tryWrLock ( )
```

Test the lock.

7.80.3.5 unlock()

```
int BRWLock::unlock ( )
```

Unlock the lock.

7.80.3.6 operator=()

```
BRWLock & BRWLock::operator= (
            const BRWLock & rwlock )
```

The documentation for this class was generated from the following files:

- BRWLock.h
- BRWLock.cpp

7.81 BSema Class Reference

Sempahore class.

```
#include <BSema.h>
```

Public Member Functions

- BSema (int value=0)
- BSema (const BSema &sema)
- ~BSema ()
- int post ()

  Post condition.
- int wait ()

  Wait for contition.
- int timedWait (int timeUs)

  Wait for condition with timeout.
- int tryWait ()

  Test for the condition.
- int getValue () const
- BSema & operator= (const BSema &sema)

7.81.1 Detailed Description

Sempahore class.

7.81.2 Constructor & Destructor Documentation

7.81.2.1 BSema() [1/2]

```
BSema::BSema (
            int value = 0 )
```

7.81.2.2 BSema() [2/2]

```
BSema::BSema (
            const BSema & sema )
```

7.81.2.3 ~BSema()

```
BSema::~BSema ( )
```

7.81.3 Member Function Documentation

7.81.3.1 post()

```
int BSema::post ( )
```

Post condition.

7.81.3.2 wait()

```
int BSema::wait ( )
```

Wait for contition.

7.81.3.3 timedWait()

```
int BSema::timedWait (
            int timeUs )
```

Wait for condition with timeout.

7.81.3.4 tryWait()

```
int BSema::tryWait ( )
```

Test for the condition.

7.81.3.5 getValue()

```
int BSema::getValue ( ) const
```

7.81.3.6 operator=()

```
BSema & BSema::operator= (
            const BSema & sema )
```

The documentation for this class was generated from the following files:

- BSema.h
- BSema.cpp

7.82 BSemaphore Class Reference

Base Semaphore class.

`#include <BSemaphore.h>`

Public Member Functions

- BSemaphore ()
- BSemaphore (const BSemaphore &semaphore)
- ~BSemaphore ()
- Bool wait (BTimeout timeoutUs=BTimeoutForever)

  Wait for the semaphore.
- void set ()

  Set the semaphore.
- int getValue () const
- BSemaphore & operator= (const BSemaphore &semaphore)

7.82.1 Detailed Description

Base Semaphore class.

7.82.2 Constructor & Destructor Documentation

7.82.2.1 BSemaphore() [1/2]

```
BSemaphore::BSemaphore ( )
```

7.82.2.2 BSemaphore() [2/2]

```
BSemaphore::BSemaphore (
            const BSemaphore & semaphore )
```

7.82.2.3 ~BSemaphore()

```
BSemaphore::~BSemaphore ( )
```

7.82.3 Member Function Documentation

7.82.3.1 wait()

```
Bool BSemaphore::wait (
            BTimeout timeoutUs = BTimeoutForever )
```

Wait for the semaphore.

7.82.3.2 set()

```
void BSemaphore::set ( )
```

Set the semaphore.

7.82.3.3 getValue()

```
int BSemaphore::getValue ( ) const
```

7.82.3.4 operator=()

```
BSemaphore & BSemaphore::operator= (
            const BSemaphore & semaphore )
```

The documentation for this class was generated from the following files:

- BSemaphore.h
- BSemaphore.cpp

7.83 BSemaphoreBool Class Reference

Boolean semaphore.

```
#include <BSemaphore.h>
```

Public Member Functions

- BSemaphoreBool ()
- BSemaphoreBool (const BSemaphoreBool &semaphore)
- ~BSemaphoreBool ()
- void set (Bool on=1)
- void clear ()
- Bool wait (Bool v=1, BTimeout timeoutUs=BTimeoutForever)

  Wait for the semaphore.
- Bool value ()
- operator int ()
- int operator== (Bool on)
- BSemaphoreBool & operator= (Bool on)

7.83.1 Detailed Description

Boolean semaphore.

7.83.2 Constructor & Destructor Documentation

7.83.2.1 BSemaphoreBool() [1/2]

```
BSemaphoreBool::BSemaphoreBool ( )
```

7.83.2.2 BSemaphoreBool() [2/2]

```
BSemaphoreBool::BSemaphoreBool (
            const BSemaphoreBool & semaphore )
```

7.83.2.3 ~BSemaphoreBool()

```
BSemaphoreBool::~BSemaphoreBool ( )
```

7.83.3 Member Function Documentation

7.83.3.1 set()

```
void BSemaphoreBool::set (
            Bool on = 1 )
```

7.83.3.2 clear()

```
void BSemaphoreBool::clear ( )
```

7.83.3.3 wait()

```
Bool BSemaphoreBool::wait (
            Bool v = 1,
            BTimeout timeoutUs = BTimeoutForever )
```

Wait for the semaphore.

7.83.3.4 value()

```
Bool BSemaphoreBool::value ( )
```

7.83.3.5 operator int()

```
BSemaphoreBool::operator int ( )
```

7.83.3.6 operator==()

```
int BSemaphoreBool::operator== (
            Bool on )
```

7.83.3.7 operator=()

```
BSemaphoreBool & BSemaphoreBool::operator= (
            Bool on )
```

The documentation for this class was generated from the following files:

- BSemaphore.h
- BSemaphore.cpp

7.84 BSemaphoreCount Class Reference

Integer counting semaphore.

`#include <BSemaphore.h>`

Public Member Functions

- BSemaphoreCount ()
- BSemaphoreCount (const BSemaphoreCount &semaphore)
- ~BSemaphoreCount ()
- void setValue (BUInt v)
- void add (int v=1)

  Set the semaphore.
- Bool wait (BUInt v=1, BTimeout timeoutUs=BTimeoutForever)

  Wait for the semaphore.
- Bool take (BUInt v=1, BTimeout timeoutUs=BTimeoutForever)

  Take for the semaphore.
- BUInt value ()
- BSemaphoreCount & operator= (const BSemaphoreCount &semaphore)

7.84.1 Detailed Description

Integer counting semaphore.

7.84.2 Constructor & Destructor Documentation

7.84.2.1 BSemaphoreCount() [1/2]

```
BSemaphoreCount::BSemaphoreCount ( )
```

7.84.2.2 BSemaphoreCount() [2/2]

```
BSemaphoreCount::BSemaphoreCount (
            const BSemaphoreCount & semaphore )
```

7.84.2.3 ~BSemaphoreCount()

```
BSemaphoreCount::~BSemaphoreCount ( )
```

7.84.3 Member Function Documentation

7.84.3.1 setValue()

```
void BSemaphoreCount::setValue (
            BUInt v )
```

7.84.3.2 add()

```
void BSemaphoreCount::add (
            int v = 1 )
```

Set the semaphore.

7.84.3.3 wait()

```
Bool BSemaphoreCount::wait (
            BUInt v = 1,
            BTimeout timeoutUs = BTimeoutForever )
```

Wait for the semaphore.

7.84.3.4 take()

```
Bool BSemaphoreCount::take (
            BUInt v = 1,
            BTimeout timeoutUs = BTimeoutForever )
```

Take for the semaphore.

7.84.3.5 value()

```
BUInt BSemaphoreCount::value ( )
```

7.84.3.6 operator=()

```
BSemaphoreCount & BSemaphoreCount::operator= (
            const BSemaphoreCount & semaphore )
```

The documentation for this class was generated from the following files:

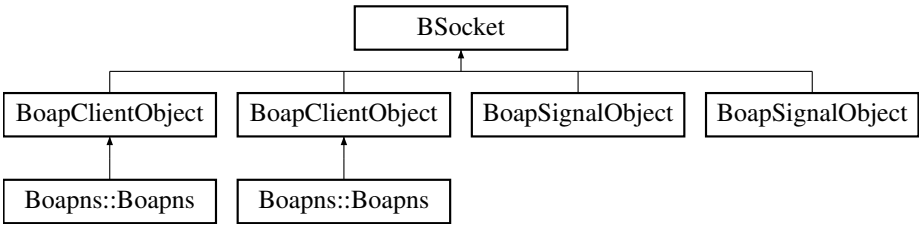
- BSemaphore.h
- BSemaphore.cpp

7.85 BSocket Class Reference

A network communications socket.

`#include <BSocket.h>`

Inheritance diagram for BSocket:



Public Types

- enum NType { STREAM , DGRAM }
- enum Priority { PriorityLow , PriorityNormal , PriorityHigh }

Public Member Functions

- BSocket ()
- BSocket (int fd)
- BSocket (NType type)
- BSocket (int domain, int type, int protocol)
- ~BSocket ()
- BError init (int domain, int type, int protocol)
- BError init (NType type)
- void setFd (int fd)
- int getFd ()
- BError bind (const BSocketAddress &add)
- BError connect (const BSocketAddress &add)
- BError shutdown (int how)
- BError close ()
- BError listen (int backlog=5)
- BError accept (int &fd)
- BError accept (int &fd, BSocketAddress &address)
- BError send (const void *buf, BSize nbytes, BSize &nbytesSent, int flags=0)

- BError sendTo (const BSocketAddress &address, const void *buf, BSize nbytes, BSize &nbytesSent, int flags=0)
- BError sendChunks (const BDataChunk *chunks, BSize nChunks, BSize &nbytesSent, int flags=0)
- BError recv (void *buf, BSize maxbytes, BSize &nbytesRecv, int flags=0)
- BError recvFrom (BSocketAddress &address, void *buf, BSize maxbytes, BSize &nbytesRecv, int flags=0)
- BError recvWithTimeout (void *buf, BSize maxbytes, BSize &nbytesRecv, int timeout, int flags=0)
- BError recvFromWithTimeout (BSocketAddress &address, void *buf, BSize maxbytes, BSize &nbytesRecv, int timeout, int flags=0)
- BUInt recvAvailable ()
- BError setSockOpt (int level, int optname, void *optval, unsigned int optlen)
- BError getSockOpt (int level, int optname, void *optval, unsigned int *optlen)
- BError setReuseAddress (int on)
- BError setBroadCast (int on)
- BError setPriority (Priority priority)
- BError getMTU (uint32_t &mtu)
- BError getAddress (BSocketAddress &address)

7.85.1 Detailed Description

A network communications socket.

7.85.2 Member Enumeration Documentation

7.85.2.1 NType

`enum BSocket::NType`

Enumerator

STREAM	
DGRAM	

7.85.2.2 Priority

`enum BSocket::Priority`

Enumerator

PriorityLow	
PriorityNormal	
PriorityHigh	

7.85.3 Constructor & Destructor Documentation

7.85.3.1 BSocket() [1/4]

```
BSocket::BSocket ( )
```

7.85.3.2 BSocket() [2/4]

```
BSocket::BSocket (
            int fd )
```

7.85.3.3 BSocket() [3/4]

```
BSocket::BSocket (
            NType type )
```

7.85.3.4 BSocket() [4/4]

```
BSocket::BSocket (
            int domain,
            int type,
            int protocol )
```

7.85.3.5 ~BSocket()

```
BSocket::~BSocket ( )
```

7.85.4 Member Function Documentation

7.85.4.1 init() [1/2]

```
BError BSocket::init (
            int domain,
            int type,
            int protocol )
```

7.85.4.2 init() [2/2]

```
BError BSocket::init (
            NType type )
```

7.85.4.3 setFd()

```
void BSocket::setFd (
            int fd )
```

7.85.4.4 getFd()

```
int BSocket::getFd ( )
```

7.85.4.5 bind()

```
BError BSocket::bind (
            const BSocketAddress & add )
```

7.85.4.6 connect()

```
BError BSocket::connect (
            const BSocketAddress & add )
```

7.85.4.7 shutdown()

```
BError BSocket::shutdown (
            int how )
```

7.85.4.8 close()

```
BError BSocket::close ( )
```

7.85.4.9 listen()

```
BError BSocket::listen (
            int backlog = 5 )
```

7.85.4.10 accept() [1/2]

```
BError BSocket::accept (
            int & fd )
```

7.85.4.11 accept() [2/2]

```
BError BSocket::accept (
            int & fd,
            BSocketAddress & address )
```

7.85.4.12 send()

```
BError BSocket::send (
            const void * buf,
            BSize nbytes,
            BSize & nbytesSent,
            int flags = 0 )
```

7.85.4.13 sendTo()

```
BError BSocket::sendTo (
            const BSocketAddress & address,
            const void * buf,
            BSize nbytes,
            BSize & nbytesSent,
            int flags = 0 )
```

7.85.4.14 sendChunks()

```
BError BSocket::sendChunks (
            const BDataChunk * chunks,
            BSize nChunks,
            BSize & nbytesSent,
            int flags = 0 )
```

7.85.4.15 recv()

```
BError BSocket::recv (
            void * buf,
            BSize maxbytes,
            BSize & nbytesRecv,
            int flags = 0 )
```

7.85.4.16 recvFrom()

```
BError BSocket::recvFrom (
            BSocketAddress & address,
            void * buf,
            BSize maxbytes,
            BSize & nbytesRecv,
            int flags = 0 )
```

7.85.4.17 recvWithTimeout()

```
BError BSocket::recvWithTimeout (
            void * buf,
            BSize maxbytes,
            BSize & nbytesRecv,
            int timeout,
            int flags = 0 )
```

7.85.4.18 recvFromWithTimeout()

```
BError BSocket::recvFromWithTimeout (
            BSocketAddress & address,
            void * buf,
            BSize maxbytes,
            BSize & nbytesRecv,
            int timeout,
            int flags = 0 )
```

7.85.4.19 recvAvailable()

```
BUInt BSocket::recvAvailable ( )
```

7.85.4.20 setSockOpt()

```
BError BSocket::setSockOpt (
            int level,
            int optname,
            void * optval,
            unsigned int optlen )
```

7.85.4.21 getSockOpt()

```
BError BSocket::getSockOpt (
            int level,
            int optname,
            void * optval,
            unsigned int * optlen )
```

7.85.4.22 setReuseAddress()

```
BError BSocket::setReuseAddress (
            int on )
```

7.85.4.23 setBroadCast()

```
BError BSocket::setBroadCast (
            int on )
```

7.85.4.24 setPriority()

```
BError BSocket::setPriority (
            Priority priority )
```

7.85.4.25 getMTU()

```
BError BSocket::getMTU (
            uint32_t & mtu )
```

7.85.4.26 getAddress()

```
BError BSocket::getAddress (
            BSocketAddress & address )
```

The documentation for this class was generated from the following files:

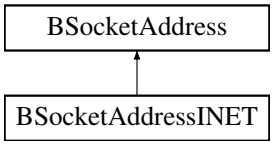
- BSocket.h
- BSocket.cpp

7.86 BSocketAddress Class Reference

Socket Address.

`#include <BSocket.h>`

Inheritance diagram for BSocketAddress:



Public Types

- typedef struct sockaddr SockAddr

Public Member Functions

- BSocketAddress ()
- BSocketAddress (const BSocketAddress &add)
- BSocketAddress (SockAddr *address, int len)
- ~BSocketAddress ()
- BError set (SockAddr *address, int len)
- const SockAddr * raw () const
- int len () const
- BString getString () const

  Return string version of address <ip>:<port>
- BSocketAddress & operator= (const BSocketAddress &add)
- operator const SockAddr * () const
- int operator== (const BSocketAddress &add) const
- int operator!= (const BSocketAddress &add) const

7.86.1 Detailed Description

Socket Address.

7.86.2 Member Typedef Documentation

7.86.2.1 SockAddr

```
typedef struct sockaddr BSocketAddress::SockAddr
```

7.86.3 Constructor & Destructor Documentation

7.86.3.1 BSocketAddress() [1/3]

```
BSocketAddress::BSocketAddress ( )
```

7.86.3.2 BSocketAddress() [2/3]

```
BSocketAddress::BSocketAddress (
            const BSocketAddress & add )
```

7.86.3.3 BSocketAddress() [3/3]

```
BSocketAddress::BSocketAddress (
            SockAddr * address,
            int len )
```

7.86.3.4 ~BSocketAddress()

```
BSocketAddress::~BSocketAddress ( )
```

7.86.4 Member Function Documentation

7.86.4.1 set()

```
BError BSocketAddress::set (
            SockAddr * address,
            int len )
```

7.86.4.2 raw()

```
const BSocketAddress::SockAddr * BSocketAddress::raw ( ) const
```

7.86.4.3 len()

```
int BSocketAddress::len ( ) const
```

7.86.4.4 getString()

```
BString BSocketAddress::getString ( ) const
```

Return string version of address <ip>:<port>

7.86.4.5 operator=()

```
BSocketAddress & BSocketAddress::operator= (
            const BSocketAddress & add )
```

7.86.4.6 operator const SockAddr *()

```
BSocketAddress::operator const SockAddr * ( ) const  [inline]
```

7.86.4.7 operator==()

```
int BSocketAddress::operator== (
            const BSocketAddress & add ) const
```

7.86.4.8 operator"!=()

```
int BSocketAddress::operator!= (
            const BSocketAddress & add ) const
```

The documentation for this class was generated from the following files:

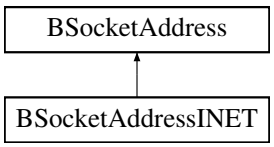
- BSocket.h
- BSocket.cpp

7.87 BSocketAddressINET Class Reference

IPV4 aware socket address.

`#include <BSocket.h>`

Inheritance diagram for BSocketAddressINET:



Public Types

- typedef struct sockaddr_in SockAddrIP

Public Member Functions

- BError set (BString hostName, uint32_t port)
- BError set (uint32_t address, uint32_t port)
- BError set (BString hostName, BString service, BString type)
- void setPort (uint32_t port)
- uint32_t address ()

  Returns socket ip address.
- uint32_t port ()

  Returns socket port.
- BString getString ()

  Return string version of address <ip>:<port>

Static Public Member Functions

- static BString getHostName ()

  Get this hosts network name.
- static BList< uint32_t > getIpAddresses ()

  Get a list of all the IP addresses of this host.
- static BList< BString > getIpAddressList ()

  Get a list of all the IP addresses of this host under hostname.
- static BList< BString > getIpAddressListAll ()

  Get a list of all the IP addresses of this host looking at physical interfaces.

7.87.1 Detailed Description

IPV4 aware socket address.

7.87.2 Member Typedef Documentation

7.87.2.1 SockAddrIP

```
typedef struct sockaddr_in BSocketAddressINET::SockAddrIP
```

7.87.3 Member Function Documentation

7.87.3.1 set() [1/3]

```
BError BSocketAddressINET::set (
            BString hostName,
            uint32_t port )
```

7.87.3.2 set() [2/3]

```
BError BSocketAddressINET::set (
            uint32_t address,
            uint32_t port )
```

7.87.3.3 set() [3/3]

```
BError BSocketAddressINET::set (
            BString hostName,
            BString service,
            BString type )
```

7.87.3.4 setPort()

```
void BSocketAddressINET::setPort (
            uint32_t port )
```

7.87.3.5 address()

```
uint32_t BSocketAddressINET::address ( )
```

Returns socket ip address.

7.87.3.6 port()

```
uint32_t BSocketAddressINET::port ( )
```

Returns socket port.

7.87.3.7 getString()

```
BString BSocketAddressINET::getString ( )
```

Return string version of address <ip>:<port>

7.87.3.8 getHostName()

```
BString BSocketAddressINET::getHostName ( )  [static]
```

Get this hosts network name.

7.87.3.9 getIpAddresses()

```
BList< uint32_t > BSocketAddressINET::getIpAddresses ( )  [static]
```

Get a list of all the IP addresses of this host.

7.87.3.10 getIpAddressList()

```
BList< BString > BSocketAddressINET::getIpAddressList ( )  [static]
```

Get a list of all the IP addresses of this host under hostname.

7.87.3.11 getIpAddressListAll()

```
BList< BString > BSocketAddressINET::getIpAddressListAll ( )  [static]
```

Get a list of all the IP addresses of this host looking at physical interfaces.

The documentation for this class was generated from the following files:

- BSocket.h
- BSocket.cpp

7.88 BSpi Class Reference

BSpi class for accessing SPI hardware devices.

```
#include <BSpi.h>
```

Public Types

- enum Mode { Mode0 = 0 , Mode1 = 1 , Mode2 = 2 , Mode3 = 3 }

Public Member Functions

- BSpi ()
- BError init (BString devName, BUInt speed=1000000, Mode mode=Mode1, Bool csActive=0)
- BError transact (BUInt8 dev, void *txBuf, int txLen, int pad, void *rxBuf, int rxLen)

7.88.1 Detailed Description

BSpi class for accessing SPI hardware devices.

7.88.2 Member Enumeration Documentation

7.88.2.1 Mode

```
enum BSpi::Mode
```

Enumerator

Mode0	
Mode1	
Mode2	
Mode3	

7.88.3 Constructor & Destructor Documentation

7.88.3.1 BSpi()

```
BSpi::BSpi ( )
```

7.88.4 Member Function Documentation

7.88.4.1 init()

```
BError BSpi::init (
            BString devName,
            BUInt speed = 1000000,
            Mode mode = Mode1,
            Bool csActive = 0 )
```

7.88.4.2 transact()

```
BError BSpi::transact (
            BUInt8 dev,
            void * txBuf,
            int txLen,
            int pad,
            void * rxBuf,
            int rxLen )
```

The documentation for this class was generated from the following files:

- BSpi.h
- BSpi.cpp

7.89 BString Class Reference

This class stores and manipulates ASCII strings.

```
#include <BString.h>
```

Public Member Functions

- BString ()
- BString (const BString &string)
- BString (const char *str)
- BString (const char *str, unsigned int len)
- BString (char ch)
- BString (BInt v)
- BString (BUInt v)
- BString (BUInt64 v)
- BString (double v)
- ~BString ()
- BString copy () const

  Return an independant copy.
- int len () const

  Length of string.
- const char * retStr () const

  Ptr to char representation.*
- const char * str () const

  Ptr to char representation.*
- char * retStrDup () const

  Ptr to newly malloc'd char.*
- int retInt () const

  Return string as a int.
- unsigned int retUInt () const

  Return string as a int.
- double retDouble () const

  Return string as a double.
- BFloat64 retFloat64 () const

  Return string as a BFloat64.
- int compare (const BString &string) const

  Compare strings. Returns 0 for match.
- int compareWild (const BString &string) const

  Compare string to string with wildcards . Returns 0 for match.
- int compareWildExpression (const BString &string) const

  Compare string to space deliminated patterns. Returns 0 for match.
- int compareRegex (const BString &pattern, int ignoreCase=0) const

  Compare strings. Returns 1 for match.
- BString & truncate (int len)

  Truncate to length len.
- BString & pad (int len)

  Pad to length len.
- void clear ()

  Clear the string.
- BString & toUpper ()

  Convert to uppercase.
- BString & toLower ()

  Convert to lowercase.
- BString lowerFirst ()

  Return string with lowercase first character.
- void removeNL ()

  Remove if present NL from last char.

- BString justify (int leftMargin, int width)

  Justify the string to the given width.
- BString fixedLen (int length, int rightJustify=0)

  return string formated to fixed length
- BString firstLine ()

  Return first line.
- BString translateChar (char ch, BString replace=" ")

  Translate character converting them to the given string.
- BString reverse () const

  Reverse character order.
- BString subString (int start, int len) const

  Returns substring.
- int del (int start, int len)

  Delete substring.
- int insert (int start, BString str)

  Insert substring.
- int append (const BString &str)

  Append a string.
- BString add (const BString &str) const

  Add strings returning result.
- BString & printf (const char *fmt,...)

  Formated print into the string.
- int find (char ch) const

  Find ch in string searching forwards. Returns -1 if not found.
- int find (BString str) const

  Find string in string searching forwards. Returns -1 if not found.
- int findReverse (char ch) const

  Find ch in string searching backwards. Returns -1 if not found.
- BString csvEncode () const

  Encode a string for CSV.
- BString & csvDecode (const BString str)

  Decode a string from CSV.
- BString base64Encode () const

  Encode a string to base64.
- BError base64Decode (BString &str) const

  Decode a string from base64.
- BList< BString > getTokenList (BString separators)

  Break string into tokens.
- BList< BString > getTokenList (char separator)

  Break string into tokens.
- BString removeSeparators (BString separators)

  Remove any char from sepatators from string.
- BString pullToken (BString terminators)

  Pull token from start of string.
- BString pullSeparators (BString separators)

  Pull separators from start of string.
- BString pullWord ()

  Pull a word out of the head of the string.
- BString pullLine ()

  Pull a line out of the head of the string.
- BList< BString > split (char splitChar)

Split string into an array based on the character separator.

- BString dirname ()

  Return the directory component if the string is a file path name.
- BString filename ()

  Return the filename component if the string is a file path name.
- BString basename ()

  Return the file name component if the string is a file path name.
- BString extension ()

  Return the file extension component if the string is a file path name.
- BString extensionFull ()

  Return the file extension component with leading '.' if the string is a file path name.
- BUInt32 hash () const

  Create a 32bit hash number for the string.
- char & get (int pos)

  Return the character at the position give. Will print an error message and raise the SIGABORT exception if out of range.
- const char & get (int pos) const

  Return the character at the position give. Will print an error message and raise the SIGABORT exception if out of range.
- BString & operator= (const BString &string)
- char & operator[ ] (int pos)
- int operator== (const BString &s) const
- int operator== (const char ∗s) const
- int operator> (const BString &s) const
- int operator> (const char ∗s) const
- int operator< (const BString &s) const
- int operator< (const char ∗s) const
- int operator>= (const BString &s) const
- int operator<= (const BString &s) const
- int operator!= (const BString &s) const
- int operator!= (const char ∗s) const
- BString operator+ (const BString &s) const
- BString operator+ (const char ∗s) const
- BString operator+= (const BString &s)
- BString operator+= (const char ∗s)
- BString operator+ (char ch) const
- BString operator+ (BInt i) const
- BString operator+ (BUInt i) const
- BString operator+ (BUInt64 i) const
- operator const char ∗ () const
- BString field (int field) const

  Depreciated function.
- char ∗∗ fields ()

  Depreciated function.

Static Public Member Functions

- static BString convert (char ch)

  Converts char to string.
- static BString convert (BInt value)

  Converts int to string.
- static BString convert (BUInt value)

Converts uint to string.

- static BString convert (double value, int eFormat=0)

  Converts double to string.
- static BString convert (BUInt64 value)

  Converts long long to string.
- static BString convertHex (BInt value)

  Converts int to string as hex value.
- static BString convertHex (BUInt value)

  Converts uint to string as hex value.

Protected Attributes

- BRefData * ostr

  This is the reference counted string storage.

7.89.1 Detailed Description

This class stores and manipulates ASCII strings.

The BString class is designed for the storage and manipulation of variable length ASCII strings. It uses the BRefData class to store the null terminated strings in shared and references counted shared memory areas on the heap. This efficient method reduces memory allocation, deallocation and copying. Copying or just passing a string in and out of a function becomes a simple pointer copy with the string data reference count incremented.

You can convert a BStirng to a const char* using the BString::str() method. You can create a BString from a char* with its constructor BString(const char*) which is used implicitly for conversions. The BString also supports conversion to and from Qt QStrings if the Qt headers are included before the BString.h header. The BString also supports input and output from std::iostream objects.

As well as its constructor function, BString supports a number of explicity convert() functions that can convert basic types such as integers to a BString. There are also some ret*() functions to parse the BString for integer and floating point values.

The operators: =, +, <, >, >=, <=, ==, != operate as you would expect with the +" appending strings.

7.89.2 Constructor & Destructor Documentation

7.89.2.1 BString() [1/9]

```
BString::BString ( )
```

7.89.2.2 BString() [2/9]

```
BString::BString (
            const BString & string )
```

7.89.2.3 BString() [3/9]

```
BString::BString (
            const char * str )
```

7.89.2.4 BString() [4/9]

```
BString::BString (
            const char * str,
            unsigned int len )
```

7.89.2.5 BString() [5/9]

```
BString::BString (
            char ch )
```

7.89.2.6 BString() [6/9]

```
BString::BString (
            BInt v )
```

7.89.2.7 BString() [7/9]

```
BString::BString (
            BUInt v )
```

7.89.2.8 BString() [8/9]

```
BString::BString (
            BUInt64 v )
```

7.89.2.9 BString() [9/9]

```
BString::BString (
            double v )
```

7.89.2.10 ~BString()

```
BString::~BString ( )
```

7.89.3 Member Function Documentation

7.89.3.1 convert() [1/5]

```
BString BString::convert (
            char ch )  [static]
```

Converts char to string.

7.89.3.2 convert() [2/5]

```
BString BString::convert (
            BInt value )  [static]
```

Converts int to string.

7.89.3.3 convert() [3/5]

```
BString BString::convert (
            BUInt value )  [static]
```

Converts uint to string.

7.89.3.4 convert() [4/5]

```
BString BString::convert (
            double value,
            int eFormat = 0 )  [static]
```

Converts double to string.

7.89.3.5 convert() [5/5]

```
BString BString::convert (
            BUInt64 value )  [static]
```

Converts long long to string.

7.89.3.6 convertHex() [1/2]

```
BString BString::convertHex (
            BInt value )  [static]
```

Converts int to string as hex value.

7.89.3.7 convertHex() [2/2]

```
BString BString::convertHex (
            BUInt value )  [static]
```

Converts uint to string as hex value.

7.89.3.8 copy()

```
BString BString::copy ( ) const
```

Return an independant copy.

7.89.3.9 len()

```
int BString::len ( ) const
```

Length of string.

7.89.3.10 retStr()

```
const char * BString::retStr ( ) const
```

Ptr to char* representation.

7.89.3.11 str()

```
const char * BString::str ( ) const
```

Ptr to char* representation.

7.89.3.12 retStrDup()

```
char * BString::retStrDup ( ) const
```

Ptr to newly malloc'd char*.

7.89.3.13 retInt()

```
int BString::retInt ( ) const
```

Return string as a int.

7.89.3.14 retUInt()

```
unsigned int BString::retUInt ( ) const
```

Return string as a int.

7.89.3.15 retDouble()

```
double BString::retDouble ( ) const
```

Return string as a double.

7.89.3.16 retFloat64()

```
BFloat64 BString::retFloat64 ( ) const
```

Return string as a BFloat64.

7.89.3.17 compare()

```
int BString::compare (
            const BString & string ) const
```

Compare strings. Returns 0 for match.

7.89.3.18 compareWild()

```
int BString::compareWild (
            const BString & string ) const
```

Compare string to string with wildcards . Returns 0 for match.

7.89.3.19 compareWildExpression()

```
int BString::compareWildExpression (
            const BString & string ) const
```

Compare string to space deliminated patterns. Returns 0 for match.

7.89.3.20 compareRegex()

```
int BString::compareRegex (
            const BString & pattern,
            int ignoreCase = 0 ) const
```

Compare strings. Returns 1 for match.

7.89.3.21 truncate()

```
BString & BString::truncate (
            int len )
```

Truncate to length len.

7.89.3.22 pad()

```
BString & BString::pad (
            int len )
```

Pad to length len.

7.89.3.23 clear()

```
void BString::clear ( )
```

Clear the string.

7.89.3.24 toUpper()

```
BString & BString::toUpper ( )
```

Convert to uppercase.

7.89.3.25 toLower()

```
BString & BString::toLower ( )
```

Convert to lowercase.

7.89.3.26 lowerFirst()

```
BString BString::lowerFirst ( )
```

Return string with lowercase first character.

7.89.3.27 removeNL()

```
void BString::removeNL ( )
```

Remove if present NL from last char.

7.89.3.28 justify()

```
BString BString::justify (
            int leftMargin,
            int width )
```

Justify the string to the given width.

7.89.3.29 fixedLen()

```
BString BString::fixedLen (
            int length,
            int rightJustify = 0 )
```

return string formated to fixed length

7.89.3.30 firstLine()

```
BString BString::firstLine ( )
```

Return first line.

7.89.3.31 translateChar()

```
BString BString::translateChar (
            char ch,
            BString replace = " " )
```

Translate character converting them to the given string.

7.89.3.32 reverse()

```
BString BString::reverse ( ) const
```

Reverse character order.

7.89.3.33 subString()

```
BString BString::subString (
            int start,
            int len ) const
```

Returns substring.

7.89.3.34 del()

```
int BString::del (
            int start,
            int len )
```

Delete substring.

7.89.3.35 insert()

```
int BString::insert (
            int start,
            BString str )
```

Insert substring.

7.89.3.36 append()

```
int BString::append (
            const BString & str )
```

Append a string.

7.89.3.37 add()

```
BString BString::add (
            const BString & str ) const
```

Add strings returning result.

7.89.3.38 printf()

```
BString & BString::printf (
            const char * fmt,
             ...  )
```

Formated print into the string.

7.89.3.39 find() [1/2]

```
int BString::find (
            char ch ) const
```

Find ch in string searching forwards. Returns -1 if not found.

7.89.3.40 find() [2/2]

```
int BString::find (
            BString str ) const
```

Find string in string searching forwards. Returns -1 if not found.

7.89.3.41 findReverse()

```
int BString::findReverse (
            char ch ) const
```

Find ch in string searching backwards. Returns -1 if not found.

7.89.3.42 csvEncode()

```
BString BString::csvEncode ( ) const
```

Encode a string for CSV.

7.89.3.43 csvDecode()

```
BString & BString::csvDecode (
            const BString str )
```

Decode a string from CSV.

7.89.3.44 base64Encode()

```
BString BString::base64Encode ( ) const
```

Encode a string to base64.

7.89.3.45 base64Decode()

```
BError BString::base64Decode (
            BString & str ) const
```

Decode a string from base64.

7.89.3.46 getTokenList() [1/2]

```
BList< BString > BString::getTokenList (
            BString separators )
```

Break string into tokens.

7.89.3.47 getTokenList() [2/2]

```
BList< BString > BString::getTokenList (
            char separator )
```

Break string into tokens.

7.89.3.48 removeSeparators()

```
BString BString::removeSeparators (
            BString separators )
```

Remove any char from sepatators from string.

7.89.3.49 pullToken()

```
BString BString::pullToken (
            BString terminators )
```

Pull token from start of string.

7.89.3.50 pullSeparators()

```
BString BString::pullSeparators (
            BString separators )
```

Pull separators from start of string.

7.89.3.51 pullWord()

```
BString BString::pullWord ( )
```

Pull a word out of the head of the string.

7.89.3.52 pullLine()

```
BString BString::pullLine ( )
```

Pull a line out of the head of the string.

7.89.3.53 split()

```
BList< BString > BString::split (
            char splitChar )
```

Split string into an array based on the character separator.

7.89.3.54 dirname()

```
BString BString::dirname ( )
```

Return the directory component if the string is a file path name.

7.89.3.55 filename()

```
BString BString::filename ( )
```

Return the filename component if the string is a file path name.

7.89.3.56 basename()

```
BString BString::basename ( )
```

Return the file name component if the string is a file path name.

7.89.3.57 extension()

```
BString BString::extension ( )
```

Return the file extension component if the string is a file path name.

7.89.3.58 extensionFull()

```
BString BString::extensionFull ( )
```

Return the file extension component with leading '.' if the string is a file path name.

7.89.3.59 hash()

```
BUInt32 BString::hash ( ) const
```

Create a 32bit hash number for the string.

7.89.3.60 get() [1/2]

```
char & BString::get (
            int pos )
```

Return the character at the position give. Will print an error message and raise the SIGABORT exception if out of range.

7.89.3.61 get() [2/2]

```
const char & BString::get (
            int pos ) const
```

Return the character at the position give. Will print an error message and raise the SIGABORT exception if out of range.

7.89.3.62 operator=()

```
BString & BString::operator= (
            const BString & string )
```

7.89.3.63 operator[]()

```
char & BString::operator[] (
            int pos )
```

7.89.3.64 operator==() [1/2]

```
int BString::operator== (
            const BString & s ) const  [inline]
```

7.89.3.65 operator==() [2/2]

```
int BString::operator== (
            const char * s ) const  [inline]
```

7.89.3.66 operator>() [1/2]

```
int BString::operator> (
            const BString & s ) const  [inline]
```

7.89.3.67 operator>() [2/2]

```
int BString::operator> (
            const char * s ) const  [inline]
```

7.89.3.68 operator<() [1/2]

```
int BString::operator< (
            const BString & s ) const  [inline]
```

7.89.3.69 operator<() [2/2]

```
int BString::operator< (
            const char * s ) const  [inline]
```

7.89.3.70 operator>=()

```
int BString::operator>= (
            const BString & s ) const  [inline]
```

7.89.3.71 operator<=()

```
int BString::operator<= (
            const BString & s ) const  [inline]
```

7.89.3.72 operator"!=() [1/2]

```
int BString::operator!= (
            const BString & s ) const  [inline]
```

7.89.3.73 operator"!=() [2/2]

```
int BString::operator!= (
            const char * s ) const  [inline]
```

7.89.3.74 operator+() [1/6]

```
BString BString::operator+ (
            const BString & s ) const  [inline]
```

7.89.3.75 operator+() [2/6]

```
BString BString::operator+ (
            const char * s ) const  [inline]
```

7.89.3.76 operator+=() [1/2]

```
BString BString::operator+= (
            const BString & s )  [inline]
```

7.89.3.77 operator+=() [2/2]

```
BString BString::operator+= (
            const char * s )  [inline]
```

7.89.3.78 operator+() [3/6]

```
BString BString::operator+ (
            char ch ) const  [inline]
```

7.89.3.79 operator+() [4/6]

```
BString BString::operator+ (
            BInt i ) const  [inline]
```

7.89.3.80 operator+() [5/6]

```
BString BString::operator+ (
            BUInt i ) const  [inline]
```

7.89.3.81 operator+() [6/6]

```
BString BString::operator+ (
            BUInt64 i ) const  [inline]
```

7.89.3.82 operator const char *()

```
BString::operator const char * ( ) const  [inline]
```

7.89.3.83 field()

```
BString BString::field (
            int field ) const
```

Depreciated function.

7.89.3.84 fields()

```
char ** BString::fields ( )
```

Depreciated function.

7.89.4 Member Data Documentation

7.89.4.1 ostr

```
BRefData* BString::ostr  [protected]
```

This is the reference counted string storage.

The documentation for this class was generated from the following files:

- BString.h
- BString.cpp

7.90 BStringLocked Class Reference

Provides a basic thread locked string.

```
#include <BStringLocked.h>
```

Public Member Functions

- BStringLocked ()
- BStringLocked (const BStringLocked &s)
- BStringLocked (const BString &s)
- int len () const

  Length of string.
- operator BString () const
- BStringLocked operator+ (const BStringLocked &s) const
- BStringLocked & operator= (const BStringLocked &s)

7.90.1 Detailed Description

Provides a basic thread locked string.

7.90.2 Constructor & Destructor Documentation

7.90.2.1 BStringLocked() [1/3]

```
BStringLocked::BStringLocked ( )  [inline]
```

7.90.2.2 BStringLocked() [2/3]

```
BStringLocked::BStringLocked (
            const BStringLocked & s )  [inline]
```

7.90.2.3 BStringLocked() [3/3]

```
BStringLocked::BStringLocked (
            const BString & s )  [inline]
```

7.90.3 Member Function Documentation

7.90.3.1 len()

```
int BStringLocked::len ( ) const  [inline]
```

Length of string.

7.90.3.2 operator BString()

```
BStringLocked::operator BString ( ) const  [inline]
```

7.90.3.3 operator+()

```
BStringLocked BStringLocked::operator+ (
            const BStringLocked & s ) const  [inline]
```

7.90.3.4 operator=()

```
BStringLocked & BStringLocked::operator= (
            const BStringLocked & s )  [inline]
```

The documentation for this class was generated from the following file:

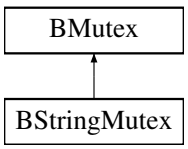
- BStringLocked.h

7.91 BStringMutex Class Reference

Thread locked string internal mutex.

`#include <BStringLocked.h>`

Inheritance diagram for BStringMutex:



Public Member Functions

- BStringMutex ()

Additional Inherited Members

7.91.1 Detailed Description

Thread locked string internal mutex.

7.91.2 Constructor & Destructor Documentation

7.91.2.1 BStringMutex()

```
BStringMutex::BStringMutex ( )  [inline]
```

The documentation for this class was generated from the following file:

- BStringLocked.h

7.92 BTable Class Reference

A simple string based table structure.

