

CICS Transaction Server for z/OS  
Version 5 Release 6

*C++ OO Class Libraries*





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## About this PDF

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This PDF describes how to use the CICS C++ foundation classes, which allow an application programmer to access CICS services that are available via the EXEC CICS API.

For details of the terms and notation used, see [Conventions and terminology used in the CICS documentation](#) in IBM Knowledge Center.

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# Chapter 1. Installation and setup

This section describes the CICS foundation classes installed on your CICS server.

## Getting ready for object oriented CICS

You must be familiar with object oriented concepts and technology, the C++ language and with CICS in order to understand the topics that follow.

This is not intended to be an introduction to any of these subjects.

## Installed contents

The CICS foundation classes package consists of several files or data sets.

The CICS foundation classes package consists of several files or data sets. These contain the:

- header files
- executables (DLL's)
- samples
- other CICS Transaction Server for z/OS files

This section describes the files that comprise the CICS C++ Foundation Classes and explains where you can find them on your CICS server.

## Header files

The header files are the C++ class definitions needed to compile CICS C++ Foundation Class programs.

C++ Header File	Classes Defined in this Header
ICCABDEH	IccAbendData
ICCBASEH	IccBase
ICCBUFEH	IccBuf
ICCCLKEH	IccClock
ICCCNDEH	IccCondition (struct)
ICCCONEH	IccConsole
ICCCTLEH	IccControl
ICCDATEH	IccDataQueue
ICCEH	see <a href="#">“1” on page 2</a>
ICCEVTEH	IccEvent
ICCEXCEH	IccException
ICCFILEH	IccFile
ICCFLIEH	IccFileIterator
ICCGLBEH	Icc (struct) (global functions)
ICCJRNEH	IccJournal
ICCMSGEH	IccMessage
ICCPRGEH	IccProgram
ICCRECEH	IccRecordIndex, IccKey, IccRBA and IccRRN



C++ Header File	Classes Defined in this Header
ICCRESEH	IccResource
ICCRIDEH	IccResourceId + subclasses (such as IccConvId)
ICCSEMEH	IccSemaphore
ICCSESEH	IccSession
ICCSRQEH	IccStartRequestQ
ICCSYSEH	IccSystem
ICCTIMEH	IccTime, IccAbsTime, IccTimeInterval, IccTimeOfDay
ICCTMDEH	IccTerminalData
ICCTMPEH	IccTempStore
ICCTRMEH	IccTerminal
ICCTSKEH	IccTask
ICCUSREH	IccUser
ICCVALEH	IccValue (struct)

**Note:**

1. A single header that #includes all the listed header files is supplied as ICCEH
2. The file ICCMAIN is also supplied with the C++ header files. This contains the **main** function stub that should be used when you build a Foundation Class program.
3. Header files are located in CICSTS56.CICS.SDFHC370.

**Location**

PDS: CICSTS56.CICS.SDFHC370.

## Dynamic link library

The Dynamic Link Library is the runtime environment that is needed to support a CICS C++ Foundation Class program.

**Location**

ICCFCDLL module in PDS: CICSTS56.CICS.SDFHLOAD.

## Sample source code

The samples are provided to help you understand how to use the classes to build object oriented applications.

**Location**

PDS: CICSTS56.CICS.SDFHSAMP.

### Running the sample applications

If you have installed the resources defined in the member DFHCURDS, you should be ready to run some of the sample applications.

The sample programs are supplied as source code in library CICSTS56.CICS.SDFHSAMP and before you can run the sample programs, you need to compile, pre-link and link them. To do this, use the procedure ICCFCCL in data set CICSTS56.CICS.SDFHPROC.



ICCFCL contains the Job Control Language needed to compile, pre-link and link a CICS user application. Before using ICCFCL you may find it necessary to perform some customization to conform to your installation standards. See also [Compiling programs](#).

Sample programs such as ICC\$BUF, ICC\$CLK and ICC\$HEL require no additional CICS resource definitions, and should now execute successfully.

Other sample programs, in particular the DTP samples named ICC\$SES1 and ICC\$SES2, require additional CICS resource definitions. Refer to the prologues in the source of the sample programs for information about these additional requirements.

## **Other data sets for CICS Transaction Server for z/OS**

CICSTS56.CICS.SDFHSDCK contains the member

- ICCFCIMP - 'sidedeck' containing import control statements

CICSTS56.CICS.SDFHPROC contains the members

- ICCFCC - JCL to compile a CFC user program
- ICCFCCL - JCL to compile, prelink and link a CFC user program
- ICCFCGL - JCL to compile and link an XPLINK program that uses CFC libraries.
- ICCFCL - JCL to prelink and link a CFC user program

CICSTS56.CICS.SDFHLOAD contains the members

- DFHCURDS - program definitions required for CICS system definition.
- DFHCURDI - program definitions required for CICS system definition.







---

## Chapter 2. Using the CICS foundation classes

This section describes the CICS foundation classes and how to use them. There is a formal listing of the user interface in [Foundation Classes: reference](#).

### C++ Objects

This section describes how to create, use, and delete objects.

This section describes how to create, use, and delete objects. In our context an object is an instance of a class. An object cannot be an instance of a base or abstract base class. It is possible to create objects of all the concrete (non-base) classes described in the reference part of this book.

### Creating an object

If a class has a constructor it is executed when an object of that class is created. This constructor typically initializes the state of the object. Foundation Classes' constructors often have mandatory positional parameters that the programmer must provide at object creation time.

C++ objects can be created in one of two ways:

1. Automatically, where the object is created on the C++ stack. For example:

```
{
  ClassX objX
  ClassY objY(parameter1);
} //objects deleted here
```

Here, objX and objY are automatically created on the stack. Their lifetime is limited by the context in which they were created; when they go out of scope they are automatically deleted (that is, their destructors run and their storage is released).

2. Dynamically, where the object is created on the C++ heap. For example:

```
{
  ClassX* pObjX = new ClassX;
  ClassY* pObjY = new ClassY(parameter1);
} //objects NOT deleted here
```

Here we deal with pointers to objects instead of the objects themselves. The lifetime of the object outlives the scope in which it was created. In the previous sample the pointers (pObjX and pObjY) are 'lost' as they go out of scope but the objects they pointed to still exist! The objects exist until they are explicitly deleted as shown here:

```
{
  ClassX* pObjX = new ClassX;
  ClassY* pObjY = new ClassY(parameter1);
  :
  pObjX->method1();
  pObjY->method2();
  :
  delete pObjX;
  delete pObjY;
}
```

Most of the samples in this book use automatic storage. You are **advised** to use automatic storage, because you do not have to remember to explicitly delete objects, but you are free to use either style for CICS C++ Foundation Class programs. For more information on Foundation Classes and storage management see [“Storage management” on page 41](#).



## Using an object

Any of the class public methods can be called on an object of that class.

Any of the class public methods can be called on an object of that class. The following example creates object *obj* and then calls method **doSomething** on it:

```
ClassY obj("TEMP1234");  
obj.doSomething();
```

Alternatively, you can do this using dynamic object creation:

```
ClassY* pObj = new ClassY("parameter1");  
pObj->doSomething();
```

## Deleting an object

When an object is destroyed its destructor function, which has the same name as the class preceded with ~(tilde), is automatically called. (You cannot call the destructor explicitly).

If the object was created automatically it is automatically destroyed when it goes out of scope.

If the object was created dynamically it exists until an explicit **delete** operator is used.

## Overview of the foundation classes

This topic is a formal introduction to what the Foundation Classes can do for you.

See [ICC\\$HEL: C++ Hello World sample](#) for a simple example to get you started. The section takes a brief look at the CICS C++ Foundation Class library by considering the categories in turn.

See [Foundation classes reference](#) for more detailed information on the Foundation Classes.

Every class that belongs to the CICS Foundation Classes is prefixed by **Icc**.

## Base classes

All classes inherit, directly or indirectly, from **IccBase**.

```
IccBase  
  IccRecordIndex  
  IccResource  
  IccControl  
  IccTime  
  IccResourceId
```

*Figure 1. Base classes*

All resource identification classes, such as **IccTermId**, and **IccTransId**, inherit from **IccResourceId** class. These are typically CICS table entries.

All CICS resources—in fact any class that needs access to CICS services—inherit from **IccResource** class.

Base classes enable common interfaces to be defined for categories of class. They are used to create the foundation classes, as provided by IBM, and they can be used by application programmers to create their own derived classes.

### **IccBase**

The base for every other foundation class. It enables memory management and allows objects to be interrogated to discover which type they are.



**IccControl**

The abstract base class that the application program has to subclass and provide with an implementation of the **run** method.

**IccResource**

The base class for all classes that access CICS resources or services. See [“Resource classes” on page 8](#).

**IccResourceId**

The base class for all table entry (resource name) classes, such as **IccFileId** and **IccTempStoreId**.

**IccTime**

The base class for the classes that store time information: **IccAbsTime** , **IccTimeInterval** and **IccTimeOfDay**.

**Resource identification classes**

Resource identification classes are as follows.

```

IccBase
  IccResourceId
  IccConvId
  IccDataQueueId
  IccFileId
  IccGroupId
  IccJournalId
  IccJournalTypeId
  IccLockId
  IccPartnerId
  IccProgramId
  IccRequestId
  IccAlarmRequestId
  IccSysId
  IccTempStoreId
  IccTermId
  IccTPNameId
  IccTransId
  IccUserId

```

*Figure 2. Resource identification classes*

CICS resource identification classes define CICS resource identifiers – typically the name of the resource as specified in its RDO resource definition. For example an **IccFileId** object represents a CICS file name. All concrete resource identification classes have the following properties:

- The name of the class ends in **Id**.
- The class is a subclass of the **IccResourceId** class.
- The constructors check that any supplied resource identifier meets CICS standards. For example, an **IccFileId** object must contain a 1 to 8 byte character field; providing a 9-byte field is not tolerated.

The resource identification classes improve type checking; methods that expect an **IccFileId** object as a parameter do not accept an **IccProgramId** object instead. If character strings representing the resource names are used instead, the compiler cannot check for validity – it cannot check whether the string is a file name or a program name.

Many of the resource classes, described in [“Resource classes” on page 8](#) , contain resource identification classes. For example, an **IccFile** object contains an **IccFileId** object. You must use the resource object, not the resource identification object, to operate on a CICS resource. For example, you must use **IccFile** , rather than **IccFileId** to read a record from a file.



<b>Class</b>	<b>CICS resource</b>
IccAlarmRequestId	alarm request
IccConvId	conversation
IccDataQueueId	transient data queue
IccFileId	file
IccGroupId	group
IccJournalId	journal
IccJournalTypeId	journal type
IccLockId	(Not applicable)
IccPartnerId	APPC partner definition files
IccProgramId	program
IccRequestId	request
IccSysId	remote system
IccTempStoreId	temporary storage queue
IccTermId	terminal
IccTPNameId	remote APPC TP name
IccTransId	transaction
IccUserId	user

## Resource classes

All CICS resource classes inherit from the **IccResource** base class.

```

IccBase
  IccResource
  IccAbendData
  IccClock
  IccConsole
  IccControl
  IccDataQueue
  IccFile
  IccFileIterator
  IccJournal
  IccProgram
  IccSemaphore
  IccSession
  IccStartRequestQ
  IccSystem
  IccTask
  IccTempStore
  IccTerminal
  IccTerminalData
  IccUser

```

*Figure 3. Resource classes*

These classes model the behavior of the major CICS resources, for example:



- Terminals are modelled by **IccTerminal**.
- Programs are modelled by **IccProgram**.
- Temporary Storage queues are modelled by **IccTempStore**.
- Transient Data queues are modelled by **IccDataQueue**.

Any operation on a CICS resource may raise a CICS condition; the **condition** method of **IccResource** (see [IccResource method: condition](#) ) can interrogate it.

(Any class that accesses CICS services **must** be derived from **IccResource**).

Class	CICS resource
IccAbendData	task abend data
IccClock	CICS time and date services
IccConsole	CICS console
IccControl	control of executing program
IccDataQueue	transient data queue
IccFile	file
IccFileIterator	file iterator (browsing files)
IccJournal	user or system journal
IccProgram	program (outside executing program)
IccSemaphore	semaphore (locking services)
IccSession	session
IccStartRequestQ	start request queue; asynchronous transaction starts
IccSystem	CICS system
IccTask	current task
IccTempStore	temporary storage queue
IccTerminal	terminal belonging to current task
IccTerminalData	attributes of <b>IccTerminal</b>
IccTime	time specification
IccUser	user (security attributes)



## Support Classes

Support classes are as follows.

**IccBase**  
**IccBuf**  
**IccEvent**  
**IccException**  
**IccMessage**  
**IccRecordIndex**  
**IccKey**  
**IccRBA**  
**IccRRN**  
**IccResource**  
**IccTime**  
**IccAbsTime**  
**IccTimeInterval**  
**IccTimeOfDay**

*Figure 4. Support classes*

These classes are tools that complement the resource classes: they make life easier for the application programmer and thus add value to the object model.

Resource class	Description
IccAbsTime	Absolute time (milliseconds since January 1 1900)
IccBuf	Data buffer (makes manipulating data areas easier)
IccEvent	Event (the outcome of a CICS command)
IccException	Foundation Class exception (supports the C++ exception handling model)
IccTimeInterval	Time interval (for example, five minutes)
IccTimeOfDay	Time of day (for example, five minutes past six)

**IccAbsTime**, **IccTimeInterval** and **IccTimeOfDay** classes make it simpler for the application programmer to specify time measurements as objects within an application program. **IccTime** is a base class: **IccAbsTime**, **IccTimeInterval**, and **IccTimeOfDay** are derived from **IccTime**.

Consider method **delay** in class **IccTask**, whose signature is as follows:

```
void delay(const IccTime& time, const IccRequestId*  
reqId = 0);
```

To request a delay of 1 minute and 7 seconds (that is, a time interval) the application programmer can do this:

```
IccTimeInterval time(0, 1, 7);  
task()->delay(time);
```

**Note:** The task method is provided in class **IccControl** and returns a pointer to the application's task object.

Alternatively, to request a delay until 10 minutes past twelve (lunchtime?) the application programmer can do this:

```
IccTimeOfDay lunchtime(12, 10);  
task()->delay(lunchtime);
```



The **IccBuf** class allows easy manipulation of buffers, such as file record buffers, transient data record buffers, and COMMAREAs (for more information on **IccBuf** class see [“Buffer objects” on page 12](#)).

**IccMessage** class is used primarily by **IccException** class to encapsulate a description of why an exception was thrown. The application programmer can also use **IccMessage** to create their own message objects.

**IccException** objects are thrown from many of the methods in the Foundation Classes when an error is encountered.

The **IccEvent** class allows a programmer to gain access to information relating to a particular CICS event (command).

## Using CICS resources

To use a CICS resource, such as a file or program, you must first create an appropriate object and then call methods on the object.

### Creating a resource object

When you create a resource object you create a representation of the actual CICS resource (such as a file or program). You do not create the CICS resource; the object is the application's view of the resource. The same is true of destroying objects.

Use an accompanying resource identification object when creating a resource object. For example:

```
IccFileId id("XYZ123");  
IccFile file(id);
```

This allows the C++ compiler to protect you against doing something wrong such as:

```
IccDataQueueId id("WXYZ");  
IccFile file(id); //gives error at compile time
```

The alternative of using the text name of the resource when creating the object is also permitted:

```
IccFile file("XYZ123");
```

### Singleton classes

Many resource classes, such as **IccFile**, can be used to create multiple resource objects within a single program.

```
IccFileId id1("File1");  
IccFileId id2("File2");  
IccFile file1(id1);  
IccFile file2(id2);
```

However, some resource classes are designed to allow the programmer to create only **one** instance of the class; these are called singleton classes. The following Foundation Classes are singleton:

- **IccAbendData** provides information about task abends.
- **IccConsole**, or a derived class, represents the system console for operator messages.
- **IccControl**, or a derived class, such as **IccUserControl**, controls the executing program.
- **IccStartRequestQ**, or a derived class, allows the application program to start CICS transactions (tasks) asynchronously.
- **IccSystem**, or a derived class, is the application view of the CICS system in which it is running.
- **IccTask**, or a derived class, represents the CICS task under which the executing program is running.
- **IccTerminal**, or a derived class, represents your task's terminal, provided that your principal facility is a 3270 terminal.

Any attempt to create more than one object of a singleton class results in an error – a C++ exception is thrown.



A class method, **instance**, is provided for each of these singleton classes, which returns a pointer to the requested object and creates one if it does not already exist. For example:

```
IccControl* pControl = IccControl::instance();
```

### Calling methods on a resource object

Any of the public methods can be called on an object of that class.

For example:

```
IccTempStoreId id("TEMP1234");  
IccTempStore temp(id);  
temp.writeItem("Hello TEMP1234");
```

Method **writeItem** writes the contents of the string it is passed ("Hello TEMP1234") to the CICS Temporary Storage queue "TEMP1234".

## Buffer objects

The Foundation Classes make extensive use of **IccBuf** objects – buffer objects that simplify the task of handling pieces of data or records.

Understanding the use of these objects is a necessary precondition for much of the rest of this book.

Each of the CICS Resource classes that involve passing data to CICS (for example by writing data records) and getting data from CICS (for example by reading data records) make use of the **IccBuf** class. Examples of such classes are **IccConsole**, **IccDataQueue**, **IccFile**, **IccFileIterator**, **IccJournal**, **IccProgram**, **IccSession**, **IccStartRequestQ**, **IccTempStore**, and **IccTerminal**.

### IccBuf class

**IccBuf**, which is described in detail in the reference part of this book, provides generalized manipulation of data areas.

Because it can be used in a number of ways, there are several **IccBuf** constructors that affect the behavior of the object. Two important attributes of an **IccBuf** object are now described.

#### Data area ownership

**IccBuf** has an attribute indicating whether the data area has been allocated inside or outside of the object.

The possible values of this attribute are 'internal' and 'external'. It can be interrogated by using the **dataAreaOwner** method.

#### *Internal/External ownership of buffers*

When **DataAreaOwner** = external, it is the application programmer's responsibility to ensure the validity of the storage on which the **IccBuf** object is based. If the storage is invalid or inappropriate for a particular method applied to the object, unpredictable results will occur.

#### Data area extensibility

This attribute defines whether the length of the data area within the **IccBuf** object, once created, can be increased.

The possible values of this attribute are 'fixed' and 'extensible'. It can be interrogated by using the **dataAreaType** method.

As an object that is 'fixed' cannot have its data area size increased, the length of the data (for example, a file record) assigned to the **IccBuf** object must not exceed the data area length, otherwise a C++ exception is thrown.

**Note:** By definition, an 'extensible' buffer *must* also be 'internal'.



## IccBuf constructors

There are several forms of the **IccBuf** constructor, used when creating **IccBuf** objects.

Some examples are shown here.

```
IccBuf buffer;
```

This creates an 'internal' and 'extensible' data area that has an initial length of zero. When data is assigned to the object the data area length is automatically extended to accommodate the data being assigned.

```
IccBuf buffer(50);
```

This creates an 'internal' and 'extensible' data area that has an initial length of 50 bytes. The data length is zero until data is assigned to the object. If 50 bytes of data are assigned to the object, both the data length and the data area length return a value of 50. When more than 50 bytes of data are assigned into the object, the data area length is automatically (that is, without further intervention) extended to accommodate the data.

```
IccBuf buffer(50, IccBuf::fixed);
```

This creates an 'internal' and 'fixed' data area that has a length of 50 bytes. If an attempt is made to assign more than 50 bytes of data into the object, the data is truncated and an exception is thrown to notify the application of the error situation.

```
struct MyRecordStruct
{
    short id;
    short code;
    char data(30);
    char rating;
};
MyRecordStruct myRecord;
IccBuf buffer(sizeof(MyRecordStruct), &myRecord);
```

This creates an **IccBuf** object that uses an 'external' data area called myRecord. By definition, an 'external' data area is also 'fixed'. Data can be assigned using the methods on the **IccBuf** object or using the myRecord structure directly.

```
IccBuf buffer("Hello World");
```

This creates an 'internal' and 'extensible' data area that has a length equal to the length of the string "Hello World". The string is copied into the object's data area. This initial data assignment can then be changed using one of the manipulation methods (such as **insert** , **cut** , or **replace** ) provided.

```
IccBuf buffer("Hello World");
buffer << " out there";
IccBuf buffer2(buffer);
```

Here the copy constructor creates the second buffer with almost the same attributes as the first; the exception is the data area ownership attribute – the second object always contains an 'internal' data area that is a copy of the data area in the first. In the given example buffer2 contains "Hello World out there" and has both data area length and data length of 21.

## IccBuf methods

An **IccBuf** object can be manipulated using a number of supplied methods; for example you can append data to the buffer, change the data in the buffer, cut data out of the buffer, or insert data into the middle of the buffer.

The operators **const char\*** , **=** , **+=** , **==** , **!=** , and **<<** have been overloaded in class **IccBuf** . There are also methods that allow the **IccBuf** attributes to be queried. For more details see the reference section.



## Working with **IccResource** subclasses

To illustrate working with **IccResource** subclasses, consider writing a queue item to CICS temporary storage using **IccTempstore** class.

```
IccTempStore store("TEMP1234");  
IccBuf buffer(50);
```

The **IccTempStore** object created is the application's view of the CICS temporary storage queue named "TEMP1234". The **IccBuf** object created holds a 50-byte data area (it also happens to be 'extensible').

```
buffer = "Hello Temporary Storage Queue";  
store.writeItem(buffer);
```

The character string "Hello Temporary Storage Queue" is copied into the buffer. This is possible because the **operator=** method has been overloaded in the **IccBuf** class.

The **IccTempStore** object calls its **writeItem** method, passing a reference to the **IccBuf** object as the first parameter. The contents of the **IccBuf** object are written out to the CICS temporary storage queue.

Now consider the inverse operation, reading a record from the CICS resource into the application program's **IccBuf** object:

```
buffer = store.readItem(5);
```

The **readItem** method reads the contents of the fifth item in the CICS Temporary Storage queue and returns the data as an **IccBuf** reference.

The C++ compiler resolves the given line of code into two method calls, **readItem** defined in class **IccTempStore** and **operator=** which has been overloaded in class **IccBuf**. This second method takes the contents of the returned **IccBuf** reference and copies its data into the buffer.

The given style of reading and writing records using the foundation classes is typical. The final example shows how to write code – using a similar style to the above example – but this time accessing a CICS transient data queue.

```
IccDataQueue queue("DATQ");  
IccBuf buffer(50);  
buffer = queue.readItem();  
buffer << "Some extra data";  
queue.writeItem(buffer);
```

The **readItem** method of the **IccDataQueue** object is called, returning a reference to an **IccBuf** which it then assigns (via **operator=** method, overloaded in class **IccBuf**) to the **buffer** object. The character string – "Some extra data" – is appended to the buffer (via **operator chevron «** method, overloaded in class **IccBuf**). The **writeItem** method then writes back this modified buffer to the CICS transient data queue.

You can find further examples of this syntax in the samples presented in the following sections, which describe how to use the foundation classes to access CICS services.

Refer to the reference section for further information on the **IccBuf** class. You might also find the supplied sample – ICC\$BUF – helpful.

## Using CICS Services

This section describes how to use CICS services. The services are considered in turn.

### File control

The file control classes **IccFile**, **IccFileId**, **IccKey**, **IccRBA**, and **IccRRN** allow you to read, write, update and delete records in files.

In addition, **IccFileIterator** class allows you to browse through all the records in a file.



An **IccFile** object is used to represent a file. It is convenient, but not necessary, to use an **IccFileId** object to identify a file by name.

An application program reads and writes its data in the form of individual records. Each read or write request is made by a method call. To access a record, the program must identify both the file and the particular record.

VSAM (or VSAM-like) files are of the following types:

#### **KSDS**

Key-sequenced: each record is identified by a key – a field in a predefined position in the record. Each key must be unique in the file.

The logical order of records within a file is determined by the key. The physical location is held in an index which is maintained by VSAM.

When browsing, records are found in their logical order.

#### **ESDS**

Entry-sequenced: each record is identified by its relative byte address (RBA).

Records are held in an ESDS in the order in which they were first loaded into the file. New records are always added at the end and records may not be deleted or have their lengths altered.

When browsing, records are found in the order in which they were originally written.

#### **RRDS file**

Relative record: records are written in fixed-length slots. A record is identified by the relative record number (RRN) of the slot which holds it.

#### **Reading records**

A read operation uses two classes – **IccFile** to perform the operation and one of **IccKey**, **IccRBA**, and **IccRRN** to identify the particular record, depending on whether the file access type is KSDS, ESDS, or RRDS.

The **readRecord** method of **IccFile** class reads the record.

#### *Reading KSDS records*

Before reading a record you must use the **registerRecordIndex** method of **IccFile** to associate an object of class **IccKey** with the file.

You must use a key, held in the **IccKey** object, to access records. A 'complete' key is a character string of the same length as the physical file's key. Every record can be separately identified by its complete key.

A key can also be 'generic'. A generic key is shorter than a complete key and is used for searching for a set of records. The **IccKey** class has methods that allow you to set and change the key.

**IccFile** class has methods **isReadable**, **keyLength**, **keyPosition**, **recordIndex**, and **recordLength**, which help you when reading KSDS records.

#### *Reading ESDS records*

You must use a relative byte address (RBA) held in an **IccRBA** object to access the beginning of a record.

Before reading a record you must use the **registerRecordIndex** method of **IccFile** to associate an object of class **IccRBA** with the file.

**IccFile** class has methods **isReadable**, **recordFormat**, **recordIndex**, and **recordLength** that help you when reading ESDS records.



### *Reading RRDS records*

You must use a relative record number (RRN) held in an **IccRRN** object to access a record.

Before reading a record you must use **registerRecordIndex** method of **IccFile** to associate an object of class **IccRRN** with the file.

**IccFile** class has methods **isReadable** , **recordFormat** , **recordIndex** , and **recordLength** which help you when reading RRDS records.

### **Writing records**

Writing records is also known as "adding records".

This topic describes writing records that have not previously been written. Writing records that already exist is not permitted unless they have been previously been put into 'update' mode. See [“Updating records” on page 16](#) for more information.

Before writing a record you must use **registerRecordIndex** method of **IccFile** to associate an object of class **IccKey** , **IccRBA** , or **IccRRN** with the file. The **writeRecord** method of **IccFile** class writes the record.

A write operation uses two classes – **IccFile** to perform the operation and one of **IccKey** , **IccRBA** , and **IccRRN** to identify the particular record, depending on whether the file access type is KSDS, ESDS, or RRDS.

If you have more than one record to write, you can improve the speed of writing by using mass insertion of data. You begin and end this mass insertion by calling the **beginInsert** and **endInsert** methods of **IccFile**.

### *Writing KSDS records*

You must use a key, held in an **IccKey** object to access records.

A 'complete' key is a character string that uniquely identifies a record. Every record can be separately identified by its complete key.

The **writeRecord** method of **IccFile** class writes the record.

**IccFile** class has methods **isAddable** , **keyLength** , **keyPosition** , **recordIndex** , **recordLength** , and **registerRecordIndex** which help you when writing KSDS records.

### *Writing ESDS records*

You must use a relative byte address (RBA) held in an **IccRBA** object to access the beginning of a record.

**IccFile** class has methods **isAddable** , **recordFormat** , **recordIndex** , **recordLength** , and **registerRecordIndex** that help you when writing ESDS records.

### *Writing RRDS records*

Use the **writeRecord** method to add a new ESDS record.

**IccFile** class has methods **isAddable** , **recordFormat** , **recordIndex** , **recordLength** , and **registerRecordIndex** that help you when writing RRDS records.

### **Updating records**

Updating a record is also known as "rewriting a record".

Before updating a record you must first read it, using **readRecord** method in 'update' mode. This locks the record so that nobody else can change it.

Use **rewriteRecord** method to update the record. Note that the **IccFile** object remembers which record is being processed and this information is not passed in again.

For an example, see [code fragment: "Read record for update"](#).



The base key in a KSDS file must not be altered when the record is modified. If the file definition allows variable-length records, the length of the record can be changed.

The length of records in an ESDS, RRDS, or fixed-length KSDS file must not be changed on update.

For a file defined to CICS as containing fixed-length records, the length of record being updated must be the same as the original length. The length of an updated record must not be greater than the maximum defined to VSAM.

### Deleting records

Records can never be deleted from an ESDS file.

#### *Deleting normal records*

The **deleteRecord** method of **IccFile** class deletes one or more records, provided they are not locked by virtue of being in 'update' mode.

The records to be deleted are defined by the **IccKey** or **IccRRN** object.

#### *Deleting locked records*

The **deleteLockedRecord** method of **IccFile** class deletes a record which has been previously locked by virtue of being put in 'update' mode by the **readRecord** method.

### Browsing records

Browsing, or sequential reading of files uses another class – **IccFileIterator** .

An object of this class must be associated with an **IccFile** object and an **IccKey** , **IccRBA** , or **IccRRN** object. After this association has been made the **IccFileIterator** object can be used without further reference to the other objects.

Browsing can be done either forwards, using **readNextRecord** method or backwards, using **readPreviousRecord** method. The **reset** method resets the **IccFileIterator** object to point to the record specified by the **IccKey** or **IccRBA** object.

Examples of browsing files are shown in page [Code fragment "List all records in assending order of key"](#).

### Example of file control

This sample program demonstrates how to use the **IccFile** and **IccFileIterator** classes.

The source for this sample can be found in C++ sample programs , in file ICC\$FIL. Here the code is presented without any of the terminal input and output that can be found in the source file.

```
#include "icceh.hpp"
#include "iccmmain.hpp"
```

The first two lines include the header files for the Foundation Classes and the standard **main** function which sets up the operating environment for the application program.

```
const char* fileRecords[] =
{
//NAME KEY PHONE USERID
"BACH, J S 003 00-1234 BACH ",
"BEETHOVEN, L 007 00-2244 BEET ",
"CHOPIN, F 004 00-3355 CHOPIN ",
"HANDEL, G F 005 00-4466 HANDEL ",
"MOZART, W A 008 00-5577 WOLFGANG "
};
```

This defines several lines of data that are used by the sample program.

```
void IccUserControl::run()
{
```

The **run** method of **IccUserControl** class contains the user code for this example. As a terminal is to be used, the example starts by creating a terminal object and clearing the associated screen.



```

    short recordsDeleted = 0;
    IccFileId id("ICCKFILE");
    IccKey key(3,IccKey::generic);
    IccFile file( id );
    file.registerRecordIndex( &key );
    key = "00";
    recordsDeleted = file.deleteRecord();

```

The *key* and *file* objects are first created and then used to delete all the records whose key starts with "00" in the KSDS file "ICCKFILE". *key* is defined as a generic key having 3 bytes, only the first two of which are used in this instance.

```

    IccBuf buffer(40);
    key.setKind( IccKey::complete );
    for (short j = 0; j < 5; j++)
    {
        buffer = fileRecords[j];
        key.assign(3, fileRecords[j]+15);
        file.writeRecord( buffer );
    }

```

This next fragment writes all the data provided into records in the file. The data is passed by means of an **IccBuf** object that is created for this purpose. **setKind** method is used to change *key* from 'generic' to 'complete'.

The **for** loop between these calls loops round all the data, passing the data into the buffer, using the **operator=** method of **IccBuf**, and thence into a record in the file, by means of **writeRecord**. On the way the key for each record is set, using **assign**, to be a character string that occurs in the data (3 characters, starting 15 characters in).

```

    IccFileIterator fIterator( &file,
                              &key );
    key = "000";
    buffer = fIterator.readNextRecord();
    while (fIterator.condition() == IccCondition::NORMAL)
    {
        term->sendLine("- record read: [%s]",(const char*) buffer);
        buffer = fIterator.readNextRecord();
    }

```

The loop shown here lists to the terminal, using **sendLine**, all the records in ascending order of key. It uses an **IccFileIterator** object to browse the records. It starts by setting the minimum value for the key which, as it happens, does not exist in this example, and relying on CICS to find the first record in key sequence.

The loop continues until any condition other than NORMAL is returned.

```

    key = "\xFF\xFF\xFF";
    fIterator.reset( &key );
    buffer = fIterator.readPreviousRecord();
    while (fIterator.condition() == IccCondition::NORMAL)
    {
        buffer = fIterator.readPreviousRecord();
    }

```

The next loop is nearly identical to the last, but lists the records in reverse order of key.

```

    key = "008";
    buffer = file.readRecord( IccFile::update );
    buffer.replace( 4, "5678", 23);
    file.rewriteRecord( buffer );

```

This fragment reads a record for update, locking it so that others cannot change it. It then modifies the record in the buffer and writes the updated record back to the file.

```

    buffer = file.readRecord();

```

The same record is read again and sent to the terminal, to show that it has indeed been updated.



```

    return;
}

```

The end of **run** , which returns control to CICS.

See [C++ sample programs](#) for the expected output from this sample.

## Program control

This section describes how to access and use a program other than the one that is currently executing.

Program control uses **IccProgram** class, one of the resource classes.

Programs may be loaded, unloaded and linked to, using an **IccProgram** object. An **IccProgram** object can be interrogated to obtain information about the program. See [IccProgram class](#) for more details.

The example shown here shows one program calling another two programs in turn, with data passing between them via a COMMAREA. One program is assumed to be local, the second is on a remote CICS system. The programs are in two files, ICC\$PRG1 and ICC\$PRG2. See [C++ sample programs](#) for the location of these files and the expected output from these sample programs.

Most of the terminal IO in these samples has been omitted from the code that follows.

```

#include "icceh.hpp"
#include "iccmmain.hpp"
void IccUserControl::run()
{

```

The code for both programs starts by including the header files for the Foundation Classes and the stub for **main** method. The user code is located in the **run** method of the **IccUserControl** class for each program.

```

IccSysId sysId( "ICC2" );
IccProgram icc$prg2( "ICC$PRG2" );
IccProgram remoteProg( "ICC$PRG3" );
IccBuf commArea( 100, IccBuf::fixed );

```

The first program (ICC\$PRG1) creates an **IccSysId** object representing the remote region, and two **IccProgram** objects representing the local and remote programs that will be called from this program. A 100 byte, fixed length buffer object is also created to be used as a communication area between programs.

```

icc$prg2.load();
if (icc$prg2.condition() == IccCondition::NORMAL)
{
    term->sendLine( "Loaded program: %s <%s> Length=%ld Address=%x",
        icc$prg2.name(),
        icc$prg2.conditionText(),
        icc$prg2.length(),
        icc$prg2.address() );
    icc$prg2.unload();
}

```

The program then attempts to load and interrogate the properties of program ICC\$PRG2.

```

commArea = "DATA SET BY ICC$PRG1";
icc$prg2.link( &commArea );

```

The communication area buffer is set to contain some data to be passed to the first program that ICC \$PRG1 links to (ICC\$PRG2). ICC\$PRG1 is suspended while ICC\$PRG2 is run.

