



TIBCO Rendezvous®

.NET Reference

Version 8.8.0 | February 2025

Contents

Concepts	10
Strings and Character Encodings	11
Programmer's Checklist	13
Install	13
Code	13
Compile	13
Run	13
Shared Library Files	15
IPM Library	15
Rendezvous Environment	16
Environment	17
Environment.Close	20
Environment.IsIPM()	22
Environment.Open	23
Environment.SetRVParameters()	25
SDContext	27
SDContext.SetDaemonCertificate	29
SDContext.SetUserCertificateWithKey	32
SDContext.SetUserNameWithPassword	34

TimeoutValue	36
Data	38
Field Names and Field Identifiers	39
Finding a Field Instance	40
IPPort	41
IPPort	43
Message	44
Message	50
Message.AddField	52
Message.AddStringAsXml	57
Message.Dispose()	59
Message.Expand	60
Message.GetField	61
Message.GetFieldByIndex	64
Message.GetFieldInstance	65
Message.GetXmlAsString	67
Message.GetSource	69
Message.RegisterCustomDataType	70
Message.RemoveField	71
Message.RemoveFieldInstance	73

Message.Reset	75
Message.ToByteArray	76
Message.UpdateField	77
MessageField	80
MessageField	83
Opaque	85
ICustomDataType	86
ICustomDataAdapter	87
ICustomDataAdapter.Decode()	89
ICustomDataAdapter.Encode()	90
Listeners	91
Listener	92
Listener	96
Listener.Destroy	98
MessageReceivedEventArgs	99
MessageReceivedEventHandler	101
VectorListener	103
VectorListener	105
VectorListener.Destroy	111
VectorListener.GetClosure	112

MessagesReceivedEventArgs	113
MessagesReceivedEventHandler	114
Event Queues	115
IDisposable	116
IDisposable.dispatch	118
IDisposable.Poll	119
IDisposable.TimedDispatch	120
Queue	122
Queue	125
Queue.Destroy	126
Queue.Dispatch	127
Queue.Poll	128
Queue.TimedDispatch	129
LimitPolicy	131
LimitPolicy	133
LimitPolicyStrategy	135
QueueGroup	136
QueueGroup	138
QueueGroup.Add	139
QueueGroup.Destroy	140

QueueGroup.Dispatch	141
QueueGroup.Poll	143
QueueGroup.Remove	145
QueueGroup.TimedDispatch	146
Dispatcher	148
Dispatcher	150
Dispatcher.Destroy	152
Dispatcher.Join	153
Dispatcher.Pause	154
Dispatcher.Resume	155
Transports	156
Transport	157
Transport.CreateInbox	160
Transport.Destroy	162
Transport.Send	163
Transport.SendReply	165
Transport.SendRequest	167
Transport.SetBatchSize	169
IntraProcessTransport	171
NetTransport	173

NetTransport	177
TransportBatchMode	180
Virtual Circuits	182
VCTransport	183
VCTransport.CreateAcceptVC	186
VCTransport.CreateConnectVC	188
VCTransport.WaitForVCConnection	190
Fault Tolerance	192
Fault Tolerance Road Map	193
FTGroupMember	194
FTGroupMember	197
FTGroupMember.Destroy	202
ActionToken	203
ActionTokenReceivedEventArgs	205
ActionTokenReceivedEventHandler	207
FTGroupMonitor	209
FTGroupMonitor	212
FTGroupMonitor.Destroy	215
GroupStateChangedEventArgs	216
GroupStateChangedEventHandler	218

Certified Message Delivery	220
CMListener	221
CMListener	224
CMListener.ConfirmMessage	226
CMListener.Destroy	228
CMListener.SetExplicitConfirmation	230
CMTransport	232
CMTransport	239
CMTransport.AddListener	244
CMTransport.AllowListener	246
CMTransport.Destroy	248
CMTransport.DisallowListener	250
CmTransport.ExpireMessages()	252
CMTransport.RemoveListener	254
CMTransport.RemoveSendState	256
CMTransport.ReviewLedger	258
CMTransport.Send	260
CMTransport.SendReply	262
CMTransport.SendRequest	264
CMTransport.SynchronizeLedgerNow	266

ReviewLedgerDelegate	267
CMMessage	270
CMMessage	275
Distributed Queue	277
CMQueueTransport	278
CMQueueTransport	285
Exceptions and Errors	289
RendezvousException	290
RendezvousException.GetStatusText	293
Status	294
TIBCO Documentation and Support Services	299
Legal and Third-Party Notices	301

Concepts

This section presents concepts specific to the TIBCO Rendezvous® .NET interface. For concepts that pertain to Rendezvous software in general, see the book *TIBCO Rendezvous Concepts*.

Strings and Character Encodings

Rendezvous software uses strings in several roles:

- String data inside message fields
- Field names
- Subject names (and other *associated* strings that are not strictly *inside* the message)
- Certified delivery (CM) correspondent names
- Group names (fault tolerance)

.NET programs represent all these strings in the Unicode 2-byte character set. Before sending a message, Rendezvous software translates these strings into the character encoding appropriate to the ANSI code page. Conversely, when extracting these strings from inbound messages, Rendezvous software translates these strings into Unicode, *as if* they used the encoding appropriate to the ANSI code page.

For example, the United States is code page `us-ascii`, and uses the Latin-1 character encoding (also called ISO 8859-1); Japan is code page `shift-jis`, and uses the Shift-JIS character encoding.

When two programs exchange messages using the same code page, the translation is correct. However, when a message sender and receiver use different character encodings, the receiving program must retranslate between encodings as needed.

The default translation depends on the code page where the program is running. Programs can override this default encoding; for details, see the environment property [StringEncoding](#).

Outbound Translation

Outbound translation from Unicode to the local code page occurs when the program sends the message (for example, using [Transport.Send](#) or a related method), or converts the message to a byte array.

Inbound Translation

Inbound translation occurs before the program receives the data.

Automatic inbound translation is correct when two programs exchange messages using the same code page.



Warning

In contrast, the automatic translation might be incorrect when the sender and receiver use different character encodings.

In this situation, the receiver must *explicitly* retranslate to the local encoding.

See Also

[StringEncoding](#)

Programmer's Checklist

Developers of Rendezvous programs can use this checklist during the four phases of the development cycle: installing Rendezvous software, coding your program, compiling your program, and running your program.

Install

- Before installing Rendezvous software, we recommend that you first install the .NET framework. If the .NET framework is present, then Rendezvous installation automatically registers the TIBCO.Rendezvous DLL in Microsoft's general assembly cache (GAC).
- Install the Rendezvous software release, which automatically includes the TIBCO.Rendezvous assembly DLL in the bin subdirectory.

Code

- Import the Rendezvous assembly TIBCO.Rendezvous.

Compile

- Compile with any .NET compiler.

Run

- A copy of the TIBCO.Rendezvous assembly must be in the GAC.
(If the .NET framework was not present when you installed the Rendezvous software, you can manually add the TIBCO.Rendezvous DLL to the GAC now.)

- The TIBCO Rendezvous C libraries must be accessible in the system path; see [Shared Library Files](#).
- You must arrange appropriate .NET security for your applications. The TIBCO Rendezvous library calls unmanaged code, and requires full trust.
- The application must be able to connect to a Rendezvous daemon process (rvd).

IPM

- Ensure that the IPM C library is in the PATH variable; see [IPM Library](#).

Shared Library Files

Programs that use network transports must be able to access Rendezvous shared library files (C libraries). [Environment Variables for Shared Library Files](#) details the environment variables that direct .NET applications to the Rendezvous installation directory. The installation directory must contain the required shared library files.

Environment Variables for Shared Library Files

Platform	Environment Variable
Windows	PATH must include <code>\install_dir\bin</code> The installation procedure sets this variable automatically.

IPM Library

A .NET program can use standard Rendezvous communication library or the IPM library.

To select between the standard Rendezvous communication library or the IPM library, modify the PATH variable according to [Selecting the Communications Library](#).

Selecting the Communications Library

Library	Instructions
Standard Rendezvous Communications Library	Ensure that the subdirectory <code>TIBCO_HOME\bin</code> appears <i>before</i> <code>TIBCO_HOME\bin\ipm</code> in your PATH environment variable.
IPM Communications Library	Ensure that the subdirectory <code>TIBCO_HOME\bin\ipm</code> appears <i>before</i> <code>TIBCO_HOME\bin</code> in your PATH environment variable.

Existing Rendezvous applications that use the standard shared library do not require modifications in order to use the IPM library instead.

Rendezvous Environment

This brief section describes the methods that open and close the internal machinery upon which Rendezvous software depends. It also describes secure daemon contexts, and timeout values.

Environment

Class

Superclasses

System.Object Environment

Visual Basic

NotInheritable Public Class Environment
--

C#

public sealed class Environment
--

Purpose

The Rendezvous environment.

Remarks

Programs do not create instances of [Environment](#). Instead, programs use its static methods to open and close the Rendezvous environment.

Method	Description	Page
Public Static Methods		
Environment.Open	Start Rendezvous	Environment.Open

Method	Description	Page
	internal machinery.	
Environment.Close	Stop and destroy Rendezvous internal machinery.	Environment.Close



IPM

Environment.IsIPM()	Test whether the IPM library is linked.	Environment.IsIPM()
Environment.SetRVParameters()	Set TIBCO Rendezvous daemon command line parameters for IPM.	Environment.SetRVParameters()

Member	Description
--------	-------------

Public Static Properties

DefaultQueue	Queue	Get
<p>The default queue. Each process has exactly one default queue; the call Environment.Open automatically creates it. Programs must not destroy the default queue.</p>		
IntraProcessTransport	IntraProcessTransport	Get
<p>The intra-process transport. Each process has exactly one intra-process transport; the call Environment.Open automatically creates it. Programs cannot destroy the intra-process transport.</p> <p>If the Rendezvous environment is not open, this property is null.</p>		

Member	Description	
StringEncoding	Encoding	Get
	<p>The character encoding for converting between Unicode strings and Rendezvous wire format strings. For more information, see Strings and Character Encodings.</p> <p> Warning</p> <p>Do not set this property while any listener objects are valid. We recommend setting it at program start, before creating any listeners.</p> <p> Note</p> <p>Encoding changes are not retroactive; that is, changing the encoding affects only future string translations.</p>	Set
Version	String	Get
	TIBCO Rendezvous API release number.	

Environment.Close

Method

Visual Basic

```
Public Shared Sub Close()
```

C#

```
public static void Close();
```

Purpose

Stop and destroy Rendezvous internal machinery.

Remarks

After [Environment.Close](#) destroys the internal machinery, Rendezvous software becomes inoperative:

- Events no longer arrive in queues.
- All events, queues and queue groups are unusable, so programs can no longer dispatch events.
- All transports are unusable, so programs can no longer send outbound messages.

After closing the [Environment](#), all events, transports, queues and queue groups associated with that environment are invalid; it is illegal to call any methods of these objects.

After closing the [Environment](#), you can reopen it.

Reference Count

A reference count protects against interactions between programs and third-party packages that call [Environment.Open](#) and [Environment.Close](#). Each call to [Environment.Open](#) increments an internal counter; each call to [Environment.Close](#) decrements that counter. A call to [Environment.Open](#) actually creates internal machinery only when the reference counter is zero; subsequent calls merely increment the counter, but do not duplicate the machinery. A call to [Environment.Close](#) actually destroys the internal machinery only when the call decrements the counter to zero; other calls merely decrement the counter. In each program, the number of calls to [Environment.Open](#) and [Environment.Close](#) must match.

See Also

[Environment.Open](#)

Environment.IsIPM()

Method

Visual Basic

Not supported.

C#

```
public static bool IsIPM();
```

Purpose

Test whether the IPM library is linked.

Remarks

You can use this call to determine whether an application program process has linked the IPM library. You can test that your program dynamically links the correct library. You can program different behavior depending on which library is linked.

`true` indicates that the program links the IPM library (from the `lib\ipm\` subdirectory).

`false` indicates that the program links the standard Rendezvous library (from the `lib\` directory).

Environment.Open

Method

Visual Basic

```
Public Shared Sub Open()
```

C#

```
public static void Open();  
public static void Open(string pathname)
```

Purpose

Start Rendezvous internal machinery.

Remarks

This call creates the internal machinery that Rendezvous software requires for its operation:

- Internal data structures
- Default event queue
- Intra-process transport
- Event driver

Until the first call to [Environment.Open](#) creates the internal machinery, all events, transports, queues and queue groups are unusable. Messages and their methods do not depend on the internal machinery.

Parameter	Description
pathname	<p>Programs that use IPM can supply a filepath name, which explicitly specifies a configuration file. IPM reads parameter values from that file.</p> <p>For details, see Configuring IPM in TIBCO Rendezvous Concepts.</p> <p>When IPM is not available, this version of the method fails with error status.</p> <p>Not supported for Visual Basic.</p>

Reference Count

A reference count protects against interactions between programs and third-party packages that call [Environment.Open](#) and [Environment.Close](#). Each call to [Environment.Open](#) increments an internal counter; each call to [Environment.Close](#) decrements that counter. A call to [Environment.Open](#) actually creates internal machinery only when the reference counter is zero; subsequent calls merely increment the counter, but do not duplicate the machinery. A call to [Environment.Close](#) actually destroys the internal machinery only when the call decrements the counter to zero; other calls merely decrement the counter. In each program, the number of calls to [Environment.Open](#) and [Environment.Close](#) must match.

See Also

[Environment.Close](#)

Environment.SetRVParameters()

Method

Visual Basic

Not supported.

C#

```
public static Status SetRVParameters(  
    string[] parameters)
```

Purpose

Set TIBCO Rendezvous daemon command line parameters for IPM.

Remarks

The TIBCO Rendezvous daemon process (rvd) accepts several command line parameters. When IPM serves the role of the daemon, this call lets you supply those parameters from within the application program.

This call is optional. When this call is present, it *must* precede the call to [Environment.Open](#). For interaction semantics, see Parameter Configuration—Precedence and Interaction in TIBCO Rendezvous Concepts.

This call is available only with IPM. When IPM is not available, this call fails with error status.

Parameter	Description
parameters	Supply an array of strings. Each string is either a command line parameter name (for example, <code>-logfile</code>) or its value.

Parameter	Description
	For details about parameters, see rvd in TIBCO Rendezvous Administration

IPM: Configuring Parameters In Program Code

```
string[] parameters = new string[] { "-reliability", "3",  
                                     "-reuse-port", "30000" };  
Environment.SetRVParameters(parameters);  
Environment.Open();
```

See Also

Configuring IPM in TIBCO Rendezvous Concepts

SDContext

Class

Superclasses

```
System.Object  
SDContext
```

Visual Basic

```
NotInheritable Public Class SDContext
```

C#

```
public sealed class SDContext
```

Purpose

This class defines static methods for interacting with secure Rendezvous daemons.

Remarks

Programs do not create instances of [SDContext](#). Instead, programs use its static methods to configure usernames, passwords and certificates, and to register trust in daemon certificates.

Method	Description	Page
SDContext.SetDaemonCertificate	Register trust in a secure	SDContext.SetDaemonCertificate

Method	Description	Page
	daemon.	
SDContext.SetUserCertificateWithKey	Register a certificate with the private key for identification to secure daemons.	SDContext.SetUserCertificateWithKey
SDContext.SetUserNameWithPassword	Register a username with password for identification to secure daemons.	SDContext.SetUserNameWithPassword

Member	Description
Public Static Fields	
SecureDaemonAnyName	String This value instructs the method SDContext.SetDaemonCertificate to register a catch-all certificate for any daemon that does not have a more specific certificate. For details, see Daemon Name .
SecureDaemonAnyCertificate	String This value instructs the method SDContext.SetDaemonCertificate to accept any certificate from a specific daemon. For details, see Daemon Name . For details, see Certificate .

SDContext.SetDaemonCertificate

Method

Visual Basic

```
Public Shared Sub SetDaemonCertificate(  
    ByVal daemonName As String,  
    ByVal daemonCert As String)
```

C#

```
public static void SetDaemonCertificate(  
    string daemonName,  
    string daemonCert);
```

Purpose

Register trust in a secure daemon.

Remarks

When any program transport connects to a secure daemon, it verifies the daemon's identity using TLS protocols. Certificates registered using this method identify trustworthy daemons. Programs divulge usernames and passwords to daemons that present registered certificates.

Parameter	Description
daemonName	Register a certificate for a secure daemon with this name. For the syntax and semantics of this parameter, see Daemon Name , below.

Parameter	Description
<code>daemonCert</code>	Register this public certificate. The text of this certificate must be in PEM encoding. See also Certificate .

Daemon Name

The daemon name is a three-part string of the form:

```
ssl:host:port_number
```

This string must be identical to the string you supply as the daemon argument to the transport creation call; see [NetTransport](#).

Colon characters (:) separate the three parts.

`ssl` indicates the protocol to use when attempting to connect to the daemon.

`host` indicates the host computer of the secure daemon. You can specify this host either as a network IP address, or a hostname. Omitting this part specifies the local host.

`port_number` specifies the port number where the secure daemon listens for TLS connections.

(This syntax is similar to the syntax connecting to remote daemons, with the addition of the prefix `ssl`.)

In place of this three-part string, you can also supply the constant [SecureDaemonAnyName](#). This form lets you register a catch-all certificate that applies to any secure daemon for which you have not explicitly registered another certificate. For example, you might use this form when several secure daemons share the same certificate.

Certificate

For important details, see CA-Signed Certificates in TIBCO Rendezvous Administration.

In place of an actual certificate, you can also supply the constant [SecureDaemonAnyCertificate](#). The program accepts any certificate from the named secure daemon. For example, you might use this form when testing a secure daemon configuration, before generating any actual certificates.

Any Name and Any Certificate

Notice that the constants [SecureDaemonAnyName](#) and [SecureDaemonAnyCertificate](#) each eliminate one of the two security checks before transmitting sensitive identification data to a secure daemon. We strongly discourage using both of these constants simultaneously, because that would eliminate all security checks, leaving the program vulnerable to unauthorized daemons.

SDContext.SetUserCertificateWithKey

Method

Visual Basic

```
Overloads Public Shared Sub SetUserCertificateWithKey(  
    ByVal userCertificateWithKey As String,  
    ByVal password As String)  
Overloads Public Shared Sub SetUserCertificateWithKey(  
    ByVal userCertificateWithKeyBinaryFormat As Byte(),  
    ByVal password As String)
```

C#

```
public static void SetUserCertificateWithKey(  
    string userCertificateWithKey,  
    string password);  
public static void SetUserCertificateWithKey(  
    byte[] userCertificateWithKeyBinaryFormat,  
    string password);
```

Purpose

Register a certificate with the private key for identification to secure daemons.

Remarks

When any program transport connects to a secure daemon, the daemon verifies the program's identity using TLS protocols.

Overload

The certificate argument can be either a string in PEM text format, or a byte array in PKCS #12 binary format.

Parameter	Description
userCertificateWithKey	Register this user certificate with the private key. The text of this certificate must be in PEM encoding.
userCertificateWithKeyBinaryFormat	Register this user certificate with the private key. The binary data of this certificate must be in PKCS #12 encoding.
password	Use this password to decrypt the private key.

**Important**

For important information about password security, see Security Factors in TIBCO Rendezvous Administration.

CA-Signed Certificate

You can also supply a certificate signed by a certificate authority (CA). To use a CA-signed certificate, you must supply not only the certificate and private key, but also the CA's public certificate (or a chain of such certificates). Concatenate these items in one string or binary data object. For important details, see CA-Signed Certificates in TIBCO Rendezvous Administration.

Exceptions

An exception that reports status [InvalidFile](#) can indicate either disk I/O failure, or invalid certificate data, or an incorrect password.

See Also

www.rsasecurity.com/rsalabs/pkcs

SDContext.SetUserNameWithPassword

Method

Visual Basic

```
Public Shared Sub SetUserNameWithPassword(  
    ByVal userName As String,  
    ByVal password As String)
```

C#

```
public static void SetUserNameWithPassword(  
    string userName,  
    string password);
```

Purpose

Register a username with password for identification to secure daemons.

Remarks

When any program transport connects to a secure daemon, the daemon verifies the program's identity using TLS protocols.

Parameter	Description
userName	Register this username for communicating with secure daemons.
password	Register this password for communicating with secure daemons.



Important

For important information about password security, see Security Factors in TIBCO Rendezvous Administration.