```
#include <BTable.h>
```

Public Member Functions

- BTable ()
- ~BTable ()
- void clear ()
- void setTitle (BArray< BString > title)
- void addRow (BArray< BString > data)
- BString getString ()
- void print (FILE *file=stdout)

7.92.1 Detailed Description

A simple string based table structure.

7.92.2 Constructor & Destructor Documentation

7.92.2.1 BTable()

```
BTable::BTable ( )
```

7.92.2.2 ~BTable()

```
BTable::~BTable ( )
```

7.92.3 Member Function Documentation

7.92.3.1 clear()

```
void BTable::clear ( )
```

7.92.3.2 setTitle()

```
void BTable::setTitle (
            BArray< BString > title )
```

7.92.3.3 addRow()

```
void BTable::addRow (
            BArray< BString > data )
```

7.92.3.4 getString()

```
BString BTable::getString ( )
```

7.92.3.5 print()

```
void BTable::print (
            FILE * file = stdout )
```

The documentation for this class was generated from the following files:

- BTable.h
- BTable.cpp

7.93 BTask Class Reference

Implements a thread of execution.

```
#include <BTask.h>
```

Public Member Functions

- BTask (const char ∗name="", BUInt stackSize=0, BUInt priority=1)
- virtual ∼BTask ()
- void init (const char ∗name, BUInt stackSize=0, BUInt priority=1)
- BError start ()

  Starts the task running.
- void stop ()
- void waitForCompletion ()
- int setPriority (BUInt priority)

  Set the priority of the task: 0 upwards.
- virtual void run ()

Static Protected Member Functions

- static void ∗ taskFunc (void ∗)

Protected Attributes

- const char ∗ oname
- BUInt ostackSize
- BUInt opolicy
- BUInt opriority
- pthread_t othread
- Bool orunning

7.93.1 Detailed Description

Implements a thread of execution.

7.93.2 Constructor & Destructor Documentation

7.93.2.1 BTask()

```
BTask::BTask (
            const char * name = "",
            BUInt stackSize = 0,
            BUInt priority = 1 )
```

7.93.2.2 ∼BTask()

```
BTask::~BTask ( )  [virtual]
```

7.93.3 Member Function Documentation

7.93.3.1 init()

```
void BTask::init (
            const char * name,
            BUInt stackSize = 0,
            BUInt priority = 1 )
```

7.93.3.2 start()

```
BError BTask::start ( )
```

Starts the task running.

7.93.3.3 stop()

```
void BTask::stop ( )
```

7.93.3.4 waitForCompletion()

```
void BTask::waitForCompletion ( )
```

7.93.3.5 setPriority()

```
int BTask::setPriority (
            BUInt priority )
```

Set the priority of the task: 0 upwards.

7.93.3.6 run()

```
void BTask::run ( )  [virtual]
```

7.93.3.7 taskFunc()

```
void * BTask::taskFunc (
            void * arg )  [static], [protected]
```

7.93.4 Member Data Documentation

7.93.4.1 oname

```
const char* BTask::oname  [protected]
```

7.93.4.2 ostackSize

```
BUInt BTask::ostackSize  [protected]
```

7.93.4.3 opolicy

```
BUInt BTask::opolicy  [protected]
```

7.93.4.4 opriority

```
BUInt BTask::opriority  [protected]
```

7.93.4.5 othread

```
pthread_t BTask::othread  [protected]
```

7.93.4.6 orunning

```
Bool BTask::orunning  [protected]
```

The documentation for this class was generated from the following files:

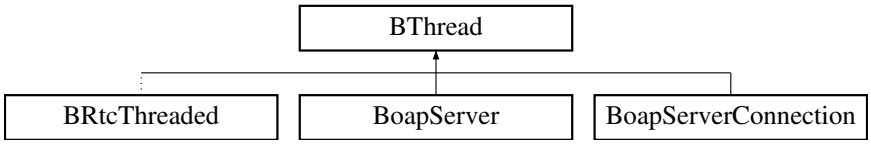
- BTask.h
- BTask.cpp

7.94 BThread Class Reference

Implements a program execution thread.

`#include <BThread.h>`

Inheritance diagram for BThread:



Public Member Functions

- BThread ()
- virtual ~BThread ()
- int setInitPriority (int policy, int priority)
- int setInitStackSize (size_t stackSize)
- int start ()
- void * result ()
- int running ()
- int setPriority (int policy, int priority)
- int cancel ()
- void * waitForCompletion ()
- pthread_t getThread ()
- virtual void * function ()

7.94.1 Detailed Description

Implements a program execution thread.

7.94.2 Constructor & Destructor Documentation

7.94.2.1 BThread()

`BThread::BThread ( )`

7.94.2.2 ~BThread()

`BThread::~BThread ( )  [virtual]`

7.94.3 Member Function Documentation

7.94.3.1 setInitPriority()

```
int BThread::setInitPriority (
            int policy,
            int priority )
```

7.94.3.2 setInitStackSize()

```
int BThread::setInitStackSize (
            size_t stackSize )
```

7.94.3.3 start()

```
int BThread::start ( )
```

7.94.3.4 result()

```
void * BThread::result ( )
```

7.94.3.5 running()

```
int BThread::running ( )
```

7.94.3.6 setPriority()

```
int BThread::setPriority (
            int policy,
            int priority )
```

7.94.3.7 cancel()

```
int BThread::cancel ( )
```

7.94.3.8 waitForCompletion()

```
void * BThread::waitForCompletion ( )
```

7.94.3.9 getThread()

```
pthread_t BThread::getThread ( )
```

7.94.3.10 function()

```
void * BThread::function ( )  [virtual]
```

Reimplemented in BoapServer.

The documentation for this class was generated from the following files:

- BThread.h
- BThread.cpp

7.95 BTime Class Reference

Implements a simple date/time class. Stores the date/time as a number of seconds since Unix epoch 1970-01-02T00:00:00.

```
#include <BTime.h>
```

Public Member Functions

- BTime (BUInt32 t=0)
- void set (BUInt32 seconds)

  Set the date and time.
- void set (BUInt year, BUInt month, BUInt day, BUInt hour=0, BUInt minute=0, BUInt second=0)

  Set the date and time.
- void setYearDay (BUInt year, BUInt yearDay, BUInt hour=0, BUInt minute=0, BUInt second=0)

  Set the date and time.
- void getDate (BUInt &year, BUInt &month, BUInt &day) const

  Retun the date information.
- void getTime (BUInt &hour, BUInt &minute, BUInt &second) const

  Return the time information.
- BUInt32 getSeconds () const

  Return the number of seconds.
- int isSet () const

  Check if set.
- int isLeapYear ()

  Returns if a leap year.
- void addSeconds (int seconds)

  Add the given number of seconds.
- BString getString (BString format="iso") const

  Gets the date/time in string format.
- BError setString (const BString dateTime)

  Sets the date/time from string format.
- BTime utcToLocal () const

  Converts a UTC time to a local time.
- BTime localToUtc () const

  Converts a local time to UTC time.
- BString getStringLocal (BString format="iso") const

  Gets the date/time in string format.
- BError setStringLocal (const BString dateTime)

  Sets the date/time from string format.
- int operator== (const BTime &time) const
- int operator!= (const BTime &time) const
- int operator> (const BTime &time) const
- int operator>= (const BTime &time) const
- int operator< (const BTime &time) const
- int operator<= (const BTime &time) const
- BTime operator+ (int seconds) const
- BTime & operator+= (int seconds)

7.95.1 Detailed Description

Implements a simple date/time class. Stores the date/time as a number of seconds since Unix epoch 1970-01-02T00:00:00.

BTime has a range until 2106-02-07. This sets and returns datetime strings in UTC time by default. There are also ∗Local() functions to return and set using local time strings.

Uses some sepcial values. 0 - DateTime not set.

7.95.2 Constructor & Destructor Documentation

7.95.2.1 BTime()

```
BTime::BTime (
            BUInt32 t = 0 )
```

7.95.3 Member Function Documentation

7.95.3.1 set() [1/2]

```
void BTime::set (
            BUInt32 seconds )
```

Set the date and time.

7.95.3.2 set() [2/2]

```
void BTime::set (
            BUInt year,
            BUInt month,
            BUInt day,
            BUInt hour = 0,
            BUInt minute = 0,
            BUInt second = 0 )
```

Set the date and time.

7.95.3.3 setYearDay()

```
void BTime::setYearDay (
            BUInt year,
            BUInt yearDay,
            BUInt hour = 0,
            BUInt minute = 0,
            BUInt second = 0 )
```

Set the date and time.

7.95.3.4 getDate()

```
void BTime::getDate (
            BUInt & year,
            BUInt & month,
            BUInt & day ) const
```

Retun the date information.

7.95.3.5 getTime()

```
void BTime::getTime (
            BUInt & hour,
            BUInt & minute,
            BUInt & second ) const
```

Return the time information.

7.95.3.6 getSeconds()

```
BUInt32 BTime::getSeconds ( ) const
```

Return the number of seconds.

7.95.3.7 isSet()

```
int BTime::isSet ( ) const  [inline]
```

Check if set.

7.95.3.8 isLeapYear()

```
int BTime::isLeapYear ( )
```

Returns if a leap year.

7.95.3.9 addSeconds()

```
void BTime::addSeconds (
            int seconds )
```

Add the given number of seconds.

7.95.3.10 getString()

```
BString BTime::getString (
            BString format = "iso" ) const
```

Gets the date/time in string format.

7.95.3.11 setString()

```
BError BTime::setString (
            const BString dateTime )
```

Sets the date/time from string format.

7.95.3.12 utcToLocal()

```
BTime BTime::utcToLocal ( ) const
```

Converts a UTC time to a local time.

7.95.3.13 localToUtc()

```
BTime BTime::localToUtc ( ) const
```

Converts a local time to UTC time.

7.95.3.14 getStringLocal()

```
BString BTime::getStringLocal (
            BString format = "iso" ) const
```

Gets the date/time in string format.

7.95.3.15 setStringLocal()

```
BError BTime::setStringLocal (
            const BString dateTime )
```

Sets the date/time from string format.

7.95.3.16 operator==()

```
int BTime::operator== (
            const BTime & time ) const  [inline]
```

7.95.3.17 operator"!=()

```
int BTime::operator!= (
            const BTime & time ) const  [inline]
```

7.95.3.18 operator>()

```
int BTime::operator> (
            const BTime & time ) const  [inline]
```

7.95.3.19 operator>=()

```
int BTime::operator>= (
            const BTime & time ) const  [inline]
```

7.95.3.20 operator<()

```
int BTime::operator< (
            const BTime & time ) const  [inline]
```

7.95.3.21 operator<=()

```
int BTime::operator<= (
            const BTime & time ) const  [inline]
```

7.95.3.22 operator+()

```
BTime BTime::operator+ (
            int seconds ) const  [inline]
```

7.95.3.23 operator+=()

```
BTime & BTime::operator+= (
            int seconds )  [inline]
```

The documentation for this class was generated from the following files:

- BTime.h
- BTime.cpp

7.96 BTimer Class Reference

Stopwatch style timer.

`#include <BTimer.h>`

Public Member Functions

- BTimer ()
- ~BTimer ()
- void start ()

  Start timer.
- void stop ()

  Stop timer.
- void clear ()

  Clear timer.
- double getElapsedTime ()

  Returns the elapsed time from the last start.
- void add (BTimer &timer)

  Add two timers.
- double average ()

  Average time is duration between start() and stop() / number of stops.
- double peak ()

  Peak time.

7.96.1 Detailed Description

Stopwatch style timer.

7.96.2 Constructor & Destructor Documentation

7.96.2.1 BTimer()

```
BTimer::BTimer ( )
```

7.96.2.2 ~BTimer()

```
BTimer::~BTimer ( )
```

7.96.3 Member Function Documentation

7.96.3.1 start()

```
void BTimer::start ( )
```

Start timer.

7.96.3.2 stop()

```
void BTimer::stop ( )
```

Stop timer.

7.96.3.3 clear()

```
void BTimer::clear ( )
```

Clear timer.

7.96.3.4 getElapsedTime()

```
double BTimer::getElapsedTime ( )
```

Returns the elapsed time from the last start.

7.96.3.5 add()

```
void BTimer::add (
            BTimer & timer )
```

Add two timers.

7.96.3.6 average()

```
double BTimer::average ( )
```

Average time is duration between start() and stop() / number of stops.

7.96.3.7 peak()

```
double BTimer::peak ( )
```

Peak time.

The documentation for this class was generated from the following files:

- BTimer.h
- BTimer.cpp

7.97 BTimeStamp Class Reference

A date and time storage class with microsecond resolution.

```
#include <BTimeStamp.h>
```

Public Member Functions

- BTimeStamp ()
- BTimeStamp (int year, int month=1, int day=1, int hour=0, int minute=0, int second=0, int microsecond=0)
- BTimeStamp (const BString str)
- ~BTimeStamp ()
- void clear ()

  Clear the date/time.
- void setFirst ()

  Set the first date available.
- void setLast ()

  Set the last date available.
- void set (time_t time, int microSeconds)

  Set time using Unix time (seconds from 1970-01-01)
- void set (int year=0, int month=1, int day=1, int hour=0, int minute=0, int second=0, int microsecond=0)
- void set (const BTimeStampMs &timeStamp)

  Set the timeStamp to given MS time stamp.
- void setYDay (int year=0, int yday=0, int hour=0, int minute=0, int second=0, int microsecond=0)
- void setTime (int hour=0, int minute=0, int second=0, int microsecond=0)
- void setNow ()

  Set the timeStamp to now.
- int year () const
- int yday () const
- int month () const
- int day () const
- int hour () const
- int minute () const
- int second () const
- int microSecond () const
- void getDate (int &year, int &mon, int &day) const
- BString getString (BString separator="T") const

  Get the time as an ISO date/time string.
- BError setString (const BString dateTime)

  Set the time from an ISO date/time.
- BString getStringNoMs (BString separator="T") const

  Get the time as an ISO date/time string without microseconds.
- BString getStringFormatted (BString format) const

  Gets the time in a string form as per the format. Format syntax as per strftime()
- void addMilliSeconds (int milliSeconds)

  Add the given number of milli seconds. This should be less that a year.
- void addMicroSeconds (int64_t microSeconds)

  Add the given number of micro seconds. This should be less that a year.
- void addSeconds (int seconds)

  Add the given number of seconds. This should be less that a year.
- uint32_t getYearSeconds () const

  Get number of seconds within the year.
- uint64_t getYearMicroSeconds () const

  Get number of micro seconds within the year.
- int isSet () const
- int compare (const BTimeStamp &timeStamp) const

  Compare two dates.
- operator BString () const

- BTimeStamp & operator= (const BTimeStampMs &timeStamp)
- int operator== (const BTimeStamp &timeStamp) const
- int operator!= (const BTimeStamp &timeStamp) const
- int operator> (const BTimeStamp &timeStamp) const
- int operator>= (const BTimeStamp &timeStamp) const
- int operator< (const BTimeStamp &timeStamp) const
- int operator<= (const BTimeStamp &timeStamp) const

Static Public Member Functions

- static int isLeap (int year)
- static BInt64 difference (BTimeStamp t2, BTimeStamp t1)

Public Attributes

- BUInt16 oyear

  Year (0 .. 65535)
- BUInt16 oyday

  Day in year (0 .. 365)
- BUInt8 ohour

  Hour (0 .. 23)
- BUInt8 ominute

  Minute (0 .. 59)
- BUInt8 osecond

  Second (0 .. 59)
- BUInt8 ospare

  Padding.
- BUInt32 omicroSecond

  MicroSecond (0 .. 999999)

7.97.1 Detailed Description

A date and time storage class with microsecond resolution.

7.97.2 Constructor & Destructor Documentation

7.97.2.1 BTimeStamp() [1/3]

```
BTimeStamp::BTimeStamp ( )
```

7.97.2.2 BTimeStamp() [2/3]

```
BTimeStamp::BTimeStamp (
            int year,
            int month = 1,
            int day = 1,
            int hour = 0,
            int minute = 0,
            int second = 0,
            int microsecond = 0 )
```

7.97.2.3 BTimeStamp() [3/3]

```
BTimeStamp::BTimeStamp (
            const BString str )
```

7.97.2.4 ~BTimeStamp()

```
BTimeStamp::~BTimeStamp ( )
```

7.97.3 Member Function Documentation

7.97.3.1 clear()

```
void BTimeStamp::clear ( )
```

Clear the date/time.

7.97.3.2 setFirst()

```
void BTimeStamp::setFirst ( )
```

Set the first date available.

7.97.3.3 setLast()

```
void BTimeStamp::setLast ( )
```

Set the last date available.

7.97.3.4 set() [1/3]

```
void BTimeStamp::set (
            time_t time,
            int microSeconds )
```

Set time using Unix time (seconds from 1970-01-01)

7.97.3.5 set() [2/3]

```
void BTimeStamp::set (
            int year = 0,
            int month = 1,
            int day = 1,
            int hour = 0,
            int minute = 0,
            int second = 0,
            int microsecond = 0 )
```

7.97.3.6 set() [3/3]

```
void BTimeStamp::set (
            const BTimeStampMs & timeStamp )
```

Set the timeStamp to given MS time stamp.

7.97.3.7 setYDay()

```
void BTimeStamp::setYDay (
            int year = 0,
            int yday = 0,
            int hour = 0,
            int minute = 0,
            int second = 0,
            int microsecond = 0 )
```

7.97.3.8 setTime()

```
void BTimeStamp::setTime (
             int hour = 0,
             int minute = 0,
             int second = 0,
             int microsecond = 0 )
```

7.97.3.9 setNow()

```
void BTimeStamp::setNow ( )
```

Set the timeStamp to now.

7.97.3.10 year()

```
int BTimeStamp::year ( ) const
```

7.97.3.11 yday()

```
int BTimeStamp::yday ( ) const
```

7.97.3.12 month()

```
int BTimeStamp::month ( ) const
```

7.97.3.13 day()

```
int BTimeStamp::day ( ) const
```

7.97.3.14 hour()

```
int BTimeStamp::hour ( ) const
```

7.97.3.15 minute()

```
int BTimeStamp::minute ( ) const
```

7.97.3.16 second()

```
int BTimeStamp::second ( ) const
```

7.97.3.17 microSecond()

```
int BTimeStamp::microSecond ( ) const
```

7.97.3.18 getDate()

```
void BTimeStamp::getDate (
            int & year,
            int & mon,
            int & day ) const
```

7.97.3.19 getString()

```
BString BTimeStamp::getString (
            BString separator = "T" ) const
```

Get the time as an ISO date/time string.

7.97.3.20 setString()

```
BError BTimeStamp::setString (
            const BString dateTime )
```

Set the time from an ISO date/time.

This accepts a string and parses for a supported datetime format string. The function will return an error if it cannot parse a datatime string or if one of the parsed fields is out of range. The conversion supports a fractional second resolution of 1 microsecond rounding the fractional value given to this. Supported formats include: ISO: YYYY-MM-DD[T]HH:MM:SS.FS, UK: YYYY/MM/DD[T]HH:MM:SS.FS, UK: YY/MM/DD[T]HH:MM:SS.FS, HH:MM:SS.FS and YYYYDDD[T]HH:MM:SS.FS.

7.97.3.21 getStringNoMs()

```
BString BTimeStamp::getStringNoMs (
            BString separator = "T" ) const
```

Get the time as an ISO date/time string without microseconds.

7.97.3.22 getStringFormatted()

```
BString BTimeStamp::getStringFormatted (
            BString format ) const
```

Gets the time in a string form as per the format. Format syntax as per strftime()

7.97.3.23 addMilliSeconds()

```
void BTimeStamp::addMilliSeconds (
            int milliSeconds )
```

Add the given number of milli seconds. This should be less that a year.

7.97.3.24 addMicroSeconds()

```
void BTimeStamp::addMicroSeconds (
            int64_t microSeconds )
```

Add the given number of micro seconds. This should be less that a year.

7.97.3.25 addSeconds()

```
void BTimeStamp::addSeconds (
            int seconds )
```

Add the given number of seconds. This should be less that a year.

7.97.3.26 getYearSeconds()

```
uint32_t BTimeStamp::getYearSeconds ( ) const
```

Get number of seconds within the year.

7.97.3.27 getYearMicroSeconds()

```
uint64_t BTimeStamp::getYearMicroSeconds ( ) const
```

Get number of micro seconds within the year.

7.97.3.28 isSet()

```
int BTimeStamp::isSet ( ) const  [inline]
```

7.97.3.29 compare()

```
int BTimeStamp::compare (
            const BTimeStamp & timeStamp ) const
```

Compare two dates.

7.97.3.30 operator BString()

```
BTimeStamp::operator BString ( ) const  [inline]
```

7.97.3.31 operator=()

```
BTimeStamp & BTimeStamp::operator= (
            const BTimeStampMs & timeStamp )  [inline]
```

7.97.3.32 operator==()

```
int BTimeStamp::operator== (
            const BTimeStamp & timeStamp ) const  [inline]
```

7.97.3.33 operator"!=()

```
int BTimeStamp::operator!= (
            const BTimeStamp & timeStamp ) const  [inline]
```

7.97.3.34 operator>()

```
int BTimeStamp::operator> (
            const BTimeStamp & timeStamp ) const  [inline]
```

7.97.3.35 operator>=()

```
int BTimeStamp::operator>= (
            const BTimeStamp & timeStamp ) const  [inline]
```

7.97.3.36 operator<()

```
int BTimeStamp::operator< (
            const BTimeStamp & timeStamp ) const  [inline]
```

7.97.3.37 operator<=()

```
int BTimeStamp::operator<= (
            const BTimeStamp & timeStamp ) const  [inline]
```

7.97.3.38 isLeap()

```
int BTimeStamp::isLeap (
            int year )  [static]
```

7.97.3.39 difference()

```
BInt64 BTimeStamp::difference (
            BTimeStamp t2,
            BTimeStamp t1 )  [static]
```

7.97.4 Member Data Documentation

7.97.4.1 oyear

```
BUInt16 BTimeStamp::oyear
```

Year (0 .. 65535)

7.97.4.2 oyday

```
BUInt16 BTimeStamp::oyday
```

Day in year (0 .. 365)

7.97.4.3 ohour

```
BUInt8 BTimeStamp::ohour
```

Hour (0 .. 23)

7.97.4.4 ominute

```
BUInt8 BTimeStamp::ominute
```

Minute (0 .. 59)

7.97.4.5 osecond

```
BUInt8 BTimeStamp::osecond
```

Second (0 .. 59)

7.97.4.6 ospare

```
BUInt8 BTimeStamp::ospare
```

Padding.

7.97.4.7 omicroSecond

```
BUInt32 BTimeStamp::omicroSecond
```

MicroSecond (0 .. 999999)

The documentation for this class was generated from the following files:

- BTimeStamp.h
- BTimeStamp.cpp

7.98 BTimeStampMs Class Reference

A date and time storage class with milisecond resolution and an extra field to indicate a particular sampleNumber it reffers to.

```
#include <BTimeStampMs.h>
```

Public Member Functions

- BTimeStampMs (BString str="")
- ~BTimeStampMs ()
- void clear ()

  Clear the date/time.
- void setNow ()

  Set the timeStamp to now.
- void setFirst ()

  Set the first date available.
- void setLast ()

  Set the last date available.
- void set (time_t time, int milliSeconds=0)

  Set time using Unix time (seconds from 1970-01-01)
- void setYDay (int year=0, int yday=0, int hour=0, int minute=0, int second=0, int milliSecond=0)
- void setTime (int hour=0, int minute=0, int second=0, int milliSecond=0)
- BTimeStampMs & addMilliSeconds (int milliSeconds)

  Add the given number of milli seconds. This should be less that a year.
- BTimeStampMs & subMilliSeconds (int milliSeconds)

  Add the given number of milli seconds. This should be less that a year.
- BTimeStampMs & addSeconds (int seconds)

  Add the given number of seconds. This should be less that a year.
- BTimeStampMs & subSeconds (int seconds)

  Subtract the given number of seconds. This should be less that a year.
- uint32_t getYearSeconds ()

  Get number of seconds within the year.
- uint64_t getYearMilliSeconds ()

  Get number of seconds within the year.
- BString getString (BString separator="T")

  Get the time as an ISO date/time string.
- BString getStringNoMs (BString separator="T")

Get the time as an ISO date/time string with no ms.

- BError setString (BString dateTime)

  Set the time from an ISO date/time.
- BString getDurationString (BString separator="T")

  Get the time as an ISO date/time string but with month's and days starting from 0.
- BString getDurationStringNoMs (BString separator="T")

  Get the time as an ISO date/time string but with month's and days starting from 0 with no ms.
- BError setDurationString (BString dateTime)

  Set the time from an ISO date/time string but with month's and days starting from 0.
- BString getStringRaw ()
- void getDate (int &year, int &mon, int &day)

  Get the year, month and day.
- int compare (const BTimeStampMs &timeStamp)

  Compare two dates.
- int operator> (const BTimeStampMs &timeStamp)
- int operator>= (const BTimeStampMs &timeStamp)
- int operator< (const BTimeStampMs &timeStamp)
- int operator<= (const BTimeStampMs &timeStamp)

Static Public Member Functions

- static int isLeap (int year)
- static BUInt64 difference (BTimeStampMs t2, BTimeStampMs t1)

Public Attributes

- uint16_t year

  Year (2000 .. 3000)
- uint16_t yday

  Day in year (0 .. 365)
- uint16_t hour

  Hour (0 .. 23)
- uint16_t minute

  Minute (0 .. 59)
- uint16_t second

  Second (0 .. 59)
- uint16_t milliSecond

  MilliSecond (0 .. 999)
- int32_t sampleNumber

  The sample number this time refers to.

7.98.1 Detailed Description

A date and time storage class with milisecond resolution and an extra field to indicate a particular sampleNumber it reffers to.

7.98.2 Constructor & Destructor Documentation

7.98.2.1 BTimeStampMs()

```
BTimeStampMs::BTimeStampMs (
            BString str = "" )
```

7.98.2.2 ~BTimeStampMs()

```
BTimeStampMs::~BTimeStampMs ( )
```

7.98.3 Member Function Documentation

7.98.3.1 clear()

```
void BTimeStampMs::clear ( )
```

Clear the date/time.

7.98.3.2 setNow()

```
void BTimeStampMs::setNow ( )
```

Set the timeStamp to now.

7.98.3.3 setFirst()

```
void BTimeStampMs::setFirst ( )
```

Set the first date available.

7.98.3.4 setLast()

```
void BTimeStampMs::setLast ( )
```

Set the last date available.

7.98.3.5 set()

```
void BTimeStampMs::set (
            time_t time,
            int milliSeconds = 0 )
```

Set time using Unix time (seconds from 1970-01-01)

7.98.3.6 setYDay()

```
void BTimeStampMs::setYDay (
            int year = 0,
            int yday = 0,
            int hour = 0,
            int minute = 0,
            int second = 0,
            int milliSecond = 0 )
```

7.98.3.7 setTime()

```
void BTimeStampMs::setTime (
            int hour = 0,
            int minute = 0,
            int second = 0,
            int milliSecond = 0 )
```

7.98.3.8 addMilliSeconds()

```
BTimeStampMs & BTimeStampMs::addMilliSeconds (
            int milliSeconds )
```

Add the given number of milli seconds. This should be less that a year.

7.98.3.9 subMilliSeconds()

```
BTimeStampMs & BTimeStampMs::subMilliSeconds (
            int milliSeconds )
```

Add the given number of milli seconds. This should be less that a year.

7.98.3.10 addSeconds()

```
BTimeStampMs & BTimeStampMs::addSeconds (
            int seconds )
```

Add the given number of seconds. This should be less that a year.

7.98.3.11 subSeconds()

```
BTimeStampMs & BTimeStampMs::subSeconds (
            int seconds )
```

Subtract the given number of seconds. This should be less that a year.

7.98.3.12 getYearSeconds()

```
uint32_t BTimeStampMs::getYearSeconds ( )
```

Get number of seconds within the year.

7.98.3.13 getYearMilliSeconds()

```
uint64_t BTimeStampMs::getYearMilliSeconds ( )
```

Get number of seconds within the year.

7.98.3.14 getString()

```
BString BTimeStampMs::getString (
            BString separator = "T" )
```

Get the time as an ISO date/time string.

7.98.3.15 getStringNoMs()

```
BString BTimeStampMs::getStringNoMs (
            BString separator = "T" )
```

Get the time as an ISO date/time string with no ms.

7.98.3.16 setString()

```
BError BTimeStampMs::setString (
            BString dateTime )
```

Set the time from an ISO date/time.

This accepts a string and parses for a supported datetime format string. The function will return an error if it cannot parse a datatime string or if one of the parsed fields is out of range. The conversion supports a fractional second resolution of 1 milisecond resolution rounding the fractional value given to this. Supported formats include: ISO: YYYY-MM-DD[T]HH:MM:SS.FS.

7.98.3.17 getDurationString()

```
BString BTimeStampMs::getDurationString (
            BString separator = "T" )
```

Get the time as an ISO date/time string but with month's and days starting from 0.

7.98.3.18 getDurationStringNoMs()

```
BString BTimeStampMs::getDurationStringNoMs (
            BString separator = "T" )
```

Get the time as an ISO date/time string but with month's and days starting from 0 with no ms.

7.98.3.19 setDurationString()

```
BError BTimeStampMs::setDurationString (
            BString dateTime )
```

Set the time from an ISO date/time string but with month's and days starting from 0.

7.98.3.20 getStringRaw()

```
BString BTimeStampMs::getStringRaw ( )
```

7.98.3.21 getDate()

```
void BTimeStampMs::getDate (
            int & year,
            int & mon,
            int & day )
```

Get the year, month and day.

7.98.3.22 compare()

```
int BTimeStampMs::compare (
            const BTimeStampMs & timeStamp )
```

Compare two dates.

7.98.3.23 operator>()

```
int BTimeStampMs::operator> (
            const BTimeStampMs & timeStamp )  [inline]
```

7.98.3.24 operator>=()

```
int BTimeStampMs::operator>= (
            const BTimeStampMs & timeStamp )  [inline]
```

7.98.3.25 operator<()

```
int BTimeStampMs::operator< (
            const BTimeStampMs & timeStamp )  [inline]
```

7.98.3.26 operator<=()

```
int BTimeStampMs::operator<= (
            const BTimeStampMs & timeStamp )  [inline]
```

7.98.3.27 isLeap()

```
int BTimeStampMs::isLeap (
            int year )  [static]
```

7.98.3.28 difference()

```
BUInt64 BTimeStampMs::difference (
            BTimeStampMs t2,
            BTimeStampMs t1 )  [static]
```

7.98.4 Member Data Documentation

7.98.4.1 year

```
uint16_t BTimeStampMs::year
```

Year (2000 .. 3000)

7.98.4.2 yday

```
uint16_t BTimeStampMs::yday
```

Day in year (0 .. 365)

7.98.4.3 hour

```
uint16_t BTimeStampMs::hour
```

Hour (0 .. 23)

7.98.4.4 minute

```
uint16_t BTimeStampMs::minute
```

Minute (0 .. 59)

7.98.4.5 second

`uint16_t BTimeStampMs::second`

Second (0 .. 59)

7.98.4.6 milliSecond

`uint16_t BTimeStampMs::milliSecond`

MilliSecond (0 .. 999)

7.98.4.7 sampleNumber

`int32_t BTimeStampMs::sampleNumber`

The sample number this time refers to.

The documentation for this class was generated from the following files:

- BTimeStampMs.h
- BTimeStampMs.cpp

7.99 BTimeUs Class Reference

Time storage as an unsigned 64bit value to TAI standard.

`#include <BTimeUs.h>`

Public Member Functions

- BTimeUs (BUInt64 t=0)
- BTimeUs (BTime t)
- void set (BUInt64 microSeconds)

  Set the time to TAI us.
- void set (BUInt year, BUInt month, BUInt day, BUInt hour=0, BUInt minute=0, BUInt second=0, BUInt microSecond=0)

  Set the date and time from UTC.
- void setYearDay (BUInt year, BUInt yearDay, BUInt hour=0, BUInt minute=0, BUInt second=0, BUInt microSecond=0)

  Set the date and time from UTC.
- void getDate (BUInt &year, BUInt &month, BUInt &day) const

  Return the date information UTC.
- void getTime (BUInt &hour, BUInt &minute, BUInt &second) const

Return the time information UTC.

- BUInt64 getSeconds () const

  Return the number of seconds TAI.
- BUInt64 getMicroSeconds () const

  Return the number of micro seconds TAI.
- int isSet () const

  Check if set.
- int isLeapYear ()

  Returns if a leap year.
- void addSeconds (BInt64 seconds)

  Add the given number of seconds.
- void addMicroSeconds (BInt64 microSeconds)

  Add the given number of seconds.
- BString getString (BString format="isoT") const

  Gets the date/time in string format.
- BString getStringUs (BString format="isoT") const

  Gets the date/time in string format.
- BError setString (const BString dateTime)

  Sets the date/time from string format.
- operator BTime () const
- int operator== (const BTimeUs &time) const
- int operator!= (const BTimeUs &time) const
- int operator> (const BTimeUs &time) const
- int operator>= (const BTimeUs &time) const
- int operator< (const BTimeUs &time) const
- int operator<= (const BTimeUs &time) const
- BTimeUs operator+ (BInt64 microSeconds) const
- BTimeUs & operator+= (BInt64 microSeconds)

7.99.1 Detailed Description

Time storage as an unsigned 64bit value to TAI standard.

7.99.2 Constructor & Destructor Documentation

7.99.2.1 BTimeUs() [1/2]

```
BTimeUs::BTimeUs (
            BUInt64 t = 0 )
```

7.99.2.2 BTimeUs() [2/2]

```
BTimeUs::BTimeUs (
            BTime t )
```

7.99.3 Member Function Documentation

7.99.3.1 set() [1/2]

```
void BTimeUs::set (
            BUInt64 microSeconds )
```

Set the time to TAI us.

7.99.3.2 set() [2/2]

```
void BTimeUs::set (
            BUInt year,
            BUInt month,
            BUInt day,
            BUInt hour = 0,
            BUInt minute = 0,
            BUInt second = 0,
            BUInt microSecond = 0 )
```

Set the date and time from UTC.

7.99.3.3 setYearDay()

```
void BTimeUs::setYearDay (
            BUInt year,
            BUInt yearDay,
            BUInt hour = 0,
            BUInt minute = 0,
            BUInt second = 0,
            BUInt microSecond = 0 )
```

Set the date and time from UTC.

7.99.3.4 getDate()

```
void BTimeUs::getDate (
            BUInt & year,
            BUInt & month,
            BUInt & day ) const
```

Return the date information UTC.

7.99.3.5 getTime()

```
void BTimeUs::getTime (
            BUInt & hour,
            BUInt & minute,
            BUInt & second ) const
```

Return the time information UTC.

7.99.3.6 getSeconds()

```
BUInt64 BTimeUs::getSeconds ( ) const
```

Return the number of seconds TAI.

7.99.3.7 getMicroSeconds()

```
BUInt64 BTimeUs::getMicroSeconds ( ) const
```

Return the number of micro seconds TAI.

7.99.3.8 isSet()

```
int BTimeUs::isSet ( ) const  [inline]
```

Check if set.

7.99.3.9 isLeapYear()

```
int BTimeUs::isLeapYear ( )
```

Returns if a leap year.

7.99.3.10 addSeconds()

```
void BTimeUs::addSeconds (
            BInt64 seconds )
```

Add the given number of seconds.

7.99.3.11 addMicroSeconds()

```
void BTimeUs::addMicroSeconds (
            BInt64 microSeconds )
```

Add the given number of seconds.

7.99.3.12 getString()

```
BString BTimeUs::getString (
            BString format = "isoT" ) const
```

Gets the date/time in string format.

7.99.3.13 getStringUs()

```
BString BTimeUs::getStringUs (
            BString format = "isoT" ) const
```

Gets the date/time in string format.

7.99.3.14 setString()

```
BError BTimeUs::setString (
            const BString dateTime )
```

Sets the date/time from string format.

7.99.3.15 operator BTime()

```
BTimeUs::operator BTime ( ) const  [inline]
```

7.99.3.16 operator==()

```
int BTimeUs::operator== (
            const BTimeUs & time ) const  [inline]
```

7.99.3.17 operator"!=()

```
int BTimeUs::operator!= (
            const BTimeUs & time ) const  [inline]
```

7.99.3.18 operator>()

```
int BTimeUs::operator> (
            const BTimeUs & time ) const  [inline]
```

7.99.3.19 operator>=()

```
int BTimeUs::operator>= (
            const BTimeUs & time ) const  [inline]
```

7.99.3.20 operator<()

```
int BTimeUs::operator< (
            const BTimeUs & time ) const  [inline]
```

7.99.3.21 operator<=()

```
int BTimeUs::operator<= (
            const BTimeUs & time ) const  [inline]
```

7.99.3.22 operator+()

```
BTimeUs BTimeUs::operator+ (
            BInt64 microSeconds ) const  [inline]
```

7.99.3.23 operator+=()

```
BTimeUs & BTimeUs::operator+= (
            BInt64 microSeconds )  [inline]
```

The documentation for this class was generated from the following files:

- BTimeUs.h
- BTimeUs.cpp

7.100 BUrl Class Reference

Access to a Url.

`#include <BUrl.h>`

Public Member Functions

- BUrl ()
- ~BUrl ()
- BError readString (BString url, BString &str)

  Reads URL.

7.100.1 Detailed Description

Access to a Url.

7.100.2 Constructor & Destructor Documentation

7.100.2.1 BUrl()

```
BUrl::BUrl ( )
```

7.100.2.2 ~BUrl()

```
BUrl::~BUrl ( )
```

7.100.3 Member Function Documentation

7.100.3.1 readString()

```
BError BUrl::readString (
            BString url,
            BString & str )
```

Reads URL.

The documentation for this class was generated from the following files:

- BUrl.h
- BUrl.cpp

Chapter 8

File Documentation

8.1 BArray.h File Reference

```
#include <BTypes.h>
#include <vector>
#include <algorithm>
```

Classes

- class BArray< T >

  Template based Array class.

Macros

- #define BArrayLoop(list, i) for(BUInt i = 0; i < list.number(); i++)

8.1.1 Macro Definition Documentation

8.1.1.1 BArrayLoop

```
#define BArrayLoop(
             list,
             i ) for(BUInt i = 0; i < list.number(); i++)
```

8.2 BArray.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BArray.h    BEAM Array
3  *  T.Barnaby,  BEAM Ltd,   2007-02-06
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  *****************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
15 #ifndef BArray_H
16 #define BArray_H    1
17
18 #include <BTypes.h>
19 #include <vector>
20 #include <algorithm>
21
23 template <class T> class BArray : public std::vector<T> {
24 public:
25     typedef int (*SortFunc)(T& a, T& b);
26
27             BArray() : std::vector<T>() {}
28             BArray(BSize size, T value = T()) : std::vector<T>(size, value) {}
29             BArray(const BArray& array) : std::vector<T>(array) {}
30 #ifdef OLD_GXX
31     T*      data(){
32                 return &(*std::vector<T>::begin());
33             }
34 #endif
35     BUInt       number() const { return std::vector<T>::size(); }
36     void        append(const T& value){   std::vector<T>::insert(std::vector<T>::end(), value);   }
37     void        append(const BArray<T>& array);
38     void        insert(BUInt pos, const T& value){ std::vector<T>::insert(typename
       std::vector<T>::iterator(this->_M_impl._M_start + pos), value); }
39     void        del(BUInt pos, BUInt num = 1){ std::vector<T>::erase(std::vector<T>::begin() + pos,
       std::vector<T>::begin() + pos + num); }
40     T&      rear(){ return std::vector<T>::back(); }
41 //  void        sort(SortFunc func){    std::sort(std::vector<T>::begin(), std::vector<T>::end(), func);
       }
42     void        sort(){ std::sort(std::vector<T>::begin(), std::vector<T>::end());  }
43 private:
44 };
45
46 template <class T> void BArray<T>::append(const BArray<T>& array){
47     BUInt  l = BArray<T>::size();
48     BUInt  i;
49
50     BArray<T>::resize(l + array.size());
51     for(i = 0; i < array.size(); i++){
52         BArray<T>::data()[l + i] = array[i];
53     }
54 }
55
56 // Macros
57 #define BArrayLoop(list, i) for(BUInt i = 0; i < list.number(); i++)
58
59 #endif
```

8.3 BAtomic.h File Reference

`#include <BTypes.h>`

Classes

- class BAtomic< Type >

  BAtomic class increments/decrements different integer types.