The called program, ICC\$PRG2, is a simple program, the gist of which is as follows:

```

IccBuf& commArea = IccControl::commArea();
commArea = "DATA RETURNED BY ICC$PRG2";
return;

```



ICC\$PRG2 gains access to the communication area that was passed to it. It then modifies the data in this communication area and passes control back to the program that called it.

The first program (ICC\$PRG1) now calls another program, this time on another system, as follows:

```
remoteProg.setRouteOption( sysId );  
commArea = "DATA SET BY ICC$PRG1";  
remoteProg.link( &commArea );
```

The **setRouteOption** requests that calls on this object are routed to the remote system. The communication area is set again (because it will have been changed by ICC\$PRG2) and it then links to the remote program (ICC\$PRG3 on system ICC2).

The called program uses CICS temporary storage but the three lines we consider are:

```
IccBuf& commArea = IccControl::commArea();  
commArea = "DATA RETURNED BY ICC$PRG3";  
return;
```

Again, the remote program (ICC\$PRG3) gains access to the communication area that was passed to it. It modifies the data in this communication area and passes control back to the program that called it.

```
return;  
};
```

Finally, the calling program itself ends and returns control to CICS.

## Starting transactions asynchronously

The **IccStartRequestQ** class enables a program to start another CICS transaction instance asynchronously (and optionally pass data to the started transaction).

The same class is used by a started transaction to gain access to the data that the task that issued the start request passed to it. Finally start requests (for some time in the future) can be cancelled.

### Starting transactions

You can use any of the following methods to establish what data will be sent to the started transaction.

- **registerData** or **setData**
- **setQueueName**
- **setReturnTermId**
- **setReturnTransId**

The actual start is requested using the **start** method.

### Accessing start data

A started transaction can access its start data by invoking the **retrieveData** method.

This method stores all the start data attributes in the **IccStartRequestQ** object such that the individual attributes can be accessed using the following methods:

- **data**
- **queueName**
- **returnTermId**
- **returnTransId**

### Cancelling unexpired start requests

Unexpired start requests (that is, start requests for some future time that has not yet been reached) can be cancelled using the **cancel** method.



### Example of starting transactions

start transaction ISR1 on terminal PEO1 on system ICC1.

CICS system	ICC1	ICC2
Transaction	ISR1/ITMP	ISR2
Program	ICC\$SRQ1/ICC\$TMP	ICC\$SRQ2
Terminal	PEO1	PEO2

This issues two start requests; the first is cancelled before it has expired. The second starts transaction ISR2 on terminal PEO2 on system ICC2. This transaction accesses its start data and finishes by starting transaction ITMP on the original terminal (PEO1 on system ICC1).

The programs and the expected output from them, can be found in [C++ sample programs](#) as files ICC\$SRQ1 and ICC\$SRQ2. Here the code is presented without the terminal IO requests.

Transaction ISR1 runs program ICC\$SRQ1 on system ICC1. Let us consider this program first:

```
#include "icceh.hpp"
#include "iccmmain.hpp"
void IccUserControl::run()
{
```

These lines include the header files for the Foundation Classes, and the **main** function needed to set up the class library for the application program. The **run** method of **IccUserControl** class contains the user code for this example.

```
    IccRequestId req1;
    IccRequestId req2("REQUEST1");
    IccTimeInterval ti(0,0,5);
    IccTermId remoteTermId("PEO2");
    IccTransId ISR2("ISR2");
    IccTransId ITMP("ITMP");
    IccBuf buffer;
    IccStartRequestQ* startQ = startRequestQ();
```

Here we are creating a number of objects:

#### **req1**

An empty **IccRequestId** object ready to identify a particular start request.

#### **req2**

An **IccRequestId** object containing the user-supplied identifier "REQUEST1".

#### **ti**

An **IccTimeInterval** object representing 0 hours, 0 minutes, and 5 seconds.

#### **remoteTermId**

An **IccTermId** object; the terminal on the remote system where we start a transaction.

#### **ISR2**

An **IccTransId** object; the transaction we start on the remote system.

#### **ITMP**

An **IccTransId** object; the transaction that the started transaction starts on this program's terminal.

#### **buffer**

An **IccBuf** object that holds start data.

Finally, the **startRequestQ** method of **IccControl** class returns a pointer to the single instance (singleton) class **IccStartRequestQ**.

```
    startQ->setRouteOption( "ICC2" );
    startQ->registerData( &buffer );
    startQ->setReturnTermId( terminal()->name() );
    startQ->setReturnTransId( ITMP );
    startQ->setQueueName( "startqnm" );
```



This code fragment prepares the start data that is passed when we issue a start request. The **setRouteOption** says we will issue the start request on the remote system, ICC2. The **registerData** method associates an **IccBuf** object that will contain the start data (the contents of the **IccBuf** object are not extracted until we issue the start request). The **setReturnTermId** and **setReturnTransId** methods allow the start requester to pass a transaction and terminal name to the started transaction. These fields are typically used to allow the started transaction to start *another* transaction (as specified) on another terminal, in this case ours.

The **setQueueName** is another piece of information that can be passed to the started transaction.

```
buffer = "This is a greeting from program
'icc$srq1'!!";
req1 = startQ->start( ISR2, &remoteTermId, &ti );
startQ->cancel( req1 );
```

Here we set the data that we pass on the start requests. We start transaction ISR2 after an interval *ti* (5 seconds). The request identifier is stored in *req1*. Before the five seconds has expired (that is, immediately) we cancel the start request.

```
req1 = startQ->start( ISR2, &remoteTermID,
&ti, &req2 );
return;
}
```

Again we start transaction ISR2 after an interval *ti* (5 seconds). This time the request is allowed to expire so transaction ISR2 is started on the remote system. Meanwhile, we end by returning control to CICS.

Let us now consider the started program, ICC\$SRQ2.

```
IccBuf buffer;
IccRequestId req("REQUESTX");
IccTimeInterval ti(0,0,5);
IccStartRequestQ* startQ = startRequestQ();
```

Here, as in ICC\$SRQ1, we create a number of objects:

#### **buffer**

An **IccBuf** object to hold the start data we were passed by our caller (ICC\$SRQ1).

#### **req**

An **IccRequestId** object to identify the start we will issue on our caller's terminal.

#### **ti**

An **IccTimeInterval** object representing 0 hours, 0 minutes, and 5 seconds.

The **startRequestQ** method of **IccControl** class returns a pointer to the singleton class **IccStartRequestQ**.

```
if ( task()->startType() != IccTask::startRequest )
{
term->sendLine(
"This program should only be started via the StartRequestQ");
task()->abend( "OOPS" );
}
```

Here we use the **startType** method of **IccTask** class to check that ICC\$SRQ2 was started by the **start** method, and not in any other way (such as typing the transaction name on a terminal). If it was not started as intended, we abend with an "OOPS" abend code.

```
startQ->retrieveData();
```

We retrieve the start data that we were passed by ICC\$SRQ1 and store within the **IccStartRequestQ** object for subsequent access.



```

    buffer = startQ->data();
    term->sendLine( "Start buffer contents = [%s]", buffer.dataArea() );
    term->sendLine( "Start queue= [%s]", startQ->queueName() );
    term->sendLine( "Start rtrn = [%s]",
    startQ->returnTransId().name());
    term->sendLine( "Start rtrm = [%s]", startQ->returnTermId().name() );

```

The start data buffer is copied into our **IccBuf** object. The other start data items (queue, returnTransId, and returnTermId) are displayed on the terminal.

```

    task()->delay( ti );

```

We delay for five seconds (that is, we sleep and do nothing).

```

    startQ->setRouteOption( "ICC1" );

```

The **setRouteOption** signals that we will start on our caller's system (ICC1).

```

    startQ->start(
    startQ->returnTransId(),startQ->returnTermId());
    return;

```

We start a transaction called ITMP (the name of which was passed by ICC\$SRQ1 in the returnTransId start information) on the originating terminal (where ICC\$SRQ1 completed as it started this transaction). Having issued the start request, ICC\$SRQ1 ends, by returning control to CICS.

Finally, transaction ITMP runs on the first terminal. This is the end of this demonstration of starting transactions asynchronously.

## Transient Data

The transient data classes, **IccDataQueue** and **IccDataQueueId**, allow you to store data in transient data queues for subsequent processing.

You can:

- Read data from a transient data queue ( **readItem** method)
- Write data to a transient data queue ( **writeItem** method)
- Delete a transient data queue ( **empty** method)

An **IccDataQueue** object is used to represent a temporary storage queue. An **IccDataQueueId** object is used to identify a queue by name. Once the **IccDataQueueId** object is initialized it can be used to identify the queue as an alternative to using its name, with the advantage of additional error detection by the C++ compiler.

The methods available in **IccDataQueue** class are similar to those in the **IccTempStore** class. For more information on these see [“Temporary storage” on page 24](#).

### Reading data

The **readItem** method is used to read items from the queue.

It returns a reference to the **IccBuf** object that contains the information.

### Writing data

The **writeItem** method of **IccDataQueue** adds a new item of data to the queue, taking the data from the buffer specified.

### Deleting queues

The **empty** method deletes all items on the queue.



### Example of managing transient data

This sample program demonstrates how to use the **IccDataQueue** and **IccDataQueueId** classes.

It can be found, along with the expected output, in [C++ sample programs](#) as file ICC\$DAT. Here the code is presented without the terminal IO requests.

```
#include "icceh.hpp"
#include "iccmmain.hpp"
```

The first two lines include the header files for the foundation classes and the standard **main** function that sets up the operating environment for the application program.

```
const char* queueItems[] =
{
    "Hello World - item 1",
    "Hello World - item 2",
    "Hello World - item 3"
};
```

This defines some buffer for the sample program.

```
void IccUserControl::run()
{
```

The **run** method of **IccUserControl** class contains the user code for this example.

```
    short itemNum =1;
    IccBuf buffer( 50 );
    IccDataQueueId id( "ICCQ" );
    IccDataQueue queue( id );
    queue.empty();
```

This fragment first creates an identification object, of type **IccDataQueueId** containing "ICCQ". It then creates an **IccDataQueue** object representing the transient data queue "ICCQ", which it empties of data.

```
    for (short i=0 ; i<3 ; i++)
    {
        buffer = queueItems[i];
        queue.writeItem( buffer );
    }
```

This loop writes the three data items to the transient data object. The data is passed by means of an **IccBuf** object that was created for this purpose.

```
    buffer = queue.readItem();
    while ( queue.condition() == IccCondition::NORMAL )
    {
        buffer = queue.readItem();
    }
```

Having written out three records we now read them back in to show they were successfully written.

```
    return;
}
```

The end of **run** , which returns control to CICS.

## Temporary storage

The temporary storage classes, **IccTempStore** and **IccTempStoreId** , allow you to store data in temporary storage queues.

You can:

- Read an item from the temporary storage queue ( **readItem** method)
- Write a new item to the end of the temporary storage queue ( **writeItem** method)



- Update an item in the temporary storage queue ( **rewriteItem** method)
- Read the next item in the temporary storage queue ( **readNextItem** method)
- Delete all the temporary data ( **empty** method)

An **IccTempStore** object is used to represent a temporary storage queue. An **IccTempStoreId** object is used to identify a queue by name. Once the **IccTempStoreId** object is initialized it can be used to identify the queue as an alternative to using its name, with the advantage of additional error detection by the C++ compiler.

The methods available in **IccTempStore** class are similar to those in the **IccDataQueue** class. For more information on these see [“Transient Data” on page 23](#).

### Reading items

The **readItem** method of **IccTempStore** reads the specified item from the temporary storage queue.

It returns a reference to the **IccBuf** object that contains the information.

### Writing items

Writing items is also known as "adding" items.

This section describes writing items that have not previously been written. Writing items that already exist can be done using the **rewriteItem** method. See [“Updating items” on page 25](#) for more information.

The **writeItem** method of **IccTempStore** adds a new item at the end of the queue, taking the data from the buffer specified. If this is done successfully, the item number of the record added is returned.

### Updating items

Updating an item is also known as "rewriting" an item.

The **rewriteItem** method of **IccTempStore** class is used to update the specified item in the temporary storage queue.

### Deleting items

You cannot delete individual items in a temporary storage queue.

To delete *all* the temporary data associated with an **IccTempStore** object use the **empty** method of **IccTempStore** class.

### Example of Temporary Storage

This sample program demonstrates how to use the **IccTempStore** and **IccTempStoreId** classes.

This program, and the expected output from it, can be found in [C++ sample programs](#) , as file ICC\$TMP. The sample is presented here without the terminal IO requests.

```
#include "icceh.hpp"
#include "iccmmain.hpp"
#include <stdlib.h>
```

The first three lines include the header files for the foundation classes, the standard **main** function that sets up the operating environment for the application program, and the standard library.

```
const char* bufferItems[] =
{
    "Hello World - item 1",
    "Hello World - item 2",
    "Hello World - item 3"
};
```

This defines some buffer for the sample program.

```
void IccUserControl::run()
{
```

The **run** method of **IccUserControl** class contains the user code for this example.



```

    short itemNum = 1;
    IccTempStoreId id("ICCSTORE");
    IccTempStore store( id );
    IccBuf buffer( 50 );
    store.empty();

```

This fragment first creates an identification object, **IccTempStoreId** containing the field "ICCSTORE". It then creates an **IccTempStore** object representing the temporary storage queue "ICCSTORE", which it empties of records.

```

    for (short j=1 ; j <= 3 ; j++)
    {
        buffer = bufferItems[j-1];
        store.writeItem( buffer );
    }

```

This loop writes the three data items to the Temporary Storage object. The data is passed by means of an **IccBuf** object that was created for this purpose.

```

    buffer = store.readItem( itemNum );
    while ( store.condition() == IccCondition::NORMAL )
    {
        buffer.insert( 9, "Modified " );
        store.rewriteItem( itemNum, buffer );
        itemNum++;
        buffer = store.readItem( itemNum );
    }

```

This next fragment reads the items back in, modifies the item, and rewrites it to the temporary storage queue. First, the **readItem** method is used to read the buffer from the temporary storage object. The data in the buffer object is changed using the **insert** method of **IccBuf** class and then the **rewriteItem** method overwrites the buffer. The loop continues with the next buffer item being read.

```

    itemNum = 1;
    buffer = store.readItem( itemNum );
    while ( store.condition() == IccCondition::NORMAL )
    {
        term->sendLine( " - record #%d = [%s]", itemNum,
            (const char*)buffer );
        buffer = store.readNextItem();
    }

```

This loop reads the temporary storage queue items again to show they have been updated.

```

    return;
}

```

The end of **run** , which returns control to CICS.

## Terminal control

The terminal control classes, **IccTerminal** , **IccTermId** , and **IccTerminalData** , allow you to send data to, receive data from, and find out information about the terminal belonging to the CICS task.

An **IccTerminal** object is used to represent the terminal that belongs to the CICS task. It can only be created if the transaction has a 3270 terminal as its principal facility. The **IccTermId** class is used to identify the terminal. **IccTerminalData** , which is owned by **IccTerminal** , contains information about the terminal characteristics.

### Sending data to a terminal

The **send** and **sendLine** methods of **IccTerminal** class are used to write data to the screen.

The **set...** methods allow you to do this. You may also want to erase the data currently displayed at the terminal, using the **erase** method, and free the keyboard so that it is ready to receive input, using the **freeKeyboard** method.



## Receiving data from a terminal

The **receive** and **receive3270data** methods of **IccTerminal** class are used to receive data from the terminal.

## Finding out information about a terminal

You can find out information about both the characteristics of the terminal and its current state.

The **data** object points to the **IccTerminalData** object that contains information about the characteristics of the terminal. The methods in **IccTerminalData** allow you to discover, for example, the height of the screen or whether the terminal supports Erase Write Alternative. Some of the methods in **IccTerminal** also give you information about characteristics, such as how many lines a screen holds.

Other methods give you information about the current state of the terminal. These include **line**, which returns the current line number, and **cursor**, which returns the current cursor position.

## Example of terminal control

This sample program demonstrates how to use the **IccTerminal**, **IccTermId**, and **IccTerminalData** classes.

This program, and the expected output from it, can be found in [C++ sample programs](#), as file ICC\$TRM.

```
#include "icceh.hpp"
#include "iccmmain.hpp"
```

The first two lines include the header files for the Foundation Classes and the standard **main** function that sets up the operating environment for the application program.

```
void IccUserControl::run()
{
    IccTerminal& term = *terminal();
    term.erase();
}
```

The **run** method of **IccUserControl** class contains the user code for this example. As a terminal is to be used, the example starts by creating a terminal object and clearing the associated screen.

```
term.sendLine( "First part of the line..." );
term.send( "... a continuation of the line." );
term.sendLine( "Start this on the next line" );
term.sendLine( 40, "Send this to column 40 of current line" );
term.send( 5, 10, "Send this to row 5, column 10" );
term.send( 6, 40, "Send this to row 6, column 40" );
```

This fragment shows how the **send** and **sendLine** methods are used to send data to the terminal. All of these methods can take **IccBuf** references (const IccBuf&) instead of string literals (const char\*).

```
term.setNewLine();
```

This sends a blank line to the screen.

```
term.setColor( IccTerminal::red );
term.sendLine( "A Red line of text." );
term.setColor( IccTerminal::blue );
term.setHighlight( IccTerminal::reverse );
term.sendLine( "A Blue, Reverse video line of text." );
```

The **setColor** method is used to set the color of the text on the screen and the **setHighlight** method to set the highlighting.



```

    term << "A cout sytle interface... " <<
endl;
term << "you can " << "chain input together; "
<< "use different types, eg numbers: " << (short)123 <<
" "
<< (long)4567890 << " " << (double)123456.7891234
<< endl;
term << "... and everything is buffered till you issue a flush."
<< flush;

```

This fragment shows how to use the iostream–like interface **endl** to start data on the next line. To improve performance, you can buffer data in the terminal until **flush** is issued, which sends the data to the screen.

```

    term.send( 24,1, "Program 'icc$trm' complete: Hit PF12
to End" );
term.waitForAID( IccTerminal::PF12 );
term.erase();

```

The **waitForAID** method causes the terminal to wait until the specified key is hit, before calling the **erase** method to clear the display.

```

    return;
}

```

The end of **run** , which returns control to CICS.

## Time and date services

The **IccClock** class controls access to the CICS time and date services.

**IccAbsTime** holds information about absolute time (the time in milliseconds that have elapsed since the beginning of 1900), and this can be converted to other forms of date and time. The methods available on **IccClock** objects and on **IccAbsTime** objects are very similar.

### Example of time and date services

This sample program demonstrates how to use **IccClock** class.

The source for this program, and the expected output from it, can be found in [C++ sample programs](#) , as file ICC\$CLK . The sample is presented here without the terminal IO requests.

```

#include "icceh.hpp"
#include "iccmmain.hpp"
void IccUserControl::run()
{

```

The first two lines include the header files for the Foundation Classes and the standard **main** function that sets up the operating environment for the application program.

The **run** method of **IccUserControl** class contains the user code for this example.

```

    IccClock clock;

```

This creates a clock object.

```

    term->sendLine( "date() = [%s]",
clock.date() );
term->sendLine( "date(DDMMYY) = [%s]",
clock.date(IccClock::DDMMYY) );
term->sendLine( "date(DDMMYY,':') = [%s]",
clock.date(IccClock::DDMMYY,':') );
term->sendLine( "date(MMDDYY) = [%s]",
clock.date(IccClock::MMDDYY) );
term->sendLine( "date(YYDDD) = [%s]",
clock.date(IccClock::YYDDD) );

```

Here the **date** method is used to return the date in the format specified by the *format* enumeration. In order the formats are system, DDMMYY, DD:MM:YY, MMDDYY and YYDDD. The character used to separate the fields is specified by the *dateSeparator* character (that defaults to nothing if not specified).



```
term->sendLine( "daysSince1900() = %ld",
clock.daysSince1900());
term->sendLine( "dayOfWeek() = %d",
clock.dayOfWeek());
if ( clock.dayOfWeek() == IccClock::Friday )
term->sendLine( 40, "Today IS Friday" );
else
term->sendLine( 40, "Today is NOT Friday" );
```

This fragment demonstrates the use of the **daysSince1900** and **dayOfWeek** methods. **dayOfWeek** returns an enumeration that indicates the day of the week. If it is Friday, a message is sent to the screen, 'Today IS Friday'; otherwise the message 'Today is NOT Friday' is sent.

```
term->sendLine( "dayOfMonth() = %d",
clock.dayOfMonth());
term->sendLine( "monthOfYear() = %d",
clock.monthOfYear());
```

This demonstrates the **dayOfMonth** and **monthOfYear** methods of **IccClock** class.

```
term->sendLine( "time() = [%s]",
clock.time() );
term->sendLine( "time('-') = [%s]",
clock.time('-') );
term->sendLine( "year() = [%ld]",
clock.year());
```

The current time is sent to the terminal, first without a separator (that is HHMMSS format), then with '-' separating the digits (that is, HH-MM-SS format). The year is sent, for example 1996.

```
return;
};
```

The end of **run** , which returns control to CICS.

## Compiling, executing, and debugging

This section describes how to compile, execute, and debug a CICS Foundation Class program.

### Compiling a CICS Foundation Class program

To compile and link a CICS Foundation Class program you need access to the program source, a compiler, header files and a dynamic link library.

You need access to the following items:

- The source of the program you are compiling

Your C++ program source code needs `#include` statements for the Foundation Class headers and the Foundation Class `main()` program stub:

```
#include "icceh.hpp"
#include "iccmmain.hpp"
```

- The IBM C++ compiler
- The Foundation Classes header files (see [Header files](#) )
- The Foundation Classes dynamic link library (DLL). The ICCFCDLL module is in CICSTS56.CICS.SDFHLOAD.

Note that, when using the Foundation Classes, you do not need to translate the "EXEC CICS " API before compile.

The following sample job statements show how to compile, prelink and link a program called ICC\$HEL :

```
//ICC$HEL JOB 1,user_name,MSGCLASS=A,CLASS=A,NOTIFY=userid
//PROCLIB JCLLIB ORDER=(
```



```

CICSTS56.CICS
.SDFHPROC)
//ICC$HEL EXEC ICCFCCL,INFILE=
indatasetname
(ICC$HEL),OUTFILE=
outdatasetname
(ICC$HEL)
//

```

## Header files

The header files are the C++ class definitions needed to compile CICS C++ Foundation Class programs.

C++ Header File	Classes Defined in this Header
ICCABDEH	IccAbendData
ICCBASEH	IccBase
ICCBUFEH	IccBuf
ICCCLKEH	IccClock
ICCCNDEH	IccCondition (struct)
ICCCONEH	IccConsole
ICCCTLEH	IccControl
ICCDATEH	IccDataQueue
ICCEH	see <a href="#">“1” on page 31</a>
ICCEVTEH	IccEvent
ICCEXCEH	IccException
ICCFILEH	IccFile
ICCFLIEH	IccFileIterator
ICCGLBEH	Icc (struct) (global functions)
ICCJRNEH	IccJournal
ICCMSGEH	IccMessage
ICCPRGEH	IccProgram
ICCRECEH	IccRecordIndex, IccKey, IccRBA and IccRRN
ICCRESEH	IccResource
ICCRIDEH	IccResourceId + subclasses (such as IccConvId)
ICCSEMEH	IccSemaphore
ICCSESEH	IccSession
ICCSRQEH	IccStartRequestQ
ICCSYSEH	IccSystem
ICCTIMEH	IccTime, IccAbsTime, IccTimeInterval, IccTimeOfDay
ICCTMDEH	IccTerminalData
ICCTMPEH	IccTempStore
ICCTRMEH	IccTerminal
ICCTSKEH	IccTask
ICCUSREH	IccUser



C++ Header File	Classes Defined in this Header
ICCVALEH	IccValue (struct)

**Note:**

1. A single header that #includes all the listed header files is supplied as ICCEH
2. The file ICCMAIN is also supplied with the C++ header files. This contains the **main** function stub that should be used when you build a Foundation Class program.
3. Header files are located in CICSTS56.CICS .SDFHC370.

## Executing Programs

To run a compiled and linked (that is, executable) Foundation Classes program you need to do the following.

1. Make the executable program available to CICS . This involves making sure the program is in a suitable directory or load library. Depending on your server, you may also need to create a CICS program definition (using CICS resource definition facilities) before you can execute the program.
2. Logon to a CICS terminal.
3. Run the program.

## Program debugging

Having successfully compiled, linked, and attempted to run your Foundation Classes program, you might need to debug it.

There are three options available to help debug a CICS Foundation Classes program:

- Use a symbolic debugger
- Run the Foundation Class Program with tracing active
- Run the Foundation Class Program with the CICS Execution Diagnostic Facility

### Symbolic debugger

You can use a symbolic debugger to step through the source of your CICS Foundation Classes program. Debug Tool is shipped as a feature with IBM C/C++. To debug a CICS Foundation Classes program with a symbolic debugger, compile the program with a flag that adds debugging information to your executable program. For CICS Transaction Server for z/OS, this flag is TEST(ALL).

For more information, see [Debug Tool for z/OS](#).

### Tracing

You can configure the CICS Foundation Classes to write a trace file for debugging purposes.

Exception tracing is always active. The CETR transaction controls the auxiliary and internal traces for all CICS programs including those developed using the C++ classes.

### Execution diagnostic facility

You can use the Execution Diagnostic Facility (EDF) to step through your CICS program, stopping at each **EXEC CICS** call. The display screen shows the procedural **EXEC CICS** call interface rather than the CICS Foundation Class type interface.

To enable EDF, use the preprocessor macro ICC\_EDF in your source code before including the file ICCMAIN.

```
#define ICC_EDF //switch EDF on
#include "iccmmain.hpp"
```



Alternatively use the appropriate flag on your compiler CPARM to declare ICC\_EDF.

## Conditions, errors, and exceptions

This section describes how the Foundation Classes have been designed to respond to various error situations they might encounter.

### Foundation Class Abend codes

For serious errors (such as insufficient storage to create an object) the Foundation Classes immediately terminate the CICS task.

All CICS Foundation Class abend codes are of the form ACLx. If your application is terminated with an abend code starting 'ACL' then please refer to [CICS messages](#).

### C++ Exceptions and the Foundation Classes

C++ exceptions are managed using the reserved words **try**, **throw**, and **catch**.

Refer to your compiler's documentation or one of the C++ books in the bibliography for more information.

Here is sample ICC\$EXC1 (see [C++ sample programs](#)):

```
#include "icceh.hpp"
#include "iccmmain.hpp"
class Test {
public:
void tryNumber( short num ) {
IccTerminal* term = IccTerminal::instance();
*term << "Number passed = " << num << endl <<
flush;
if ( num > 10 ) {
*term << ">>Out of Range - throwing exception" << endl
<< flush;
throw "!!Number is out of range!!";
}
}
};
```

The first two lines include the header files for the Foundation Classes and the standard **main** function that sets up the operating environment for the application program.

We then declare class **Test**, which has one public method, **tryNumber**. This method is implemented inline so that if an integer greater than ten is passed an exception is thrown. We also write out some information to the CICS terminal.

```
void IccUserControl::run()
{
IccTerminal* term = IccTerminal::instance();
term->erase();
*term << "This is program 'icc$exc1' ..." << endl;
try {
Test test;
test.tryNumber( 1 );
test.tryNumber( 7 );
test.tryNumber( 11 );
test.tryNumber( 6 );
}
catch( const char* exception ) {
term->setLine( 22 );
*term << "Exception caught: " << exception << endl
<< flush;
}
term->send( 24,1,"Program 'icc$exc1' complete: Hit PF12 to End" );
term->waitForAID( IccTerminal::PF12 );
term->erase();
return;
}
```

The **run** method of **IccUserControl** class contains the user code for this example.



After erasing the terminal display and writing some text, we begin our **try** block. A **try** block can scope any number of lines of C++ code.

Here we create a **Test** object and invoke our only method, **tryNumber**, with various parameters. The first two invocations (1, 7) succeed, but the third (11) causes **tryNumber** to throw an exception. The fourth **tryNumber** invocation (6) is not executed because an exception causes the program execution flow to leave the current **try** block.

We then leave the **try** block and look for a suitable **catch** block. A suitable **catch** block is one with arguments that are compatible with the type of exception being thrown (here a **char\***). The **catch** block writes a message to the CICS terminal and then execution resumes at the line after the **catch** block.

The output from this CICS program is as follows:

```
This is program 'iccc$exc1' ...
      Number passed = 1
      Number passed = 7
      Number passed = 11
      >>Out of Range - throwing exception
      Exception caught: !!Number is out of range!!
      Program 'iccc$exc1' complete: Hit PF12 to End
```

The CICS C++ Foundation Classes do not throw **char\*** exceptions as in the previous sample but they do throw **IccException** objects instead.

There are several types of **IccException**. The **type** method returns an enumeration that indicates the type. Here is a description of each type in turn.

#### **objectCreationError**

An attempt to create an object was invalid. This happens, for example, if an attempt is made to create a second instance of a singleton class, such as **IccTask**.

#### **invalidArgument**

A method was called with an invalid argument. This happens, for example, if an **IccBuf** object with too much data is passed to the **writeItem** method of the **IccTempStore** class by the application program.

It also happens when attempting to create a subclass of **IccResourceId**, such as **IccTermId**, with a string that is too long.

The following sample can be found in C++ sample programs, as file ICC\$EXC2. The sample is presented here without many of the terminal IO requests.

```
#include "icceh.hpp"
#include "icccmain.hpp"
void IccUserControl::run()
{
    try
    {
        IccTermId id1( "1234" );
        IccTermId id2( "12345" );
    }
    catch( IccException& exception )
    {
        terminal()->send( 21, 1, exception.summary() );
    }
    return;
}
```

In the previous example the first **IccTermId** object is successfully created, but the second caused an **IccException** to be thrown, because the string "12345" is 5 bytes where only 4 are allowed. See [C++ sample programs](#) for the expected output from this sample program.

#### **invalidMethodCall**

A method cannot be called. A typical reason is that the object cannot honor the call in its current state. For example, a **readRecord** call on an **IccFile** object is only honored if an **IccRecordIndex** object, to specify *which* record is to be read, has already been associated with the file.



### **CICSCondition**

A CICS condition, listed in the **IccCondition** structure, has occurred in the object and the object was configured to throw an exception.

### **familyConformanceError**

Family subset enforcement is on for this program and an operation that is not valid on all supported platforms has been attempted.

### **internalError**

The CICS foundation classes have detected an internal error. Please call service.

## **CICS conditions**

The CICS foundation classes provide a powerful framework for handling conditions that happen when executing an application.

Accessing a CICS resource can raise a number of CICS conditions as documented in [Foundation classes reference](#).

A condition might represent an error or information being returned to the calling application; the deciding factor is often the context in which the condition is raised.

The application program can handle the CICS conditions in a number of ways. Each CICS resource object, such as a program, file, or data queue, can handle CICS conditions differently, if required.

A resource object can be configured to take one of the following actions for each condition it can encounter:

### **noAction**

Manual condition handling

### **callHandleEvent**

Automatic condition handling

### **throwException**

Exception handling

### **abendTask**

Severe error handling.

### **Manual condition handling (noAction)**

This is the default action for all CICS conditions (for any resource object).

This means that the condition must be handled manually, using the **condition** method. For example:

```
IccTempStore temp("TEMP1234");
IccBuf buf(40);
temp.setActionOnCondition(IccResource::noAction,
IccCondition::QIDERR);
buf = temp.readNextItem();
switch (temp.condition())
{
case IccCondition::QIDERR:
//do whatever here
:
default:
//do something else here
}
```

### **Automatic condition handling (callHandleEvent)**

Activate this for any CICS condition, such as QIDERR, as follows.

```
IccTempStore temp("TEMP1234");
temp.setActionOnCondition(IccResource::callHandleEvent,
IccCondition::QIDERR);
```

When a call to any method on object 'temp' causes CICS to raise the QIDERR condition, **handleEvent** method is automatically called. As the **handleEvent** method is only a virtual method, this call is only



useful if the object belongs to a subclass of **IccTempStore** and the **handleEvent** method has been overridden.

Make a subclass of **IccTempStore** , declare a constructor, and override the **handleEvent** method.

```
class MyTempStore : public IccTempStore
{
public:
    MyTempStore(const char* storeName) : IccTempStore(storeName) {}
    HandleEventReturnOpt handleEvent(IccEvent& event);
};
```

Now implement the **handleEvent** method.

```
IccResource::HandleEventReturnOpt
MyTempStore::handleEvent(IccEvent& event)
{
    switch (event.condition())
    {
    case ...
    :
    case IccCondition::QIDERR:
        //Handle QIDERR condition here.
    :
    //
    default:
        return rAbendTask;
    }
}
```

This code is called for any **MyTempStore** object which is configured to 'callHandleEvent' for a particular CICS condition.

### Exception handling (throwException)

Activate this for any CICS condition, such as QIDERR, as follows.

```
IccTempStore temp("TEMP1234");
temp.setActionOnCondition(IccResource::throwException,
IccCondition::QIDERR);
```

Exception handling is by means of the C++ exception handling model using **try** , **throw** , and **catch** . For example:

```
try
{
    buf = temp.readNextItem();
    ...
}
catch (IccException& exception)
{
    //Exception handling code
    ...
}
```

An exception is thrown if any of the methods inside the try block raise the QIDERR condition for object 'temp'. When an exception is thrown, C++ unwinds the stack and resumes execution at an appropriate **catch** block – it is not possible to resume within the **try** block. For a fuller example, see sample ICC \$EXC3.

**Note:** Exceptions can be thrown from the Foundation Classes for many reasons other than this example – see [“C++ Exceptions and the Foundation Classes”](#) on page 32 for more details.

### Severe error handling (abendTask)

This option allows CICS to terminate the task when certain conditions are raised.

Activate this for any CICS condition, such as QIDERR, as follows:

```
IccTempStore temp("TEMP1234");
temp.setActionOnCondition(IccResource::abendTask,
IccCondition::QIDERR);
```



If CICS raises the QIDERR condition for object 'temp' the CICS task terminates with an ACL3 abend.