TimeoutValue

Class

Superclasses

```
System.Object
    TimeoutValue
```

Visual Basic

```
NotInheritable Public Class TimeoutValue
```

C#

```
public sealed class TimeoutValue
```

Description

Defines constants for special timeout values.

Remarks

Programs can supply these special numeric values as timeout arguments to methods such as [IDisposable.TimedDispatch](#) and [VCTransport.WaitForVCConnection](#).

Member	Description
Public Static Fields	
TimeoutValue.NoWait	double

Member	Description
	This value (zero) instructs methods to timeout immediately.
TimeoutValue.WaitForever	double This value (-1) instructs methods to wait indefinitely, instead of returning after a finite time limit.

See Also

[IDisposable.TimedDispatch](#)

[VCTransport.WaitForVCConnection](#)

Data

This section describes messages and the data they contain.

See Also

[Strings and Character Encodings](#)

Field Names and Field Identifiers

In Rendezvous 5 and earlier releases, programs would specify fields within a message using a field name. In Rendezvous 6 and later releases, programs can specify fields in two ways:

- A *field name* is a character string. Each field can have at most one name. Several fields can have the same name.
- A *field identifier* is a 16-bit unsigned integer (unsigned short), which must be unique within the message. That is, two fields in the same message cannot have the same identifier. However, a nested submessage is considered a separate identifier space from its enclosing parent message and any sibling submessages.

Message methods specify fields using a combination of a field name and a unique field identifier. When absent, the default field identifier is zero.

To compare the speed and space characteristics of these two options, see [Search Characteristics](#).

Rules and Restrictions

Null is a legal field name *only* when the identifier is zero. It is *illegal* for a field to have *both* a non-zero identifier *and* a null field name.

Note that in .NET, null is *not* the same as "" (the empty string). It is legal for a field to have a non-zero identifier and the empty string as its field name. However, we generally recommend *against* using the empty string as a field name.

Adding a New Field

When a program adds a new field to a message, it can attach a field name, a field identifier, or both. If the program supplies an identifier, Rendezvous software checks that it is unique within the message; if the identifier is already in use, the operation fails with the status code [IDInUse](#).

Search Characteristics

In general, an identifier search completes in constant time. In contrast, a name search completes in linear time proportional to the number of fields in the message. Name search

is quite fast for messages with 16 fields or fewer; for messages with more than 16 fields, identifier search is faster.

Space Characteristics

The smallest field name is a one-character string, which occupies three bytes in Rendezvous wire format. That one ASCII character yields a name space of 127 possible field names; a larger range requires additional characters.

Field identifiers are 16 bits, which also occupy three bytes in Rendezvous wire format. However, those 16 bits yield a space of 65535 possible field identifiers; that range is fixed, and cannot be extended.

Finding a Field Instance

When a message contains several field instances with the same field name, these methods find a specific instance by name and number (they do not use field identifiers):

- [Message.RemoveFieldInstance](#).
- [Message.GetFieldInstance](#).

IPPort

Class

Superclasses

```
System.Object  
    IPPort
```

Visual Basic

```
Public Class IPPort
```

C#

```
public class IPPort
```

Purpose

Represent an IP port number.

Remarks

In general, an IP Port number is an unsigned 16-bit integer [0;65535], in network byte order.

Member	Description
--------	-------------

Public Instance Properties

Member	Description	
Value	ushort	Get
	The IP port number that this object represents.	Set

Method	Description	Page
IPPort	Create an IP port object.	IPPort

See Also

[Message.GetField](#)

IPPort

Constructor

Visual Basic

```
Public Sub New()
```

C#

```
public IPPort();
```

Purpose

Create an IP port object.

Message

Class

Superclasses

```
System.Object  
    Message
```

Visual Basic

```
Public Class Message
```

C#

```
public class Message
```

Purpose

Represent Rendezvous messages.

Remarks

This class has no `destroy()` method. Instead, the garbage collector reclaims storage automatically. Nonetheless it is possible to explicitly manage native message storage; see [Message.Dispose\(\)](#).

Method	Description	Page
--------	-------------	------

Message Life Cycle and Properties

Method	Description	Page
Message	Create a message object.	Message
Message.Dispose()	Release native storage associated with the message.	Message.Dispose()
Fields		
Message.AddField	Add a field to a message.	Message.AddField
Message.AddStringAsXml	Add a string to a message as the value of an XML field (without parsing it to verify that it specifies a well-formed XML document).	Message.AddStringAsXml
Message.Expand	Enlarge a message by allocating additional storage.	Message.Expand
Message.GetField	Get a specified field from a message.	Message.GetField
Message.GetFieldByIndex	Get a field	Message.GetFieldByIndex

Method	Description	Page
	from a message by an index.	
Message.GetFieldInstance	Get a specific instance of a field from a message.	Message.GetFieldInstance
Message.GetXmlAsString Message.GetXmlAsStringByIndex()	Get an XML field from a message, and return its value as a string (without parsing to verify that it specifies a well-formed XML document).	Message.GetXmlAsString
Message.RemoveField	Remove a field from a message.	Message.RemoveField
Message.RemoveFieldInstance	Remove a specified instance of a field from a message.	Message.RemoveFieldInstance
Message.Reset	Clear a message, preparing it for re-use.	Message.Reset

Method	Description	Page
Message.ToByteArray	Extract the data from a message as a byte sequence.	Message.ToByteArray
Message.UpdateField	Update a field within a message.	Message.UpdateField

Message Dispatched

Message.GetSource	Extract the source associated with a (dispatched) message object.	Message.GetSource
-----------------------------------	---	-----------------------------------

Custom Datatypes (Static Method)

Message.RegisterCustomDataType	Register a custom datatype for automatic encoding and decoding.	Message.RegisterCustomDataType
--	---	--

Member	Description
--------	-------------

Public Instance Properties

FieldCount	uint	Get
	The number of fields in the message.	
	This count includes only the	

Member	Description	
	immediate fields of the message; it does not include fields within recursive submessages.	
FieldCountAsInt	int	Get
	Identical to FieldCount , except its type is int. (for loops in Visual Basic .NET require int parameters.)	
ReplySubject	string	Get
	The reply subject of the message.	Set
	For more information, see Subjects .	
SendSubject	string	Get
	The destination subject of the message.	Set
	When this property is null, the message is unsendable.	
	For more information, see Subjects .	
Size	uint	Get
	The size of the message (in bytes).	

Public Static Fields

MinimumCustomDataTypeID MaximumCustomDataTypeID	byte	
	Type designators of custom datatypes must be in the inclusive range defined by these two constants—that is:	

Member	Description
	<code>[MinimumCustomDataTypeIDMaximumCustomDataTypeID, MinimumCustomDataTypeIDMaximumCustomDataTypeID]</code>

Subjects

Rendezvous routing daemons modify message subjects and reply subjects to enable transparent point-to-point communication across network boundaries. This modification does not apply to subject names stored in within message data fields; we discourage storing point-to-point subject names in data fields.

Subjects and reply subjects are parts of a message's address information—they are *not* part of the message itself; see also Supplementary Information for Messages in TIBCO Rendezvous Concepts.

See Also

[Strings and Character Encodings](#)

[MessageField](#)

Message

Constructor

Visual Basic

```
Overloads Public Sub New()  
Overloads Public Sub New(  
    ByVal initialSize As UInt32)  
Overloads Public Sub New(  
    ByVal bytes As Byte() )  
Overloads Public Sub New(  
    ByVal message As Message)
```

C#

```
public Message();  
public Message(uint initialSize);  
public Message(byte[] bytes);  
public Message(Message message);
```

Purpose

Create a message object.

Remarks

The constructor without an argument allocates 512 bytes of unmanaged storage and initializes it as a new message.

None of these constructors place address information on the new message object.

This class has no `destroy()` method. Instead, the garbage collector reclaims storage automatically.

Parameter	Description
initialSize	Allocate unmanaged storage of this size (in bytes) for the new message.
bytes	<p>Fill the new message with data from this byte array.</p> <p>For example, programs can create such byte arrays from messages using the method Message.ToByteArray, and store them in files; after reading them from such files, programs can reconstruct a message from its byte array.</p>
message	Create an independent copy of this message. Field values are also independent copies.

See Also

[Message.ToByteArray](#)

Message.AddField

Method

Visual Basic

```
Overloads Public Sub AddField(  
    ByVal messageField As MessageField)  
Overloads Public Sub AddField(  
    ByVal fieldName As String,  
    ByVal fieldValue As value_type)  
Overloads Public Sub AddField(  
    ByVal messageField As MessageField,  
    ByVal fieldValue As value_type,  
    ByVal fieldId As UInt16)
```

C#

```
public void AddField(MessageField messageField);  
public void AddField(  
    string fieldName,  
    value_type fieldValue);  
public void AddField(  
    string fieldName,  
    value_type fieldValue,  
    ushort fieldId);
```

Purpose

Add a field to a message.

Overloading

This method has many overloads. [Message.add Overloads by Category](#) classifies them into three main categories (based on the number of parameters). [Message.add Homologous Types](#) documents the automatic conversion from types in Visual Basic and C# to homologous types within the resulting field in Rendezvous wire format.

Message.add Overloads by Category

Signature	Description
<code>messageField</code>	The parameter is a message field object, which fully specifies the field—including its name, type, value, and field identifier; see MessageField .
<code>fieldName,</code> <code>fieldValue</code>	<p>Overloads with two parameters add fields without identifiers.</p> <p>The first parameter specifies the name of the new field. Fields without identifiers must have non-null names.</p> <p>The second parameter specifies both the type of the field and its data; see also Message.add Homologous Types.</p>
<code>fieldName,</code> <code>fieldValue,</code> <code>fieldId</code>	<p>Overloads with three parameters add fields with identifiers.</p> <p>The first parameter specifies the name of the new field. A field with an identifier may have a null name.</p> <p>The second parameter specifies both the type of the field and its data; see also Message.add Homologous Types.</p> <p>The third parameter specifies the field identifier. All field identifiers must be unique within each message. Integers in the range [1, 65535] are valid arguments for this parameter.</p>

Message.add Homologous Types

Visual Basic Value Type	C# Value Type	Rendezvous Wire Format Type
Message	Message	TIBRVMSG_MSG
Date	DateTime	TIBRVMSG_DATETIME
Opaque	Opaque	TIBRVMSG_OPAQUE
String	string	TIBRVMSG_STRING
XmlDocument	XmlDocument	TIBRVMSG_XML

Visual Basic Value Type	C# Value Type	Rendezvous Wire Format Type
Scalar Types		
Boolean	bool	TIBRVMSG_BOOL
SByte	sbyte	TIBRVMSG_I8
Byte	byte	TIBRVMSG_U8
Short	short	TIBRVMSG_I16
UInt16	ushort	TIBRVMSG_U16
Integer	int	TIBRVMSG_I32
UInt32	uint	TIBRVMSG_U32
Long	long	TIBRVMSG_I64
UInt64	ulong	TIBRVMSG_U64
Single	float	TIBRVMSG_F32
Double	double	TIBRVMSG_F64
IPPort	IPPort	TIBRVMSG_IPPORT16
IPAddress	IPAddress	TIBRVMSG_IPADDR32

Array Types

The add method copies the array into the field.

SByte()	sbyte	TIBRVMSG_I8ARRAY
Byte()	byte[]	TIBRVMSG_U8ARRAY
Short()	short[]	TIBRVMSG_I16ARRAY

Visual Basic Value Type	C# Value Type	Rendezvous Wire Format Type
UInt16()	ushort[]	TIBRVMSG_U16ARRAY
Integer()	int[]	TIBRVMSG_I32ARRAY
UInt32()	uint[]	TIBRVMSG_U32ARRAY
Long()	long[]	TIBRVMSG_I64ARRAY
UInt64()	ulong[]	TIBRVMSG_U64ARRAY
Single()	float[]	TIBRVMSG_F32ARRAY
Double()	double[]	TIBRVMSG_F64ARRAY
Message()	Message[]	TIBRVMSG_MESSAGEARRAY
String()	String[]	TIBRVMSG_STRINGARRAY

Field Name Length

The the longest possible field name is 127 bytes.

Nested Message

When the `fieldValue` argument (that is, the second parameter) is a message object, this method adds only the data portion of the nested message; it does not include any address information or certified delivery information.

Date & Time Representations

Rendezvous software represents time values in two ways—one within programs, and a more compact wire format within messages. In both representations, zero denotes the epoch, 12:00 midnight, January 1st, 1970.

Rendezvous wire format represents time as a two-part value—seconds as a 40-bit signed integer, plus microseconds as a 24-bit unsigned integer. This representation yields the effective range detailed in [Date and Time Ranges in Rendezvous Wire Format](#). Range limits

denote the extreme value on either side of zero (the epoch). Bold type indicates the primary unit of measurement.

Date and Time Ranges in Rendezvous Wire Format

range in years	17,432
range in seconds	549,755,813,887
range in milliseconds	549,755,813,887,000

See Also

[Message.AddStringAsXml](#)

Message.AddStringAsXml

Method

Visual Basic

```
Overloads Public Sub AddStringAsXml(  
    ByVal fieldName As String,  
    ByVal fieldValue As String)  
Overloads Public Sub AddStringAsXml(  
    ByVal messageField As MessageField,  
    ByVal fieldValue As String,  
    ByVal fieldId As UInt16)
```

C#

```
public void AddStringAsXml(  
    string fieldName,  
    string fieldValue);  
public void AddStringAsXml(  
    string fieldName,  
    string fieldValue,  
    ushort fieldId);
```

Purpose

Add a string to a message as the value of an XML field (without parsing it to verify that it specifies a well-formed XML document).

Remarks

When creating an [XmlDocument](#) object, .NET parses the data to verify that it specifies well-formed XML. Because such parsing is occasionally inappropriate, this method lets you add XML string data directly into an XML field, compressing its data, without incurring the overhead of parsing the XML string.

Overloading

This method has two overloads. [Message.AddStringAsXml Overloads](#) describes their behavior.

Message.AddStringAsXml Overloads

Signature	Description
<code>fieldName, fieldValue</code>	<p>The overload with two parameters adds a field without an identifier.</p> <p>The first parameter specifies the name of the new field. Fields without identifiers must have non-null names.</p> <p>The second parameter specifies the data.</p>
<code>fieldName, fieldValue, fieldId</code>	<p>The overload with three parameters adds a field with an identifier.</p> <p>The first parameter specifies the name of the new field. A field with an identifier may have a null name.</p> <p>The second parameter specifies the data.</p> <p>The third parameter specifies the field identifier. All field identifiers must be unique within each message. Integers in the range [1, 65535] are valid arguments for this parameter.</p>

See Also

[Message.GetXmlAsString](#)

Message.Dispose()

Method

Declaration

```
void Dispose()
```

Purpose

Release native storage associated with the message.

Remarks

Messages occupy storage outside of the .NET environment (that is, in the native C environment) and also within the .NET environment. When the .NET garbage collector recycles the .NET message object, this action triggers release of the corresponding native storage as well.

However, the timing of garbage collection is unpredictable, delaying the release of native storage as well. In applications where efficient management of native storage is a critical performance factor, you can use this method to explicitly free the native storage.

Call this `Dispose` method at the end of a message callback method to immediately free the native storage associated with the message. The .NET message object is independent of the native storage (and independent of this method), and it remains intact until the .NET garbage collector recycles it in the usual way.

Attempting to access the message after calling this method results in an exception.

Message.Expand

Method

Visual Basic

```
Public Sub Expand(  
    ByVal additionalStorage As UInt32)
```

C#

```
public void Expand(  
    uint additionalStorage);
```

Purpose

Enlarge a message by allocating additional storage.

Remarks

.NET programs store messages in unmanaged objects. When adding data to a message would overflow the allocated space, the message automatically expands by allocating additional storage. However, reallocation (whether explicit or automatic) is a slow operation; to optimize program performance, we recommend allocating sufficient storage initially, so that reallocation is not required.

If no space is available, this method throws an exception with the error code [NoMemory](#).

Parameter	Description
additionalStorage	Enlarge the message by this amount (in bytes) to allocate for the message. If the message was <i>oldSize</i> bytes before this call, it is <i>oldSize</i> + <i>additionalStorage</i> when the method returns.

Message.GetField

Method

Visual Basic

```
Overloads Public Function GetField(  
    ByVal fieldName As String)  
Overloads Public Function GetField(  
    ByVal messageField As MessageField,  
    ByVal fieldId As UInt16)
```

C#

```
public MessageField GetField(  
    string fieldName);  
public MessageField GetField(  
    string fieldName,  
    ushort fieldId);
```

Purpose

Get a specified field from a message.

Remarks

Programs specify the field to retrieve using the `fieldName` and `fieldId` parameters.

The method takes a snapshot of the field, and returns that information as a [MessageField](#) object. To obtain the value of the field, programs can either extract the [Value](#) property from the [MessageField](#) object explicitly, or implicitly extract its [Value](#) by assigning the object to a variable; see [Implicit Conversions](#).

Programs can use a related method to loop through all the fields of a message; to retrieve each field by its integer index number, see [Message.GetFieldByIndex](#).

Parameter	Description
fieldName	Get a field with this name.
fieldId	Get the field with this identifier. The constant <code>MessageField.NoSpecificId</code> (zero) is a special value; it indicates the absence of any identifier to the field search algorithm.

Field Search Algorithm

This method, and related methods that *get* message fields, all use this algorithm to find a field within a message, as specified by a field identifier and a field name.

Procedure

1. If the program supplied `MessageField.NoSpecificId` (zero) as the identifier, or omitted any identifier, then begin at step 3.
If the program supplied a *non-zero* field identifier, then search for the field with that identifier.
If the search succeeds, return the field.
On failure, continue to step 2.
2. If the identifier search (in step 1) fails, and the program supplied a non-null field name, then search for a field with that name.
If the name search succeeds, and the identifier in the field is null, return the field.
If the name search succeeds, but the actual identifier in the field is non-null (so it does not match the identifier supplied) then throw an exception with the status code `IDConflict`.
On failure, or if the program supplied null as the field name, return null.
3. When the program supplied `MessageField.NoSpecificId` (zero) as the identifier, or omitted any identifier, then begin here.
Search for a field with the specified name—even if that name is null.
If the search succeeds, return the field.
On failure, return null.

If a message contains several fields with the same name, searching by name finds the first instance of the field with that name.

Extracting Fields from a Nested Message

Earlier releases of Rendezvous software allowed programs to get fields from a nested submessage by concatenating field names. Starting with release 6, Rendezvous software no longer supports this special case convenience. Instead, programs must separately extract the nested submessage using [Message.GetField](#) (or a related method), and then get the desired fields from the submessage.

Method Forms

With only a field name, find the field by name. If the field name is not present in the message, return null. If several fields with that name are present in the message, this method returns the first one that it finds.

With only a field identifier, find the field with that identifier (since identifiers are unique, the message can contain at most one such field). If the identifier is not present in the message, return null.

With both a field name and a field identifier, search first by identifier, and then by field name. If neither are present in the message, return null. If identifier search succeeds, return the field value. If the name search succeeds, but the actual identifier in the field is non-zero (so it does not match the identifier supplied) then throw a [RendezvousException](#) with status code [IDConflict](#).

Message.GetFieldByIndex

Method

Visual Basic

```
Public Function GetFieldByIndex(  
    ByVal fieldIndex As UInt32  
) As MessageField
```

C#

```
public MessageField GetFieldByIndex(  
    uint fieldIndex)
```

Purpose

Get a field from a message by an index.

Remarks

Programs can loop through all the fields of a message, to retrieve each field in turn using an integer index.

The method takes a snapshot of the field, and returns that information as a [MessageField](#) object. To obtain the value of the field, programs can either extract the [Value](#) property from the [MessageField](#) object explicitly, or implicitly extract its [Value](#) by assigning the object to a variable; see [Implicit Conversions](#).

Add, *remove* and *update* calls can perturb the order of fields (which, in turn, affects the results when a program gets a field by index).

Parameter	Description
fieldIndex	Get the field with this index. Zero specifies the first field.

Message.GetFieldInstance

Method

Visual Basic

```
Public Function GetFieldInstance(  
    ByVal fieldName As String,  
    ByVal instanceNumber As UInt32  
) As MessageField
```

C#

```
public MessageField GetFieldInstance(  
    string    fieldName,  
    uint      instanceNumber)
```

Purpose

Get a specific instance of a field from a message.