Typedefs

- typedef BAtomic< BInt32 > BAtomicInt32
- typedef BAtomic< BInt64 > BAtomicInt64
- typedef BAtomic< BUInt32 > BAtomicUInt32
- typedef BAtomic< BUInt64 > BAtomicUInt64

8.3.1 Typedef Documentation

8.3.1.1 BAtomicInt32

```
typedef BAtomic<BInt32> BAtomicInt32
```

8.3.1.2 BAtomicInt64

```
typedef BAtomic<BInt64> BAtomicInt64
```

8.3.1.3 BAtomicUInt32

```
typedef BAtomic<BUInt32> BAtomicUInt32
```

8.3.1.4 BAtomicUInt64

```
typedef BAtomic<BUInt64> BAtomicUInt64
```

8.4 BAtomic.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BAtomic.h   BAtomic     Atomic variables
3  *  T.Barnaby,  BEAM Ltd,   2010-10-07
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  *****************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BAtomic_H
10 #define BAtomic_H   1
11
12 #include <BTypes.h>
13
15 template <class Type> class BAtomic {
16 public:
17             BAtomic(Type value = 0) : ovalue(value){}
18
19     Type        getValue() const {
20                 return __sync_fetch_and_add(&ovalue, 0);
21             }
22     Type        add(long value){
23                 return __sync_add_and_fetch(&ovalue, value);
24             }
25     Type        operator++(int){
26                 return __sync_fetch_and_add(&ovalue, 1);
27             }
28     Type        operator++(){
29                 return __sync_add_and_fetch(&ovalue, 1);
30             }
31     Type        operator--(int){
32                 return __sync_fetch_and_add(&ovalue, -1);
33             }
34     Type        operator--(){
35                 return __sync_add_and_fetch(&ovalue, -1);
36             }
37             operator Type() const {
38                 return getValue();
39             }
40 private:
41     mutable Type    ovalue;
42 };
43
44 typedef BAtomic<BInt32>      BAtomicInt32;
45 typedef BAtomic<BInt64>      BAtomicInt64;
46 typedef BAtomic<BUInt32>    BAtomicUInt32;
47 typedef BAtomic<BUInt64>    BAtomicUInt64;
48
49 #endif
```

8.5 BAtomicCount.h File Reference

```
#include <bits/atomicity.h>
```

Classes

- class BAtomicCount

  BAtomicCount class.

8.6 BAtomicCount.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BAtomicCount.h      BAtomicCount Atomic Counter
```

```
3  *  T.Barnaby,  BEAM Ltd,   2008-06-17
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  ********************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9  #ifndef BAtomicCount_H
10 #define BAtomicCount_H  1
11
12 #if TARGET_vdc
14 class BAtomicCount {
15 public:
16             BAtomicCount(long value = 0) : ovalue(value){}
17
18     long        getValue() const {
19                 return __sync_fetch_and_add(&ovalue, 0);
20             }
21     long        add(long value){
22                 return __sync_fetch_and_add(&ovalue, value) + value;
23             }
24     long        operator++(int){
25                 return __sync_fetch_and_add(&ovalue, 1);
26             }
27     long        operator++(){
28                 return __sync_fetch_and_add(&ovalue, 1) + 1;
29             }
30     long        operator--(int){
31                 return __sync_fetch_and_add(&ovalue, -1);
32             }
33     long        operator--(){
34                 return __sync_fetch_and_add(&ovalue, -1) - 1;
35             }
36             operator long() const {
37                 return getValue();
38             }
39 private:
40     mutable long    ovalue;
41 };
42 #else
43 #if __GNUC__ >= 5 || __GNUC_MINOR__ >= 4
44 #include <ext/atomicity.h>
45 #else
46 #include <bits/atomicity.h>
47 #endif
48
50 class BAtomicCount {
51 public:
52             BAtomicCount(long value = 0) : ovalue(value){}
53
54     long        getValue() const {
55                 return __gnu_cxx::__exchange_and_add(&ovalue, 0);
56             }
57     long        add(long value){
58                 return __gnu_cxx::__exchange_and_add(&ovalue, value) + value;
59             }
60     long        operator++(int){
61                 return __gnu_cxx::__exchange_and_add(&ovalue, 1);
62             }
63     long        operator++(){
64                 return __gnu_cxx::__exchange_and_add(&ovalue, 1) + 1;
65             }
66     long        operator--(int){
67                 return __gnu_cxx::__exchange_and_add(&ovalue, -1);
68             }
69     long        operator--(){
70                 return __gnu_cxx::__exchange_and_add(&ovalue, -1) - 1;
71             }
72             operator long() const {
73                 return getValue();
74             }
75 private:
76     mutable _Atomic_word    ovalue;
77 };
78 #endif
79
80 #endif
```

8.7 BBuffer.cpp File Reference

```
#include <stdlib.h>
#include <memory.h>
```

```
#include <BBuffer.h>
#include <BEndian.h>
#include <BTimeStamp.h>
#include <BComplex.h>
```

Variables

- const int roundSize = 256

8.7.1 Variable Documentation

8.7.1.1 roundSize

```
const int roundSize = 256
```

8.8 BBuffer.h File Reference

```
#include <BTypes.h>
#include <BString.h>
#include <BError.h>
#include <BComplex.h>
#include <BEndian.h>
```

Classes

- class BBuffer

  Create and manipulate a variable sized byte data buffer.
- class BBufferStore

  Create and manipulate a variable sized byte data buffer. Has functions to store and retrieve basic and extended types/classes in the binary buffer.

Macros

- #define BBigEndian 0

8.8.1 Macro Definition Documentation

8.8.1.1 BBigEndian

```
#define BBigEndian 0
```

8.9 BBuffer.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BBuffer.h   Buffer Class
3  *  T.Barnaby,  BEAM Ltd,   27/2/94
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  **************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BBUFFER_H
10 #define BBUFFER_H   1
11
12 #include <BTypes.h>
13 #include <BString.h>
14 #include <BError.h>
15 #include <BComplex.h>
16 #include <BEndian.h>
17
18 #if IS_BIG_ENDIAN
19 #define BBigEndian  1
20 #else
21 #define BBigEndian  0
22 #endif
23
24 class BTimeStamp;
25
27 class BBuffer {
28 public:
29             BBuffer(BUInt size = 0);
30             ~BBuffer();
31
32     int     setSize(BUInt32 size);
33     int     setData(const void* data, BUInt32 size);
34     int     writeData(BUInt32 pos, const void* data, BUInt32 size);
35
36     char*       data();
37     BUInt32      size();
38
39     int     resize(BUInt32 size){ return setSize(size); }
40 protected:
41     BUInt32      odataSize;
42     char*       odata;
43     BUInt32      osize;
44 };
45
47 class BBufferStore : public BBuffer{
48 public:
49             BBufferStore(BUInt size = 0, int swapBytes = BBigEndian);
50             ~BBufferStore();
51
52     BUInt32      getPos();
53     void        setPos(BUInt32 pos);
54
55     BString      getHexString();
56     void        setHexString(BString s);
57
58     int     push(BInt8 v);
59     int     push(BUInt8 v);
60     int     push(BInt16 v);
61     int     push(BUInt16 v);
62     int     push(BInt32 v);
63     int     push(BUInt32 v);
64     int     push(BInt64 v);
65     int     push(BUInt64 v);
66     int     push(BFloat32 v);
67     int     push(BFloat64 v);
68     int     push(const BString& v);
69     int     push(const BError& v);
70     int     push(const BTimeStamp& v);
71     int     push(const BComplex& v);
72     int     push(BUInt32 nBytes, const void* data, const char* swapType = "1");
73
74     int     pop(BInt8& v);
```

```
75      int     pop(BUInt8& v);
76      int     pop(BInt16& v);
77      int     pop(BUInt16& v);
78      int     pop(BInt32& v);
79      int     pop(BUInt32& v);
80      int     pop(BInt64& v);
81      int     pop(BUInt64& v);
82      int     pop(BFloat32& v);
83      int     pop(BFloat64& v);
84      int     pop(BString& v);
85      int     pop(BError& v);
86      int     pop(BTimeStamp& v);
87      int     pop(BComplex& v);
88      int     pop(BUInt32 nBytes, void* data, const char* swapType = "1");
89
90  protected:
91      BUInt32     opos;
92      int     oswapBytes;
93  };
94
95  #endif
```

8.10 BComms.cpp File Reference

```
#include <BComms.h>
```

8.11 BComms.h File Reference

```
#include <BTypes.h>
#include <BEvent.h>
#include <BError.h>
```

Classes

- class BComms

  A base class for communications classes having a generic API.

8.12 BComms.h

Go to the documentation of this file.

```
1  /*****************************************************************************
2   *  BComms.h    BComms class
3   *  T.Barnaby,  Beam Ltd,   2012-11-12
4   *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5   *****************************************************************************
6   *
7   * For license see LICENSE.txt at the root of the beamlib source tree.
8   */
9  #ifndef BComms_h
10 #define BComms_h
11
12 #include <BTypes.h>
13 #include <BEvent.h>
14 #include <BError.h>
15
16 class BComms {
17 public:
18     enum Flush     { FlushRead, FlushWrite, FlushReadWrite };
19
20                 BComms();
21
```

```
22      virtual          ~BComms();
23
24      virtual BError         init();
25      virtual void         close();
26
27      virtual const char* name();
28      virtual BUInt32       byteRate();
29
30      virtual BError         setPacketMode(Bool packetMode);
31      virtual Bool         packetMode();
32      virtual BError         setTimeout(BTimeout timeoutUs);
33
34      virtual BError         connect(const char* resource);
35      virtual Bool         isConnected();
36      virtual BError         disconnect();
37
38      virtual void         flush(Flush flush);
39
40      virtual BUInt       writeAvailable();
41      virtual BError         write(const void* data, BUInt32 nBytes, BUInt32& nTrans) = 0;
42      virtual BError         writeChunks(const BDataChunk* chunks, BUInt nChunks, BUInt32& nTrans);
43
44      virtual BUInt       readAvailable();
45      virtual BError         read(void* data, BUInt32 num, BUInt32& nTrans) = 0;
46
47      virtual BError         wait(BUInt32 eventSet, BTimeout timeoutUs = BTimeoutForever, BUInt32 num = 1);
48      virtual void         eventQueue(BEventQueue* eventQueue, BUInt32 event, BUInt32 eventSet, BUInt num =
        1);
49      virtual void         eventEnable(Bool on);
50
51  protected:
52      Bool             oconnected;
53      Bool             opacketMode;
54      BTimeout         otimeout;
55      BEventQueue*      oeventQueue;
56      Bool             oeventEnabled;
57      BUInt32           oevent;
58      BUInt32           oeventSet;
59      BUInt           oeventNum;
60  };
61  #endif
```

8.13 BComplex.h File Reference

```
#include <BTypes.h>
#include <complex>
#include <algorithm>
```

Typedefs

- typedef std::complex< BFloat64 > BComplex

  This is a complex number using BFloat64 sized parameters. It is based on the Standard C++ library complex class and has all of the functionality of that class.
- typedef std::complex< BFloat32 > BComplex32

  This is a complex number using BFloat32 sized parameters. It is based on the Standard C++ library complex class and has all of the functionality of that class.
- typedef std::complex< BFloat64 > BComplex64

  This is a complex number using BFloat64 sized parameters. It is based on the Standard C++ library complex class and has all of the functionality of that class.

8.13.1 Typedef Documentation

8.13.1.1 BComplex

```
typedef std::complex<BFloat64> BComplex
```

This is a complex number using BFloat64 sized parameters. It is based on the Standard C++ library complex class and has all of the functionality of that class.

8.13.1.2 BComplex32

```
typedef std::complex<BFloat32> BComplex32
```

This is a complex number using BFloat32 sized parameters. It is based on the Standard C++ library complex class and has all of the functionality of that class.

8.13.1.3 BComplex64

```
typedef std::complex<BFloat64> BComplex64
```

This is a complex number using BFloat64 sized parameters. It is based on the Standard C++ library complex class and has all of the functionality of that class.

8.14 BComplex.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BComplex.h  BEAM Array
3  *  T.Barnaby,  BEAM Ltd,   2009-09-10
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  *****************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BComplex_H
10 #define BComplex_H  1
11
12 #include <BTypes.h>
13 #include <complex>
14 #include <algorithm>
15
17 typedef std::complex<BFloat64>  BComplex;
18
20 typedef std::complex<BFloat32>  BComplex32;
21
23 typedef std::complex<BFloat64>  BComplex64;
24
25 #endif
```

8.15 BCond.cpp File Reference

```
#include <BCond.h>
#include <sys/time.h>
#include <stdio.h>
```

8.16 BCond.h File Reference

```
#include <pthread.h>
```

Classes

- class BCond

  Thread safe conditional variable.

8.17 BCond.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BCond.h     BCond Classes
3  *  T.Barnaby,  BEAM Ltd,   15/11/02
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  *****************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BCOND_H
10 #define BCOND_H 1
11
12 #include <pthread.h>
13
15 class BCond {
16 public:
17             BCond();
18             ~BCond();
19
20     int     signal();         // Signal the condition. Unblock all threads waiting on condition
21     int     wait();             // Wait for contition
22     int     timedWait(int timeOutUs);  // Wait for the condition, with timeout
23 private:
24     pthread_mutex_t omutex;
25     pthread_cond_t  ocond;
26 };
27
28 #endif
```

8.18 BCondInt.cpp File Reference

```
#include <BCondInt.h>
#include <sys/time.h>
#include <stdio.h>
#include <errno.h>
```

Functions

- static struct timespec getTimeout (uint32_t timeOutUs)

8.18.1 Function Documentation

8.18.1.1 getTimeout()

```
static struct timespec getTimeout (
            uint32_t timeOutUs )  [static]
```

8.19 BCondInt.h File Reference

```
#include <BTypes.h>
#include <pthread.h>
```

Classes

- class BCondInt

  Thread conditional value.
- class BCondValue

  Thread conditional value.
- class BCondBool

  Thread conditional boolean.
- class BCondWrap

  Thread conditional unsigned 32 bit integer value that can wrap around.
- class BCondResource

  Resource lock.

8.20 BCondInt.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BCondInt.h  BCondInt Class
3  *  T.Barnaby,  BEAM Ltd,   10/12/02
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  *****************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BCONDINT_H
10 #define BCONDINT_H  1
11
12 #include <BTypes.h>
13 #include <pthread.h>
14
16 class BCondInt {
17 public:
18             BCondInt();
19             ~BCondInt();
20
21     void        setValue(BInt value);
22     BInt        value() const;
23
24     BInt        increment(BInt v = 1);
25     BInt        decrement(BInt v = 1);
26
27     Bool        waitMoreThanOrEqual(BInt v, Bool decrement = 0, BTimeout timeoutUs = BTimeoutForever);
28     Bool        waitLessThanOrEqual(BInt v, Bool increment = 0, BTimeout timeoutUs = BTimeoutForever);
29     Bool        waitLessThan(BInt v, BTimeout timeoutUs = BTimeoutForever);
30
31     void        operator+=(int v);
32     void        operator-=(int v);
33     void        operator++(int);
34     void        operator--(int);
35
```

```
36 private:
37     pthread_mutex_t omutex;
38     pthread_cond_t  ocond;
39     BInt        ovalue;
40 };
41
42 inline void BCondInt::operator+=(BInt v){
43     increment(v);
44 }
45
46 inline void BCondInt::operator-=(BInt v){
47     decrement(v);
48 }
49
50 inline void BCondInt::operator++(int){
51     increment(1);
52 }
53
54 inline void BCondInt::operator--(int){
55     decrement(1);
56 }
57
58
60 class BCondValue {
61 public:
62             BCondValue();
63             ~BCondValue();
64
65     void        setValue(int value);
66     int     value();
67
68     int     increment(int v = 1);
69     int     decrement(int v = 1);
70
71     int     waitMoreThanOrEqual(int v, int decrement = 0, int timeOutUs = 0);
72     int     waitLessThanOrEqual(int v, int increment = 0, int timeOutUs = 0);
73     int     waitLessThan(int v, int timeOutUs = 0);
74
75     void        operator+=(int v);
76     void        operator-=(int v);
77     void        operator++(int);
78     void        operator--(int);
79 private:
80     pthread_mutex_t omutex;
81     pthread_cond_t  ocond;
82     int     ovalue;
83 };
84
85 inline void BCondValue::operator+=(int v){
86     increment(v);
87 }
88
89 inline void BCondValue::operator-=(int v){
90     decrement(v);
91 }
92
93 inline void BCondValue::operator++(int){
94     increment(1);
95 }
96
97 inline void BCondValue::operator--(int){
98     decrement(1);
99 }
100
102 class BCondBool {
103 public:
104             BCondBool();
105             ~BCondBool();
106
107     int     set();
108     int     clear();
109     int     value();
110     int     wait();
111     int     timedWait(int timeOutUs);
112
113             operator int(){ return value();     }
114 private:
115     pthread_mutex_t omutex;
116     pthread_cond_t  ocond;
117     int     ovalue;
118 };
119
121 class BCondWrap {
122 public:
123             BCondWrap();
124             ~BCondWrap();
125
```

```
126     void        setValue(uint32_t value);
127     uint32_t    value();
128
129     uint32_t    increment(uint32_t v = 1);
130     uint32_t    decrement(uint32_t v = 1);
131
132     int     waitMoreThanOrEqual(uint32_t v, uint32_t decrement = 0, uint32_t timeOutUs = 0);
133     int     waitLessThanOrEqual(uint32_t v, uint32_t increment = 0, uint32_t timeOutUs = 0);
134     int     waitLessThan(uint32_t v, uint32_t timeOutUs = 0);
135
136     void        operator+=(int v);
137     void        operator-=(int v);
138     void        operator++(int);
139     void        operator--(int);
140 private:
141     int     diff(uint32_t v);
142
143     pthread_mutex_t omutex;
144     pthread_cond_t  ocond;
145     uint32_t    ovalue;
146 };
147
148 inline void BCondWrap::operator+=(int v){
149     increment(v);
150 }
151
152 inline void BCondWrap::operator-=(int v){
153     decrement(v);
154 }
155
156 inline void BCondWrap::operator++(int){
157     increment(1);
158 }
159
160 inline void BCondWrap::operator--(int){
161     decrement(1);
162 }
163
165 class BCondResource {
166 public:
167             BCondResource();
168             ~BCondResource();
169
170     int     lock(uint32_t timeOutUs = 0);
171     int     unlock();
172
173     int     start(uint32_t timeOutUs = 0);
174     int     end();
175
176     int     locked();
177     int     inUse();
178 private:
179     pthread_mutex_t omutex;
180     pthread_cond_t  ocond;
181     int     olock;
182     int     ouse;
183 };
184
185 #endif
```

8.21 BConfig.cpp File Reference

```
#include <BConfig.h>
#include <string.h>
```

8.22 BConfig.h File Reference

```
#include <BDict.h>
#include <BFile.h>
#include <BMutex.h>
```

Classes

- class BConfig

  This class implements the configuration file access.

8.23 BConfig.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BConfig.h   Config File Access
3  *  T.Barnaby,  BEAM Ltd,   2009-01-28
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  *****************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BConfig_H
10 #define BConfig_H
11
12 #include <BDict.h>
13 #include <BFile.h>
14 #include <BMutex.h>
15
17 class BConfig : public BDictString {
18 public:
19     BError        open(BString fileName, BString mode = "r");
20     void         close();
21     BError        read();
22     BError        write();
23
24     BString      findValue(BString name);
25     BString      fileName();
26
27 private:
28     BMutex        olock;
29     BString      ofileName;
30     BFile       ofile;
31 };
32 #endif
```

8.24 BCrc16.cpp File Reference

```
#include <BCrc16.h>
```

Functions

- BUInt16 bcrc16 (void *buf, BUInt16 len)

  A 16bit CRC generator.

Variables

- static const BUInt8 table_crc_hi [ ]
- static const BUInt8 table_crc_lo [ ]

8.24.1 Function Documentation

8.24.1.1 bcrc16()

```
BUInt16 bcrc16 (
            void * buf,
            BUInt16 len )
```

A 16bit CRC generator.

8.24.2 Variable Documentation

8.24.2.1 table_crc_hi

```
const BUInt8 table_crc_hi[]  [static]
```

Initial value:

```
= {
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
    0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
    0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
    0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40,
    0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
    0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40,
    0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
    0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40,
    0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
    0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40
}
```

8.24.2.2 table_crc_lo

```
const BUInt8 table_crc_lo[]  [static]
```

Initial value:

```
= {
    0x00, 0xC0, 0xC1, 0x01, 0xC3, 0x03, 0x02, 0xC2, 0xC6, 0x06,
    0x07, 0xC7, 0x05, 0xC5, 0xC4, 0x04, 0xCC, 0x0C, 0x0D, 0xCD,
    0x0F, 0xCF, 0xCE, 0x0E, 0x0A, 0xCA, 0xCB, 0x0B, 0xC9, 0x09,
    0x08, 0xC8, 0xD8, 0x18, 0x19, 0xD9, 0x1B, 0xDB, 0xDA, 0x1A,
    0x1E, 0xDE, 0xDF, 0x1F, 0xDD, 0x1D, 0x1C, 0xDC, 0x14, 0xD4,
    0xD5, 0x15, 0xD7, 0x17, 0x16, 0xD6, 0xD2, 0x12, 0x13, 0xD3,
    0x11, 0xD1, 0xD0, 0x10, 0xF0, 0x30, 0x31, 0xF1, 0x33, 0xF3,
    0xF2, 0x32, 0x36, 0xF6, 0xF7, 0x37, 0xF5, 0x35, 0x34, 0xF4,
    0x3C, 0xFC, 0xFD, 0x3D, 0xFF, 0x3F, 0x3E, 0xFE, 0xFA, 0x3A,
    0x3B, 0xFB, 0x39, 0xF9, 0xF8, 0x38, 0x28, 0xE8, 0xE9, 0x29,
    0xEB, 0x2B, 0x2A, 0xEA, 0xEE, 0x2E, 0x2F, 0xEF, 0x2D, 0xED,
    0xEC, 0x2C, 0xE4, 0x24, 0x25, 0xE5, 0x27, 0xE7, 0xE6, 0x26,
```

```
    0x22, 0xE2, 0xE3, 0x23, 0xE1, 0x21, 0x20, 0xE0, 0xA0, 0x60,
    0x61, 0xA1, 0x63, 0xA3, 0xA2, 0x62, 0x66, 0xA6, 0xA7, 0x67,
    0xA5, 0x65, 0x64, 0xA4, 0x6C, 0xAC, 0xAD, 0x6D, 0xAF, 0x6F,
    0x6E, 0xAE, 0xAA, 0x6A, 0x6B, 0xAB, 0x69, 0xA9, 0xA8, 0x68,
    0x78, 0xB8, 0xB9, 0x79, 0xBB, 0x7B, 0x7A, 0xBA, 0xBE, 0x7E,
    0x7F, 0xBF, 0x7D, 0xBD, 0xBC, 0x7C, 0xB4, 0x74, 0x75, 0xB5,
    0x77, 0xB7, 0xB6, 0x76, 0x72, 0xB2, 0xB3, 0x73, 0xB1, 0x71,
    0x70, 0xB0, 0x50, 0x90, 0x91, 0x51, 0x93, 0x53, 0x52, 0x92,
    0x96, 0x56, 0x57, 0x97, 0x55, 0x95, 0x94, 0x54, 0x9C, 0x5C,
    0x5D, 0x9D, 0x5F, 0x9F, 0x9E, 0x5E, 0x5A, 0x9A, 0x9B, 0x5B,
    0x99, 0x59, 0x58, 0x98, 0x88, 0x48, 0x49, 0x89, 0x4B, 0x8B,
    0x8A, 0x4A, 0x4E, 0x8E, 0x8F, 0x4F, 0x8D, 0x4D, 0x4C, 0x8C,
    0x44, 0x84, 0x85, 0x45, 0x87, 0x47, 0x46, 0x86, 0x82, 0x42,
    0x43, 0x83, 0x41, 0x81, 0x80, 0x40
}
```

8.25 BCrc16.h File Reference

```
#include <BTypes.h>
```

Functions

- BUInt16 bcrc16 (void *buf, BUInt16 len)

  A 16bit CRC generator.

8.25.1 Function Documentation

8.25.1.1 bcrc16()

```
BUInt16 bcrc16 (
            void * buf,
            BUInt16 len )
```

A 16bit CRC generator.

8.26 BCrc16.h

Go to the documentation of this file.

```
1 /*********************************************************************************
2  *  BCrc16.h        Checksum 16 bit
3  *  T.Barnaby,  BEAM Ltd,   2014-07-22
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  *********************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BCrc16_H
10 #define BCrc16_H
11
12 #include <BTypes.h>
13
15 BUInt16 bcrc16(void* buf, BUInt16 len);
16
17 #endif
```

8.27 BCrc32.cpp File Reference

```
#include <BCrc32.h>
```

Functions

- BUInt32 bcrc32 (BUInt32 crc, const void *buf, BUInt32 len)
  A 32bit CRC generator.

Variables

- static BUInt32 crc32_tab [ ]

8.27.1 Function Documentation

8.27.1.1 bcrc32()

```
BUInt32 bcrc32 (
            BUInt32 crc,
            const void * buf,
            BUInt32 len )
```

A 32bit CRC generator.

8.27.2 Variable Documentation

8.27.2.1 crc32_tab

```
BUInt32 crc32_tab[]  [static]
```

8.28 BCrc32.h File Reference

```
#include <BTypes.h>
```

Functions

- BUInt32 bcrc32 (BUInt32 crc, const void *buf, BUInt32 len)
  A 32bit CRC generator.

8.28.1 Function Documentation

8.28.1.1 bcrc32()

```
BUInt32 bcrc32 (
            BUInt32 crc,
            const void * buf,
            BUInt32 len )
```

A 32bit CRC generator.

8.29 BCrc32.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BCrc32.h        Checksum 32 bit
3  *  T.Barnaby,  BEAM Ltd,   2017-11-14
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  *****************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BCrc32_H
10 #define BCrc32_H
11
12 #include <BTypes.h>
13
15 BUInt32 bcrc32(BUInt32 crc, const void* buf, BUInt32 len);
16
17 #endif
```

8.30 BDate.cpp File Reference

```
#include <BDate.h>
#include <sys/time.h>
```

Functions

- void toBString (BDate &v, BString &s)
- void fromBString (BString &s, BDate &v)

Variables

- static int mon_yday [2][13]

8.30.1 Function Documentation

8.30.1.1 toBString()

```
void toBString (
            BDate & v,
            BString & s )
```

8.30.1.2 fromBString()

```
void fromBString (
            BString & s,
            BDate & v )
```

8.30.2 Variable Documentation

8.30.2.1 mon_yday

```
int mon_yday[2][13]  [static]
```

Initial value:

```
= {
    { 0, 31, 59, 90, 120, 151, 181, 212, 243, 273, 304, 334, 365 },
    { 0, 31, 60, 91, 121, 152, 182, 213, 244, 274, 305, 335, 366 }
}
```

8.31 BDate.h File Reference

```
#include <stdint.h>
#include <BError.h>
```

Classes

- class BDate

  This class store a UTC calendar date as a year and a year's day.

Functions

- void toBString (BDate &v, BString &s)
- void fromBString (BString &s, BDate &v)

8.31.1 Function Documentation

8.31.1.1 toBString()

```
void toBString (
            BDate & v,
            BString & s )
```

8.31.1.2 fromBString()

```
void fromBString (
            BString & s,
            BDate & v )
```

8.32 BDate.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BDate.h     Date class
3  *  T.Barnaby,  BEAM Ltd,   2009-08-14
4  *  Copyright (c) 2012 All Right Reserved, Beam Ltd, http://www.beam.ltd.uk
5  **************************************************************************
6  *
7  * For license see LICENSE.txt at the root of the beamlib source tree.
8  */
9 #ifndef BDate_H
10 #define BDate_H 1
11
12 #include <stdint.h>
13 #include <BError.h>
14
16 class BDate {
17 public:
18             BDate(int year = 0, int month = 1, int day = 1);
19             BDate(BString str);
20             ~BDate();
21
22     void        clear();
23     void        setFirst();
24     void        setLast();
25
26     void        set(time_t time);
27     void        set(int year = 0, int month = 1, int day = 1);
28     void        setYDay(int year = 0, int yday = 0);
29     void        setNow();
30
31     int     year();
32     int     yday();
33     int     month();
34     int     day();
35
36     void        getDate(int& year, int& mon, int& day);
37
38     BString      getString();
39     BString      getStringFormatted(BString format);
40     BError        setString(BString str);
41
42     int     isSet(){ return oyear != 0; }
43     int     compare(const BDate& date) const;
44
45             operator BString(){ return getString(); }
46
47     int     operator==(const BDate& date) const { return (compare(date) == 0); }
```

```
48      int     operator!=(const BDate& date) const { return (compare(date) != 0); }
49      int     operator>(const BDate& date) const { return (compare(date) > 0); }
50      int     operator>=(const BDate& date) const { return (compare(date) >= 0); }
51      int     operator<(const BDate& date) const { return (compare(date) < 0); }
52      int     operator<=(const BDate& date) const { return (compare(date) <= 0); }
53
54      static int  isLeap(int year);
55      static int  daysInMonth(int year, int month);
56
57  public:
58      uint16_t    oyear;
59      uint16_t    oyday;
60  };
61
62  // String conversion functions
63  void toBString(BDate& v, BString& s);
64  void fromBString(BString& s, BDate& v);
65
66  #endif
```

8.33 BDebug.cpp File Reference

```
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/time.h>
#include <stdarg.h>
#include <fcntl.h>
#include <ctype.h>
#include <BDebug.h>
```

Functions

- void bhd8 (const void *data, unsigned int n)

  Software debug functions.
- void bhd8a (const void *data, unsigned int n)
- void bhda8 (const void *data, unsigned int n)
- void bhd32 (const void *data, unsigned int n)
- void bhda32 (const void *data, unsigned int n)
- double getTime ()
- void setDebug (int d)
- void tprintf (int log, const char *fmt,...)

Variables

- int bdebug

8.33.1 Function Documentation

8.33.1.1 bhd8()

```
void bhd8 (
            const void * data,
            unsigned int n )
```

Software debug functions.

8.33.1.2 bhd8a()

```
void bhd8a (
            const void * data,
            unsigned int n )
```

8.33.1.3 bhda8()

```
void bhda8 (
            const void * data,
            unsigned int n )
```

8.33.1.4 bhd32()

```
void bhd32 (
            const void * data,
            unsigned int n )
```

8.33.1.5 bhda32()

```
void bhda32 (
            const void * data,
            unsigned int n )
```

8.33.1.6 getTime()

```
double getTime ( )
```

8.33.1.7 setDebug()

```
void setDebug (
            int d )
```

8.33.1.8 tprintf()

```
void tprintf (
            int log,
            const char * fmt,
             ...  )
```

8.33.2 Variable Documentation

8.33.2.1 bdebug

```
int bdebug
```

8.34 BDebug.h File Reference

```
#include <stdio.h>
#include <time.h>
#include <syslog.h>
```

Classes

- class BDebugBacktrace

  Backtrace on crash class.

Macros

- #define BDebug_STD 0x000001
- #define dprintf(level, fmt, a...)

  General debug functions.
- #define nprintf(fmt, a...) syslog(LOG_NOTICE, fmt, ##a)

  Warnings and errors logging.
- #define wprintf(fmt, a...) syslog(LOG_WARNING, fmt, ##a)
- #define eprintf(fmt, a...) syslog(LOG_ERR, fmt, ##a)
- #define dl1printf(fmt, a...)
- #define dl2printf(fmt, a...)
- #define dl3printf(fmt, a...)
- #define dl4printf(fmt, a...)

Functions

- void bhd8 (const void *data, unsigned int n)

  Software debug functions.
- void bhd8a (const void *data, unsigned int n)
- void bhda8 (const void *data, unsigned int n)
- void bhd32 (const void *data, unsigned int n)
- void bhds32 (const void *data, unsigned int n)
- double getTime ()
- void setDebug (int debug)
- void tprintf (int log, const char *fmt,...)
- pid_t bgettid ()

Variables

- int bdebug

8.34.1 Macro Definition Documentation

8.34.1.1 BDebug_STD

```
#define BDebug_STD 0x000001
```

8.34.1.2 dprintf

```
#define dprintf(
              level,
              fmt,
              a...  )
```

General debug functions.

8.34.1.3 nprintf

```
#define nprintf(
              fmt,
              a...  ) syslog(LOG_NOTICE, fmt, ##a)
```

Warnings and errors logging.

8.34.1.4 wprintf

```
#define wprintf(
              fmt,
              a...  ) syslog(LOG_WARNING, fmt, ##a)
```

8.34.1.5 eprintf

```
#define eprintf(
              fmt,
              a...  ) syslog(LOG_ERR, fmt, ##a)
```

8.34.1.6 dl1printf

```
#define dl1printf(
              fmt,
              a...  )
```

8.34.1.7 dl2printf

```
#define dl2printf(
              fmt,
              a...  )
```

8.34.1.8 dl3printf

```
#define dl3printf(
              fmt,
              a...  )
```

8.34.1.9 dl4printf

```
#define dl4printf(
              fmt,
              a...  )
```

8.34.2 Function Documentation

8.34.2.1 bhd8()

```
void bhd8 (
            const void * data,
            unsigned int n )
```

Software debug functions.

8.34.2.2 bhd8a()

```
void bhd8a (
            const void * data,
            unsigned int n )
```

8.34.2.3 bhda8()

```
void bhda8 (
            const void * data,
            unsigned int n )
```

8.34.2.4 bhd32()

```
void bhd32 (
            const void * data,
            unsigned int n )
```

8.34.2.5 bhds32()

```
void bhds32 (
            const void * data,
            unsigned int n )
```

8.34.2.6 getTime()

```
double getTime ( )
```

8.34.2.7 setDebug()

```
void setDebug (
            int debug )
```

8.34.2.8 tprintf()

```
void tprintf (
            int log,
            const char * fmt,
             ...  )
```

8.34.2.9 bgettid()

```
pid_t bgettid ( )
```

8.34.3 Variable Documentation

8.34.3.1 bdebug

```
int bdebug  [extern]
```

8.35 BDebug.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BDebug.h    Debug information and routines
3  *  T.Barnaby,  BEAM Ltd,   2009-01-05
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  */
8 #ifndef BDebug_H
9 #define BDebug_H
10
11 #include <stdio.h>
12 #include <time.h>
13
14 #define BDebug_STD      0x000001
15
16 extern int  bdebug;
17
19 void bhd8(const void* data, unsigned int n);
20 void bhd8a(const void* data, unsigned int n);
21 void bhda8(const void* data, unsigned int n);
22 void bhd32(const void* data, unsigned int n);
23 void bhds32(const void* data, unsigned int n);
24 double getTime();
25 void setDebug(int debug);
26 void tprintf(int log, const char* fmt, ...);
27
28 pid_t bgettid();
29
31 #if BDEBUG
32 #define dprintf(level, fmt, a...)       if((level) & bdebug) tprintf(1, fmt, ##a);
33 #else
34 #define dprintf(level, fmt, a...)
35 #endif
36
38 #if !TARGET_win32 && !TARGET_win64
39 #include <syslog.h>
40
41 #if BDEBUG
42 #define nprintf(fmt, a...)  { syslog(LOG_NOTICE, fmt, ##a); tprintf(0, fmt, ##a); }
43 #define wprintf(fmt, a...)  { syslog(LOG_WARNING, fmt, ##a); tprintf(0, fmt, ##a); }
44 #define eprintf(fmt, a...)  { syslog(LOG_ERR, fmt, ##a); tprintf(0, fmt, ##a); }
45 #else
46 #define nprintf(fmt, a...)  syslog(LOG_NOTICE, fmt, ##a)
47 #define wprintf(fmt, a...)  syslog(LOG_WARNING, fmt, ##a)
48 #define eprintf(fmt, a...)  syslog(LOG_ERR, fmt, ##a)
49 #endif
50 #endif
51
52 #if BDEBUGL1
53 #define dl1printf(fmt, a...)    printf(fmt, ##a);
54 #else
55 #define dl1printf(fmt, a...)
56 #endif
57
58 #if BDEBUGL2
59 #define dl2printf(fmt, a...)    printf(fmt, ##a);
60 #else
61 #define dl2printf(fmt, a...)
62 #endif
63
64 #if BDEBUGL3
65 #define dl3printf(fmt, a...)    printf(fmt, ##a);
66 #else
67 #define dl3printf(fmt, a...)
68 #endif
69
70 #if BDEBUGL4
71 #define dl4printf(fmt, a...)    printf(fmt, ##a);
72 #else
73 #define dl4printf(fmt, a...)
74 #endif
75
77 class BDebugBacktrace {
78 public:
79             BDebugBacktrace();
80             ~BDebugBacktrace();
81
82     void        dumpBacktraceStdout(char* comment);
83     int     dumpBacktraceFile(char* fileName, char* comment);
84     void        dumpBacktraceSyslog(char* comment);
85     void        dumpBacktrace(char* strBuf, int strBufLen, char* comment);
86 private:
```

```
87 };
88
89 #endif
```

8.36 BDict.cpp File Reference

```
#include <BDict.h>
```

Functions

- void toBString (const BDictString &v, BString &s)
- void fromBString (const BString &str, BDictString &v)
- BString bdictStringToString (const BDictString &dict)

8.36.1 Function Documentation

8.36.1.1 toBString()

```
void toBString (
            const BDictString & v,
            BString & s )
```

8.36.1.2 fromBString()

```
void fromBString (
            const BString & str,
            BDictString & v )
```

8.36.1.3 bdictStringToString()

```
BString bdictStringToString (
            const BDictString & dict )
```

8.37 BDict.h File Reference

```
#include <BNameValue.h>
```

Classes

- class BDictItem< Type >

  Template based Dictionary classes item.
- class BDict< Type >

  Dictionary list class using templates.