## Platform differences

The CICS Foundation Classes, as described here, are designed to be independent of the particular CICS platform on which they are running. There are however some differences between platforms; these, and ways of coping with them, are described here.

**Note:** References in this section to other CICS platforms are included for completeness. There have been Technology Releases of the CICS Foundation Classes on those platforms.

Applications can be run in one of two modes:

### **fsAllowPlatformVariance**

Applications written using the CICS Foundation Classes are able to access all the functions available on the target CICS server.

### **fsEnforce**

Applications are restricted to the CICS functions that are available across all CICS Servers ( z/OS and UNIX).

The default is to allow platform variance and the alternative is to force the application to only use features which are common to all CICS platforms.

The class headers are the same for all platforms and they "support" (that is, define) all the CICS functions that are available through the Foundation Classes on any of the CICS platforms. The restrictions on each platform are documented in [Foundation classes reference](#). Platform variations exist at:

- object level
- method level
- parameter level

### **Object level**

Some objects are not supported on certain platforms.

For example, **IccConsole** objects cannot be created on CICS(r) for AIX® as CICS(r) for AIX(r) does not support console services.

Any attempt to create an **IccConsole** object on CICS(r) for AIX(r) causes an **IccException** object of type 'platformError' to be thrown, but would be acceptable on the other platforms

```
IccConsole* cons = console(); //No good on CICS for AIX
```

If you initialize your application with 'fsEnforce' selected (see [initializeEnvironment](#) ) the previous examples both cause an **IccException** object, of type 'familyConformanceError' to be thrown on all platforms.

Unlike objects of the **IccConsole** and **IccJournal** classes, most objects can be created on any CICS server platform. However the use of the methods can be restricted. [Foundation classes reference](#) fully documents all platform restrictions.

### **Method level**

Methods that run successfully on one platform can cause a problem on another platform.

Consider, for example method **programId** in the **IccControl** class:

```
void IccUserControl::run()
{
    if (strcmp(programId.name(), "PROG1234") == 0)
        //do something
}
```

Here method **programId** executes correctly on CICS TS for z/OS but throws an **IccException** object of type 'platformError' on CICS(r) for AIX(r).



Alternatively, if you initialize your application with family subset enforcement on (see **initializeEnvironment** function of **Icc** structure), method **programId** throws an **IccException** object of type 'familyConformanceError' on *any* CICS server platform.

### Parameter level

At this level a method is supported on all platforms, but a particular positional parameter has some platform restrictions.

Consider method **abend** in **IccTask** class.

```
task()->abend();  
1  
task()->abend("WXYZ");  
2  
task()->abend("WXYZ", IccTask::respectAbendHandler);  
3  
task()->abend("WXYZ", IccTask::ignoreAbendHandler);  
4  
task()->abend("WXYZ", IccTask::ignoreAbendHandler,  
5  
IccTask::suppressDump);
```

Abends **1** to **4** run successfully on all CICS server platforms.

If family subset enforcement is off, abend **5** throws an **IccException** object of type 'platformError' on a CICS(r) for AIX(r) platform, but not on a CICS Transaction Server for z/OS platform.

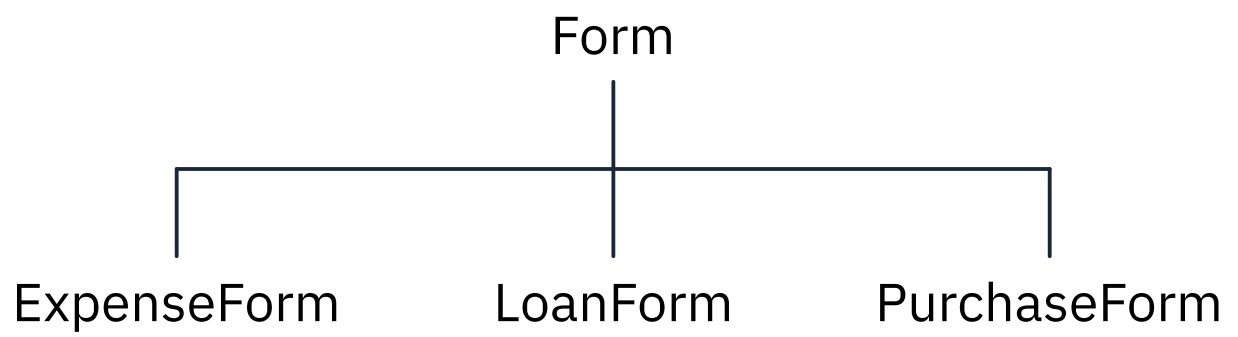
If family subset enforcement is on, abend **5** throws an **IccException** object of type 'familyConformanceError', irrespective of the target CICS platform.

## Polymorphic Behavior

Polymorphism (*poly* = many, *morphe* = form) is the ability to treat many different forms of an object as if they were the same.

Polymorphism is achieved in C++ by using inheritance and virtual functions. Consider the scenario where we have three forms (ExpenseForm, LoanForm, PurchaseForm) that are specializations of a general Form:







Each form needs printing at some time. In procedural programming, we would either code a print function to handle the three different forms or we would write three different functions (printExpenseForm, printLoanForm, printPurchaseForm).

In C++, this can be achieved far more elegantly as follows:

```
class Form {
public:
    virtual void print();
};
class ExpenseForm : public Form {
public:
    virtual void print();
};
class LoanForm : public Form {
public:
    virtual void print();
};
class PurchaseForm : public Form {
public:
    virtual void print();
};
```

Each of these overridden functions is implemented so that each form prints correctly. Now an application using form objects can do this:

```
Form* pForm[10]
//create Expense/Loan/Purchase Forms...
for (short i=0 ; i < 9 ; i++)
    pForm->print();
```

Here we create ten objects that might be any combination of Expense, Loan, and Purchase Forms. However, because we are dealing with pointers to the base class, **Form**, we do not need to know which sort of form object we have; the correct **print** method is called automatically.

Limited polymorphic behavior is available in the Foundation Classes. Three virtual functions are defined in the base class **IccResource** :

```
virtual void clear();
virtual const IccBuf& get();
virtual void put(const IccBuf&
    buffer
);
```

These methods have been implemented in the subclasses of **IccResource** wherever possible:

Class	clear	get	put
IccConsole	x	x	✓
IccDataQueue	✓	✓	✓
IccJournal	x	x	✓
IccSession	x	✓	✓
IccTempStore	✓	✓	✓
IccTerminal	✓	✓	✓

These virtual methods are **not** supported by any subclasses of **IccResource** except those in the table.

**Note:** The default implementations of **clear**, **get**, and **put** in the base class **IccResource** throw an exception to prevent the user from calling an unsupported method.



## Example of polymorphic behavior

The following sample can be found in the samples directory as file ICC\$RES2.

It is presented here without the terminal IO requests. See [C++ sample programs](#).

```
#include "icceh.hpp"
#include "iccmmain.hpp"
char* dataItems[] =
{
    "Hello World - item 1",
    "Hello World - item 2",
    "Hello World - item 3"
};
void IccUserControl::run()
{
```

Here we include Foundation Class headers and the **main** function. **dataItems** contains some sample data items. We write our application code in the **run** method of **IccUserControl** class.

```
    IccBuf buffer( 50 );
    IccResource* pObj[2];
```

We create an **IccBuf** object (50 bytes initially) to hold our data items. An array of two pointers to **IccResource** objects is declared.

```
    pObj[0] = new IccDataQueue("ICCQ");
    pObj[1] = new IccTempStore("ICCTEMPS");
```

We create two objects whose classes are derived from **IccResource** – **IccDataQueue** and **IccTempStore**.

```
    for ( short index=0; index <= 1 ; index++ )
    {
        pObj[index]->clear();
    }
```

For both objects we invoke the **clear** method. This is handled differently by each object in a way that is transparent to the application program; this is polymorphic behavior.

```
    for ( index=0; index <= 1 ; index++ )
    {
        for (short j=1 ; j <= 3 ; j++)
        {
            buffer = dataItems[j-1];
            pObj[index]->put( buffer );
        }
    }
```

Now we **put** three data items in each of our resource objects. Again the **put** method responds to the request in a way that is appropriate to the object type.

```
    for ( index=0; index <= 1 ; index++ )
    {
        buffer = pObj[index]->get();
        while (pObj[index]->condition() == IccCondition::NORMAL)
        {
            buffer = pObj[index]->get();
        }
        delete pObj[index];
    }
    return;
}
```

The data items are read back in from each of our resource objects using the **get** method. We delete the resource objects and return control to CICS.



## Storage management

C++ objects are usually stored on the stack or heap.

Objects on the stack are automatically destroyed when they go out of scope, but objects on the heap are not.

Many of the objects that the CICS Foundation Classes create internally are created on the heap rather than the stack. This can cause a problem in some CICS server environments.

On CICS Transaction Server for z/OS, CICS and Language Environment® manage all task storage so that it is released at task termination (normal or abnormal).

In a CICS for AIX environment, storage allocated on the heap is not automatically released at task termination. This can lead to "memory leaks" if the application programmer forgets to explicitly delete an object on the heap, or, more seriously, if the task abends.

This problem has been overcome in the CICS Foundation Classes by providing operators **new** and **delete** in the base Foundation Class, **IccBase**. These can be configured to map dynamic storage allocation requests to CICS task storage, so that **all** storage is automatically released at task termination. The disadvantage of this approach is a performance hit as the Foundation Classes typically issue a large number of small storage allocation requests rather than a single, larger allocation request.

This facility is affected by the **Icc::initializeEnvironment** call that must be issued before using the Foundation Classes. (This function is called from the default **main** function; see [CICS C++ main function](#).)

The first parameter passed to the **initializeEnvironment** function is an enumeration that takes one of these three values:

### **cmmDefault**

The default action is platform dependent:

#### **z/OS**

same as 'cmmNonCICS' - see the 'cmmNonCICS' section.

#### **UNIX**

same as 'cmmCICS' - see the 'cmmCICS' section.

### **cmmNonCICS**

The **new** and **delete** operators in class **IccBase** **do not** map dynamic storage allocation requests to CICS task storage; instead the C++ default **new** and **delete** operators are invoked.

### **cmmCICS**

The **new** and **delete** operators in class **IccBase** map dynamic storage allocation requests to CICS task storage (which is automatically released at normal or abnormal task termination).

The default **main** function supplied with the Foundation Classes calls **initializeEnvironment** with an enum of 'cmmDefault'. You can change this in your program without changing the supplied "header file" **ICCMAN** as follows:

```
#define ICC_CLASS_MEMORY_MGMT Icc::cmmNonCICS
#include "iccmmain.hpp"
```

Alternatively, set the option **DEV(ICC\_CLASS\_MEMORY\_MGMT)** when compiling.

## Parameter passing conventions

The convention used for passing objects on Foundation Classes method calls is if the object is mandatory, pass by reference; if it is optional pass by pointer.

For example, consider method **start** of class **IccStartRequestQ**, which has the following signature:

```
const IccRequestId& start( const IccTransId&
transId,
const IccTime* time=0,
const IccRequestId* reqId=0 );
```



Using the preceding convention, we see that an **IccTransId** object is mandatory, while an **IccTime** and an **IccRequestId** object are both optional. This enables an application to use this method in any of the following ways:

```
IccTransId trn("ABCD");
IccTimeInterval int(0,0,5);
IccRequestId req("MYREQ");
IccStartRequestQ* startQ = startRequestQ();
startQ->start( trn );
startQ->start( trn, &int );
startQ->start( trn, &int, &req );
startQ->start( trn, 0, &req );
```

## Scope of data in IccBuf reference returned from 'read' methods

Many of the subclasses of **IccResource** have 'read' methods that return **const IccBuf** references; for example, **IccFile::readRecord**, **IccTempStore::readItem** and **IccTerminal::receive**.

Care should be taken if you choose to maintain a reference to the **IccBuf** object, rather than copy the data from the **IccBuf** reference into your own **IccBuf** object. For example, consider the following

```
IccBuf buf(50);
IccTempStore store("TEMPSTOR");
buf = store.readNextItem();
```

Here, the data in the **IccBuf** reference returned from **IccTempStore::readNextItem** is *immediately* copied into the application's own **IccBuf** object, so it does not matter if the data is later invalidated. However, the application might look like this

```
IccTempStore store("TEMPSTOR");
const IccBuf& buf = store.readNextItem();
```

Here, the **IccBuf** reference returned from **IccTempStore::readNextItem** is *not* copied into the application's own storage and care must therefore be taken.

**Note:** You are recommended not to use this style of programming to avoid using a reference to an **IccBuf** object that does not contain valid data.

The returned **IccBuf** reference typically contains valid data until one of the following conditions is met:

- Another 'read' method is invoked on the **IccResource** object (for example, another **readNextItem** or **readItem** method in the example).
- The resource updates are committed (see method **IccTask::commitUOW**).
- The task ends (normally or abnormally).



---

## Chapter 3. Foundation Classes: reference

This section contains the reference information on the foundation classes and structures that are provided as part of CICS. The classes and structures are arranged in alphabetic order. All the functionality you require to create object-oriented CICS programs is included within these classes and structures.

All of the classes and structures begin with the unique prefix **Icc**. Do not create your own classes with this prefix.

**Icc** structure contains some functions and enumerations that are widely applicable. **IccValue** structure consists of a large enumeration of all the CVDA values used in traditional CICS programs.

The description of each class starts with a simple diagram that shows how it is derived from **IccBase** class, the basis of all the other classes. This is followed by a short description and an indication of the name of the header file that includes it and, where appropriate, a sample source file that uses it.

Within each class or structure description are, where appropriate, the following sections:

1. Inheritance diagram
2. Brief description of class
3. Header file where class is defined. For the location of the C++ header files on your system see [Header files](#).
4. Sample program demonstrating class. For the location of the supplied C++ sample programs on your system see [C++ sample programs](#).
5. Icc... constructors
6. Public methods (in alphabetic order)
7. Protected methods (in alphabetic order)
8. Inherited public methods (in tabular form)
9. Inherited protected methods (in tabular form)
10. Enumerations

Methods, including constructors, start with a formal function prototype that shows what a call returns and what the parameters are. There follows a description, in order, of the parameters. To avoid duplication, inherited methods just have an indication of the class from which they are derived (and where they are described).

The convention for names is:

1. Variable names are shown as *variable*.
2. Names of classes, structures, enumerations and methods are shown as **method**
3. Members of enumerations are shown as 'enumMember'.
4. The names of all the supplied classes and structures begin with **Icc**.
5. Compound names have no separators, but have capital letters to demark the beginning of second and subsequent words, as in **IccJournalTypeId**.
6. Class and structure names and enumeration types begin with capital letters. Other names begin with lowercase letters.

For further information on how to use these classes, see [Using the CICS foundation classes](#).



## Mapping EXEC CICS calls to Foundation Class methods

The following table shows the correspondence between CICS calls made using the EXEC CICS API and the equivalent calls from the Foundation Classes.

EXEC CICS	Class	Method
ABEND	IccTask	abend
ADDRESS COMMAREA	IccControl	commArea
ADDRESS CWA	IccSystem	workArea
ADDRESS EIB	No direct access to EIB: please use appropriate method on appropriate class.	
ADDRESS TCTUA	IccTerminal	workArea
ADDRESS TWA	IccTask	workArea
ALLOCATE	IccSession	allocate
ASKTIME	IccClock	update
ASSIGN ABCODE	IccAbendData	abendCode
ASSIGN ABDUMP	IccAbendData	isDumpAvaliable
ASSIGN ABPROGRAM	IccAbendData	programName
ASSIGN ALTSCRNHT	IccTerminalData	alternateHeight
ASSIGN ALTSCRNWD	IccTerminalData	alternateWidth
ASSIGN APLKYBD	IccTerminalData	isAPLKeyboard
ASSIGN APLTEXT	IccTerminalData	isAPLText
ASSIGN ASRAINTRPT	IccAbendData	ASRAInterrupt
ASSIGN ASRAKEY	IccAbendData	ASRAKeyType
ASSIGN ASRAPSW	IccAbendData	ASRAPSW
ASSIGN ASRAREGS	IccAbendData	ASRARegisters
ASSIGN ASRASPC	IccAbendData	ASRASpaceType
ASSIGN ASRASTG	IccAbendData	ASRAStorageType
ASSIGN APPLID	IccSystem	applName
ASSIGN BTRANS	IccTerminalData	isBTrans
ASSIGN CMDSEC	IccTask	isCommandSecurityOn
ASSIGN COLOR	IccTerminalData	isColor
ASSIGN CWALENG	IccSystem	workArea
ASSIGN DEFSCRNHT	IccTerminalData	defaultHeight
ASSIGN DEFSCRNWD	IccTerminalData	defaultWidth
ASSIGN EWASUPP	IccTerminalData	isEWA
ASSIGN EXTDS	IccTerminalData	isExtended3270
ASSIGN FACILITY	IccTerminal	name
ASSIGN FCI	IccTask	facilityType



<b>EXEC CICS</b>	<b>Class</b>	<b>Method</b>
ASSIGN GCHARS	IccTerminalData	graphicCharSetId
ASSIGN GCODES	IccTerminalData	graphicCharCodeSet
ASSIGN GMMI	IccTerminalData	isGoodMorning
ASSIGN HILIGHT	IccTerminalData	isHighlight
ASSIGN INITPARM	IccControl	initData
ASSIGN INITPARMLEN	IccControl	initData
ASSIGN INVOKINGPROG	IccControl	callingProgramId
ASSIGN KATAKANA	IccTerminalData	isKatakana
ASSIGN NETNAME	IccTerminal	netName
ASSIGN OUTLINE	IccTerminalData	isFieldOutline
ASSIGN ORGABCODE	IccAbendData	originalAbendCode
ASSIGN PRINSYSID	IccTask	principalSysId
ASSIGN PROGRAM	IccControl	programId
ASSIGN PS	IccTerminalData	isPS
ASSIGN QNAME	IccTask	triggerDataQueueId
ASSIGN RESSEC	IccTask	isResourceSecurityOn
ASSIGN RESTART	IccTask	isRestarted
ASSIGN SCRNHT	IccTerminal	height
ASSIGN SCRNWD	IccTerminal	width
ASSIGN SOSI	IccTerminalData	isSOSI
ASSIGN STARTCODE	IccTask	startType, isCommitSupported, isStartDataAvailable
ASSIGN SYSID	IccSystem	sysId
ASSIGN TASKPRIORITY	IccTask	priority
ASSIGN TCTUALENG	IccTerminal	workArea
ASSIGN TEXTKYBD	IccTerminalData	isTextKeyboard
ASSIGN TEXTPRINT	IccTerminalData	isTextPrint
ASSIGN TWALENG	IccTask	workArea
ASSIGN USERID	IccTask	userId
ASSIGN VALIDATION	IccTerminalData	isValidation
CANCEL	IccClock	cancelAlarm
CANCEL	IccStartRequestQ	cancel
CHANGE PASSWORD	IccUser	changePassword
CHANGE TASK	IccTask	setPriority
CONNECT PROCESS	IccSession	connectProcess
CONVERSE	IccSession	converse



<b>EXEC CICS</b>	<b>Class</b>	<b>Method</b>
DELAY	IccTask	delay
DELETE	IccFile	deleteRecord
DELETE	IccFile	deleteLockedRecord
DELETEQ TD	IccDataQueue	empty
DELETEQ TS	IccTempStore	empty
DEQ	IccSemaphore	unlock
DUMP TRANSACTION	IccTask	dump
DUMP TRANSACTION	IccTask	setDumpOpts
ENDBR	IccFileIterator	IccFileIterator (destructor)
ENQ	IccSemaphore	lock
ENQ	IccSemaphore	tryLock
ENTER TRACENUM	IccTask	enterTrace
EXTRACT ATTRIBUTES	IccSession	state, stateText
EXTRACT PROCESS	IccSession	extractProcess
FORMATTIME YYDDD, YYMMDD, etc	IccClock	date
FORMATTIME DATE	IccClock	date
FORMATTIME DATEFORM	IccSystem	dateFormat
FORMATTIME DAYCOUNT	IccClock	daysSince1900
FORMATTIME DAYOFWEEK	IccClock	dayOfWeek
FORMATTIME DAYOFMONTH	IccClock	dayOfMonth
FORMATTIME MONTHOFYEAR	IccClock	monthOfYear
FORMATTIME TIME	IccClock	time
FORMATTIME YEAR	IccClock	year
FREE	IccSession	free
FREEMAIN	IccTask	freeStorage
GETMAIN	IccTask	getStorage
HANDLE ABEND	IccControl	setAbendHandler, cancelAbendHandler, resetAbendHandler
INQUIRE FILE ACCESSMETHOD	IccFile	accessMethod
INQUIRE FILE ADD	IccFile	isAddable
INQUIRE FILE BROWSE	IccFile	isBrowsable
INQUIRE FILE DELETE	IccFileControl	isDeletable
INQUIRE FILE EMPTYSTATUS	IccFile	isEmptyOn
INQUIRE FILE ENABLESTATUS	IccFile	enableStatus



EXEC CICS	Class	Method
INQUIRE FILE KEYPOSITION	IccFile	keyPosition
INQUIRE FILE OPENSTATUS	IccFile	openStatus
INQUIRE FILE READ	IccFile	isReadable
INQUIRE FILE RECORDFORMAT	IccFile	recordFormat
INQUIRE FILE RECORDSIZE	IccFile	recordLength
INQUIRE FILE RECOVSTATUS	IccFile	isRecoverable
INQUIRE FILE TYPE	IccFile	type
INQUIRE FILE UPDATE	IccFile	isUpdatable
ISSUE ABEND	IccSession	issueAbend
ISSUE CONFIRMATION	IccSession	issueConfirmation
ISSUE ERROR	IccSession	issueError
ISSUE PREPARE	IccSession	issuePrepare
ISSUE SIGNAL	IccSession	issueSignal
LINK	IccProgram	link
LINK INPUTMSG INPUTMSGLEN	IccProgram	setInputMessage
LOAD	IccProgram	load
POST	IccClock	setAlarm
READ	IccFile	readRecord
READNEXT	IccFileIterator	readNextRecord
READPREV	IccFileIterator	readPreviousRecord
READQ TD	IccDataQueue	readItem
READQ TS	IccTempStore	readItem
RECEIVE (APPC)	IccSession	receive
RECEIVE (3270)	IccTerminal	receive, receive3270Data
RELEASE	IccProgram	unload
RESETBR	IccFileIterator	reset
RETRIEVE	IccStartRequestQ	retrieveData <sup>1</sup>

**Note:** The **retrieveData** method gets the start information from CICS and stores it in the IccStartRequestQ object: the information can then be accessed using **data**, **queueName**, **returnTermId** and **returnTransId** methods.

RETRIEVE INTO, LENGTH	IccStartRequestQ	data
RETRIEVE QUEUE	IccStartRequestQ	queueName
RETRIEVE RTRANSID	IccStartRequestQ	returnTransId
RETRIEVE RTERMID	IccStartRequestQ	returnTermId
RETURN	IccControl	main <sup>2</sup>



EXEC CICS	Class	Method
<b>Note:</b> Returning (using C++ reserved word <b>return</b> ) from method <b>run</b> in class <b>IccControl</b> results in an EXEC CICS RETURN.		
RETURN TRANSID	IccTerminal	setNextTransId <sup>3</sup>
RETURN IMMEDIATE	IccTerminal	setNextTransId <sup>3</sup>
RETURN COMMAREA LENGTH	IccTerminal	setNextCommArea <sup>3</sup>
RETURN INPUTMSG, INPUTMSGLEN	IccTerminal	setNextInputMessage <sup>3</sup>
<b>Note:</b> Issue this call before returning from <b>IccControl::run</b> .		
REWRITE	IccFile	rewriteRecord
SEND (APPC)	IccSession	send, sendInvite, sendLast
SEND (3270)	IccTerminal	send, sendLine
SEND CONTROL CURSOR	IccTerminal	setCursor setLine, setNewLine
SEND CONTROL ERASE	IccTerminal	erase
SEND CONTROL FREEKB	IccTerminal	freeKeyboard
SET FILE ADD BROWSE DELETE  ...	IccFile	setAccess
SET FILE EMPTYSTATUS	IccFile	setEmptyOnOpen
SET FILE OPEN STATUS  ENABLESTATUS	IccFile	setStatus
SIGNOFF	IccTerminal	signoff
SIGNON	IccTerminal	signon
START TRANSID AT/AFTER	IccStartRequestQ	start <sup>4</sup>
START TRANSID FROM LENGTH	IccStartRequestQ	setData, registerDataBuffer <sup>4</sup>
START TRANSID NOCHECK	IccStartRequestQ	setStartOpts <sup>4</sup>
START TRANSID PROTECT	IccStartRequestQ	setStartOpts <sup>4</sup>
START TRANSID QUEUE	IccStartRequestQ	setQueueName <sup>4</sup>
START TRANSID REQID	IccStartRequestQ	start <sup>4</sup>
START TRANSID TERMID	IccStartRequestQ	start <sup>4</sup>
START TRANSID USERID	IccStartRequestQ	start <sup>4</sup>
START TRANSID RTERMID	IccStartRequestQ	setReturnTermId <sup>4</sup>
START TRANSID RTRANSID	IccStartRequestQ	setReturnTransId <sup>4</sup>
<b>Note:</b> Use methods <b>setData</b> , <b>setQueueName</b> , <b>setReturnTermId</b> , <b>setReturnTransId</b> , <b>setStartOpts</b> to set the state of the <b>IccStartRequestQ</b> object before issuing start requests with the <b>start</b> method.		
STARTBR	IccFileIterator	IccFileIterator (constructor)
SUSPEND	IccTask	suspend
SYNCPOINT	IccTask	commitUOW



EXEC CICS	Class	Method
SYNCPOINT ROLLBACK	IccTask	rollBackUOW
UNLOCK	IccFile	unlockRecord
VERIFY PASSWORD	IccUser	verifyPassword
WAIT CONVID	IccSession	flush
WAIT EVENT	IccTask	waitOnAlarm
WAIT EXTERNAL	IccTask	waitExternal
WAIT JOURNALNUM	IccJournal	wait
WRITE	IccFile	writeRecord
WRITE OPERATOR	IccConsole	write, writeAndGetReply
WRITEQ TD	IccDataQueue	writeItem
WRITEQ TS	IccTempStore	writeItem, rewriteItem

## Mapping Foundation Class methods to EXEC CICS calls

The following table shows the correspondence between CICS calls made using the Foundation Classes and the equivalent EXEC CICS API calls.

Table 1. IccAbendData Class	
Method	EXEC CICS
abendCode	ASSIGN ABCODE
ASRAInterrupt	ASSIGN ASRAINTRPT
ASRAKeyType	ASSIGN ASRAKEY
ASRAPSW	ASSIGN ASRAPSW
ASRARegisters	ASSIGN ASRAREGS
ASRASpaceType	ASSIGN ASRASPC
ASRAStorageType	ASSIGN ASRASTG
isDumpAvailable	ASSIGN ABDUMP
originalAbendCode	ASSIGN ORGABCODE
programName	ASSIGN ABPROGRAM

Table 2. IccAbsTime Class	
Method	EXEC CICS
date	FORMATTIME YYDDD/YYMMDD/etc.
dayOfMonth	FORMATTIME DAYOFMONTH
dayOfWeek	FORMATTIME DAYOFWEEK
daysSince1900	FORMATTIME DAYCOUNT
monthOfYear	FORMATTIME MONTHOFYEAR
time	FORMATTIME TIME



<i>Table 2. IccAbsTime Class (continued)</i>	
<b>Method</b>	<b>EXEC CICS</b>
year	FORMATTIME YEAR

<i>Table 3. IccClock Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
cancelAlarm	CANCEL
date	FORMATTIME YYDDD/YYMMDD/etc.
dayOfMonth	FORMATTIME DAYOFMONTH
dayOfWeek	FORMATTIME DAYOFWEEK
daysSince1900	FORMATTIME DAYCOUNT
monthOfYear	FORMATTIME MONTHOFYEAR
setAlarm	POST
time	FORMATTIME TIME
update	ASKTIME
year	FORMATTIME YEAR

<i>Table 4. IccConsole Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
write	WRITE OPERATOR
writeAndGetReply	WRITE OPERATOR

<i>Table 5. IccControl Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
callingProgramId	ASSIGN INVOKINGPROG
cancelAbendHandler	HANDLE ABEND CANCEL
commArea	ADDRESS COMMAREA
initData	ASSIGN INITPARM & INITPARMLEN
programId	ASSIGN PROGRAM
resetAbendHandler	HANDLE ABEND RESET
setAbendHandler	HANDLE ABEND PROGRAM

<i>Table 6. IccDataQueue Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
empty	DELETEQ TD
readItem	READQ TD
writeItem	WRITEQ TD



<i>Table 7. IccFile Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
access	INQUIRE FILE ADD BROWSE DELETE READ UPDATE
accessMethod	INQUIRE FILE ACCESSMETHOD
deleteRecord	DELETE FILE RIDFLD
deleteLockedRecord	DELETE FILE
enableStatus	INQUIRE FILE ENABLESTATUS
isAddable	INQUIRE FILE ADD
isBrowsable	INQUIRE FILE BROWSE
isDeletable	INQUIRE FILE DELETE
isEmptyOnOpen	INQUIRE FILE EMPTYSTATUS
isReadable	INQUIRE FILE READ
isRecoverable	INQUIRE FILE RECOVSTATUS
isUpdatable	INQUIRE FILE UPDATE
keyPosition	INQUIRE FILE KEYPOSITION
openStatus	INQUIRE FILE OPENSTATUS
readRecord	READ FILE
recordFormat	INQUIRE FILE RECORDFORMAT
recordLength	INQUIRE FILE RECORDSIZE
rewriteRecord	REWRITE FILE
setAccess	SET FILE ADD BROWSE DELETE etc.
setEmptyOnOpen	SET FILE EMPTYSTATUS
setStatus	SET FILE OPENSTATUS ENABLESTATUS
type	INQUIRE FILE TYPE
unlockRecord	UNLOCK FILE
writeRecord	WRITE FILE

<i>Table 8. IccFileIterator Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
IccFileIterator (constructor)	STARTBR FILE
~IccFileIterator (destructor)	ENDBR FILE
readNextRecord	READNEXT FILE
readPreviousRecord	READPREV FILE
reset	RESETBR FILE



<i>Table 9. IccJournal Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
wait	WAIT JOURNALNUM
writeRecord	WRITE JOURNALNUM

<i>Table 10. IccProgram Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
link	LINK PROGRAM
load	LOAD PROGRAM
unload	RELEASE PROGRAM

<i>Table 11. IccResource Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
condition	(RESP & RESP2)
setRouteOption	(SYSID)

<i>Table 12. IccSemaphore Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
lock	ENQ RESOURCE
tryLock	ENQ RESOURCE NOSUSPEND
unlock	DEQ RESOURCE

<i>Table 13. IccSession Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
allocate	ALLOCATE
connectProcess	CONNECT PROCESS CONVID
converse	CONVERSE CONVID
extractProcess	EXTRACT PROCESS CONVID
flush	WAIT CONVID
free	FREE CONVID
issueAbend	ISSUE ABEND CONVID
issueConfirmation	ISSUE CONFIRMATION CONVID
issueError	ISSUE ERROR CONVID
issuePrepare	ISSUE PREPARE CONVID
issueSignal	ISSUE SIGNAL CONVID
receive	RECEIVE CONVID
send	SEND CONVID
sendInvite	SEND CONVID INVITE



<i>Table 13. IccSession Class (continued)</i>	
<b>Method</b>	<b>EXEC CICS</b>
sendLast	SEND CONVID LAST
state	EXTRACT ATTRIBUTES

<i>Table 14. IccStartRequestQ Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
cancel	CANCEL
retrieveData	RETRIEVE
start	START TRANSID

<i>Table 15. IccSystem Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
applName	ASSIGN APPLID
beginBrowse	INQUIRE (FILE, TDQUEUE, etc) START
dateFormat	FORMATTIME DATEFORM
endBrowse	INQUIRE (FILE, TDQUEUE, etc) END
freeStorage	FREEMAIN
getFile	INQUIRE FILE
getNextFile	INQUIRE FILE NEXT
getStorage	GETMAIN SHARED
operatingSystem	INQUIRE SYSTEM OPSYS
operatingSystemLevel	INQUIRE SYSTEM OPREL
release	INQUIRE SYSTEM RELEASE
releaseText	INQUIRE SYSTEM RELEASE
sysId	ASSIGN SYSID
workArea	ADDRESS CWA

<i>Table 16. IccTask Class</i>	
<b>Method</b>	<b>EXEC CICS</b>
abend	ABEND
commitUOW	SYNCPOINT
delay	DELAY
dump	DUMP TRANSACTION
enterTrace	ENTER TRACENUM
facilityType	ASSIGN STARTCODE, TERMCODE, PRINSYSID, FCI
freeStorage	FREEMAIN
isCommandSecurityOn	ASSIGN CMDSEC



*Table 16. IccTask Class (continued)*

<b>Method</b>	<b>EXEC CICS</b>
isCommitSupported	ASSIGN STARTCODE
isResourceSecurityOn	ASSIGN RESSEC
isRestarted	ASSIGN RESTART
isStartDataAvailable	ASSIGN STARTCODE
principalSysId	ASSIGN PRINSYSID
priority	ASSIGN TASKPRIORITY
rollBackUOW	SYNCPOINT ROLLBACK
setPrioity	CHANGE TASK PRIORITY
startType	ASSIGN STARTCODE
suspend	SUSPEND
triggerDataQueueId	ASSIGN QNAME
userId	ASSIGN USERID
waitExternal	WAIT EXTERNAL / WAITCICS
waitOnAlarm	WAIT EVENT
workArea	ADDRESS TWA

*Table 17. IccTempStore Class*

<b>Method</b>	<b>EXEC CICS</b>
empty	DELETEQ TS
readItem	READQ TS ITEM
readNextItem	READQ TS NEXT
rewriteItem	WRITEQ TS ITEM REWRITE
writeItem	WRITEQ TS ITEM

*Table 18. IccTerminal Class*

<b>Method</b>	<b>EXEC CICS</b>
erase	SEND CONTROL ERASE
freeKeyboard	SEND CONTROL FREEKB
height	ASSIGN SCRNHHT
netName	ASSIGN NETNAME
receive	RECEIVE
receive3270Data	RECEIVE BUFFER
send	SEND
sendLine	SEND
setCursor	SEND CONTROL CURSOR



*Table 18. IccTerminal Class (continued)*

<b>Method</b>	<b>EXEC CICS</b>
setLine	SEND CONTROL CURSOR
setNewLine	SEND CONTROL CURSOR
signoff	SIGNOFF
signon	SIGNON
waitForAID	RECEIVE
width	ASSIGN SCRNEW
workArea	ADDRESS TCTUA

*Table 19. IccTerminalData Class*

<b>Method</b>	<b>EXEC CICS</b>
alternateHeight	ASSIGN ALTSCRNHT
alternateWidth	ASSIGN ALTSCRNEW
defaultHeight	ASSIGN DEFSCRNHT
defaultWidth	ASSIGN DEFSCRNEW
graphicCharSetId	ASSIGN GCHARS
graphicCharCodeSet	ASSIGN GCODES
isAPLKeyboard	ASSIGN APLKYBD
isAPLText	ASSIGN APLTEXT
isBTTrans	ASSIGN BTRANS
isColor	ASSIGN COLOR
isEWA	ASSIGN ESASUPP
isExtended3270	ASSIGN EXTDS
isGoodMorning	ASSIGN GMMI
isHighlight	ASSIGN HILIGHT
isKatakana	ASSIGN KATAKANA
isMSRControl	ASSIGN MSRCONTROL
isFieldOutline	ASSIGN OUTLINE
isPS	ASSIGN PS
isSOSI	ASSIGN SOSI
isTextKeyboard	ASSIGN TEXTKYBD
isTextPrint	ASSIGN TEXTPRINT
isValidation	ASSIGN VALIDATION



Table 20. IccUser Class	
Method	EXEC CICS
changePassword	CHANGE PASSWORD
verifyPassword	VERIFY PASSWORD

## Icc structure

This structure holds global enumerations and functions for the CICS Foundation Classes. These globals are defined within this structure to avoid name conflicts.