Remarks

When a message contains several field instances with the same field name, retrieve a specific instance by number (for example, get the i^{th} field named foo). Programs can use this method in a loop that examines every field with a specified name.

The argument 1 denotes the first instance of the named field.

The method takes a snapshot of the field, and returns that information as a [MessageField](#) object. To obtain the value of the field, programs can either extract the [Value](#) property from the [MessageField](#) object explicitly, or implicitly extract its [Value](#) by assigning the object to a variable; see [Implicit Conversions](#).

When the instance argument is greater than the actual number of instances of the field in the message, this method throws an exception.

Release 5 Interaction

Rendezvous 5 (and earlier) did not support array datatypes. Some older programs circumvented this limitation by using several fields with the same name to simulate arrays. This work-around is no longer necessary, since release 6 (and later) supports array datatypes within message fields. The method [Message.GetFieldInstance](#) ensures backward compatibility, so new programs can still receive and manipulate messages sent from older programs. Nonetheless, we encourage programmers to use array types as appropriate, and we discourage storing several fields with the same name in a message.

Parameter	Description
<code>fieldName</code>	Get an instance of the field with this name. Null specifies the empty string as the field name.
<code>instanceNumber</code>	Get this instance of the specified field name. The argument 1 denotes the first instance of the named field.

See Also

[MessageField](#)

Message.GetXmlAsString

Method

Visual Basic

```
Overloads Public Function GetXmlAsString(  
    ByVal fieldName As String)  
Overloads Public Function GetXmlAsString(  
    ByVal fieldName As String,  
    ByVal fieldId As UInt16)  
Public Function GetXmlAsStringByIndex(  
    ByVal fieldIndex As UInt32  
) As String
```

C#

```
public String GetXmlAsString(  
    string fieldName);  
public String GetXmlAsString(  
    string fieldName,  
    ushort fieldId);  
public String GetXmlAsStringByIndex(  
    uint fieldIndex)
```

Purpose

Get an XML field from a message, and return its value as a string (without parsing to verify that it specifies a well-formed XML document).

Remarks

When [Message.GetField](#) gets the value of an XML field, it creates an [XmlDocument](#) data object; in the process, .NET parses the data to verify that it specifies well-formed XML. Because such parsing is occasionally inappropriate, this method gets an XML field, uncompresses its data, and returns it as a string—without parsing it.

The semantics of finding a field within a message are identical to the method [Message.GetField](#); for a complete description, see [Field Search Algorithm](#).

fieldName	Get a field with this name.
fieldId	Get the field with this identifier. The constant <code>MessageField.NoSpecificId</code> (zero) is a special value; it indicates the absence of any identifier to the field search algorithm.
fieldIndex	Get the field with this index. Zero specifies the first field. See also Message.GetFieldByIndex .

See Also

[Message.AddStringAsXml](#)

Message.GetSource

Method

Visual Basic

```
Public Function GetSource() As Object
```

C#

```
public object GetSource();
```

Purpose

Extract the source associated with a (dispatched) message object.

Remarks

Dispatch associates the message with either a [Listener](#) or a [VectorListener](#). This method returns that source.

This call is valid only for an inbound message that has already been dispatched. If the message is not associated with a listener or a vector listener, then this method returns null.

Message.RegisterCustomDataType

Method

Visual Basic

```
Public Shared Sub RegisterCustomDataType(  
    ByVal type As Type,  
    ByVal customDataAdapter As ICustomDataAdapter)
```

C#

```
public static void RegisterCustomDataType(  
    Type type,  
    ICustomDataAdapter customDataAdapter);
```

Purpose

Register a custom datatype for automatic encoding and decoding.

Parameter	Description
type	Register this .NET type (that is, a class defined in your program) as a Rendezvous custom datatype.
customDataAdapter	Register this adapter class (defined in your program) to encode and decode instances of the custom datatype.

See Also

[ICustomDataType](#)

[ICustomDataAdapter](#)

Message.RemoveField

Method

Visual Basic

```
Overloads Public Sub RemoveField(  
    ByVal messageField As MessageField)  
Overloads Public Sub RemoveField(  
    ByVal fieldName As String)  
Overloads Public Sub RemoveField(  
    ByVal fieldName As String,  
    ByVal fieldId As UInt16)
```

C#

```
public void RemoveField(  
    MessageField messageField );  
public void RemoveField(  
    string fieldName );  
public void RemoveField(  
    string fieldName,  
    ushort fieldId );
```

Purpose

Remove a field from a message.

Parameter	Description
messageField	The parameter is a message field object, which specifies either the field name, the field identifier, or both; see MessageField .
fieldName	Remove the field with this name.

Parameter	Description
fieldId	Remove the field with this identifier. <code>MessageField.NoSpecificId</code> (zero) is a special value that signifies no identifier.

Field Search Algorithm

This method uses this algorithm to find and remove a field within a message, as specified by a field identifier and a field name.

Procedure

1. If the program supplied `MessageField.NoSpecificId` (zero) as the identifier, or omitted any identifier, then begin at step 3.
If the program supplied a *non-zero* field identifier, then search for the field with that identifier. If the search succeeds, remove the field and return.
On the search does not find a field, continue to step 2.
2. If the identifier search (in step 1) fails, and the program supplied a non-null field name, then search for a field with that name.
On the search does not find a field, or if the program supplied null as the field name, throw an exception with the status code `NotFound`.
If the name search succeeds, but the actual identifier in the field is non-zero (so it does not match the identifier supplied) then throw an exception with the status code `IDConflict`.
If the search succeeds, remove the field and return.
3. When the program supplied `MessageField.NoSpecificId` (zero) as the identifier, or omitted any identifier, then begin here.
Search for a field with the specified name—even if that name is null.
If the search succeeds, remove the field and return.
If the search does not find a field, throw an exception with the status code `NotFound`.

If a message contains several fields with the same name, searching by name removes the first instance of the field with that name.

Message.RemoveFieldInstance

Method

Visual Basic

```
Public Sub RemoveFieldInstance(  
    ByVal fieldName As String,  
    ByVal instanceNumber As UInt32)
```

C#

```
public void RemoveFieldInstance(  
    string  fieldName,  
    uint    instanceNumber)
```

Purpose

Remove a specified instance of a field from a message.

Remarks

When a message contains several field instances with the same field name, remove a specific instance by number (for example, remove the i^{th} field named foo). Programs can use this method in a loop that examines every field with a specified name.

The argument 1 denotes the first instance of the named field.

If the specified instance does not exist, the method throws an exception with the status code [NotFound](#).

Parameter	Description
fieldName	Remove the field with this name.
instance	Remove this instance of the field. The argument 1 specifies the first instance of the named field.

Message.Reset

Method

Visual Basic

```
Public Sub Reset()
```

C#

```
public void Reset();
```

Purpose

Clear a message, preparing it for re-use.

Remarks

This method is the equivalent of creating a new message—except that the unmanaged storage is re-used.

When this method returns, the message has no fields; it is like a newly created message. The message's address information is also reset.

Message.ToArray

Method

Visual Basic

```
Public Function ToByteArray(  
    ) As Byte()
```

C#

```
public byte[] ToByteArray()
```

Purpose

Extract the data from a message as a byte sequence.

Remarks

This method returns a copy of the message data as a byte sequence, suitable for archiving in a file. To reconstruct the message from bytes, see [Message](#).

The byte data includes the message header and all message fields in Rendezvous wire format. It does not include address information, such as the subject and reply subject, nor certified delivery information.

The byte sequence can contain interior null bytes.

See Also

[Message](#)

Message.UpdateField

Method

Visual Basic

```
Overloads Public Sub UpdateField(  
    ByVal messageField As MessageField)  
Overloads Public Sub UpdateField(  
    ByVal fieldName As String,  
    ByVal fieldValue As value_type)  
Overloads Public Sub UpdateField(  
    ByVal messageField As MessageField,  
    ByVal fieldValue As value_type,  
    ByVal fieldId As UInt16)
```

C#

```
public void UpdateField(MessageField messageField);  
public void UpdateField(  
    string fieldName,  
    value_type fieldValue);  
public void UpdateField(  
    string fieldName,  
    value_type fieldValue,  
    ushort fieldId);
```

Purpose

Update a field within a message.

Remarks

This method copies the new data into the message field.

This method locates a field within the message by matching the `fieldName` and `fieldId` arguments. Then it updates the message field using the `fieldValue` argument. (Notice that only the value of the message field can change.)

If no existing field matches the specifications in the `fieldName` and `fieldId` arguments, then this method adds a new field to the message.

The type of the existing message field and the *value_type* of the updating `fieldValue` argument must be identical; otherwise, the method throws an exception with the error status code [InvalidType](#). However, when updating array or vector fields, the count (number of elements) can change.

Parameter	Description
<code>fieldName</code>	Update a field with this name. When absent, locate the field by identifier only.
<code>fieldValue</code>	Update a field using this data value. It is illegal to add or update a field with null data. To remove a field, use Message.RemoveField .
<code>fieldId</code>	Update a field with this identifier. All field identifiers must be unique within each message. Zero is a special value, indicating no identifier. It is illegal to add a field that has both a null field name, and a non-zero field identifier.

Field Search Algorithm

The method uses this algorithm to find and update a field within a message, as specified by a field identifier and a field name.

Procedure

1. If the program supplied `MessageField.NoSpecificId` (zero) as the identifier, or omitted any identifier, then begin at step 3.

If the program supplied a *non-zero* field identifier, then search for the field with that identifier.

If the search succeeds, then update that field.

On failure, continue to step 2.

2. If the identifier search (in step 1) fails, and the program supplied a non-null field name, then search for a field with that name.

If the search succeeds, then update that field.

If the name search succeeds, but the actual identifier in the field is non-null (so it does not match the identifier supplied) then throw an exception with the status code `IDConflict`.

If the search fails, *add* the field as specified (with name and identifier).

However, if the program supplied null as the field name, then do not search for the field name; instead, throw an exception with the status code `NotFound`.

3. When the program supplied `MessageField.NoSpecificId` (zero) as the identifier, or omitted any identifier, then begin here.

Search for a field with the specified name—even if that name is null.

If the search fails, *add* the field as specified (with name and identifier).

If a message contains several fields with the same name, searching by name finds the first instance of the field with that name.

Nested Message

When the new value is a message object, this method uses only the data portion of the nested message (`fieldValue`); it does not include any address information or certified delivery information.

MessageField

Class

Superclasses

System.Object
MessageField

Visual Basic

Public Class MessageField

C#

public class MessageField

Purpose

Represent a message field.

Remarks

This class has no destroy() method. Instead, the garbage collector reclaims storage automatically.

Method	Description	Page
Constructor		
MessageField	Create a message field object.	MessageField

Member	Description
--------	-------------

Public Instance Properties

Name	string	Get
	Name of the field.	
	Field names use ISO 8859-1 (Latin-1) encoding.	
Value	Snapshot value of the field.	Get
	Datatype is implicit in the value.	
Identifier	ushort	Get
	Unique field identifier.	

Public Static Fields

NoSpecificId	ushort; zero
	Supply this constant to indicate a null <code>fieldId</code> argument.
NoSpecificIndex	long; -1
	Supply this constant to indicate a null <code>fieldIndex</code> argument.
NoSpecificInstance	uint; zero
	Supply this constant to indicate a null <code>instanceNumber</code> argument.

Implicit Conversions

This class defines implicit type conversions. When a program assigns a [MessageField](#) object to a variable of another type, the field object attempts to convert its [Value](#) property to the target type.

See Also

[Message.AddField](#)

[Message.GetField](#)

[Message.RemoveField](#)

[Message.UpdateField](#)

MessageField

Constructor

Visual Basic

```
Overloads Public Sub New(  
    ByVal fieldName As String,  
    ByVal fieldValue As value_type)  
Overloads Public Sub New(  
    ByVal messageField As MessageField,  
    ByVal fieldValue As value_type,  
    ByVal fieldId As UInt16)
```

C#

```
public MessageField(  
    string fieldName,  
    value_type fieldValue);  
public MessageField(  
    string fieldName,  
    value_type fieldValue,  
    ushort fieldId);
```

Purpose

Create a message field object.

Remarks

Overloading

This method has many overloads. [MessageField Constructor Overloads by Category](#) classifies them into two main categories (based on the number of parameters).

MessageField Constructor Overloads by Category

Signature	Description
<code>fieldName, fieldValue</code>	<p>Overloads with two parameters add fields without identifiers.</p> <p>The first parameter specifies the name of the new field. Fields without identifiers must have non-null names.</p> <p>The second parameter specifies both the type of the field and its data; see also Message.add Homologous Types.</p>
<code>fieldName, fieldValue, fieldId</code>	<p>Overloads with three parameters add fields with identifiers.</p> <p>The first parameter specifies the name of the new field. A field with an identifier may have a null name.</p> <p>The second parameter specifies both the type of the field and its data; see also Message.add Homologous Types.</p> <p>The third parameter specifies the field identifier. All field identifiers must be unique within each message. Integers in the range [1, 65535] are valid arguments for this parameter.</p>

See Also[Message.AddField](#)[Message.RemoveField](#)[Message.UpdateField](#)

Opaque

Class

Superclasses

```
System.Object  
    Opaque
```

Visual Basic

```
Public Class Opaque
```

C#

```
public class Opaque
```

Purpose

Wrap an opaque byte sequence.

Member	Description
--------	-------------

Public Instance Properties

Value	byte[]	Get
	The value of an opaque is the sequence of bytes it represents.	Set

ICustomDataType

Interface

Visual Basic

```
Public Interface ICustomDataType
```

C#

```
public interface ICustomDataType
```

Purpose

Interface for custom datatypes.

Remarks

Custom datatype classes must implement this interface. However, this interface does not define any contract. Merely declaring that your datatype class implements this interface is sufficient; for example:

```
class myDatatypeClass : ICustomDataType
{
    ...
}
```

See Also

[Message.RegisterCustomDataType](#)

[ICustomDataAdapter](#)

ICustomDataAdapter

Interface

Visual Basic

```
Public Interface ICustomDataAdapter
```

C#

```
public interface ICustomDataAdapter
```

Purpose

Interface for encoding and decoding custom datatypes.

Member	Description
--------	-------------

Public Instance Properties

TypeID	byte	Get
--------	------	-----

Each adapter class must return the type designator corresponding to the type that it encodes and decodes.

Type designators of custom datatypes must be in this inclusive range (the range constants are public static fields of [Message](#)):

```
[MinimumCustomDataTypeIDMaximumCustomDataTypeID,  
MinimumCustomDataTypeIDMaximumCustomDataTypeID]
```

Type designators must be consistent across all senders and receivers within a network environment.

Method	Description	Page
ICustomDataAdapter.Decode()	Decode a byte array to produce a custom datatype.	ICustomDataAdapter.Decode()
ICustomDataAdapter.Encode()	Encode a custom datatype instance to produce a byte array.	ICustomDataAdapter.Encode()

Remarks

Programs must implement this interface to automatically convert between custom datatypes and Rendezvous wire format.

To define a custom datatype, a program must do three steps:

Procedure

1. Define the datatype class, indicating that it implements [ICustomDataType](#).
2. Define an adapter that implements this [ICustomDataAdapter](#) interface—including the [TypeID](#) property, and Decode and Encode methods.

The encoder and decoder must implement inverse operators. That is, when the encoder encodes a .NET object as a byte array, the decoder must decode the byte array to an identical .NET object. Conversely, when the decoder decodes the byte array to a .NET object, the encoder must encode the .NET object as an identical byte array.

3. Register the pairing of datatype and adapter.

See Also

[Message.RegisterCustomDataType](#)

[ICustomDataType](#)

ICustomDataAdapter.Decode()

Method

Visual Basic

```
Function Decode(  
    ByVal bytes As Byte() )  
    As ICustomDataType
```

C#

```
ICustomDataType Decode(  
    byte[] bytes);
```

Purpose

Decode a byte array to produce a custom datatype.

Remarks

When this method successfully decodes the data, it must return the decoding as a .NET object—namely, an instance of the custom datatype. When this method cannot decode the data, it must return null.

Parameter	Description
bytes	Decode the data contained in this byte array. This argument cannot be null. However, it can be a byte array with length zero.

ICustomDataAdapter.Encode()

Method

Visual Basic

```
Function Encode(  
    ByVal customDataType As ICustomDataType) )  
    As Byte()
```

C#

```
byte[] Encode(  
    ICustomDataType customDataType);
```

Purpose

Encode a custom datatype instance to produce a byte array.

Remarks

When this method successfully encodes the data, it must return the encoding as a byte array; the byte array can have length zero. When this method fails, it must return null.

Rendezvous methods that call this encoder incorporate its byte array value directly into a [Message](#) object.

Parameter	Description
customDataType	Encode this data (that is, an instance of a custom datatype class).

Listeners

Each listener object expresses interest in a set of inbound messages. This section presents the classes, methods and delegates for receiving messages.

Listener

Class

Superclasses

```
System.Object  
    Listener
```

Visual Basic

```
Public Class Listener
```

C#

```
public class Listener
```

Purpose

Listen for inbound messages.

Remarks

Each [Listener](#) object represents your program's interest in a set of message events. When a matching message arrives, TIBCO Rendezvous places the message in the listener's queue. Dispatch removes the first message from the queue, and raises a [MessageReceived](#) event. .NET calls the event handler delegates associated with the listener to process the message.

A listener object continues listening for messages until the program destroys it. The method [Listener.Destroy](#) destroys a listener explicitly, immediately canceling interest in messages. You can also destroy a listener implicitly by deleting all references to it, but the garbage collector might introduce a delay before it destroys the object and cancels interest.

Destroying the queue or transport of an listener automatically invalidates the listener as well.

Method	Description	Page
Constructor		
Listener	Create a listener object to listen for inbound messages.	Listener
Listener.Destroy	Destroy a listener, canceling interest.	Listener.Destroy

Member	Description	
Public Instance Properties		
Queue	Queue The listener's event queue.	Get
Subject	string The listener expresses interest in this subject, and receives messages with matching destination subjects.	Get
Transport	Transport The listener receives inbound messages from this transport.	Get

Public Events

MessageReceived	MessageReceivedEventHandler An inbound message arrived.
-----------------	--

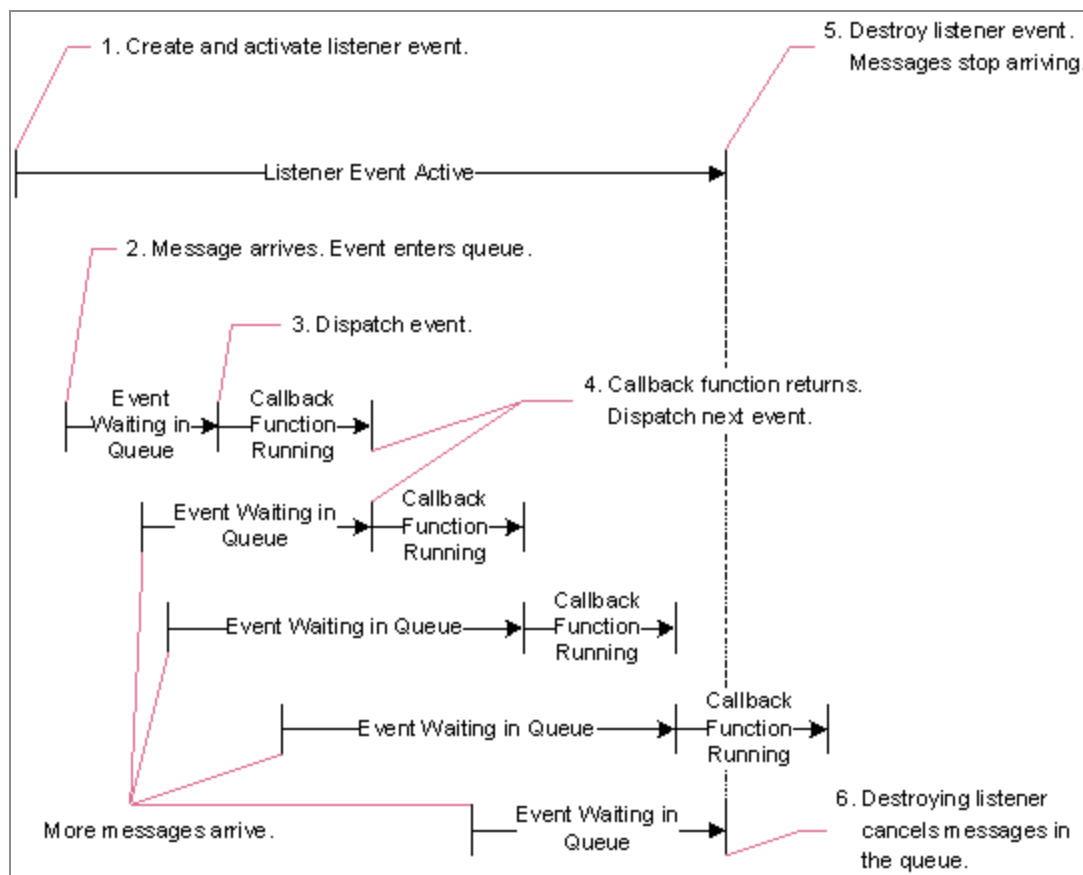
Activation and Dispatch

Inbound messages on the transport that match the subject trigger the listener; dispatch raises a [MessageReceived](#) event.