Typedefs

- typedef BDict< BString > BDictString

Functions

- void toBString (const BDictString &v, BString &s)
- void fromBString (const BString &s, BDictString &v)
- BString bdictStringToString (const BDictString &dict)

8.37.1 Typedef Documentation

8.37.1.1 BDictString

```
typedef BDict<BString> BDictString
```

8.37.2 Function Documentation

8.37.2.1 toBString()

```
void toBString (
            const BDictString & v,
            BString & s )
```

8.37.2.2 fromBString()

```
void fromBString (
            const BString & s,
            BDictString & v )
```

8.37.2.3 bdictStringToString()

```
BString bdictStringToString (
            const BDictString & dict )
```

8.38 BDict.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BDict.h BEAM Dictionary class
3  *  T.Barnaby,  BEAM Ltd,   2008-05-21
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  */
8 #ifndef BDict_H
9 #define BDict_H 1
10
11 #include <BNameValue.h>
12
14 template <class Type> class BDictItem {
15 public:
16             BDictItem(BString k = "", Type v = Type()) : key(k), value(v){}
17     BString      key;
18     Type        value;
19
20 //  BDictItem<Type> operator=(BDictItem<Type>& item){ key = item.key; value = item.value; return *this; }
21 };
22
24 template <class Type> class BDict : public BList<BDictItem<Type> > {
25 public:
26     typedef BIter  iterator;
27
28             BDict(int hashSize = 100);
29             BDict(const BDict<Type>& dict);
30
31     int     hasKey(const BString& k) const;
32     BString      key(const BIter& i) const;
33     void        clear();
34     void        insert(BIter& i, const BDictItem<Type>& item);
35     void        append(const BDictItem<Type>& item);
36     void        append(const BDict<Type>& dict);
37     void        del(const BString& k);
38     void        del(BIter& i);
39     BIter      find(const BString& k) const;
40
41     Type&       operator[](const BString& i);
42     const Type& operator[](const BString& i) const;
43     Type&       operator[](const BIter& i);
44     const Type& operator[](const BIter& i) const;
45     Type&       operator[](int i);
46     const Type& operator[](int i) const;
47     BDict<Type>  operator+(const BDict<Type>& dict) const;
48     BDict<Type>& operator=(const BDict<Type>& dict);
49
50     void        hashPrint();
51 private:
52     void            hashAdd(const BString& k, BIter iter);
53     void            hashDelete(const BString& k, BIter iter);
54     int         hashFind(const BString& k, BIter& iter) const;
55
56     int         ohashSize;
57     BArray<BList<BIter> >    ohashLists;
58 };
59
60 typedef BDict<BString>    BDictString;
61
62 void toBString(const BDictString& v, BString& s);
63 void fromBString(const BString& s, BDictString& v);
64 BString bdictStringToString(const BDictString& dict);
65
66 template <class Type> BDict<Type>::BDict(int hashSize){
67     ohashSize = hashSize;
68     ohashLists.resize(ohashSize);
69 }
70
71 template <class Type> BDict<Type>::BDict(const BDict<Type>& dict) : BList<BDictItem<Type> >(){
72     ohashSize = dict.ohashSize;
73     ohashLists.resize(ohashSize);
```

```
74      this->append(dict);
75  }
76
77  template <class Type> int BDict<Type>::hasKey(const BString& k) const {
78      BIter  i = this->find(k);
79      return !this->isEnd(i);
80  }
81
82  template <class Type> BString BDict<Type>::key(const BIter& i) const {
83      return this->get(i).key;
84  }
85
86  template <class Type> void BDict<Type>::clear(){
87      BUInt  i;
88
89      BList<BDictItem<Type> >::clear();
90      for(i = 0; i < ohashLists.size(); i++){
91          ohashLists[i].clear();
92      }
93  }
94
95  template <class Type> void BDict<Type>::insert(BIter& i, const BDictItem<Type>& item){
96      BList<BDictItem<Type> >::insert(i, item);
97      hashAdd(item.key, i);
98  }
99
100 template <class Type> void BDict<Type>::append(const BDictItem<Type>& item){
101     BList<BDictItem<Type> >::append(item);
102 }
103
104 template <class Type> void BDict<Type>::append(const BDict<Type>& dict){
105     BList<BDictItem<Type> >::append(dict);
106 }
107
108 template <class Type> void BDict<Type>::del(const BString& k){
109     BIter  i = find(k);
110
111     if(!this->isEnd(i)){
112         hashDelete(k, i);
113         BList<BDictItem<Type> >::del(i);
114     }
115 }
116
117 template <class Type> void BDict<Type>::del(BIter& i){
118     BList<BDictItem<Type> >::del(i);
119 }
120
121 template <class Type> BIter BDict<Type>::find(const BString& k) const {
122     BIter  i;
123
124 #ifdef ZAP
125     for(this->start(i); !this->isEnd(i); this->next(i)){
126         if(this->get(i).key == k)
127             return i;
128     }
129     return this->onodes;
130 #else
131     if(hashFind(k, i))
132         return i;
133     else
134         return this->onodes;
135 #endif
136 }
137
138 template <class Type> Type& BDict<Type>::operator[](const BString& k) {
139     BIter  i = this->find(k);
140
141     if(this->isEnd(i)){
142         this->append(BDictItem<Type>(k));
143         i = this->end();
144     }
145
146     return this->get(i).value;
147 }
148
149 template <class Type> const Type& BDict<Type>::operator[](const BString& k) const {
150     BIter  i = this->find(k);
151
152     if(this->isEnd(i)){
153         fprintf(stderr, "BDict over range\n");
154         exit(1);
155     }
156
157     return this->get(i).value;
158 }
159
160 template <class Type> Type& BDict<Type>::operator[](const BIter& i) {
```

```
161     return this->get(i).value;
162 }
163
164 template <class Type> const Type& BDict<Type>::operator[](const BIter& i) const {
165     return this->get(i).value;
166 }
167
168 template <class Type> Type& BDict<Type>::operator[](int i) {
169     return BList<BDictItem<Type> >::operator[](i).value;
170 }
171
172 template <class Type> const Type& BDict<Type>::operator[](int i) const {
173     return BList<BDictItem<Type> >::operator[](i).value;
174 }
175
176 template <class Type> BDict<Type> BDict<Type>::operator+(const BDict<Type>& dict) const {
177     BDict<Type>  r = *this;
178     BIter      i;
179
180     for(dict.start(i); !dict.isEnd(i); dict.next(i)){
181         r.append(this->get(i));
182     }
183     return r;
184 }
185
186 template <class Type> BDict<Type>& BDict<Type>::operator=(const BDict<Type>& dict){
187     BIter  i;
188
189     if(this != &dict){
190         this->clear();
191         for(dict.start(i); !dict.isEnd(i); dict.next(i)){
192             append(this->get(i));
193         }
194     }
195
196     return *this;
197 }
198
199 template <class Type> void BDict<Type>::hashAdd(const BString& k, BIter iter){
200     BUInt  pos;
201
202     pos = k.hash() % ohashSize;
203     ohashLists[pos].append(iter);
204 }
205
206 template <class Type> void BDict<Type>::hashDelete(const BString& k, BIter iter){
207     BUInt  pos;
208     BIter  i;
209
210     pos = k.hash() % ohashSize;
211     for(ohashLists[pos].start(i); !ohashLists[pos].isEnd(i); ohashLists[pos].next(i)){
212         if(ohashLists[pos][i] == iter){
213             ohashLists[pos].del(i);
214             break;
215         }
216     }
217 }
218
219 template <class Type> int BDict<Type>::hashFind(const BString& k, BIter& iter) const {
220     BUInt  pos;
221     BIter  i;
222
223     pos = k.hash() % ohashSize;
224     for(ohashLists[pos].start(i); !ohashLists[pos].isEnd(i); ohashLists[pos].next(i)){
225         if(key(ohashLists[pos][i]) == k){
226             iter = ohashLists[pos][i];
227             return 1;
228         }
229     }
230     return 0;
231 }
232
233 template <class Type> void BDict<Type>::hashPrint(){
234     BUInt  i;
235     BUInt  n = 0;
236
237     for(i = 0; i < ohashLists.size(); i++){
238         n += ohashLists[i].number();
239 //      printf("Number: %d: %d\n", i, ohashLists[i].number());
240     }
241     printf("ListSize: %d HashSize: %d\n", BList<BDictItem<Type> >::number(), n);
242 }
243
244 #endif
```

8.39 BDictMap.h File Reference

```
#include <BString.h>
#include <map>
```

Classes

- class BDictMap< Value >

  Mapped Dictionary class.

Typedefs

- typedef BDictMap< BString > BDictMapString

8.39.1 Typedef Documentation

8.39.1.1 BDictMapString

```
typedef BDictMap<BString> BDictMapString
```

8.40 BDictMap.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BDictMap.h  BEAM Dictionary class
3  *  T.Barnaby,  BEAM Ltd,   2008-05-21
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
12 #ifndef BDictMap_H
13 #define BDictMap_H  1
14
15 #include <BString.h>
16 #include <map>
17
19 template <typename Value> class BDictMap : private std::map<BString, Value> {
20 public:
21     typedef typename BDictMap<Value>::iterator iterator;
22
23     void        clear()            { std::map<BString, Value>::clear();    }
24     int     hasKey(const BString& k){ return std::map<BString, Value>::count(k);   }
25     BString      key(iterator& i) { return i->first; }
26     unsigned int    size()          { return std::map<BString, Value>::size(); }
27     void        start(iterator& i) { i = std::map<BString, Value>::begin();    }
28     int     isEnd(iterator& i) { return(i == std::map<BString, Value>::end()); }
29     void        next(iterator& i)   { ++i;  }
30     void        del(const iterator& i)   { std::map<BString, Value>::erase(i); }
31     void        del(const BString& k) { std::map<BString, Value>::erase(k); }
32     Value&      operator[](iterator& i)   { return i->second; }
33     Value&      operator[](const BString& i)   { return std::map<BString,Value>::operator[](i); }
34 private:
35 };
36
37 typedef BDictMap<BString>  BDictMapString;
38
39 #endif
```

8.41 BDir.cpp File Reference

```
#include <BDir.h>
#include <dirent.h>
#include <stdlib.h>
#include <errno.h>
#include <string.h>
```

Functions

- static int wild (const dirent *e)

Variables

- static BString wildString

8.41.1 Function Documentation

8.41.1.1 wild()

```
static int wild (
            const dirent * e )  [static]
```

8.41.2 Variable Documentation

8.41.2.1 wildString

```
BString wildString  [static]
```

8.42 BDir.h File Reference

```
#include <BList.h>
#include <BString.h>
#include <BError.h>
#include <sys/stat.h>
```

Classes

- class BDir

  File system directory class.

8.43 BDir.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BDir.h      BEAM Dir access class
3  *  T.Barnaby,  BEAM Ltd,   8/10/96
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BDIR_H
9 #define BDIR_H  1
10
11 #include    <BList.h>
12 #include    <BString.h>
13 #include    <BError.h>
14 #include    <sys/stat.h>
15
16 #ifndef __Lynx__
17 #else
18 typedef unsigned long long ino64_t;
19 typedef long long off64_t;
20 typedef unsigned long blksize_t;
21 typedef unsigned long long blkcnt64_t;
22
23 struct stat64 {
24     dev_t st_dev;
25     ino64_t st_ino;
26     mode_t st_mode;
27     nlink_t st_nlink;
28     uid_t st_uid;
29     gid_t st_gid;
30     dev_t st_rdev;
31     off64_t st_size;
32     time_t st_atime;
33     time_t st_mtime;
34     time_t st_ctime;
35     blksize_t st_blksize;
36     blkcnt64_t st_blocks;
37     mode_t st_attr;
38 };
39 #endif
40
42 class BDir : public BList<struct dirent*> {
43 public:
44             BDir();
45             BDir(BString name);
46             ~BDir();
47
48     BError        open(BString name);
49     BError        error();
50     BError        read();
51     void        clear();
52
53     void        setWild(BString wild);
54     void        setSort(int on);
55
56     BString      entryName(BIter i);
57     struct stat entryStat(BIter i);
58     struct stat64   entryStat64(BIter i);
59
60 private:
61     BError        oerror;
62     BString      odirname;
63     BString      owild;
64     int     osort;
65 };
66
67 #endif
```

8.44 BDuration.cpp File Reference

```
#include <BDuration.h>
#include <sys/time.h>
```

8.45 BDuration.h File Reference

```
#include <stdint.h>
#include <BError.h>
```

Classes

- class BDuration

  Stores and manipulates a time to the nearest microsecond and a maximum of 24 hours.

8.46 BDuration.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BDuration.h A time duration class
3  *  T.Barnaby,  BEAM Ltd,   2010-02-11
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  */
8 #ifndef BDuration_H
9 #define BDuration_H 1
10
11 #include <stdint.h>
12 #include <BError.h>
13
15 class BDuration {
16 public:
17             BDuration(int hour = 0, int minute = 0, int second = 0, int microsecond = 0);
18             BDuration(BString str);
19             ~BDuration();
20
21     void        clear();
22
23     void        set(int hour = 0, int minute = 0, int second = 0, int microsecond = 0);
24
25     void        addMilliSeconds(int64_t milliSeconds);
26     void        addMicroSeconds(int64_t microSeconds);
27     void        addSeconds(int seconds);
28     uint32_t    getSeconds();
29     uint64_t    getMicroSeconds();
30
31     int     hour();
32     int     minute();
33     int     second();
34     int     microSecond();
35
36     BString      getString();
37     BError        setString(BString time);
38
39 private:
40     uint8_t     ohour;
41     uint8_t     ominute;
42     uint8_t     osecond;
43     uint8_t     ospare;
44     uint32_t    omicroSecond;
45
46 };
47
48 #endif
```

8.47 BEndian.cpp File Reference

```
#include <BEndian.h>
#include <memory.h>
```

Functions

- void bswap_copy (int swap, const void *src, void *dst, BUInt32 nBytes, const char *swapType)

8.47.1 Function Documentation

8.47.1.1 bswap_copy()

```
void bswap_copy (
            int swap,
            const void * src,
            void * dst,
            BUInt32 nBytes,
            const char * swapType )
```

8.48 BEndian.h File Reference

```
#include <BTypes.h>
#include <byteswap.h>
```

Macros

- #define htobe16(x) __bswap_16 (x)
- #define htole16(x) (x)
- #define be16toh(x) __bswap_16 (x)
- #define le16toh(x) (x)
- #define htobe32(x) __bswap_32 (x)
- #define htole32(x) (x)
- #define be32toh(x) __bswap_32 (x)
- #define le32toh(x) (x)
- #define htobe64(x) __bswap_64 (x)
- #define htole64(x) (x)
- #define be64toh(x) __bswap_64 (x)
- #define le64toh(x) (x)

Functions

- void bswap_p8 (const void *s, void *d)
- void bswap_p16 (const void *s, void *d)
- void bswap_p32 (const void *s, void *d)
- void bswap_p64 (const void *s, void *d)
- void bswap_copy (int swap, const void *src, void *dst, BUInt32 nBytes, const char *swapType)
- uint16_t htole (uint16_t v)
- int16_t htole (int16_t v)
- uint32_t htole (uint32_t v)
- int32_t htole (int32_t v)
- uint64_t htole (uint64_t v)
- int64_t htole (int64_t v)
- double htole (double v)
- float htole (float v)
- uint16_t htobe (uint16_t v)
- int16_t htobe (int16_t v)
- uint32_t htobe (uint32_t v)
- int32_t htobe (int32_t v)
- uint64_t htobe (uint64_t v)
- int64_t htobe (int64_t v)
- double htobe (double v)
- float htobe (float v)
- uint16_t letoh (uint16_t v)
- int16_t letoh (int16_t v)
- uint32_t letoh (uint32_t v)
- int32_t letoh (int32_t v)
- uint64_t letoh (uint64_t v)
- int64_t letoh (int64_t v)
- double letoh (double v)
- float letoh (float v)
- uint16_t betoh (uint16_t v)
- int16_t betoh (int16_t v)
- uint32_t betoh (uint32_t v)
- int32_t betoh (int32_t v)
- uint64_t betoh (uint64_t v)
- int64_t betoh (int64_t v)
- double betoh (double v)
- float betoh (float v)

8.48.1 Macro Definition Documentation

8.48.1.1 htobe16

```
#define htobe16(
              x ) __bswap_16 (x)
```

8.48.1.2 htole16

```
#define htole16(
              x ) (x)
```

8.48.1.3 be16toh

```
#define be16toh(
              x ) __bswap_16 (x)
```

8.48.1.4 le16toh

```
#define le16toh(
              x ) (x)
```

8.48.1.5 htobe32

```
#define htobe32(
              x ) __bswap_32 (x)
```

8.48.1.6 htole32

```
#define htole32(
              x ) (x)
```

8.48.1.7 be32toh

```
#define be32toh(
              x ) __bswap_32 (x)
```

8.48.1.8 le32toh

```
#define le32toh(
              x ) (x)
```

8.48.1.9 htobe64

```
#define htobe64(
              x ) __bswap_64 (x)
```

8.48.1.10 htole64

```
#define htole64(
              x ) (x)
```

8.48.1.11 be64toh

```
#define be64toh(
              x ) __bswap_64 (x)
```

8.48.1.12 le64toh

```
#define le64toh(
              x ) (x)
```

8.48.2 Function Documentation

8.48.2.1 bswap_p8()

```
void bswap_p8 (
             const void * s,
             void * d )  [inline]
```

8.48.2.2 bswap_p16()

```
void bswap_p16 (
             const void * s,
             void * d )  [inline]
```

8.48.2.3 bswap_p32()

```
void bswap_p32 (
            const void * s,
            void * d )  [inline]
```

8.48.2.4 bswap_p64()

```
void bswap_p64 (
            const void * s,
            void * d )  [inline]
```

8.48.2.5 bswap_copy()

```
void bswap_copy (
            int swap,
            const void * src,
            void * dst,
            BUInt32 nBytes,
            const char * swapType )
```

8.48.2.6 htole() [1/8]

```
uint16_t htole (
            uint16_t v )  [inline]
```

8.48.2.7 htole() [2/8]

```
int16_t htole (
            int16_t v )  [inline]
```

8.48.2.8 htole() [3/8]

```
uint32_t htole (
            uint32_t v )  [inline]
```

8.48.2.9 htole() [4/8]

```
int32_t htole (
            int32_t v )  [inline]
```

8.48.2.10 htole() [5/8]

```
uint64_t htole (
            uint64_t v )  [inline]
```

8.48.2.11 htole() [6/8]

```
int64_t htole (
            int64_t v )  [inline]
```

8.48.2.12 htole() [7/8]

```
double htole (
            double v )  [inline]
```

8.48.2.13 htole() [8/8]

```
float htole (
            float v )  [inline]
```

8.48.2.14 htobe() [1/8]

```
uint16_t htobe (
            uint16_t v )  [inline]
```

8.48.2.15 htobe() [2/8]

```
int16_t htobe (
            int16_t v )  [inline]
```

8.48.2.16 htobe() [3/8]

```
uint32_t htobe (
            uint32_t v )  [inline]
```

8.48.2.17 htobe() [4/8]

```
int32_t htobe (
            int32_t v )  [inline]
```

8.48.2.18 htobe() [5/8]

```
uint64_t htobe (
            uint64_t v )  [inline]
```

8.48.2.19 htobe() [6/8]

```
int64_t htobe (
            int64_t v )  [inline]
```

8.48.2.20 htobe() [7/8]

```
double htobe (
            double v )  [inline]
```

8.48.2.21 htobe() [8/8]

```
float htobe (
            float v )  [inline]
```

8.48.2.22 letoh() [1/8]

```
uint16_t letoh (
            uint16_t v )  [inline]
```

8.48.2.23 letoh() [2/8]

```
int16_t letoh (
            int16_t v )  [inline]
```

8.48.2.24 letoh() [3/8]

```
uint32_t letoh (
            uint32_t v )  [inline]
```

8.48.2.25 letoh() [4/8]

```
int32_t letoh (
            int32_t v )  [inline]
```

8.48.2.26 letoh() [5/8]

```
uint64_t letoh (
            uint64_t v )  [inline]
```

8.48.2.27 letoh() [6/8]

```
int64_t letoh (
            int64_t v )  [inline]
```

8.48.2.28 letoh() [7/8]

```
double letoh (
            double v )  [inline]
```

8.48.2.29 letoh() [8/8]

```
float letoh (
            float v )  [inline]
```

8.48.2.30 betoh() [1/8]

```
uint16_t betoh (
            uint16_t v )  [inline]
```

8.48.2.31 betoh() [2/8]

```
int16_t betoh (
            int16_t v )  [inline]
```

8.48.2.32 betoh() [3/8]

```
uint32_t betoh (
            uint32_t v )  [inline]
```

8.48.2.33 betoh() [4/8]

```
int32_t betoh (
            int32_t v )  [inline]
```

8.48.2.34 betoh() [5/8]

```
uint64_t betoh (
            uint64_t v )  [inline]
```

8.48.2.35 betoh() [6/8]

```
int64_t betoh (
            int64_t v )  [inline]
```

8.48.2.36 betoh() [7/8]

```
double betoh (
            double v )  [inline]
```

8.48.2.37 betoh() [8/8]

```
float betoh (
            float v )  [inline]
```

8.49 BEndian.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BEndian.h   Byte swap fubctions
3  *  T.Barnaby,  BEAM Ltd,   2009-12-18
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BEndian_H
9 #define BEndian_H   1
10
11 #include <BTypes.h>
12
13 #if TARGET_win32 || TARGET_win64
14 #define __BYTE_ORDER __LITTLE_ENDIAN
15 inline uint16_t __bswap_16(uint16_t v){
16     uint16_t    r;
17     const char* sp = (const char*)&v;
18     char*       dp = (char*)&r;
19
20     dp[1] = sp[0];
21     dp[0] = sp[1];
22
23     return r;
24 }
25 inline uint32_t __bswap_32(uint32_t v){
26     uint32_t    r;
27     const char* sp = (const char*)&v;
28     char*       dp = (char*)&r;
29
30     dp[3] = sp[0];
31     dp[2] = sp[1];
32     dp[1] = sp[2];
33     dp[0] = sp[3];
34
35     return r;
36 }
37 inline uint64_t __bswap_64(uint64_t v){
38     uint64_t    r;
39     const char* sp = (const char*)&v;
40     char*       dp = (char*)&r;
41
42     dp[7] = sp[0];
43     dp[6] = sp[1];
44     dp[5] = sp[2];
45     dp[4] = sp[3];
46     dp[3] = sp[4];
47     dp[2] = sp[5];
48     dp[1] = sp[6];
49     dp[0] = sp[7];
50
51     return r;
52 }
53 #else
54 #include <byteswap.h>
55 #endif
56
57
58 #ifndef htobe16
59 # if __BYTE_ORDER == __LITTLE_ENDIAN
60 #  define htobe16(x) __bswap_16 (x)
61 #  define htole16(x) (x)
62 #  define be16toh(x) __bswap_16 (x)
63 #  define le16toh(x) (x)
64
65 #  define htobe32(x) __bswap_32 (x)
66 #  define htole32(x) (x)
67 #  define be32toh(x) __bswap_32 (x)
68 #  define le32toh(x) (x)
69
70 #  define htobe64(x) __bswap_64 (x)
71 #  define htole64(x) (x)
```

```
72 #  define be64toh(x) __bswap_64 (x)
73 #  define le64toh(x) (x)
74 # else
75 #  define htobe16(x) (x)
76 #  define htole16(x) __bswap_16 (x)
77 #  define be16toh(x) (x)
78 #  define le16toh(x) __bswap_16 (x)
79
80 #  define htobe32(x) (x)
81 #  define htole32(x) __bswap_32 (x)
82 #  define be32toh(x) (x)
83 #  define le32toh(x) __bswap_32 (x)
84
85 #  define htobe64(x) (x)
86 #  define htole64(x) __bswap_64 (x)
87 #  define be64toh(x) (x)
88 #  define le64toh(x) __bswap_64 (x)
89 # endif
90 #endif
91
92 inline void bswap_p8(const void* s, void* d){
93     const char* sp = (const char*)s;
94     char*       dp = (char*)d;
95
96     *dp = *sp;
97 }
98
99 inline void bswap_p16(const void* s, void* d){
100     const char* sp = (const char*)s;
101     char*       dp = (char*)d;
102
103     dp[1] = sp[0];
104     dp[0] = sp[1];
105 }
106
107 inline void bswap_p32(const void* s, void* d){
108     const char* sp = (const char*)s;
109     char*       dp = (char*)d;
110
111     dp[3] = sp[0];
112     dp[2] = sp[1];
113     dp[1] = sp[2];
114     dp[0] = sp[3];
115 }
116
117 inline void bswap_p64(const void* s, void* d){
118     const char* sp = (const char*)s;
119     char*       dp = (char*)d;
120
121     dp[7] = sp[0];
122     dp[6] = sp[1];
123     dp[5] = sp[2];
124     dp[4] = sp[3];
125     dp[3] = sp[4];
126     dp[2] = sp[5];
127     dp[1] = sp[6];
128     dp[0] = sp[7];
129 }
130
131 void bswap_copy(int swap, const void* src, void* dst, BUInt32 nBytes, const char* swapType);
132
133
134 inline uint16_t htole(uint16_t v){
135     return htole16(v);
136 }
137
138 inline int16_t htole(int16_t v){
139     return htole16(v);
140 }
141
142 inline uint32_t htole(uint32_t v){
143     return htole32(v);
144 }
145
146 inline int32_t htole(int32_t v){
147     return htole32(v);
148 }
149
150 inline uint64_t htole(uint64_t v){
151     return htole64(v);
152 }
153
154 inline int64_t htole(int64_t v){
155     return htole64(v);
156 }
157
158 inline double htole(double v){
```

```
159     union {
160         int64_t i;
161         double  d;
162     } t;
163 
164     t.d = v;
165     t.i = htole64(t.i);
166 
167     return t.d;
168 }
169 
170 inline float htole(float v){
171     union {
172         int32_t i;
173         float   d;
174     } t;
175 
176     t.d = v;
177     t.i = htole32(t.i);
178 
179     return t.d;
180 }
181 
182 inline uint16_t htobe(uint16_t v){
183     return htobe16(v);
184 }
185 
186 inline int16_t htobe(int16_t v){
187     return htobe16(v);
188 }
189 
190 inline uint32_t htobe(uint32_t v){
191     return htobe32(v);
192 }
193 
194 inline int32_t htobe(int32_t v){
195     return htobe32(v);
196 }
197 
198 inline uint64_t htobe(uint64_t v){
199     return htobe64(v);
200 }
201 
202 inline int64_t htobe(int64_t v){
203     return htobe64(v);
204 }
205 
206 inline double htobe(double v){
207     union {
208         int64_t i;
209         double  d;
210     } t;
211 
212     t.d = v;
213     t.i = htobe64(t.i);
214 
215     return t.d;
216 }
217 
218 inline float htobe(float v){
219     union {
220         int32_t i;
221         float   d;
222     } t;
223 
224     t.d = v;
225     t.i = htobe32(t.i);
226 
227     return t.d;
228 }
229 
230 
231 inline uint16_t letoh(uint16_t v){
232     return le16toh(v);
233 }
234 
235 inline int16_t letoh(int16_t v){
236     return le16toh(v);
237 }
238 
239 inline uint32_t letoh(uint32_t v){
240     return le32toh(v);
241 }
242 
243 inline int32_t letoh(int32_t v){
244     return le32toh(v);
245 }
```

```
246
247 inline uint64_t letoh(uint64_t v){
248     return le64toh(v);
249 }
250
251 inline int64_t letoh(int64_t v){
252     return le64toh(v);
253 }
254
255 inline double letoh(double v){
256     union {
257         int64_t i;
258         double  d;
259     } t;
260
261     t.d = v;
262     t.i = le64toh(t.i);
263
264     return t.d;
265 }
266
267 inline float letoh(float v){
268     union {
269         int32_t i;
270         float   d;
271     } t;
272
273     t.d = v;
274     t.i = le32toh(t.i);
275
276     return t.d;
277 }
278
279
280 inline uint16_t betoh(uint16_t v){
281     return be16toh(v);
282 }
283
284 inline int16_t betoh(int16_t v){
285     return be16toh(v);
286 }
287
288 inline uint32_t betoh(uint32_t v){
289     return be32toh(v);
290 }
291
292 inline int32_t betoh(int32_t v){
293     return be32toh(v);
294 }
295
296 inline uint64_t betoh(uint64_t v){
297     return be64toh(v);
298 }
299
300 inline int64_t betoh(int64_t v){
301     return be64toh(v);
302 }
303
304 inline double betoh(double v){
305     union {
306         int64_t i;
307         double  d;
308     } t;
309
310     t.d = v;
311     t.i = be64toh(t.i);
312
313     return t.d;
314 }
315
316 inline float betoh(float v){
317     union {
318         int32_t i;
319         float   d;
320     } t;
321
322     t.d = v;
323     t.i = be32toh(t.i);
324
325     return t.d;
326 }
327
328 #endif
```

8.50 BEntry.cpp File Reference

```
#include <ctype.h>
#include <stdio.h>
#include <string.h>
#include <unistd.h>
#include <fcntl.h>
#include <errno.h>
#include <BEntry.h>
```

8.51 BEntry.h File Reference

```
#include <BList.h>
#include <BString.h>
```

Classes

- class BEntry

  Manipulate a name value pair.
- class BEntryList

  List of Entries. Where each entry is a name value pair.
- class BEntryFile

  A file based list of string name/value pairs.

8.52 BEntry.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BEntry.hh   Database entry system
3  *  T.Barnaby,  BEAM Ltd,   10/5/93
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BENTRY_H
9 #define BENTRY_H
10
11 #include <BList.h>
12 #include <BString.h>
13
15 class BEntry {
16 public:
17             BEntry();
18             BEntry(BString name, BString value);
19             BEntry(BString line);
20     BString      getName();
21     BString      getValue();
22     void        setLine(BString line);
23     void        setName(BString name);
24     void        setValue(BString value);
25     BString      line();
26     void        print();
27 private:
28     BString      oname;
29     BString      ovalue;
30 };
31
32
34 class BEntryList : public BList<BEntry> {
```

```
35 public:
36             BEntryList();
37     int     isSet(BString name);
38     BEntry*       find(BString name);
39     BString      findValue(BString name);
40     int     setValue(BString name, BString value);
41     int     setValueRaw(BString name, BString value);
42     void        deleteEntry(BString name);
43
44     void        print();
45     BString      getString();
46
47             // Override these functions as we cache olastPos
48     void        insert(BIter& i, const BEntry& item);
49     void        del(BIter& i);
50     void        clear();
51     BEntryList&   operator=(const BEntryList& l);
52
53 private:
54     BIter      olastPos;   // Last position speed up
55 };
56
57 class BEntryFile : public BEntryList {
58 public:
59             BEntryFile();
60             BEntryFile(BString filename);
61             ~BEntryFile();
62
63     int     open(BString filename);
64     int     read();
65     int     write();
66     int     writeList(BEntryList& l);
67     void        clear();
68     BString      filename();
69 private:
70     BString      ofilename;
71     BString      ocomments;
72 };
73 #endif
```

8.53 BError.cpp File Reference

`#include <BError.h>`

8.54 BError.h File Reference

`#include <BString.h>`

Classes

- class BError

  Error return class. This class is used to return the error status from a function. It encapsulates an integer error number and a string.

Enumerations

- enum BErrorNum {
  ErrorOk = 0 , ErrorMisc = 1 , ErrorWarning = 2 , ErrorParam = 3 ,
  ErrorTimeout = 4 , ErrorNotAvailable = 5 , ErrorData = 6 , ErrorChecksum = 7 ,
  ErrorOverrun = 8 , ErrorUnderrun = 9 , ErrorInit = 10 , ErrorConfig = 11 ,
  ErrorNotImplemented = 12 , ErrorResourceLimit = 13 , ErrorEndOfFile = 14 , ErrorFile = 15 ,
  ErrorFormat = 16 , ErrorComms = 17 , ErrorAccessDenied = 18 , ErrorNoData = 19 ,
  ErrorEndOfData = 20 , ErrorDataPresent = 21 , ErrorDataTruncated = 22 , ErrorApiVersion = 23 ,
  ErrorSignal = 24 , ErrorAppBase = 64 , ErrorUserBase = 96 }

8.54.1 Enumeration Type Documentation

8.54.1.1 BErrorNum

```
enum BErrorNum
```

Enumerator

ErrorOk	
ErrorMisc	
ErrorWarning	
ErrorParam	
ErrorTimeout	
ErrorNotAvailable	
ErrorData	
ErrorChecksum	
ErrorOverrun	
ErrorUnderrun	
ErrorInit	
ErrorConfig	
ErrorNotImplemented	
ErrorResourceLimit	
ErrorEndOfFile	
ErrorFile	
ErrorFormat	
ErrorComms	
ErrorAccessDenied	
ErrorNoData	
ErrorEndOfData	
ErrorDataPresent	
ErrorDataTruncated	
ErrorApiVersion	
ErrorSignal	
ErrorAppBase	
ErrorUserBase	

8.55 BError.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BError.h    BError Class
3  *  T.Barnaby,  BEAM Ltd,   21/3/00
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
17 #ifndef BERROR_H
18 #define BERROR_H    1
19
20 #include <BString.h>
```

```
21
22 enum BErrorNum {
23     ErrorOk = 0, ErrorMisc = 1, ErrorWarning = 2, ErrorParam = 3, ErrorTimeout = 4,
24     ErrorNotAvailable = 5, ErrorData = 6, ErrorChecksum = 7, ErrorOverrun = 8, ErrorUnderrun = 9,
25     ErrorInit = 10, ErrorConfig = 11, ErrorNotImplemented = 12, ErrorResourceLimit = 13,
26     ErrorEndOfFile = 14, ErrorFile = 15, ErrorFormat = 16, ErrorComms = 17, ErrorAccessDenied = 18,
27     ErrorNoData = 19, ErrorEndOfData = 20, ErrorDataPresent = 21, ErrorDataTruncated = 22,
28     ErrorApiVersion = 23, ErrorSignal = 24,
29     ErrorAppBase = 64, ErrorUserBase = 96 };
30
31 class BError {
32 public:
33             BError(int errNo = ErrorOk, BString errStr = "");
34             BError(BString errStr);
35
36     BError        copy();
37
38     BError&       set(int errNo, BString errStr = "");
39     BError&       clear();
40     BError&       setError(BString errStr = "");
41
42
43     BString      getString() const;
44     int     getNumber() const;
45
46     int     num() const;
47     const char* str() const;
48
49     // Old functions
50     int     getErrorNo() const;
51
52             operator int() const;
53 private:
54     int     oerrNo;
55     BString      oerrStr;
56
57 };
58
59 inline BError::operator int () const {
60     return oerrNo;
61 }
62
63 #endif
```

8.56 BErrorTime.cpp File Reference

```
#include <BErrorTime.h>
```

8.57 BErrorTime.h File Reference

```
#include <BString.h>
#include <BTimeStamp.h>
```

Classes

- class BErrorTime

  Error return class with time field.

8.58 BErrorTime.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BErrorTime.h    BErrorTime Class
3  *  T.Barnaby,  BEAM Ltd,   2010-05-26
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BErrorTime_H
9 #define BErrorTime_H    1
10
11 #include <BString.h>
12 #include <BTimeStamp.h>
13
15 class BErrorTime {
16 public:
17     enum        Type { None = 0, Error = 1 };
18
19             BErrorTime(int errNo = None, BTimeStamp errTime = BTimeStamp(), BString errStr = "");
20
21     BErrorTime&   set(int errNo, BTimeStamp errTime = BTimeStamp(), BString errStr = "");
22     BErrorTime&   clear();
23     int     getErrorNo() const;
24     BTimeStamp    getTime() const;
25     BString      getString() const;
26
27     BErrorTime    copy();
28             operator int() const;
29
30 private:
31     int     oerrNo;
32     BTimeStamp    oerrTime;
33     BString      oerrStr;
34 };
35
36 #endif
```

8.59 BEvent.cpp File Reference

```
#include <BEvent.h>
#include <BPoll.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/ioctl.h>
```

8.60 BEvent.h File Reference

```
#include <BTypes.h>
#include <BQueue.h>
```

Classes

- class BEvent

  An event description class.
- class BEventPipe

  This class provides an interface for sending simple integer events via a pipe file descriptor.

Typedefs

- typedef BQueue< BEvent > BEventQueue

  This class provides an interface for sending simple integer events via a BQueue.

8.60.1 Typedef Documentation

8.60.1.1 BEventQueue

```
typedef BQueue<BEvent> BEventQueue
```

This class provides an interface for sending simple integer events via a BQueue.

8.61 BEvent.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BEvent.h    Event class
3  *  T.Barnaby,  BEAM Ltd,   2005-07-08
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  */
8 #ifndef BEvent_H
9 #define BEvent_H    1
10
11 #include <BTypes.h>
12 #include <BQueue.h>
13
15 class BEvent {
16 public:
17             BEvent(BUInt32 type = BEventTypeNone, BUInt32 arg = 0);
18
19     BUInt32      type();
20     BUInt32      arg();
21
22 private:
23     BUInt32      otype;
24     BUInt32      oarg;
25 };
26
28 typedef BQueue<BEvent>    BEventQueue;
29
30
32 class BEventPipe {
33 public:
34             BEventPipe();
35             ~BEventPipe();
36
37     void        clear();
38     int     getFd();
39
40     BUInt       writeAvailable() const;
41     BError        write(const BEvent& event,  BTimeout timeout = BTimeoutForever);
42
43     BUInt       readAvailable() const;
44     BError        read(BEvent& event,  BTimeout timeout = BTimeoutForever);
45
46 private:
47     int     ofds[2];
48 };
49 #endif
```

8.62 BEvent1.cpp File Reference

```
#include <stdlib.h>
#include <unistd.h>
#include <errno.h>
#include <BEvent1.h>
#include <BPoll.h>
```

8.63 BEvent1.h File Reference

```
#include <stdint.h>
#include <BError.h>
```

Classes

- class BEvent1

  This class provides a base class for all event objects that can be sent over the events interface.
- class BEvent1Error

  This class provides a class to send a BError event.
- class BEvent1Pipe

  This class provides a base interface for sending events via a pipe. This allows threads to send events that can be picked up by the poll system call.
- class BEvent1Int

  This class provides an interface for sending simple integer events via a file descriptor. This allows threads to send events that can be picked up by the poll system call.

Enumerations

- enum BEvent1Type { BEvent1TypeNone , BEvent1TypeInt , BEvent1TypeError }

8.63.1 Enumeration Type Documentation

8.63.1.1 BEvent1Type

```
enum BEvent1Type
```

Enumerator

BEvent1TypeNone	
BEvent1TypeInt	
BEvent1TypeError	

8.64 BEvent1.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BEvent1.h   File Event class
3  *  T.Barnaby,  BEAM Ltd,   2005-07-08
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  */
8 #ifndef BEvent1_H
9 #define BEvent1_H   1
10
11 #include <stdint.h>
12 #include <BError.h>
13
14 enum BEvent1Type { BEvent1TypeNone, BEvent1TypeInt, BEvent1TypeError };
15
17 class BEvent1 {
18 public:
19             BEvent1(uint32_t type);
20     virtual     ~BEvent1();
21
22     uint32_t    getType();
23
24             // Implementation functions
25     virtual BError    getBinary(void* data, uint32_t& size);
26     virtual BError    setBinary(void* data, uint32_t& size);
27 private:
28     uint32_t    otype;
29 };
30
32 class BEvent1Error : public BError, public BEvent1 {
33 public:
34             BEvent1Error(int errNo = ErrorOk, BString errStr = "");
35     BError        getBinary(void* data, uint32_t& size);
36     BError        setBinary(void* data, uint32_t& size);
37 private:
38 };
39
41 class BEvent1Pipe {
42 public:
43             BEvent1Pipe();
44             ~BEvent1Pipe();
45
46     void        clear();
47     BError        sendEvent(BEvent1* event);
48     BError        getEvent(BEvent1* event, int timeOutUs = -1);
49
50     int     getReceiveFd();
51 private:
52     int     ofds[2];
53 };
54
55
57 class BEvent1Int {
58 public:
59             BEvent1Int();
60             ~BEvent1Int();
61
62     void        clear();
63     BError        sendEvent(int event);
64     BError        getEvent(int& event, int timeOutUs = -1);
65
66     int     getFd();
67 private:
68     int     ofds[2];
69 };
70
71 #endif
```

8.65 BFifo.h File Reference

```
#include <BTypes.h>
#include <BError.h>
#include <BFifo.inc>
```

Classes

- class BFifo< Type >

  A template first in first out data buffer to store any object types.