**Header file:** ICCGLBEH

## Functions

Functions in Icc structure are as follows.

### boolText

Returns the text that represents the boolean value described by the parameters, such as "yes" or "on".

```
static const char* boolText (Bool test,  
                             BoolSet set = trueFalse)
```

### test

A boolean value, defined in this structure, that has one of two values, chosen from a set of values given by *set*.

### set

An enumeration, defined in this structure, that indicates from which pair of values *test* is selected. The default is to use true and false.

### catchException

This is the function of last resort, used to intercept **IccException** objects that the application fails to catch. It can be called from the **main** function in the stub program, listed in ICCMAIN header file, and described in [“main function” on page 244](#). All OO CICS programs should use this stub or a close equivalent.

```
static void catchException(IccException&exception)
```

### exception

A reference to an **IccException** object that holds information about a particular type of exception.

### conditionText

Returns the symbolic name associated with a condition value. For example, if **conditionText** is called with *condition* of IccCondition::NORMAL, it returns "NORMAL", if it is called with *condition* of IccCondition::IOERR, it returns "IOERR", and so on.



**static const char\* conditionText(IccCondition::Codes *condition*)**

***condition***

An enumeration, defined in the **IccCondition** structure, that indicates the condition returned by a call to CICS.

**initializeEnvironment**

Initializes the CICS Foundation Classes. The rest of the class library can only be called after this function has been called. It is called from the **main** function in the stub program, listed in ICCMAIN header file, and described in [CICS C++ main function](#). All OO CICS programs should use this stub or a close equivalent.

**static void initializeEnvironment (ClassMemoryMgmt *mem* = cmmDefault,  
FamilySubset *fam* = fsDefault,  
Icc::Bool *EDF*)**

***mem***

An enumeration, defined in this structure, that indicates the memory management policy for the foundation classes.

***fam***

An enumeration, defined in this structure, that indicates whether the use of CICS features that are not available on all platforms is permitted.

***EDF***

A boolean that indicates whether EDF tracing is initially on.

**isClassMemoryMgmtOn**

Returns a boolean value, defined in this structure, that indicates whether class memory management is on.

**static Bool isClassMemoryMgmtOn()**

**isEDFOn**

Returns a Boolean value, defined in this structure, that indicates whether EDF tracing is on at the global level.

**static Bool isEDFOn()**

See **setEDF** in this structure, **isEDFOn** and **setEDF** in **IccResource** class on [“IccResource class” on page 154](#) and [Program debugging](#).

**isFamilySubsetEnforcementOn**

Returns a boolean value, defined in this structure, that indicates whether it is permitted to use CICS features that are not available on all platforms.

**static Bool isFamilySubsetEnforcementOn()**



## **returnToCICS**

This call returns the program flow to CICS.

## **static void returnToCICS()**

It is called by the **main** function in the stub program, listed in ICCMAIN header file, and described in [“main function” on page 244](#). All OO CICS programs should use this stub or a close equivalent.

## **setEDF**

Sets EDF tracing on or off at the global level.

## **static void setEDF(Icc::Bool onOff = off)**

### **onOff**

A boolean, defined in this structure, that indicates whether EDF tracing is enabled. As EDF is more suitable for tracing programs that use EXEC CICS calls than object oriented programs, the default is off.

## **unknownException**

This function is called by the **main** function in ICCMAIN header file and is used to intercept unknown exceptions.

## **static void unknownException()**

See [“main function” on page 244](#) and **catchException** in this structure).

## **Enumerations**

References in this section to other CICS platforms, such as CICS(r) for AIX, are included for completeness. There have been Technology Releases of the CICS Foundation Classes on those platforms.

### **Bool**

Three equivalent pairs of boolean values are as follows.

- true, yes, on
- false, no, off

true, yes, and on evaluate to 1, while false, no, and off evaluate to zero. Thus you can code test functions as follows:

```
if (task()->isStartDataAvailable())
{
    //do something
}
```

**Note:** 'true' and 'false' are compiler keywords in the z/OS 1.2 C/C++ compiler and will not be generated by ICCGLBEH when using this compiler, or any later version.

### **BoolSet**

BoolSet enumerations are as follows.

- trueFalse



- yesNo
- onOff

### **ClassMemoryMgmt**

ClassMemoryMgmt enumerations are as follows.

#### **cmmDefault**

The defaults for the different platforms are:

##### **z/OS**

cmmNonCICS

##### **UNIX**

cmmCICS

#### **cmmNonCICS**

The C++ environment performs the memory management required by the program.

In z/OS Language Environment ensures that the storage for CICS tasks is released at the end of the task, or if the task terminates abnormally.

On CICS for AIX dynamic storage release does not occur at normal or abnormal task termination. This means that programs are susceptible to memory leaks.

#### **cmmCICS**

The **new** and **delete** operators defined in **IccBase** class map storage allocations to CICS; storage is automatically released at task termination.

### **FamilySubset**

FamilySubset enumerations are as follows.

#### **fsDefault**

The defaults for the different platforms are all the same: fsAllowPlatformVariance

#### **fsEnforce**

Enforces Family Subset conformance; that is, it disallows use of any CICS features that are not available on all CICS servers (OS/2, AIX, and z/OS).

**Note:** CICS OS/2 is no longer supported.

#### **fsAllowPlatformVariance**

Allows each platform to access all the CICS features available on that platform.

### **GetOpt**

This enumeration is used on a number of methods throughout the classes. It indicates whether the value held internally by the object is to be returned to the caller, or whether it has to be refreshed from CICS first.

### **object**

If the value has been previously retrieved from CICS and stored within the object, return this stored value. Otherwise, get a copy of the value from CICS and store within the object.

### **CICS**

Force the object to retrieve a fresh value from CICS (and store it within the object) even if there is already a value stored within the object from a previous invocation.

### **Platforms**

Indicates on which operating system the program is being run.

Possible values are:

- OS2
- UNIX
- MVS™



## IccAbendData class

This is a singleton class used to retrieve diagnostic information from CICS about a program abend.

**IccBase**  
**IccResource**  
**IccAbendData**

**Header file:** ICCABDEH

### IccAbendData constructor (protected)

IccAbendData constructor in IccAbendData class

**Constructor**  
**IccAbendData()**

### Public methods

These are the public methods in this class.

#### The *opt* parameter

Many methods have the same parameter, *opt*, which is described under the **abendCode** method.

#### **abendCode**

Returns the current 4-character abend code.

**const char\* abendCode(Icc::GetOpt *opt* = Icc::object)**

#### *opt*

An enumeration, defined in the **Icc** structure, that indicates whether a value should be refreshed from CICS or whether the existing value should be retained. The possible values are described under the **GetOpt** enumeration in the **Icc** structure in [“GetOpt” on page 59](#).

#### **Conditions**

INVREQ

#### **ASRAInterrupt**

Returns 8 characters of status word (PSW) interrupt information at the point when the latest abend with a code of ASRA, ASRB, ASRD, or AICA occurred. The field contains binary zeroes if no ASRA or ASRB abend occurred during the execution of the issuing transaction, or if the abend originally occurred in a remote DPL server program.

**const char\* ASRAInterrupt(Icc::GetOpt *opt* = Icc::object)**

#### **Conditions**

INVREQ



**ASRAKeyType**

Returns an enumeration, defined in **IccValue**, that indicates the execution key at the time of the last ASRA, ASRB, AICA, or AEYD abend, if any.

The possible values are:

**CICSEXECKEY**

The task was executing in CICS-key at the time of the last ASRA, ASRB, AICA, or AEYD abend. Note that all programs execute in CICS key if CICS subsystem storage protection is not active.

**USEREXECKEY**

The task was executing in user-key at the time of the last ASRA, ASRB, AICA, or AEYD abend. Note that all programs execute in CICS key if CICS subsystem storage protection is not active.

**NONCICS**

The execution key at the time of the last abend was not one of the CICS keys; that is, not key 8 or key 9.

**NOTAPPLIC**

There has not been an ASRA, ASRB, AICA, or AEYD abend.

**IccValue::CVDA ASRAKeyType(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**ASRAPSW**

Returns an 8-character status word (PSW) at the point when the latest abend with a code of ASRA, ASRB, ASRD, or AICA occurred. The field contains nulls if no ASRA, ASRB, ASRD, or AICA abend occurred during the execution of the issuing transaction, or if the abend originally occurred in a remote DPL server.

**const char\* ASRAPSW(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**ASRARegisters**

Returns the contents of general registers 0–15, as a 64-byte data area, at the point when the latest ASRA, ASRB, ASRD, or AICA abend occurred. The contents of the registers are returned in the order 0, 1, ..., 15. Note that nulls are returned if no ASRA, ASRB, ASRD, or AICA abend occurred during the execution of the issuing transaction, or if the abend originally occurred in a remote DPL server program.

**const char\* ASRARegisters(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ



### **ASRASpaceType**

Returns an enumeration, defined in **IccValue** structure, that indicates what type of space, if any, was in control at the time of the last ASRA, ASRB, AICA, or AEYD abend.

Possible values are:

#### **SUBSPACE**

The task was executing in either its own subspace or the common subspace at the time of the last ASRA, ASRB, AICA, or AEYD abend.

#### **BASESPACE**

The task was executing in the base space at the time of the last ASRA, ASRB, AICA, or AEYD abend. Note that all tasks execute in the base space if transaction isolation is not active.

#### **NOTAPPLIC**

There has not been an ASRA, ASRB, AICA, or AEYD abend.

**IccValue::CVDA ASRASpaceType(Icc::GetOpt *opt* = Icc::object)**

### **Conditions**

INVREQ

### **ASRAStorageType**

Returns an enumeration, defined in **IccValue** structure, that indicates what type of storage, if any, was being addressed at the time of the last ASRA, ASRB, AICA, or AEYD abend.

Possible values are:

#### **CICS**

CICS-key storage is being addressed. This can be in one of the CICS dynamic storage areas (CDSA or ECDSA), or in one of the read-only dynamic storage areas (RDSA or ERDSA) if either of the following apply:

- CICS is running with the NOPROTECT option on the RENTPGM system initialization parameter
- storage protection is not active

#### **USER**

User-key storage in one of the user dynamic storage areas (RDSA or ERDSA) is being addressed.

#### **READONLY**

Read-only storage in one of the read-only dynamic storage areas (RDSA or ERDSA) when CICS is running with the PROTECT option on the RENTPGM system initialization parameter.

#### **NOTAPPLIC**

One of:

- No ASRA or AEYD abend has been found for this task.
- The storage affected by an abend is not managed by CICS.
- The ASRA abend is not caused by a OC4 abend.
- An ASRB or AICA abend has occurred since the last ASRA or AEYD abend.

**IccValue::CVDA ASRAStorageType(Icc::GetOpt *opt* = Icc::object)**



### Conditions

INVREQ

### instance

Returns a pointer to the single **IccAbendData** object. If the object does not already exist, it is created by this method.

**static IccAbendData\* instance()**

### isDumpAvailable

Returns a boolean, defined in **Icc** structure, that indicates whether a dump has been produced. If it has, use **programName** method to find the name of the failing program of the latestabend.

**Icc::Bool isDumpAvailable(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### originalAbendCode

Returns the original abend code for this task in case of repeated abends.

**const char\* originalAbendCode(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### programName

Returns the name of the program that caused the abend.

**const char\* programName(Icc::GetOpt *opt* = Icc::oldValue)**

### Conditions

INVREQ

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
actionOnCondition	IccResource



Method	Class
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccAbsTime class

This class holds information about absolute time, the time in milliseconds that has elapsed since the beginning of the year 1900.

**IccBase**  
**IccResource**  
**IccTime**  
**IccAbsTime**

**Header file:** ICCTIMEH

## IccAbsTime constructor

IccAbsTime constructor in IccAbsTime class.

**Constructor (1)**  
**IccAbsTime(const char\* *absTime*)**



***absTime***

The 8-byte value of time, in packed decimal format.

**Constructor (2)**

The copy constructor.

**IccAbsTime(const IccAbsTime& *time*)**

**Public methods**

These are the public methods in this class.

***date***

Returns the date, as a character string.

**const char\* *date* (IccClock::DateFormat *format* = IccClock::defaultFormat,  
char *dateSeparator* = '\0')**

***format***

An enumeration, defined in **IccClock** class, that indicates the format of the date. The default is to use the installation default, the value set when the CICS region is initialized.

***dateSeparator***

The character that separates the different fields of the date. The default is no separation character.

**Conditions**

INVREQ

***dayOfMonth***

Returns the day of the month in the range 1 to 31.

**unsigned long *dayOfMonth*()**

**Conditions**

INVREQ

***dayOfWeek***

Returns an enumeration, defined in **IccClock** class, that indicates the day of the week.

**IccClock::DayOfWeek *dayOfWeek*()**

**Conditions**

INVREQ



**daysSince1900**

Returns the number of days that have elapsed since the first day of 1900.

**unsigned long daysSince1900()****Conditions**

INVREQ

**hours**

Returns the hours component of the time.

**virtual unsigned long hours() const****milliSeconds**

Returns the number of milliseconds that have elapsed since the first day of 1900.

**long double milliSeconds()****minutes**

Returns the minutes component of the time.

**virtual unsigned long minutes() const****monthOfYear**

Returns an enumeration, defined in **IccClock** class, that indicates the month of the year.

**IccClock::MonthOfYear monthOfYear()****Conditions**

INVREQ

**operator=**

Assigns one **IccAbsTime** object to another.

**IccAbsTime& operator=(const IccAbsTime& *absTime*)****packedDecimal**

Returns the time as an 8-byte packed decimal string that expresses the number of milliseconds that have elapsed since the beginning of the year 1900.



**const char\* packedDecimal() const**

**seconds**

Returns the seconds component of the time.

**virtual unsigned long seconds() const**

**time**

Returns the time as a text string.

**const char\* time(char *timeSeparator* = '\0')**

***timeSeparator***

The character that delimits the time fields. The default is no time separation character.

**Conditions**

INVREQ

**timeInHours**

Returns the number of hours that have elapsed since the day began.

**unsigned long timeInHours()**

**timeInMinutes**

Returns the number of minutes that have elapsed since the day began.

**unsigned long timeInMinutes()**

**timeInSeconds**

Returns the number of seconds that have elapsed since the day began.

**unsigned long timeInSeconds()**

**year**

Returns the year as a 4-digit integer, e.g. 1996.

**unsigned long year()**



## Conditions

INVREQ

## Inherited public methods

These are the inherited public methods in IccAbsTime class.

Method	Class
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
hours	IccTime
isEDFOn	IccResource
minutes	IccTime
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource
timeInHours	IccTime
timeInMinutes	IccTime
timeInSeconds	IccTime
type	IccTime

## Inherited protected methods

Inherited protected methods in IccAbsTime class:

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccAlarmRequestId class

An **IccAlarmRequestId** object represents a unique alarm request.

**IccBase**  
**IccResourceId**  
**IccRequestId**  
**IccAlarmRequestId**



It contains the 8-character name of the request identifier and a pointer to a 4-byte timer event control area. **IccAlarmRequestId** is used by the **setAlarm** method of **IccClock** class when setting an alarm, and the **waitOnAlarm** method of **IccTask** when waiting for an alarm.

**Header file:** ICCRIDEH

## **IccAlarmRequestId constructors**

IccAlarmRequestId constructors IccAlarmRequestId constructors:

### **Constructor (1)**

Creates a new object with no information present.

### **IccAlarmRequestId()**

### **Constructor (2)**

Creates an object with information already set.

**IccAlarmRequestId (const char\* *nam*,  
const void\* *timerECA*)**

#### ***name***

The 8-character name of the request.

#### ***timerECA***

A pointer to a 4-byte timer event control area.

### **Constructor (3)**

The copy constructor.

**IccAlarmRequestId(const IccAlarmRequestId& *id*)**

#### ***id***

A reference to an **IccAlarmRequestId** object.

## **Public methods**

These methods are used to copy information into an **IccAlarmRequestId** object.

### **isExpired**

Returns a boolean, defined in **Icc** structure, that indicates whether the alarm has expired.

**Icc::Bool isExpired()**



**operator= (1)**  
**IccAlarmRequestId& operator=(const IccRequestId& *id*)**

***id***  
A reference to an **IccRequestId** object.

**operator= (2)**  
**IccAlarmRequestId& operator=(const IccAlarmRequestId& *id*)**

***id***  
A reference to an **IccAlarmRequestId** object.

**operator= (3)**  
**IccAlarmRequestId& operator=(const char\* *requestName*)**

***requestName***  
The 8-character name of the alarm request.

**setTimerECA**  
**void setTimerECA(const void\* *timerECA*)**

***timerECA***  
A pointer to a 4-byte timer event control area.

**timerECA**  
Returns a pointer to the 4-byte timer event control area.

**const void\* timerECA() const**

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase



Method	Class
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccBase class

**IccBase** class is the base class from which *all* CICS Foundation Classes are derived.

### IccBase

(The methods associated with **IccBase** are described here although, in practice, they can only be called on objects of the derived classes).

**Header file:** ICCBASEH

## IccBase constructor (protected)

IccBase constructor (protected) in IccBase class

### Constructor

**IccBase(ClassType type)**

### *type*

An enumeration that indicates what the subclass type is. For example, for an **IccTempStore** object, the class type is 'cTempStore'.

## Public methods

These are the public methods in this class.

### The opt parameter

Many methods have the same parameter, *opt*, which is described under the **abendCode** method in [“abendCode” on page 60](#).

### classType

Returns an enumeration that indicates what the subclass type is. For example, for an **IccTempStore** object, the class type is 'cTempStore'. The possible values are listed under **ClassType** on page [ClassType](#).

**ClassType classType() const**



**className**

Returns the name of the class. For example, an **IccTempStore** object returns "IccTempStore". Suppose a class **MyDataQueue** inherits from **IccDataQueue**. If **MyDataQueue** calls **setClassName("MyDataQueue")**, **MyDataQueue::className(IccBase::customName)** returns "MyDataQueue" and **MyDataQueue::className(IccBase::baseName)** returns "IccDataQueue". An **IccDataQueue** object returns "IccDataQueue" for both *opt* values.

**const char\* className(NameOpt *opt*=customName)**

***opt***

An enumerator, defined in this class, that indicates whether to return the base name of the class or the name as customized by a derived class.

**customClassNum**

Returns the number that an application designer has associated with a subclass that he or she has designed.

**unsigned short customClassNum() const**

**operator delete**

Destroys an object in an orderly manner.

**void operator delete(void\* *object*)**

***object***

A pointer to an object that is to be destroyed.

**operator new**

Creates a new object of given size. This operator enables the Foundation Classes to use CICS storage allocation (see [“initializeEnvironment”](#) on page 57).

**void\* operator new(size\_t *size*)**

***size***

The size of the object that is to be created, in bytes.



## Protected methods

### **setClassName**

Sets the name of the class. It is useful for diagnostic purposes to be able to get a string representation of the name of the class to which an object belongs.

**void setClassName(const char\* *className*)**

### ***className***

The name of the class. For example, if you create a class **MyTempStore** that is a specialization of **IccTempStore**, you might call **setClassName("MyTempStore")**.

### **setCustomClassNum**

Assigns an identification number to a subclass that is not an original part of the classes, as supplied.

**void setCustomClassNum(unsigned short *number*)**

### ***number***

The number that an application designer associates with a subclass for identification purposes.

## Enumerations

Enumerations in IccBase class:

### **ClassType**

The names are derived by deleting the first two characters from the name of the class.

The possible values are:

- cAbendData
- cAlarmRequestId
- cBuf
- cClock
- cConsole
- cControl
- cConvId
- cCUSTOM
- cDataQueue
- cDataQueueId
- cEvent
- cException
- cFile
- cFileId
- cFileIterator
- cGroupId



- cJournal
- cJournalId
- cJournalTypeId
- cLockId
- cMessage
- cPartnerId
- cProgram
- cProgramId
- cRecordIndex
- cRequestId
- cSemaphore
- cSession
- cStartRequestQ
- cSysId
- cSystem
- cTask
- cTempStore
- cTempStoreId
- cTermId
- cTerminal
- cTerminalData
- cTime
- cTPNameId
- cTransId
- cUser
- cUserId

**Note:** cCUSTOM allows the class library to be extended by non-IBM developers.

### **NameOpt**

NameOpt in Enumerations:

See [“className” on page 72](#).

### **baseName**

Returns the default name assigned to the class as provided by IBM.

### **customName**

Returns the name assigned using **setClassName** method from a subclass *or*, if **setClassName** has not been invoked, the same as *baseName*.

## **IccBuf class**

**IccBuf** class is supplied for the general manipulation of buffers.

### **IccBase**

#### **IccBuf**

This class is used by other classes that make calls to CICS, but does not itself call CICS services. See [Buffer objects](#).



**Header file:** ICCBUFEH

**Sample:** ICC\$BUF

## IccBuf constructors

IccBuf constructors in IccBuf class:

### Constructor (1)

Creates an **IccBuf** object, allocating its own data area with the given length and with all the bytes within it set to NULL.

**IccBuf (unsigned long *length* = 0,  
DataAreaType *type* = extensible)**

#### *length*

The initial length of the data area, in bytes. The default length is 0.

#### *type*

An enumeration that indicates whether the data area can be dynamically extended. Possible values are extensible or fixed. The default is extensible.

### Constructor (2)

Creates an **IccBuf** object that cannot be extended, adopting the given data area as its own. See warning about [Internal/External ownership of buffers](#).

**IccBuf (unsigned long *length*,  
void\* *dataArea*)**

#### *length*

The length of the supplied data area, in bytes

#### *dataArea*

The address of the first byte of the supplied data area.

### Constructor (3)

Creates an **IccBuf** object, allocating its own data area with the same length as the *text* string, and copies the string into its data area.

**IccBuf (const char\* *text*,  
DataAreaType *type* = extensible)**

#### *text*

A null-terminated string to be copied into the new **IccBuf** object.



***type***

An enumeration that indicates whether the data area can be extended. Possible values are **extensible** or **fixed**. The default is **extensible**.

**Constructor (4)**

The copy constructor—creates a new **IccBuf** object that is a copy of the given object. The created **IccBuf** object **always** has an internal data area.

**IccBuf(const IccBuf& *buffer*)**

***buffer***

A reference to an **IccBuf** object that is to be copied into the new object.

**Public methods**

These are the public methods in this class.

**append (1)**

Appends data from the given data area to the data area in the object.

**IccBuf& append (unsigned long *length*,  
const void\* *dataArea*)**

***length***

The length of the source data area, in bytes

***dataArea***

The address of the source data area.

**append (2)**

Append data, in the form of format string and variable argument, to the data area in the object. This is the same as the form used by **printf** in the standard C library. Note that it is the responsibility of the application programmer to ensure that the optional parameters are consistent with the format string.

**IccBuf& append (const char\* *format*,  
...)**

***format***

The null-terminated format string

...

The optional parameters.



**assign (1)**

Assigns data from the given data area to the data area in the object.

**IccBuf& assign (unsigned long *length*,  
const void\* *dataArea*)**

***length***

The length of the source data area, in bytes

***dataArea***

The address of the source data area.

**assign (2)**

Assigns data, in the form of format string and variable argument, to the data area in the object. This is the same as the form used by **printf** in the standard C library.

**IccBuf& assign (const char\* *format*,  
...)**

***format***

The format string

...

The optional parameters.

**cut**

Makes the specified cut to the data in the data area and returns a reference to the **IccBuf** object.

**IccBuf& cut (unsigned long *length*,  
unsigned long *offset* = 0)**

***length***

The number of bytes to be cut from the data area.

***offset***

The offset into the data area. The default is no offset.

***dataArea***

Returns the address of data at the given offset into the data area.

**const void\* dataArea(unsigned long *offset* = 0) const**



***offset***

The offset into the data area. The default is no offset.

**dataAreaLength**

Returns the length of the data area in bytes.

**unsigned long dataAreaLength() const****dataAreaOwner**

Returns an enumeration that indicates whether the data area has been allocated by the **IccBuf** constructor or has been supplied from elsewhere.

**DataAreaOwner dataAreaOwner() const**

The possible values are listed under [“DataAreaOwner” on page 84](#).

**dataAreaType****DataAreaType dataAreaType() const**

Returns an enumeration that indicates whether the data area can be extended. The possible values are listed under [“DataAreaType” on page 84](#).

**dataLength**

Returns the length of data in the data area. This cannot be greater than the value returned by **dataAreaLength**

**unsigned long dataLength() const****insert**

Inserts the given data into the data area at the given offset and returns a reference to the **IccBuf** object.

**IccBuf& insert (unsigned long *length*,  
const void\* *dataArea*,  
unsigned long *offset* = 0)**

***length***

The length of the data, in bytes, to be inserted into the **IccBuf** object

***dataArea***

The start of the source data to be inserted into the **IccBuf** object

***offset***

The offset in the data area where the data is to be inserted. The default is no offset.



## **isFMHContained**

### **Icc::Bool isFMHContained() const**

Returns a boolean, defined in **Icc** structure, that indicates whether the data area contains FMHs (function management headers).

### **operator const char\***

### **operator const char\*() const**

Casts an **IccBuf** object to a null terminated string.

```
IccBuf data("Hello World");  
cout << (const char*) data;
```

### **operator= (1)**

Assigns data from another buffer object and returns a reference to the **IccBuf** object.

### **IccBuf& operator=(const IccBuf& *buffer*)**

#### ***buffer***

A reference to an **IccBuf** object.

### **operator= (2)**

Assigns data from a null-terminated string and returns a reference to the **IccBuf** object. See also the **assign** method.

### **IccBuf& operator=(const char\* *text*)**

#### ***text***

The null-terminated string to be assigned to the **IccBuf** object.

### **operator+= (1)**

Appends data from another buffer object and returns a reference to the **IccBuf** object.

### **IccBuf& operator+=(const IccBuf& *buffer*)**



***buffer***

A reference to an **IccBuf** object.

**operator+=(2)**

Appends data from a null-terminated string and returns a reference to the **IccBuf** object. See also the **append** method.

**IccBuf& operator+=(const char\* *text*)**

***text***

The null-terminated string to be appended to the **IccBuf** object.

**operator==**

Returns a boolean, defined in **Icc** structure, that indicates whether the data contained in the buffers of the two **IccBuf** objects is the same. It is true if the current lengths of the two data areas are the same and the contents are the same.

**Icc::Bool operator==(const IccBuf& *buffer*) const**

***buffer***

A reference to an **IccBuf** object.

**operator!=**

Returns a boolean, defined in **Icc** structure, that indicates whether the data contained in the buffers of the two **IccBuf** objects is different. It is true if the current lengths of the two data areas are different or if the contents are different.

**Icc::Bool operator!=(const IccBuf& *buffer*) const**

***buffer***

A reference to an **IccBuf** object.

**operator«(1)**

Appends another buffer.

**operator«(const IccBuf& *buffer*)**



**operator« (2)**

Appends a string.

**operator«(const char\* *text*)****operator« (3)**

Appends a character.

**operator«(char *ch*)****operator« (4)**

Appends a character.

**operator«(signed char *ch*)****operator« (5)**

Appends a character.

**operator«(unsigned char *ch*)****operator« (6)**

Appends a string.

**operator«(const signed char\* *text*)****operator« (7)**

Appends a string.

**operator«(const unsigned char\* *text*)****operator« (8)**

Appends a short.

**operator«(short *num*)****operator« (9)**

Appends an unsigned short.

**operator«(unsigned short *num*)**



**operator« (10)**

Appends a long.

**operator«(long *num*)****operator« (11)**

Appends an unsigned long.

**operator«(unsigned long *num*)****operator« (12)**

Appends an integer.

**operator«(int *num*)****operator« (13)**

Appends a float.

**operator«(float *num*)****operator« (14)**

Appends a double.

**operator«(double *num*)****operator« (15)**

Appends a long double.

**operator«(long double *num*)**

Appends data of various types to the **IccBuf** object. The types are converted to a 'readable' format, for example from a long to a string representation.

**overlay**

Makes the data area external and fixed. Any existing internal data area is destroyed. See warning about [Internal/External ownership of buffers](#).



**IccBuf& overlay (unsigned long *length*,  
void\* *dataArea*)**

***length***

The length of the existing data area.

***dataArea***

The address of the existing data area.

**replace**

Replaces the current contents of the data area at the given offset with the data provided and returns a reference to the **IccBuf** object.

**IccBuf& replace (unsigned long *length*,  
const void\* *dataArea*,  
unsigned long *offset* = 0)**

***length***

The length of the source data area, in bytes.

***dataArea***

The address of the start of the source data area.

***offset***

The position where the new data is to be written, relative to the start of the **IccBuf** data area. The default is no offset.

**setDataLength**

Changes the current length of the data area and returns the new length. If the **IccBuf** object is not extensible, the data area length is set to either the original length of the data area or *length* , whichever is less.

**unsigned long setDataLength(unsigned long *length*)**

***length***

The new length of the data area, in bytes

**setFMHContained**

Allows an application program to indicate that a data area contains function management headers.

**void setFMHContained(Icc::Bool *yesNo* = Icc::yes)**



### **yesNo**

A boolean, defined in **Icc** structure, that indicates whether the data area contains FMHs. The default value is yes.

## **Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
className	IccBase
classType	IccBase
customClassNum	IccBase
operator delete	IccBase
operator new	IccBase

## **Inherited protected methods**

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
setClassName	IccBase
setCustomClassNum	IccBase

## **Enumerations**

### **DataAreaOwner**

Indicates whether the data area of a **IccBuf** object has been allocated outside the object.

Possible values are:

#### **internal**

The data area has been allocated by the **IccBuf** constructor.

#### **external**

The data area has been allocated externally.

### **DataAreaType**

Indicates whether the data area of a **IccBuf** object can be made longer than its original length.

Possible values are:

#### **extensible**

The data area can be automatically extended to accommodate more data.

#### **fixed**

The data area cannot grow in size. If you attempt to assign too much data, the data is truncated, and an exception is thrown.

## **IccClock class**

The **IccClock** class controls access to the CICS time and date services.

### **IccBase**

### **IccResource**

### **IccClock**

**Header file:** ICCCLKEH



**Sample:** ICC\$CLK

## IccClock constructor

### Constructor

**IccClock**(UpdateMode *update* = manual)

### *update*

An enumeration, defined in this class, that indicates whether the clock is to update its time automatically whenever a time or date service is used, or whether it is to wait until an explicit **update** method call is made. If the time is updated manually, the initial clock time is the time when the **IccClock object** is created.

## Public methods

These are the public methods in this class.

### **absTime**

Returns a reference to an **IccAbsTime** object that contains the absolute time as provided by CICS.

### **IccAbsTime& absTime()**

### **cancelAlarm**

Cancels a previous **setAlarm** request if the alarm time has not yet been reached, that is, the request has not expired.

**void cancelAlarm**(const **IccRequestId\*** *reqId* = 0)

### *reqId*

An optional pointer to the **IccRequestId** object that holds information on an alarm request.

### **Conditions**

ISCINVREQ, NOTAUTH, NOTFND, SYSIDERR

### **date**

Returns the date as a string.

**const char\*** **date** (**DateFormat** *format* = defaultFormat,  
                  **char** *dateSeparator* = '\0')



***format***

An enumeration, defined in this class, that indicates in which format you want the date to be returned.

***dateSeparator***

The character that is used to separate different fields in the date. The default is no separation character.

**Conditions**

INVREQ

**dayOfMonth**

Returns the day component of the date, in the range 1 to 31.

**unsigned long dayOfMonth()****Conditions**

INVREQ

**dayOfWeek**

Returns an enumeration, defined in this class, that indicates the day of the week.

**DayOfWeek dayOfWeek()****Conditions**

INVREQ

**daysSince1900**

Returns the number of days that have elapsed since 1st January, 1900.

**unsigned long daysSince1900()****Conditions**

INVREQ

**milliSeconds**

Returns the number of milliseconds that have elapsed since 00:00 on 1st January, 1900.

**long double milliSeconds()****monthOfYear****MonthOfYear monthOfYear()**

Returns an enumeration, defined in this class, that indicates the month of the year.



## Conditions

INVREQ

## setAlarm

Sets an alarm at the time specified in *time*. It returns a reference to an **IccAlarmRequestId** object that can be used to cancel the alarm—see **cancelAlarm** method.

See also the [“waitOnAlarm” on page 197](#) method of class **IccTask**.

```
const IccAlarmRequestId& setAlarm (const IccTime& time,  
                                   const IccRequestId* reqId = 0)
```

## *time*

A reference to an **IccTime** object that contains time information. As **IccTime** is an abstract class *time* is, in practise, an object of class **IccAbsTime**, **IccTimeOfDay**, or **IccTimeInterval**.

## *reqId*

An optional pointer to an **IccRequestId** object that is used to identify this particular alarm request.

## Conditions

EXPIRED, INVREQ

## time

Returns the time as a text string.

```
const char* time(char timeSeparator = '\0')
```

## *timeSeparator*

The character that delimits the time fields. The default is no separation character.