The constructor creates a listener object, and *activates* the event—that is, it begins listening for all inbound messages with matching subjects. When a message arrives, Rendezvous software places the message on the listener's event queue. Dispatch removes the message from the queue, and raises a [MessageReceived](#) event; .NET runs the handler delegates to process the message. (To stop receiving inbound messages on the subject, destroy the listener object; this action cancels all messages already queued for the listener; see also [Listener.Destroy](#).)

[Listener Activation and Dispatch](#) illustrates that messages can continue to accumulate in the queue, even while a handler delegate callback function is processing.

Figure 1: Listener Activation and Dispatch



When the callback method is I/O-bound, messages can arrive faster than the callback delegate can process them, and the queue can grow unacceptably long. In programs where a delay in processing messages is unacceptable, consider dispatching from several threads to process messages concurrently.

Descendants

[VectorListener](#)

[CMListener](#)

Listener

Constructor

Visual Basic

```
Overloads Public Sub New(  
    ByVal queue As Queue,  
    ByVal messageReceivedEventHandler As MessageReceivedEventHandler,  
    ByVal transport As Transport,  
    ByVal subject As String,  
    ByVal closure As Object )  
Overloads Public Sub New(  
    ByVal queue As Queue,  
    ByVal transport As Transport,  
    ByVal subject As String,  
    ByVal closure As Object )
```

C#

```
public Listener(  
    Queue queue,  
    MessageReceivedEventHandler messageReceivedEventHandler,  
    Transport transport,  
    string subject,  
    object closure );  
public Listener(  
    Queue queue,  
    Transport transport,  
    string subject,  
    object closure );
```

Purpose

Create a listener object to listen for inbound messages.

Remarks

For each inbound message, place the corresponding event on the queue.

Parameter	Description
queue	For each inbound message, place the corresponding event on this event queue.
messageReceivedEventHandler	On dispatch, process the event with this delegate. Every listener requires a handler delegate. For convenience, supply the delegate to the constructor through this parameter. (It also possible to omit this parameter, and add the handler to the MessageReceived event later, using a .NET call.)
transport	Listen for inbound messages on this transport.
subject	Listen for inbound messages with subjects that match this specification. Wildcard subjects are permitted. Them empty string is <i>not</i> a legal subject name.
closure	Store this closure data in the listener object.

Inbox Listener

To receive unicast (point-to-point) messages, listen to a unique inbox subject name. First call [Transport.CreateInbox](#) to create the unique inbox name; then call [Listener](#) to begin listening. Remember that other programs have no information about an inbox until the listening program uses it as a reply subject in an outbound message.

See Also

[Listener.Destroy](#)

[MessageReceivedEventHandler](#)

Listener.Destroy

Method

Visual Basic

```
Overrideable Public Sub Destroy()
```

C#

```
public virtual void Destroy();
```

Purpose

Destroy a listener, canceling interest.

Remarks

Destroying a listener cancels interest in its subject. Upon return from [Listener.Destroy](#), the destroyed listener is no longer dispatched. However, all active callback methods of this listener continue to run and return normally, even though the listener is invalid.

It is legal for an event handler delegate to destroy its own listener.

Destroying listener interest invalidates the listener object; subsequent API calls involving the invalid listener throw exceptions, unless explicitly documented to the contrary.

MessageReceivedEventArgs

Class

Superclasses

```
System.Object
EventArgs
MessageReceivedEventArgs
```

Visual Basic

```
Public Class MessageReceivedEventArgs
    Inherits EventArgs
```

C#

```
public class MessageReceivedEventArgs : EventArgs
```

Purpose

Message received events pass instances of this class to their event handlers.

Member	Description
--------	-------------

Public Instance Properties

Closure	object	Get
The closure data, which the program supplied in the call that created the listener instance.		

Member	Description	
Message	Message The inbound message that triggered the event.	Get

MessageReceivedEventHandler

Delegate

Visual Basic

```
Public Delegate Sub MessageReceivedEventHandler (
    ByVal listener As Object,
    ByVal messageReceivedEventArgs As MessageReceivedEventArgs )
```

C#

```
public delegate void MessageReceivedEventHandler (
    object listener,
    MessageReceivedEventArgs messageReceivedEventArgs );
```

Purpose

Process inbound messages (listener events).

Remarks

Implement this method to process inbound messages.

Parameter	Description
listener	This parameter receives the listener object.
messageReceivedEventArgs	This parameter receives the closure and message.

Distinguishing CM Messages

A [CMListener](#) listener can receive messages from both CM senders and ordinary senders. The callback delegate can distinguish between them using the `TypeOf` method:

- Type [CMMessage](#) is from a [CMTransport](#) sender, using the certified delivery protocol.
- Type [Message](#) is from a [NetTransport](#) sender, using the reliable protocol.

See Also

[Listener](#)

[CMListener](#)

VectorListener

Class

Superclasses

```
System.Object  
VectorListener
```

Visual Basic

```
Public Class VectorListener
```

C#

```
public class VectorListener
```

Purpose

Listen for inbound messages, and receive them in a vector.

Remarks

A vector listener object continues listening for messages until the program destroys it.

The constructor creates a hollow object; the create method makes it operational.

The destructor calls the destroy method, unless the C object is already destroyed.

Destroying the queue or transport of a vector listener automatically invalidates the vector listener as well.

Method	Description	Page
--------	-------------	------

Constructor

VectorListener	Listen for inbound messages, and receive them in a vector.	VectorListener
VectorListener.Destroy	Destroy a listener, canceling interest.	VectorListener.Destroy

Closure

VectorListener.GetClosure	Extract the closure data from a vector listener object.	VectorListener.GetClosure
---	---	---

Member	Description
--------	-------------

Public Instance Properties

Queue	Queue The listener's event queue.	Get
Subject	string The listener expresses interest in this subject, and receives messages with matching destination subjects.	Get
Transport	Transport The listener receives inbound messages from this transport.	Get

Public Events

MessagesReceived	MessagesReceivedEventHandler An inbound message vector arrived.
------------------	--

VectorListener

Constructor

Visual Basic

```
Overloads Public Sub New(  
    ByVal queue As Queue,  
    ByVal messagesReceivedEventHandler As  
        MessagesReceivedEventHandler,  
    ByVal transport As Transport,  
    ByVal subject As String,  
    ByVal closure As Object )
```

C#

```
public VectorListener(  
    Queue queue,  
    MessagesReceivedEventHandler messagesReceivedEventHandler,  
    Transport transport,  
    string subject,  
    object closure );
```

Purpose

Listen for inbound messages, and receive them in a vector.

Parameter	Description
queue	Place each inbound message on this event queue.
messagesReceivedEventHandler	On dispatch, process the message vector with this delegate. Every listener requires a handler delegate. For

Parameter	Description
	convenience, supply the delegate to the constructor through this parameter. (It also possible to omit this parameter, and add the handler to the MessagesReceived event later, using a .NET call.)
transport	Listen for inbound messages on this transport.
subject	Listen for inbound messages with subjects that match this specification. Wild card subjects are permitted. Them empty string is <i>not</i> a legal subject name.
closure	Store this closure data in the listener object.

Motivation

The standard way of receiving messages—one at a time—has the advantage of simplicity. However, if your application requires high throughput and low latency, consider receiving data messages in a vector instead. Vector listeners can boost performance for programs that receive a large number of messages by reducing the overhead associated with message dispatch. Applications that require high throughput (that is, many messages arriving rapidly) could benefit from vector listeners.



Warning

We do *not* recommend vector listeners for command messages, administrative messages, advisory messages, nor any other out-of-band purpose.

Activation and Dispatch

This method creates a vector listener object, and *activates* the listener—that is, it begins listening for all inbound messages with matching subjects. Dispatch removes a group of matching messages from the queue, and runs the handler delegates to process the message vector.

To stop receiving inbound messages on the subject, destroy the listener object; this action cancels all messages already queued for the vector listener.

Interoperability

Vector listeners and ordinary listeners can listen on the same queue.

Grouping Messages into Vectors

When several vector listeners use the same queue, the dispatcher groups messages into vectors with the following properties:

- The sequence of messages in a vector reflect consecutive arrival in the queue.
- All messages in a vector share the same callback object (though they need not match the same listener).

From these properties we can derive further inferences:

- If two vector listeners use the same callback object, then the dispatcher can group messages on their subjects into the same vector.
- If two messages are adjacent in the queue, but require different callback objects, then the dispatcher cannot group them into the same vector.

Vector Listeners: Same Callback

Two vector listeners, F and P, listen on subjects F00 and PHU, respectively. Both F and P designate the same queue, Q1, and the same callback object, C1, to process their messages. In this situation, the dispatcher for Q1 can group messages on subjects F00 and PHU into the same vector (as long as the messages constitute a contiguous sequence within Q1).

Vector Listeners: Different Callbacks

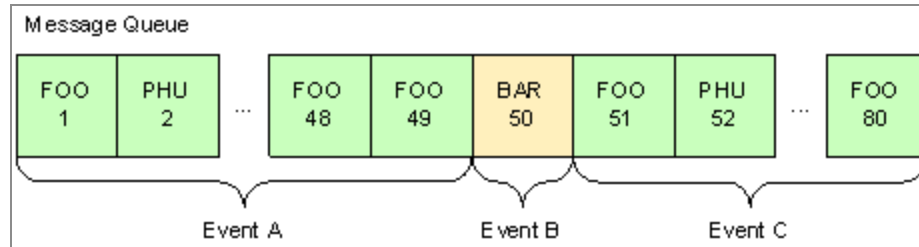
Extend the previous example by adding a third vector listener, B, which listens on subject BAR. B designates the same queue, Q1, but uses a new callback object, C2 to process its messages. In this situation, the dispatcher for Q1 must group messages on subject BAR separately from messages on subjects F00 and PHU.

Suppose the Q1 contains 49 messages with subjects F00 or PHU, then 1 message with subject BAR, then 30 more messages with subjects F00 and PHU. [Grouping Messages into Vectors](#) shows this message queue. The dispatcher produces at least three separate events.

Because messages 49 and 50 require different callbacks, the dispatcher must close the vector of F00 and PHU messages at message 49, and start a new vector for message 50 with

subject BAR. When the dispatcher encounters message 51 with subject FOO again, it closes the BAR vector after only one message, and starts a third vector for FOO.

Figure 2: Grouping Messages into Vectors



Vector Listeners: Mixing Vector and Ordinary Listeners

Altering the previous example, suppose that B is an ordinary listener, instead of a vector listener. B necessarily specifies a different callback object than F and P (because ordinary listeners and vector listeners require different callback types with different signatures).

The behavior of the dispatcher remains the same as in [Vector Listeners: Different Callbacks](#).

Dispatch Order vs. Processing Order

Messages dispatch in the order that they arrive in the queue. However, the order in which callbacks process messages can differ from dispatch order. The following examples illustrate this possibility by contrasting three scenarios.

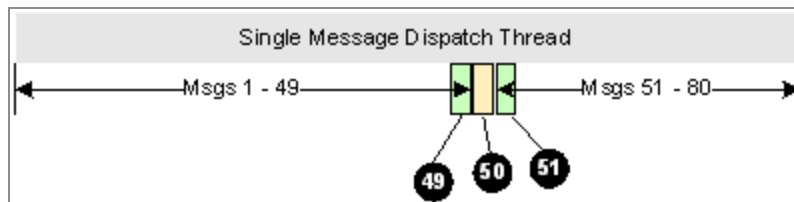
Vector Listeners: Deliberately Processing Out of Order

The simplest callback (from the programmer's perspective) processes the messages within a vector in order (that is, the order that dispatcher moves them from the queue into the vector, which mirrors the order in which the messages arrive in the queue). Nonetheless you could program a callback that processes messages in reverse order, or any other order (though one would need a convincing reason to do so).

Vector Listeners: Processing Message Vectors in a Single Dispatcher Thread

[Vector Listener Callbacks in a Single Dispatch Thread](#) shows a closer look at the situation of [Vector Listeners: Different Callbacks](#), in which several vector listeners all designate Q1 for their events. If a single thread dispatches Q1, then the callbacks are guaranteed to run in sequence. If the callbacks process messages in the order that they appear within the vectors, then message processing order is identical to dispatch order, which is also identical to arrival order. [Vector Listener Callbacks in a Single Dispatch Thread](#) shows this effect.

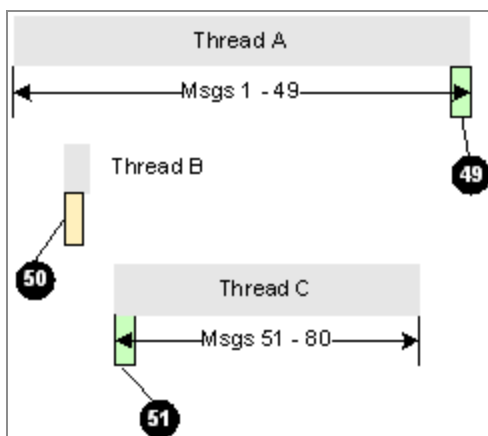
Figure 3: Vector Listener Callbacks in a Single Dispatch Thread



Vector Listeners: Processing Message Vectors in Separate Threads

However, if several threads dispatch Q1 in parallel, then the callbacks can run concurrently. In this situation, message processing order could differ dramatically from arrival order. [Vector Listener Callbacks in Multiple Dispatch Threads](#) shows this possibility.

Figure 4: Vector Listener Callbacks in Multiple Dispatch Threads



Although message number 49 dispatches (in event A) before message 50 (in event B), it is possible for the BAR callback (in thread B) to process message 50 before the F00 callback

(in thread A) processes message 49. Furthermore, it is even possible for the Foo callback (in thread C) to process message 51 before the Foo callback (in thread A) processes message 49.

**Note**

Before developing a program that processes inbound message vectors in several threads, consider carefully whether it is important (in the context of your application's semantics) to process messages in order of arrival.

See Also

[VectorListener.Destroy](#)

[MessagesReceivedEventHandler](#)

VectorListener.Destroy

Method

Visual Basic

```
Overrideable Public Sub Destroy()
```

C#

```
public virtual void Destroy();
```

Purpose

Destroy a listener, canceling interest.

Remarks

Destroying a vector listener cancels interest in its subject. Upon return from [VectorListener.Destroy](#), the destroyed listener is no longer dispatched. However, all active event handlers of this listener continue to run and return normally, even though the listener is invalid.

It is legal for an event handler to destroy its own listener.

Destroying listener interest invalidates the listener object; subsequent API calls involving the invalid listener throw exceptions, unless explicitly documented to the contrary.

VectorListener.GetClosure

Method

Visual Basic

```
Public Function GetClosure() As Object
```

C#

```
public object GetClosure();
```

Purpose

Extract the closure data from a vector listener object.

MessagesReceivedEventArgs

Class

Superclasses

```
System.Object
  EventArgs
    MessagesReceivedEventArgs
```

Visual Basic

```
Public Class MessagesReceivedEventArgs
  Inherits EventArgs
```

C#

```
public class MessagesReceivedEventArgs : EventArgs
```

Purpose

Message vector received events pass instances of this class to their event handlers.

Member	Description
--------	-------------

Public Instance Properties

Messages	Message []	Get
	The inbound messages (in an array) that triggered the event.	

MessagesReceivedEventHandler

Delegate

Visual Basic

```
Public Delegate Sub MessagesReceivedEventHandler (
    ByVal messagesReceivedEventArgs As MessagesReceivedEventArgs )
```

C#

```
public delegate void MessagesReceivedEventHandler (
    MessagesReceivedEventArgs messagesReceivedEventArgs );
```

Purpose

Process inbound message vectors (vector listener events).

Remarks

Implement this method to process inbound message vectors.

Parameter	Description
messageReceivedEventArgs	This parameter receives the message vector.

See Also

[VectorListener](#)

[VectorListener](#)

Event Queues

.NET programs can express interest in several types of events—such as inbound messages, and fault tolerance events. When a message arrives, it triggers program callback delegates to process the message. TIBCO Rendezvous events wait in queues until programs dispatch them. Dispatching a TIBCO Rendezvous event raises a corresponding .NET event, which in turn causes .NET to call the appropriate delegates.

Event queues organize events awaiting dispatch. Programs dispatch events to run callback delegates.

Queue groups add flexibility and fine-grained control to the event queue dispatch mechanism. Programs can create groups of queues and dispatch them according to their queue priorities.

This section presents classes, methods, interfaces and types associated with event dispatch.

IDispatchable

Interface

Visual Basic

```
Public Interface IDispatchable
```

C#

```
public interface IDispatchable
```

Purpose

Common interface for queues and queue groups.

Remarks

Both [Queue](#) and [QueueGroup](#) implement this interface, so programs can call the common methods on objects of either class. For example, consider a dispatcher routine that receives an object of type [IDispatchable](#); it can call the `dispatch()` method, without needing to determine whether the object is queue or a queue group.

Method	Description	Page
IDispatchable.dispatch	Dispatch an event; if no event is ready, block.	IDispatchable.dispatch
IDispatchable.Poll	Dispatch an event, if possible.	IDispatchable.Poll

Method	Description	Page
IDispatchable.TimedDispatch	Dispatch an event, but if no event is ready to dispatch, limit the time that this call blocks while waiting for an event.	IDispatchable.TimedDispatch

See Also

[Queue](#)

[QueueGroup](#)

IDispatchable.dispatch

Method

Visual Basic

```
Sub Dispatch ()
```

C#

```
void Dispatch ();
```

Purpose

Dispatch an event; if no event is ready, block.

Remarks

If an event is ready to dispatch, then this call dispatches it, and then returns. If no events are waiting, then this call blocks indefinitely while waiting for the object to receive an event.

Both [Queue](#) and [QueueGroup](#) implement this method.

See Also

[IDispatchable](#)

[Queue.Dispatch](#)

[QueueGroup.Dispatch](#)

IDispatchable.Poll

Method

Visual Basic

```
Function Poll () As Boolean
```

C#

```
bool Poll ();
```

Purpose

Dispatch an event, if possible.

Remarks

If an event is ready to dispatch, then this call dispatches it, and then returns. If no events are waiting, then this call returns immediately.

When the call dispatches an event, it returns `true`. When the call does not dispatch an event, it returns `false`.

This call is equivalent to `timedDispatch(TimeoutValue.NoWait)`.

Both [Queue](#) and [QueueGroup](#) implement this method.

See Also

[IDispatchable](#)

[Queue.Poll](#)

[QueueGroup.Poll](#)

IDispatchable.TimedDispatch

Method

Visual Basic

```
Function TimedDispatch (  
    ByVal timeout As Double )  
    As Boolean
```

C#

```
bool TimedDispatch (  
    double timeout );
```

Purpose

Dispatch an event, but if no event is ready to dispatch, limit the time that this call blocks while waiting for an event.

Remarks

If an event is ready to dispatch, then this call dispatches it, and then returns. If no events are waiting, this call waits for an event to arrive. If an event arrives before the waiting time elapses, then it dispatches the event and returns. If the waiting time elapses first, then the call returns without dispatching an event.

When the call dispatches an event, it returns `true`. When the call does not dispatch an event, it returns `false`.

Both [Queue](#) and [QueueGroup](#) implement this method.