8.66 BFifo.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BFifo.h     BFifo class
3  *  T.Barnaby,  Beam Ltd,   2013-05-03
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  *
8  */
18 #ifndef BFifo_h
19 #define BFifo_h
20
21 #include <BTypes.h>
22 #include <BError.h>
23
25 template <class Type> class BFifo {
26 public:
27             BFifo(BUInt size);
28             ~BFifo();
29
30     void        clear();
31
32     BUInt      size();
33     BError        resize(BUInt size);
34     BError        rebase();
35
36     BUInt      writeAvailable();
37     BUInt      writeAvailableChunk();
38     BError        write(const Type v);
39     BError        write(const Type* data, BUInt num);
40
41     Type*       writeData();
42     Type*       writeData(BUInt& num);
43     void        writeDone(BUInt num);
44     void        writeBackup(BUInt num);
45
46     BUInt      readAvailable();
47     BUInt      readAvailableChunk();
48     Type        read();
49     BError        read(Type* data, BUInt num);
50
51     Type*       readData();
52     Type*       readData(BUInt& num);
53     void        readDone(BUInt num);
54
55     Type        readPos(BUInt pos);
56     void        writePos(BUInt pos, const Type& v);
57     Type&       operator[](int pos);
58
59 protected:
60     BUInt      osize;
61     Type*       odata;
62     volatile BUInt owritePos;
63     volatile BUInt oreadPos;
64 };
65
66 #include <BFifo.inc>
67 #endif
```

8.67 BFifo.inc File Reference

8.68 BFifoCirc.cpp File Reference

```
#include <BFifoCirc.h>
#include <fcntl.h>
```

```
#include <errno.h>
#include <sys/mman.h>
```

Macros

- #define dprintf(fmt, a...)

8.68.1 Macro Definition Documentation

8.68.1.1 dprintf

```
#define dprintf(
              fmt,
              a...  )
```

8.69 BFifoCirc.h File Reference

```
#include <stdint.h>
#include <BError.h>
#include <BCondInt.h>
#include <BMutex.h>
#include <BFifoCirc.inc>
```

Classes

- class BFifoCircPos

  This class implements a pointer into the Fifo's circular buffer.
- class BFifoCirc< Type >

  This class implements a thread safe FIFO buffer using a binary sized circular memory.

8.70 BFifoCirc.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BFifoCirc.h     FIFO Buffer Class
3  *  T.Barnaby,  BEAM Ltd,   2006-02-22
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
18 #ifndef BFifoCirc_H
19 #define BFifoCirc_H 1
20
21 #include <stdint.h>
22 #include <BError.h>
23 #include <BCondInt.h>
24 #include <BMutex.h>
```

```
25
27 class BFifoCircPos {
28 public:
29             BFifoCircPos(uint32_t size);
30     void        setSize(uint32_t size);
31
32     void        set(uint32_t pos);
33     uint32_t    pos();
34
35     void        increment(uint32_t numFifoSamples);
36     uint32_t    difference(const BFifoCircPos& pos);
37
38             operator int();
39     void        operator+=(uint32_t numFifoSamples);
40     int     operator==(const BFifoCircPos& pos);
41     int     operator!=(const BFifoCircPos& pos);
42 private:
43     uint32_t    osize;
44     uint32_t    opos;
45 };
46
48 template <class Type> class BFifoCirc {
49 public:
50     enum        { defaultSize = 1024 };
51
52             BFifoCirc(uint32_t size = defaultSize);
53             ~BFifoCirc();
54
55     uint32_t    size();
56     void        clear();
57
58             // Data write functions
59     uint32_t    writeAvailable();
60     BError        writeWaitAvailable(uint32_t numFifoSamples);
61
62     BError        write(const Type* data, uint32_t numFifoSamples);
63
64     Type*       writeData();
65     void        writeDone(uint32_t numFifoSamples);
66
67             // Data read functions
68     uint32_t    readAvailable();
69     BError        readWaitAvailable(uint32_t numFifoSamples);
70
71     BError        read(Type* data, uint32_t numFifoSamples);
72
73     Type*       readData();
74     BError        readDone(uint32_t numFifoSamples);
75
76     Type&       operator[](int pos);
77
78 protected:
79     // Functions for internal use
80     BError            mapCircularBuffer(uint32_t size);
81     void            unmapCircularBuffer();
82
83     BMutex            olock;
84     uint32_t        ovmSize;
85     uint32_t        osize;
86     Type*           odata;
87     BFifoCircPos        owritePos;
88     BCondValue        owriteNumFifoSamples;
89     BFifoCircPos        oreadPos;
90 };
91
92 #include <BFifoCirc.inc>
93
94 #endif
```

8.71 BFifoCirc.inc File Reference

8.72 BFile.cpp File Reference

```
#include <stdarg.h>
#include <BFile.h>
#include <sys/stat.h>
#include <string.h>
```

```
#include <fcntl.h>
#include <errno.h>
#include <unistd.h>
#include <BDir.h>
#include <BDebug.h>
```

Macros

- #define BDEBUGL1 0
- #define STRBUF 10240

Functions

- BError bcopyFile (BString source, BString dest)

  Copy a file.
- BError bcopyDir (BString source, BString dest)

  Copy complete directory.

8.72.1 Macro Definition Documentation

8.72.1.1 BDEBUGL1

```
#define BDEBUGL1 0
```

8.72.1.2 STRBUF

```
#define STRBUF 10240
```

8.72.2 Function Documentation

8.72.2.1 bcopyFile()

```
BError bcopyFile (
            BString source,
            BString dest )
```

Copy a file.

8.72.2.2 bcopyDir()

```
BError bcopyDir (
            BString source,
            BString dest )
```

Copy complete directory.

8.73 BFile.h File Reference

```
#include <stdio.h>
#include <BTypes.h>
#include <BString.h>
#include <BError.h>
```

Classes

- class BFile

  File operations class.

Functions

- BError bcopyFile (BString source, BString dest)

  Copy a file.
- BError bcopyDir (BString source, BString dest)

  Copy complete directory.

8.73.1 Function Documentation

8.73.1.1 bcopyFile()

```
BError bcopyFile (
            BString source,
            BString dest )
```

Copy a file.

8.73.1.2 bcopyDir()

```
BError bcopyDir (
            BString source,
            BString dest )
```

Copy complete directory.

8.74 BFile.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BFile.h     BEAM BFile access class
3  *  T.Barnaby,  BEAM Ltd,   27/11/95
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BFILE_H
9 #define BFILE_H 1
10
11 #include    <stdio.h>
12 #include    <BTypes.h>
13 #include    <BString.h>
14 #include    <BError.h>
15
17 class BFile {
18 public:
19             BFile();
20             BFile(const BFile& file);
21             ~BFile();
22
23     BError        open(BString name, BString mode);
24     BError        open(FILE* file);
25     BError        open(int fd, BString mode);
26     BError        openTemp(BString name, BString mode);
27     BError        close();
28
29     int     isOpen();
30     int     isEnd();
31     FILE*       getFd();
32     BUInt64      length();
33     int     setVBuf(char* buf, int mode, size_t size);
34
35     int     read(void* buf, int nbytes);
36     int     readString(BString& str);
37     char*       fgets(char* buf, size_t size);
38
39     int     write(const void* buf, int nbytes);
40     int     writeString(const BString& str);
41
42     int     seek(BUInt64 pos);
43     BUInt64      position();
44
45     int     printf(const char* fmt, ...);
46
47     BError        truncate();
48     BError        flush();
49     BString      fileName();
50
51     BFile&     operator=(const BFile& file);
52 private:
53     FILE*       ofile;
54     BString      ofileName;
55     BString      omode;
56 };
57
58 BError bcopyFile(BString source, BString dest);
59 BError bcopyDir(BString source, BString dest);
60
61 #endif
```

8.75 BFileCsv.cpp File Reference

```
#include <BFileCsv.h>
#include <errno.h>
```

8.76 BFileCsv.h File Reference

```
#include <BFile.h>
```

Classes

- class BFileCsv

  A class to read and write CSV formatted files.

8.77 BFileCsv.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BFileCsv.h  BEAM CSV access class
3  *  T.Barnaby,  BEAM Ltd,   2012-01-10
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BFile_H
9 #define BFile_H 1
10
11 #include    <BFile.h>
12
14 class BFileCsv : public BFile {
15 public:
16         BFileCsv(char separator = ';');
17
18     BError    readCsv(BStringList& csvList);
19     BError    writeCsv(BStringList& csvList);
20 private:
21     char    oseparator;
22 };
23
24 #endif
```

8.78 BFileData.cpp File Reference

```
#include <BFileCsv.h>
#include <BFileData.h>
#include <errno.h>
```

8.79 BFileData.h File Reference

```
#include <BError.h>
```

Classes

- class BFileData

  A class to implement a data storage file.

8.80 BFileData.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BFileData.h BEAM Data access class
3  *  T.Barnaby,  BEAM Ltd,   2012-01-10
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BFileData_H
9 #define BFileData_H 1
10
11 #include    <BError.h>
12
14 class BFileData : public BList<BStringList> {
15 public:
16     BError    open(BString filename);
17
18     BError    getNextId(int& id);
19     BError    find(int id, BStringList& csvList);
20     BError    write(int id, BStringList& csvList);
21     BError    del(int id);
22
23 private:
24     BError    read();
25     BError    write();
26     BString  ofilename;
27 };
28
29 #endif
```

8.81 BFirmware.h File Reference

```
#include <BTypes.h>
```

Classes

- struct BFirmwareFileHeader
- struct BFirmwareSegHeader
- struct BFirmwareInfo

Typedefs

- typedef BFirmwareFileHeader BFirmwareFirmwareHeader

Functions

- struct BFirmwareFileHeader __attribute__ ((packed))
- int bfirmwareValid (BUInt32 baseAddress, BUInt type, Bool checkChecksum, char *version=0)
- void bfirmwareBoot (BUInt32 baseAddress)

Variables

- const BUInt32 BFirmwareMagic = 0x01414542
- const BUInt32 BFirmwareTypeFile = 1
- const BUInt32 BFirmwareTypeFirmware = 2
- const BUInt32 BFirmwareTypeSegment = 3
- const BUInt32 BFirmwareFormatRaw = 0
- const BUInt32 BFirmwareFormatGzip = 1
- const BUInt32 BFirmwarePlatformBMeasure125 = 33
- const BUInt32 BFirmwarePlatformBMeasure125Cpu = 34
- const BUInt32 BFirmwarePlatformBMeasure125Fpga = 35
- const BUInt32 BFirmwarePlatformBMeasure125Wifi = 36
- const BUInt32 BFirmwarePlatformBMeasure125Boot = 37
- BUInt32 magic
- BUInt32 itemType
- BUInt32 fileLength
- BUInt32 checksum
- BUInt32 platform
- BUInt32 format
- BUInt32 numSegments
- BUInt32 startAddress
- BUInt8 ver0
- BUInt8 ver1
- BUInt8 ver2
- BUInt8 ver3
- BUInt32 special [7]
- BUInt32 dataLength
- BUInt32 address
- BUInt32 length
- const BUInt32 BFirmwareInfoMagic = 0xBBEEAA00
- const BUInt8 BFirmwareInfoEncrypt1 = 0x40
- struct BFirmwareInfo __attribute__

8.81.1 Typedef Documentation

8.81.1.1 BFirmwareFirmwareHeader

```
typedef BFirmwareFileHeader BFirmwareFirmwareHeader
```

8.81.2 Function Documentation

8.81.2.1 __attribute__()

```
struct BFirmwareFileHeader __attribute__ (
            (packed)  )
```

8.81.2.2 bfirmwareValid()

```
int bfirmwareValid (
            BUInt32 baseAddress,
            BUInt type,
            Bool checkChecksum,
            char * version = 0 )
```

8.81.2.3 bfirmwareBoot()

```
void bfirmwareBoot (
            BUInt32 baseAddress )
```

8.81.3 Variable Documentation

8.81.3.1 BFirmwareMagic

```
const BUInt32 BFirmwareMagic = 0x01414542
```

8.81.3.2 BFirmwareTypeFile

```
const BUInt32 BFirmwareTypeFile = 1
```

8.81.3.3 BFirmwareTypeFirmware

```
const BUInt32 BFirmwareTypeFirmware = 2
```

8.81.3.4 BFirmwareTypeSegment

```
const BUInt32 BFirmwareTypeSegment = 3
```

8.81.3.5 BFirmwareFormatRaw

```
const BUInt32 BFirmwareFormatRaw = 0
```

8.81.3.6 BFirmwareFormatGzip

```
const BUInt32 BFirmwareFormatGzip = 1
```

8.81.3.7 BFirmwarePlatformBMeasure125

```
const BUInt32 BFirmwarePlatformBMeasure125 = 33
```

8.81.3.8 BFirmwarePlatformBMeasure125Cpu

```
const BUInt32 BFirmwarePlatformBMeasure125Cpu = 34
```

8.81.3.9 BFirmwarePlatformBMeasure125Fpga

```
const BUInt32 BFirmwarePlatformBMeasure125Fpga = 35
```

8.81.3.10 BFirmwarePlatformBMeasure125Wifi

```
const BUInt32 BFirmwarePlatformBMeasure125Wifi = 36
```

8.81.3.11 BFirmwarePlatformBMeasure125Boot

```
const BUInt32 BFirmwarePlatformBMeasure125Boot = 37
```

8.81.3.12 magic

```
BUInt32 magic
```

8.81.3.13 itemType

```
BUInt32 itemType
```

8.81.3.14 fileLength

```
BUInt32 fileLength
```

8.81.3.15 checksum

```
BUInt32 checksum
```

8.81.3.16 platform

```
BUInt32 platform
```

8.81.3.17 format

```
BUInt32 format
```

8.81.3.18 numSegments

```
BUInt32 numSegments
```

8.81.3.19 startAddress

```
BUInt32 startAddress
```

8.81.3.20 ver0

```
BUInt8 ver0
```

8.81.3.21 ver1

```
BUInt8 ver1
```

8.81.3.22 ver2

```
BUInt8 ver2
```

8.81.3.23 ver3

```
BUInt8 ver3
```

8.81.3.24 special

```
BUInt32 special
```

8.81.3.25 dataLength

```
BUInt32 dataLength
```

8.81.3.26 address

```
BUInt32 address
```

8.81.3.27 length

```
BUInt32 length
```

8.81.3.28 BFirmwareInfoMagic

```
const BUInt32 BFirmwareInfoMagic = 0xBBEEAA00
```

8.81.3.29 BFirmwareInfoEncrypt1

```
const BUInt8 BFirmwareInfoEncrypt1 = 0x40
```

8.81.3.30 __attribute__

```
struct BoapMc1Error __attribute__
```

8.82 BFirmware.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BFirmware..h    BFirmware info
3  *  T.Barnaby,  Beam Ltd,   2019-01-28
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  *
8  */
9 #ifndef BFirmware_h
10 #define BFirmware_h
11
12 #include <BTypes.h>
13
14 // Beam firmware files
15 const BUInt32    BFirmwareMagic = 0x01414542;
16
17 const BUInt32    BFirmwareTypeFile = 1;
18 const BUInt32    BFirmwareTypeFirmware = 2;
19 const BUInt32    BFirmwareTypeSegment = 3;
20
21 const BUInt32    BFirmwareFormatRaw = 0;
22 const BUInt32    BFirmwareFormatGzip = 1;
23
24 const BUInt32    BFirmwarePlatformBMeasure125 = 33;
25 const BUInt32    BFirmwarePlatformBMeasure125Cpu = 34;
26 const BUInt32    BFirmwarePlatformBMeasure125Fpga = 35;
27 const BUInt32    BFirmwarePlatformBMeasure125Wifi = 36;
28 const BUInt32    BFirmwarePlatformBMeasure125Boot = 37;
29
30 struct BFirmwareFileHeader {
31     BUInt32      magic;
32     BUInt32      itemType;
33     BUInt32      fileLength;
34     BUInt32      checksum;
35     BUInt32      platform;
36     BUInt32      format;
37     BUInt32      numSegments;
38     BUInt32      startAddress;
39     BUInt8        ver0;
40     BUInt8        ver1;
41     BUInt8        ver2;
42     BUInt8        ver3;
43     BUInt32      special[7];
44 } __attribute__((packed));
45
46 typedef BFirmwareFileHeader BFirmwareFirmwareHeader;
47
48 struct BFirmwareSegHeader {
49     BUInt32      magic;
50     BUInt32      itemType;
51     BUInt32      fileLength;
52     BUInt32      checksum;
53     BUInt32      platform;
54     BUInt32      format;
55     BUInt32      dataLength;
56     BUInt32      address;
57     BUInt32      length;
58     BUInt32      special[7];
59 } __attribute__((packed));
60
61
```

```
62 /*****************************************************************************************************
63  * Old Armsys afirm firmware format
64  *****************************************************************************************************
65  */
66 const BUInt32    BFirmwareInfoMagic    = 0xBBEEAA00;
67 const BUInt8  BFirmwareInfoEncrypt1  = 0x40;
68
69 struct BFirmwareInfo {
70     BUInt32  magic;
71     BUInt32  length;
72     BUInt32  checksum;
73     BUInt8    type;
74     BUInt8    ver0;
75     BUInt8    ver1;
76     BUInt8    ver2;
77 };
78
79 // Checks if there is a valid BFirmware application present in the CPU and returns the version if not
       NULL
80 int bfirmwareValid(BUInt32 baseAddress, BUInt type, Bool checkChecksum, char* version = 0);
81 void bfirmwareBoot(BUInt32 baseAddress);
82
83 #endif
```

8.83 BList.h File Reference

```
#include <BList_func.h>
```

Classes

- class BNode

  A BList entry's node.
- class BIter

  Iterator for BLists.
- class BList< T >

  Template based list class.
- class BList< T >::Node

  A BList internal Node.

Macros

- #define BListLoop(list, i) for(BIter i = list.begin(); !list.isEnd(i); list.next(i))

8.83.1 Macro Definition Documentation

8.83.1.1 BListLoop

```
#define BListLoop(
             list,
             i ) for(BIter i = list.begin(); !list.isEnd(i); list.next(i))
```

8.84 BList.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BList.h     BEAM List
3  *  T.Barnaby,  BEAM Ltd,   4/8/00
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BLIST_H
9 #define BLIST_H 1
10
12 class BNode {
13 public:
14         BNode() : next(0), prev(0){}
15     BNode* next;
16     BNode* prev;
17 };
18
20 class BIter {
21 public:
22         BIter(BNode* i = 0)       {   oi = i;          }
23         operator BNode* ()      {   return oi;       }
24     int operator==(const BIter& i)   {   return (i.oi == oi);    }
25     int valid()                {   return (oi != 0);   }
26 private:
27     BNode* oi;
28 };
29
31 template <class T> class BList {
32 public:
34     class Node : public BNode {
35     public:
36             Node(const T& i) : item(i){}
37         T   item;
38     };
39     typedef int      (*SortFunc)(T& a, T& b);
40
41     // Contructors
42         BList();
43         BList(const BList<T>& l);
44     virtual ~BList();
45
46     // Navigation
47     void    start(BIter& i) const;
48     BIter  begin() const;
49     BIter  end() const;
50     BIter  end(BIter& i) const;
51     void    next(BIter& i) const;
52     void    prev(BIter& i);
53     BIter  goTo(int pos) const;
54     int position(BIter i);
55
56     // Information
57     unsigned int    number() const;
58     unsigned int    size() const;
59     int isStart(BIter& i) const;
60     int isEnd(BIter& i) const;
61
62     // Get items
63     T&  front();
64     T&  rear();
65     T&  get(BIter i);
66     const T&    get(BIter i) const;
67
68     // Insert items
69     void    append(const T& item);
70     virtual void    insert(BIter& i, const T& item);
71     void    insertAfter(BIter& i, const T& item);
72
73     // Delete items
74     virtual void    clear();
75     virtual void    del(BIter& i);
76     void    deleteLast();
77     void    deleteFirst();
78
79     // Stack
80     void    push(const T& i);
81     T   pop();
82
83     // Queue
84     void    queueAdd(const T& i);
85     T   queueGet();
86
```

```
87      // Misc
88      void    append(const BList<T>& l);
89      int has(const T& i) const;
90      void    swap(BIter i1, BIter i2);
91      void    sort();
92      void    sort(SortFunc func);
93
94      // Operator functions
95      BList<T>&   operator=(const BList<T>& l);
96      T&  operator[](int i);
97      const T&    operator[](int i) const;
98      T&  operator[](BIter i);
99      const T&    operator[](const BIter& i) const;
100      BList<T>    operator+(const BList<T>& l) const;
101
102 protected:
103      virtual Node*       nodeGet(BIter i);
104      virtual const Node* nodeGet(BIter i) const;
105      virtual Node*       nodeCreate(const T& item);
106      Node*           onodes;
107      unsigned int        olength;
108
109 private:
110      virtual Node*       nodeCreate();
111 };
112
113 #include <BList_func.h>
114
115 // Macros
116 #define BListLoop(list, i)  for(BIter i = list.begin(); !list.isEnd(i); list.next(i))
117
118 #endif
```

8.85 BList_func.h File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <string.h>
#include <memory.h>
```

8.86 BList_func.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BList_func.h    BEAM List implementation based upong stdc++ lists
3  *  T.Barnaby,  BEAM Ltd,   4/8/00
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
18 #include <stdlib.h>
19 #include <stdio.h>
20 #include <string.h>
21 #include <memory.h>
22
23 template <class T> BList<T>::BList() {
24      onodes = nodeCreate();
25      onodes->next = onodes;
26      onodes->prev = onodes;
27      olength = 0;
28 }
29
30 template <class T> BList<T>::BList(const BList<T>& l) {
31      onodes = nodeCreate();
32      onodes->next = onodes;
33      onodes->prev = onodes;
34      olength = 0;
35      append((BList<T>&)l);
36 }
37
38 template <class T> BList<T>::~BList() {
39      clear();
```

```
40      delete [] (char*)onodes;
41  }
42
43  template <class T> void BList<T>::start(BIter& i) const {
44      i = onodes->next;
45  }
46
47  template <class T> BIter BList<T>::begin() const {
48      return onodes->next;
49  }
50
51  template <class T> BIter BList<T>::end() const {
52      return onodes->prev;
53  }
54
55  template <class T> BIter BList<T>::end(BIter& i) const {
56      i = onodes->prev;
57      return onodes->prev;
58  }
59
60  template <class T> void BList<T>::next(BIter& i) const {
61      BNode* n = i;
62
63      if(n != onodes)
64          n = n->next;
65      i = n;
66  }
67
68  template <class T> void BList<T>::prev(BIter& i) {
69      BNode* n = i;
70
71      if(n != onodes)
72          n = n->prev;
73      i = n;
74  }
75
76  template <class T> BIter BList<T>::goTo(int pos) const {
77      BIter  i;
78      int c;
79
80      for(i = begin(), c = 0; (c < pos) && !isEnd(i); next(i), c++);
81      return i;
82  }
83
84  template <class T> int BList<T>::position(BIter i) {
85      BIter  ii;
86      int c;
87
88      for(ii = begin(), c = 0; !isEnd(ii); next(ii), c++){
89          if(ii == i)
90              return c;
91      }
92      return -1;
93  }
94
95  template <class T> unsigned int BList<T>::number() const {
96      return olength;
97  }
98
99  template <class T> unsigned int BList<T>::size() const {
100     return number();
101 }
102
103 template <class T> int BList<T>::isStart(BIter& i) const {
104     Node*   n = (Node*)(BNode*)i;
105
106     return (n == onodes->next);
107 }
108
109 template <class T> int BList<T>::isEnd(BIter& i) const {
110     Node*   n = (Node*)(BNode*)i;
111
112     return (n == onodes);
113 }
114
115 template <class T> void BList<T>::clear(){
116     BIter  i;
117
118     for(start(i); !isEnd(i); )
119         del(i);
120 }
121
122 template <class T> T& BList<T>::front(){
123     return get(begin());
124 }
125
126 template <class T> T& BList<T>::rear(){
```

```
127     return get(end());
128 }
129
130 template <class T> T& BList<T>::get(BIter i){
131     return nodeGet(i)->item;
132 }
133
134 template <class T> const T& BList<T>::get(BIter i) const {
135     return nodeGet(i)->item;
136 }
137
138 template <class T> void BList<T>::append(const T& item){
139     BIter  i = end();
140
141     insertAfter(i, item);
142 }
143
144 template <class T> void BList<T>::insert(BIter& i, const T& item){
145     Node*   c = (Node*)(BNode*)i;
146     Node*   n = nodeCreate(item);
147
148     n->next = c;
149     n->prev = c->prev;
150     c->prev->next = n;
151     c->prev = n;
152     olength++;
153     i = n;
154 }
155
156 template <class T> void BList<T>::insertAfter(BIter& i, const T& item){
157     next(i);
158     insert(i, item);
159 }
160
161 template <class T> void BList<T>::del(BIter& i){
162     Node*   n = (Node*)(BNode*)i;
163
164     if(olength){
165         i = n->next;
166         n->prev->next = n->next;
167         n->next->prev = n->prev;
168         delete n;
169         olength--;
170     }
171 }
172
173 template <class T> void BList<T>::deleteLast(){
174     BIter  i = end();
175
176     del(i);
177 }
178
179 template <class T> void BList<T>::deleteFirst(){
180     BIter  i = begin();
181     del(i);
182 }
183
184 template <class T> void BList<T>::push(const T& item){
185     append(item);
186 }
187
188 template <class T> T BList<T>::pop(){
189     T   t = rear();
190
191     deleteLast();
192     return t;
193 }
194
195 template <class T> void BList<T>::queueAdd(const T& i){
196     append(i);
197 }
198
199 template <class T> T BList<T>::queueGet(){
200     T   t = front();
201
202     deleteFirst();
203     return t;
204 }
205
206 template <class T> void BList<T>::append(const BList<T>& l){
207     BIter  i;
208
209     for(l.start(i); !l.isEnd(i); l.next(i)){
210         append(l.get(i));
211     }
212 }
213
```

```
214 template <class T> int BList<T>::has(const T& v) const {
215     BIter      i;
216
217     for(start(i); !isEnd(i); next(i)){
218         if(get(i) == v)
219             return 1;
220     }
221     return 0;
222 }
223
224 template <class T> void BList<T>::swap(BIter i1, BIter i2){
225     BNode* n1 = (BNode*)i1;
226     BNode* n2 = (BNode*)i2;
227     BNode* n1p = n1->prev;
228     BNode* n1n = n1->next;
229     BNode* n2p = n2->prev;
230     BNode* n2n = n2->next;
231
232     if(n1->next == n2){
233         n1p->next = n2;
234         n2n->prev = n1;
235
236         n1->prev = n2;
237         n2->prev = n1p;
238         n1->next = n2n;
239         n2->next = n1;
240     }
241     else if(n1->prev == n2){
242         n2p->next = n1;
243         n1n->prev = n2;
244
245         n1->prev = n2p;
246         n2->prev = n1;
247         n1->next = n2;
248         n2->next = n1n;
249     }
250     else {
251         n1p->next = n2;
252         n1n->prev = n2;
253         n2p->next = n1;
254         n2n->prev = n1;
255
256         n1->prev = n2p;
257         n2->prev = n1p;
258         n1->next = n2n;
259         n2->next = n1n;
260     }
261 }
262
263 template <class T> void BList<T>::sort(){
264     BIter      i;
265     BIter      s;
266     int     n = number();
267     int     c;
268
269     while(n){
270         for(c = n - 1, i = begin(); c > 0; c--, next(i)){
271             s = i;
272             next(s);
273             if(get(i) > get(s)){
274                 swap(i, s);
275                 i = s;
276             }
277         }
278         n--;
279     }
280 }
281
282 template <class T> void BList<T>::sort(SortFunc func){
283     BIter      i;
284     BIter      s;
285     int     n = number();
286     int     c;
287
288     while(n){
289         for(c = n - 1, i = begin(); c > 0; c--, next(i)){
290             s = i;
291             next(s);
292             if(func(get(i), get(s)) > 0){
293                 swap(i, s);
294                 i = s;
295             }
296         }
297         n--;
298     }
299 }
300
```

```
301 template <class T> T& BList<T>::operator[](BIter i){
302     return get(i);
303 }
304
305 template <class T> const T& BList<T>::operator[](const BIter& i) const {
306     return get(i);
307 }
308
309 template <class T> T& BList<T>::operator[](int i){
310     BIter  ii;
311
312     if((ii = goTo(i))){
313         return get(ii);
314     }
315     else {
316         fprintf(stderr, "BList over range\n");
317         exit(1);
318     }
319 }
320
321 template <class T> const T& BList<T>::operator[](int i) const {
322     BIter  ii;
323
324     if((ii = goTo(i))){
325         return get(ii);
326     }
327     else {
328         fprintf(stderr, "BList over range\n");
329         exit(1);
330     }
331 }
332
333 template <class T> BList<T>& BList<T>::operator=(const BList<T>& l){
334     BIter  i;
335
336     if(this != &l){
337         clear();
338         for(l.start(i); !l.isEnd(i); l.next(i)){
339             append(l[i]);
340         }
341     }
342
343     return *this;
344 }
345
346 template <class T> BList<T> BList<T>::operator+(const BList<T>& l) const {
347     BList<T>    rl = *this;
348     BIter      i;
349
350     for(l.start(i); !l.isEnd(i); l.next(i)){
351         rl.append(l[i]);
352     }
353     return rl;
354 }
355
356 template <class T> typename BList<T>::Node* BList<T>::nodeGet(BIter i){
357     return (Node*)(BNode*)i;
358 }
359
360 template <class T> const typename BList<T>::Node* BList<T>::nodeGet(BIter i) const{
361     return (Node*)(BNode*)i;
362 }
363
364 template <class T> typename BList<T>::Node* BList<T>::nodeCreate(const T& item){
365     return new Node(item);
366 }
367 template <class T> typename BList<T>::Node* BList<T>::nodeCreate(){
368     Node*   n;
369
370     n = (Node*)new char [ sizeof(Node) ];
371     // WARNING: This is not ideal. However only used for the list start/end Node where the object is not
    valid anyway.
372     memset((void*)n, 0, sizeof(Node));
373     return n;
374 }
```

8.87 BMutex.cpp File Reference

```
#include <BMutex.h>
```

Macros

- #define MDEBUG 0

8.87.1 Macro Definition Documentation

8.87.1.1 MDEBUG

```
#define MDEBUG 0
```

8.88 BMutex.h File Reference

```
#include <pthread.h>
```

Classes

- class BMutex

  Mutex class. Note these are recursive Mutexes and so you need to make sure the number of unlocks equals the number of locks.
- class BMutexLock

  Mutex class that removes the lock on deletion and so is useful to lock data in a function call.

8.89 BMutex.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BMutex.h        BMutex Classes
3  *  T.Barnaby,  BEAM Ltd,   1/11/02
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BMUTEX_H
9 #define BMUTEX_H    1
10
11 #include <pthread.h>
12
13 class BMutex {
14 public:
15     enum Type   { Normal, Recursive };
16
17             BMutex(Type type =  Normal);
18             BMutex(const BMutex& mutex);
19             ~BMutex();
20
21     int     lock();
22     int     timedLock(int timeoutUs);
23     int     unlock();
24     int     tryLock();
25
26     BMutex&       operator=(const BMutex& mutex);
27 private:
28     pthread_mutex_t omutex;
29 };
30
31 class BMutexLock {
32 public:
33             BMutexLock(BMutex& lock, int doLock = 0) : olock(lock)  { if(doLock) olock.lock();  }
34             ~BMutexLock()                { olock.unlock();     }
35     int     lock()                  { return olock.lock();      }
36     int     unlock()              { return olock.unlock();  }
37 private:
38     BMutex&       olock;
39 };
40 #endif
```

8.90 BMysql.cpp File Reference

```
#include <stdlib.h>
#include <string.h>
#include <BMysql.h>
```

8.91 BMysql.h File Reference

```
#include <BTypes.h>
#include <BError.h>
#include <BDict.h>
#include <BMutex.h>
#include <mysql/mysql.h>
```

Classes

- class BMysql

  A class to provide access to a MySQL database.

8.92 BMysql.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BMysql.h    BDS Database Access Object
3  *  T.Barnaby,  BEAM Ltd,   2008-05-20
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BMysql_H
9 #define BMysql_H    1
10
11 #include <BTypes.h>
12 #include <BError.h>
13 #include <BDict.h>
14 #include <BMutex.h>
15 #include <mysql/mysql.h>
16
18 class BMysql {
19 public:
20             BMysql();
21             ~BMysql();
22
23     BError        open(BString hostName, BString dataBase, BString userName, BString password);
24     void        close();
25
26     BError        get(BString table, BString where, BDictString& fields);
27     BError        insert(BString table, BDictString fields, BUInt32* id = 0);
28     BError        update(BString table, BUInt32 id, BDictString fields);
29     BError        del(BString table, BUInt32 id);
30     BError        flush();
31
32     BString      escapeString(BString str);
33
34     // Low level routines
35     BError        query(BString cmd, BList<BDictString>& result);
36     MYSQL&      db();
37     void        setDebug(int debug);
38 private:
39     MYSQL       odb;
40     int     oopened;
41     int     odebug;
42     BMutex        olock;
43 //  static BMutex   olock;      // All BMysql instances share this
44 };
45
46 #endif
```

8.93 BNameValue.h File Reference

```
#include <BList.h>
#include <BString.h>
```

Classes

- class BNameValue< T >

  A simple, templated, name/value pair.
- class BNameValueList< T >

  A simple, templated, name/value pair list.

8.94 BNameValue.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BNameValue.h    Beam Name Vlaue Object
3  *  T.Barnaby,  BEAM Ltd,   16/8/00
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BNAMEVALUE_H
9 #define BNAMEVALUE_H    1
10
11 #include    <BList.h>
12 #include    <BString.h>
13
15 template <class T> class BNameValue {
16 public:
17             BNameValue(){
18             }
19             BNameValue(BString name, const T& value){
20                 oname = name;
21                 ovalue = value;
22             }
23
24     BString      getName(){   return oname; }
25     T&      getValue(){ return ovalue; }
26 private:
27     BString      oname;
28     T       ovalue;
29 };
30
32 template <class T> class BNameValueList : public BList< BNameValue<T> > {
33 public:
34     T*      find(BString name){
35                 for(BIter i = this->begin(); !this->isEnd(i); this->next(i)){
36                     if(this->get(i).getName() == name)
37                         return &this->get(i).getValue();
38                 }
39                 return 0;
40             }
41     BIter      findPos(BString name){
42                 for(BIter i = this->begin(); !this->isEnd(i); this->next(i)){
43                     if(this->get(i).getName() == name)
44                         return i;
45                 }
46                 return this->onodes;
47             }
48 };
49
50 #endif
```

8.95 Boap.cpp File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <errno.h>
#include <unistd.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <netinet/tcp.h>
#include <Boap.h>
#include <byteswap.h>
#include <BoapnsD.h>
#include <BoapnsC.h>
```

Macros

- #define DEBUG 0
- #define APIVERSION_TEST 1
- #define dprintf(fmt, a...)
- #define IS_BIG_ENDIAN 1

Variables

- const int boapPort = 12000

  The default BOAP connection port.

8.95.1 Macro Definition Documentation

8.95.1.1 DEBUG

```
#define DEBUG 0
```

8.95.1.2 APIVERSION_TEST

```
#define APIVERSION_TEST 1
```

8.95.1.3 dprintf

```
#define dprintf(
              fmt,
              a...  )
```

8.95.1.4 IS_BIG_ENDIAN

```
#define IS_BIG_ENDIAN 1
```

8.95.2 Variable Documentation

8.95.2.1 boapPort

```
const int boapPort = 12000
```

The default BOAP connection port.

8.96 Boap.h File Reference

```
#include <stdint.h>
#include <BTypes.h>
#include <BPoll.h>
#include <BSocket.h>
#include <BThread.h>
#include <BError.h>
#include <BEvent1.h>
#include <BMutex.h>
#include <BTimeStamp.h>
#include <BBuffer.h>
```

Classes

- struct BoapPacketHead

  Boap packet header.
- class BoapPacket

  Boap packet.
- class BoapClientObject

  Base for all Boap client objects.
- class BoapSignalObject

  A Boap object to send signals using an RPC mechanism.
- class BoapServiceEntry

  Boap server single service entry.
- class BoapServerConnection

  Boap server connection.
- class BoapServer

  Boap server.
- class BoapFuncEntry

  Boap service function.
- class BoapServiceObject

  Boap service object.

Namespaces

- namespace Boapns

Typedefs

- typedef BUInt32 BoapService
- typedef BError(BoapServiceObject::* BoapFunc) (BoapServerConnection *conn, BoapPacket &rx, BoapPacket &tx)

Enumerations

- enum BoapType { BoapTypeRpc , BoapTypeRpcReply , BoapTypeSignal , BoapTypeRpcError , BoapTypeRpc , BoapTypeSignal }
- enum BoapPriority { BoapPriorityLow , BoapPriorityNormal , BoapPriorityHigh }

Variables

- const BUInt32 BoapMagic = 0x424F4100

8.96.1 Typedef Documentation

8.96.1.1 BoapService

```
typedef BUInt32 BoapService
```

8.96.1.2 BoapFunc

```
typedef BError(BoapServiceObject::* BoapFunc) (BoapServerConnection *conn, BoapPacket &rx,
BoapPacket &tx)
```

8.96.2 Enumeration Type Documentation

8.96.2.1 BoapType

```
enum BoapType
```

Enumerator

BoapTypeRpc	
BoapTypeRpcReply	
BoapTypeSignal	
BoapTypeRpcError	
BoapTypeRpc	
BoapTypeSignal	

8.96.2.2 BoapPriority

```
enum BoapPriority
```

Enumerator

BoapPriorityLow	
BoapPriorityNormal	
BoapPriorityHigh	

8.96.3 Variable Documentation

8.96.3.1 BoapMagic

```
const BUInt32 BoapMagic = 0x424F4100
```

8.97 Boap.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  Boap.h  Boap RPC protocol
3  *  T.Barnaby,  BEAM Ltd,   8/5/03
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef Boap_HH
9 #define Boap_HH
10
11 #include <stdint.h>
12 #include <BTypes.h>
13 #include <BPoll.h>
14 #include <BSocket.h>
15 #include <BThread.h>
16 #include <BError.h>
17 #include <BEvent1.h>
18 #include <BMutex.h>
19 #include <BTimeStamp.h>
20 #include <BBuffer.h>
21
```

```
22 // Main BOAP Types
23 const BUInt32        BoapMagic = 0x424F4100;
24 enum BoapType       { BoapTypeRpc, BoapTypeRpcReply, BoapTypeSignal, BoapTypeRpcError };
25 typedef BUInt32      BoapService;
26 enum BoapPriority   { BoapPriorityLow, BoapPriorityNormal, BoapPriorityHigh };
27
29 struct BoapPacketHead {
30     BUInt32      type;
31     BUInt32      length;
32     BUInt32      service;
33     BUInt32      cmd;
34 };
35
37 class BoapPacket : public BBufferStore {
38 public:
39             BoapPacket();
40             ~BoapPacket();
41
42     BUInt32      getCmd();
43
44     int     peekHead(BoapPacketHead& head);
45     int     pushHead(BoapPacketHead& head);
46     int     popHead(BoapPacketHead& head);
47     void        updateHead();
48 };
49
50 /*****************************************************************************
51  *  Main Client communications classes
52  *****************************************************************************
53  */
54
56 class BoapClientObject : public BSocket {
57 public:
58             BoapClientObject(BString name = "");
59     virtual     ~BoapClientObject();
60
61     BUInt32      apiVersion();
62     BError        connectService(BString name);
63     BError        disconnectService();
64     BString      getServiceName();
65
66     BError        ping(BUInt32& apiVersion);
67     BError        setConnectionPriority(BoapPriority priority);
68     void        setMaxLength(BUInt32 maxLength);
69     void        setTimeout(int timeout);
70
71
72 protected:
73     BError        pingLocked(BUInt32& apiVersion);
74     BError        checkApiVersion();
75     BError        performCall(BoapPacket& tx, BoapPacket& rx);
76     BError        performSend(BoapPacket& tx);
77     BError        performRecv(BoapPacket& rx);
78     virtual BError    handleReconnect(BError err);
79
80     BString      oname;
81     BUInt32      oapiVersion;
82     BoapPriority    opriority;
83     BoapService  oservice;
84     int     oconnected;
85     BUInt32      omaxLength;
86     BoapPacket    otx;
87     BoapPacket    orx;
88     BMutex        olock;
89     int     otimeout;
90     int     oreconnect;
91 };
92
93
95 class BoapSignalObject : public BSocket {
96 public:
97             BoapSignalObject();
98
99 protected:
100     BError        performSend(BoapPacket& tx);           // Performs a send to the named service
101     BoapPacket    otx;
102     BoapPacket    orx;
103 };
104
105
106 /*****************************************************************************
107  *  Main Server communications class
108  *****************************************************************************
109  */
110 class BoapServiceObject;
111
113 class BoapServiceEntry {
```

```
114 public:
115                 BoapServiceEntry(BoapService service = 0, BoapServiceObject* object = 0){
116                     oservice = service;
117                     oobject = object;
118                 }
119     BoapService      oservice;
120     BoapServiceObject* oobject;
121 };
122
123 class BoapServer;
124
126 class BoapServerConnection : public BThread {
127 public:
128             BoapServerConnection(BoapServer& boapServer, int fd);
129     virtual     ~BoapServerConnection();
130
131     virtual BError        init();
132     virtual BError        process();
133     virtual BSocket& getSocket();
134     virtual void        setMaxLength(BUInt32 maxLength);
135     virtual BError        getHead(BoapPacketHead& head);
136
137     virtual BError        validate();
138 private:
139     void*           function();
140
141     BoapServer&       oboapServer;
142     BSocket          osocket;
143     BoapPacket        orx;
144     BoapPacket        otx;
145     BUInt32          omaxLength;
146 };
147
148 namespace Boapns {
149 class Boapns;
150 }
151
153 class BoapServer : public BThread {
154 public:
155     enum        { NOTHREADS=0, THREADED=1 };
156
157                     BoapServer();
158     virtual             ~BoapServer();
159     virtual BError            init(BString boapNsHost = "", int port = 0, int threaded = 0, int isBoapns
        = 0);
160     virtual BError            run(int inThread = 0);
161     virtual BError            process(BoapServerConnection* conn, BoapPacket& rx, BoapPacket& tx);
162     virtual BError            processEvent(BoapPacket& rx);
163
164     // Support routines
165     virtual BError            addObject(BoapServiceObject* object);
166     virtual BError            sendEvent(BoapPacket& tx);
167     virtual BError            processEvent(int fd);
168     virtual void           clientGone(BoapServerConnection* client);
169     BSocket&         getSocket();
170     BSocket&         getEventSocket();
171     BString              getHostName();
172     int             getConnectionsNumber();
173     void                closeConnections();
174
175     // Override functions
176     virtual BoapServerConnection*   newConnection(int fd, BSocketAddressINET address);
177
178 protected:
179     void*               function();
180
181     BMutex               olock;
182     int             othreaded;
183     int             oisBoapns;
184     Boapns::Boapns*           oboapns;
185     BList<BoapServerConnection*>    oclients;
186     BEvent1Int            oclientGoneEvent;
187     BList<BoapServiceEntry>      oservices;
188     BPoll              opoll;
189     BSocket              onet;
190     BSocket              onetEvent;
191     BSocketAddressINET        onetEventAddress;
192     BString              ohostName;
193
194 public:
195     BUInt64              onumOperations;
196 };
197
198 /*****************************************************************************
199  *  Base for all Server Objects
200  *****************************************************************************
201  */
```

```
202 class BoapServiceObject;
203
204 typedef BError (BoapServiceObject::*BoapFunc)(BoapServerConnection* conn, BoapPacket& rx, BoapPacket&
      tx);
205
207 class BoapFuncEntry {
208 public:
209             BoapFuncEntry(int cmd, BoapFunc func);
210     BUInt32      ocmd;
211     BoapFunc    ofunc;
212 };
213
215 class BoapServiceObject {
216 public:
217             BoapServiceObject(BoapServer& server, BString name = "");
218     virtual     ~BoapServiceObject();
219
220     BError        setName(BString name);
221
222     BError        sendEvent(BString signalName, BInt32 arg);
223     virtual BError    processEvent(BString objectName, BString name, BInt32 arg);
224
225     BString      name();
226     BUInt32      apiVersion();
227     BError        doPing(BoapServerConnection* conn, BoapPacket& rx, BoapPacket& tx);
228     BError        doConnectionPriority(BoapServerConnection* conn, BoapPacket& rx, BoapPacket& tx);
229     BError        process(BoapServerConnection* conn, BoapPacket& rx, BoapPacket& tx);
230     virtual BError    processEvent(BoapPacket& rx);
231 protected:
232     BError            sendEvent(BoapPacket& tx);
233
234     BoapServer&       oserver;
235     BString          oname;
236     BUInt32          oapiVersion;
237     BList<BoapFuncEntry>    ofuncList;
238 };
239 #endif
```

8.98 BoapMc.cpp File Reference

```
#include <BoapMc.h>
#include <BCrc16.h>
#include <stdlib.h>
#include <string.h>
#include <stdio.h>
```

Macros

- #define DEBUG_LOCAL 0
- #define DEBUG_LOCAL1 0
- #define dlprintf(fmt, a...)
- #define dl1printf(fmt, a...)