## Conditions

INVREQ

## update

Updates the clock time and date from CICS. See the **IccClock** constructor.

```
void update()
```

```
year
```

```
unsigned long year()
```

Returns the 4-figure year number, such as 1996.



## Conditions

INVREQ

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### DateFormat

- defaultFormat
- DDMMYY
- MMDDYY
- YYDDD
- YYDDMM
- YYMMDD
- DDMMYYYY



- MMDDYYYY
- YYYYDDD
- YYYYDDMM
- YYYYMMDD

#### **DayOfWeek**

Indicates the day of the week.

- Sunday
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday

#### **MonthOfYear**

Indicates the month of the year.

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

#### **UpdateMode**

Indicates whether the clock is automatically updated.

##### **manual**

The clock initially holds the time at which it was created. It is subsequently updated only when an **update** method call is made.

##### **automatic**

The clock is updated to the current CICS time and date whenever any time or date method is called (for example, **daysSince1900**).

## **IccCondition structure**

This structure contains an enumeration of all the CICS condition codes.

**Header file:** ICCCNDEH

## **Enumerations**



## Codes

The possible values are:

Value	Value	Value
0 NORMAL	35 TSIOERR	70 NOTAUTH
1 ERROR	36 MAPFAIL	---
2 RDATT	37 INVERRTERM	72 SUPPRESSED
3 WRBRK	38 INVMPSZ	---
4 ICCEOF	39 IGREQID	---
5 EODS	40 OVERFLOW	75 RESIDERR
6 EOC	41 INVLDC	---
7 INBFMH	42 NOSTG	---
8 ENDINPT	43 JIDERR	---
9 NONVAL	44 QIDERR	---
10 NOSTART	45 NOJBUFSP	80 NOSPOOL
11 TERMIDERR	46 DSSTAT	81 TERMERR
12 FILENOTFOUND	47 SELNERR	82 ROLLEDBACK
13 NOTFND	48 FUNCERR	83 END
14 DUPREC	49 UNEXPIN	84 DISABLED
15 DUPKEY	50 NOPASSBKRD	85 ALLOCERR
16 INVREQ	51 NOPASSBKWR	86 STRELERR
17 IOERR	---	87 OPENERR
18 NOSPACE	53 SYSIDERR	88 SPOLBUSY
19 NOTOPEN	54 ISCINVREQ	89 SPOLERR
20 ENDFILE	55 ENQBUSY	90 NODEIDERR
21 ILLOGIC	56 ENVDEFERR	91 TASKIDERR
22 LENGERR	57 IGREQCD	92 TCIDERR
23 QZERO	58 SESSIONERR	93 DSNNOTFOUND
24 SIGNAL	59 SYSBUSY	94 LOADING
25 QBUSY	60 SESSBUSY	95 MODELIDERR
26 ITEMERR	61 NOTALLOC	96 OUTDESCERR
27 PGMIDERR	62 CBIDERR	97 PARTNERIDERR
28 TRANSIDERR	63 INVEXITREQ	98 PROFILEIDERR
29 ENDDATA	64 INVPARTNSET	99 NETNAMEIDERR
30 INVTSREQ	65 INVPARTN	100 LOCKED
31 EXPIRED	66 PARTNFAIL	101 RECORDBUSY
32 RETPAGE	---	102 UOWNOTFOUND
33 RTEFAIL	---	103 UOWLNOTFOUND
34 RTESOME	69 USERIDERR	



**Range**

**maxValue**

The highest CICS condition, currently 103.

## IccConsole class

This is a singleton class that represents the CICS console.

**IccBase**

**IccResource**

**IccConsole**

**Header file:** ICCONEH

**Sample:** ICC\$CON

## IccConsole constructor (protected)

**Constructor**

No more than one of these objects is permitted in a task. An attempt to create more objects causes an exception to be thrown.

**IccConsole()**

## Public methods

These are the public methods in this class.

**The opt parameter**

Many methods have the same parameter, *opt*, which is described under the **abendCode** method in [“abendCode” on page 60](#).

**instance**

Returns a pointer to the single **IccConsole** object that represents the CICS console. If the object does not already exist, it is created by this method.

**static IccConsole\* instance()**

**put**

Writes the data in *send* to the CICS console. **put** is a synonym for **write**. See [Polymorphic Behavior](#).

**virtual void put(const IccBuf& send)**

**send**

A reference to an **IccBuf** object that contains the data that is to be written to the console.

**replyTimeout**



**unsigned long replyTimeout() const**

Returns the length of the reply timeout in milliseconds.

**resetRouteCodes**

**void resetRouteCodes()**

Removes all route codes held in the **IccConsole** object.

**setAllRouteCodes**

**void setAllRouteCodes()**

Sets all possible route codes in the **IccConsole** object, that is, 1 through 28.

**setReplyTimeout (1)**

**void setReplyTimeout(IccTimeInterval& interval)**

*interval*

A reference to a **IccTimeInterval** object that describes the length of the time interval required.

**setReplyTimeout (2)**

The two different forms of this method are used to set the length of the reply timeout.

**void setReplyTimeout(unsigned long seconds)**

*seconds*

The length of the time interval required, in seconds.

**setRouteCodes**

Saves route codes in the object for use on subsequent **write** and **writeAndGetReply** calls. Up to 28 codes can be held in this way.

**void setRouteCodes (unsigned short numRoutes,  
...)**



### ***numRoutes***

The number of route codes provided in this call—the number of arguments that follow this one.

...

One or more arguments, the number of which is given by *numRoutes*. Each argument is a route code, of type **unsigned short**, in the range 1 to 28.

### **write**

Writes the data in *send* to the CICS console.

```
void write (const IccBuf& send,  
            SeverityOpt opt = none)
```

### ***send***

A reference to an **IccBuf** object that contains the data that is to be written to the console.

### ***opt***

An enumeration that indicates the severity of the console message.

### **Conditions**

INVREQ, LENGERR, EXPIRED

### **writeAndGetReply**

Writes the data in *send* to the CICS console and returns a reference to an **IccBuf** object that contains the reply from the CICS operator.

```
const IccBuf& writeAndGetReply (const IccBuf& send,  
                                SeverityOpt opt= none)
```

### ***send***

A reference to an **IccBuf** object that contains the data that is to be written to the console.

### ***opt***

An enumeration that indicates the severity of the console message.

### **Conditions**

INVREQ, LENGERR, EXPIRED

## **Inherited public methods**

These are the public methods inherited by this class.

### **Method**

actionOnCondition

actionOnConditionAsChar

actionsOnConditionsText

classType

### **Class**

IccResource

IccResource

IccResource

IccBase



Method	Class
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### SeverityOpt

Possible values are:

- none
- warning
- error
- severe

## IccControl class

**IccControl** class controls an application program that uses the supplied Foundation Classes.

```

IccBase
  IccResource
    IccControl

```

This class is a singleton class in the application program; each program running under a CICS task has a single **IccControl** object.

**IccControl** has a pure virtual **run** method, where application code is written, and is therefore an abstract base class. The application programmer must subclass **IccControl**, and implement the **run** method.

**Header file:** ICCCTLEH



## IccControl constructor (protected)

### Constructor

#### IccControl()

## Public methods

These are the public methods in this class.

### callingProgramId

Returns a reference to an **IccProgramId** object that represents the program that called this program. The returned **IccProgramId** reference contains a null name if the executing program was not called by another program.

#### const IccProgramId& callingProgramId()

### Conditions

INVREQ

### cancelAbendHandler

Cancels a previously established exit at this logical program level.

#### void cancelAbendHandler()

### Conditions

NOTAUTH, PGMIDERR

### commArea

Returns a reference to an **IccBuf** object that encapsulates the COMMAREA—the communications area of CICS memory that is used for passing data between CICS programs and transactions.

#### IccBuf& commArea()

### Conditions

INVREQ

### console

Returns a pointer to the single **IccConsole** object. If this object has not yet been created, this method creates the object before returning a pointer to it.

#### IccConsole\* console()



## **initData**

### **const IccBuf& initData()**

Returns a reference to an **IccBuf** object that contains the initialization parameters specified for the program in the INITPARM system initialization parameter.

#### **Conditions**

INVREQ

#### **instance**

Returns a pointer to the single **IccControl** object. The object is created if it does not already exist.

### **static IccControl\* instance()**

#### **isCreated**

### **static Icc::Bool isCreated()**

Returns a boolean value that indicates whether the **IccControl** object already exists. Possible values are true or false.

#### **programId**

### **const IccProgramId& programId()**

Returns a reference to an **IccProgramId** object that refers to this executing program.

#### **Conditions**

INVREQ

#### **resetAbendHandler**

Reactivates a previously cancelled abend handler for this logical program level. (See **cancelAbendHandler** on page [“cancelAbendHandler”](#) on page 95).

### **void resetAbendHandler()**

#### **Conditions**

NOTAUTH, PGMIDERR

#### **returnProgramId**

Returns a reference to an **IccProgramId** object that refers to the program that resumes control when this logical program level issues a return.



**const IccProgramId& returnProgramId()**

**run**

**virtual void run() = 0**

This method should be implemented in a subclass of **IccControl** by the application programmer.

**session**

**IccSession\* session()**

Returns a pointer to the **IccSession** object that represents the principal facility for this program. An exception is thrown if this program does not have a session as its principal facility.

**setAbendHandler (1)**

**void setAbendHandler(const IccProgramId& *programId*)**

***programId***

A reference to the **IccProgramId** object that indicates which program is affected.

**setAbendHandler (2)**

These methods set the abend handler to the named program for this logical program level.

**void setAbendHandler(const char\* *programName*)**

***programName***

The name of the program affected.

**Conditions**

NOTAUTH, PGMIDERR

**startRequestQ**

Returns a pointer to the **IccStartRequestQ** object. If this object has not yet been created, this method creates the object before returning a pointer to it.

**IccStartRequestQ\* startRequestQ()**



## **system**

### **IccSystem\* system()**

Returns a pointer to the **IccSystem** object. If this object has not yet been created, this method creates the object before returning a pointer to it.

## **task**

### **IccTask\* task()**

Returns a pointer to the **IccTask** object. If this object has not yet been created, this method creates the object before returning a pointer to it.

## **terminal**

### **IccTerminal\* terminal()**

Returns a pointer to the **IccTerminal** object. If this object has not yet been created, this method creates the object before returning a pointer to it.

This method has a condition, that the transaction must have a terminal as its principal facility. That is, there must be a physical terminal involved.

## **Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource



Method	Class
setActionsOnConditions	IccResource
setEDF	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccConvId class

**IccConvId** class is used to identify an APPC conversation.

**IccBase**  
**IccResourceId**  
**IccConvId**

**IccConvId** class is used to identify an APPC conversation.

**Header file:** ICCRIDEH

## IccConvId constructors

### Constructor (1)

**IccConvId(const char\* convName)**

**convName**

The 4-character name of the conversation.

### Constructor (2)

The copy constructor.

**IccConvId(const IccConvId& convId)**

**convId**

A reference to an **IccConvId** object.

## Public methods

These are the public methods in this class.

### operator= (1)



**IccConvId& operator=(const char\* convName)**

**operator= (2)**  
Assigns new value.

**IccConvId& operator=(const IccConvId id)**

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccDataQueue class

This class represents a CICS transient data queue.

**IccBase**  
**IccResource**  
**IccDataQueue**

**Header file:** ICCDATEH

**Sample:** ICC\$DAT

## IccDataQueue constructors

**Constructor (1)**

**IccDataQueue(const IccDataQueueId& id)**



*id*

A reference to an **IccDataQueueId** object that contains the name of the CICS transient data queue.

## Constructor (2)

**IccDataQueue(const char\* *queueName*)**

*queueName*

The 4-byte name of the queue that is to be created. An exception is thrown if *queueName* is not valid.

## Public methods

These are the public methods in this class.

**clear**

A synonym for **empty**. See [Polymorphic Behavior](#).

**virtual void clear()**

**empty**

**void empty()**

Empties the queue, that is, deletes all items on the queue.

## Conditions

ISCINVREQ, NOTAUTH, QIDERR, SYSIDERR, DISABLED, INVREQ

**get**

A synonym for **readItem**. See [Polymorphic Behavior](#).

**virtual const IccBuf& get()**

**put**

A synonym for **writeItem**. See [Polymorphic Behavior](#).

**virtual void put(const IccBuf& *buffer*)**



***buffer***

A reference to an **IccBuf** object that contains data to be put into the queue.

**readItem****const IccBuf& readItem()**

Returns a reference to an **IccBuf** object that contains one item read from the data queue.

**Conditions**

IOERR, ISCINVREQ, LENGERR, NOTAUTH, NOTOPEN, QBUSY, QIDERR, QZERO, SYSIDERR, DISABLED, INVREQ

**writeItem (1)****void writeItem(const IccBuf& item)*****item***

A reference to an **IccBuf** object that contains data to be written to the queue.

**writeItem (2)**

Writes an item of data to the queue.

**void writeItem(const char\* text)*****text***

Text that is to be written to the queue.

**Conditions**

IOERR, ISCINVREQ, LENGERR, NOSPAC, NOTAUTH, NOTOPEN, QIDERR, SYSIDERR, DISABLED, INVREQ

**Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
className	IccBase
classType	IccBase
condition	IccResource



Method	Class
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
isRouteOptionOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
routeOption	IccResource
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource
setRouteOption	IccResource

### Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccDataQueueId class

**IccDataQueueId** is used to identify a CICS Transient Data Queue name.

```

IccBase
  IccResourceId
    IccDataQueueId

```

**IccDataQueueId** is used to identify a CICS Transient Data Queue name.

**Header file:** ICCRIDEH

### IccDataQueueId constructors

#### Constructor (1)

**IccDataQueueId(const char\* *queueName*)**

***queueName***

The 4-character name of the queue



## Constructor (2)

**IccDataQueueId(const IccDataQueueId& *id*)**

*id*

A reference to an **IccDataQueueId** object.

## Public methods

These are the public methods in this class.

**operator= (1)**

**IccDataQueueId& operator=(const char\* *queueName*)**

*queueName*

The 4-character name of the queue

**operator= (2)**

Assigns new value.

**IccDataQueueId& operator=(const IccDataQueueId& *id*)**

*id*

A reference to an **IccDataQueueId** object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase



## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccEvent class

The **IccEvent** class contains information on a specific CICS call, called a CICS event.

**IccBase**  
**IccEvent**

**Header file:** ICCEVTEH

**Sample:** ICC\$RES1

## IccEvent constructor

### Constructor

**IccEvent (const IccResource\* *object*,  
const char\* *methodName*)**

#### *object*

A pointer to the **IccResource** object that is responsible for this event.

#### *methodName*

The name of the method that caused the event to be created.

## Public methods

These are the public methods in this class.

### **className**

Returns the name of the class responsible for this event.

**const char\* className() const**

### **classType**

**IccBase::ClassType classType() const**

Returns an enumeration, described under **classType** on page “[classType](#)” on page 71 in **IccBase** class, that indicates the type of class that is responsible for this event.



### **condition**

Returns an enumerated type that indicates the condition returned from this CICS event. The possible values are described under the **Codes** type in the **IccCondition** structure.

```
IccCondition::Codes condition(IccResource::ConditionType type =  
    IccResource::majorCode) const
```

### **type**

An enumeration that indicates whether a major code or minor code is being requested. Possible values are 'majorCode' or 'minorCode'. 'majorCode' is the default value.

### **conditionText**

```
const char* conditionText() const
```

Returns the text of the CICS condition code, such as "NORMAL" or "LENGERR".

### **methodName**

```
const char* methodName() const
```

Returns the name of the method responsible for this event.

### **summary**

```
const char* summary()
```

Returns a summary of the CICS event in the form:

```
CICS event summary: IccDataQueue::readItem condition=23 (QZERO) minor=0
```

## **Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
className	IccBase
classType	IccBase
customClassNum	IccBase
operator delete	IccBase
operator new	IccBase



## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccException class

**IccException** class contains information about CICS Foundation Class exceptions.

**IccBase**  
**IccException**

It is used to create objects that are 'thrown' to application programs. They are generally used for error conditions such as invalid method calls, but the application programmer can also request an exception is thrown when CICS raises a particular condition.

**Header file:** ICCEXCEH

**Samples:** ICC\$EXC1, ICC\$EXC2, ICC\$EXC3

## IccException constructor

**Constructor**

```
IccException (Type exceptionType,  
              IccBase::ClassType classType,  
              const char* className,  
              const char* methodName,  
              IccMessage* message,  
              IccBase* object = 0,  
              unsigned short exceptionNum = 0)
```

***exceptionType***

An enumeration, defined in this class, that indicates the type of the exception

***classType***

An enumeration, defined in this class, that indicates from which type of class the exception was thrown

***className***

The name of the class from which the exception was thrown

***methodName***

The name of the method from which the exception was thrown

***message***

A pointer to the **IccMessage** object that contains information about why the exception was created.

***object***

A pointer to the object that threw the exception

***exceptionNum***

The unique exception number.

**Note:** When the **IccException** object is created it takes ownership of the **IccMessage** given on the constructor. When the **IccException** is deleted, the **IccMessage** object is deleted automatically by the



**IccException** destructor. Therefore, do not delete the **IccMessage** object before deleting the **IccException** object.

## Public methods

These are the public methods in this class.

### **className**

Returns the name of the class responsible for throwing this exception.

**const char\* className() const**

### **classType**

**IccBase::ClassType classType() const**

Returns an enumeration, described under **ClassType** in **IccBase** class, that indicates the type of class which threw this exception.

### **message**

**IccMessage\* message() const**

Returns a pointer to an **IccMessage** object that contains information on any message associated with this exception.

### **methodName**

**const char\* methodName() const**

Returns the name of the method responsible for throwing this exception.

### **number**

**unsigned short number() const**

Returns the unique exception number.

This is a useful diagnostic for IBM service. The number uniquely identifies from where in the source code the exception was thrown.

### **summary**

**const char\* summary()**

Returns a string containing a summary of the exception. This combines the **className**, **methodName**, **number**, **Type**, and **IccMessage::text** methods into the following form:



**type****Type type() const**

Returns an enumeration, defined in this class, that indicates the type of exception.

**typeText****const char\* typeText() const**

Returns a string representation of the exception type, for example, "objectCreationError", "invalidArgument".

**Inherited public methods**

These are the public methods inherited by this class.

Method	Class
className	IccBase
classType	IccBase
customClassNum	IccBase
operator delete	IccBase
operator new	IccBase

**Inherited protected methods**

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

**Enumerations****Type****objectCreationError**

An attempt to create an object was invalid. This happens, for example, if an attempt is made to create a second instance of a singleton class, such as **IccTask**.

**invalidArgument**

A method was called with an invalid argument. This happens, for example, if an **IccBuf** object with too much data is passed to the **writeItem** method of the **IccTempStore** class by the application program. An attempt to create an **IccFileId** object with a 9-character filename also generates an exception of this type.

**invalidMethodCall**

A method call cannot proceed. A typical reason is that the object cannot honor the call in its current state. For example, a **readRecord** call on an **IccFile** object is only honored if an **IccRecordIndex** object, to specify *which* record is to be read, has already been associated with the file.



### **CICSCondition**

A CICS condition, listed in the **IccCondition** structure, has occurred in the object and the object was configured to throw an exception.

### **platformError**

An operation is invalid because of limitations of this particular platform.

A platformError exception can occur at 3 levels:

1. An object is not supported on this platform.
2. An object is supported on this platform, but a particular method is not.
3. A method is supported on this platform, but a particular positional parameter is not.

See [Platform differences](#) for more details.

### **familyConformanceError**

Family subset enforcement is on for this program and an operation that is not valid on all supported platforms has been attempted.

### **internalError**

The CICS Foundation Classes have detected an internal error. Please call your support organization.

## **IccFile class**

**IccFile** class enables the application program to access CICS files.

### **IccBase**

#### **IccResource**

#### **IccFile**

**Header file:** ICCFILEH

**Sample:** ICC\$FIL

## **IccFile constructors**

### **Constructor (1)**

**IccFile (const IccFileId& *id*,  
IccRecordIndex\* *index* = 0)**

#### ***id***

A reference to the **IccFileId** object that identifies which file is being operated on

#### ***index***

An optional pointer to the **IccRecordIndex** object that identifies which record in the file is being operated on.

### **Constructor (2)**

To access files using an **IccFile** object, it must have an **IccRecordIndex** object associated with it. If this association is not made when the object is created, use the **registerRecordIndex** method.



**IccFile (const char\* *fileName*,  
IccRecordIndex\* *index* = 0)**

***fileName***

The 8-character name of the file

***index***

An optional pointer to the **IccRecordIndex** object that identifies which record in the file is being operated on.

## Public methods

These are the public methods in this class.

### The *opt* parameter

Many methods have the same parameter, *opt*, which is described under the **abendCode** method in [“abendCode”](#) on page 60.

### **access**

Returns a composite number indicating the access properties of the file. See also **isReadable**, **isBrowsable**, **isAddable**, **isDeletable**, and **isUpdatable** methods.

**unsigned long access(Icc::GetOpt *opt* = Icc::object)**

### ***opt***

An enumeration, defined in **Icc** structure, that indicates whether you can use a value previously retrieved from CICS (object), or whether the object should retrieve a fresh value from CICS.

### **accessMethod**

Returns an enumeration, defined in **IccValue**, that represents the access method for this file.

Possible values are:

- VSAM
- BDAM
- SFS

**IccValue::CVDA accessMethod(Icc::GetOpt *opt* = Icc::object)**

### ***opt***

See **access** method.

### Conditions

END, FILENOTFOUND, ILLOGIC, NOTAUTH



**beginInsert (VSAM only)**

Signals the start of a mass insertion of data into the file.

**void beginInsert()****deleteLockedRecord**

Deletes a record that has been previously locked by **readRecord** method in update mode. (See also **readRecord** method.)

**void deleteLockedRecord(unsigned long *updateToken* = 0)*****updateToken***

A token that indicates which previously read record is to be deleted. This is the token that is returned from **readRecord** method when in update mode.

**Conditions**

DISABLED, DUPKEY, FILENOTFOUND, ILLOGIC, INVREQ, IOERR, ISCINVREQ, NOTAUTH, NOTFIND, NOTOPEN, SYSIDERR, LOADING

**deleteRecord**

Deletes one or more records, as specified by the associated **IccRecordIndex** object, and returns the number of deleted records.

**unsigned short deleteRecord()****Conditions**

DISABLED, DUPKEY, FILENOTFOUND, ILLOGIC, INVREQ, IOERR, ISCINVREQ, NOTAUTH, NOTFIND, NOTOPEN, SYSIDERR, LOADING

**enableStatus**

Returns an enumeration, defined in **IccValue**, that indicates whether the file is enabled to be used by programs.

Possible values are:

- DISABLED
- DISABLING
- ENABLED
- UNENABLED

**IccValue::CVDA enableStatus(Icc::GetOpt *opt* = Icc::object)**



***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**endInsert (VSAM only)**

Marks the end of a mass insertion operation. See **beginInsert**.

**void endInsert()**

**isAddable**

Indicates whether more records can be added to the file.

**Icc::Bool isAddable(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**isBrowsable**

Indicates whether the file can be browsed.

**Icc::Bool isBrowsable(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**isDeletable**

Indicates whether the records in the file can be deleted.

**Icc::Bool isDeletable(Icc::GetOpt *opt* = Icc::object)**



***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**isEmptyOnOpen**

Returns a Boolean that indicates whether the EMPTYREQ option is specified. EMPTYREQ causes the object associated with this file to be set to empty when opened, if it is a VSAM data set defined as reusable.

**Icc::Bool isEmptyOnOpen(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**isReadable**

Indicates whether the file records can be read.

**Icc::Bool isReadable(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**isRecoverable**

**Icc::Bool isRecoverable(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions:** END, FILENOTFOUND, ILLOGIC, NOTAUTH



**isUpdatable**

Indicates whether the file can be updated.

**Icc::Bool isUpdatable(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**keyLength**

Returns the length of the search key.

**unsigned long keyLength(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**keyPosition**

Returns the position of the key field in each record relative to the beginning of the record. If there is no key, zero is returned.

**long keyPosition(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**openStatus**

Returns a CVDA that indicates the open status of the file. Possible values are:

**IccValue::CVDA openStatus(Icc::GetOpt *opt* = Icc::object)**



***opt***

See **access** method.

**CLOSED**

The file is closed.

**CLOSING**

The file is in the process of being closed. Closing a file may require dynamic deallocation of data sets and deletion of shared resources, so the process may last a significant length of time.

**CLOSEREQUEST**

The file is open and one or more application tasks are using it. A request has been received to close it.

**OPEN**

The file is open.

**OPENING**

The file is in the process of being opened.

**Conditions:** END, FILENOTFOUND, ILLOGIC, NOTAUTH

**readRecord**

Reads a record and returns a reference to an **IccBuf** object that contains the data from the record.

```
const IccBuf& readRecord (ReadMode mode = normal,  
                          unsigned long* updateToken = 0)
```

***mode***

An enumeration, defined in this class, that indicates in which mode the record is to be read.

***updateToken***

A pointer to an **unsigned long** token that will be updated by the method when *mode* is update and you want to make multiple read updates. The token uniquely identifies the update request and is passed to the **deleteLockedRecord**, **rewriteRecord**, or **unlockRecord** methods

**Conditions**

DISABLED, DUPKEY, FILENOTFOUND, ILLOGIC, INVREQ, IOERR, ISCINVREQ, LENGERR, NOTAUTH, NOTFND, NOTOPEN, SYSIDERR, LOADING

**recordFormat**

Returns a CVDA that indicates the format of the data. Possible values are:

```
IccValue::CVDA recordFormat(Icc::GetOpt opt = Icc::object)
```

***opt***

See **access** method.



**FIXED**

The records are of fixed length.

**UNDEFINED (BDAM data sets only)**

The format of records on the file is undefined.

**VARIABLE**

The records are of variable length. If the file is associated with a data table, the record format is always variable length, even if the source data set contains fixed-length records.

**Conditions:** END, FILENOTFOUND, ILLOGIC, NOTAUTH

**recordIndex**

Returns a pointer to an **IccRecordIndex** object that indicates which records are to be accessed when using methods such as **readRecord**, **writeRecord**, and **deleteRecord**.

**IccRecordIndex\* recordIndex() const**

**recordLength**

Returns the length of the current record.

**unsigned long recordLength(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**registerRecordIndex**

**void registerRecordIndex(IccRecordIndex\* *index*)**

***index***

A pointer to an **IccKey**, **IccRBA**, or **IccRRN** object that will be used by methods such as **readRecord**, **writeRecord**, etc..

**rewriteRecord**

Updates a record with the contents of *buffer*.

**void rewriteRecord (const IccBuf& *buffer*,  
                  unsigned long *updateToken* = 0)**



***buffer***

A reference to the **IccBuf** object that holds the new record data to be written to the file.

***updateToken***

The token that identifies which previously read record is to be rewritten. See **readRecord**.

**Conditions**

DISABLED, FILENOTFOUND, ILLOGIC, INVREQ, IOERR, ISCINVREQ, NOTAUTH, NOTFND, NOTOPEN, SYSIDERR, LOADING

**setAccess**

Sets the permitted access to the file.

For example:

```
file.setAccess(IccFile::readable + IccFile::notUpdatable);
```

**void setAccess(unsigned long *access*)*****access***

A positive integer value created by ORing (or adding) one or more of the values of the Access enumeration, defined in this class.

**Conditions**

FILENOTFOUND, INVREQ, IOERR, NOTAUTH

**setEmptyOnOpen****void setEmptyOnOpen(Icc::Bool *trueFalse*)**

Specifies whether or not to make the file empty when it is next opened.

**Conditions**

FILENOTFOUND, INVREQ, IOERR, NOTAUTH

**setStatus**

Sets the status of the file.

**void setStatus(Status *status*)*****status***

An enumeration, defined in this class, that indicates the required status of the file after this method is called.



**Conditions**

FILENOTFOUND, INVREQ, IOERR, NOTAUTH

**type**

Returns a CVDA that identifies the type of data set that corresponds to this file. Possible values are:

**IccValue::CVDA type(Icc::GetOpt *opt* = Icc::object)**

***opt***

See **access** method.

**ESDS**

The data set is an entry-sequenced data set.

**KEYED**

The data set is addressed by physical keys.

**KSDS**

The data set is a key-sequenced data-set.

**NOTKEYED**

The data set is not addressed by physical keys.

**RRDS**

The data set is a relative record data set.

**VRRDS**

The data set is a variable relative record data set.

**Conditions:** END, FILENOTFOUND, ILLOGIC, NOTAUTH

**unlockRecord**

Unlock a record, previously locked by reading it in update mode. See **readRecord**.

**void unlockRecord(unsigned long *updateToken* = 0)**

***updateToken***

A token that indicates which previous **readRecord** update request is to be unlocked.

**Conditions**

DISABLED, FILENOTFOUND, ILLOGIC, IOERR, ISCINVREQ, NOTAUTH, NOTOPEN, SYSIDERR, INVREQ

**writeRecord**

Write either a single record or a sequence of records, if used with the **beginInsert** and **endInsert** methods.

**void writeRecord(const IccBuf& *buffer*)**



***buffer***

A reference to the **IccBuf** object that holds the data that is to be written into the record.

**Conditions**

DISABLED, DUPREC, FILENOTFOUND, ILLOGIC, INVREEQ, IOERR, ISCINVREQ, LENGERR, NOSPACE, NOTAUTH, NOTOPEN, SYSIDERR, LOADING, SUPPRESSED

**Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
className	IccBase
classType	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
isRouteOptionOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
routeOption	IccResource
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource
setRouteOption	IccResource

**Inherited protected methods**

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
setClassName	IccBase
setCustomClassNum	IccBase

**Enumerations**



## **Access**

### **readable**

File records can be read by CICS tasks.

### **notReadable**

File records cannot be read by CICS tasks.

### **browsable**

File records can be browsed by CICS tasks.

### **notBrowsable**

File records cannot be browsed by CICS tasks.

### **addable**

Records can be added to the file by CICS tasks.

### **notAddable**

Records cannot be added to the file by CICS tasks.

### **updatable**

Records in the file can be updated by CICS tasks.

### **notUpdatable**

Records in the file cannot be updated by CICS tasks.

### **deletable**

Records in the file can be deleted by CICS tasks.

### **notDeletable**

Records in the file cannot be deleted by CICS tasks.

### **fullAccess**

Equivalent to readable AND browsable AND addable AND updatable AND deletable.

### **noAccess**

Equivalent to notReadable AND notBrowsable AND notAddable AND notUpdatable AND notDeletable.

## **ReadMode**

ReadMode is the mode in which a file is read.

### **normal**

No update is to be performed (that is, read-only mode)

### **update**

The record is to be updated. The record is locked by CICS until:

- it is rewritten using the **rewriteRecord** method *or*
- it is deleted using the **deleteLockedRecord** method *or*
- it is unlocked using the **unlockRecord** method *or*
- the task commits or rolls back its resource updates *or*
- the task is abended.

## **SearchCriterion**

### **equalToKey**

The search only finds an exact match.

### **gteqToKey**

The search finds either an exact match or the next record in search order.

## **Status**

### **open**

File is open, ready for read/write requests by CICS tasks.

### **closed**

File is closed, and is therefore not currently being used by CICS tasks.



**enabled**

File is enabled for access by CICS tasks.

**disabled**

File is disabled from access by CICS tasks.

## **IccFileId class**

**IccFileId** is used to identify a file name in the CICS system.

**IccBase****IccResourceId****IccFileId**

**Header file:** ICCRIDEH

## **IccFileId constructors**

**Constructor (1)**

**IccFileId(const char\* *fileName*)**

***fileName***

The name of the file.

**Constructor (2)**

**IccFileId(const IccFileId& *id*)**

***id***

A reference to an **IccFileId** object.

## **Public methods**

These are the public methods in this class.

**operator= (1)**

**IccFileId& operator=(const char\* *fileName*)**

***fileName***

The 8-byte name of the file.



**operator= (2)**  
Assigns new value.

**IccFileId& operator=(const IccFileId& id)**

**id**  
A reference to an **IccFileId** object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccFileIterator class

This class is used to create **IccFileIterator** objects that can be used to browse through the records of a CICS file, represented by an **IccFile** object.

**IccBase**  
**IccResource**  
**IccFileIterator**

**Header file:** ICCFLIEH

**Sample:** ICC\$FIL

## IccFileIterator constructor

### Constructor

The **IccFile** and **IccRecordIndex** object must exist before the **IccFileIterator** is created.



```
IccFileIterator (IccFile* file,  
                IccRecordIndex* index,  
                IccFile::SearchCriterion search = IccFile::gteqToKey)
```

***file***

A pointer to the **IccFile** object that is to be browsed

***index***

A pointer to the **IccRecordIndex** object that is being used to select a record in the file

***search***

An enumeration, defined in **IccFile**, that indicates the criterion being used to find a search match. The default is **gteqToKey**.

**Conditions**

DISABLED, FILENOTFOUND, ILLOGIC, INVREQ, IOERR, ISCINVREQ, NOTAUTH, NOTFND, NOTOPEN, SYSIDERR, LOADING

## Public methods

These are the public methods in this class.

**readNextRecord**

Read the record that follows the current record.

```
const IccBuf& readNextRecord (IccFile::ReadMode mode = IccFile::normal,  
                             unsigned long* updateToken = 0)
```

***mode***

An enumeration, defined in **IccFile** class, that indicates the type of read request

***updateToken***

A returned token that is used to identify this unique update request on a subsequent **rewriteRecord**, **deleteLockedRecord**, or **unlockRecord** method on the file object.

**Conditions**

DUPKEY, ENDFILE, FILENOTFOUND, ILLOGIC, INVREQ, IOERR, ISCINVREQ, LENGERR, NOTAUTH, NOTFIND, SYSIDERR

**readPreviousRecord**

Read the record that precedes the current record.

```
const IccBuf& readPreviousRecord (IccFile::ReadMode mode = IccFile::normal,  
                                 unsigned long* updateToken = 0)
```



### ***mode***

An enumeration, defined in **IccFile** class, that indicates the type of read request.

### ***updateToken***

See **readNextRecord**.

### **Conditions**

DUPKEY, ENDFILE, FILENOTFOUND, ILLOGIC, INVREQ, IOERR, ISCINVREQ, LENGERR, NOTAUTH, NOTFIND, SYSIDERR

### **reset**

Resets the **IccFileIterator** object to point to the record identified by the **IccRecordIndex** object and the specified search criterion.

```
void reset (IccRecordIndex* index,  
            IccFile::SearchCriterion search = IccFile::gteqToKey)
```

### ***index***

A pointer to the **IccRecordIndex** object that is being used to select a record in the file.