Parameter	Description
timeout	<p>Maximum time (in seconds) that this call can block while waiting for an event to arrive.</p> <p>TimeoutValue.NoWait indicates no blocking (immediate timeout).</p> <p>TimeoutValue.WaitForever indicates no timeout.</p>

See Also

[IDispatchable](#)

[Queue.TimedDispatch](#)

[QueueGroup.TimedDispatch](#)

Queue

Class

Superclasses

```
System.Object  
Queue
```

Visual Basic

```
Public Class Queue  
    Implements IDispatchable
```

C#

```
public class Queue : IDispatchable
```

Purpose

Event queue.

Remarks

Each listener is associated with a [Queue](#) object; when a message arrives, Rendezvous software places an event in the corresponding queue. Programs dispatch queues to process message events.

Destroying a queue object preempts subsequent events in that queue, and invalidates any other objects that use the queue. The method [Queue.Destroy](#) destroys a queue explicitly and immediately. You can also destroy a queue implicitly by deleting all references to it, but the garbage collector might introduce a delay before it destroys the object.

Member	Description	
Public Static Properties		
Default	<p>Queue</p> <p>Programs that need only one event queue can use this default queue (instead of creating one). The default queue has priority 1, can hold an unlimited number of events, and never discards an event (since it never exceeds an event limit).</p> <p>Rendezvous software places all advisories pertaining to queue overflow on the default queue.</p> <p>Programs cannot destroy the default queue, except as a side effect of Environment.Close. Programs cannot change the properties of the default queue.</p>	Get
Public Instance Properties		
Count	<p>uint</p> <p>The number of message events currently in the queue.</p>	Get
LimitPolicy	<p>LimitPolicy</p> <p>The queue's strategy for resolving overflow of its event limit.</p>	Get Set
Name	<p>string</p> <p>Queue names assist programmers and administrators in troubleshooting queues. When Rendezvous software delivers an advisory message pertaining to a queue, it includes the queue's name; administrators can use queue names to identify specific queues within a program.</p> <p>The default name of every queue is <code>tibrvQueue</code>. We strongly recommend that you relabel each queue with a distinct and informative name, for use in debugging.</p> <p>Queue names must be non-null.</p>	Get Set

Member	Description
Priority	<p>uint</p> <p>Each queue has a priority value, which controls its dispatch precedence within queue groups. Higher values dispatch before lower values; queues with equal priority values dispatch in round-robin fashion.</p> <p>The priority must be a non-negative integer. Priority zero signifies the last queue to dispatch.</p> <p>Changing the priority of a queue affects its position in all the queue groups that contain it.</p>

Method	Description	Page
Life Cycle		
Queue	Create an event queue.	Queue
Queue.Destroy	Shared Library Files	Queue.Destroy
Dispatch		
Queue.Dispatch	Dispatch an event; if no event is ready, block.	Queue.Dispatch
Queue.Poll	Dispatch an event, if possible.	Queue.Poll
Queue.TimedDispatch	Dispatch an event, but if no event is ready to dispatch, limit the time that this call blocks while waiting for an event.	Queue.TimedDispatch

Queue

Constructor

Visual Basic

```
Overloads Public Sub New()
```

C#

```
public Queue();
```

Purpose

Create an event queue.

Remarks

Upon creation, new queues use these default property values.

Property	Default Value
LimitPolicy	The queue can contain an unlimited number of events, and never needs to discard.
Name	tibrvQueue
Priority	1

Queue.Destroy

Method

Visual Basic

```
Public Sub Destroy()
```

C#

```
public void Destroy();
```

Purpose

Destroy a queue.

Remarks

When a queue is destroyed, events that remain in the queue are discarded.

Destroying a queue invalidates all events associated with the queue.

A program must not call [Queue.Destroy](#) on the default queue. Closing the [Environment](#) destroys the default queue; see [Environment.Close](#).

Queue.Dispatch

Method

Visual Basic

```
NotOverrideable Public Sub Dispatch ()  
    Implements IDispatchable.dispatch
```

C#

```
public void Dispatch ();
```

Purpose

Dispatch an event; if no event is ready, block.

Remarks

If the queue is not empty, then this call dispatches the event at the head of the queue, and then returns. If the queue is empty, then this call blocks indefinitely while waiting for the queue to receive an event.

See Also

[IDispatchable](#)

[IDispatchable.dispatch](#)

[Queue.Poll](#)

[Queue.TimedDispatch](#)

[Dispatcher](#)

Queue.Poll

Method

Visual Basic

```
NotOverrideable Public Function Poll ()  
    Implements IDisposable.Poll
```

C#

```
public bool Poll ();
```

Purpose

Dispatch an event, if possible.

Remarks

If the queue is not empty, then this call dispatches the event at the head of the queue, and then returns. If the queue is empty, then this call returns immediately.

When the call dispatches an event, it returns `true`. When the call does not dispatch an event, it returns `false`.

This call is equivalent to `TimedDispatch(0)`.

See Also

[IDisposable](#)

[IDisposable.Poll](#)

[Queue.Dispatch](#)

[Queue.TimedDispatch](#)

Queue.TimedDispatch

Method

Visual Basic

```
NotOverrideable Public Function TimedDispatch (  
    ByVal timeout As Double )  
    As Boolean  
    Implements IDispatchable.TimedDispatch
```

C#

```
public bool TimedDispatch (  
    double timeout );
```

Purpose

Dispatch an event, but if no event is ready to dispatch, limit the time that this call blocks while waiting for an event.

Remarks

If an event is already in the queue, this call dispatches it, and returns immediately. If the queue is empty, this call waits for an event to arrive. If an event arrives before the waiting time elapses, then it dispatches the event and returns. If the waiting time elapses first, then the call returns without dispatching an event.

When the call dispatches an event, it returns `true`. When the call does not dispatch an event, it returns `false`.

Parameter	Description
timeout	<p>Maximum time (in seconds) that this call can block while waiting for an event to arrive in the queue.</p> <p>TimeoutValue.NoWait indicates no blocking (immediate timeout).</p> <p>TimeoutValue.WaitForever indicates no timeout.</p>

See Also

[IDispatchable](#)

[IDispatchable.TimedDispatch](#)

[Queue.Dispatch](#)

[Queue.Poll](#)

LimitPolicy

Class

Superclasses

```
System.Object  
LimitPolicy
```

Visual Basic

```
Public Class LimitPolicy
```

C#

```
public class LimitPolicy
```

Purpose

Determine queue overflow behavior.

Method	Description	Page
Constructor		
LimitPolicy	Create a limit policy.	LimitPolicy

Member	Description	
Public Instance Properties		
DiscardAmount	uint	Get
When the queue exceeds its maximum event limit, discard a block of events. This property specifies the number of events to discard.		
MaxEvents	uint	Get
Programs can limit the maximum number of message events that the queue can hold—either to curb queue growth, or implement a specialized dispatch semantics.		
Zero (the initial value) specifies an unlimited number of events.		
Strategy	LimitPolicyStrategy	Get
Each queue has a policy strategy for discarding events when a new event would cause the queue to exceed its MaxEvents limit.		

LimitPolicy

Constructor

Visual Basic

```
Public Sub New(  
    ByVal limitPolicyStrategy As LimitPolicyStrategy,  
    ByVal maxEvents As UInt32,  
    ByVal discardAmount As UInt32 )
```

C#

```
public LimitPolicy(  
    LimitPolicyStrategy limitPolicyStrategy,  
    uint maxEvents,  
    uint discardAmount );
```

Purpose

Create a limit policy.

Parameter	Description
limitPolicyStrategy	<p>Each queue has a policy strategy for discarding events when a new event would cause the queue to exceed its MaxEvents limit.</p> <p>When maxEvents is zero (unlimited), the strategy must be LimitPolicyStrategy.DiscardNone.</p>
maxEvents	<p>Programs can limit the number of events that a queue can hold—either to curb queue growth, or implement a specialized dispatch semantics.</p> <p>Zero specifies an unlimited number of events; in this case, the</p>

Parameter	Description
	strategy must be LimitPolicyStrategy.DiscardNone .
discardAmount	<p>When the queue exceeds its maximum event limit, discard a block of events. This argument specifies the number of events to discard.</p> <p>When discardAmount is zero, the strategy must be LimitPolicyStrategy.DiscardNone.</p>

LimitPolicyStrategy

Enumeration

Visual Basic

```
Public Enum LimitPolicyStrategy
```

C#

```
public enum LimitPolicyStrategy
```

Description

These enumerated constants specify the possible strategies for resolving queue overflow.

Member	Description
LimitPolicyStrategy.DiscardNone	Never discard events; use this policy when a queue has no limit on then number of events it can contain.
LimitPolicyStrategy.DiscardFirst	Discard the first event in the queue (that is, the oldest event in the queue, which would otherwise be the next event to dispatch).
LimitPolicyStrategy.DiscardLast	Discard the last event in the queue (that is, the youngest event in the queue).
LimitPolicyStrategy.DiscardNew	Discard the new event (which would otherwise cause the queue to overflow its maximum events limit).

QueueGroup

Class

Superclasses

```
System.Object  
QueueGroup
```

Visual Basic

```
Public Class QueueGroup  
    Implements IDispatchable
```

C#

```
public class QueueGroup : IDispatchable
```

Purpose

Prioritized dispatch of several queues with one call.

Remarks

Queue groups add flexibility and fine-grained control to the event queue dispatch mechanism. Programs can create groups of queues and dispatch them according to their queue priorities.

Programs must explicitly destroy instances of this class. Rendezvous software keeps internal references to these objects, so the garbage collector does not delete them automatically.

Method	Description	Page
Life Cycle		
QueueGroup	Create an event queue group.	QueueGroup
QueueGroup.Destroy	Destroy an event queue group.	QueueGroup.Destroy
Dispatch		
QueueGroup.Dispatch	Dispatch an event from a queue group; if no event is ready, block.	QueueGroup.Dispatch
QueueGroup.Poll	Dispatch an event, but if no event is ready to dispatch, return immediately (without blocking).	QueueGroup.Poll
QueueGroup.TimedDispatch	Dispatch an event, but if no event is ready to dispatch, limit the time that this call blocks while waiting for an event.	QueueGroup.TimedDispatch
Queues		
QueueGroup.Add	Add an event queue to a queue group.	QueueGroup.Add
QueueGroup.Remove	Remove an event queue from a queue group.	QueueGroup.Remove

QueueGroup

Constructor

Visual Basic

```
Overloads Public Sub New()
```

C#

```
public QueueGroup();
```

Purpose

Create an event queue group.

Remarks

The new queue group is empty.

The queue group remains valid until the program explicitly destroys it.

See Also

[QueueGroup.Add](#)

[QueueGroup.Destroy](#)

QueueGroup.Add

Method

Visual Basic

```
Public Sub Add(  
    ByVal queue As Queue )
```

C#

```
public void Add(  
    Queue queue );
```

Purpose

Add an event queue to a queue group.

Remarks

If the queue is already in the group, adding it again has no effect.

If either the queue or the group is invalid, this method throws a [RendezvousException](#).

Parameter	Description
queue	Add this event queue to a queue group.

See Also

[Queue](#)

[QueueGroup.Remove](#)

QueueGroup.Destroy

Method

Visual Basic

```
Public Sub Destroy()
```

C#

```
public void Destroy();
```

Purpose

Destroy an event queue group.

Remarks

The individual queues in the group continue to exist, even though the group has been destroyed.

See Also

[QueueGroup](#)

QueueGroup.Dispatch

Method

Visual Basic

```
NotOverrideable Public Sub Dispatch ()  
    Implements IDisposable.Dispatch
```

C#

```
public void Dispatch ();
```

Purpose

Dispatch an event from a queue group; if no event is ready, block.

Remarks

If any queue in the group contains an event, then this call searches the queues in priority order, dispatches an event from the first non-empty queue that it finds, and then returns. If all the queues are empty, then this call blocks indefinitely while waiting for any queue in the group to receive an event.

When searching the group for a non-empty queue, this call searches according to the priority values of the queues. If two or more queues have identical priorities, subsequent dispatch and poll calls rotate through them in round-robin fashion.

See Also

[IDisposable](#)

[IDisposable.Dispatch](#)

[QueueGroup.TimedDispatch](#)

QueueGroup.Poll

QueueGroup.Poll

Method

Visual Basic

```
NotOverrideable Public Function Poll ()  
    As Boolean  
    Implements IDispatchable.Poll
```

C#

```
public bool Poll ();
```

Purpose

Dispatch an event, but if no event is ready to dispatch, return immediately (without blocking).

Remarks

If any queue in the group contains an event, then this call searches the queues in priority order, dispatches an event from the first non-empty queue that it finds, and then returns. If all the queues are empty, then this call returns immediately.

When searching the group for a non-empty queue, this call searches according to the priority values of the queues. If two or more queues have identical priorities, subsequent dispatch and poll calls rotate through them in round-robin fashion.

When the call dispatches an event, it returns `true`. When the call does not dispatch an event, it returns `false`.

This call is equivalent to `TimedDispatch(0)`.

See Also

[IDispatchable](#)

[IDispatchable.Poll](#)

[QueueGroup.Dispatch](#)

[QueueGroup.TimedDispatch](#)

QueueGroup.Remove

Method

Visual Basic

```
Public Sub Remove (  
    ByVal queue as Queue )
```

C#

```
public void Remove (  
    Queue queue );
```

Purpose

Remove an event queue from a queue group.

Remarks

If the queue is not in the group, or if the group is invalid, this call throws an exception with the status code [InvalidQueue](#).

Parameter	Description
queue	Remove this event queue from a queue group.

See Also

[Queue](#)

[QueueGroup.Add](#)

QueueGroup.TimedDispatch

Method

Visual Basic

```
NotOverrideable Public Function TimedDispatch (  
    ByVal timeout As Double )  
    As Boolean  
    Implements IDispatchable.TimedDispatch
```

C#

```
public bool TimedDispatch (  
    double timeout );
```

Purpose

Dispatch an event, but if no event is ready to dispatch, limit the time that this call blocks while waiting for an event.

Remarks

If any queue in the group contains an event, then this call searches the queues in priority order, dispatches an event from the first non-empty queue that it finds, and then returns. If the queue is empty, this call waits for an event to arrive in any queue. If an event arrives before the waiting time elapses, then the call searches the queues, dispatches the event, and returns. If the waiting time elapses first, then the call returns without dispatching an event.

When searching the group for a non-empty queue, this call searches according to the priority values of the queues. If two or more queues have identical priorities, subsequent dispatch calls rotate through them in round-robin fashion.

When the call dispatches an event, it returns `true`. When the call does not dispatch an event, it returns `false`.

Parameter	Description
timeout	<p>Maximum time (in seconds) that this call can block while waiting for an event to arrive in the queue group.</p> <p>TimeoutValue.NoWait indicates no blocking (immediate timeout).</p> <p>TimeoutValue.WaitForever indicates no timeout.</p>

See Also

[IDispatchable](#)

[IDispatchable.TimedDispatch](#)

[QueueGroup.Dispatch](#)

[QueueGroup.Poll](#)

Dispatcher

Class

Superclasses

```
System.Object  
Dispatcher
```

Visual Basic

```
Public Class Dispatcher
```

C#

```
public class Dispatcher
```

Purpose

Dispatch events from a queue or queue group.

Remarks

Each instance of this class represents a thread that loops indefinitely, repeatedly dispatching a queue or queue group.

This class is a programming convenience. Programs can implement specialized dispatcher threads, and use them instead of this class.

Destroying a dispatcher stops it from dispatching its queue or queue group. The method [Dispatcher.Destroy](#) destroys a dispatcher explicitly and immediately. You can also destroy a dispatcher implicitly by deleting all references to it, but the garbage collector might introduce a delay before it destroys the object.

Method	Description	Page
Dispatcher	Create a dispatcher thread.	Dispatcher
Dispatcher.Destroy	Destroy a dispatcher thread.	Dispatcher.Destroy
Dispatcher.Join	Wait for a dispatcher thread to finish.	Dispatcher.Join
Dispatcher.Pause	Pause a dispatcher thread (so it does not dispatch events).	Dispatcher.Pause
Dispatcher.Resume	Resume a dispatcher thread (after pause).	Dispatcher.Resume

Member	Description
--------	-------------

Public Instance Properties

<code>Dispatchable</code>	IDispatchable	Get
The dispatcher dispatches this queue or queue group.		

See Also

[Queue.Dispatch](#)

Dispatcher

Constructor

Visual Basic

```
Overloads Public Sub New(  
    ByVal dispatchable As IDispatchable,  
    ByVal name As String,  
    ByVal timeout As Double )  
Overloads Public Sub New(  
    ByVal dispatchable As IDispatchable,  
    ByVal name As String )  
Overloads Public Sub New(  
    ByVal dispatchable As IDispatchable,  
    ByVal timeout As Double )  
Overloads Public Sub New(  
    ByVal dispatchable As IDispatchable )
```

C#

```
public Dispatcher(  
    IDispatchable dispatchable,  
    string name,  
    double timeout );  
public Dispatcher(  
    IDispatchable dispatchable,  
    string name )  
public Dispatcher(  
    IDispatchable dispatchable,  
    double timeout );  
public Dispatcher(  
    IDispatchable dispatchable )
```

Purpose

Create a dispatcher thread.

Remarks

This constructor immediately starts the thread.

Parameter	Description
dispatchable	Create a thread that dispatches this Queue or QueueGroup .
name	Assign this name to the dispatcher thread. When absent, the thread receives a default name.
timeout	When this time period (in seconds) elapses without dispatching an event, the thread exits. When absent, the default is to run indefinitely (with no timeout).

See Also

[Dispatcher](#)

DISPATCHER.THREAD_EXITED in TIBCO Rendezvous Concepts

Dispatcher.Destroy

Method

Visual Basic

```
Public Sub Destroy()
```

C#

```
public void Destroy();
```

Purpose

Destroy a dispatcher thread.

Remarks

Destroying a dispatcher leaves its dispatchable intact.

See Also

[Dispatcher](#)

Dispatcher.Join

Method

Visual Basic

```
Public Sub Join()
```

C#

```
public void Join();
```

Purpose

Wait for a dispatcher thread to finish.

Remarks

The calling thread blocks until after the dispatcher thread is destroyed.

Consider a program in which the main thread creates a queue and listeners, and then creates a dispatcher for that queue. After that, the main thread is inactive. However, if the main thread exits, the scope for its queue and listeners evaporates (and those objects evaporate too) so the program can no longer operate correctly. To prevent this situation, the main thread calls this method, indicating a dependency between the two threads.

See Also

[Dispatcher](#)

Dispatcher.Pause

Method

Visual Basic

```
Public Sub Pause()
```

C#

```
public void Pause();
```

Purpose

Pause a dispatcher thread (so it does not dispatch events).

Remarks

Use [Dispatcher.Resume](#) to start dispatching again.

See Also

[Dispatcher](#)

[Dispatcher.Resume](#)

Dispatcher.Resume

Method

Visual Basic

```
Public Sub Resume()
```

C#

```
public void Resume();
```

Purpose

Resume a dispatcher thread (after pause).

Remarks

The thread continues dispatching events.

See Also

[Dispatcher](#)

[Dispatcher.Pause](#)

Transports

Transports manage network connections and send outbound messages.

This section presents the various transport classes and their methods.

See Also

[CMTransport](#)

[CMQueueTransport](#)

Transport

Class

Superclasses

```
System.Object  
Transport
```

Visual Basic

```
MustInherit Public Class Transport
```

C#

```
public abstract class Transport
```

Purpose

A transport object represents a delivery mechanism for messages.

Remarks

A transport describes a carrier for messages—whether across a network, among processes on a single computer, or within a process. Transports manage network connections, and send outbound messages.

A transport also defines the delivery scope of a message—that is, the set of *possible* destinations for the messages it sends.

Destroying a transport object invalidates subsequent send calls on that transport, and invalidates any listeners using that transport. The method [Transport.Destroy](#) destroys a transport explicitly and immediately. You can also destroy a transport implicitly by deleting

all references to it, but the garbage collector might introduce a delay before it destroys the object.

This abstract class is the superclass of all other transport classes. Methods defined by this class are implemented by all transport subclasses (except [CMQueueTransport](#), for which some methods do not apply).

Intra-Process Transport

Each process has exactly one intra-process transport; the call [Environment.Open](#) automatically creates it. Programs must not destroy the intra-process transport.