8.98.1 Macro Definition Documentation

8.98.1.1 DEBUG_LOCAL

```
#define DEBUG_LOCAL 0
```

8.98.1.2 DEBUG_LOCAL1

```
#define DEBUG_LOCAL1 0
```

8.98.1.3 dlprintf

```
#define dlprintf(
              fmt,
              a...  )
```

8.98.1.4 dl1printf

```
#define dl1printf(
              fmt,
              a...  )
```

8.99 BoapMc.h File Reference

```
#include <BTypes.h>
#include <BMutex.h>
#include <BSemaphore.h>
#include <BQueue.h>
#include <BFifo.h>
#include <BComms.h>
```

Classes

- struct BoapMcPacketHead
- class BoapMcPacket
- class BoapMcClientObject
- class BoapMcSignalObject
- class BoapMcServiceObject
- class BoapMcComms

Enumerations

- enum BoapMcType { BoapMcTypeRequest = 0x00 , BoapMcTypeReply = 0x80 }

Functions

- struct BoapMcPacketHead __attribute__ ((aligned(8), packed))

Variables

- BUInt8 length
- BUInt8 addressTo
- BUInt8 addressFrom
- BUInt8 cmd
- BUInt16 error
- BUInt16 checksum
- class BoapMcPacket __attribute__

8.99.1 Enumeration Type Documentation

8.99.1.1 BoapMcType

```
enum BoapMcType
```

Enumerator

BoapMcTypeRequest	
BoapMcTypeReply	

8.99.2 Function Documentation

8.99.2.1 __attribute__()

```
struct BoapMcPacketHead __attribute__ (
            (aligned(8), packed)  )
```

8.99.3 Variable Documentation

8.99.3.1 length

```
BUInt8 length
```

8.99.3.2 addressTo

```
BUInt8 addressTo
```

8.99.3.3 addressFrom

```
BUInt8 addressFrom
```

8.99.3.4 cmd

```
BUInt8 cmd
```

8.99.3.5 error

```
BUInt16 error
```

8.99.3.6 checksum

```
BUInt16 checksum
```

8.99.3.7 __attribute__

```
class BoapMcPacket __attribute__
```

8.100 BoapMc.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BoapMc.h    BoapMc RPC protocol
3  *  T.Barnaby,  BEAM Ltd,   2012-11-14
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BoapMc_HH
9 #define BoapMc_HH
10
11 #include <BTypes.h>
12 #include <BMutex.h>
13 #include <BSemaphore.h>
14 #include <BQueue.h>
15 #include <BFifo.h>
16 #include <BComms.h>
17
18 // Main BOAP Types
19 enum BoapMcType       { BoapMcTypeRequest = 0x00, BoapMcTypeReply = 0x80 };
20
21 // BoapMc packet header
22 struct BoapMcPacketHead {
23     BUInt8        length;
24     BUInt8        addressTo;
25     BUInt8        addressFrom;
26     BUInt8        cmd;
27     BUInt16       error;
28     BUInt16       checksum;
29 } __attribute__((aligned(8),packed));
30
31 // BoapMc packet
32 class BoapMcPacket {
33 public:
34     BoapMcPacketHead    head;
35     char            data[256 - sizeof(BoapMcPacketHead)];
36 };
37
38 /*****************************************************************************
39  *  Base for all client interface objects
40  *****************************************************************************
41  */
42 class BoapMcClientObject {
43 public:
44             BoapMcClientObject(BComms& comms);
45     virtual     ~BoapMcClientObject();
46
47     void        setAddress(BUInt8 addressTo, BUInt8 addressFrom);
48     BUInt32      getApiVersion();
49
50 protected:
51     BError        performCall();
52     BError        performSend();
53     BError        performRecv();
54
55     BUInt32      oapiVersion;
56     BComms&       ocomms;
57     BUInt8        oaddressTo;
58     BUInt8        oaddressFrom;
59     BoapMcPacket    opacket;
60 };
61
62 class BoapMcSignalObject {
63 public:
64             BoapMcSignalObject(BComms& comms);
65
66 protected:
67     BError        performSend(BoapMcPacket& tx);           // Performs a send to the named service
68     BComms&       ocomms;
69 };
70
71
72 /*****************************************************************************
73  *  Base for server communications objects
74  *****************************************************************************
75  */
76 class BoapMcServiceObject {
77 public:
78             BoapMcServiceObject();
79     virtual     ~BoapMcServiceObject();
80
81     virtual BError    process(BoapMcPacket& rx, BoapMcPacket& tx);
82     virtual BError    processEvent(BoapMcPacket& rx);
```

```
83 protected:
84     BError        sendEvent(BoapMcPacket& tx);
85     BUInt32      oapiVersion;
86 };
87
88 /*****************************************************************************
89  *  Base for bidirectional communications objects
90  *****************************************************************************
91  */
92 class BoapMcComms {
93 public:
94             BoapMcComms(Bool threaded = 0, BUInt rxQueueSize = 4);
95     virtual     ~BoapMcComms();
96
97     void        setCommsMode(Bool slave, BUInt txQueueSize);
98     void        setComms(BComms& comms);
99     void        setComms(BComms* comms);
100     void        setAddress(BUInt8 addressTo, BUInt8 addressFrom);
101     BUInt32      getApiVersion();
102     BUInt32      setTimeout(BUInt32 timeoutUs);
103
104     virtual BError    processRx(BTimeout timeoutUs = BTimeoutForever);
105     virtual BError    processRequests(BTimeout timeoutUs = BTimeoutForever);
106     virtual BError    processRequest(BTimeout timeoutUs = BTimeoutForever);
107     virtual BError    processPacket(BoapMcPacket& rx, BoapMcPacket& tx);
108
109 protected:
110     // Communications functions
111     BError        performCall();
112     BError        performSend();
113
114     BError        packetSend(BoapMcPacket& packet);
115     BError        packetRecv(BoapMcPacket& packet);
116
117     Bool            othreaded;
118     BMutex            olockCall;
119     BMutex            olockTx;
120     BComms*           ocomms;
121     BUInt32          oapiVersion;
122     Bool            oslave;
123     BUInt32          otimeout;
124     BUInt8            oaddressTo;
125     BUInt8            oaddressFrom;
126     BoapMcPacket        opacket;
127     BoapMcPacket        opacketTx;
128     BoapMcPacket        opacketRx;
129     BSemaphore        opacketRxSema;
130     BoapMcPacket        opacketReqTx;
131     BoapMcPacket        opacketReqRx;
132     BQueue<BoapMcPacket>    opacketReqQueue;
133
134     BFifo<BoapMcPacket>  opacketTxQueue;
135     BSemaphoreCount      opacketTxQueueWriteNum;
136     BSemaphore        opacketTxSema;
137 };
138
139
140 #endif
```

8.101 BoapMc1.cpp File Reference

```
#include <BoapMc1.h>
#include <BSys.h>
#include <BCrc32.h>
#include <stdlib.h>
#include <string.h>
#include <stdio.h>
#include <BDebug.h>
```

Macros

- #define BDEBUGL1 0
- #define BDEBUGL2 0

8.101.1 Macro Definition Documentation

8.101.1.1 BDEBUGL1

```
#define BDEBUGL1 0
```

8.101.1.2 BDEBUGL2

```
#define BDEBUGL2 0
```

8.102 BoapMc1.h File Reference

```
#include <BTypes.h>
#include <BMutex.h>
#include <BSemaphore.h>
#include <BQueue.h>
#include <BFifo.h>
#include <BComms.h>
```

Classes

- struct BoapMc1PacketHead
- class BoapMc1Packet
- struct BoapMc1Error
- class BoapMc1Comms

Enumerations

- enum BoapMc1Type { BoapMc1TypeRequest = 0x0000 , BoapMc1TypeReply = 0x8000 }

Functions

- struct BoapMc1PacketHead __attribute__ ((aligned(8), packed))
- BUInt32 boapMc1CommsRoundupLen (BUInt32 len)

Variables

- const BUInt16 BoapMc1Magic = 0x5542
- BUInt16 magic

  Packet magic pattern.
- BUInt16 length

  Total packet length including the header.
- BUInt16 addressTo

  Address to send to.
- BUInt16 addressFrom

  Address packet is from.
- BUInt16 cmd

  The RPC command or reply number.
- BInt16 error

  Error number.
- BUInt32 checksum

  Packet checksum, when used.
- BoapMc1PacketHead head
- char data [8]
- BInt16 number

  The error number.
- char string [32]

  The error string.
- class BoapMc1Comms __attribute__

8.102.1 Enumeration Type Documentation

8.102.1.1 BoapMc1Type

```
enum BoapMc1Type
```

Enumerator

BoapMc1TypeRequest	
BoapMc1TypeReply	

8.102.2 Function Documentation

8.102.2.1 __attribute__()

```
struct BoapMc1PacketHead __attribute__ (
            (aligned(8), packed)  )
```

8.102.2.2 boapMc1CommsRoundupLen()

```
BUInt32 boapMc1CommsRoundupLen (
            BUInt32 len )  [inline]
```

8.102.3 Variable Documentation

8.102.3.1 BoapMc1Magic

```
const BUInt16 BoapMc1Magic = 0x5542
```

8.102.3.2 magic

```
BUInt16 magic
```

Packet magic pattern.

8.102.3.3 length

```
BUInt16 length
```

Total packet length including the header.

8.102.3.4 addressTo

```
BUInt16 addressTo
```

Address to send to.

8.102.3.5 addressFrom

```
BUInt16 addressFrom
```

Address packet is from.

8.102.3.6 cmd

```
BUInt16 cmd
```

The RPC command or reply number.

8.102.3.7 error

```
BInt16 error
```

Error number.

8.102.3.8 checksum

```
BUInt32 checksum
```

Packet checksum, when used.

8.102.3.9 head

```
BoapMc1PacketHead head
```

8.102.3.10 data

```
char data[8]
```

8.102.3.11 number

```
BInt16 number
```

The error number.

8.102.3.12 string

```
char string[32]
```

The error string.

8.102.3.13 __attribute__

```
class BoapMc1Comms __attribute__
```

8.103 BoapMc1.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BoapMc1.h   BoapMc1 RPC protocol
3  *  T.Barnaby,  BEAM Ltd,   2018-06-21
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BoapMc1_h
9 #define BoapMc1_h
10
11 #include <BTypes.h>
12 #include <BMutex.h>
13 #include <BSemaphore.h>
14 #include <BQueue.h>
15 #include <BFifo.h>
16 #include <BComms.h>
17
18 // Main BOAP Types
19 const BUInt16    BoapMc1Magic    = 0x5542;
20 enum BoapMc1Type     { BoapMc1TypeRequest = 0x0000, BoapMc1TypeReply = 0x8000 };
21
22 // BoapMc1 packet header
23 struct BoapMc1PacketHead {
24     BUInt16      magic;
25     BUInt16      length;
26     BUInt16      addressTo;
27     BUInt16      addressFrom;
28     BUInt16      cmd;
29     BInt16        error;
30     BUInt32      checksum;
31 } __attribute__((aligned(8),packed));
32
33 // BoapMc1 packet
34 class BoapMc1Packet {
35 public:
36     BoapMc1PacketHead  head;
37     char            data[8];
38 } __attribute__((aligned(8),packed));
39
40 struct BoapMc1Error {
41     BInt16        number;
42     char        string[32];
43 } __attribute__((aligned(8),packed));
44
45 inline BUInt32 boapMc1CommsRoundupLen(BUInt32 len){
46     return ((len + 3) & ~3);
47 }
48
49 /*****************************************************************************
50  *  Base for bidirectional communications objects
51  *****************************************************************************
52  */
53
54 class BoapMc1Comms {
55 public:
56             BoapMc1Comms(Bool threaded = 0, BUInt reqSize = 512);
57     virtual     ~BoapMc1Comms();
58
```

```
59      void        setCommsMode(Bool halfDuplex);
60      void        setComms(BComms& comms);
61      void        setComms(BComms* comms);
62      void        setAddress(BUInt16 addressTo, BUInt16 addressFrom);
63      BUInt32      getApiVersion();
64      BUInt32      setTimeout(BUInt32 timeoutUs);
65
66      virtual BError    validate();
67      BoapMc1Packet* packetRx();
68
69      virtual BError    processRx();
70
71  protected:
72      // Communications functions
73      virtual BError        processRequests();
74      virtual BError        processRequest();
75
76      BError            packetTx(BDataChunk* chunks, BUInt nChunks, BUInt16 waitCmdReply);
77
78  #ifdef ZAP_IDEAS
79      BError            packetRxWait(BUInt num, char** data);
80      BError            packetRxWait(BUInt16 cmd);
81  #endif
82
83      BError            packetRxData(void* data, BUInt nBytes);
84      BError            packetRxEnd();
85
86      Bool            othreaded;
87      BUInt32          oreqSize;
88      BMutex            olockCall;
89      BMutex            olockTx;
90      BComms*           ocomms;
91      BUInt32          oapiVersion;
92      Bool            ohalfDuplex;
93      BUInt32          otimeout;
94      BUInt16          oaddressTo;
95      BUInt16          oaddressFrom;
96
97      BoapMc1Packet      opacketRxBase;
98      BoapMc1Packet*     opacketRx;
99      BoapMc1Packet      opacketTxBase;
100     BoapMc1Packet*     opacketTx;
101     BUInt           opacketRpcCmd;
102     BSemaphore        opacketRpcSema;
103     BSemaphore        opacketRpcDoneSema;
104     BoapMc1Error        oerror;
105 };
106
107
108 #endif
```

8.104 BoapnsC.cpp File Reference

```
#include <BoapnsC.h>
```

Namespaces

- namespace Boapns

8.105 BoapnsC.h File Reference

```
#include <stdlib.h>
#include <stdint.h>
#include <Boap.h>
#include <BString.h>
#include <BList.h>
#include <BArray.h>
#include <BoapnsD.h>
```

Classes

- class Boapns::Boapns

Namespaces

- namespace Boapns

Variables

- const BUInt32 Boapns::apiVersion = 0

8.106 BoapnsC.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BoapnsC.h   Produced by Bidl
3  *****************************************************************************
4  */
5
6 #ifndef BOAPNSC_H
7 #define BOAPNSC_H 1
8
9 #include <stdlib.h>
10 #include <stdint.h>
11 #include <Boap.h>
12 #include <BString.h>
13 #include <BList.h>
14 #include <BArray.h>
15 #include <BoapnsD.h>
16
17
18 namespace Boapns {
19     const BUInt32 apiVersion = 0;
20
21     class Boapns : public BoapClientObject {
22     public:
23             Boapns(BString name = "");
24         BError getVersion(BString& version);
25         BError getEntryList(BList<BoapEntry >& entryList);
26         BError getEntry(BString name, BoapEntry& entry);
27         BError addEntry(BoapEntry entry);
28         BError delEntry(BString name);
29         BError getNewName(BString& name);
30     private:
31     };
32 }
33 #endif
```

8.107 BoapnsD.cpp File Reference

```
#include <BoapnsD.h>
```

Namespaces

- namespace Boapns

8.108 BoapnsD.h File Reference

BOAP data class definitions for: Boapns.

```
#include <Boap.h>
#include <BObj.h>
#include <BDate.h>
#include <BTimeStamp.h>
#include <BComplex.h>
#include <BList.h>
#include <BArray.h>
```

Classes

- class Boapns::BoapEntry

Namespaces

- namespace Boapns

8.108.1 Detailed Description

BOAP data class definitions for: Boapns.

Date

2022-11-30T14:15:59

The classes in here have been defined by a BOAP ∗.bidl file and define classes able to be communicated across a BOAP link

8.109 BoapnsD.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BoapnsD.h   Produced by Bidl
3  *****************************************************************************
4  */
10
11 #ifndef BOAPNSD_H
12 #define BOAPNSD_H 1
13
14 #include <Boap.h>
15 #include <BObj.h>
16 #include <BDate.h>
17 #include <BTimeStamp.h>
18 #include <BComplex.h>
19 #include <BList.h>
20 #include <BArray.h>
21
22 namespace Boapns {
23     class BoapEntry {
24     public:
25         BoapEntry(BString name = BString(), BString hostName = BString(), BList<BString > addressList =
      BList<BString >(), BUInt32 port = 0, BUInt32 service = 0);
26     public:
27         BString  name;
28         BString  hostName;
29         BList<BString >  addressList;
30         BUInt32  port;
31         BUInt32  service;
32     };
33
34 }
35
36 #endif
```

8.110 BoapSimple.cc File Reference

```
#include <stdlib.h>
#include <stdio.h>
#include <errno.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <Boap.h>
#include <BoapnsD.h>
#include <BoapnsC.h>
```

Macros

- #define DEBUG 0
- #define dprintf(fmt, a...)

Variables

- const int roundSize = 256

8.110.1 Macro Definition Documentation

8.110.1.1 DEBUG

```
#define DEBUG 0
```

8.110.1.2 dprintf

```
#define dprintf(
              fmt,
              a...  )
```

8.110.2 Variable Documentation

8.110.2.1 roundSize

```
const int roundSize = 256
```

8.111 BoapSimple.h File Reference

```
#include <stdint.h>
#include <BPoll.h>
#include <BSocket.h>
#include <BError.h>
```

Classes

- struct BoapPacketHead

  Boap packet header.
- class BoapPacket

  Boap packet.
- class BoapClientObject

  Base for all Boap client objects.
- class BoapSignalObject

  A Boap object to send signals using an RPC mechanism.
- class BoapServiceEntry

  Boap server single service entry.
- class BoapServer

  Boap server.
- class BoapFuncEntry

  Boap service function.
- class BoapServiceObject

  Boap service object.

Typedefs

- typedef int8_t Int8
- typedef uint8_t UInt8
- typedef int16_t Int16
- typedef uint16_t UInt16
- typedef int32_t Int32
- typedef uint32_t UInt32
- typedef double Double
- typedef uint32_t BoapService
- typedef BError(BoapServiceObject::* BoapFunc) (BoapPacket &rx, BoapPacket &tx)

Enumerations

- enum BoapType {
  BoapTypeRpc , BoapTypeRpcReply , BoapTypeSignal , BoapTypeRpcError ,
  BoapTypeRpc , BoapTypeSignal }

8.111.1 Typedef Documentation

8.111.1.1 Int8

```
typedef int8_t Int8
```

8.111.1.2 UInt8

```
typedef uint8_t UInt8
```

8.111.1.3 Int16

```
typedef int16_t Int16
```

8.111.1.4 UInt16

```
typedef uint16_t UInt16
```

8.111.1.5 Int32

```
typedef int32_t Int32
```

8.111.1.6 UInt32

```
typedef uint32_t UInt32
```

8.111.1.7 Double

```
typedef double Double
```

8.111.1.8 BoapService

```
typedef uint32_t BoapService
```

8.111.1.9 BoapFunc

```
typedef BError(BoapServiceObject::* BoapFunc) (BoapPacket &rx, BoapPacket &tx)
```

8.111.2 Enumeration Type Documentation

8.111.2.1 BoapType

```
enum BoapType
```

Enumerator

BoapTypeRpc	
BoapTypeRpcReply	
BoapTypeSignal	
BoapTypeRpcError	
BoapTypeRpc	
BoapTypeSignal	

8.112 BoapSimple.h

Go to the documentation of this file.

```
1 /*********************************************************************************
2  *  Boap.h  Boap RPC protocol
3  *  T.Barnaby,  BEAM Ltd,   8/5/03
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *********************************************************************************
7  */
8 #ifndef Boap_HH
9 #define Boap_HH
10
11 #include <stdint.h>
12 #include <BPoll.h>
13 #include <BSocket.h>
14 #include <BError.h>
15
16 // Main BOAP Types
17 typedef int8_t      Int8;
18 typedef uint8_t     UInt8;
19 typedef int16_t     Int16;
20 typedef uint16_t    UInt16;
21 typedef int32_t     Int32;
22 typedef uint32_t    UInt32;
23 typedef double      Double;
24 typedef uint32_t    BoapService;
25 enum BoapType { BoapTypeRpc, BoapTypeSignal };
26
27 // Boap packet header
28 struct BoapPacketHead {
29     UInt32        length;
30     BoapType    type;
31     BoapService  service;
32     UInt32        cmd;
33     UInt32        reserved[12];
34 };
35
36 // Boap packet
37 class BoapPacket {
```

```
38 public:
39             BoapPacket();
40             ~BoapPacket();
41 
42     int     resize(int size);
43     BError        setData(void* data, int nbytes);
44     int     nbytes();
45     char*       data();
46 
47     int     pushHead(BoapPacketHead& head);
48     int     push(Int8 v);
49     int     push(UInt8 v);
50     int     push(Int16 v);
51     int     push(UInt16 v);
52     int     push(Int32 v);
53     int     push(UInt32 v);
54     int     push(BString& v);
55     int     push(Double v);
56     int     push(BError& v);
57     int     push(UInt32 nBytes, const void* data);
58 
59     int     popHead(BoapPacketHead& head);
60     int     pop(Int8& v);
61     int     pop(UInt8& v);
62     int     pop(Int16& v);
63     int     pop(UInt16& v);
64     int     pop(Int32& v);
65     int     pop(UInt32& v);
66     int     pop(BString& v);
67     int     pop(Double& v);
68     int     pop(BError& v);
69     int     pop(UInt32 nBytes, void* data);
70 private:
71     void        updateLen();
72     int     osize;
73     int     onbytes;
74     char*       odata;
75     int     opos;
76 
77 };
78 
79 /*****************************************************************************
80  *  Main Client communications classes
81  *****************************************************************************
82  */
83 
84 /*****************************************************************************
85  *  Base for all Client Objects
86  *****************************************************************************
87  */
88 class BoapClientObject : public BSocket {
89 public:
90             BoapClientObject(BString name);
91 
92     BError        connectService(BString name);
93 protected:
94     BError        performSend(BoapPacket& tx);           // Performs a send to the named service
95     BError        performRecv(BoapPacket& rx);           // Performs a receive
96     BError        performCall(BoapPacket& tx, BoapPacket& rx); // Performs a RPC call to the named
       service
97 
98     BString      oname;
99     BoapService  oservice;
100     int     oconnected;
101     BoapPacket    otx;
102     BoapPacket    orx;
103 };
104 
105 class BoapSignalObject : public BSocket {
106 public:
107             BoapSignalObject();
108 
109 protected:
110     BError        performSend(BoapPacket& tx);           // Performs a send to the named service
111     BoapPacket    otx;
112     BoapPacket    orx;
113 };
114 
115 
116 /*****************************************************************************
117  *  Main Server communications class
118  *****************************************************************************
119  */
120 class BoapServiceObject;
121 
122 class BoapServiceEntry {
123 public:
```

```
124                 BoapServiceEntry(BoapService service = 0, BoapServiceObject* object = 0){
125                     oservice = service;
126                     oobject = object;
127                 }
128     BoapService      oservice;
129     BoapServiceObject* oobject;
130 };
131
132 class BoapServer {
133 public:
134             BoapServer();
135     BError        init(int boapNs = 0);
136     BError        run();
137
138     BError        processEvent(BoapPacket& rx);
139
140     // Support routines
141     BError        addObject(BoapServiceObject* object);
142     BError        process(int fd);
143     BError        sendEvent(BoapPacket& tx);
144     BSocket& getSocket();
145     BSocket& getEventSocket();
146     BError        processEvent(int fd);
147     BString      getHostName();
148 private:
149     int             oboapNs;
150     BoapPacket            orx;
151     BoapPacket            otx;
152     BList<BoapServiceEntry>      oservices;
153     BPoll              opoll;
154     BSocket              onet;
155     BSocket              onetEvent;
156     BSocketAddressINET        onetEventAddress;
157     BString              ohostName;
158 };
159
160 /*****************************************************************************
161  *  Base for all Server Objects
162  *****************************************************************************
163  */
164 class BoapServiceObject;
165
166 typedef BError (BoapServiceObject::*BoapFunc)(BoapPacket& rx, BoapPacket& tx);
167
168 class BoapFuncEntry {
169 public:
170             BoapFuncEntry(int cmd, BoapFunc func);
171     UInt32        ocmd;
172     BoapFunc    ofunc;
173 };
174
175 class BoapServiceObject {
176 public:
177             BoapServiceObject(BoapServer& server, BString name);
178     virtual     ~BoapServiceObject();
179
180     BError        sendEvent(BString signalName, Int32 arg);
181     virtual BError    processEvent(BString objectName, BString name, Int32 arg);
182
183     BString      name();
184     BError        process(BoapPacket& rx, BoapPacket& tx);
185     virtual BError    processEvent(BoapPacket& rx);
186 protected:
187     BError            sendEvent(BoapPacket& tx);
188
189     BoapServer&       oserver;
190     BString          oname;
191     BList<BoapFuncEntry>    ofuncList;
192 };
193 #endif
```

8.113 BObj.cpp File Reference

```
#include <BObj.h>
```

8.114 BObj.h File Reference

```
#include <BTypes.h>
#include <BDict.h>
#include <BString.h>
#include <BError.h>
```

Classes

- class BObj

  A generic object base class that has runtime definable data feilds.

8.115 BObj.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BObj.h      Beam Object
3  *  T.Barnaby,  BEAM Ltd,   2008-06-04
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BObj_H
9 #define BObj_H  1
10
11 #include    <BTypes.h>
12 #include    <BDict.h>
13 #include    <BString.h>
14 #include    <BError.h>
15
17 class BObj {
18 public:
19                 BObj();
20     virtual         ~BObj();
21
22     // member interface
23     virtual const char*     getType() const;
24     virtual const BObjMember* getMembers() const;
25
26     // Old member interface
27     virtual BError        getMembers(BDictString& members);
28     virtual BError        getMember(BString name, BString& value);
29     virtual BError        setMembers(BDictString& members);
30     virtual BError        setMember(BString name, BString value);
31
32                 // Debug functions
33     virtual void        membersPrint() const;
34     virtual BString      getDebugString();
35 };
36
37 #endif
```

8.116 BObjStringFormat.cpp File Reference

```
#include <BObjStringFormat.h>
#include <BTime.h>
#include <math.h>
```

Functions

- BString toBString (BString n, Bool v)

  A set of functions to perform object to string and string to object for standard types and generic BObj classes.
- BString toBString (BString n, BInt8 v)
- BString toBString (BString n, BUInt8 v)
- BString toBString (BString n, BInt16 v)
- BString toBString (BString n, BUInt16 v)
- BString toBString (BString n, BInt32 v)
- BString toBString (BString n, BUInt32 v)
- BString toBString (BString n, BInt64 v)
- BString toBString (BString n, BUInt64 v)
- BString toBString (BString n, BFloat32 v)
- BString toBString (BString n, BFloat64 v)
- BString toBString (BString n, BChar v)
- BString toBString (BString n, const BChar *v)
- BString toBString (BString n, BString v)
- BString toBString (BString n, BError v)
- BString toBString (BString n, BTime v)
- BString toBString (BString name, const BObjMember *m, const void *obj, BStringList ignoreFields)
- BString toBString (BString n, BObj &obj)
- BString toBStringJson (BString n, Bool v)
- BString toBStringJson (BString n, BInt8 v)
- BString toBStringJson (BString n, BUInt8 v)
- BString toBStringJson (BString n, BInt16 v)
- BString toBStringJson (BString n, BUInt16 v)
- BString toBStringJson (BString n, BInt32 v)
- BString toBStringJson (BString n, BUInt32 v)
- BString toBStringJson (BString n, BInt64 v)
- BString toBStringJson (BString n, BUInt64 v)
- BString toBStringJson (BString n, BFloat32 v)
- BString toBStringJson (BString n, BFloat64 v)
- BString toBStringJson (BString n, BChar v)
- BString toBStringJson (BString n, const BChar *v)
- BString toBStringJson (BString n, BString v)
- BString toBStringJson (BString n, BError v)
- BString toBStringJson (BString n, BTime v)
- BString toBStringJson (BString n, const BObjMember *m, const void *obj, BStringList ignoreFields)
- BString toBStringJson (BString n, BObj &obj)
- BError toBDictStringFromJson (BString json, BDictString &ds)

8.116.1 Function Documentation

8.116.1.1 toBString() [1/18]

```
BString toBString (
            BString n,
            Bool v )
```

A set of functions to perform object to string and string to object for standard types and generic BObj classes.

8.116.1.2 toBString() [2/18]

```
BString toBString (
            BString n,
            BInt8 v )
```

8.116.1.3 toBString() [3/18]

```
BString toBString (
            BString n,
            BUInt8 v )
```

8.116.1.4 toBString() [4/18]

```
BString toBString (
            BString n,
            BInt16 v )
```

8.116.1.5 toBString() [5/18]

```
BString toBString (
            BString n,
            BUInt16 v )
```

8.116.1.6 toBString() [6/18]

```
BString toBString (
            BString n,
            BInt32 v )
```

8.116.1.7 toBString() [7/18]

```
BString toBString (
            BString n,
            BUInt32 v )
```

8.116.1.8 toBString() [8/18]

```
BString toBString (
            BString n,
            BInt64 v )
```

8.116.1.9 toBString() [9/18]

```
BString toBString (
            BString n,
            BUInt64 v )
```

8.116.1.10 toBString() [10/18]

```
BString toBString (
            BString n,
            BFloat32 v )
```

8.116.1.11 toBString() [11/18]

```
BString toBString (
            BString n,
            BFloat64 v )
```

8.116.1.12 toBString() [12/18]

```
BString toBString (
            BString n,
            BChar v )
```

8.116.1.13 toBString() [13/18]

```
BString toBString (
            BString n,
            const BChar * v )
```

8.116.1.14 toBString() [14/18]

```
BString toBString (
            BString n,
            BString v )
```

8.116.1.15 toBString() [15/18]

```
BString toBString (
            BString n,
            BError v )
```

8.116.1.16 toBString() [16/18]

```
BString toBString (
            BString n,
            BTime v )
```

8.116.1.17 toBString() [17/18]

```
BString toBString (
            BString name,
            const BObjMember * m,
            const void * obj,
            BStringList ignoreFields )
```

8.116.1.18 toBString() [18/18]

```
BString toBString (
            BString n,
            BObj & obj )
```

8.116.1.19 toBStringJson() [1/18]

```
BString toBStringJson (
            BString n,
            Bool v )
```

8.116.1.20 toBStringJson() [2/18]

```
BString toBStringJson (
            BString n,
            BInt8 v )
```

8.116.1.21 toBStringJson() [3/18]

```
BString toBStringJson (
            BString n,
            BUInt8 v )
```

8.116.1.22 toBStringJson() [4/18]

```
BString toBStringJson (
            BString n,
            BInt16 v )
```

8.116.1.23 toBStringJson() [5/18]

```
BString toBStringJson (
            BString n,
            BUInt16 v )
```

8.116.1.24 toBStringJson() [6/18]

```
BString toBStringJson (
            BString n,
            BInt32 v )
```

8.116.1.25 toBStringJson() [7/18]

```
BString toBStringJson (
            BString n,
            BUInt32 v )
```

8.116.1.26 toBStringJson() [8/18]

```
BString toBStringJson (
            BString n,
            BInt64 v )
```

8.116.1.27 toBStringJson() [9/18]

```
BString toBStringJson (
            BString n,
            BUInt64 v )
```

8.116.1.28 toBStringJson() [10/18]

```
BString toBStringJson (
            BString n,
            BFloat32 v )
```

8.116.1.29 toBStringJson() [11/18]

```
BString toBStringJson (
            BString n,
            BFloat64 v )
```

8.116.1.30 toBStringJson() [12/18]

```
BString toBStringJson (
            BString n,
            BChar v )
```

8.116.1.31 toBStringJson() [13/18]

```
BString toBStringJson (
            BString n,
            const BChar * v )
```

8.116.1.32 toBStringJson() [14/18]

```
BString toBStringJson (
            BString n,
            BString v )
```

8.116.1.33 toBStringJson() [15/18]

```
BString toBStringJson (
            BString n,
            BError v )
```

8.116.1.34 toBStringJson() [16/18]

```
BString toBStringJson (
            BString n,
            BTime v )
```

8.116.1.35 toBStringJson() [17/18]

```
BString toBStringJson (
            BString n,
            const BObjMember * m,
            const void * obj,
            BStringList ignoreFields )
```

8.116.1.36 toBStringJson() [18/18]

```
BString toBStringJson (
            BString n,
            BObj & obj )
```

8.116.1.37 toBDictStringFromJson()

```
BError toBDictStringFromJson (
            BString json,
            BDictString & ds )
```

8.117 BObjStringFormat.h File Reference

```
#include <BObj.h>
#include <BString.h>
#include <BTime.h>
```

Functions

- BString toBString (BString name, Bool value)

  A set of functions to perform object to string and string to object for standard types and generic BObj classes.
- BString toBString (BString name, BInt8 value)
- BString toBString (BString name, BUInt8 value)
- BString toBString (BString name, BInt16 value)
- BString toBString (BString name, BUInt16 value)
- BString toBString (BString name, BInt32 value)
- BString toBString (BString name, BUInt32 value)
- BString toBString (BString name, BInt64 value)
- BString toBString (BString name, BUInt64 value)
- BString toBString (BString name, BFloat32 value)
- BString toBString (BString name, BFloat64 value)
- BString toBString (BString name, BChar value)
- BString toBString (BString name, const BChar *value)
- BString toBString (BString name, BString value)
- BString toBString (BString name, BError value)
- BString toBString (BString name, BTime time)
- BString toBString (BString name, const BObjMember *members, const void *obj, BStringList ignore↩ Fields=BStringList())
- BString toBString (BString name, BObj &obj)
- BString toBStringJson (BString name, Bool value)
- BString toBStringJson (BString name, BInt8 value)
- BString toBStringJson (BString name, BUInt8 value)
- BString toBStringJson (BString name, BInt16 value)
- BString toBStringJson (BString name, BUInt16 value)
- BString toBStringJson (BString name, BInt32 value)
- BString toBStringJson (BString name, BUInt32 value)
- BString toBStringJson (BString name, BInt64 value)
- BString toBStringJson (BString name, BUInt64 value)
- BString toBStringJson (BString name, BFloat32 value)
- BString toBStringJson (BString name, BFloat64 value)
- BString toBStringJson (BString name, BChar value)
- BString toBStringJson (BString name, const BChar *value)
- BString toBStringJson (BString name, BString value)
- BString toBStringJson (BString name, BError value)
- BString toBStringJson (BString name, BTime time)
- BString toBStringJson (BString name, const BObjMember *members, const void *obj, BStringList ignore↩ Fields=BStringList())
- BString toBStringJson (BString name, BObj &obj)
- BError toBDictStringFromJson (BString json, BDictString &ds)
- BString base64_encode (void *data, BUInt len)
- BError base64_decode (BString strIn, BString &strOut)

8.117.1 Function Documentation

8.117.1.1 toBString() [1/18]

```
BString toBString (
            BString name,
            Bool value )
```

A set of functions to perform object to string and string to object for standard types and generic BObj classes.

8.117.1.2 toBString() [2/18]

```
BString toBString (
            BString name,
            BInt8 value )
```

8.117.1.3 toBString() [3/18]

```
BString toBString (
            BString name,
            BUInt8 value )
```

8.117.1.4 toBString() [4/18]

```
BString toBString (
            BString name,
            BInt16 value )
```

8.117.1.5 toBString() [5/18]

```
BString toBString (
            BString name,
            BUInt16 value )
```

8.117.1.6 toBString() [6/18]

```
BString toBString (
            BString name,
            BInt32 value )
```

8.117.1.7 toBString() [7/18]

```
BString toBString (
            BString name,
            BUInt32 value )
```

8.117.1.8 toBString() [8/18]

```
BString toBString (
            BString name,
            BInt64 value )
```

8.117.1.9 toBString() [9/18]

```
BString toBString (
            BString name,
            BUInt64 value )
```

8.117.1.10 toBString() [10/18]

```
BString toBString (
            BString name,
            BFloat32 value )
```

8.117.1.11 toBString() [11/18]

```
BString toBString (
            BString name,
            BFloat64 value )
```

8.117.1.12 toBString() [12/18]

```
BString toBString (
            BString name,
            BChar value )
```

8.117.1.13 toBString() [13/18]

```
BString toBString (
            BString name,
            const BChar * value )
```

8.117.1.14 toBString() [14/18]