### ***search***

An enumeration, defined in **IccFile**, that indicates the criterion being used to find a search match. The default is **gteqToKey**.

### **Conditions**

FILENOTFOUND, ILLOGIC, INVREQ, IOERR, ISCINVREQ, NOTAUTH, NOTFND, SYSIDERR

## **Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
<b>actionOnCondition</b>	IccResource
<b>actionOnConditionAsChar</b>	IccResource
<b>actionsOnConditionsText</b>	IccResource
<b>className</b>	IccBase
<b>classType</b>	IccBase
<b>condition</b>	IccResource
<b>conditionText</b>	IccResource
<b>customClassNum</b>	IccBase
<b>handleEvent</b>	IccResource
<b>id</b>	IccResource
<b>isEDFOn</b>	IccResource
<b>isRouteOptionOn</b>	IccResource
<b>name</b>	IccResource
<b>operator delete</b>	IccBase



Method	Class
operator new	IccBase
routeOption	IccResource
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource
setRouteOption	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccGroupId class

**IccGroupId** class is used to identify a CICS group.

**IccBase**  
**IccResourceId**  
**IccGroupId**

**IccGroupId** class is used to identify a CICS group.

**Header file:** ICCRIDEH

## IccGroupId constructors

### Constructor (1)

**IccGroupId(const char\* *groupName*)**

***groupName***

The 8-character name of the group.

### Constructor (2)

The copy constructor.

**IccGroupId(const IccGroupId& *id*)**

***id***

A reference to an **IccGroupId** object.



## Public methods

These are the public methods in this class.

### **operator= (1)**

**IccGroupId& operator=(const char\* groupName)**

#### ***groupName***

The 8-character name of the group.

### **operator= (2)**

Assigns new value.

**IccGroupId& operator=(const IccGroupId& id)**

#### ***id***

A reference to an **IccGroupId** object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase



## IccJournal class

**IccJournal** class represents a user or system CICS journal.

**IccBase**  
**IccResource**  
**IccJournal**

**Header file:** ICCJRNEH

**Sample:** ICC\$JRN

## IccJournal constructors

### Constructor (1)

**IccJournal (const IccJournalId& *id*,  
unsigned long *options* = 0)**

#### *id*

A reference to an **IccJournalId** object that identifies which journal is being used.

#### *options*

An integer, constructed from the **Options** enumeration defined in this class, that affects the behavior of **writeRecord** calls on the **IccJournal** object. The values may be combined by addition or bitwise ORing, for example:

```
IccJournal::startIO | IccJournal::synchronous
```

The default is to use the system default.

### Constructor (2)

**IccJournal (unsigned short *journalNum*,  
unsigned long *options* = 0)**

#### *journalNum*

The journal number (in the range 1-99)

#### *options*

See above.

## Public methods

These are the public methods in this class.

#### **clearPrefix**

Clears the current prefix as set by **registerPrefix** or **setPrefix**. If the current prefix was set using **registerPrefix**, then the **IccJournal** class only removes its own reference to the prefix. The buffer itself is



left unchanged. If the current prefix was set by **setPrefix**, then the **IccJournal**'s copy of the buffer is deleted.

**void clearPrefix()**

**journalTypeId**

Returns a reference to an **IccJournalTypeId** object that contains a 2-byte field used to identify the origin of journal records.

**const IccJournalTypeId& journalTypeId() const**

**put**

A synonym for **writeRecord**—puts data into the journal. See [Polymorphic Behavior](#) for information on polymorphism.

**virtual void put(const IccBuf& *buffer*)**

***buffer***

A reference to an **IccBuf** object that holds data to be put into the journal.

**registerPrefix**

**void registerPrefix(const IccBuf\* *prefix*)**

Stores pointer to prefix object for use when the **writeRecord** method is called on this **IccJournal** object.

**setJournalTypeId (1)**

**void setJournalTypeId(const IccJournalTypeId& *id*)**

**setJournalTypeId (2)**

Sets the journal type—a 2 byte identifier—included in the journal record created when using the **writeRecord** method.

**void setJournalTypeId(const char\* *jtypeid*)**



## **setPrefix (1)**

**void setPrefix(const IccBuf& *prefix*)**

## **setPrefix (2)**

**void setPrefix(const char\* *prefix*)**

Stores the *current* contents of *prefix* for inclusion in the journal record created when the **writeRecord** method is called.

## **wait**

Waits until a previous journal write has completed.

**void wait (unsigned long *requestNum*=0,  
          unsigned long *option* = 0)**

## ***requestNum***

The write request. Zero indicates the last write on this journal.

## ***option***

An integer that affects the behaviour of **writeRecord** calls on the **IccJournal** object. Values other than 0 should be made from the **Options** enumeration, defined in this class. The values may be combined by addition or bitwise ORing, for example `IccJournal::startIO + IccJournal::synchronous`. The default is to use the system default.

## **writeRecord (1)**

**unsigned long writeRecord (const IccBuf& *record*,  
                          unsigned long *option* = 0)**

## ***record***

A reference to an **IccBuf** object that holds the record

## ***option***

See above.

## **writeRecord (2)**

Writes the data in the record to the journal. The returned number represents the particular write request and can be passed to the **wait** method in this class.



**unsigned long writeRecord (const char\* *record*,  
unsigned long *option* = 0)**

***record***

The name of the record

***option***

See above.

**Conditions**

IOERR, JIDERR, LENGERR, NOJBUFSP, NOTAUTH, NOTOPEN

**Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

**Inherited protected methods**

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
setClassName	IccBase
setCustomClassNum	IccBase

**Enumerations**



### Options

The behaviour of **writeRecord** calls on the **IccJournal** object.

The values can be combined in an integer by addition or bitwise ORing.

### startIO

Specifies that the output of the journal record is to be initiated immediately. If 'synchronous' is specified for a journal that is not frequently used, you should also specify 'startIO' to prevent the requesting task waiting for the journal buffer to be filled. If the journal is used frequently, startIO is unnecessary.

### noSuspend

Specifies that the NOJBUFSP condition does not suspend an application program.

### synchronous

Specifies that synchronous journal output is required. The requesting task waits until the record has been written.

## IccJournalId class

**IccJournalId** is used to identify a journal number in the CICS sytem.

### IccBase

#### IccResourceId

#### IccJournalId

**Header file:** ICCRIDEH

## IccJournalId constructors

### Constructor (1)

**IccJournalId(unsigned short *journalNum*)**

### *journalNum*

The number of the journal, in the range 1 to 99

### Constructor (2)

The copy constructor.

**IccJournalId(const IccJournalId& *id*)**

### *id*

A reference to an **IccJournalId** object.



## Public methods

These are the public methods in this class.

### **number**

Returns the journal number, in the range 1 to 99.

**unsigned short number() const**

**operator= (1)**

**IccJournalId& operator=(unsigned short *journalNum*)**

### ***journalNum***

The number of the journal, in the range 1 to 99

**operator= (2)**

Assigns new value.

**IccJournalId& operator=(const IccJournalId& *id*)**

### ***id***

A reference to an **IccJournalId** object.

## Inherited public methods

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
operator=	IccResourceId
setClassName	IccBase



**Method**

setCustomClassNum

**Class**

IccBase

**IccJournalTypeId class**

An **IccJournalTypeId** class object is used to help identify the origin of a journal record—it contains a 2-byte field that is included in the journal record.

**IccBase****IccResourceId****IccJournalTypeId**

An **IccJournalTypeId** class object is used to help identify the origin of a journal record—it contains a 2-byte field that is included in the journal record.

**Header file:** ICCRIDEH

**IccJournalTypeId constructors****Constructor (1)**

**IccJournalTypeId(const char\* *journalTypeName*)**

***journalTypeName***

A 2-byte identifier used in journal records.

**Constructor (2)**

**IccJournalTypeId(const IccJournalId& *id*)**

***id***

A reference to an **IccJournalTypeId** object.

**Public methods**

These are the public methods in this class.

**operator= (1)**

**void operator=(const IccJournalTypeId& *id*)**

***id***

A reference to an **IccJournalTypeId** object.



**operator= (2)**

Sets the 2-byte field that is included in the journal record.

**void operator=(const char\* *journalTypeName*)**

***journalTypeName***

A 2-byte identifier used in journal records.

**Inherited public methods**

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

**Inherited protected methods**

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

**IccKey class**

**IccKey** class is used to hold a search key for an indexed (KSDS) file.

**IccBase****IccRecordIndex****IccKey**

**Header file:** ICCRECEH

**Sample:** ICC\$FIL

**IccKey constructors****Constructor (1)**



**IccKey** (const char\* *initValue*,  
Kind *kind* = complete)

## Constructor (2)

**IccKey** (unsigned short *completeLength*,  
Kind *kind* = complete)

## Constructor (3)

**IccKey**(const IccKey& *key*)

## Public methods

These are the public methods in this class.

### **assign**

Copies the search key into the **IccKey** object.

**void assign** (unsigned short *length*,  
const void\* *dataArea*)

### **length**

The length of the data area

### **dataArea**

A pointer to the start of the data area that holds the search key.

### **completeLength**

Returns the length of the key when it is complete.

**unsigned short completeLength() const**

**kind**

**Kind kind() const**

Returns an enumeration, defined in this class, that indicates whether the key is generic or complete.



**operator= (1)**

**IccKey& operator=(const IccKey& *key*)**

**operator= (2)**

**IccKey& operator=(const IccBuf& *buffer*)**

**operator= (3)**

Assigns new value to key.

**IccKey& operator=(const char\* *value*)**

**operator== (1)**

**Icc::Bool operator==(const IccKey& *key*) const**

**operator== (2)**

**Icc::Bool operator==(const IccBuf& *text*) const**

**operator== (3)**

Tests equality.

**Icc::Bool operator==(const char\* *text*) const**

**operator!= (1)**

**Icc::Bool operator!=(const IccKey& *key*) const**



**operator!= (2)**

**Icc::Bool operator!=(const IccBuf& *text*) const**

**operator!= (3)**

Tests inequality.

**Icc::Bool operator!=(const char\* *text*) const**

**setKind**

Changes the type of key from generic to complete or vice versa.

**void setKind(Kind *kind*)**

***kind***

An enumeration, defined in this class, that indicates whether the key is generic or complete.

**value**

**const char\* value()**

Returns the start of the data area containing the search key.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
className	IccBase
classType	IccBase
customClassNum	IccBase
length	IccRecordIndex
operator delete	IccBase
operator new	IccBase
type	IccRecordIndex
value	IccRecordIndex



## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### Kind

#### **complete**

Specifies that the supplied key is not generic.

#### **generic**

Specifies that the search key is generic. A search is satisfied when a record is found with a key whose prefix matches the supplied key.

## IccLockId class

**IccLockId** class is used to identify a lock request.

### **IccBase**

#### **IccResourceId**

#### **IccLockId**

**IccLockId** class is used to identify a lock request.

**Header file:** ICCRIDEH

## IccLockId constructors

### **Constructor (1)**

**IccLockId(const char\* *name*)**

#### ***name***

The 8-character name of the lock request.

### **Constructor (2)**

The copy constructor.

**IccLockId(const IccLockId& *id*)**

#### ***id***

A reference to an **IccLockId** object.



## Public methods

These are the public methods in this class.

### **operator= (1)**

**IccLockId& operator=(const char\* *name*)**

#### ***name***

The 8-character name of the lock request.

### **operator= (2)**

Assigns new value.

**IccLockId& operator=(const IccLockId& *id*)**

#### ***id***

A reference to an **IccLockId** object.

## Inherited public methods

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase



## IccMessage class

**IccMessage** can be used to hold a message description.

IccBase  
IccMessage

It is used primarily by the **IccException** class to describe why the **IccException** object was created.

**Header file:** ICCMSGEH

### IccMessage constructor

#### Constructor

```
IccMessage (unsigned short number,  
             const char* text,  
             const char* className = 0,  
             const char* methodName = 0)
```

#### *number*

The number associated with the message

#### *text*

The text associated with the message

#### *className*

The optional name of the class associated with the message

#### *methodName*

The optional name of the method associated with the message.

### Public methods

These are the public methods in this class.

#### **className**

Returns the name of the class with which the message is associated, if any. If there is no name to return, a null pointer is returned.

```
const char* className() const
```

#### **methodName**

```
const char* methodName() const
```

Returns the name of the method with which the message is associated, if any. If there is no name to return, a null pointer is returned.

#### **number**



**unsigned short number() const**

Returns the number of the message.

**summary**

**const char\* summary()**

Returns the text of the message.

**text**

**const char\* text() const**

Returns the text of the message in the same way as summary.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
className	IccBase
classType	IccBase
customClassNum	IccBase
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccPartnerId class

**IccPartnerId** class represents CICS remote (APPC) partner transaction definitions.

**IccBase**

**IccResourceId**

**IccPartnerId**

**IccPartnerId** class represents CICS remote (APPC) partner transaction definitions.

**Header file:** ICCRIDEH

## IccPartnerId constructors

**Constructor (1)**



**IccPartnerId(const char\* *partnerName*)**

***partnerName***

The 8-character name of an APPC partner.

**Constructor (2)**

The copy constructor.

**IccPartnerId(const IccPartnerId& *id*)**

***id***

A reference to an **IccPartnerId** object.

## Public methods

**operator= (1)**

**IccPartnerId& operator=(const char\* *partnerName*)**

***partnerName***

The 8-character name of an APPC partner.

**operator= (2)**

Assigns new value.

**IccPartnerId& operator=(const IccPartnerId& *id*)**

***id***

A reference to an **IccPartnerId** object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId



Method	Class
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccProgram class

The **IccProgram** class represents any CICS program outside of your currently executing one, which the **IccControl** object represents.

**IccBase**  
**IccResource**  
**IccProgram**

**Header file:** ICCPRGEH

**Sample:** ICC\$PRG1, ICC\$PRG2, ICC\$PRG3

## IccProgram constructors

### Constructor (1)

**IccProgram(const IccProgramId& *id*)**

***id***

A reference to an **IccProgramId** object.

### Constructor (2)

**IccProgram(const char\* *progName*)**

***progName***

The 8-character name of the program.



## Public methods

### The *opt* parameter

Many methods have the same parameter, *opt*, which is described under the **abendCode** method in [“abendCode”](#) on page 60.

### **address**

Returns the address of a program module in memory. This is only valid after a successful **load** call.

**const void\* address() const**

### **clearInputMessage**

Clears the current input message which was set by **setInputMessage** or **registerInputMessage**. If the current input message was set using **registerInputMessage** then only the pointer is deleted: the buffer is left unchanged. If the current input message was set using **setInputMessage** then **clearInputMessage** releases the memory used by that buffer.

**void clearInputMessage()**

### **entryPoint**

**const void\* entryPoint() const**

Returns a pointer to the entry point of a loaded program module. This is only valid after a successful **load** call.

### **length**

**unsigned long length() const**

Returns the length of a program module. This is only valid after a successful **load** call.

### **link**

**void link (const IccBuf\* commArea = 0,  
const IccTransId\* transId = 0,  
CommitOpt opt = noCommitOnReturn)**

### **commArea**

An optional pointer to the **IccBuf** object that contains the COMMAREA—the buffer used to pass information between the calling program and the program that is being called



**transId**

An optional pointer to the **IccTransId** object that indicates the name of the mirror transaction under which the program is to run if it is a remote (DPL) program link

**opt**

An enumeration, defined in this class, that affects the behavior of the link when the program is remote (DPL). The default (noCommitOnReturn) is not to commit resource changes on the remote CICS region until the current task commits its resources. The alternative (commitOnReturn) means that the resources of the remote program are committed whether or not this task subsequently abends or encounters a problem.

**Conditions:** INVREQ, NOTAUTH, PGMIDERR, SYSIDERR, LENGERR, ROLLEDBACK, TERMERR

**Restrictions**

Links may be nested, that is, a linked program may **link** to another program. However, due to implementation restrictions, you may only nest such programs 15 times. If this is exceeded, an exception is thrown.

**load**

**void load(LoadOpt opt = releaseAtTaskEnd)**

**opt**

An enumeration, defined in this class, that indicates whether CICS should automatically allow the program to be unloaded at task termination (releaseAtTaskEnd), or not (hold).

**Conditions:** NOTAUTH, PGMIDERR, INVREQ, LENGERR

**registerInputMessage**

Store pointer to InputMessage for when the **link** method is called.

**void registerInputMessage(const IccBuf& msg)**

**setInputMessage**

Specifies data to be made available, by the **IccSession::receive()** method, to the called program, when using the **link** method in this class.

**void setInputMessage(const IccBuf& msg)**

**unload**

Allow a program to be unloaded. It can be reloaded by a call to **load**.

**void unload()**



## Conditions

NOTAUTH, PGMIDERR, INVREQ

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
className	IccBase
classType	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
isRouteOptionOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
routeOption	IccResource
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource
setRouteOption	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### CommitOpt

### noCommitOnReturn

Changes to resources on the remote CICS region are not committed until the current task commits its resources. This is the default setting.



**commitOnReturn**

Changes to resources on the remote CICS region are committed whether or not the current task subsequently abends or encounters a problem.

**LoadOpt****releaseAtTaskEnd**

Indicates that CICS should automatically allow the program to be unloaded at task termination.

**hold**

Indicates that CICS should not automatically allow the program to be unloaded at task termination. (In this case, this or another task must explicitly use the **unload** method).

## **IccProgramId class**

**IccProgramId** objects represent program names in the CICS system.

**IccBase****IccResourceId****IccProgramId**

Header file: ICCRIDEH

### **IccProgramId constructors**

**Constructor (1)**

**IccProgramId(const char\* *progName*)**

***progName***

The 8-character name of the program.

**Constructor (2)**

The copy constructor.

**IccProgramId(const IccProgramId& *id*)**

***id***

A reference to an **IccProgramId** object.

### **Public methods**

**operator= (1)**

**IccProgramId& operator=(const char\* *progName*)**



***progName***

The 8-character name of the program.

**operator= (2)**

Assigns new value.

**IccProgramId& operator=(const IccProgramId& id)**

***id***

A reference to an **IccProgramId** object.

### Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

### Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

### IccRBA class

An **IccRBA** object holds a relative byte address which is used for accessing VSAM ESDS files.

**IccBase**

**IccRecordIndex**

**IccRBA**

An **IccRBA** object holds a relative byte address which is used for accessing VSAM ESDS files.

**Header file:** ICCRECEH

### IccRBA constructor

**Constructor**



**IccRBA(unsigned long *initRBA* = 0)**

***initRBA***

An initial value for the relative byte address.

## **Public methods**

**operator= (1)**

**IccRBA& operator=(const IccRBA& *rba*)**

**operator= (2)**

Assigns a new value for the relative byte address.

**IccRBA& operator=(unsigned long *num*)**

***num***

A valid relative byte address.

**operator== (1)**

**Icc::Bool operator== (const IccRBA& *rba*) const**

**operator== (2)**

Tests equality

**Icc::Bool operator== (unsigned long *num*) const**

**operator!= (1)**

**Icc!:Bool operator== (const IccRBA& *rba*) const**



**operator!= (2)**  
Tests inequality

**Icc::Bool operator!=(unsigned long *num*) const**

**number**

**unsigned long number() const**

Returns the relative byte address.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
className	IccBase
classType	IccBase
customClassNum	IccBase
length	IccRecordIndex
operator delete	IccBase
operator new	IccBase
type	IccRecordIndex
value	IccRecordIndex

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccRecordIndex class

CICS File Control Record Identifier.

**IccBase**  
**IccRecordIndex**  
**IccKey**  
**IccRBA**  
**IccRRN**

CICS File Control Record Identifier. Used to tell CICS which particular record the program wants to retrieve, delete, or update. **IccRecordIndex** is a base class from which **IccKey**, **IccRBA**, and **IccRRN** are derived.

**Header file:** ICCRECEH



## IccRecordIndex constructor (protected)

### Constructor

**IccRecordIndex**(Type *type*)

#### *type*

An enumeration, defined in this class, that indicates whether the index type is key, RBA, or RRN.

**Note:** This is protected because you should not create **IccRecordIndex** objects; see subclasses **IccKey**, **IccRBA**, and **IccRRN**.

## Public methods

### **length**

Returns the length of the record identifier.

**unsigned short length() const**

### **type**

**Type type() const**

Returns an enumeration, defined in this class, that indicates whether the index type is key, RBA, or RRN.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
className	IccBase
classType	IccBase
customClassNum	IccBase
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations



**Type**

Type indicates the access method.

Possible values are:

- key
- RBA
- RRN

## **IccRequestId class**

An **IccRequestId** is used to hold the name of a request.

**IccBase****IccResourceId****IccRequestId**

An **IccRequestId** is used to hold the name of a request. This request identifier can subsequently be used to cancel a request—see, for example, **start** and **cancel** methods in **IccStartRequestQ** class.

**Header file:** ICCRIDEH

## **IccRequestId constructors**

**Constructor (1)**

An empty **IccRequestId** object.

**IccRequestId()****Constructor (2)****IccRequestId(const char\* *requestName*)*****requestName***

The 8-character name of the request.

**Constructor (3)**

The copy constructor.

**IccRequestId(const IccRequestId& *id*)*****id***

A reference to an **IccRequestId**.

## **Public methods**



**operator= (1)**

**IccRequestId& operator=(const IccRequestId& *id*)**

***id***

A reference to an **IccRequestId** object whose properties are copied into this object.

**operator= (2)**

Assigns new value.

**IccRequestId& operator=(const char\* *requestName*)**

***requestName***

An 8-character string which is copied into this object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccResource class

**IccResource** class is a base class that is used to derive other classes.

IccBase  
IccResource



The methods associated with **IccResource** are described here although, in practise, they are only called on objects of derived classes.

**IccResource** is the parent class for all CICS resources—tasks, files, programs, etc. Every class inherits from **IccBase**, but only those that use CICS services inherit from **IccResource**.

**Header file:** ICCRESEH

**Sample:** ICC\$RES1, ICC\$RES2

## IccResource constructor (protected)

### Constructor

**IccResource(IccBase::ClassType *classType*)**

#### *classType*

An enumeration that indicates what the subclass type is. For example, for an **IccTempStore** object, the class type is cTempStore. The possible values are listed under **ClassType** in the description of the **IccBase** class.

## Public methods

### **actionOnCondition**

Returns an enumeration that indicates what action the class will take in response to the specified condition being raised by CICS. The possible values are described in this class.

**ActionOnCondition actionOnCondition(IccCondition::Codes *condition*)**

#### *condition*

The name of the condition as an enumeration. See **IccCondition** structure for a list of the possible values.

### **actionOnConditionAsChar**

**char actionOnConditionAsChar(IccCondition::Codes *condition*)**

This method is the same as **actionOnCondition** but returns a character, rather than an enumeration, as follows:

#### **0 (zero)**

No action is taken for this CICS condition.

#### **H**

The virtual method **handleEvent** is called for this CICS condition.

#### **X**

An exception is generated for this CICS condition.



## A

This program is abended for this CICS condition.

### **actionsOnConditionsText**

Returns a string of characters, one character for each possible condition. Each character indicates the actions to be performed for that corresponding condition. .

The characters used in the string are described in “[actionOnConditionAsChar](#)” on [page 155](#). For example, the string: 0X00H0A ... shows the actions for the first seven conditions are as follows:

#### **condition 0 (NORMAL)**

action=0 (noAction)

#### **condition 1 (ERROR)**

action=X (throwException)

#### **condition 2 (RDATT)**

action=0 (noAction)

#### **condition 3 (WRBRK)**

action=0 (noAction)

#### **condition 4 (ICCEOF)**

action=H (callHandleEvent)

#### **condition 5 (EODS)**

action=0 (noAction)

#### **condition 6 (EOC)**

action=A (abendTask)

### **const char\* actionsOnConditionsText()**

### **clear**

Clears the contents of the object. This method is virtual and is implemented, wherever appropriate, in the derived classes. See [Polymorphic Behavior](#) for a description of polymorphism. The default implementation in this class throws an exception to indicate that it has not been overridden in a subclass.

### **virtual void clear()**

### **condition**

Returns a number that indicates the condition code for the most recent CICS call made by this object.

### **unsigned long condition(ConditionType type = majorCode) const**

### **type**

An enumeration, defined in this class, that indicates the type of condition requested. Possible values are majorCode (the default) and minorCode.

### **conditionText**

### **const char\* conditionText() const**

Returns the symbolic name of the last CICS condition for this object.



**get**

**virtual const IccBuf& get()**

Gets data from the **IccResource** object and returns it as an **IccBuf** reference. This method is virtual and is implemented, wherever appropriate, in the derived classes. See Polymorphic Behavior for a description of polymorphism. The default implementation in this class throws an exception to indicate that it has not been overridden in a subclass.

**handleEvent**

This virtual function may be re-implemented in a subclass (by the application programmer) to handle CICS events (see **IccEvent** class on page [“IccEvent class” on page 105](#)).

**virtual HandleEventReturnOpt handleEvent(IccEvent& event)**

**event**

A reference to an **IccEvent** object that describes the reason why this method is being called.

**id**

**const IccResourceId\* id() const**

Returns a pointer to the **IccResourceId** object associated with this **IccResource** object.

**isEDFOn**

**Icc::Bool isEDFOn() const**

Returns a boolean value that indicates whether EDF trace is active. Possible values are yes or no.

**isRouteOptionOn**

**Icc::Bool isRouteOptionOn() const**

Returns a boolean value that indicates whether the route option is active. Possible values are yes or no.

**name**

**const char\* name() const**

Returns a character string that gives the name of the resource that is being used. For an **IccTempStore** object, the 8-character name of the temporary storage queue is returned. For an **IccTerminal** object, the 4-character terminal name is returned. This is equivalent to calling **id()→name**.



**put**

Puts information from the buffer into the **IccResource** object. This method is virtual and is implemented, wherever appropriate, in the derived classes. See [Polymorphic Behavior](#) for more information on polymorphism. The default implementation in this class throws an exception to indicate that it has not been overridden in a subclass.

**virtual void put(const IccBuf& *buffer*)**

***buffer***

A reference to an **IccBuf** object that contains data that is to be put into the object.

**routeOption**

**const IccSysId& routeOption() const**

Returns a reference to an **IccSysId** object that represents the system to which all CICS requests are routed—explicit function shipping.

**setActionOnAnyCondition**

Specifies the default action to be taken by the CICS foundation classes when a CICS condition occurs.

**void setActionOnAnyCondition(ActionOnCondition *action*)**

***action***

The name of the action as an enumeration. The possible values are listed under the description of this class.

**setActionOnCondition**

Specifies what action is automatically taken by the CICS foundation classes when a given CICS condition occurs.

**void setActionOnCondition (ActionOnCondition *action*,  
IccCondition::Codes *condition*)**

***action***

The name of the action as an enumeration. The possible values are listed under the description of this class.

***condition***

See **IccCondition** structure.

**setActionsOnConditions**



**void setActionsOnConditions(const char\* *actions* = 0)**

***actions***

A string that indicates what action is to be taken for each condition. The default is not to indicate any actions, in which case each condition is given a default **ActionOnCondition** of noAction. The string should have the same format as the one returned by the **actionsOnConditionsText** method.

**setEDF**

Switches EDF on or off for this resource object. These methods force the object to route CICS requests to the named remote system. This is called explicit function shipping.

**void setEDF(Icc::Bool *onOff*)**

***onOff***

A boolean value that selects whether EDF trace is switched on or off.

**setRouteOption (1)**

The parameters are:

**void setRouteOption(const IccSysId& *sysId*)**

***sysId***

The **IccSysId** object that represents the remote system to which commands are routed.

**setRouteOption (2)**

This option is only valid for certain classes: Attempting to use this method on other subclasses of **IccResource** causes an exception to be thrown.

Valid classes are:

- **IccDataQueue**
- **IccFile**
- **IccFileIterator**
- **IccProgram**
- **IccStartRequestQ**
- **IccTempStore**

To turn off the route option specify no parameter, for example:

```
obj.setRouteOption()
```

**void setRouteOption(const char\* *sysName* = 0)**

***sysName***

The 4-character name of the system to which commands are routed.



## Inherited public methods

These are the public methods inherited by this class.

Method	Class
className	IccBase
classType	IccBase
customClassNum	IccBase
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### ActionOnCondition

Possible values are:

#### noAction

Carry on as normal; it is the application program's responsibility to test CICS conditions using the **condition** method, after executing a method that calls CICS services.

#### callHandleEvent

Call the virtual **handleEvent** method.

#### throwException

An **IccException** object is created and thrown. This is typically used for more serious conditions or errors.

#### abendTask

Abend the CICS task.

### HandleEventReturnOpt

Possible values are:

#### rContinue

The CICS event proceeded satisfactorily and normal processing is to resume.

#### rThrowException

The application program could not handle the CICS event and an exception is to be thrown.

#### rAbendTask

The application program could not handle the CICS event and the CICS task is to be abended.

### ConditionType

Possible values are:

#### majorCode

The returned value is the CICS RESP value. This is one of the values in `IccCondition::codes`.

#### minorCode

The returned value is the CICS RESP2 value.



## IccResourceId class

This is a base class from which **IccTransId** and other classes, whose names all end in "Id", are derived.

**IccBase**

**IccResourceId**

Many of these derived classes represent CICS resource names.

**Header file:** ICCRIDEH

### IccResourceId constructors (protected)

#### Constructor (1)

**IccResourceId (IccBase::ClassType *typ*,  
const IccResourceId& *id*)**

***type***

An enumeration, defined in **IccBase** class, that indicates the type of class.

***id***

A reference to an **IccResourceId** object that is used to create this object.

#### Constructor (2)

**IccResourceId (IccBase::ClassType *type*,  
const char\* *resName*)**

***type***

An enumeration, defined in **IccBase** class, that indicates the type of class.

***resName***

The name of a resource that is used to create this object.

### Public methods

These are the public methods in this class.

**name**

Returns the name of the resource identifier as a string. Most **...Id** objects have 4- or 8-character names.

**const char\* name() const**

**nameLength**

**unsigned short nameLength() const**



Returns the length of the name returned by the **name** method.

## Protected methods

### **operator=**

Set an **IccResourceId** object to be identical to *id*.

**IccResourceId& operator=(const IccResourceId& id)**

### *id*

A reference to an **IccResourceId** object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
className	IccBase
classType	IccBase
customClassNum	IccBase
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccRRN class

An **IccRRN** object holds a relative record number and is used to identify records in VSAM RRDS files.

### **IccBase**

### **IccRecordIndex**

### **IccRRN**

An **IccRRN** object holds a relative record number and is used to identify records in VSAM RRDS files.

**Header file:** ICCRECEH

## IccRRN constructors

### **Constructor**

**IccRRN(unsigned long *initRRN* = 1)**



***initRRN***

The initial relative record number—an integer greater than 0. The default is 1.

**Public methods**

These are the public methods in this class.

**operator= (1)**

**IccRRN& operator=(const IccRRN& *rrn*)**

**operator= (2)**

Assigns a new value for the relative record number.

**IccRRN& operator=(unsigned long *num*)**

***num***

A relative record number—an integer greater than 0.

**operator== (1)**

**Icc::Bool operator== (const IccRRN& *rrn*) const**

**operator== (2)**

Tests equality

**Icc::Bool operator== (unsigned long *num*) const**

**operator!= (1)**

**Icc::Bool operator!= (const IccRRN& *rrn*) const**

**operator!= (2)**

Tests inequality

**Icc::Bool operator!=(unsigned long *num*) const**



**number**

**unsigned long number() const**

Returns the relative record number.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
className	IccBase
classType	IccBase
customClassNum	IccBase
length	IccRecordIndex
operator delete	IccBase
operator new	IccBase
type	IccRecordIndex
value	IccRecordIndex

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccSemaphore class

This class enables synchronization of resource updates.

**IccBase**  
**IccResource**  
**IccSemaphore**

**Header file:** ICCSEMEH

**Sample:** ICC\$SEM

## IccSemaphore constructor

**Constructor (1)**

**IccSemaphore (const char\* *resource*,  
LockType *type* = byValue,  
LifeTime *life* = UOW)**



**resource**

A text string, if *type* is byValue, otherwise an address in storage.

**type**

An enumeration, defined in this class, that indicates whether locking is by value or by address. The default is by value.

**life**

An enumeration, defined in this class, that indicates how long the semaphore lasts. The default is to last for the length of the UOW.

**Constructor (2)**

**IccSemaphore (const IccLockId& *id*,  
LifeTime *life* = UOW)**

***id***

A reference to an **IccLockId** object

***life***

An enumeration, defined in this class, that indicates how long the semaphore lasts. The default is to last for the length of the UOW.

**Public methods**

These are the public methods in this class.

**lifeTime**

Returns an enumeration, defined in this class, that indicates whether the lock lasts for the length of the current unit-of-work ('UOW') or until the task terminates('task').

**LifeTime lifeTime() const**

**lock****void lock()**

Attempts to get a lock. This method blocks if another task already owns the lock.

**Conditions**

ENQBUSY, LENGERR, INVREQ

**tryLock**

Attempts to get a lock. This method does not block if another task already owns the lock. It returns a boolean that indicates whether it succeeded.

**Icc::Bool tryLock()**



**Conditions**

ENQBUSY, LENGERR, INVREQ

**type**

Returns an enumeration, defined in this class, that indicates what type of semaphore this is.

**LockType type() const****unlock****void unlock()**

Release a lock.

**Conditions**

LENGERR, INVREQ

**Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource



## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### LockType

#### byValue

The lock is on the contents (for example, name).

#### byAddress

The lock is on the memory address.

### LifeTime

#### UOW

The semaphore lasts for the length of the current unit of work.

#### task

The semaphore lasts for the length of the task.

## IccSession class

This class enables APPC and DTP programming.

### IccBase

#### IccResource

#### IccSession

**Header file:** ICCSESEH

**Sample:** ICC\$SES1, ICC\$SES2

## IccSession constructors (public)

### Constructor (1)

**IccSession(const IccPartnerId& id)**

#### *id*

A reference to an **IccPartnerId** object

### Constructor (2)

**IccSession (const IccSysId& sysId,  
const char\* profile = 0)**



***sysId***

A reference to an **IccSysId** object that represents a remote CICS system

***profile***

The 8-character name of the profile.

**Constructor (3)**

```
IccSession (const char* sysName,  
            const char* profile = 0)
```

***sysName***

The 4-character name of the remote CICS system with which this session is associated

***profile***

The 8-character name of the profile.