Method	Description	Page
Public Instance Methods		
Transport.CreateInbox	Create a unique inbox subject name.	Transport.CreateInbox
Transport.Destroy	Destroy a transport.	Transport.Destroy
Transport.Send	Send a message.	Transport.Send
Transport.SendReply	Send a reply message.	Transport.SendReply
Transport.SendRequest	Send a request message and wait for a reply.	Transport.SendRequest
Transport.SetBatchSize	Enable outbound batching of data from IPM, and set the batch size (in bytes).	Transport.SetBatchSize

Descendants

[IntraProcessTransport](#)

[NetTransport](#)

[CMTransport](#)

[CMQueueTransport](#)

See Also

Transport in TIBCO Rendezvous Concepts

Transport.CreateInbox

Method

Visual Basic

```
Public Function CreateInbox ()  
    As String
```

C#

```
public string CreateInbox ();
```

Purpose

Create a unique inbox subject name.

Remarks

This method creates inbox names that are unique throughout the transport scope.

- For network transports, inbox subject names are unique across all processes within the local router domain—that is, anywhere that direct multicast contact is possible. The inbox name is not necessarily unique outside of the local router domain.
- For the intra-process transport, inbox names are unique across all threads of the process.

This method creates only the unique name for an inbox; it does not begin listening for messages on that subject name. To begin listening, pass the inbox name as the subject argument to the [Listener](#) constructor. The inbox name is only valid for use with the same transport that created it. When calling [Listener](#), you *must* pass the same transport object that created the inbox subject name.

Remember that other programs have no information about an inbox subject name until the listening program uses it as a reply subject in an outbound message.

Use inbox subject names for delivery to a specific destination. In the context of a network transport, an inbox destination specifies unicast (point-to-point) delivery.

Rendezvous routing daemons (rvrd) translate inbox subject names that appear as the send subject or reply subject of a message. They do not translate inbox subject names within the data fields of a message.

This inherited method is disabled for [CMQueueTransport](#) objects.

**Warning**

This method is the only legal way for programs to create inbox subject names.

See Also

[ReplySubject](#)

Transport.Destroy

Method

Visual Basic

```
Overrideable Public Sub Destroy ()
```

C#

```
public virtual void Destroy ();
```

Purpose

Destroy a transport.

Remarks

Programs must explicitly destroy each transport object.

Destroying a transport achieves these effects:

- The transport flushes all outbound data to the Rendezvous daemon.
This effect is especially important, and neither exiting the program nor calling [Environment.Close](#) is sufficient to flush outbound data.
- The transport invalidates (but does not destroy) all associated listeners.

It is illegal to destroy the intra-process transport.

Transport.Send

Method

Visual Basic

```
Overrideable Public Sub Send (  
    ByVal message As Message )  
Overrideable Public Sub Send (  
    ByVal messages As Message[] )
```

C#

```
public virtual void Send (  
    Message message );  
public virtual void Send (  
    Message[] messages)
```

Purpose

Send a message.

Remarks

The message must have a valid destination subject; see [SendSubject](#).

Parameter	Description
message	Send this message.
messages	Send this array of messages with one call. In most applications this call is more efficient than a series of send calls on individual messages.

See Also

[Message](#)

[SendSubject](#)

Transport.SendReply

Method

Visual Basic

```
Overrideable Public Sub SendReply (  
    ByVal reply As Message,  
    ByVal request As Message )
```

C#

```
public virtual void SendReply (  
    Message reply,  
    Message request );
```

Purpose

Send a reply message.

Remarks

This convenience call extracts the reply subject of an inbound request message, and sends an outbound reply message to that subject. In addition to the convenience, this call is marginally faster than using separate calls to extract the subject and send the reply.

This method overwrites any existing send subject of the reply message with the reply subject of the request message.

Parameter	Description
reply	Send this <i>outbound</i> reply message.

Parameter	Description
request	Send a reply to this <i>inbound</i> request message; extract its reply subject to use as the subject of the outbound reply message.

**Warning**

Give special attention to the order of the arguments to this method. Reversing the inbound and outbound messages can cause an infinite loop, in which the program repeatedly resends the inbound message to itself (and all other recipients).

See Also

[Message](#)

[ReplySubject](#)

Transport.SendRequest

Method

Visual Basic

```
Overrideable Public Function SendRequest (  
    ByVal request As Message,  
    ByVal timeout As Double )  
    As Message
```

C#

```
public virtual Message SendRequest (  
    Message request,  
    double timeout );
```

Purpose

Send a request message and wait for a reply.

Blocking can Stall Event Dispatch



Warning

This call blocks all other activity on its program thread. If appropriate, programmers must ensure that other threads continue dispatching events on its queues.

Parameter	Description
request	Send this message.
timeout	Maximum time (in seconds) that this call can block while

Parameter	Description
	waiting for a reply. TimeoutValue.WaitForever indicates no timeout (wait without limit for a reply).

Remarks

When the method receives a reply, it returns the reply. When the call does not receive a reply, it returns null, indicating timeout.

Programs that receive and process the request message cannot determine that the sender has blocked until a reply arrives.

The request message must have a valid destination subject; see [SendSubject](#).

Operation

This method operates in several synchronous steps:

Procedure

1. Create an inbox name, and an event that listens to it. Overwrite any existing reply subject of message with the inbox name.
2. Send the outbound message.
3. Block until the listener receives a reply; if the time limit expires before a reply arrives, then return null. (The reply circumvents the event queue mechanism, so it is not necessary to explicitly call dispatch methods in the program.)
4. Return the reply as the value of this method.

Transport.SetBatchSize

Method

Visual Basic

Not supported.

C#

```
public virtual void SetBatchSize (  
    uint numBytes );
```

Purpose

Enable outbound batching of data from IPM, and set the batch size (in bytes).

Remarks

This type of batching is available only in the IPM library. It is not available in the standard (daemon-based) Rendezvous library, and this call throws an error exception.

When the batch size is greater than zero, IPM transfers data to the network in batches. This option can increase throughput, at the cost of higher latency.

When the batch size is zero, IPM transfers data to the network immediately, for lowest latency.

If you do not explicitly set the batch size using this call, then the default behavior disables outbound batching.



Contraindications

Note

These conditions characterize situations in which we do not recommend batching:

-
- Data latency is *not* acceptable.
 - Batch behavior does *not* produce measurable improvements in the performance of your application.
-

Parameter	Description
numBytes	Set the batch size (in bytes). Zero is a special value, which disables batching for the transport.

IntraProcessTransport

Class

Superclasses

```
System.Object  
  Transport  
    IntraProcessTransport
```

Visual Basic

```
NotInheritable Public Class IntraProcessTransport  
  Inherits Transport
```

C#

```
public sealed class IntraProcessTransport : Transport
```

Purpose

The intra-process transport delivers messages among the threads of a program.

Remarks

The intra-process transport does not access the network.

Each process has exactly one intra-process transport; the call [Environment.Open](#) automatically creates it. Programs cannot destroy this unique instance, nor create additional instances.

Member	Description
--------	-------------

Public Static Properties

UniqueInstance	IntraProcessTransport	Get
----------------	---------------------------------------	-----

Inherited Members

[Transport.CreateInbox](#)

[Transport.Destroy](#)

[Transport.Send](#)

[Transport.SendReply](#)

[Transport.SendRequest](#)

[System.Object.Equals](#)

[System.Object.GetType](#)[System.Object.GetHashCode](#)[System.Object.ToString](#)

Related Classes

[Transport](#)

[NetTransport](#)

NetTransport

Class

Superclasses

```
System.Object  
  Transport  
    NetTransport
```

Visual Basic

```
Public Class NetTransport  
  Inherits Transport
```

C#

```
public class NetTransport : Transport
```

Purpose

Deliver messages across a network.

Remarks

Programs must explicitly destroy instances of this class. Rendezvous software keeps internal references to these objects, so the garbage collector does not delete them automatically.

Member	Description
--------	-------------

Public Instance Properties

BatchMode	TransportBatchMode	Set
	The socket where the transport connects to the Rendezvous daemon.	
Daemon	string	Get
	The socket where the transport connects to the Rendezvous daemon.	
Description	string	Get
	The description identifies programs and their transports to Rendezvous components. Browser administration interfaces display the description string.	Set
	As a debugging aid, we recommend setting a unique description string for each transport. Use a string that distinguishes both the application and the role of the transport within it.	
Network	string	Get
	The network interface that the transport uses for communication.	
Reliability	double	Set
	Set this property to request a reliability interval (message retention time, in seconds) for the transport's service. This value must be greater than zero. For details, see Reliability .	
Service	string	Get
	The effective service that the transport uses for communication.	

Method	Description	Page
NetTransport	Create a transport that connects to a Rendezvous daemon.	NetTransport

Remarks

This class is the superclass of other network transport classes.

Inherited Methods

[Transport.CreateInbox](#)

[Transport.Destroy](#)

[Transport.Send](#)

[Transport.SendReply](#)

[Transport.SendRequest](#)

Reliability

Setting the [Reliability](#) property (in seconds) lets application programs shorten the reliability interval of the specific service associated with a transport object. Successfully setting this property changes the daemon's reliability interval for all transports within the application process that use the same service.

Programs can request reliability only from daemons of release 8.2 or later.

An application can request a shorter retention time than the value that governs the daemon as a whole (either the factory default or the daemons `-reliability` parameter). The daemon's governing value silently overrides requests for a longer retention time.

Maximum Value Rule

Client transport objects that connect to the same daemon could specify different reliability intervals on the same service—whether by requesting a reliability value, or by using the daemon's effective value. In this situation, the daemon selects the *largest* potential value from among all the transports on that service, and uses that maximum value as the effective reliability interval for the service (that is, for all the transports on the service). This method of resolution favors the more stringent reliability requirements. (Contrast this rule with the LOWER VALUE RULE that applies between two daemons.)

Recomputing the Reliability

Whenever a transport connects, requests reliability, or disconnects from the daemon, the daemon recalculates the reliability interval for the corresponding service, by selecting the

largest value of all transports communicating on that service.

When recomputing the reliability interval would result in a shorter retention time, the daemon delays using the new value until after an interval equivalent to the older (longer) retention time. This delay ensures that the daemon retains message data at least as long as the effective reliability interval at the time the message is sent.

Related Classes

[Transport](#)

[IntraProcessTransport](#)

[CMTransport](#)

[CMQueueTransport](#)

See Also

[Reliability and Message Retention Time](#)

[Changing the Reliability Interval within an Application Program](#)

[Reliable Message Delivery](#)

NetTransport

Constructor

Visual Basic

```
Overloads Public Sub New()  
Overloads Public Sub New(  
    ByVal service As String,  
    ByVal network As String,  
    ByVal daemon As String )  
Overloads Public Sub New(  
    ByVal service As String,  
    ByVal network As String,  
    ByVal daemon As String,  
    ByVal licenseTicket As String )
```

C#

```
public NetTransport( );  
public NetTransport(  
    string service,  
    string network,  
    string daemon );  
public NetTransport(  
    string service,  
    string network,  
    string daemon,  
    string licenseTicket );
```

Purpose

Create a transport that connects to a Rendezvous daemon.

Overloading

All arguments specify options for connecting to rvd.

Overloads that omit arguments supply null as default values.

Connecting to the Rendezvous Daemon

Rendezvous daemon processes do the work of moving messages across a network. Every [NetTransport](#) must connect to a Rendezvous daemon.

If a Rendezvous daemon process with a corresponding daemon parameter is already running, the transport connects to it.

If an appropriate Rendezvous local daemon is *not* running, the transport tries to start it. However, the transport does not attempt to start a *remote* daemon when none is running.

If the transport cannot connect to the Rendezvous daemon, the constructor throws an exception with the status code [DaemonNotFound](#).

Description String

As a debugging aid, we recommend setting a unique description string for each transport. Use a string that distinguishes both the application and the role of the transport within it. See [Description](#).

Parameter	Description
service	<p>The Rendezvous daemon divides the network into logical partitions. Each NetTransport communicates on a single service; a transport can communicate only with other transports on the same service.</p> <p>To communicate on more than one service, a program must create more than one transport—one transport for each service.</p> <p>You can specify the service in several ways. For details, see Service Parameter in TIBCO Rendezvous Concepts.</p> <p>Null specifies the default rendezvous service.</p>
network	<p>Every network transport communicates with other transports over a single network interface. On computers with more than one network interface, the network parameter instructs the Rendezvous daemon to use a particular network for all outbound messages from this transport.</p>

Parameter	Description
	<p>To communicate over more than one network, programs must create more than one transport.</p> <p>You can specify the network in several ways. For details, see Network Parameter in TIBCO Rendezvous Concepts.</p> <p>Null specifies the primary network interface for the host computer.</p>
daemon	<p>The daemon parameter instructs the transport object about how and where to find the Rendezvous daemon and establish communication.</p> <p>For details, see Daemon Parameter in TIBCO Rendezvous Concepts.</p> <p>You can specify a daemon on a remote computer. For details, see Remote Daemon in TIBCO Rendezvous Concepts.</p> <p>If you specify a secure daemon, this string must be identical to as the <code>daemonName</code> argument of SDContext.SetDaemonCertificate. See also, Secure Daemon in TIBCO Rendezvous Concepts.</p> <p>Null specifies the default—find the local daemon on TCP socket 7500. (This default is not valid when the local daemon is a secure daemon.)</p>
licenseTicket	<p>License tickets are no longer required. Values for this parameter are ignored.</p>

TransportBatchMode

Enumeration

Visual Basic

```
Public Enum TransportBatchMode
```

C#

```
public enum TransportBatchMode
```

Description

These enumerated constants specify the possible strategies for batching outbound messages.

Remarks

The batch mode determines when the transport transmits outbound message data to rvd:

- As soon as possible (the initial default for all transports)
- Either when its buffer is full, or when a timer interval expires—either event triggers transmission to the daemon

Member	Description
TransportBatchMode.Default	Default batch behavior. The transport transmits outbound messages to rvd as soon as possible. This value is the initial default for all transports.
TransportBatchMode.TimerBatch	Timer batch behavior. The transport accumulates

Member	Description
	outbound messages, and transmits them to <code>rvd</code> in batches—either when its buffer is full, or when a timer interval expires. (Programs cannot adjust the timer interval.)

See Also

Batch Modes for Transports in TIBCO Rendezvous Concepts

Virtual Circuits

Virtual circuits feature Rendezvous communication between two terminals over an exclusive, continuous, monitored connection.

See Also

Virtual Circuits in TIBCO Rendezvous Concepts

VCTransport

Class

Superclasses

```
System.Object  
  Transport  
    VCTransport
```

Visual Basic

```
Public Class VCTransport  
  Inherits Transport
```

C#

```
public class VCTransport : Transport
```

Purpose

A virtual circuit transport object represents a terminal in a potential circuit.

Remarks

A virtual circuit transport can fill the same roles as an ordinary transport. Programs can use them to create inbox names, send messages, create listeners and other events.

Instead of a constructor, this class has two create methods. These two methods also determine the protocol role of the transport object—one method creates a terminal that *accepts* connections, and another method creates a terminal that attempts to *connect*.

The two terminals play complementary roles as they attempt to establish a connection. However, this difference soon evaporates. After the connection is complete, the two terminals behave identically.

Method	Description	Page
Public Static Methods		
VCTransport.CreateAcceptVC	Create a virtual circuit accept object.	VCTransport.CreateAcceptVC
VCTransport.CreateConnectVC	Create a virtual circuit connect object	VCTransport.CreateConnectVC
Public Instance Methods		
VCTransport.WaitForVCConnection	Test the connection status of a virtual circuit.	VCTransport.WaitForVCConnection

Broken Connection

The following conditions can close a virtual circuit connection:

- Contact is broken between the object and its terminal.
- The virtual circuit loses data in either direction (see DATALOSS in TIBCO Rendezvous Concepts).
- The partner program destroys its terminal object (or that terminal becomes invalid).
- The program destroys the object.
- The program destroys the object's ordinary transport.

Direct Communication

Because virtual circuits rely on point-to-point messages between the two terminals, they can use direct communication to good advantage. To do so, both terminals must use network transports that enable direct communication.

For an overview, see [Direct Communication in TIBCO Rendezvous Concepts](#).

For programming details, see [Specifying Direct Communication in TIBCO Rendezvous Concepts](#).

Inherited Methods

Description

[Transport.CreateInbox](#)

[Transport.Destroy](#)

[Transport.Send](#)

[Transport.SendReply](#)

[Transport.SendRequest](#)

Related Classes

[Transport](#)

[IntraProcessTransport](#)

[NetTransport](#)

See Also

[Virtual Circuits in TIBCO Rendezvous Concepts](#)

VCTransport.CreateAcceptVC

Method

Visual Basic

```
Public Shared Function CreateAcceptVC(  
    ByVal transport As Transport,  
    ByRef connectSubject As String )  
    As VCTransport
```

C#

```
public static VCTransport CreateAcceptVC(  
    Transport transport,  
    out string connectSubject );
```

Purpose

Create a virtual circuit accept object.

Remarks

After this call returns, the program must send a message to another program, inviting it to establish a virtual circuit. Furthermore, the *reply subject* of that invitation message must be the connect subject (which this method creates). To complete the virtual circuit, the second program must extract this subject from the invitation, and supply it to [VCTransport.CreateConnectVC](#).

Parameter	Description
transport	The virtual circuit terminal uses this ordinary transport for communications.

Parameter	Description
	<p>Programs may use this transport for other purposes.</p> <p>It is illegal to supply a virtual circuit transport object for this parameter (that is, you cannot nest a virtual circuit within another virtual circuit).</p>
connectSubject	<p>Supply a location of type string.</p> <p>The method creates an inbox where it can accept a request from a virtual circuit <i>connect</i> object, and places the inbox name in this location.</p>

Test Before Using

Either of two conditions indicate that the connection is ready to use:

- The transport presents the `VC.CONNECTED` advisory.
- [VCTransport.WaitForVCConnection](#) returns without error.

Procedure

Immediately after this call, test *both* conditions with these two steps (in this order):

1. Listen on the virtual circuit transport object for the `VC.CONNECTED` advisory.
2. Call [VCTransport.WaitForVCConnection](#) with zero as the timeout parameter.

For an explanation, see Testing the New Connection in TIBCO Rendezvous Concepts.

See Also

[VCTransport.CreateConnectVC](#)

[VCTransport.WaitForVCConnection](#)

`VC.CONNECTED` in TIBCO Rendezvous Concepts

`VC.DISCONNECTED` in TIBCO Rendezvous Concepts

VCTransport.CreateConnectVC

Method

Visual Basic

```
Public Shared Function CreateConnectVC(  
    ByVal transport As Transport,  
    ByVal connectSubject As String )  
    As VCTransport
```

C#

```
public static VCTransport CreateConnectVC(  
    Transport transport,  
    string connectSubject );
```

Purpose

Create a virtual circuit connect object

Parameter	Description
transport	<p>The virtual circuit terminal uses this ordinary transport for communications.</p> <p>Programs may use this transport for other purposes.</p> <p>It is illegal to supply a virtual circuit transport object for this parameter (that is, you cannot nest a virtual circuit within another virtual circuit).</p>
connectSubject	<p>The terminal uses this connect subject to establish a virtual circuit with an <i>accept</i> transport in another program.</p> <p>The program must receive this connect subject from the accepting</p>

Parameter	Description
	program. The call to VCTransport.CreateAcceptVC creates and returns this subject.

Test Before Using

Either of two conditions indicate that the connection is ready to use:

- The transport presents the [VC.CONNECTED](#) advisory.
- [VCTransport.WaitForVCConnection](#) returns without error.

Procedure

Immediately after this call, test *both* conditions with these two steps (in this order):

1. Listen on the virtual circuit transport object for the [VC.CONNECTED](#) advisory.
2. Call [VCTransport.WaitForVCConnection](#) with zero as the timeout parameter.

For an explanation, see [Testing the New Connection](#).

See Also

[VCTransport.CreateAcceptVC](#)

[VC.CONNECTED](#)

[VC.DISCONNECTED](#)

VCTransport.WaitForVCConnection

Method

Visual Basic

```
Public Sub WaitForVCConnection(  
    ByVal timeout As Double )  
    As VCTransport
```

C#

```
public void WaitForVCConnection(  
    double timeout );
```

Purpose

Test the connection status of a virtual circuit.

Remarks

This method tests (and can block) until this virtual circuit transport object has established a connection with its opposite terminal. You may call this method for either an accept terminal or a connect terminal.

This method produces the same information as the virtual circuit advisory messages—but it produces it synchronously (while advisories are asynchronous). Programs can use this method not only to test the connection, but also to block until the connection is ready to use.