```
BString toBString (
            BString name,
            BString value )
```

8.117.1.15 toBString() [15/18]

```
BString toBString (
            BString name,
            BError value )
```

8.117.1.16 toBString() [16/18]

```
BString toBString (
            BString name,
            BTime time )
```

8.117.1.17 toBString() [17/18]

```
BString toBString (
            BString name,
            const BObjMember * members,
            const void * obj,
            BStringList ignoreFields = BStringList() )
```

8.117.1.18 toBString() [18/18]

```
BString toBString (
            BString name,
            BObj & obj )
```

8.117.1.19 toBStringJson() [1/18]

```
BString toBStringJson (
            BString name,
            Bool value )
```

8.117.1.20 toBStringJson() [2/18]

```
BString toBStringJson (
            BString name,
            BInt8 value )
```

8.117.1.21 toBStringJson() [3/18]

```
BString toBStringJson (
            BString name,
            BUInt8 value )
```

8.117.1.22 toBStringJson() [4/18]

```
BString toBStringJson (
            BString name,
            BInt16 value )
```

8.117.1.23 toBStringJson() [5/18]

```
BString toBStringJson (
            BString name,
            BUInt16 value )
```

8.117.1.24 toBStringJson() [6/18]

```
BString toBStringJson (
            BString name,
            BInt32 value )
```

8.117.1.25 toBStringJson() [7/18]

```
BString toBStringJson (
            BString name,
            BUInt32 value )
```

8.117.1.26 toBStringJson() [8/18]

```
BString toBStringJson (
            BString name,
            BInt64 value )
```

8.117.1.27 toBStringJson() [9/18]

```
BString toBStringJson (
            BString name,
            BUInt64 value )
```

8.117.1.28 toBStringJson() [10/18]

```
BString toBStringJson (
            BString name,
            BFloat32 value )
```

8.117.1.29 toBStringJson() [11/18]

```
BString toBStringJson (
            BString name,
            BFloat64 value )
```

8.117.1.30 toBStringJson() [12/18]

```
BString toBStringJson (
            BString name,
            BChar value )
```

8.117.1.31 toBStringJson() [13/18]

```
BString toBStringJson (
            BString name,
            const BChar * value )
```

8.117.1.32 toBStringJson() [14/18]

```
BString toBStringJson (
            BString name,
            BString value )
```

8.117.1.33 toBStringJson() [15/18]

```
BString toBStringJson (
            BString name,
            BError value )
```

8.117.1.34 toBStringJson() [16/18]

```
BString toBStringJson (
            BString name,
            BTime time )
```

8.117.1.35 toBStringJson() [17/18]

```
BString toBStringJson (
            BString name,
            const BObjMember * members,
            const void * obj,
            BStringList ignoreFields = BStringList() )
```

8.117.1.36 toBStringJson() [18/18]

```
BString toBStringJson (
            BString name,
            BObj & obj )
```

8.117.1.37 toBDictStringFromJson()

```
BError toBDictStringFromJson (
            BString json,
            BDictString & ds )
```

8.117.1.38 base64_encode()

```
BString base64_encode (
            void * data,
            BUInt len )
```

8.117.1.39 base64_decode()

```
BError base64_decode (
            BString strIn,
            BString & strOut )
```

8.118 BObjStringFormat.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BObjStringFormat.h  Beam Object to/from strings
3  *  T.Barnaby,  BEAM Ltd,   2016-09-27
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  *
8  * Convert data objects to and from various string formats.
9  */
10 #ifndef BObjStringFormat_H
11 #define BObjStringFormat_H  1
12
13 #include    <BObj.h>
14 #include    <BString.h>
15 #include    <BTime.h>
16
18 BString toBString(BString name, Bool value);
19 BString toBString(BString name, BInt8 value);
20 BString toBString(BString name, BUInt8 value);
21 BString toBString(BString name, BInt16 value);
22 BString toBString(BString name, BUInt16 value);
23 BString toBString(BString name, BInt32 value);
24 BString toBString(BString name, BUInt32 value);
25 BString toBString(BString name, BInt64 value);
26 BString toBString(BString name, BUInt64 value);
27 BString toBString(BString name, BFloat32 value);
```

```
28 BString toBString(BString name, BFloat64 value);
29 BString toBString(BString name, BChar value);
30 BString toBString(BString name, const BChar* value);
31 BString toBString(BString name, BString value);
32 BString toBString(BString name, BError value);
33 BString toBString(BString name, BTime time);
34
35 BString toBString(BString name, const BObjMember* members, const void* obj, BStringList ignoreFields =
       BStringList());
36 BString toBString(BString name, BObj& obj);
37
38 BString toBStringJson(BString name, Bool value);
39 BString toBStringJson(BString name, BInt8 value);
40 BString toBStringJson(BString name, BUInt8 value);
41 BString toBStringJson(BString name, BInt16 value);
42 BString toBStringJson(BString name, BUInt16 value);
43 BString toBStringJson(BString name, BInt32 value);
44 BString toBStringJson(BString name, BUInt32 value);
45 BString toBStringJson(BString name, BInt64 value);
46 BString toBStringJson(BString name, BUInt64 value);
47 BString toBStringJson(BString name, BFloat32 value);
48 BString toBStringJson(BString name, BFloat64 value);
49 BString toBStringJson(BString name, BChar value);
50 BString toBStringJson(BString name, const BChar* value);
51 BString toBStringJson(BString name, BString value);
52 BString toBStringJson(BString name, BError value);
53 BString toBStringJson(BString name, BTime time);
54
55 BString toBStringJson(BString name, const BObjMember* members, const void* obj, BStringList ignoreFields
       = BStringList());
56 BString toBStringJson(BString name, BObj& obj);
57
58 BError toBDictStringFromJson(BString json, BDictString& ds);
59
60 BString base64_encode(void* data, BUInt len);
61 BError base64_decode(BString strIn, BString& strOut);
62
63 #endif
```

8.119 BPoll.cpp File Reference

```
#include <stdlib.h>
#include <unistd.h>
#include <errno.h>
#include <BPoll.h>
```

8.120 BPoll.h File Reference

```
#include <BList.h>
#include <BError.h>
#include <sys/poll.h>
```

Classes

- class BPoll

  This class provides an interface for polling a number of file descriptors. It uses round robin polling.

8.121 BPoll.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BPoll.h     File poll class
3  *  T.Barnaby,  BEAM Ltd,   01/4/05
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BPOLL_H
9 #define BPOLL_H 1
10
11 #include <BList.h>
12 #include <BError.h>
13
14 #if TARGET_win32 || TARGET_win64
15 //#undef _WIN32_WINNT
16 //#define _WIN32_WINNT  WindowsVista
17 #include <winsock2.h>
18
19 #ifdef ZAP
20 #define POLLRDNORM 0x0100
21 #define POLLRDBAND 0x0200
22 #define POLLIN    (POLLRDNORM | POLLRDBAND)
23 #define POLLPRI    0x0400
24
25 #define POLLWRNORM 0x0010
26 #define POLLOUT   (POLLWRNORM)
27 #define POLLWRBAND 0x0020
28
29 #define POLLERR    0x0001
30 #define POLLHUP    0x0002
31 #define POLLNVAL   0x0004
32
33 struct pollfd {
34     int     fd;     /* File descriptor to poll.  */
35     short int   events;     /* Types of events poller cares about.  */
36     short int   revents;    /* Types of events that actually occurred.  */
37 };
38 #endif
39
40 #define NFDBITS     (8 * sizeof(int))
41
42 #else
43 #include <sys/poll.h>
44 #endif
45
48 class BPoll {
49 public:
50     typedef struct pollfd PollFd;
51
52             BPoll();
53             ~BPoll();
54
55     void        append(int fd, int events = POLLIN|POLLERR|POLLHUP|POLLNVAL);
56     void        delFd(int fd);
57
58     BError        doPoll(int& fd, int timeoutUs = -1);
59     BError        doPollEvents(int& fd, int& events, int timeoutUs = -1);
60
61     int     getPollFdsNum();
62     PollFd*       getPollFds();
63     void        clear();
64 private:
65     int     nextFd(int i);
66
67     int     ofdsNum;
68     PollFd*       ofds;
69     int     ofdsNext;
70 };
71
72 #endif
```

8.122 BProc.cpp File Reference

```
#include <BProc.h>
#include <unistd.h>
```

```
#include <errno.h>
#include <sys/wait.h>
#include <BDebug.h>
```

Macros

- #define BDEBUGL1 0

8.122.1 Macro Definition Documentation

8.122.1.1 BDEBUGL1

```
#define BDEBUGL1 0
```

8.123 BProc.h File Reference

```
#include <BError.h>
#include <signal.h>
```

Classes

- class BProc

  Implements system process manager.

8.124 BProc.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BProc.h BProc class
3  *  T.Barnaby,  Beam Ltd,   2015-01-01
4  *  Copyright (c) 2015 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  *
8  */
32 #ifndef BProc_h
33 #define BProc_h
34
35 #include <BError.h>
36 #include <signal.h>
37
39 class BProc {
40 public:
41             BProc();
42             ~BProc();
43
44     BError        usePipes(Bool fileIn, Bool fileOut, Bool fileErr);
45     BError        runForeground(BString cmd, BStringList argList = BStringList(), int* status = 0, int
       timeoutMs = -1);
46     BError        runBackground(BString cmd, BStringList argList = BStringList());
```

```
47
48      int     getPid();
49      int     getFd(int cmdFd);
50      BError        wait(int& status, int timeoutMs = -1);
51      BError        kill(int sig = SIGTERM);
52      void        finish();
53
54  private:
55      BError        run(BString cmd, BStringList argList, Bool background, int* status, int timeoutMs);
56      BError        pipesOpen();
57      void        pipesCleanup();
58
59      int     opid;
60      Bool        oioFiles[3];
61      int     opipeIn[2];
62      int     opipeOut[2];
63      int     opipeErr[2];
64      int     ochildErrno;
65  };
66  #endif
```

8.125 BQueue.h File Reference

```
#include <BTypes.h>
#include <BError.h>
#include <BList.h>
#include <BMutex.h>
#include <BCondInt.h>
```

Classes

- class BQueue< T >

  Provides a thread save queue of objects that can be used to communicate between threads.

Typedefs

- typedef BQueue< BInt32 > BQueueInt

8.125.1 Typedef Documentation

8.125.1.1 BQueueInt

```
typedef BQueue<BInt32> BQueueInt
```

8.126 BQueue.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BQueue.h    Queue Classes
3  *  T.Barnaby,  BEAM Ltd,   2014-07-23
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  *
8  * Simple thread safe queue.
9  */
10 #ifndef BQueue_h
11 #define BQueue_h    1
12
13 #include <BTypes.h>
14 #include <BError.h>
15 #include <BList.h>
16 #include <BMutex.h>
17 #include <BCondInt.h>
18
20 template <class T> class BQueue : private BList<T>{
21 public:
22             BQueue(BUInt size);
23             ~BQueue();
24
25     void        clear();
26
27     BUInt      writeAvailable() const;
28     BError        write(const T& v,  BTimeout timeout = BTimeoutForever);
29
30     BUInt      readAvailable() const;
31     BError        read(T& v,  BTimeout timeout = BTimeoutForever);
32
33 private:
34     BMutex        olock;
35     BUInt      osize;
36     BCondInt    onumber;
37 };
38
39 // BQueueInt class
40 typedef BQueue<BInt32>    BQueueInt;
41
42 // BQueue class implementation
43 template <class T> BQueue<T>::BQueue(BUInt size){
44     osize = size;
45 }
46
47 template <class T> BQueue<T>::~BQueue(){
48 }
49
50 template <class T> void BQueue<T>::clear(){
51     olock.lock();
52     BList<T>::clear();
53     olock.unlock();
54 }
55
56 template <class T> BUInt BQueue<T>::writeAvailable() const{
57     return osize - onumber.value();
58 }
59
60 template <class T> BUInt BQueue<T>::readAvailable() const{
61     return onumber.value();
62 }
63
64 template <class T> BError BQueue<T>::write(const T& v,  BTimeout timeout){
65     BError        err;
66
67     if(!onumber.waitLessThanOrEqual(osize - 1, 0, timeout))
68         return err.set(ErrorTimeout, "Timeout");
69
70     olock.lock();
71     BList<T>::queueAdd(v);
72     olock.unlock();
73     onumber.increment();
74
75     return err;
76 }
77
78 template <class T> BError BQueue<T>::read(T& v,  BTimeout timeout){
79     BError        err;
80
81     if(!onumber.waitMoreThanOrEqual(1, 1, timeout))
82         return err.set(ErrorTimeout, "Timeout");
83
```

```
84      olock.lock();
85      v = BList<T>::queueGet();
86      olock.unlock();
87
88      return err;
89  }
90
91  #endif
```

8.127 BRefData.cpp File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <BRefData.h>
```

Macros

- #define CHUNK 16

8.127.1 Macro Definition Documentation

8.127.1.1 CHUNK

```
#define CHUNK 16
```

8.128 BRefData.h File Reference

```
#include <BAtomicCount.h>
```

Classes

- class BRefData

  A pointer to a variable sized data area with reference counting so the data areas can be shared.

8.129 BRefData.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BRefData.h  Referenced data storage
3  *  T.Barnaby,  Beam Ltd,   6/10/94
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  */
14 #ifndef BREFDATA_H
15 #define BREFDATA_H  1
16
17 #include <BAtomicCount.h>
18
20 class BRefData {
21 public:
22             BRefData();
23             BRefData(int len);
24             BRefData(const BRefData& refData);
25             ~BRefData();
26
27     BRefData*   copy();
28     BRefData*   addRef();
29     int     deleteRef();
30
31     char*       data(){ return (char*)odata; }
32     int     len(){ return olen; }
33
34     BRefData&   operator=(const BRefData& refData);
35
36     void        setLen(int len);
37
38 private:
39
40     BAtomicCount    orefCount;
41     int     olen;
42     void*       odata;
43 };
44
45
46 #endif
```

8.130 BRtc.cpp File Reference

```
#include <BRtc.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <errno.h>
#include <unistd.h>
#include <fcntl.h>
#include <sys/ioctl.h>
#include <linux/rtc.h>
```

8.131 BRtc.h File Reference

```
#include <BError.h>
#include <BThread.h>
#include <BCond.h>
```

Classes

- class BRtc

  Realtime clock for access to the systems real time battery backed up time hardware.
- class BRtcThreaded

  A thread safe class to access to the systems real time battery backed up time hardware.

8.132 BRtc.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BRtc.h      Real Time Clock interface
3  *  T.Barnaby,  BEAM Ltd,   19/5/04
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BRTC_H
9 #define BRTC_H
10
11 #include <BError.h>
12 #include <BThread.h>
13 #include <BCond.h>
14
16 class BRtc {
17 public:
18             BRtc();
19             ~BRtc();
20
21     BError        init(int rate);
22     void        wait(int delayUs);
23 private:
24     int     ofd;
25     int     orate;
26 };
27
29 class BRtcThreaded : private BThread {
30 public:
31             BRtcThreaded();
32             ~BRtcThreaded();
33
34     BError        init(int rate);
35     void        wait(int delayUs);
36 private:
37     void*       function();
38     BRtc        ortc;
39     int     orate;
40     BCond       ocond;
41 };
42 #endif
```

8.133 BRWLock.cpp File Reference

```
#include <BRWLock.h>
```

8.134 BRWLock.h File Reference

```
#include <pthread.h>
```

Classes

- class BRWLock

  Thread read-write lock.

8.135 BRWLock.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BRWLock.h   BRWLock Classes
3  *  T.Barnaby,  BEAM Ltd,   3/07/03
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BRWLOCK_H
9 #define BRWLOCK_H   1
10
11 #include <pthread.h>
12
14 class BRWLock {
15 public:
16             BRWLock();
17             BRWLock(const BRWLock& rwlock);
18             ~BRWLock();
19
20     int     rdLock();
21     int     tryRdLock();
22     int     wrLock();
23     int     tryWrLock();
24     int     unlock();
25
26     BRWLock& operator=(const BRWLock& rwlock);
27 private:
28     pthread_rwlock_t    olock;
29 };
30
31 #endif
```

8.136 BSema.cpp File Reference

```
#include <BSema.h>
#include <errno.h>
#include <sys/time.h>
```

8.137 BSema.h File Reference

```
#include <sys/types.h>
#include <semaphore.h>
```

Classes

- class BSema

  Sempahore class.

8.138 BSema.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BSema.h     BSema Classes
3  *  T.Barnaby,  BEAM Ltd,   6/11/02
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BSEMA_H
9 #define BSEMA_H 1
10
11 #include <sys/types.h>
12 #include <semaphore.h>
13
15 class BSema {
16 public:
17             BSema(int value = 0);
18             BSema(const BSema& sema);
19             ~BSema();
20
21     int     post();
22     int     wait();
23     int     timedWait(int timeUs);
24     int     tryWait();
25     int     getValue() const;
26
27     BSema&     operator=(const BSema& sema);
28 private:
29     sem_t       osema;
30 };
31
32 #endif
```

8.139 BSemaphore.cpp File Reference

```
#include <BSemaphore.h>
#include <sys/time.h>
```

8.140 BSemaphore.h File Reference

```
#include <BTypes.h>
#include <BMutex.h>
#include <semaphore.h>
```

Classes

- class BSemaphore

  Base Semaphore class.
- class BSemaphoreBool

  Boolean semaphore.
- class BSemaphoreCount

  Integer counting semaphore.

8.141 BSemaphore.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BSemaphore.h    Semaphore Classes
3  *  T.Barnaby,  BEAM Ltd,   2012-11-17
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BSemaphore_h
9 #define BSemaphore_h    1
10
11 #include <BTypes.h>
12 #include <BMutex.h>
13 #include <semaphore.h>
14
16 class BSemaphore {
17 public:
18                 BSemaphore();
19                 BSemaphore(const BSemaphore& semaphore);
20                 ~BSemaphore();
21
22     Bool            wait(BTimeout timeoutUs = BTimeoutForever);
23     void            set();
24
25     int         getValue() const;
26     BSemaphore&       operator=(const BSemaphore& semaphore);
27
28 private:
29     sem_t           osema;
30 };
31
33 class BSemaphoreBool {
34 public:
35                 BSemaphoreBool();
36                 BSemaphoreBool(const BSemaphoreBool& semaphore);
37                 ~BSemaphoreBool();
38
39     void            set(Bool on = 1);
40     void            clear();
41     Bool            wait(Bool v = 1, BTimeout timeoutUs = BTimeoutForever);
42     Bool            value();
43
44                 operator int();
45     int         operator==(Bool on);
46     BSemaphoreBool&       operator=(Bool on);
47
48 private:
49     BSemaphore        osema;
50     volatile Bool       ovalue;
51 };
52
54 class BSemaphoreCount {
55 public:
56                 BSemaphoreCount();
57                 BSemaphoreCount(const BSemaphoreCount& semaphore);
58                 ~BSemaphoreCount();
59
60     void            setValue(BUInt v);
61     void            add(int v = 1);
62     Bool            wait(BUInt v = 1, BTimeout timeoutUs = BTimeoutForever);
63     Bool            take(BUInt v = 1, BTimeout timeoutUs = BTimeoutForever);
64
65     BUInt          value();
66
67     BSemaphoreCount& operator=(const BSemaphoreCount& semaphore);
68
69 private:
70     BMutex            olock;
71     BSemaphore        osema;
72     volatile BUInt     ovalue;
73 };
74 #endif
```

8.142 BSocket.cpp File Reference

```
#include <stdlib.h>
#include <unistd.h>
```

```
#include <stdio.h>
#include <errno.h>
#include <sys/types.h>
#include <BSocket.h>
#include <sys/ioctl.h>
#include <sys/socket.h>
#include <arpa/inet.h>
#include <netdb.h>
#include <net/if.h>
```

Macros

- #define IP_MTU 14

8.142.1 Macro Definition Documentation

8.142.1.1 IP_MTU

```
#define IP_MTU 14
```

8.143 BSocket.h File Reference

```
#include <BString.h>
#include <BError.h>
#include <BTypes.h>
#include <stdint.h>
#include <sys/types.h>
#include <netinet/in.h>
```

Classes

- class BSocketAddress

  Socket Address.
- class BSocketAddressINET

  IPV4 aware socket address.
- class BSocket

  A network communications socket.

Macros

- #define SOL_IP 0
- #define SO_PRIORITY 12
- #define MSG_NOSIGNAL 0

8.143.1 Macro Definition Documentation

8.143.1.1 SOL_IP

```
#define SOL_IP 0
```

8.143.1.2 SO_PRIORITY

```
#define SO_PRIORITY 12
```

8.143.1.3 MSG_NOSIGNAL

```
#define MSG_NOSIGNAL 0
```

8.144 BSocket.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BSocket.h   BSocket Access Classes
3  *  T.Barnaby,  BEAM Ltd,   1/4/05
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BSOCKET_H
9 #define BSOCKET_H   1
10
11 #include <BString.h>
12 #include <BError.h>
13 #include <BTypes.h>
14 #include <stdint.h>
15 #include <sys/types.h>
16
17 #if TARGET_win32 || TARGET_win64
18 #include <winsock2.h>
19 #else
20 #ifdef __linux__
21 #include <sys/prctl.h>
22 #else
23 #include <netinet/in.h>
24 #define SOL_IP  0
25 #define SO_PRIORITY 12
26 #define MSG_NOSIGNAL 0
27 #endif
28 #endif
29
31 class BSocketAddress {
32 public:
33     typedef struct sockaddr SockAddr;
34
35             BSocketAddress();
36             BSocketAddress(const BSocketAddress& add);
37             BSocketAddress(SockAddr* address, int len);
38             ~BSocketAddress();
39
40     BError        set(SockAddr* address, int len);
41
42     const SockAddr* raw() const;
```

```
43      int     len() const;
44
45      BString      getString() const;
46
47              // Operator functions
48      BSocketAddress&   operator=(const BSocketAddress& add);
49              operator const SockAddr*() const { return raw(); }
50      int     operator==(const BSocketAddress& add) const;
51      int     operator!=(const BSocketAddress& add) const;
52  private:
53      int     olen;
54      SockAddr*   oaddress;
55  };
56
58  class BSocketAddressINET : public BSocketAddress {
59  public:
60      typedef struct sockaddr_in SockAddrIP;
61
62      BError        set(BString hostName, uint32_t port);
63      BError        set(uint32_t address, uint32_t port);
64      BError        set(BString hostName, BString service, BString type);
65
66      void        setPort(uint32_t port);
67      uint32_t    address();
68      uint32_t    port();
69
70      BString      getString();
71
72      // Some useful generic system functions
73      static BString       getHostName();
74      static BList<uint32_t>   getIpAddresses();
75      static BList<BString> getIpAddressList();
76      static BList<BString> getIpAddressListAll();
77  };
78
80  class BSocket {
81  public:
82      enum NType { STREAM, DGRAM };
83      enum Priority   { PriorityLow, PriorityNormal, PriorityHigh };
84
85              BSocket();
86              BSocket(int fd);
87              BSocket(NType type);
88              BSocket(int domain, int type, int protocol);
89              ~BSocket();
90
91      BError        init(int domain, int type, int protocol);
92      BError        init(NType type);
93      void        setFd(int fd);
94      int     getFd();
95
96              // Main functions
97      BError        bind(const BSocketAddress& add);
98      BError        connect(const BSocketAddress& add);
99      BError        shutdown(int how);
100     BError        close();
101     BError        listen(int backlog = 5);
102     BError        accept(int& fd);
103     BError        accept(int& fd, BSocketAddress& address);
104
105             // Main data transfer functions
106     BError        send(const void* buf, BSize nbytes, BSize& nbytesSent, int flags = 0);
107     BError        sendTo(const BSocketAddress& address, const void* buf, BSize nbytes, BSize&
        nbytesSent, int flags = 0);
108     BError        sendChunks(const BDataChunk* chunks, BSize nChunks, BSize& nbytesSent, int flags = 0);
109     BError        recv(void* buf, BSize maxbytes, BSize& nbytesRecv, int flags = 0);
110     BError        recvFrom(BSocketAddress& address, void* buf, BSize maxbytes, BSize& nbytesRecv, int
        flags = 0);
111     BError        recvWithTimeout(void* buf, BSize maxbytes, BSize& nbytesRecv, int timeout, int flags =
        0);
112     BError        recvFromWithTimeout(BSocketAddress& address, void* buf, BSize maxbytes, BSize&
        nbytesRecv, int timeout, int flags = 0);
113
114     BUInt      recvAvailable();
115
116             // Configuration functions
117     BError        setSockOpt(int level, int optname, void* optval, unsigned int optlen);
118     BError        getSockOpt(int level, int optname, void* optval, unsigned int* optlen);
119     BError        setReuseAddress(int on);
120     BError        setBroadCast(int on);
121     BError        setPriority(Priority priority);
122
123     BError        getMTU(uint32_t& mtu);
124     BError        getAddress(BSocketAddress& address);
125
126 private:
127     int     osocket;
```

```
128 };
129 #endif
```

8.145 BSpi.cpp File Reference

```
#include <BSpi.h>
#include <fcntl.h>
#include <errno.h>
#include <sys/ioctl.h>
#include <linux/spi/spidev.h>
```

8.146 BSpi.h File Reference

```
#include <BTypes.h>
#include <BError.h>
```

Classes

- class BSpi

  BSpi class for accessing SPI hardware devices.

8.147 BSpi.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BSpi.h  BSpi class
3  *  T.Barnaby,  Beam Ltd,   2012-11-12
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BSpi_h
9 #define BSpi_h
10
11 #include <BTypes.h>
12 #include <BError.h>
13
15 class BSpi {
16 public:
17     enum Mode   { Mode0 = 0, Mode1 = 1, Mode2 = 2, Mode3 = 3 };
18
19             BSpi();
20     BError        init(BString devName, BUInt speed = 1000000, Mode mode = Mode1, Bool csActive = 0);
21
22     BError        transact(BUInt8 dev, void* txBuf, int txLen, int pad, void* rxBuf, int rxLen);
23
24 private:
25     BString      odevName;
26     int     odev;
27 };
28
29 #endif
```

8.148 BString.cpp File Reference

```
#include <stdarg.h>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <ctype.h>
#include <BString.h>
#include <BError.h>
#include <signal.h>
#include <regex.h>
```

Macros

- #define STRIP 0x7f
- #define MINUS '-'

Functions

- static int gmatch (const char *s, const char *p)
- std::ostream & operator<< (std::ostream &o, BString &s)
- std::istream & operator>> (std::istream &i, BString &s)
- int bstringListinList (BStringList &list, BString s)
- BString blistToString (const BStringList &list)

  Convert a string list to a comma separated string.
- BStringList bstringToList (BString str, int stripSpaces)

  Convert a comma separated string to a string list.
- BStringList charToList (const char **str)
- BString barrayToString (const BStringArray &list)

  Convert a string array to a comma separated string.
- BStringArray bstringToArray (BString str, int stripSpaces)

  Convert a comma separated string to a string array.
- BStringArray charToArray (const char **str)
- void toBString (BString &v, BString &s)
- void toBString (BStringList &v, BString &s)
- void toBString (BInt32 &v, BString &s)
- void toBString (BUInt32 &v, BString &s)
- void toBString (BUInt64 &v, BString &s)
- void toBString (BFloat64 &v, BString &s)
- void fromBString (BString &s, BString &v)
- void fromBString (BString &s, BStringList &v)
- void fromBString (BString &s, BInt32 &v)
- void fromBString (BString &s, BUInt32 &v)
- void fromBString (BString &s, BUInt64 &v)
- void fromBString (BString &s, BFloat64 &v)
- const char * intToString (char *str, BUInt strLen, int value, int base)
- const char * int64ToString (char *str, BUInt strLen, BInt64 value, int base)
- const char * floatToString (char *str, BUInt strLen, BFloat32 f, BUInt precision)
- char * bstrncpy (char *dest, const char *src, size_t n)
- char * bstrtrim (char *str)

Variables

- static const BUInt8 base64_decode_table [ ]

8.148.1 Macro Definition Documentation

8.148.1.1 STRIP

```
#define STRIP 0x7f
```

8.148.1.2 MINUS

```
#define MINUS '-'
```

8.148.2 Function Documentation

8.148.2.1 gmatch()

```
static int gmatch (
            const char * s,
            const char * p )  [static]
```

8.148.2.2 operator<<()

```
std::ostream & operator<< (
            std::ostream & o,
            BString & s )
```

8.148.2.3 operator>>()

```
std::istream & operator>> (
            std::istream & i,
            BString & s )
```

8.148.2.4 bstringListinList()

```
int bstringListinList (
            BStringList & list,
            BString s )
```

8.148.2.5 blistToString()

```
BString blistToString (
            const BStringList & list )
```

Convert a string list to a comma separated string.

8.148.2.6 bstringToList()

```
BStringList bstringToList (
            BString str,
            int stripSpaces )
```

Convert a comma separated string to a string list.

8.148.2.7 charToList()

```
BStringList charToList (
            const char ** str )
```

8.148.2.8 barrayToString()

```
BString barrayToString (
            const BStringArray & list )
```

Convert a string array to a comma separated string.

8.148.2.9 bstringToArray()

```
BStringArray bstringToArray (
            BString str,
            int stripSpaces )
```

Convert a comma separated string to a string array.

8.148.2.10 charToArray()

```
BStringArray charToArray (
            const char ** str )
```

8.148.2.11 toBString() [1/6]

```
void toBString (
            BString & v,
            BString & s )
```

8.148.2.12 toBString() [2/6]

```
void toBString (
            BStringList & v,
            BString & s )
```

8.148.2.13 toBString() [3/6]

```
void toBString (
            BInt32 & v,
            BString & s )
```

8.148.2.14 toBString() [4/6]

```
void toBString (
            BUInt32 & v,
            BString & s )
```

8.148.2.15 toBString() [5/6]

```
void toBString (
            BUInt64 & v,
            BString & s )
```

8.148.2.16 toBString() [6/6]

```
void toBString (
            BFloat64 & v,
            BString & s )
```

8.148.2.17 fromBString() [1/6]

```
void fromBString (
            BString & s,
            BString & v )
```

8.148.2.18 fromBString() [2/6]

```
void fromBString (
            BString & s,
            BStringList & v )
```

8.148.2.19 fromBString() [3/6]

```
void fromBString (
            BString & s,
            BInt32 & v )
```

8.148.2.20 fromBString() [4/6]

```
void fromBString (
            BString & s,
            BUInt32 & v )
```

8.148.2.21 fromBString() [5/6]

```
void fromBString (
            BString & s,
            BUInt64 & v )
```

8.148.2.22 fromBString() [6/6]

```
void fromBString (
            BString & s,
            BFloat64 & v )
```

8.148.2.23 intToString()

```
const char * intToString (
            char * str,
            BUInt strLen,
            int value,
            int base )
```

8.148.2.24 int64ToString()

```
const char * int64ToString (
            char * str,
            BUInt strLen,
            BInt64 value,
            int base )
```

8.148.2.25 floatToString()

```
const char * floatToString (
            char * str,
            BUInt strLen,
            BFloat32 f,
            BUInt precision )
```

8.148.2.26 bstrncpy()

```
char * bstrncpy (
            char * dest,
            const char * src,
            size_t n )
```

8.148.2.27 bstrtrim()

```
char * bstrtrim (
            char * str )
```

8.148.3 Variable Documentation

8.148.3.1 base64_decode_table

```
const BUInt8 base64_decode_table[]  [static]
```

Initial value:

```
= {
    66,66,66,66,66,66,66,66,66,66,64,66,66,66,66,66,66,66,66,66,66,66,66,66,66,
    66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,62,66,66,66,63,52,53,
    54,55,56,57,58,59,60,61,66,66,66,65,66,66,66, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9,
    10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,66,66,66,66,66,66,26,27,28,
    29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,66,66,
    66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,
    66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,
    66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,
    66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,
    66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,66,
    66,66,66,66,66,66
}
```

8.149 BString.h File Reference

```
#include <BTypes.h>
#include <BRefData.h>
#include <BList.h>
#include <BArray.h>
#include <iostream>
```

Classes

- class BString

  This class stores and manipulates ASCII strings.

Typedefs

- typedef BList< BString > BStringList
- typedef BArray< BString > BStringArray

Functions

- std::ostream & operator<< (std::ostream &o, BString &s)
- std::istream & operator>> (std::istream &i, BString &s)
- int bstringListinList (BStringList &l, BString s)
- BString blistToString (const BStringList &list)

  Convert a string list to a comma separated string.
- BStringList bstringToList (BString str, int stripSpaces=0)

  Convert a comma separated string to a string list.
- BStringList charToList (const char **str)

- BString barrayToString (const BStringArray &list)

  Convert a string array to a comma separated string.
- BStringArray bstringToArray (BString str, int stripSpaces=0)

  Convert a comma separated string to a string array.
- BStringArray charToArray (const char **str)
- void toBString (BString &v, BString &s)
- void toBString (BStringList &v, BString &s)
- void toBString (BInt32 &v, BString &s)
- void toBString (BUInt32 &v, BString &s)
- void toBString (BUInt64 &v, BString &s)
- void toBString (BFloat64 &v, BString &s)
- void fromBString (BString &s, BString &v)
- void fromBString (BString &s, BStringList &v)
- void fromBString (BString &s, BInt32 &v)
- void fromBString (BString &s, BUInt32 &v)
- void fromBString (BString &s, BUInt64 &v)
- void fromBString (BString &s, BFloat64 &v)
- char from_hex (char ch)
- char to_hex (char code)
- char * bstrncpy (char *dest, const char *src, size_t n)
- char * bstrtrim (char *str)
- const char * intToString (char *str, BUInt strLen, int value, int base=10)
- const char * int64ToString (char *str, BUInt strLen, BInt64 value, int base=10)
- const char * floatToString (char *str, BUInt strLen, BFloat32 f, BUInt precision)

8.149.1 Typedef Documentation

8.149.1.1 BStringList

```
typedef BList<BString> BStringList
```

8.149.1.2 BStringArray

```
typedef BArray<BString> BStringArray
```

8.149.2 Function Documentation

8.149.2.1 operator<<()

```
std::ostream & operator<< (
            std::ostream & o,
            BString & s )
```

8.149.2.2 operator>>()

```
std::istream & operator>> (
            std::istream & i,
            BString & s )
```

8.149.2.3 bstringListinList()

```
int bstringListinList (
            BStringList & l,
            BString s )
```

8.149.2.4 blistToString()

```
BString blistToString (
            const BStringList & list )
```

Convert a string list to a comma separated string.

8.149.2.5 bstringToList()

```
BStringList bstringToList (
            BString str,
            int stripSpaces = 0 )
```

Convert a comma separated string to a string list.

8.149.2.6 charToList()

```
BStringList charToList (
            const char ** str )
```

8.149.2.7 barrayToString()

```
BString barrayToString (
            const BStringArray & list )
```

Convert a string array to a comma separated string.

8.149.2.8 bstringToArray()

```
BStringArray bstringToArray (
             BString str,
             int stripSpaces = 0 )
```

Convert a comma separated string to a string array.

8.149.2.9 charToArray()

```
BStringArray charToArray (
             const char ** str )
```

8.149.2.10 toBString() [1/6]

```
void toBString (
             BString & v,
             BString & s )
```

8.149.2.11 toBString() [2/6]

```
void toBString (
             BStringList & v,
             BString & s )
```

8.149.2.12 toBString() [3/6]

```
void toBString (
             BInt32 & v,
             BString & s )
```

8.149.2.13 toBString() [4/6]

```
void toBString (
             BUInt32 & v,
             BString & s )
```

8.149.2.14 toBString() [5/6]

```
void toBString (
            BUInt64 & v,
            BString & s )
```

8.149.2.15 toBString() [6/6]

```
void toBString (
            BFloat64 & v,
            BString & s )
```

8.149.2.16 fromBString() [1/6]

```
void fromBString (
            BString & s,
            BString & v )
```

8.149.2.17 fromBString() [2/6]

```
void fromBString (
            BString & s,
            BStringList & v )
```

8.149.2.18 fromBString() [3/6]

```
void fromBString (
            BString & s,
            BInt32 & v )
```

8.149.2.19 fromBString() [4/6]

```
void fromBString (
            BString & s,
            BUInt32 & v )
```

8.149.2.20 fromBString() [5/6]

```
void fromBString (
            BString & s,
            BUInt64 & v )
```

8.149.2.21 fromBString() [6/6]

```
void fromBString (
            BString & s,
            BFloat64 & v )
```

8.149.2.22 from_hex()

```
char from_hex (
            char ch )  [inline]
```

8.149.2.23 to_hex()

```
char to_hex (
            char code )  [inline]
```

8.149.2.24 bstrncpy()

```
char * bstrncpy (
            char * dest,
            const char * src,
            size_t n )
```

8.149.2.25 bstrtrim()

```
char * bstrtrim (
            char * str )
```

8.149.2.26 intToString()

```
const char * intToString (
             char * str,
             BUInt strLen,
             int value,
             int base = 10 )
```

8.149.2.27 int64ToString()

```
const char * int64ToString (
             char * str,
             BUInt strLen,
             BInt64 value,
             int base = 10 )
```

8.149.2.28 floatToString()

```
const char * floatToString (
             char * str,
             BUInt strLen,
             BFloat32 f,
             BUInt precision )
```

8.150 BString.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BString.h   BString Handling
3  *  T.Barnaby,  BEAM Ltd, 29/10/91
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BSTRING_H
9 #define BSTRING_H   1
10
11 #include    <BTypes.h>
12 #include    <BRefData.h>
13 #include    <BList.h>
14 #include    <BArray.h>
15 #include    <iostream>
16
17 class BError;
18
20 class BString {
21 public:
22             BString();
23             BString(const BString& string);
24             BString(const char* str);
25             BString(const char* str, unsigned int len);
26             BString(char ch);
27             BString(BInt v);
28             BString(BUInt v);
29             BString(BUInt64 v);
30             BString(double v);
31
32             ~BString();
```

```
33
34      static      BString convert(char ch);
35      static      BString  convert(BInt value);
36      static      BString  convert(BUInt value);
37      static      BString  convert(double value, int eFormat = 0);
38      static      BString  convert(BUInt64 value);
39      static      BString  convertHex(BInt value);
40      static      BString  convertHex(BUInt value);
41
42      BString      copy() const;
43
44      int     len() const;
45      const char* retStr() const;
46      const char* str() const;
47      char*       retStrDup() const;
48      int     retInt() const;
49      unsigned int    retUInt() const;
50      double      retDouble() const;
51      BFloat64    retFloat64() const;
52
53      int     compare(const BString& string) const;
54      int     compareWild(const BString& string) const;
55      int     compareWildExpression(const BString& string) const;
56      int     compareRegex(const BString& pattern, int ignoreCase = 0) const;
57      BString& truncate(int len);
58      BString& pad(int len);
59      void        clear();
60
61      BString& toUpper();
62      BString& toLower();
63      BString      lowerFirst();
64      void        removeNL();
65      BString      justify(int leftMargin, int width);
66      BString      fixedLen(int length, int rightJustify = 0);
67      BString      firstLine();
68      BString      translateChar(char ch, BString replace = " ");
69      BString      reverse() const;
70
71      BString      subString(int start, int len) const;
72      int     del(int start, int len);
73      int     insert(int start, BString str);
74      int     append(const BString& str);
75      BString      add(const BString& str) const;
76      BString& printf(const char* fmt, ...) ;
77
78      int     find(char ch) const;
79      int     find(BString str) const;
80      int     findReverse(char ch) const;
81
82      BString      csvEncode() const;
83      BString& csvDecode(const BString str);
84
85      BString      base64Encode() const;
86      BError        base64Decode(BString& str) const;
87
88
89      BList<BString>    getTokenList(BString separators);
90      BList<BString>    getTokenList(char separator);
91      BString      removeSeparators(BString separators);
92      BString      pullToken(BString terminators);
93      BString      pullSeparators(BString separators);
94      BString      pullWord();
95      BString      pullLine();
96      BList<BString>    split(char splitChar);
97
98      // Filename operations
99      BString      dirname();
100      BString      filename();
101      BString      basename();
102      BString      extension();
103      BString      extensionFull();
104
105      // Misc functions
106      BUInt32      hash() const;
107      char&       get(int pos);
108      const char& get(int pos) const;
109
110      /* Operator functions */
111      BString& operator=(const BString& string);
112      char&       operator[](int pos);
113
114      int     operator==(const BString& s) const{
115                  return (compare(s) == 0);
116              }
117      int     operator==(const char* s) const{
118                  return (compare(s) == 0);
119              }
```

```
120     int     operator>(const BString& s) const{
121                 return (compare(s) > 0);
122             }
123     int     operator>(const char* s) const{
124                 return (compare(s) > 0);
125             }
126     int     operator<(const BString& s) const{
127                 return (compare(s) < 0);
128             }
129     int     operator<(const char* s) const{
130                 return (compare(s) < 0);
131             }
132     int     operator>=(const BString& s) const{
133                 return (compare(s) >= 0);
134             }
135     int     operator<=(const BString& s) const{
136                 return (compare(s) <= 0);
137             }
138     int     operator!=(const BString& s) const{
139                 return (compare(s) != 0);
140             }
141     int     operator!=(const char* s) const{
142                 return (compare(s) != 0);
143             }
144     BString  operator+(const BString& s) const {
145                 return add(s);
146             }
147     BString  operator+(const char* s) const {
148                 return add(s);
149             }
150     BString  operator+=(const BString& s){
151                 *this = add(s);
152                 return *this;
153             }
154     BString  operator+=(const char* s){
155                 *this = add(s);
156                 return *this;
157             }
158 
159     /* Special operators */
160     BString  operator+(char ch) const {
161                 return add(convert(ch));
162             }
163     BString  operator+(BInt i) const {
164                 return add(convert(i));
165             }
166     BString  operator+(BUInt i) const {
167                 return add(convert(i));
168             }
169     BString  operator+(BUInt64 i) const {
170                 return add(convert(i));
171             }
172             operator const char* () const {
173                 return retStr();
174             }
175 #ifdef QSTRING_H
176     // QT support
177             BString(const QString& str){
178 #if QT_VERSION >= 0x040000
179                 init(str.toLatin1());
180 #else
181                 init(str);
182 #endif
183             }
184 #ifndef ZAP
185             operator QString (){        // QString support
186                 return QString(retStr());
187             }
188 #endif
189 #endif
190 
191     // For backwards compatibility
192     BString      field(int field) const;
193     char**      fields();
194 
195 protected:
196     BRefData*   ostr;
197 
198 private:
199     void        init(const char* str);
200     int     inString(int pos) const;
201     int     isSpace(char ch) const;
202 };
203 
204 // std::Stream Functions
205 std::ostream& operator<<(std::ostream& o, BString& s);
206 std::istream& operator>>(std::istream& i, BString& s);
```

```
207
208 // List and array functions
209 typedef BList<BString>    BStringList;
210 typedef BArray<BString>  BStringArray;
211
212 int bstringListinList(BStringList& l, BString s);
213
214 BString blistToString(const BStringList& list);
215 BStringList bstringToList(BString str, int stripSpaces = 0);
216 BStringList charToList(const char** str);
217
218 BString barrayToString(const BStringArray& list);
219 BStringArray bstringToArray(BString str, int stripSpaces = 0);
220 BStringArray charToArray(const char** str);
221
222 // String conversion functions
223 void toBString(BString& v, BString& s);
224 void toBString(BStringList& v, BString& s);
225 void toBString(BInt32& v, BString& s);
226 void toBString(BUInt32& v, BString& s);
227 void toBString(BUInt64& v, BString& s);
228 void toBString(BFloat64& v, BString& s);
229 void fromBString(BString& s, BString& v);
230 void fromBString(BString& s, BStringList& v);
231 void fromBString(BString& s, BInt32& v);
232 void fromBString(BString& s, BUInt32& v);
233 void fromBString(BString& s, BUInt64& v);
234 void fromBString(BString& s, BFloat64& v);
235
236 // CString functions
237 inline char from_hex(char ch){
238     return isdigit(ch) ? ch - '0' : tolower(ch) - 'a' + 10;
239 }
240
241 inline char to_hex(char code){
242     static char hex[] = "0123456789abcdef";
243     return hex[code & 15];
244 }
245
246 char* bstrncpy(char* dest, const char* src, size_t n);
247 char* bstrtrim(char* str);
248 const char* intToString(char* str, BUInt strLen, int value, int base = 10);
249 const char* int64ToString(char* str, BUInt strLen, BInt64 value, int base = 10);
250 const char* floatToString(char *str, BUInt strLen, BFloat32 f, BUInt precision);
251
252 #endif
```

8.151 BStringLocked.h File Reference

```
#include <BString.h>
#include <BMutex.h>
```

Classes

- class BStringMutex

  Thread locked string internal mutex.
- class BStringLocked

  Provides a basic thread locked string.