**IccSession constructor (protected)****Constructor**

This constructor is for back end DTP CICS tasks that have a session as their principal facility. In this case the application program uses the **session** method on the **IccControl** object to gain access to their **IccSession** object.

**IccSession()****Public methods**

These are the public methods in this class.

**allocate**

Establishes a session (communication channel) to the remote system.

```
void allocate(AllocateOpt option = queue)
```

***option***

An enumeration, defined in this class, that indicates what action CICS is to take if a communication channel is unavailable when this method is called.

**Conditions**

INVREQ, SYSIDERR, CBIDERR, NETNAMEIDERR, PARTNERIDERR, SYSBUSY

**connectProcess (1)**

This method can only be used if an **IccPartnerId** object was used to construct this session object.



**void connectProcess (SyncLevel *level*,  
const IccBuf\* *PIP* = 0)**

***level***

An enumeration, defined in this class, that indicates what sync level is to be used for this conversation

***PIP***

An optional pointer to an **IccBuf** object that contains the PIP data to be sent to the remote system

**connectProcess (2)**

**void connectProcess (SyncLevel *level*,  
const IccTransId& *transId*,  
const IccBuf\* *PIP* = 0)**

***level***

An enumeration, defined in this class, that indicates what sync level is to be used for this conversation

***transId***

A reference to an **IccTransId** object that holds the name of the transaction to be started on the remote system

***PIP***

An optional pointer to an **IccBuf** object that contains the PIP data to be sent to the remote system

**connectProcess (3)**

Starts a partner process on the remote system in preparation for sending and receiving information.

**void connectProcess (SyncLevel *level*,  
const IccTPNameId& *TPName*,  
const IccBuf\* *PIP* = 0)**

***level***

An enumeration, defined in this class, that indicates what sync level is to be used for this conversation

***TPName***

A reference to an **IccTPNameId** object that contains the 1–64 character TP name.

***PIP***

An optional pointer to an **IccBuf** object that contains the PIP data to be sent to the remote system

**Conditions**

INVREQ, LENGERR, NOTALLOC, PARTNERIDERR, NOTAUTH, TERMERR, SYSBUSY

**converse**

**converse** sends the contents of *send* and returns a reference to an **IccBuf** object that holds the reply from the remote APPC partner.



**const IccBuf& converse(const IccBuf& send)**

**send**

A reference to an **IccBuf** object that contains the data that is to be sent.

**Conditions**

EOC, INVREQ, LENGERR, NOTALLOC, SIGNAL, TERMERR

**convId**

Returns a reference to an **IccConvId** object that contains the 4-byte conversation identifier.

**const IccConvId& convId()**

**errorCode**

**const char\* errorCode() const**

Returns the 4-byte error code received when **isErrorSet** returns true. See the relevant DTP Guide for more information.

**extractProcess**

**void extractProcess()**

Retrieves information from an APPC conversation attach header and holds it inside the object. See **PIPList**, **process**, and **syncLevel** methods to retrieve the information from the object. This method should be used by the back end task if it wants access to the PIP data, the process name, or the synclevel under which it is running.

**Conditions**

INVREQ, NOTALLOC, LENGERR

**flush**

Ensure that accumulated data and control information are transmitted on an APPC mapped conversation.

**void flush()**

**Conditions**

INVREQ, NOTALLOC

**free**

Return the APPC session to CICS so that it may be used by other tasks.



**void free()**

**Conditions**

INVREQ, NOTALLOC

**get**

A synonym for **receive**. See [Polymorphic Behavior](#) for information on polymorphism.

**virtual const IccBuf& get()**

**isErrorSet**

**Icc::Bool isErrorSet() const**

Returns a boolean variable, defined in **Icc** structure, that indicates whether an error has been set.

**isNoDataSet**

**Icc::Bool isNoDataSet() const**

Returns a boolean variable, defined in **Icc** structure, that indicates if no data was returned on a **send**—just control information.

**isSignalSet**

**Icc::Bool isSignalSet() const**

Returns a boolean variable, defined in **Icc** structure, that indicates whether a signal has been received from the remote process.

**issueAbend**

**void issueAbend()**

Abnormally ends the conversation. The partner transaction sees the TERMERR condition.

**Conditions**

INVREQ, NOTALLOC, TERMERR

**issueConfirmation**

Sends positive response to a partner's **send** request that specified the confirmation option.

**void issueConfirmation()**



### Conditions

INVREQ, NOTALLOC, TERMERR, SIGNAL

### issueError

Signals an error to the partner process.

### void issueError()

### Conditions

INVREQ, NOTALLOC, TERMERR, SIGNAL

### issuePrepare

This only applies to DTP over APPC links. It enables a syncpoint initiator to prepare a syncpoint slave for syncpointing by sending only the first flow ('prepare to commit') of the syncpoint exchange.

### void issuePrepare()

### Conditions

INVREQ, NOTALLOC, TERMERR

### issueSignal

Signals that a mode change is needed.

### void issueSignal()

### Conditions

INVREQ, NOTALLOC, TERMERR

### PIPList

Returns a reference to an **IccBuf** object that contains the PIP data sent from the front end process. A call to this method should be preceded by a call to **extractProcess** on back end DTP processes.

### IccBuf& PIPList()

### process

### const IccBuf& process() const

Returns a reference to an **IccBuf** object that contains the process data sent from the front end process. A call to this method should be preceded by a call to **extractProcess** on back end DTP processes.

### put

A synonym for **send**. See [Polymorphic Behavior](#) for information on polymorphism.



**virtual void put(const IccBuf& data)**

**data**

A reference to an **IccBuf** object that holds the data to be sent to the remote process.

**receive**

**const IccBuf& receive()**

Returns a reference to an **IccBuf** object that contains the data received from the remote system.

**Conditions**

EOC, INVREQ, LENGERR, NOTALLOC, SIGNAL, TERMERR

**send (1)**

**void send (const IccBuf& send,  
SendOpt option = normal)**

**send**

A reference to an **IccBuf** object that contains the data that is to be sent.

**option**

An enumeration, defined in this class, that affects the behavior of the **send** method. The default is normal.

**send (2)**

Sends data to the remote partner.

**void send(SendOpt option = normal)**

**option**

An enumeration, defined in this class, that affects the behavior of the **send** method. The default is normal.

**Conditions**

INVREQ, LENGERR, NOTALLOC, SIGNAL, TERMERR

**sendInvite (1)**



**void sendInvite (const IccBuf& send,  
SendOpt option = normal)**

***send***

A reference to an **IccBuf** object that contains the data that is to be sent.

***option***

An enumeration, defined in this class, that affects the behavior of the **sendInvite** method. The default is normal.

**sendInvite (2)**

Sends data to the remote partner and indicates a change of direction, that is, the next method on this object will be **receive**.

**void sendInvite(SendOpt option = normal)**

***option***

An enumeration, defined in this class, that affects the behavior of the **sendInvite** method. The default is normal.

**Conditions**

INVREQ, LENGERR, NOTALLOC, SIGNAL, TERMERR

**sendLast (1)**

**void sendLast (const IccBuf& send,  
SendOpt option = normal)**

***send***

A reference to an **IccBuf** object that contains the data that is to be sent.

***option***

An enumeration, defined in this class, that affects the behavior of the **sendLast** method. The default is normal.

**sendLast (2)**

Sends data to the remote partner and indicates that this is the final transmission. The **free** method must be invoked next, unless the sync level is 2, when you must commit resource updates before the **free**. (See **commitUOW** on page [“commitUOW”](#) on page 191 in **IccTaskClass**).

**void sendLast(SendOpt option = normal)**



***option***

An enumeration, defined in this class, that affects the behavior of the **sendLast** method. The default is normal.

**Conditions**

INVREQ, LENGERR, NOTALLOC, SIGNAL, TERMERR

**state**

Returns a CVDA, defined in **IccValue** structure, that indicates the current state of the APPC conversation.

Possible values are:

- ALLOCATED
- CONFFREE
- CONFSEND
- FREE
- PENDFREE
- PENDRECEIVE
- RECEIVE
- ROLLBACK
- SEND
- SYNCFREE
- SYNCRECEIVE
- SYNCSEND
- NOTAPPLIC

IccValue::NOTAPPLIC is returned if there is no APPC conversation state.

**IccValue::CVDA state(StateOpt *option* = lastCommand)**

***option***

An enumeration, defined in this class, that indicates how to report the state of the conversation

**Conditions**

INVREQ, NOTALLOC

**stateText**

Returns the symbolic name of the state that **state** method would return. For example, if **state** returns IccValue::ALLOCATED, **stateText** would return "ALLOCATED".

**const char\* stateText(StateOpt *option* = lastCommand)**

***option***

An enumeration, defined in this class, that indicates how to report the state of the conversation



## syncLevel

### SyncLevel syncLevel() const

Returns an enumeration, defined in this class, that indicates the synchronization level that is being used in this session. A call to this method should be preceded by a call to **extractProcess** on back end DTP processes.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### AllocateOpt

#### queue

If all available sessions are in use, CICS is to queue this request (and block the method) until it can allocate a session.



**noQueue**

Control is returned to the application if it cannot allocate a session. CICS raises the SYSBUSY condition.

Indicates whether queuing is required on an **allocate** method.

**SendOpt****normal**

The default.

**confirmation**

Indicates that a program using SyncLevel level1 or level2 requires a response from the remote partner program. The remote partner can respond positively, using the **issueConfirmation** method, or negatively, using the **issueError** method. The sending program does not receive control back from CICS until the response is received.

**wait**

Requests that the data is sent and not buffered internally. CICS is free to buffer requests to improve performance if this option is not specified.

**StateOpt**

Use StateOpt to indicate how the state of a conversation is to be reported.

**lastCommand**

Return the state at the time of the completion of the last operation on the session.

**extractState**

Return the explicitly extracted current state.

**SyncLevel****level0**

Sync level 0

**level1**

Sync level 1

**level2**

Sync level 2

**IccStartRequestQ class**

This is a singleton class that enables the application programmer to request an asynchronous start of another CICS transaction.

**IccBase****IccResource****IccStartRequestQ**

(see the **start** method on page [“start” on page 181](#)).

An asynchronously started transaction uses the **IccStartRequestQ** class method **retrieveData** to gain the information passed to it by the transaction that issued the **start** request.

An unexpired start request can be cancelled by using the **cancel** method.

**Header file:** ICCSRQEH

**Sample:** ICC\$SRQ1, ICC\$SRQ2

**IccStartRequestQ constructor (protected)****Constructor**



## **IccStartRequestQ()**

### **Public methods**

These are the public methods in this class.

#### **cancel**

Cancels a previously issued **start** request that has not yet expired.

```
void cancel (const IccRequestId& reqId,  
             const IccTransId* transId = 0)
```

#### **reqId**

A reference to an **IccRequestId** object that represents the request to be cancelled

#### **transId**

An optional pointer to an **IccTransId** object that represents the transaction that is to be cancelled.

#### **Conditions**

ISCINVREQ, NOTAUTH, NOTFND, SYSIDERR

#### **clearData**

**clearData** clears the current data that is to be passed to the started transaction.

#### **void clearData()**

The data was set using **setData** or **registerData**.

If the data was set using **registerData**, only the pointer to the data is removed, the data in the buffer is left unchanged.

If the data was set using **setData**, then **clearData** releases the memory used by the buffer.

#### **data**

Returns a reference to an **IccBuf** object that contains data passed on a start request. A call to this method should be preceded by a call to **retrieveData** method.

```
const IccBuf& data() const
```

#### **instance**

```
static IccStartRequestQ* instance()
```

Returns a pointer to the single **IccStartRequestQ** object. If the object does not exist it is created. See also **startRequestQ** method on page [“startRequestQ” on page 97 of IccControl](#).

#### **queueName**



### **const char\* queueName() const**

Returns the name of the queue that was passed by the start requester. A call to this method should be preceded by a call to **retrieveData** method.

### **registerData**

Registers an **IccBuf** object to be interrogated for start data on each subsequent **start** method invocation. This just stores the address of the **IccBuf** object within the **IccStartRequestQ** so that the **IccBuf** object can be found when using the **start** method. This differs from the **setData** method, which takes a copy of the data held in the **IccBuf** object during the time that it is invoked.

### **void registerData(const IccBuf\* buffer)**

#### ***buffer***

A pointer to the **IccBuf** object that holds data to be passed on a **start** request.

### **reset**

### **void reset()**

Clears any associations previously made by **set...** methods in this class.

### **retrieveData**

Used by a task that was started, via an async start request, to gain access to the information passed by the start requester. The information is returned by the **data**, **queueName**, **returnTermId**, and **returnTransId** methods.

### **void retrieveData(RetrieveOpt option = noWait)**

#### ***option***

An enumeration, defined in this class, that indicates what happens if there is no start data available.

### **Conditions**

ENDDATA, ENVDEFERR, IOERR, LENGERR, NOTFND, INVREQ

**Note:** The ENVDEFERR condition will be raised if all the possible options (**setData**, **setQueueName**, **setReturnTermId**, and **setReturnTransId**) are not used before issuing the **start** method. This condition is therefore not necessarily an error condition and your program should handle it accordingly.

### **returnTermId**

Returns a reference to an **IccTermId** object that identifies which terminal is involved in the session. A call to this method should be preceded by a call to **retrieveData** method.

### **const IccTermId& returnTermId() const**



## **returnTransId**

### **const IccTransId& returnTransId() const**

Returns a reference to an **IccTransId** object passed on a start request. A call to this method should be preceded by a call to **retrieveData** method.

## **setData**

### **void setData(const IccBuf& buf)**

Copies the data in *buf* into the **IccStartRequestQ**, which passes it to the started transaction when the **start** method is called. See also **registerData** on page [“registerData” on page 179](#) for an alternative way to pass data to started transactions.

### **setQueueName**

Requests that this queue name be passed to the started transaction when the **start** method is called.

### **void setQueueName(const char\* queueName)**

#### **queueName**

An 8-character queue name.

### **setReturnTermId (1)**

### **void setReturnTermId(const IccTermId& termId)**

#### **termId**

A reference to an **IccTermId** object that identifies which terminal is involved in the session.

### **setReturnTermId (2)**

Requests that this return terminal ID be passed to the started transaction when the **start** method is called.

### **void setReturnTermId(const char\* termName)**

#### **termName**

The 4-character name of the terminal that is involved in the session.

### **setReturnTransId (1)**



**void setReturnTransId(const IccTransId& *transId*)**

***transId***

A reference to an **IccTransId** object.

**setReturnTransId (2)**

Requests that this return transaction ID be passed to the started transaction when the **start** method is called.

**void setReturnTransId(const char\* *transName*)**

***transName***

The 4-character name of the return transaction.

**setStartOpts**

Sets whether the started transaction is to have protection and whether it is to be checked.

**void setStartOpts (ProtectOpt *popt* = none,  
                  CheckOpt *copt* = check)**

***popt***

An enumeration, defined in this class, that indicates whether start requests are to be protected

***copt***

An enumeration, defined in this class, that indicates whether start requests are to be checked.

**start**

Asynchronously starts the named CICS transaction. The returned reference to an **IccRequestId** object identifies the **start** request and can be used subsequently to **cancel** the **start** request.

**const IccRequestId& start (const IccTransId& *transId*,  
                          const IccTermId\* *termId*,  
                          const IccTime\* *time* = 0,  
                          const IccRequestId\* *reqId* = 0)**

or

**const IccRequestId& start (const IccTransId& *transId*,  
                          const IccUserId\* *userId*,  
                          const IccTime\* *time* = 0,  
                          const IccRequestId\* *reqId* = 0)**

or



```
const IccRequestId& start (const IccTransId& transId,
                        const IccTime* time = 0,
                        const IccRequestId* reqId = 0)
```

***transId***

A reference to an **IccTransId** object that represents the transaction to be started

***termId***

A reference to an **IccTermId** object that identifies which terminal is involved in the session.

***userId***

A reference to an **IccUserId** object that represents the user ID.

***time***

An (optional) pointer to an **IccTime** object that specifies when the task is to be started. The default is for the task to be started immediately.

***reqId***

An (optional) pointer to an **IccRequestId** object that is used to identify this start request so that the **cancel** can cancel the request.

**Conditions**

INVREQ, IOERR, ISCINVREQ, LENGERR, NOTAUTH, SYSIDERR, TERMIDERR, TRANSIDERR, USERIDERR

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
className	IccBase
classType	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
isRouteOptionOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
routeOption	IccResource
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource



Method	Class
setEDF	IccResource
setRouteOption	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### RetrieveOpt

- noWait
- wait

### ProtectOpt

- none
- protect

### CheckOpt

- check
- noCheck

## IccSysId class

**IccSysId** class is used to identify a remote CICS system.

**IccBase**

**IccResourceId**

**IccSysId**

**IccSysId** class is used to identify a remote CICS system.

**Header file:** ICCRIDEH

## IccSysId constructors

### Constructor (1)

**IccSysId(const char\* *name*)**

***name***

The 4-character name of the CICS system.



## Constructor (2)

The copy constructor.

**IccSysId(const IccSysId& *id*)**

*id*

A reference to an **IccSysId** object.

## Public methods

These are the public methods in this class.

**operator= (1)**

**IccSysId& operator=(const IccSysId& *id*)**

*id*

A reference to an existing **IccSysId** object.

**operator= (2)**

Sets the name of the CICS system held in the object.

**IccSysId& operator=(const char\* *name*)**

*name*

The 4-character name of the CICS system.

## Inherited public methods

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase



## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccSystem class

This is a singleton class that represents the CICS system. It is used by an application program to discover information about the CICS system on which it is running.

**IccBase**  
**IccResource**  
**IccSystem**

**Header file:** ICCSYSEH

**Sample:** ICC\$SYS

## IccSystem constructor (protected)

**Constructor**

**IccSystem()**

## Public methods

These are the public methods in this class.

**applName**  
Returns the 8-character name of the CICS region.

**const char\* applName()**

**Conditions**

INVREQ

**beginBrowse (1)**

**void beginBrowse (ResourceType *resource*,  
const IccResourceId\* *resId* = 0)**

***resource***

An enumeration, defined in this class, that indicates the type of resource to be browsed within the CICS system.



***resId***

An optional pointer to an **IccResourceId** object that indicates the starting point for browsing through the resources.

**beginBrowse (2)**

Signals the start of a browse through a set of CICS resources.

**void beginBrowse (ResourceType *resource*,  
const char\* *resName*)**

***resource***

An enumeration, defined in this class, that indicates the type of resource to be browsed within the CICS system.

***resName***

The name of the resource that is to be the starting point for browsing the resources.

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**dateFormat**

Returns the default dateFormat for the CICS region.

**const char\* dateFormat()**

**Conditions**

INVREQ

**endBrowse**

Signals the end of a browse through a set of CICS resources.

**void endBrowse(ResourceType *resource*)**

**Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

**freeStorage**

Releases the storage obtained by the **IccSystem** **getStorage** method.

**void freeStorage(void\* *pStorage*)**

**Conditions**

INVREQ



## **getFile (1)**

**IccFile\*** **getFile(const IccFileId& id)**

**id**

A reference to an **IccFileId** object that identifies a CICS file.

## **getFile (2)**

Returns a pointer to the **IccFile** object identified by the argument.

**IccFile\*** **getFile(const char\* fileName)**

**fileName**

The name of a CICS file.

## **Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

## **getNextFile**

This method is only valid after a successful **beginBrowse(IccSystem::file)** call. It returns the next file object in the browse sequence in the CICS system.

**IccFile\*** **getNextFile()**

## **Conditions**

END, FILENOTFOUND, ILLOGIC, NOTAUTH

## **getStorage**

Obtains a block of storage of the requested size and returns a pointer to it. The storage is not released automatically at the end of task; it is only released when a **freeStorage** operation is performed.

**void\*** **getStorage (unsigned long size,  
char initByte = -1,  
unsigned long storageOpts = 0)**

**size**

The amount of storage being requested, in bytes

**initByte**

The initial setting of all bytes in the allocated storage

**storageOpts**

An enumeration, defined in **IccTask** class, that affects the way that CICS allocates storage.



### Conditions

LENGERR, NOSTG

### instance

Returns a pointer to the singleton **IccSystem** object. The object is created if it does not already exist.

**static IccSystem\* instance()**

**operatingSystem**

**char operatingSystem()**

Returns a 1-character value that identifies the operating system under which CICS is running:

**A**

AIX

**N**

Windows

**X**

z/OS

### Conditions

NOTAUTH

**operatingSystemLevel**

Returns a halfword binary field giving the release number of the operating system under which CICS is running. The value returned is ten times the formal release number (the version number is not represented). For example, MVS/ESA Version 3 Release 2.1 would produce a value of 21.

**unsigned short operatingSystemLevel()**

### Conditions

NOTAUTH

**IccSystem public method: release**

Returns the level of the CICS system. The value is taken from the number returned in the **RELEASE** parameter of the **EXE CICS INQUIRE SYSTEM** command.

For example, the release level returned for CICS Transaction Server for z/OS Version 4 Release 2 is 670.

**unsigned long release()**

### Conditions

NOTAUTH

**releaseText**

Returns the same as **release**, except as a 4-character string. For example, CICS Transaction Server for z/OS [Version 1] Release 3 would return "0130".



**const char\* releaseText()**

**Conditions**

NOTAUTH

**sysId**

Returns a reference to the **IccSysId** object that identifies this CICS system.

**IccSysId& sysId()**

**Conditions**

INVREQ

**workArea**

Returns a reference to the **IccBuf** object that holds the work area for the CICS system.

**const IccBuf& workArea()**

**Conditions**

INVREQ

**Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource



## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## Enumerations

### ResourceType

- autoInstallModel
- connection
- dataQueue
- exitProgram
- externalDataSet
- file
- journal
- modename
- partner
- profile
- program
- requestId
- systemDumpCode
- tempStore
- terminal
- transactionDumpCode
- transaction
- transactionClass

## IccTask class

**IccTask** is a singleton class used to invoke task related CICS services.

**IccBase**  
**IccResource**  
**IccTask**

**Header file:** ICCTSKEH

**Sample:** ICC\$TSK

## IccTask Constructor (protected)

### Constructor

**IccTask()**



## Public methods

These are the public methods in this class.

### The *opt* parameter

Many methods have the same parameter, *opt*, which is described under the **abendCode** method in [“abendCode” on page 60](#).

### **abend**

Requests CICS to abend this task.

```
void abend (const char* abendCode = 0,  
            AbendHandlerOpt opt1 = respectAbendHandler,  
            AbendDumpOpt opt2 = createDump)
```

### ***abendCode***

The 4-character abend code

### ***opt1***

An enumeration, defined in this class, that indicates whether to respect or ignore any abend handling program specified by **setAbendHandler** method in **IccControl** class

### ***opt2***

An enumeration, defined in this class, that indicates whether a dump is to be created.

### **abendData**

### **IccAbendData\* abendData()**

Returns a pointer to an **IccAbendData** object that contains information about the program abends, if any, that relate to this task.

### **commitUOW**

### **void commitUOW()**

Commit the resource updates within the current UOW for this task. This also causes a new UOW to start for subsequent resource update activity.

### **Conditions**

INVREQ, ROLLEDBACK

### **delay**

Requests that this task be delayed for an interval of time, or until a specific time.

```
void delay (const IccTime& time,  
            const IccRequestId* reqId = 0)
```



**time**

A reference to an object that contains information about the delay time. The object can be one of these types:

**IccAbsTime**

Expresses time as the number of milliseconds since the beginning of the year 1900.

**IccTimeInterval**

Expresses an interval of time, such as 3 hours, 2 minutes, and 1 second.

**IccTimeOfDay**

Expresses a time of day, such as 13 hours, 30 minutes (1-30 pm).

**reqId**

An optional pointer to an **IccRequestId** object that can be used to cancel an unexpired delay request.

**Conditions**

EXPIRED, INVREQ

**dump**

Requests CICS to take a memory dump for this task. (See also **setDumpOpts**.) Returns the character identifier of the dump.

```
const char* dump (const char* dumpCode,  
                  const IccBuf* buf = 0)
```

**dumpCode**

A 4-character label that identifies this dump

**buf**

A pointer to the **IccBuf** object that contains additional data to be included in the dump.

**Conditions**

INVREQ, IOERR, NOSPACE, NOSTG, NOTOPEN, OPENERR, SUPPRESSED

**enterTrace**

Writes a user trace entry in the CICS trace table.

```
void enterTrace (unsigned short traceNum,  
                 const char* resource = 0,  
                 IccBuf* data = 0,  
                 TraceOpt opt = normal)
```

**traceNum**

The trace identifier for a user trace table entry; a value in the range 0 through 199.

**resource**

An 8-character name to be entered in the resource field of the trace table entry.



**data**

A pointer to the **IccBuf** object containing data to be included in the trace record.

**opt**

An enumeration, defined in this class, that indicates whether tracing should be normal or whether only exceptions should be traced.

**Conditions**

INVREQ, LENGERR

**facilityType**

Returns an enumeration, defined in this class, that indicates what type of principal facility this task has. This is usually a terminal, such as when the task was started by someone keying a transaction name on a CICS terminal. It is a session if the task is the back end of a mapped APPC conversation.

**FacilityType facilityType()****Conditions**

INVREQ

**freeStorage**

Releases the storage obtained by the **IccTask** **getStorage** method.

**void freeStorage(void\* pStorage)****Conditions**

INVREQ

**getStorage**

Obtains a block of storage of the requested size. The storage is released automatically at the end of task, or when the **freeStorage** operation is performed. See also **getStorage** on page [“getStorage” on page 187](#) in **IccSystem**class.

```
void* getStorage (unsigned long size,  

                char initByte = -1,  

                unsigned short storageOpts = 0)
```

**size**

The amount of storage being requested, in bytes

**initByte**

The initial setting of all bytes in the allocated storage

**storageOpts**

An enumeration, defined in this class, that affects the way that CICS allocates storage.

**Conditions**

LENGERR, NOSTG



**instance**

Returns a pointer to the singleton **IccTask** object. The object is created if it does not already exist.

**static IccTask\* instance();**

**isCommandSecurityOn****Icc::Bool isCommandSecurityOn()**

Returns a boolean, defined in **Icc** structure, that indicates whether this task is subject to command security checking.

**Conditions**

INVREQ

**isCommitSupported**

Returns a boolean, defined in **Icc** structure that indicates whether this task can support the **commit** method. This method returns true in most environments; the exception to this is in a DPL environment (see **link** on page [“link” on page 145](#) in **IccProgram**).

**Icc::Bool isCommitSupported()****Conditions**

INVREQ

**isResourceSecurityOn**

Returns a boolean, defined in **Icc** structure, that indicates whether this task is subject to resource security checking.

**Icc::Bool isResourceSecurityOn()****Conditions**

INVREQ

**isRestarted**

Returns a boolean, defined in **Icc** structure, that indicates whether this task has been automatically restarted by CICS.

**Icc::Bool isRestarted()****Conditions**

INVREQ

**isStartDataAvailable**

Returns a boolean, defined in **Icc** structure, that indicates whether start data is available for this task. See the **retrieveData** method in **IccStartRequestQ** class if start data is available.



**Icc::Bool isStartDataAvailable()**

**Conditions**

INVREQ

**number**

Returns the number of this task, unique within the CICS system.

**unsigned long number() const**

**principalSysId**

**IccSysId& principalSysId(Icc::GetOpt *opt* = Icc::object)**

Returns a reference to an **IccSysId** object that identifies the principal system identifier for this task.

**Conditions**

INVREQ

**priority**

Returns the priority for this task.

**unsigned short priority(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**rollBackUOW**

Roll back (backout) the resource updates associated with the current UOW within this task.

**void rollBackUOW()**

**Conditions**

INVREQ, ROLLEDBACK

**setDumpOpts**

Set the dump options for this task. This method affects the behavior of the **dump** method defined in this class.

**void setDumpOpts(unsigned long *opts* = dDefault)**



***opts***

An integer, made by adding or logically ORing values from the **DumpOpts** enumeration, defined in this class.

**setPriority**

Changes the dispatch priority of this task.

**void setPriority(unsigned short *pri*)**

***pri***

The new priority.

**Conditions**

INVREQ

**setWaitText**

Sets the text that will appear when someone inquires on this task while it is suspended as a result of a **waitExternal** or **waitOnAlarm** method call.

**void setWaitText(const char\* *name*)**

***name***

The 8-character string label that indicates why this task is waiting.

**startType**

**StartType startType()**

Returns an enumeration, defined in this class, that indicates how this task was started.

**Conditions**

INVREQ

**suspend**

Suspend this task, allowing other tasks to be dispatched.

**void suspend()**

**transId**

**const IccTransId& transId()**

Returns the **IccTransId** object representing the transaction name of this CICS task.

**triggerDataQueueId**



### **const IccDataQueueId& triggerDataQueueId()**

Returns a reference to the **IccDataQueueId** representing the trigger queue, if this task was started as a result of data arriving on an **IccDataQueue**. See **startType** method.

#### **Conditions**

INVREQ

### **userId**

Returns the ID of the user associated with this task.

### **const IccUserId& userId(Icc::GetOpt *opt* = Icc::object)**

#### ***opt***

An enumeration, defined in **Icc** structure, that indicates whether the information already existing in the object is to be used or whether it is to be refreshed from CICS.

#### **Conditions**

INVREQ

### **waitExternal**

Waits for events that post Event Control Blocks (ECBs).

The call causes the issuing task to be suspended until one of the ECBs has been posted—that is, one of the events has occurred. The task can wait on more than one ECB and can be dispatched as soon as any of them are posted. For more information about ECB, see [WAIT EXTERNAL](#).

**void waitExternal (long\*\* *ECBList*,  
                  unsigned long *numEvents*,  
                  WaitPurgeability *opt* = purgeable,  
                  WaitPostType *type* = MVSPost)**

#### ***ECBList***

A pointer to a list of addresses of ECBs that represent events.

#### ***numEvents***

The number of events in *ECBList*.

#### ***opt***

An enumeration, defined in this class, that indicates whether the wait is purgeable.

#### ***type***

An enumeration, defined in this class, that indicates whether the post type is a standard MVS POST.

#### **Conditions**

INVREQ

### **waitOnAlarm**

Suspends the task until the alarm goes off (expires).

See also [“setAlarm”](#) on page 87 in **IccClock**.

### **void waitOnAlarm(const IccAlarmRequestId& *id*)**



*id*

A reference to the **IccAlarmRequestId** object that identifies a particular alarm request.

### Conditions

INVREQ

### workArea

Returns a reference to the **IccBuf** object that holds the work area for this task.

### IccBuf& workArea()

### Conditions

INVREQ

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase



## Enumerations

### **AbendHandlerOpt**

#### **respectAbendHandler**

Allows control to be passed to an abend handling program if one is in effect.

#### **ignoreAbendHandler**

Does not allow control to be passed to any abend handling program that may be in effect.

### **AbendDumpOpt**

#### **createDump**

Take a transaction dump when servicing an abend request.

#### **suppressDump**

Do not take a transaction dump when servicing an abend request.

### **DumpOpts**

The values may be added, or bitwise ORed, together to get the intended combination.

The values may be added, or bitwise ORed, together to get the intended combination. For example  
`IccTask::dProgram + IccTask::dDCT + IccTask::dSIT`.

#### **dDefault**

#### **dComplete**

#### **dTask**

#### **dStorage**

#### **dProgram**

#### **dTerminal**

#### **dTables**

#### **dDCT**

#### **dFCT**

#### **dPCT**

#### **dPPT**

#### **dSIT**

#### **dTCT**

#### **dTRT**

### **FacilityType**

#### **none**

The task has no principal facility, that is, it is a background task.



**terminal**

This task has a terminal as its principal facility.

**session**

This task has a session as its principal facility, that is, it was probably started as a back-end DTP program.

**dataqueue**

This task has a transient data queue as its principal facility.

**StartType****DPL**

Distributed program link request

**dataQueueTrigger**

Trigger by data arriving on a data queue

**startRequest**

Started as a result of an asynchronous start request. See **IccStartRequestQ** class.

**FEPIRequest**

Front end programming interface.

**terminalInput**

Started via a terminal input

**CICSInternalTask**

Started by CICS.

**StorageOpts****ifSOSReturnCondition**

If insufficient space is available, return NOSTG condition instead of blocking the task.

**below**

Allocate storage below the 16Mb line.

**userDataKey**

Allocate storage in the USER data key.

**CICSDataKey**

Allocate storage in the CICS data key.

**TraceOpt****normal**

The trace entry is a standard entry.

**exception**

The trace entry is an exception entry.

**WaitPostType****MVSPost**

ECB is posted using the MVS POST service.

**handPost**

ECB is hand posted (that is, using some method other than the MVS POST service).

**WaitPurgeability****purgeable**

Task can be purged via a system call.

**notPurgeable**

Task cannot be purged via a system call.



## IccTempStore class

**IccTempStore** objects are used to manage the temporary storage of data.

**IccBase**  
**IccResource**  
**IccTempStore**

(**IccTempStore** data can exist between transaction calls.)

**Header file:** ICCTMPEH

**Sample:** ICC\$TMP

## IccTempStore constructors

### Constructor (1)

**IccTempStore (const IccTempStoreId& *id*,  
Location *loc* = auxStorage)**

***id***

Reference to an **IccTempStoreId** object

***loc***

An enumeration, defined in this class, that indicates where the storage is to be located when it is first created. The default is to use auxiliary storage (disk).

### Constructor (2)

**IccTempStore (const char\* *storeName*,  
Location *loc* = auxStorage)**

***storeName***

Specifies the 8-character name of the queue to be used. The name must be unique within the CICS system.

***loc***

An enumeration, defined in this class, that indicates where the storage is to be located when it is first created. The default is to use auxiliary storage (disk).

## Public methods

These are the public methods in this class.

### The *opt* parameter

Many methods have the same parameter, *opt*, which is described under the **abendCode** method in [“abendCode”](#) on page 60.



**clear**

A synonym for **empty**. See [Polymorphic Behavior](#) for information on polymorphism.

**virtual void clear()****empty****void empty()**

Deletes all the temporary data associated with the **IccTempStore** object and deletes the associated TD queue.

**Conditions**

INVREQ, ISCINVREQ, NOTAUTH, QIDERR, SYSIDERR

**get**

A synonym for **readNextItem**. See [Polymorphic Behavior](#) for information on polymorphism.

**virtual const IccBuf& get()****numberOfItems****unsigned short numberOfItems() const**

Returns the number of items in temporary storage. This is only valid after a successful **writeItem** call.