For example, a program can create a terminal object, then call this method to wait until the connection completes.

Parameter	Description
timeout	<p>This parameter determines the behavior of the call:</p> <ul style="list-style-type: none">• For a quick test of current connection status, supply TimeoutValue.NoWait. The call returns immediately, without blocking.• To wait for a new terminal to establish a connection, supply a reasonable positive value. The call returns either when the connection is complete, or when this time limit elapses.• To wait indefinitely for a usable connection, supply TimeoutValue.WaitForever. The call returns when the connection is complete. If the connection was already complete and is now broken, the call returns immediately.

Results

When the connection is complete (ready to use), this method returns normally. Otherwise it throws an exception; the status value in the exception yields additional information about the unusable connection.

Status	Description
Timeout	The connection is not yet complete, but the non-negative time limit for waiting has expired.
VCNotConnected	The connection was formerly complete, but is now irreparably broken.

See Also

[VCTransport.CreateAcceptVC](#)

[VCTransport.CreateConnectVC](#)

Testing the New Connection in TIBCO Rendezvous Concepts

VC.CONNECTED in TIBCO Rendezvous Concepts

VC.DISCONNECTED in TIBCO Rendezvous Concepts

Fault Tolerance

Rendezvous fault tolerance software coordinates a group of redundant processes into a fault-tolerant distributed program. Some processes actively fulfill the tasks of the program, while other processes wait in readiness. When one of the active processes fails, another process rapidly assumes active duty.

Fault Tolerance Road Map

For a complete discussion of concepts and operating principles, see [Fault Tolerance Concepts](#).

For suggestions to help you design programs using fault tolerance features, see [Fault Tolerance Programming](#).

For step-by-step hints for implementing fault-tolerant systems, see [Developing Fault Tolerant Programs](#).

Fault tolerance software uses advisory messages to inform programs of status changes. For details, see [Fault Tolerance \(RVFT\) Advisory Messages](#).

If your application distributes fault-tolerant processes across network boundaries, you must configure the Rendezvous routing daemons to exchange _RVFT administrative messages. For details, see [Fault Tolerance](#), and discuss with your network administrator.

FTGroupMember

Class

Superclasses

```
System.Object
  FTGroupMember
```

Visual Basic

```
Public Class FTGroupMember
```

C#

```
public class FTGroupMember
```

Purpose

Represent membership in a fault tolerance group.

Remarks

Upon creating this object, the program joins a fault tolerance group.

By destroying a member object, the program withdraws its membership in the fault tolerance group. The method [FTGroupMember.Destroy](#) destroys a member object explicitly and immediately. You can also destroy a member object implicitly by deleting all references to it, but the garbage collector might introduce a delay before it destroys the object.

Destroying the queue or transport of a member object automatically destroys the member object as well.

Member	Description
--------	-------------

Public Instance Properties

GroupName	string	Get
	The group member joins the fault tolerant group with this name.	
Queue	Queue	Get
	Fault tolerance events for this member dispatch from this event queue.	
Transport	Transport	Get
	The group member uses this transport for fault tolerance internal protocol messages (such as heartbeat messages).	
Weight	ushort	Get
	<p>Weight represents the ability of this member to fulfill its purpose, relative to other members of the same fault tolerance group. Rendezvous fault tolerance software uses relative weight values to select which members to activate; members with higher weight take precedence over members with lower weight.</p> <p>Acceptable values range from 1 to 65535. Zero is a special, reserved value; Rendezvous fault tolerance software assigns zero weight to processes with resource errors, so they only activate when no other members are available. For more information, see Weight below.</p>	
		Set

Public Events

ActionTokenReceived	ActionTokenReceivedEventHandler
	An action token arrived.

Method	Description	Page
FTGroupMember	Create a member of a fault tolerance group.	FTGroupMember
FTGroupMember.Destroy	Destroy a member of a fault tolerance group.	FTGroupMember.Destroy

Weight

Weight summarizes the relative suitability of a member for its task, relative to other members of the same fault tolerance group. That suitability is a combination of computer speed and load factors, network bandwidth, computer and network reliability, and other factors. Programs may reset their weight when any of these factors change, overriding the previous assigned weight.

You can use relative weights to indicate priority among group members.

Zero is a special value; Rendezvous fault tolerance software assigns zero weight to processes with resource errors, so they only activate when no other members are available. Programs must always assign weights greater than zero.

When Rendezvous fault tolerance software requests a resource but receives an error (for example, the member process cannot allocate memory, or start a timer), it attempts to send the member process a [DISABLING.MEMBER](#) advisory message, and sets the member's weight to zero, effectively disabling the member. Weight zero implies that this member is active only as a last resort—when no other members outrank it. (However, if the disabled member process does become active, it might not operate correctly.)

For more information, see [Rank and Weight](#) and [Adjusting Member Weights](#).

Related Classes

[FTGroupMonitor](#)

See Also

[ActionTokenReceivedEventHandler](#)

FTGroupMember

Constructor

Visual Basic

```
Public Sub New(  
    ByVal queue As Queue,  
    ByVal actionTokenReceivedEventHandler  
        As ActionTokenReceivedEventHandler,  
    ByVal transport As Transport,  
    ByVal groupName As String,  
    ByVal weight As UInt16,  
    ByVal activeGoal As UInt16,  
    ByVal heartbeatInterval As Double,  
    ByVal preparationInterval As Double,  
    ByVal activationInterval As Double,  
    ByVal closure As Object )
```

C#

```
public FTGroupMember(  
    Queue queue,  
    ActionTokenReceivedEventHandler  
        actionTokenReceivedEventHandler,  
    Transport transport,  
    string groupName,  
    ushort weight,  
    ushort activeGoal,  
    double heartbeatInterval,  
    double preparationInterval,  
    double activationInterval,  
    object closure )
```

Purpose

Create a member of a fault tolerance group.

Remarks

Upon creating a member object, the program becomes a member of the group.

A program may hold simultaneous memberships in several distinct fault tolerance groups. For examples, see [Multiple Groups in TIBCO Rendezvous Concepts](#).

Avoid joining the same group twice. It is illegal for a program to maintain more than one membership in any one fault tolerance group. The constructor does not guard against this illegal situation, and results are unpredictable.

All arguments are required except for `preparationInterval` (which may be zero) and `closure` (which may be null).

Intervals

The heartbeat interval must be less than the activation interval. If the preparation interval is non-zero, it must be greater than the heartbeat interval and less than the activation interval. It is an error to violate these rules.

In addition, intervals must be reasonable for the hardware and network conditions. For information and examples, see [Step 4: Choose the Intervals in TIBCO Rendezvous Concepts](#).

Group Name

The group name must be a legal Rendezvous subject name (see [Subject Names in TIBCO Rendezvous Concepts](#)). You may use names with several elements; for examples, see [Multiple Groups in TIBCO Rendezvous Concepts](#).

Parameter	Description
<code>queue</code>	Place fault tolerance events for this member on this event queue.
<code>actionTokenReceivedEventHandler</code>	<p>On dispatch, process the event with this delegate.</p> <p>Every group member requires a handler delegate. For convenience, supply the delegate to the constructor through this parameter. (It also possible to omit this parameter, and add the handler to the ActionTokenReceived event later, using a .NET call.)</p>

Parameter	Description
transport	Use this transport for fault tolerance internal protocol messages (such as heartbeat messages).
groupName	<p>Join the fault tolerant group with this name.</p> <p>The group name must conform to the syntax required for Rendezvous subject names. For details, see Subject Names in TIBCO Rendezvous Concepts.</p>
weight	<p>Weight represents the ability of this member to fulfill its purpose, relative to other members of the same fault tolerance group. Rendezvous fault tolerance software uses relative weight values to select which members to activate; members with higher weight take precedence over members with lower weight.</p> <p>Acceptable values range from 1 to 65535. Zero is a special, reserved value; Rendezvous fault tolerance software assigns zero weight to processes with resource errors, so they only activate when no other members are available.</p> <p>For more information, see Rank and Weight in TIBCO Rendezvous Concepts.</p>
activeGoal	<p>Rendezvous fault tolerance software sends callback instructions to maintain this number of active members.</p> <p>Acceptable values range from 1 to 65535.</p>
heartbeatInterval	<p>When this member is active, it sends heartbeat messages at this interval (in seconds).</p> <p>The interval must be positive. To determine the correct value, see Step 4: Choose the Intervals in TIBCO Rendezvous Concepts.</p>
preparationInterval	When the heartbeat signal from one or more active

Parameter	Description
activationInterval	<p>members has been silent for this interval (in seconds), Rendezvous fault tolerance software issues an early warning hint (ActionToken.PrepareToActivate) to the ranking inactive member. This warning lets the inactive member prepare to activate, for example, by connecting to a database server, or allocating memory.</p> <p>The interval must be non-negative. Zero is a special value, indicating that the member does not need advance warning to activate; Rendezvous fault tolerance software never issues a ActionToken.PrepareToActivate hint when this value is zero. To determine the correct value, see Step 4: Choose the Intervals in TIBCO Rendezvous Concepts.</p>
closure	Store this closure data in the member object.

See Also

[FTGroupMember.](#)

[ActionTokenReceivedEventHandler.](#)

[FTGroupMember.Destroy.](#)

Step 1: Choose a Group Name in TIBCO Rendezvous Concepts

Step 2: Choose the Active Goal in TIBCO Rendezvous Concepts

Step 4: Choose the Intervals in TIBCO Rendezvous Concepts

Step 5: Program Start Sequence in TIBCO Rendezvous Concepts

FTGroupMember.Destroy

Method

Visual Basic

```
Public Sub Destroy ()
```

C#

```
public void Destroy ();
```

Purpose

Destroy a member of a fault tolerance group.

Remarks

By destroying a member object, the program cancels or withdraws its membership in the group.

This method has two effects:

- If this member is active, stop sending the heartbeat signal.
- Reclaim the program storage associated with this member.

Once a program withdraws from a group, it no longer receives fault tolerance events. One direct consequence is that an active program that withdraws can never receive an instruction to deactivate.

See Also

[FTGroupMember](#)

ActionToken

Enumeration

Visual Basic

```
Public Enum ActionToken
```

C#

```
public enum ActionToken
```

Description

These enumerated constants specify the possible strategies for batching outbound messages.

Remarks

Each of these constants is a token designating a command to a fault tolerance callback method. The program's callback method receives one of these tokens, and interprets it as an instruction from the Rendezvous fault tolerance software as described in this table (see also, Fault Tolerance Callback Actions in TIBCO Rendezvous Concepts).

Member	Description
ActionToken.PrepareToActivate	Prepare to activate (hint). Rendezvous fault tolerance software passes this token to the callback method to instruct the program to make itself ready to activate on short notice—so that if the callback method

Member	Description
	<p>subsequently receives the instruction to activate, it can do so without delay.</p> <p>This token is a hint, indicating that the program might soon receive an instruction to activate. It does not guarantee that an activate instruction will follow, nor that any minimum time will elapse before an activate instruction follows.</p>
ActionToken.Activate	<p>Activate immediately.</p> <p>Rendezvous fault tolerance software passes this token to the callback method to instruct the program to activate.</p>
ActionToken.Deactivate	<p>Deactivate immediately.</p> <p>Rendezvous fault tolerance software passes this token to the callback method to instruct the program to deactivate.</p>

ActionTokenReceivedEventArgs

Class

Superclasses

```
System.Object
  EventArgs
    ActionTokenReceivedEventArgs
```

Visual Basic

```
Public Class ActionTokenReceivedEventArgs
  Inherits EventArgs
```

C#

```
public class ActionTokenReceivedEventArgs : EventArgs
```

Purpose

Action token received events pass instances of this class to their event handlers.

Member	Description
--------	-------------

Public Instance Properties

ActionToken	ActionToken Get
	This token specifies the response required of the group member.

Member	Description	
Closure	object The closure data, which the program supplied in the call that created the group member.	Get
GroupName	string The group name of the member.	Get

See Also

[FTGroupMember](#)

[ActionTokenReceivedEventHandler](#)

ActionTokenReceivedEventHandler

Delegate

Visual Basic

```
Public Delegate Sub ActionTokenReceivedEventHandler (  
    ByVal ftGroupMember As Object,  
    ByVal actionTokenReceivedEventArgs  
        As ActionTokenReceivedEventArgs )
```

C#

```
public delegate void ActionTokenReceivedEventHandler (  
    object ftGroupMember,  
    ActionTokenReceivedEventArgs actionTokenReceivedEventArgs );
```

Purpose

Process action token events for a fault tolerance group member.

Parameter	Description
ftGroupMember	This parameter receives the group member object.
actionTokenReceivedEventArgs	This parameter receives the closure and the action token.

Implementation

Each member program of a fault tolerance group must implement this method. Programs register a member callback delegate with each call to [FTGroupMember](#).

Rendezvous fault tolerance software queues a member action event in three situations. In each case, it passes a different `action` argument, instructing the callback method to activate, deactivate, or prepare to activate the program.

- When the number of active members drops below the active goal, the fault tolerance callback method (in the ranking inactive member process) receives the token [ActionToken.Activate](#); the callback method must respond by assuming the duties of an active member.
- When the number of active members exceeds the active goal, the fault tolerance callback method (in any active member that is outranked by another active member) receives the action token [ActionToken.Deactivate](#); the callback method must respond by switching the program to its inactive state.
- When the number of active members equals the active goal, and Rendezvous fault tolerance software detects that it might soon decrease below the active goal, the fault tolerance callback method (in the ranking inactive member) receives the action token [ActionToken.PrepareToActivate](#); the callback method must respond by making the program ready to activate immediately. For example, preparatory steps might include time-consuming tasks such as connecting to a database. If the callback method subsequently receives the [ActionToken.Activate](#) token, it will be ready to activate without delay.

For additional information see Fault Tolerance Callback Actions in TIBCO Rendezvous Concepts.

See Also

[FTGroupMember](#)

[ActionTokenReceivedEventArgs](#)

FTGroupMonitor

Class

Superclasses

```
System.Object  
    FTGroupMonitor
```

Visual Basic

```
Public Class FTGroupMonitor
```

C#

```
public class FTGroupMonitor
```

Purpose

Monitor a fault tolerance group.

Remarks

Upon creating this object, the program monitors a fault tolerance group.

Monitors are passive—they do not affect the group members in any way.

Rendezvous fault tolerance software queues a monitor event whenever the number of active members in the group changes—either it detects a new heartbeat, or it detects that the heartbeat from a previously active member is now silent, or it receives a message from the fault tolerance component of an active member indicating deactivation or termination.

The monitor callback method receives the number of active members as an argument.

By destroying a monitor object, the program stops monitoring the fault tolerance group. The method [FTGroupMonitor.Destroy](#) destroys a monitor explicitly and immediately. You can also destroy a monitor implicitly by deleting all references to it, but the garbage collector might introduce a delay before it destroys the object.

Destroying the queue or transport of a monitor automatically destroys the monitor as well.

Member	Description
--------	-------------

Public Instance Properties

GroupName	string	Get
The instance monitors the fault tolerant group with this name.		
Transport	Transport	Get
The group monitor uses this transport to receive fault tolerance internal protocol messages (such as heartbeat messages).		

Public Events

GroupStateChanged	GroupStateChangedEventHandler
The number of active members in a group changed.	

Method	Description	Page
FTGroupMonitor	Monitor a fault tolerance group.	FTGroupMonitor
FTGroupMonitor.Destroy	Stop monitoring a fault tolerance group, and free associated resources.	FTGroupMonitor.Destroy

Related Classes

[FTGroupMember](#)

See Also

[GroupStateChangedEventHandler](#)

FTGroupMonitor

Constructor

Visual Basic

```
Overloads Public Sub New(  
    ByVal queue As Queue,  
    ByVal groupStateChangedEventHandler  
        As GroupStateChangedEventHandler,  
    ByVal transport As Transport,  
    ByVal groupName As String,  
    ByVal lostInterval As Double,  
    ByVal closure As Object )  
Overloads Public Sub New(  
    ByVal queue As Queue,  
    ByVal transport As Transport,  
    ByVal groupName As String,  
    ByVal lostInterval As Double,  
    ByVal closure As Object )
```

C#

```
public FTGroupMonitor(  
    Queue queue,  
    GroupStateChangedEventHandler  
        groupStateChangedEventHandler,  
    Transport transport,  
    string groupName,  
    double lostInterval,  
    object closure )  
public FTGroupMonitor(  
    Queue queue,  
    Transport transport,  
    string groupName,  
    double lostInterval,  
    object closure )
```

Purpose

Monitor a fault tolerance group.

Remarks

The monitor event handler delegate receives the number of active members as an argument.

The group need not have any members at the time of this constructor call.

Parameter	Description
queue	Place events for this monitor on this event queue.
groupStateChangedEventHandler	<p>On dispatch, process the event with this delegate.</p> <p>Every group monitor requires a handler delegate. For convenience, supply the delegate to the constructor through this parameter. (It also possible to omit this parameter, and add the handler to the GroupStateChanged event later, using a .NET call.)</p>
transport	Listen on this transport for fault tolerance internal protocol messages (such as heartbeat messages).
groupName	<p>Monitor the fault tolerant group with this name.</p> <p>The group name must conform to the syntax required for Rendezvous subject names. For details, see Subject Names in TIBCO Rendezvous Concepts.</p> <p>See also, Group Name.</p>
lostInterval	<p>When the heartbeat signal from an active member has been silent for this interval (in seconds), Rendezvous fault tolerance software considers that member lost, and queues a monitor event.</p> <p>The interval must be positive. To determine the correct value, see Step 4: Choose the Intervals in TIBCO</p>

Parameter	Description
	Rendezvous Concepts. See also, Lost Interval .
<code>closure</code>	Store this closure data in the monitor object.

Lost Interval

The monitor uses the `lostInterval` to determine whether a member is still active. When the heartbeat signal from an active member has been silent for this interval (in seconds), the monitor considers that member lost, and queues a monitor event.

We recommend setting the `lostInterval` identical to the group's `activationInterval`, so the monitor accurately reflects the behavior of the group members.

Group Name

The group name must be a legal Rendezvous subject name (see Subject Names in TIBCO Rendezvous Concepts in TIBCO Rendezvous Concepts). You may use names with several elements; for examples, see Multiple Groups in TIBCO Rendezvous Concepts.

See Also

[GroupStateChangedEventHandler](#).

[FTGroupMonitor.Destroy](#).

FTGroupMonitor.Destroy

Method

Visual Basic

```
Public Sub Destroy ()
```

C#

```
public void Destroy ();
```

Declaration

```
void Destroy()
```

Purpose

Stop monitoring a fault tolerance group, and free associated resources.

Remarks

This method throws an exception when the monitor object is already invalid, or when its queue or transport are invalid.

See Also

[FTGroupMonitor](#)

GroupStateChangedEventArgs

Class

Superclasses

```
System.Object
  EventArgs
    GroupStateChangedEventArgs
```

Visual Basic

```
Public Class GroupStateChangedEventArgs
    Inherits EventArgs
```

C#

```
public class GroupStateChangedEventArgs : EventArgs
```

Purpose

Group state changed events pass instances of this class to their event handlers.

Member	Description
--------	-------------

Public Instance Properties

Closure	object	Get
The closure data, which the program supplied in the call that created the monitor.		

Member	Description	
NumberActiveMembers	uint The number of group members now active.	Get

See Also

[FTGroupMonitor](#)

[GroupStateChangedEventHandler](#)

GroupStateChangedEventHandler

Delegate

Visual Basic

```
Public Delegate Sub GroupStateChangedEventHandler (  
    ByVal monitor As Object,  
    ByVal groupStateChangedEventArgs  
        As GroupStateChangedEventArgs )
```

C#

```
public delegate void GroupStateChangedEventHandler (  
    object monitor,  
    GroupStateChangedEventArgs groupStateChangedEventArgs );
```

Purpose

Process fault tolerance events for a monitor.

Parameter	Description
monitor	This parameter receives the monitor object.
groupStateChangedEventArgs	This parameter receives the closure and the number of active group members.

Implementation

Rendezvous fault tolerance software queues a monitor event whenever the number of active members in the group changes. Programs can define this delegate to handle such events, and register it in a call to [FTGroupMonitor](#).

A program need not be a member of a group in order to monitor that group. Programs that do not monitor need not define a monitor callback method.