8.152 BStringLocked.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BStringLocked.h     Threaded BString Handling
3  *  T.Barnaby,  BEAM Ltd, 2008-06-17
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
```

```
6  ******************************************************************************
7  */
8 #ifndef BStringLocked_H
9 #define BStringLocked_H 1
10
11 #include    <BString.h>
12 #include    <BMutex.h>
13
15 class BStringMutex : public BMutex {
16 public:
17             BStringMutex(): BMutex(BMutex::Recursive){}
18 };
19
21 class BStringLocked {
22 public:
23             BStringLocked(){}
24             BStringLocked(const BStringLocked& s) : ostr(s.ostr){}
25             BStringLocked(const BString& s) : ostr(s){}
26
27     int     len() const  { BMutexLock l(olock); return ostr.len(); }
28
29 public:
30             operator BString() const { BMutexLock l(olock); return ostr; }
31
32     BStringLocked  operator+(const BStringLocked& s) const { BMutexLock l(olock); BMutexLock l1(s.olock);
       ostr.append(s.ostr); return *this; }
33     BStringLocked&     operator=(const BStringLocked& s) { BMutexLock l(olock); BMutexLock l1(s.olock);
       ostr = s.ostr; return *this; }
34
35 private:
36     mutable BStringMutex        olock;
37     BString             ostr;
38 };
39
40 #endif
```

8.153 BSys.cpp File Reference

```
#include <BSys.h>
#include <time.h>
```

Functions

- void delayUs (BUInt us)

  Will delay for given time in us, if tasks running task will sleep.
- void delayMs (BUInt ms)

  Will delay for given time in ms, if tasks running task will sleep.

8.153.1 Function Documentation

8.153.1.1 delayUs()

```
void delayUs (
            BUInt us )
```

Will delay for given time in us, if tasks running task will sleep.

8.153.1.2 delayMs()

```
void delayMs (
            BUInt ms )
```

Will delay for given time in ms, if tasks running task will sleep.

8.154 BSys.h File Reference

```
#include <BTypes.h>
```

Functions

- void delayUs (BUInt us)

  Will delay for given time in us, if tasks running task will sleep.
- void delayMs (BUInt ms)

  Will delay for given time in ms, if tasks running task will sleep.

8.154.1 Function Documentation

8.154.1.1 delayUs()

```
void delayUs (
            BUInt us )
```

Will delay for given time in us, if tasks running task will sleep.

8.154.1.2 delayMs()

```
void delayMs (
            BUInt ms )
```

Will delay for given time in ms, if tasks running task will sleep.

8.155 BSys.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BSys.h      BSys system class
3  *  T.Barnaby,  Beam Ltd,   2018-10-22
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  *
8  *  Core system class.
9  */
10 #ifndef BSys_h
11 #define BSys_h
12
13 #include <BTypes.h>
14
15 extern  "C" {
16 extern void     delayUs(BUInt us);
17 extern void     delayMs(BUInt ms);
18 }
19
20 #endif
```

8.156 BTable.cpp File Reference

```
#include <BTable.h>
```

8.157 BTable.h File Reference

```
#include <BArray.h>
#include <BString.h>
```

Classes

- class BTable

  A simple string based table structure.

8.158 BTable.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BTable.h    Simple table of data with CSV output
3  *  T.Barnaby,  BEAM Ltd,   2009-02-10
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BTable_H
9 #define BTable_H
10
11 #include <BArray.h>
12 #include <BString.h>
13
15 class BTable {
16 public:
17                 BTable();
18                 ~BTable();
```

```
19
20      void            clear();
21      void            setTitle(BArray<BString> title);
22      void            addRow(BArray<BString>  data);
23
24      BString          getString();
25      void            print(FILE* file = stdout);
26
27  private:
28      void            calculateWidths();
29      BString          lineString(BArray<BString> line, int comment = 0);
30
31      BArray<BString>  otitle;
32      BList<BArray<BString> >    odata;
33      BArray<int>      ocolumnWidths;
34  };
35
36  #endif
```

8.159 BTask.cpp File Reference

```
#include <BTask.h>
#include <unistd.h>
#include <errno.h>
#include <sys/types.h>
```

8.160 BTask.h File Reference

```
#include <BError.h>
#include <pthread.h>
```

Classes

- class BTask

  Implements a thread of execution.

8.161 BTask.h

Go to the documentation of this file.

```
1  /*****************************************************************************
2   *  BTask.h BTask class
3   *  T.Barnaby,  Beam Ltd,   2012-11-12
4   *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5   *  For license see LICENSE.txt at the root of the beamlib source tree.
6   *****************************************************************************
7   *
8   * Stack size of 0 assumes system will grow using MMU.
9   * Task priorities can be set from 0 to 4 inclusive. Basic default and idle priority is 0.
10   */
11  #ifndef BTask_h
12  #define BTask_h
13
14  #include <BError.h>
15  #include <pthread.h>
16
17  class BTask {
18  public:
19              BTask(const char* name = "", BUInt stackSize = 0, BUInt priority = 1);
20      virtual     ~BTask();
21
```

```
22
23      void        init(const char* name, BUInt stackSize = 0, BUInt priority = 1);
24      BError        start();
25      void        stop();
26      void        waitForCompletion();
27
28      // Task manipulation
29      int     setPriority(BUInt priority);
30
31      // Task operation
32      virtual void    run();
33
34  protected:
35      static void*    taskFunc(void*);
36
37      const char* oname;
38      BUInt       ostackSize;
39      BUInt       opolicy;
40      BUInt       opriority;
41      pthread_t   othread;
42      Bool        orunning;
43  };
44  #endif
```

8.162 BThread.cpp File Reference

```
#include <BThread.h>
#include <unistd.h>
#include <errno.h>
#include <sys/types.h>
```

8.163 BThread.h File Reference

```
#include <pthread.h>
```

Classes

- class BThread

  Implements a program execution thread.

8.164 BThread.h

Go to the documentation of this file.

```
1  /*****************************************************************************
2   *  BThread.h   BThread Classes
3   *  T.Barnaby,  BEAM Ltd,   31/3/00
4   *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5   *  For license see LICENSE.txt at the root of the beamlib source tree.
6   *****************************************************************************
7   */
8  #ifndef BTHREAD_H
9  #define BTHREAD_H   1
10
11 #include <pthread.h>
12
14 class BThread {
15 public:
16              BThread();
17      virtual     ~BThread();
18
```

```
19      // Prior to start setup
20      int     setInitPriority(int policy, int priority);
21      int     setInitStackSize(size_t stackSize);
22
23      int     start();
24      void*       result();
25      int     running();
26
27      int     setPriority(int policy, int priority);
28      int     cancel();
29      void*       waitForCompletion();
30      pthread_t   getThread();
31
32      virtual void*   function();
33  private:
34      static void*    startFunc(void*);
35
36      pthread_t   othread;
37      size_t      ostackSize;
38      int     opolicy;
39      int     opriority;
40      int     orunning;
41      void*       oresult;
42  };
43
44  #endif
```

8.165 BTime.cpp File Reference

```
#include <BTime.h>
```

Functions

- static bool yearIsLeap (BUInt16 year)
- static BUInt16 yearDays (BUInt16 year)

Variables

- static BUInt16 monDays [2][13]

8.165.1 Function Documentation

8.165.1.1 yearIsLeap()

```
static bool yearIsLeap (
            BUInt16 year )  [inline], [static]
```

8.165.1.2 yearDays()

```
static BUInt16 yearDays (
            BUInt16 year )  [inline], [static]
```

8.165.2 Variable Documentation

8.165.2.1 monDays

```
BUInt16 monDays[2][13]  [static]
```

Initial value:

```
= {
    { 0, 31, 59, 90, 120, 151, 181, 212, 243, 273, 304, 334, 365 },
    { 0, 31, 60, 91, 121, 152, 182, 213, 244, 274, 305, 335, 366 }
}
```

8.166 BTime.h File Reference

```
#include <BTypes.h>
#include <BError.h>
#include <BString.h>
```

Classes

- class BTime

  Implements a simple date/time class. Stores the date/time as a number of seconds since Unix epoch 1970-01-02T00:00:00.

8.167 BTime.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BTime.h BTime functions
3  *  T.Barnaby,  Beam Ltd,   2012-11-12
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  *
8  */
20 #ifndef BTime_h
21 #define BTime_h
22
23 #include <BTypes.h>
24 #include <BError.h>
25 #include <BString.h>
26
27 class BTime {
28 public:
29             BTime(BUInt32 t = 0);
30
31     void        set(BUInt32 seconds);
32     void        set(BUInt year, BUInt month, BUInt day, BUInt hour = 0, BUInt minute = 0, BUInt second =
       0);
33     void        setYearDay(BUInt year, BUInt yearDay, BUInt hour = 0, BUInt minute = 0, BUInt second =
       0);
34
35     void        getDate(BUInt& year, BUInt& month, BUInt& day) const;
36     void        getTime(BUInt& hour, BUInt& minute, BUInt& second) const;
37     BUInt32      getSeconds() const;
38
39     int     isSet() const{ return otime != 0; }
40     int     isLeapYear();
```

```
41      void        addSeconds(int seconds);
42
43      BString     getString(BString format = "iso") const;
44      BError       setString(const BString dateTime);
45
46      BTime      utcToLocal() const;
47      BTime      localToUtc() const;
48      BString     getStringLocal(BString format = "iso") const;
49      BError       setStringLocal(const BString dateTime);
50
51              // Operator functions
52      int     operator==(const BTime& time) const { return (otime == time.otime); }
53      int     operator!=(const BTime& time) const { return (otime != time.otime); }
54      int     operator>(const BTime& time) const { return (otime > time.otime); }
55      int     operator>=(const BTime& time) const { return (otime >= time.otime); }
56      int     operator<(const BTime& time) const { return (otime < time.otime); }
57      int     operator<=(const BTime& time) const { return (otime <= time.otime); }
58      BTime      operator+(int seconds) const { return BTime(getSeconds() + seconds); }
59      BTime&     operator+=(int seconds){ addSeconds(seconds); return *this; }
60
61  private:
62      BUInt32      otime;
63  };
64
65  #endif
```

8.168 BTimer.cpp File Reference

```
#include <BTimer.h>
#include <sys/time.h>
```

8.169 BTimer.h File Reference

```
#include <BMutex.h>
```

Classes

- class BTimer

  Stopwatch style timer.

8.170 BTimer.h

Go to the documentation of this file.

```
1  /*****************************************************************************
2   *  BTimer.h        Quantel Quentin BTimers
3   *  T.Barnaby,  BEAM Ltd,   3/2/04
4   *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5   *  For license see LICENSE.txt at the root of the beamlib source tree.
6   *****************************************************************************
7   */
8  #ifndef BTIMER_H
9  #define BTIMER_H
10
11 #include <BMutex.h>
12
14 class BTimer {
15 public:
16              BTimer();
17              ~BTimer();
18
19      void        start();
```

```
20     void        stop();
21     void        clear();
22     double      getElapsedTime();
23
24     // Overall operations
25     void        add(BTimer& timer);
26
27     // Statistics
28     double      average();
29     double      peak();
30 private:
31     static double   getTime();
32
33     BMutex        olock;
34     unsigned int    onum;
35     double      ostartTime;
36     double      oendTime;
37     double      oaverage;
38     double      opeak;
39 };
40 #endif
```

8.171 BTimeStamp.cpp File Reference

```
#include <BTimeStamp.h>
#include <BTimeStampMs.h>
#include <math.h>
#include <sys/time.h>
```

Functions

- void toBString (BTimeStamp &v, BString &s)
- void fromBString (BString &s, BTimeStamp &v)

Variables

- static int mon_yday [2][13]

8.171.1 Function Documentation

8.171.1.1 toBString()

```
void toBString (
            BTimeStamp & v,
            BString & s )
```

8.171.1.2 fromBString()

```
void fromBString (
            BString & s,
            BTimeStamp & v )
```

8.171.2 Variable Documentation

8.171.2.1 mon_yday

```
int mon_yday[2][13]  [static]
```

Initial value:

```
= {
    { 0, 31, 59, 90, 120, 151, 181, 212, 243, 273, 304, 334, 365 },
    { 0, 31, 60, 91, 121, 152, 182, 213, 244, 274, 305, 335, 366 }
}
```

8.172 BTimeStamp.h File Reference

```
#include <stdint.h>
#include <BError.h>
```

Classes

- class BTimeStamp

  A date and time storage class with microsecond resolution.

Functions

- void toBString (BTimeStamp &v, BString &s)
- void fromBString (BString &s, BTimeStamp &v)

8.172.1 Function Documentation

8.172.1.1 toBString()

```
void toBString (
            BTimeStamp & v,
            BString & s )
```

8.172.1.2 fromBString()

```
void fromBString (
            BString & s,
            BTimeStamp & v )
```

8.173 BTimeStamp.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BTimeStamp.h    TimeStamp classes
3  *  T.Barnaby,  BEAM Ltd,   2008-06-26
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BTimeStamp_H
9 #define BTimeStamp_H    1
10
11 #include <stdint.h>
12 #include <BError.h>
13
14 class BTimeStampMs;
15
17 class BTimeStamp {
18 public:
19             BTimeStamp();
20             BTimeStamp(int year, int month = 1, int day = 1, int hour = 0, int minute = 0, int second =
       0, int microsecond = 0);
21             BTimeStamp(const BString str);
22             ~BTimeStamp();
23
24     void        clear();
25     void        setFirst();
26     void        setLast();
27
28     void        set(time_t time, int microSeconds);
29     void        set(int year = 0, int month = 1, int day = 1, int hour = 0, int minute = 0, int second =
       0, int microsecond = 0);
30     void        set(const BTimeStampMs& timeStamp);
31     void        setYDay(int year = 0, int yday = 0, int hour = 0, int minute = 0, int second = 0, int
       microsecond = 0);
32     void        setTime(int hour = 0, int minute = 0, int second = 0, int microsecond = 0);
33     void        setNow();
34
35     int     year() const;
36     int     yday() const;
37     int     month() const;
38     int     day() const;
39     int     hour() const;
40     int     minute() const;
41     int     second() const;
42     int     microSecond() const;
43
44     void        getDate(int& year, int& mon, int& day) const;
45
46     BString      getString(BString separator = "T") const;
47     BError        setString(const BString dateTime);
48     BString      getStringNoMs(BString separator = "T") const;
49     BString      getStringFormatted(BString format) const;
50
51     void        addMilliSeconds(int milliSeconds);
52     void        addMicroSeconds(int64_t microSeconds);
53     void        addSeconds(int seconds);
54     uint32_t    getYearSeconds() const;
55     uint64_t    getYearMicroSeconds() const;
56
57     int     isSet() const{ return oyear != 0; }
58     int     compare(const BTimeStamp& timeStamp) const;
59
60             operator BString() const { return getString(); }
61     BTimeStamp&   operator=(const BTimeStampMs& timeStamp){ set(timeStamp); return *this; }
62
63     int     operator==(const BTimeStamp& timeStamp) const { return (compare(timeStamp) == 0); }
64     int     operator!=(const BTimeStamp& timeStamp) const { return (compare(timeStamp) != 0); }
65     int     operator>(const BTimeStamp& timeStamp) const { return (compare(timeStamp) > 0); }
66     int     operator>=(const BTimeStamp& timeStamp) const { return (compare(timeStamp) >= 0); }
67     int     operator<(const BTimeStamp& timeStamp) const { return (compare(timeStamp) < 0); }
68     int     operator<=(const BTimeStamp& timeStamp) const { return (compare(timeStamp) <= 0); }
69
70     static int  isLeap(int year);
71     static BInt64 difference(BTimeStamp t2, BTimeStamp t1);
72
73 public:
74     BUInt16      oyear;
75     BUInt16      oyday;
76     BUInt8        ohour;
77     BUInt8        ominute;
78     BUInt8        osecond;
79     BUInt8        ospare;
80     BUInt32      omicroSecond;
```

```
81 };
82
83 // String conversion functions
84 void toBString(BTimeStamp& v, BString& s);
85 void fromBString(BString& s, BTimeStamp& v);
86
87 #endif
```

8.174 BTimeStampMs.cpp File Reference

```
#include <BTimeStampMs.h>
#include <math.h>
#include <sys/time.h>
```

Variables

- static int mon_yday [2][13]

8.174.1 Variable Documentation

8.174.1.1 mon_yday

```
int mon_yday[2][13]  [static]
```

Initial value:

```
= {

    { 0, 31, 59, 90, 120, 151, 181, 212, 243, 273, 304, 334, 365 },

    { 0, 31, 60, 91, 121, 152, 182, 213, 244, 274, 305, 335, 366 }
}
```

8.175 BTimeStampMs.h File Reference

```
#include <stdint.h>
#include <BError.h>
```

Classes

- class BTimeStampMs

  A date and time storage class with milisecond resolution and an extra field to indicate a particular sampleNumber it reffers to.

8.176 BTimeStampMs.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BTimeStampMs.h  TimeStamp classes
3  *  T.Barnaby,  BEAM Ltd,   2005-10-20
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BTimeStampMs_H
9 #define BTimeStampMs_H  1
10
11 #include <stdint.h>
12 #include <BError.h>
13
15 class BTimeStampMs {
16 public:
17             BTimeStampMs(BString str = "");
18             ~BTimeStampMs();
19
20     void        clear();
21
22     void        setNow();
23     void        setFirst();
24     void        setLast();
25
26     void        set(time_t time, int milliSeconds = 0);
27     void        setYDay(int year = 0, int yday = 0, int hour = 0, int minute = 0, int second = 0, int
       milliSecond = 0);
28     void        setTime(int hour = 0, int minute = 0, int second = 0, int milliSecond = 0);
29
30     BTimeStampMs&   addMilliSeconds(int milliSeconds);
31     BTimeStampMs&   subMilliSeconds(int milliSeconds);
32     BTimeStampMs&   addSeconds(int seconds);
33     BTimeStampMs&   subSeconds(int seconds);
34     uint32_t    getYearSeconds();
35     uint64_t    getYearMilliSeconds();
36
37     BString      getString(BString separator = "T");
38     BString      getStringNoMs(BString separator = "T");
39     BError        setString(BString dateTime);
40
41     BString      getDurationString(BString separator = "T");
42     BString      getDurationStringNoMs(BString separator = "T");
43     BError        setDurationString(BString dateTime);
44     BString      getStringRaw();
45
46     void        getDate(int& year, int& mon, int& day);
47     int     compare(const BTimeStampMs& timeStamp);
48
49     int     operator>(const BTimeStampMs& timeStamp){ return (compare(timeStamp) > 0); }
50     int     operator>=(const BTimeStampMs& timeStamp){ return (compare(timeStamp) >= 0); }
51     int     operator<(const BTimeStampMs& timeStamp){ return (compare(timeStamp) < 0); }
52     int     operator<=(const BTimeStampMs& timeStamp){ return (compare(timeStamp) <= 0); }
53
54     static int  isLeap(int year);
55     static BUInt64   difference(BTimeStampMs t2, BTimeStampMs t1);
56
57 public:
58     uint16_t    year;
59     uint16_t    yday;
60     uint16_t    hour;
61     uint16_t    minute;
62     uint16_t    second;
63     uint16_t    milliSecond;
64     int32_t     sampleNumber;
65 private:
66 };
67
68 #endif
```

8.177 BTimeUs.cpp File Reference

```
#include <BTimeUs.h>
#include <stdio.h>
```

Functions

- static bool yearIsLeap (BUInt16 year)
- static BUInt16 yearDays (BUInt16 year)

Variables

- static BUInt16 monDays [2][13]

8.177.1 Function Documentation

8.177.1.1 yearIsLeap()

```
static bool yearIsLeap (
            BUInt16 year )  [inline], [static]
```

8.177.1.2 yearDays()

```
static BUInt16 yearDays (
            BUInt16 year )  [inline], [static]
```

8.177.2 Variable Documentation

8.177.2.1 monDays

```
BUInt16 monDays[2][13]  [static]
```

Initial value:

```
= {
    { 0, 31, 59, 90, 120, 151, 181, 212, 243, 273, 304, 334, 365 },
    { 0, 31, 60, 91, 121, 152, 182, 213, 244, 274, 305, 335, 366 }
}
```

8.178 BTimeUs.h File Reference

```
#include <BTypes.h>
#include <BError.h>
#include <BString.h>
#include <BTime.h>
```

Classes

- class BTimeUs

  Time storage as an unsigned 64bit value to TAI standard.

8.179 BTimeUs.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BTimeUs.h   BTimeUs functions
3  *  T.Barnaby,  Beam Ltd,   2018-08-15
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  *
8  * Implements a microsecond accurate time class. Stores the time as a number of microseconds
9  *  to the TAI standard with no leap seconds. 0 time is 1970-01-02T00:00:00.
10  * The class provides conversions between UTC time and TAI microsecond time (leap second handling)
11  *
12  * Uses some sepcial values.
13  *  0 - DateTime not set.
14  */
15 #ifndef BTimeUs_h
16 #define BTimeUs_h
17
18 #include <BTypes.h>
19 #include <BError.h>
20 #include <BString.h>
21 #include <BTime.h>
22
24 class BTimeUs {
25 public:
26             BTimeUs(BUInt64 t = 0);
27             BTimeUs(BTime t);
28
29     void        set(BUInt64 microSeconds);
30     void        set(BUInt year, BUInt month, BUInt day, BUInt hour = 0, BUInt minute = 0, BUInt second =
       0, BUInt microSecond = 0);
31     void        setYearDay(BUInt year, BUInt yearDay, BUInt hour = 0, BUInt minute = 0, BUInt second = 0,
       BUInt microSecond = 0);
32
33     void        getDate(BUInt& year, BUInt& month, BUInt& day) const;
34     void        getTime(BUInt& hour, BUInt& minute, BUInt& second) const;
35     BUInt64      getSeconds() const;
36     BUInt64      getMicroSeconds() const;
37
38     int     isSet() const{ return otime != 0; }
39     int     isLeapYear();
40     void        addSeconds(BInt64 seconds);
41     void        addMicroSeconds(BInt64 microSeconds);
42
43     BString      getString(BString format = "isoT") const;
44     BString      getStringUs(BString format = "isoT") const;
45     BError        setString(const BString dateTime);
46
47             // Operator functions
48             operator BTime() const { return BTime(getSeconds()); }
49     int     operator==(const BTimeUs& time) const { return (otime == time.otime); }
50     int     operator!=(const BTimeUs& time) const { return (otime != time.otime); }
51     int     operator>(const BTimeUs& time) const { return (otime > time.otime); }
52     int     operator>=(const BTimeUs& time) const { return (otime >= time.otime); }
53     int     operator<(const BTimeUs& time) const { return (otime < time.otime); }
54     int     operator<=(const BTimeUs& time) const { return (otime <= time.otime); }
55     BTimeUs      operator+(BInt64 microSeconds) const { return BTimeUs(otime + microSeconds); }
56     BTimeUs& operator+=(BInt64 microSeconds){ addMicroSeconds(microSeconds); return *this; }
57
58 private:
59     BUInt64      otime;
60 };
61
62 #endif
```

8.180 BTypes.cpp File Reference

```
#include <BTypes.h>
```

Variables

- BUInt32 beamlibVersion = BeamlibVersion

8.180.1 Variable Documentation

8.180.1.1 beamlibVersion

```
BUInt32 beamlibVersion = BeamlibVersion
```

8.181 BTypes.h File Reference

```
#include <stdint.h>
#include <sys/types.h>
#include <vector>
```

Classes

- class BDataChunk

  A chunk of data allowing writes of multiple chunks of segmented data.
- struct BObjMember

  A structure to define a member of a generic BObj.

Macros

- #define BeamlibVersion 0x030100

Typedefs

- typedef bool Bool
- typedef int8_t BInt8
- typedef uint8_t BUInt8
- typedef int16_t BInt16
- typedef uint16_t BUInt16
- typedef int32_t BInt32
- typedef uint32_t BUInt32
- typedef int64_t BInt64
- typedef uint64_t BUInt64
- typedef float BFloat32
- typedef double BFloat64
- typedef char BChar
- typedef BInt32 BInt
- typedef BUInt32 BUInt
- typedef BFloat32 BFloat
- typedef BFloat64 BDouble
- typedef size_t BSize
- typedef std::vector< BFloat32 > BArrayFloat
- typedef std::vector< BFloat64 > BArrayDouble
- typedef BUInt32 BTimeout

Enumerations

- enum BEventType {
  BEventTypeNone , BEventTypeError , BEventTypeRead , BEventTypeReadLine ,
  BEventTypeWrite , BEventTypeConnect , BEventTypeDisconnect , BEventTypeClientConnect ,
  BEventTypeClientDisconnect }
- enum BEventWaitSet {
  BEventWaitNone = 0x00 , BEventWaitError = 0x01 , BEventWaitRead = 0x02 , BEventWaitReadLine = 0x04
  ,
  BEventWaitWrite = 0x08 , BEventWaitConnect = 0x10 , BEventWaitDisconnect = 0x20 , BEventWaitClientConnect
  = 0x40 ,
  BEventWaitClientDisconnect = 0x80 , BEventWaitAny = 0xFFFFFFFF }
- enum BType {
  BTypeNone , BTypeBool , BTypeInt8 , BTypeUInt8 ,
  BTypeInt16 , BTypeUInt16 , BTypeInt32 , BTypeUInt32 ,
  BTypeInt64 , BTypeUInt64 , BTypeFloat32 , BTypeFloat64 ,
  BTypeChar , BTypeString , BTypeError , BTypeTime ,
  BTypeTimeUs , BTypeObj = 100 }
- enum BTypeComp {
  BTypeCompSingle , BTypeCompArray , BTypeCompArrayFixed , BTypeCompList ,
  BTypeCompDict }

Functions

- BTimeout timeoutTicks (BTimeout timeoutUs)
- void byteSwap8 (void *d, void *s)
- void byteSwap16 (void *d, void *s)
- void byteSwap32 (void *d, void *s)
- void byteSwap64 (void *d, void *s)

Variables

- const BTimeout BTimeoutForever = 0xFFFFFFFF

8.181.1 Macro Definition Documentation

8.181.1.1 BeamlibVersion

```
#define BeamlibVersion 0x030100
```

8.181.2 Typedef Documentation

8.181.2.1 Bool

```
typedef bool Bool
```

8.181.2.2 BInt8

```
typedef int8_t BInt8
```

8.181.2.3 BUInt8

```
typedef uint8_t BUInt8
```

8.181.2.4 BInt16

```
typedef int16_t BInt16
```

8.181.2.5 BUInt16

```
typedef uint16_t BUInt16
```

8.181.2.6 BInt32

```
typedef int32_t BInt32
```

8.181.2.7 BUInt32

```
typedef uint32_t BUInt32
```

8.181.2.8 BInt64

```
typedef int64_t BInt64
```

8.181.2.9 BUInt64

```
typedef uint64_t BUInt64
```

8.181.2.10 BFloat32

```
typedef float BFloat32
```

8.181.2.11 BFloat64

```
typedef double BFloat64
```

8.181.2.12 BChar

```
typedef char BChar
```

8.181.2.13 BInt

```
typedef BInt32 BInt
```

8.181.2.14 BUInt

```
typedef BUInt32 BUInt
```

8.181.2.15 BFloat

```
typedef BFloat32 BFloat
```

8.181.2.16 BDouble

```
typedef BFloat64 BDouble
```

8.181.2.17 BSize

```
typedef size_t BSize
```

8.181.2.18 BArrayFloat

```
typedef std::vector<BFloat32> BArrayFloat
```

8.181.2.19 BArrayDouble

```
typedef std::vector<BFloat64> BArrayDouble
```

8.181.2.20 BTimeout

```
typedef BUInt32 BTimeout
```

8.181.3 Enumeration Type Documentation

8.181.3.1 BEventType

```
enum BEventType
```

Enumerator

BEventTypeNone	
BEventTypeError	
BEventTypeRead	
BEventTypeReadLine	
BEventTypeWrite	
BEventTypeConnect	
BEventTypeDisconnect	
BEventTypeClientConnect	
BEventTypeClientDisconnect	

8.181.3.2 BEventWaitSet

enum BEventWaitSet

Enumerator

BEventWaitNone	
BEventWaitError	
BEventWaitRead	
BEventWaitReadLine	
BEventWaitWrite	
BEventWaitConnect	
BEventWaitDisconnect	
BEventWaitClientConnect	
BEventWaitClientDisconnect	
BEventWaitAny	

8.181.3.3 BType

enum BType

Enumerator

BTypeNone	
BTypeBool	
BTypeInt8	
BTypeUInt8	
BTypeInt16	
BTypeUInt16	
BTypeInt32	
BTypeUInt32	
BTypeInt64	
BTypeUInt64	
BTypeFloat32	
BTypeFloat64	
BTypeChar	
BTypeString	
BTypeError	
BTypeTime	
BTypeTimeUs	
BTypeObj	

8.181.3.4 BTypeComp

enum BTypeComp

Enumerator

BTypeCompSingle	
BTypeCompArray	
BTypeCompArrayFixed	
BTypeCompList	
BTypeCompDict	

8.181.4 Function Documentation

8.181.4.1 timeoutTicks()

```
BTimeout timeoutTicks (
            BTimeout timeoutUs )  [inline]
```

8.181.4.2 byteSwap8()

```
void byteSwap8 (
            void * d,
            void * s )  [inline]
```

8.181.4.3 byteSwap16()

```
void byteSwap16 (
            void * d,
            void * s )  [inline]
```

8.181.4.4 byteSwap32()

```
void byteSwap32 (
            void * d,
            void * s )  [inline]
```

8.181.4.5 byteSwap64()

```
void byteSwap64 (
            void * d,
            void * s )  [inline]
```

8.181.5 Variable Documentation

8.181.5.1 BTimeoutForever

```
const BTimeout BTimeoutForever = 0xFFFFFFFF
```

8.182 BTypes.h

Go to the documentation of this file.

```
1 /*****************************************************************************
2  *  BTypes.h    Basic Types
3  *  T.Barnaby,  BEAM Ltd,   1/4/05
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  *****************************************************************************
7  */
8 #ifndef BTYPES_H
9 #define BTYPES_H    1
10
11 #include <stdint.h>
12 #include <sys/types.h>
13 #include <vector>
14
15 #define BeamlibVersion  0x030100
16
17 // The standard types
18 typedef bool            Bool;
19 typedef int8_t          BInt8;
20 typedef uint8_t         BUInt8;
21 typedef int16_t         BInt16;
22 typedef uint16_t        BUInt16;
23 typedef int32_t         BInt32;
24 typedef uint32_t        BUInt32;
25 typedef int64_t         BInt64;
26 typedef uint64_t        BUInt64;
27 typedef float           BFloat32;
28 typedef double          BFloat64;
29 typedef char            BChar;
30
31 // Generic
32 typedef BInt32            BInt;
33 typedef BUInt32          BUInt;
34 typedef BFloat32        BFloat;
35 typedef BFloat64        BDouble;
36 typedef size_t          BSize;
37 typedef std::vector<BFloat32>   BArrayFloat;
38 typedef std::vector<BFloat64>   BArrayDouble;
39
40 // Events
41 enum BEventType           { BEventTypeNone, BEventTypeError, BEventTypeRead, BEventTypeReadLine,
       BEventTypeWrite, BEventTypeConnect, BEventTypeDisconnect, BEventTypeClientConnect,
       BEventTypeClientDisconnect };
42 enum BEventWaitSet     { BEventWaitNone = 0x00, BEventWaitError = 0x01, BEventWaitRead = 0x02,
       BEventWaitReadLine = 0x04, BEventWaitWrite = 0x08, BEventWaitConnect = 0x10, BEventWaitDisconnect =
       0x20, BEventWaitClientConnect = 0x40, BEventWaitClientDisconnect = 0x80, BEventWaitAny = 0xFFFFFFFF
       };
43
44 // Timeouts
45 typedef BUInt32          BTimeout;
46 const BTimeout  BTimeoutForever = 0xFFFFFFFF;        // Forever timeout
47
```

```
48 // Convert timeout to system ticks. Note system tick rate hard coded as ms
49 inline BTimeout timeoutTicks(BTimeout timeoutUs){
50     if(timeoutUs == BTimeoutForever)
51         return timeoutUs;
52     else
53         return timeoutUs / 1000;
54 }
55
56 // Byte swap routines
57 inline void byteSwap8(void* d, void* s){
58     char*   dp = (char*)d;
59     char*   sp = (char*)s;
60
61     *dp = *sp;
62 }
63 inline void byteSwap16(void* d, void* s){
64     char*   dp = (char*)d;
65     char*   sp = (char*)s;
66
67     dp[1] = sp[0];
68     dp[0] = sp[1];
69 }
70 inline void byteSwap32(void* d, void* s){
71     char*   dp = (char*)d;
72     char*   sp = (char*)s;
73
74     dp[3] = sp[0];
75     dp[2] = sp[1];
76     dp[1] = sp[2];
77     dp[0] = sp[3];
78 }
79 inline void byteSwap64(void* d, void* s){
80     char*   dp = (char*)d;
81     char*   sp = (char*)s;
82
83     dp[7] = sp[0];
84     dp[6] = sp[1];
85     dp[5] = sp[2];
86     dp[4] = sp[3];
87     dp[3] = sp[4];
88     dp[2] = sp[5];
89     dp[1] = sp[6];
90     dp[0] = sp[7];
91 }
92
94 class BDataChunk {
95 public:
96         BDataChunk(void* data = 0, BUInt size = 0) : data(data), size(size){}
97     void*   data;
98     BUInt  size;
99 };
100
101 // BObj member information
102 enum BType { BTypeNone, BTypeBool, BTypeInt8, BTypeUInt8, BTypeInt16, BTypeUInt16, BTypeInt32,
       BTypeUInt32, BTypeInt64, BTypeUInt64, BTypeFloat32, BTypeFloat64, BTypeChar, BTypeString, BTypeError,
       BTypeTime, BTypeTimeUs, BTypeObj = 100 };
103 enum BTypeComp { BTypeCompSingle, BTypeCompArray, BTypeCompArrayFixed, BTypeCompList, BTypeCompDict };
104
106 struct BObjMember {
107     BType      type;
108     BTypeComp  typeComp;
109     BUInt16      dataOffset;
110     BUInt16      size;
111     const char* typeName;
112     const char* name;
113 };
114
115 #endif
```

8.183 BUrl.cpp File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <memory.h>
#include <BUrl.h>
#include <curl/curl.h>
```

8.184 BUrl.h File Reference

```
#include <stdio.h>
#include <BString.h>
#include <BError.h>
```

Classes

- class BUrl

  Access to a Url.

8.185 BUrl.h

Go to the documentation of this file.

```
1 /**************************************************************************
2  *  BUrl.h      BEAM BUrl access class
3  *  T.Barnaby,  BEAM Ltd,   12/11/02
4  *  Copyright (c) 2022 All Right Reserved, Beam Ltd, https://www.beam.ltd.uk
5  *  For license see LICENSE.txt at the root of the beamlib source tree.
6  **************************************************************************
7  */
8 #ifndef BURL_H
9 #define BURL_H  1
10
11 #include    <stdio.h>
12 #include    <BString.h>
13 #include    <BError.h>
14
16 class BUrl {
17 public:
18             BUrl();
19             ~BUrl();
20
21     BError        readString(BString url, BString& str);
22 private:
23     static int  oinit;
24     static size_t   writeData(void* data, size_t size, size_t elSize, void* stream);
25
26     BString      ores;
27 };
28
29 #endif
```

8.186 /src/bdev3/beamlib/doc/overview.dox File Reference

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