**put**

A synonym for **writeItem**. See [Polymorphic Behavior](#) for information on polymorphism.

**virtual void put(const IccBuf& *buffer*)*****buffer***

A reference to an **IccBuf** object that contains the data that is to be added to the end of the temporary storage queue.

**readItem**

Reads the specified item from the temporary storage queue and returns a reference to the **IccBuf** object that contains the information.

**const IccBuf& readItem(unsigned short *itemNum*)*****itemNum***

Specifies the item number of the logical record to be retrieved from the queue.



### Conditions

INVREQ, IOERR, ISCINVREQ, ITEMERR, LENGERR, NOTAUTH, QIDERR, SYSIDERR

### readNextItem

Reads the next item from a temporary storage queue and returns a reference to the **IccBuf** object that contains the information.

**const IccBuf& readNextItem()**

### Conditions

INVREQ, IOERR, ISCINVREQ, ITEMERR, LENGERR, NOTAUTH, QIDERR, SYSIDERR

### rewriteItem

The parameters are: This method updates the specified item in the temporary storage queue.

**void rewriteItem (unsigned short *itemNum*,  
                  const IccBuf& *item*,  
                  NoSpaceOpt *opt* = suspend)**

### *itemNum*

Specifies the item number of the logical record that is to be modified

### *item*

The name of the **IccBuf** object that contains the update data.

### *opt*

An enumeration, defined in this class, that indicates whether the application program is to be suspended if a shortage of space in the queue prevents the record being added. suspend is the default.

### Conditions

INVREQ, IOERR, ISCINVREQ, ITEMERR, LENGERR, NOSPACE, NOTAUTH, QIDERR, SYSIDERR

**writeItem (1)**

**unsigned short writeItem (const IccBuf& *item*,  
                          NoSpaceOpt *opt* = suspend)**

### *item*

The name of the **IccBuf** object that contains the data that is to be added to the end of the temporary storage queue.

### *opt*

An enumeration, defined in this class, that indicates whether the application program is to be suspended if a shortage of space in the queue prevents the record being added. suspend is the default.



### **writeItem (2)**

This method adds a new record at the end of the temporary storage queue. The returned value is the item number that was created (if this was done successfully).

**unsigned short writeItem (const char\* *text*,  
NoSpaceOpt *opt* = suspend)**

#### ***text***

The text string that is to added to the end of the temporary storage queue.

#### ***opt***

An enumeration, defined in this class, that indicates whether the application program is to be suspended if a shortage of space in the queue prevents the record being added. suspend is the default.

### **Conditions**

INVREQ, IOERR, ISCINVREQ, ITEMERR, LENGERR, NOSPACE, NOTAUTH, QIDERR, SYSIDERR

## **Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
className	IccBase
classType	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
isRouteOptionOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
routeOption	IccResource
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource



**Method**

setRouteOption

**Class**

IccResource

**Inherited protected methods**

These are the protected methods inherited by this class.

**Method**

setClassName

setCustomClassNum

**Class**

IccBase

IccBase

**Enumerations****Location****auxStorage**

Temporary store data is to reside in auxiliary storage (disk).

**memory**

Temporary store data is to reside in memory.

**NoSpaceOpt**

Take this action if a shortage of space in the queue prevents the record being added immediately.

**suspend**

Suspend the application program.

**returnCondition**

Do not suspend the application program, but raise the NOSPACE condition instead.

**IccTempStoreId class**

**IccTempStoreId** class is used to identify a temporary storage name in the CICS system.

**IccBase****IccResourceId****IccTempStoreId**

**Header file:** ICCRIDEH

**IccTempStoreId constructors****Constructor (1)**

**IccTempStoreId(const char\* *name*)**

***name***

The 8-character name of the temporary storage entry.

**Constructor (2)**

The copy constructor.



## **IccTempStoreId(const IccTempStoreId& *id*)**

*id*

A reference to an **IccTempStoreId** object.

## **Public methods**

These are the public methods in this class.

### **operator= (1)**

## **IccTempStoreId& operator=(const char\* *name*)**

*name*

The 8-character name of the temporary storage entry.

### **operator= (2)**

Assigns a new value.

## **IccTempStoreId& operator=(const IccTempStoreId& *id*)**

*id*

A reference to an **IccTempStoreId** object.

## **Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## **Inherited protected methods**

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase



## IccTermId class

**IccTermId** class is used to identify a terminal name in the CICS system.

**IccBase**  
**IccResourceId**  
**IccTermId**

**Header file:** ICCRIDEH

## IccTermId constructors

### Constructor (1)

**IccTermId(const char\* *name*)**

***name***

The 4-character name of the terminal

### Constructor (2)

The copy constructor.

**IccTermId(const IccTermId& *id*)**

***id***

A reference to an **IccTermId** object.

## Public methods

These are the public methods in this class.

### operator= (1)

**IccTermId& operator=(const char\* *name*)**

***name***

The 4-character name of the terminal

### operator= (2)

Assigns a new value.

**IccTermId& operator=(const IccTermId& *id*)**



*id*

A reference to an **IccTermId** object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccTerminal class

This is a singleton class that represents the terminal that belongs to the CICS task. It can only be created if the transaction has a 3270 terminal as its principal facility, otherwise an exception is thrown.

**IccBase**  
**IccResource**  
**IccTerminal**

**Header file:** ICCTRMEH

**Sample:** ICC\$TRM

## IccTerminal constructor (protected)

**Constructor**

**IccTerminal()**

## Public methods

These are the public methods in this class.

### The *opt* parameter

Many methods have the same parameter, *opt*, which is described under the **abendCode** method in [“abendCode” on page 60](#).



**AID**

Returns an enumeration, defined in this class, that indicates which AID (action identifier) key was last pressed at this terminal.

**AIDVal AID()****clear****virtual void clear()**

A synonym for **erase**. See [Polymorphic Behavior](#) for information on polymorphism.

**cursor****unsigned short cursor()**

Returns the current cursor position as an offset from the upper-left corner of the screen.

**data****IccTerminalData\* data()**

Returns a pointer to an **IccTerminalData** object that contains information about the characteristics of the terminal. The object is created if it does not already exist.

**erase****void erase()**

Erase all the data displayed at the terminal.

**Conditions**

INVREQ, INVPARTN

**freeKeyboard**

Frees the keyboard so that the terminal can accept input.

**void freeKeyboard()****Conditions**

INVREQ, INVPARTN

**get**

A synonym for **receive**. See [Polymorphic Behavior](#) for information on polymorphism.



**virtual const IccBuf& get()**

**height**

**unsigned short height(Icc::getopt *opt* = Icc::object)**

Returns how many lines the screen holds.

**Conditions**

INVREQ

**inputCursor**

Returns the position of the cursor on the screen.

**unsigned short inputCursor()**

**instance**

**static IccTerminal\* instance()**

Returns a pointer to the single **IccTerminal** object. The object is created if it does not already exist.

**line**

**unsigned short line()**

Returns the current line number of the cursor from the beginning of the screen.

**netName**

**const char\* netName()**

Returns the 8-byte string representing the network logical unit name of the principal facility.

**operator« (1)**

Sets the foreground color for data subsequently sent to the terminal.

**IccTerminal& operator « (Color *color*)**

**operator« (2)**

Sets the highlighting used for data subsequently sent to the terminal.

**IccTerminal& operator « (Highlight *highlight*)**



**operator« (3)**

Writes another buffer.

**IccTerminal& operator « (const IccBuf& *buffer*)**

**operator« (4)**

Writes a character.

**IccTerminal& operator « (char *ch*)**

**operator« (5)**

Writes a character.

**IccTerminal& operator « (signed char *ch*)**

**operator« (6)**

Writes a character.

**IccTerminal& operator « (unsigned char *ch*)**

**operator« (7)**

Writes a string.

**IccTerminal& operator « (const char\* *text*)**

**operator« (8)**

Writes a string.

**IccTerminal& operator « (const signed char\* *text*)**



**operator« (9)**

Writes a string.

**IccTerminal& operator « (const unsigned char\* *text*)**

**operator« (10)**

Writes a short.

**IccTerminal& operator « (short *num*)**

**operator« (11)**

Writes an unsigned short.

**IccTerminal& operator « (unsigned short *num*)**

**operator« (12)**

Writes a long.

**IccTerminal& operator « (long *num*)**

**operator« (13)**

Writes an unsigned long.

**IccTerminal& operator « (unsigned long *num*)**

**operator« (14)**

Writes an integer.

**IccTerminal& operator « (int *num*)**

**operator« (15)**

Writes a float.



**IccTerminal& operator « (float *num*)**

**operator« (16)**

Writes a double.

**IccTerminal& operator « (double *num*)**

**operator« (17)**

Writes a long double.

**IccTerminal& operator « (long double *num*)**

**operator« (18)**

**IccTerminal& operator « (IccTerminal& (\*f)(IccTerminal&))**

Enables the following syntax:

```
Term « "Hello World" « endl;  
Term « "Hello again" « flush;
```

**put**

**virtual void put(const IccBuf& *buf*)**

A synonym for **sendLine**. See [Polymorphic Behavior](#) for information on polymorphism.

**receive**

Receives data from the terminal

**const IccBuf& receive(Case *caseOpt* = upper)**

***caseOpt***

An enumeration, defined in this class, that indicates whether text is to be converted to uppercase.

**Conditions**

EOC, INVREQ, LENGERR, NOTALLOC, SIGNAL, TERMERR



## **receive3270Data**

Receives the 3270 data buffer from the terminal

**const IccBuf& receive3270Data(Case *caseOpt* = upper)**

### ***caseOpt***

An enumeration, defined in this class, that indicates whether text is to be converted to uppercase.

### **Conditions**

INVREQ, LENGERR, TERMERR

### **send (1)**

**void send(const IccBuf& *buffer*)**

### ***buffer***

A reference to an **IccBuf** object that holds the data that is to be sent.

### **send (2)**

**void send (const char\* *format*,  
...)**

### ***format***

A format string, as in the **printf** standard library function.

...

The optional arguments that accompany *format*.

### **send (3)**

**void send (unsigned short *row*,  
unsigned short *col*,  
const IccBuf& *buffer*)**

### ***row***

The row where the writing of the data is started.

### ***col***

The column where the writing of the data is started.



***buffer***

A reference to an **IccBuf** object that holds the data that is to be sent.

**send (4)**

Writes the specified data to either the current cursor position or to the cursor position specified by the arguments.

```
void send (unsigned short row,  
           unsigned short col,  
           const char* format,  
           ...)
```

***row***

The row where the writing of the data is started.

***col***

The column where the writing of the data is started.

***format***

A format string, as in the **printf** standard library function.

...

The optional arguments that accompany *format*.

**Conditions**

INVREQ, LENGERR, TERMERR

**send3270Data (1)**

```
void send3270Data(const IccBuf& buffer)
```

***buffer***

A reference to an **IccBuf** object that holds the data that is to be sent.

**send3270Data (2)**

```
void send3270Data(const char* format,  
                  ...)
```

***format***

A format string, as in the **printf** standard library function

...

The optional arguments that accompany *format*.

**send3270Data (3)**



**void send3270Data (unsigned short *col*,  
const IccBuf& *buf*)**

***col***

The column where the writing of the data is started

***buffer***

A reference to an **IccBuf** object that holds the data that is to be sent.

**send3270Data (4)**

Writes the specified data to either the next line of the terminal or to the specified column of the current line.

**void send3270Data (unsigned short *col*,  
const char\* *format*,  
...)**

***col***

The column where the writing of the data is started

***format***

A format string, as in the **printf** standard library function

**...**

The optional arguments that accompany *format*.

**Conditions**

INVREQ, LENGERR, TERMERR

**sendLine (1)**

**void sendLine(const IccBuf&*buffer*)**

***buffer***

A reference to an **IccBuf** object that holds the data that is to be sent.

**sendLine (2)**

**void sendLine (const char\* *format*,  
...)**



***format***

A format string, as in the **printf** standard library function

...

The optional arguments that accompany *format*.

**sendLine (3)**

**void sendLine (unsigned short *col*,  
const IccBuf& *buf*)**

***col***

The column where the writing of the data is started

***buffer***

A reference to an **IccBuf** object that holds the data that is to be sent.

**sendLine (4)**

Writes the specified data to either the next line of the terminal or to the specified column of the current line.

**void sendLine (unsigned short *col*,  
const char\* *format*,  
...)**

***col***

The column where the writing of the data is started

***format***

A format string, as in the **printf** standard library function

...

The optional arguments that accompany *format*.

**Conditions**

INVREQ, LENGERR, TERMERR

**setColor**

Changes the color of the text subsequently sent to the terminal.

**void setColor(Color *color*=defaultColor)**

***color***

An enumeration, defined in this class, that indicates the color of the text that is written to the screen.



## **setCursor (1)**

**void setCursor(unsigned short *offset*)**

### ***offset***

The position of the cursor where the upper-left corner is 0.

## **setCursor (2)**

Two different ways of setting the position of the cursor on the screen.

**void setCursor (unsigned short *row*,  
unsigned short *col*)**

### ***row***

The row number of the cursor where the top row is 1

### ***col***

The column number of the cursor where the left column is 1

## **Conditions**

INVREQ, INVPARTN

## **setHighlight**

Changes the highlighting of the data subsequently sent to the terminal.

**void setHighlight(Highlight *highlight* = normal)**

### ***highlight***

An enumeration, defined in this class, that indicates the highlighting of the text that is written to the screen.

## **setLine**

Moves the cursor to the start of line *lineNum*, where 1 is the first line of the terminal. The default is to move the cursor to the start of line 1.

**void setLine(unsigned short *lineNum* = 1)**

### ***lineNum***

The line number, counting from the start.

## **Conditions**

INVREQ, INVPARTN



**setNewLine**

Requests that *numLines* blank lines be sent to the terminal.

**void setNewLine(unsigned short *numLines* = 1)**

***numLines***

The number of blank lines.

**Conditions**

INVREQ, INVPARTN

**setNextCommArea**

Specifies the COMMAREA that is to be passed to the next transaction started on this terminal.

**void setNextCommArea(const IccBuf& *commArea*)**

***commArea***

A reference to the buffer that is to be used as a COMMAREA.

**setNextInputMessage**

Specifies data that is to be made available, by the **receive** method, to the next transaction started at this terminal.

**void setNextInputMessage(const IccBuf& *message*)**

***message***

A reference to the buffer that holds the input message.

**setNextTransId**

Specifies the next transaction that is to be started on this terminal.

**void setNextTransId (const IccTransId& *transid*,  
NextTransIdOpt *opt* = queue)**

***transid***

A reference to the **IccTransId** object that holds the name of a transaction

***opt***

An enumeration, defined in this class, that indicates whether *transId* should be queued or started immediately (that is, it should be the very next transaction) at this terminal.



## **signoff**

### **void signoff()**

Signs off the user who is currently signed on. Authority reverts to the default user.

### **Conditions**

INVREQ

### **signon (1)**

```
void signon (const IccUserId& id,  
             const char* password = 0,  
             const char* newPassword = 0)
```

#### ***id***

A reference to an **IccUserId** object

#### ***password***

The 8-character existing password.

#### ***newPassword***

An optional 8-character new password.

### **signon (2)**

Signs the user on to the terminal.

```
void signon (IccUser& user,  
             const char* password = 0,  
             const char* newPassword = 0)
```

#### ***user***

A reference to an **IccUser** object

#### ***password***

The 8-character existing password.

#### ***newPassword***

An optional 8-character new password. This method differs from the first **signon** method in that the **IccUser** object is interrogated to discover **IccGroupId** and language information. The object is also updated with language and ESM return and response codes.

### **Conditions**

INVREQ, NOTAUTH, USERIDERR



**waitForAID (1)**

Waits for any input and returns an enumeration, defined in this class, that indicates which AID key is expected.

**AIDVal waitForAID()****waitForAID (2)**

Waits for the specified AID key to be pressed, before returning control. This method loops, receiving input from the terminal, until the correct AID key is pressed by the operator.

**void waitForAID(AIDVal *aid*)*****aid***

An enumeration, defined in this class, that indicates which AID key was last pressed.

**Conditions**

EOC, INVREQ, LENGERR, NOTALLOC, SIGNAL, TERMERR

**width**

Returns the width of the screen in characters.

**unsigned short width(Icc::getopt *opt* = Icc::object)****Conditions**

INVREQ

**workArea**

Returns a reference to the **IccBuf** object that holds the terminal work area.

**IccBuf& workArea()****Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource



<b>Method</b>	<b>Class</b>
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

### Inherited protected methods

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
setClassName	IccBase
setCustomClassNum	IccBase

### Enumerations

**AIDVal**

**ENTER**

**CLEAR**

**PA1 to PA3**

**PF1 to PF24**

**Case**

**upper**

**mixed**

**Color**

**defaultColor**

**blue**

**red**



**pink**

**green**

**cyan**

**yellow**

**neutral**

**Highlight**

**defaultHighlight**

**blink**

**reverse**

**underscore**

**NextTransIdOpt**

**queue**

Queue the transaction with any other outstanding starts queued on the terminal.

**immediate**

Start the transaction immediately, that is, before any other outstanding starts queued on the terminal.

## **IccTerminalData class**

**IccTerminalData** is a singleton class owned by **IccTerminal**. It contains information about the terminal characteristics.

See [“data” on page 209](#) in **IccTerminal** class).

**IccBase**

**IccResource**

**IccTerminalData**

**Header file:** ICCTMDEH

**Sample:** ICC\$TRM

## **IccTerminalData constructor (protected)**

**Constructor**

**IccTerminalData()**



## Public methods

These are the public methods in this class.

### The *opt* parameter

Many methods have the same parameter, *opt*, which is described under the **abendCode** method in [“abendCode” on page 60](#).

### **alternateHeight**

Returns the alternate height of the screen, in lines.

**unsigned short alternateHeight(Icc::GetOpt *opt* = Icc::object)**

### *opt*

An enumeration that indicates whether the information in the object should be refreshed from CICS before being extracted. The default is not to refresh.

### Conditions

INVREQ

### **alternateWidth**

Returns the alternate width of the screen, in characters.

**unsigned short alternateWidth(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### **defaultHeight**

Returns the default height of the screen, in lines.

**unsigned short defaultHeight(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### **defaultWidth**

Returns the default width of the screen, in characters.

**unsigned short defaultWidth(Icc::GetOpt *opt* = Icc::object)**



### Conditions

INVREQ

### **graphicCharCodeSet**

Returns the binary code page global identifier as a value in the range 1 to 65534, or 0 for a non-graphics terminal.

**unsigned short graphicCharCodeSet(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### **graphicCharSetId**

Returns the graphic character set global identifier as a number in the range 1 to 65534, or 0 for a non-graphics terminal.

**unsigned short graphicCharSetId(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### **isAPLKeyboard**

Returns a boolean that indicates whether the terminal has the APL keyboard feature.

**Icc::Bool isAPLKeyboard(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### **isAPLText**

Returns a boolean that indicates whether the terminal has the APL text feature.

**Icc::Bool isAPLText(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ



**isBTrans**

Returns a boolean that indicates whether the terminal has the background transparency capability.

**Icc::Bool isBTrans(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**isColor**

Returns a boolean that indicates whether the terminal has the extended color capability.

**Icc::Bool isColor(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**isEWA**

Returns a Boolean that indicates whether the terminal supports Erase Write Alternative.

**Icc::Bool isEWA(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**isExtended3270**

Returns a Boolean that indicates whether the terminal supports the 3270 extended data stream.

**Icc::Bool isExtended3270(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**isFieldOutline**

Returns a boolean that indicates whether the terminal supports field outlining.

**Icc::Bool isFieldOutline(Icc::GetOpt *opt* = Icc::object)**



### Conditions

INVREQ

### isGoodMorning

Returns a boolean that indicates whether the terminal has a 'good morning' message.

**Icc::Bool isGoodMorning(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### isHighlight

Returns a boolean that indicates whether the terminal has extended highlight capability.

**Icc::Bool isHighlight(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### isKatakana

Returns a boolean that indicates whether the terminal supports Katakana.

**Icc::Bool isKatakana(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ

### isMSRControl

Returns a boolean that indicates whether the terminal supports magnetic slot reader control.

**Icc::Bool isMSRControl(Icc::GetOpt *opt* = Icc::object)**

### Conditions

INVREQ



**isPS**

Returns a boolean that indicates whether the terminal supports programmed symbols.

**Icc::Bool isPS(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**isSOSI**

Returns a boolean that indicates whether the terminal supports mixed EBCDIC/DBCS fields.

**Icc::Bool isSOSI(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**isTextKeyboard**

Returns a boolean that indicates whether the terminal supports TEXTKYBD.

**Icc::Bool isTextKeyboard(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**isTextPrint**

Returns a boolean that indicates whether the terminal supports TEXTPRINT.

**Icc::Bool isTextPrint(Icc::GetOpt *opt* = Icc::object)**

**Conditions**

INVREQ

**isValidation**

Returns a boolean that indicates whether the terminal supports validation.

**Icc::Bool isValidation(Icc::GetOpt *opt* = Icc::object)**



## Conditions

INVREQ

### Inherited public methods

These are the public methods inherited by this class.

Method	Class
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

### Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccTime class

**IccTime** is used to contain time information and is the base class from which **IccAbsTime**, **IccTimeInterval**, and **IccTimeOfDay** classes are derived.

**IccBase**  
**IccResource**  
**IccTime**

**Header file:** ICCTIMEH



## IccTime constructor (protected)

### Constructor

**IccTime** (unsigned long *hours* = 0,  
          unsigned long *minutes* = 0,  
          unsigned long *seconds* = 0)

#### *hours*

The number of hours

#### *minutes*

The number of minutes

#### *seconds*

The number of seconds

## Public methods

These are the public methods in this class.

#### **hours**

Returns the hours component of time—the value specified in the constructor.

**virtual unsigned long hours() const**

#### **minutes**

**virtual unsigned long minutes() const**

Returns the minutes component of time—the value specified in the constructor.

#### **seconds**

**virtual unsigned long seconds() const**

Returns the seconds component of time—the value specified in the constructor.

#### **timeInHours**

**virtual unsigned long timeInHours()**

Returns the time in hours.

#### **timeInMinutes**



**virtual unsigned long timeInMinutes()**

Returns the time in minutes.

**timeInSeconds****virtual unsigned long timeInSeconds()**

Returns the time in seconds.

**type****Type type() const**

Returns an enumeration, defined in this class, that indicates what type of subclass of **IccTime** this is.

**Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
className	IccBase
classType	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
isEDFOn	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

**Inherited protected methods**

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
setClassName	IccBase
setCustomClassNum	IccBase

**Enumerations**



## Type

### **absTime**

The object is of **IccAbsTime** class. It is used to represent a current date and time as the number of milliseconds that have elapsed since the beginning of the year 1900.

### **timeInterval**

The object is of **IccTimeInterval** class. It is used to represent a length of time, such as 5 minutes.

### **timeOfDay**

The object is of **IccTimeOfDay** class. It is used to represent a particular time of day, such as midnight.

## IccTimeInterval class

This class holds information about a time interval.

### **IccBase**

### **IccResource**

### **IccTime**

### **IccTimeInterval**

**Header file:** ICCTIMEH

## IccTimeInterval constructors

### **Constructor (1)**

**IccTimeInterval** (**unsigned long** *hours* = 0,  
**unsigned long** *minutes* = 0,  
**unsigned long** *seconds* = 0)

### **hours**

The initial hours setting. The default is 0.

### **minutes**

The initial minutes setting. The default is 0.

### **seconds**

The initial seconds setting. The default is 0.

### **Constructor (2)**

The copy constructor.

**IccTimeInterval**(const **IccTimeInterval**& *time*)

## Public methods

These are the public methods in this class.

### **operator=**

Assigns one **IccTimeInterval** object to another.



**IccTimeInterval& operator=(const IccTimeInterval& *timeInterval*)**

**set**

Changes the time held in the **IccTimeInterval** object.

**void set (unsigned long *hours*,  
          unsigned long *minutes*,  
          unsigned long *seconds*)**

***hours***

The new hours setting

***minutes***

The new minutes setting

***seconds***

The new seconds setting

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
hours	IccTime
isEDFOn	IccResource
minutes	IccTime
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource
timeInHours	IccTime
timeInMinutes	IccTime



Method	Class
timeInSeconds	IccTime
type	IccTime

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccTimeOfDay class

This class holds information about the time of day.

```

IccBase
  IccResource
    IccTime
      IccTimeOfDay

```

**Header file:** ICCTIMEH

## IccTimeOfDay constructors

### Constructor (1)

```

IccTimeOfDay (unsigned long hours = 0,
              unsigned long minutes = 0,
              unsigned long seconds = 0)

```

#### *hours*

The initial hours setting. The default is 0.

#### *minutes*

The initial minutes setting. The default is 0.

#### *seconds*

The initial seconds setting. The default is 0.

### Constructor (2)

The copy constructor

```

IccTimeOfDay(const IccTimeOfDay& time)

```



## Public methods

These are the public methods in this class.

### **operator=**

Assigns one **IccTimeOfDay** object to another.

**IccTimeOfDay& operator=(const IccTimeOfDay& *timeOfDay*)**

### **set**

Changes the time held in the **IccTimeOfDay** object.

**void set (unsigned long *hours*,  
          unsigned long *minutes*,  
          unsigned long *seconds*)**

### ***hours***

The new hours setting

### ***minutes***

The new minutes setting

### ***seconds***

The new seconds setting

## Inherited public methods

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
hours	IccTime
isEDFOn	IccResource
minutes	IccTime
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource



Method	Class
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource
timeInHours	IccTime
timeInMinutes	IccTime
timeInSeconds	IccTime
type	IccTime

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
setClassName	IccBase
setCustomClassNum	IccBase

## IccTPNameId class

**IccTPNameId** class holds a 1-64 byte TP partner name.

**IccBase**

**IccResourceId**

**IccTPNameId**

**IccTPNameId** class holds a 1-64 byte TP partner name.

**Header file:** ICCRIDEH

## IccTPNameId constructors

### Constructor (1)

**IccTPNameId(const char\* *name*)**

***name***

The 1- to 64-character TP name.

### Constructor (2)

The copy constructor.

**IccTPNameId(const IccTPNameId& *id*)**

***id***

A reference to an **IccTPNameId** object.



## Public methods

These are the public methods in this class.

### **operator= (1)**

**IccTPNameId& operator=(const char\* *name*)**

#### ***name***

The 1- to 64-character TP name.

### **operator= (2)**

Assigns a new value.

**IccTPNameId& operator=(const IccTPNameId& *id*)**

#### ***id***

A reference to an **IccTPNameId** object.

## Inherited public methods

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase



## IccTransId class

**IccTransId** class identifies a transaction name in the CICS system.

**IccBase**

**IccResourceId**

**IccTransId**

**Header file:** ICCRIDEH

## IccTransId constructors

### Constructor (1)

**IccTransId(const char\* *name*)**

***name***

The 4-character transaction name.

### Constructor (2)

The copy constructor.

**IccTransId(const IccTransId& *id*)**

***id***

A reference to an **IccTransId** object.

## Public methods

These are the public methods in this class.

### operator= (1)

**IccTransId& operator=(const char\* *name*)**

***name***

The 4-character transaction name.

### operator= (2)

Assigns a new value.

**IccTransId& operator=(const IccTransId& *id*)**



*id*

A reference to an **IccTransId** object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccUser class

This class represents a CICS user.

**IccBase**  
**IccResource**  
**IccUser**

**Header file:** ICCUSREH

**Sample:** ICC\$USR

## IccUser constructors

### Constructor (1)

**IccUser (const IccUserId& *id*,  
const IccGroupId\* *gid* = 0)**

*id*

A reference to an **IccUserId** object that contains the user ID name

*gid*

An optional pointer to an **IccGroupId** object that contains information about the user's group ID.



## Constructor (2)

**IccUser** (**const char\*** *userName*,  
**const char\*** *groupName* = 0)

***userName***

The 8-character user ID

***gid***

The optional 8-character group ID.

## Public methods

These are the public methods in this class.

**changePassword**

Attempts to change the user's password.

**void changePassword** (**const char\*** *password*,  
**const char\*** *newPassword*)

***password***

The user's existing password—a string of up to 8 characters

***newPassword***

The user's new password—a string of up to 8 characters.

## Conditions

INVREQ, NOTAUTH, USERIDERR

**daysUntilPasswordExpires**

Returns the number of days before the password expires. This method is valid after a successful **verifyPassword** method call in this class.

**unsigned short daysUntilPasswordExpires() const**

**ESMReason**

**unsigned long ESMReason() const**

Returns the external security reason code of interest if a **changePassword** or **verifyPassword** method call is unsuccessful.

**ESMResponse**



### **unsigned long ESMResponse() const**

Returns the external security response code of interest if a **changePassword** or **verifyPassword** method call is unsuccessful.

### **groupId**

### **const IccGroupId& groupId() const**

Returns a reference to the **IccGroupId** object that holds information on the user's group ID.

### **invalidPasswordAttempts**

### **unsigned long invalidPasswordAttempts() const**

Returns the number of times the wrong password has been entered for this user since the last successful signon. This method should only be used after a successful **verifyPassword** method.

### **language**

### **const char\* language() const**

Returns the user's language after a successful call to **signon** in **IccTerminal**.

### **lastPasswordChange**

### **const IccAbsTime& lastPasswordChange() const**

Returns a reference to an **IccAbsTime** object that holds the time when the password was last changed. This method should only be used after a successful **verifyPassword** method.

### **lastUseTime**

### **const IccAbsTime& lastUseTime() const**

Returns a reference to an **IccAbsTime** object that holds the time when the user ID was last used. This method should only be used after a successful **verifyPassword** method.

### **passwordExpiration**

### **const IccAbsTime& passwordExpiration() const**

Returns a reference to an **IccAbsTime** object that holds the time when the password will expire. This method should only be used after a successful **verifyPassword** method.

### **setLanguage**

### **void setLanguage(const char\* *language*)**



Sets the IBM-defined national language code that is to be associated with this user. This should be a three character value.

### **verifyPassword**

**void verifyPassword(const char\* *password*)**

Checks that the supplied password matches the password recorded by the external security manager for this **IccUser**.

### **Conditions**

INVREQ, NOTAUTH, USERIDERR

## **Inherited public methods**

These are the public methods inherited by this class.

<b>Method</b>	<b>Class</b>
actionOnCondition	IccResource
actionOnConditionAsChar	IccResource
actionsOnConditionsText	IccResource
classType	IccBase
className	IccBase
condition	IccResource
conditionText	IccResource
customClassNum	IccBase
handleEvent	IccResource
id	IccResource
isEDFOn	IccResource
name	IccResource
operator delete	IccBase
operator new	IccBase
setActionOnAnyCondition	IccResource
setActionOnCondition	IccResource
setActionsOnConditions	IccResource
setEDF	IccResource

## **Inherited protected methods**

These are the protected methods inherited by this class.

<b>Method</b>	<b>Class</b>
setClassName	IccBase
setCustomClassNum	IccBase



## IccUserId class

**IccUserId** class represents an 8-character user name.

**IccBase**

**IccResourceId**

**IccUserId**

**IccUserId** class represents an 8-character user name.

**Header file:** ICCRIDEH

## IccUserId constructors

### Constructor (1)

**IccUserId(const char\* *name*)**

*name*

The 8-character name of the user ID.

### Constructor (2)

The copy constructor.

**IccUserId(const IccUserId& *id*)**

*id*

A reference to an **IccUserId** object.

## Public methods

These are the public methods in this class.

### operator= (1)

**IccUserId& operator=(const char\* *name*)**

*name*

The 8-character name of the user ID.

### operator= (2)

Assigns a new value.

**IccUserId& operator=(const IccUserId& *id*)**



*id*

A reference to an **IccUserId** object.

## Inherited public methods

These are the public methods inherited by this class.

Method	Class
classType	IccBase
className	IccBase
customClassNum	IccBase
name	IccResourceId
nameLength	IccResourceId
operator delete	IccBase
operator new	IccBase

## Inherited protected methods

These are the protected methods inherited by this class.

Method	Class
operator=	IccResourceId
setClassName	IccBase
setCustomClassNum	IccBase

## IccValue structure

This structure contains CICS-value data areas (CVDAs) as an enumeration.

**Header file:** ICCVALEH

## Enumeration

### Listing of valid CVDAs

Valid CVDAs are listed in the CVDAs and numeric values topics in the System Programming reference information.

## main function

You are recommended to include this code in your application.

It initializes the CICS Foundation Classes correctly, provides default exception handling, and releases allocated memory after it is finished. You may substitute your own variation of this **main** function, but this should rarely be necessary.

**Source file:** ICCMAIN

The stub has three functions:

1. It initializes the Foundation Classes environment. You can customize the way it does this by using `#defines` that control:
  - Memory management (see [Storage management](#))



- Family Subset enforcement (see “FamilySubset” on page 59)
  - EDF enablement (see [Program debugging](#))
2. It provides a default definition of a class **IccUserControl**, derived from **IccControl**, that includes a default constructor and **run** method.
  3. It invokes the **run** method of the user's control object using a try-catch construct.

The following information is the functional part of the **main** code:

```

int main() 1
{
    Icc::initializeEnvironment(ICC_CLASS_MEMORY_MGMT, 2
                               ICC_FAMILY_SUBSET,
                               ICC_EDF_BOOL); 3
    try 3
    {
        ICC_USER_CONTROL control; 4
        control.run(); 5
    }
    catch(IccException& exc) 6
    {
        Icc::catchException(exc); 7
    }
    catch(...) 8
    {
        Icc::unknownException(); 9
    }
    Icc::returnToCICS(); 10
}

```

- 1** This is the main C++ entry point.
- 2** This call initializes the environment and is essential. The three parameters have previously been defined to the defaults for the platform.
- 3** Run the user's application code, using **try** and **catch**, in case the application code does not catch exceptions.
- 4** Create control object.
- 5** Invoke **run** method of control object (defined as pure virtual in **IccControl**).
- 6** Catch any **IccException** objects not caught by the application.
- 7** Call this function to abend task.
- 8** Catch any other exceptions not caught by application.
- 9** Call this function to abend task.
- 10** Return control to CICS.







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- [Developing applications](#)
- [Developing system programs](#)
- [CICS TS security](#)
- [Developing for external interfaces](#)
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- Application Programming Guide and Application Programming Reference
- Business Transaction Services
- Customization Guide



- C++ OO Class Libraries
- Debugging Tools Interfaces Reference
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- External Interfaces Guide
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- Supplied Transactions
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