See Also

[FTGroupMonitor](#)

[GroupStateChangedEventArgs](#)

Certified Message Delivery

Although Rendezvous communications are highly reliable, some applications require even stronger assurances of delivery. Certified delivery features offers greater certainty of delivery—even in situations where processes and their network connections are unstable.

See Also

This API implements Rendezvous certified delivery features. For a complete discussion, see [Certified Message Delivery](#).

Certified delivery software uses advisory messages extensively. For example, advisories inform sending and receiving programs of the delivery status of each message. For complete details, see [Certified Message Delivery \(RVCM\) Advisory Messages](#).

If your application sends or receives certified messages across network boundaries, you must configure the Rendezvous routing daemons to exchange `_RVCM` administrative messages. For details, see [Certified Message Delivery](#).

Some programs require certified delivery to *one of n* worker processes. See [Distributed Queue](#).

CMListener

Class

Superclasses

```
System.Object  
  Listener  
    CMListener
```

Visual Basic

```
Public Class CMListener  
  Inherits Listener
```

C#

```
public class CMListener : Listener
```

Purpose

A certified delivery listener object listens for labeled messages and certified messages.

Remarks

Each call to the constructor [CMListener](#) results in a new certified delivery listener, which represents your program's listening interest in a stream of labeled messages and certified messages. Rendezvous software uses the same listener object to signal each occurrence of such an event.

We recommend that programs explicitly destroy each certified delivery listener object using [CMListener.Destroy](#). Destroying a certified listener object cancels the program's immediate interest in that event, and frees its storage; nonetheless, a parameter to the destroy call

determines whether certified delivery agreements continue to persist beyond the destroy call.

Programs must destroy instances of this class. Rendezvous software keeps internal references to these objects, so the garbage collector does not delete them automatically.

Destroying the queue or the certified delivery transport of a listener object automatically destroys the listener as well (but certified delivery agreements continue to persist).

Member	Description
--------	-------------

Public Instance Properties

Queue	Queue The listener's event queue. (Inherited from Listener .)	Get
Subject	string The listener expresses interest in this subject, and receives messages with matching destination subjects. (Inherited from Listener .)	Get
Transport	Transport The listener receives inbound messages from this transport. (Inherited from Listener .)	Get

Method	Description	Page
CMListener	Listen for messages that match the subject, and request certified delivery when available.	CMListener
CMListener.ConfirmMessage	Explicitly	CMListener.ConfirmMessage

Method	Description	Page
	confirm delivery of a certified message.	
CMListener.Destroy	Destroy a certified delivery listener.	CMListener.Destroy
CMListener.SetExplicitConfirmation	Override automatic confirmation of delivery for this listener.	CMListener.SetExplicitConfirmation

Related Classes

[Listener](#)

[MessageReceivedEventHandler](#)

CMListener

Constructor

Visual Basic

```
Overloads Public Sub New(  
    ByVal queue As Queue,  
    ByVal messageReceivedEventHandler As MessageReceivedEventHandler,  
    ByVal cmTransport As CMTransport,  
    ByVal subject As String,  
    ByVal closure As Object )  
Overloads Public Sub New(  
    ByVal queue As Queue,  
    ByVal cmTransport As CMTransport,  
    ByVal subject As String,  
    ByVal closure As Object )
```

C#

```
public CMListener(  
    Queue queue,  
    MessageReceivedEventHandler messageReceivedEventHandler,  
    CMTransport cmTransport,  
    string subject,  
    object closure );  
public CMListener(  
    Queue queue,  
    CMTransport cmTransport,  
    string subject,  
    object closure );
```

Purpose

Listen for messages that match the subject, and request certified delivery when available.

Parameter	Description
queue	For each inbound message, place the listener event on this event queue.
messageReceivedEventHandler	On dispatch, process the event with this delegate. Every listener requires a handler delegate. For convenience, supply the delegate to the constructor through this parameter. (It also possible to omit this parameter, and add the handler to the MessageReceived event later, using a .NET call.)
cmTransport	Listen for inbound messages on this certified delivery transport.
subject	Listen for inbound messages with subjects that match this specification. Wildcard subjects are permitted. The empty string is not a legal subject name.
closure	Store this closure data in the event object.

Activation and Dispatch

Details of CM listener event semantics are identical to those for ordinary listeners; see [Activation and Dispatch](#).

Inbox Listener

To receive unicast (point-to-point) messages, listen to a unique inbox subject name. First call [Transport.CreateInbox](#) to create the unique inbox name; then call [CMListener](#) to begin listening. Remember that other programs have no information about an inbox until the listening program uses it as a reply subject in an outbound message.

See Also

[CMListener](#)

[CMTransport.Destroy](#)

[Transport.CreateInbox](#)

CMListener.ConfirmMessage

Method

Visual Basic

```
Public Sub ConfirmMessage(  
    ByVal message As Message);
```

C#

```
public void ConfirmMessage(  
    Message message );
```

Purpose

Explicitly confirm delivery of a certified message.

Remarks

Use this method only in programs that override automatic confirmation (see [CMListener.SetExplicitConfirmation](#)). The default behavior of certified listeners is to automatically confirm delivery when the callback method returns.

Parameter	Description
message	Confirm receipt of this message.

Unregistered Message

When a CM listener receives a labeled message, its behavior depends on context:

- If a CM listener is registered for certified delivery, it presents the supplementary information to the callback method. If the sequence number is present, then the receiving program can confirm delivery.
- If a CM listener is *not* registered for certified delivery with the sender, it presents the sender's name to the callback method, but omits the sequence number. In this case, the receiving program cannot confirm delivery; [CMListener.ConfirmMessage](#) throws an exception with the status code [NotPermitted](#).

Notice that the first labeled message that a program receives on a subject might not be certified; that is, the sender has not registered a certified delivery agreement with the listener. If appropriate, the certified delivery library automatically requests that the sender register the listener for certified delivery. (See [Discovery and Registration for Certified Delivery](#).)

A labeled but uncertified message can also result when the sender explicitly disallows or removes the listener.

See Also

[CMListener](#)

[CMListener.SetExplicitConfirmation](#)

CMListener.Destroy

Method

Visual Basic

```
Overloads Public Sub Destroy()  
Overloads Public Sub Destroy(  
    ByVal cancelAgreements As Boolean);
```

C#

```
public void override Destroy();  
public void Destroy(  
    bool cancelAgreements );
```

Purpose

Destroy a certified delivery listener.

Parameter	Description
cancelAgreements	<p>true cancels all certified delivery agreements of this listener; certified senders delete from their ledgers all messages sent to this listener.</p> <p>false leaves all certified delivery agreements in effect, so certified senders continue to store messages.</p> <p>When absent, the default value is false.</p>

Canceling Agreements

When destroying a certified delivery listener, a program can either cancel its certified delivery agreements with senders, or let those agreements persist (so a successor listener can receive the messages covered by those agreements).

When canceling agreements, each (previously) certified sender transport receives a `REGISTRATION.CLOSED` advisory. Successor listeners cannot receive old messages.

See Also

[CMListener](#)

CMListener.SetExplicitConfirmation

Method

Visual Basic

```
Public Sub SetExplicitConfirmation()
```

C#

```
public void SetExplicitConfirmation();
```

Purpose

Override automatic confirmation of delivery for this listener.

Remarks

The default behavior of certified listeners is to automatically confirm delivery when the callback method returns (see [MessageReceivedEventHandler](#)). This call selectively overrides this behavior for this specific listener (without affecting other listeners).

By overriding automatic confirmation, the listener assumes responsibility to explicitly confirm each inbound certified message by calling [CMListener.ConfirmMessage](#).

Consider overriding automatic confirmation when the processing of inbound messages involves activity that is asynchronous with respect to the message callback method; for example, computations in other threads or additional network communications.

No method exists to restore the default behavior—that is, to reverse the effect of this method.

See Also

[MessageReceivedEventHandler](#)

[CMListener](#)

[CMListener.ConfirmMessage](#)

CMTransport

Class

Superclasses

```
System.Object  
  Transport  
    CMTransport
```

Visual Basic

```
Public Class CMTransport  
    Inherits Transport
```

C#

```
public class CMTransport : Transport
```

Purpose

A certified delivery transport object implements the CM delivery protocol for messages.

Remarks

Each certified delivery transport employs a [Transport](#) for network communications. [CMTransport](#) adds the accounting mechanisms needed for delivery tracking and certified delivery.

Several [CMTransport](#) objects can employ a [Transport](#), which also remains available for its own ordinary listeners and for sending ordinary messages.


Programs must explicitly destroy each certified delivery transport object. Destroying a certified delivery transport object invalidates subsequent certified send calls on that object,

invalidates any certified listeners using that transport (while preserving the certified delivery agreements of those listeners).

Whether explicitly or implicitly, programs must destroy instances of this class. Rendezvous software keeps internal references to these objects, so the garbage collector does not delete them automatically.

Member	Description
Public Instance Properties	
BaseTransport	<div> NetTransport Get </div> <p>The transport employed by the certified delivery transport; see CMTransport.</p>
DefaultTimeLimit	<div> double <div> Get Set </div> </div> <p>The default message time limit (in whole seconds) for all outbound certified messages from the transport.</p> <p>Every labeled message has a time limit, after which the sender no longer certifies delivery.</p> <p>Sending programs can explicitly set the time limit on a CMMessage (see TimeLimit). If a time limit is not already set for the outbound message, the transport sets it to the transport's default time limit property; if this default is not set for the transport (nor for the message), the default time limit is zero (no time limit).</p> <p>Time limits represent the minimum time that certified delivery is in effect.</p> <p>The time limit must be non-negative, and specifies a whole number of seconds.</p>

Member	Description	
Description	string	Get
	The description identifies programs and their transports to Rendezvous components. Browser administration interfaces display the description string. (Inherited from Transport .)	Set
	As a debugging aid, we recommend setting a unique description string for each transport. Use a string that distinguishes both the application and the role of the transport within it.	
LedgerName	string	Get
	The name of the ledger file; see CMTransport .	
	An exception with the error code ArgumentsConflict can indicate that the transport does not have a ledger file.	
Name	string	Get
	The correspondent name; see CMTransport .	
PublisherInactivityDiscardInterval	int	Set
	Time limit (in whole seconds) after which a listening CM transport can discard state for inactive CM senders.	
	The timeout value limits the time that can elapse during which such a sender does not send a message. When the elapsed time exceeds this limit, the listening transport declares the sender inactive, and discards internal state corresponding to the sender.	

Member	Description	
	The time limit must be non-negative.	
 Warning	<p>We discourage programmers from using this call except to solve a very specific problem, in which a long-running CM listener program accumulates state for a large number of obsolete CM senders with non-reusable names.</p> <p>Before using this call, review every subject for which the CM transport has a listener; ensure that only CM senders with non-reusable names send to those subjects. (If senders with reusable names send messages to such subjects, the listening transport can discard their state, and incorrect behavior can result.)</p>	
RequestOld	bool	Get
	The request old messages flag of the certified delivery transport; see CMTransport .	
SynchronizeLedger	bool	Get
	<p>The sync ledger flag of a certified delivery transport; see CMTransport.</p> <p>An exception with the error code ArgumentsConflict can indicate that the transport does not have a ledger file.</p>	

Method	Description	Page
CMTransport	Create a transport for certified delivery.	CMTransport

Method	Description	Page
CMTransport.AddListener	Pre-register an anticipated listener.	CMTransport.AddListener
CMTransport.AllowListener	Invite the named receiver to reinstate certified delivery for its listeners, superseding the effect of any previous disallow calls.	CMTransport.AllowListener
CMTransport.Destroy	Destroy a certified delivery transport.	CMTransport.Destroy
CMTransport.DisallowListener	Cancel certified delivery to all listeners at a specific correspondent. Deny subsequent certified delivery registration requests from those listeners.	CMTransport.DisallowListener
CMTransport.RemoveListener	Unregister a specific listener at a specific correspondent,	CMTransport.RemoveListener

Method	Description	Page
	and free associated storage in the sender's ledger.	
CMTransport.RemoveSendState	Reclaim ledger space from obsolete subjects.	CMTransport.RemoveSendState
CMTransport.ReviewLedger	Query the ledger for stored items related to a subject name.	CMTransport.ReviewLedger
CMTransport.Send	Send a labeled message.	CMTransport.Send
CMTransport.SendReply	Send a labeled reply message.	CMTransport.SendReply
CMTransport.SendRequest	Send a labeled request message and wait for a reply.	CMTransport.SendRequest
CMTransport.SynchronizeLedgerNow	Synchronize the ledger to its storage medium.	CMTransport.SynchronizeLedgerNow
Inherited Methods		
Transport.CreateInbox		

Related Classes

[Transport](#)

[Transport.CreateInbox](#)

[CMTransport](#)

[CMQueueTransport](#)

CMTransport

Constructor

Visual Basic

```
Overloads Public Sub New(  
    ByVal netTransport As NetTransport,  
    ByVal cmName As String,  
    ByVal requestOld As Boolean,  
    ByVal ledgerName As String,  
    ByVal syncLedger As Boolean )  
Overloads Public Sub New(  
    ByVal netTransport As NetTransport,  
    ByVal cmName As String,  
    ByVal requestOld As Boolean,  
    ByVal ledgerName As String,  
    ByVal syncLedger As Boolean )  
Overloads Public Sub New(  
    ByVal netTransport As NetTransport,  
    ByVal cmName As String,  
    ByVal requestOld As Boolean )  
Overloads Public Sub New(  
    ByVal netTransport As NetTransport )
```

C#

```
CMTransport(  
    NetTransport netTransport,  
    string cmName,  
    bool requestOld,  
    string ledgerName,  
    bool syncLedger );  
CMTransport(  
    NetTransport netTransport,  
    string cmName,  
    bool requestOld,  
    string ledgerName,  
    bool syncLedger );  
CMTransport(  
    NetTransport netTransport,
```

```
NetTransport netTransport,  
string cmName,  
bool requestOld );  
CMTransport(  
    NetTransport netTransport );
```

Purpose

Create a transport for certified delivery.

Remarks

The new certified delivery transport must employ a valid transport for network communications.

The certified delivery transport remains valid until the program explicitly destroys it.

Parameter	Description
transport	<p>The new CMTransport employs this transport object for network communications.</p> <p>This object must be a NetTransport.</p> <p>Destroying the CMTransport does not affect this NetTransport object.</p>
cmName	<p>Bind this reusable name to the new CMTransport, so the CMTransport represents a persistent correspondent with this name.</p> <p>If non-null, the name must conform to the syntax rules for Rendezvous subject names. It cannot begin with reserved tokens. It cannot be a non-reusable name generated by another call to the CMTransport constructor. It cannot be the empty string.</p> <p>If omitted or null, then the constructor generates a unique, non-reusable name for the duration of the transport.</p> <p>For more information, see Name.</p>
requestOld	<p>This parameter indicates whether a persistent correspondent requires delivery of messages sent to a previous certified delivery transport with the</p>

Parameter	Description
	<p>same name, for which delivery was not confirmed. Its value affects the behavior of other CM sending transports.</p> <p>If this parameter is <code>true</code> <i>and</i> <code>cmName</code> is non-null, then the new CMTransport requires certified senders to retain unacknowledged messages sent to this persistent correspondent. When the new CMTransport begins listening to the appropriate subjects, the senders can complete delivery. (It is an error to supply <code>true</code> when <code>cmName</code> is null.)</p> <p>If this parameter is <code>false</code> (or omitted), then the new CMTransport does not require certified senders to retain unacknowledged messages. Certified senders may delete those messages from their ledgers.</p>
<code>ledgerName</code>	<p>If this argument is non-null, then the new CMTransport uses a file-based ledger. The argument must represent a valid file name. Actual locations corresponding to relative file names conform to operating system conventions. We strongly discourage using the empty string as a ledger file name.</p> <p>If omitted or null, then the new CMTransport uses a process-based ledger.</p> <p>For more information, see Ledger File.</p>
<code>syncLedger</code>	<p>If this argument is <code>true</code>, then operations that update the ledger file do not return until the changes are written to the storage medium.</p> <p>If this argument is <code>false</code> (or omitted), the operating system writes changes to the storage medium asynchronously.</p>

Name

If `cmName` is null, then [CMTransport](#) generates a unique, non-reusable name for the new certified delivery transport.

If `cmName` is non-null, then the new transport binds that name. A correspondent can persist beyond transport destruction only when it has *both* a reusable name *and* a file-based ledger.

For more information about the use of reusable names, see CM Correspondent Name in TIBCO Rendezvous Concepts, and Persistent Correspondents in TIBCO Rendezvous

Concepts. For details of reusable name syntax, see Reusable Names in TIBCO Rendezvous Concepts.

Ledger File

Every certified delivery transport stores the state of its certified communications in a ledger.

If `ledgerFile` is null, then the new transport stores its ledger exclusively in process-based storage. When you destroy the transport or the process terminates, all information in the ledger is lost.

If `ledgerFile` specifies a valid file name, then the new transport uses that file for ledger storage. If the transport is destroyed or the process terminates with incomplete certified communications, the ledger file records that state. When a new transport binds the same reusable name, it reads the ledger file and continues certified communications from the state stored in the file.

Even though a transport uses a ledger file, it may sometimes replicate parts of the ledger in process-based storage for efficiency; however, programmers cannot rely on this replication.

The `syncLedger` parameter determines whether writing to the ledger file is a synchronous operation:

- To specify synchronous writing, supply `true`. Each time Rendezvous software writes a ledger item, the call does not return until the data is safely stored in the storage medium.
- To specify asynchronous writing (the default), supply `false`. Certified delivery calls may return before the data is safely stored in the storage medium, which results in greater speed at the cost of certainty. The ledger file might not accurately reflect program state in cases of hardware or operating system kernel failure (but it is accurate in cases of sudden program failure). Despite this small risk, we strongly recommend this option for maximum performance.

A program that uses an asynchronous ledger file can explicitly synchronize it by calling [CMTransport.SynchronizeLedgerNow](#).

Destroying a transport with a file-based ledger always leaves the ledger file intact; it neither erases nor removes a ledger file.

The ledger file must reside on the same host computer as the program that uses it.

See Also

[CMTransport.Destroy](#)

CMTransport.AddListener

Method

Visual Basic

```
Public Sub AddListener(  
    ByVal cmName As String,  
    ByVal subject As String )
```

C#

```
public void AddListener(  
    string cmName,  
    string subject );
```

Purpose

Pre-register an anticipated listener.

Remarks

Some sending programs can anticipate requests for certified delivery—even before the listening programs actually register. In such situations, the sending transport can pre-register listeners, so Rendezvous software begins storing outbound messages in the sender's ledger; when the listener requests certified delivery, it receives the backlogged messages.

If the correspondent with this `cmName` already receives certified delivery of this subject from this sender transport, then [CMTransport.AddListener](#) has no effect.

If the correspondent with this `cmName` is disallowed, [CMTransport.AddListener](#) throws an exception with status code [NotPermitted](#). You can call [CMTransport.AllowListener](#) to supersede the effect of a prior call to [CMTransport.DisallowListener](#); then call [CMTransport.AddListener](#) again.

It is not sufficient for a sender to use this method to anticipate listeners; the anticipated listening programs must also require old messages when creating certified delivery transports.

Parameter	Description
cmName	Anticipate a listener from a correspondent with this reusable name.
subject	Anticipate a listener for this subject. Wildcard subjects are illegal.

See Also

[Name](#)

[CMTransport.AllowListener](#)

[CMTransport.DisallowListener](#)

[CMTransport.RemoveListener](#)

Anticipating a Listener in TIBCO Rendezvous Concepts

CMTransport.AllowListener

Method

Visual Basic

```
Public Sub AllowListener(  
    ByVal cmName As String )
```

C#

```
public void AllowListener(  
    string cmName );
```

Purpose

Invite the named receiver to reinstate certified delivery for its listeners, superseding the effect of any previous *disallow* calls.

Remarks

Upon receiving the invitation to reinstate certified delivery, Rendezvous software at the listening program automatically sends new registration requests. The sending program accepts these requests, restoring certified delivery.

Parameter	Description
cmName	Accept requests for certified delivery to listeners at the transport with this correspondent name.

See Also

[Name](#)

[CMTransport.DisallowListener](#)

[Disallowing Certified Delivery](#)

CMTransport.Destroy

Method

Visual Basic

```
Overrides Public Sub Destroy()
```

C#

```
public override void Destroy();
```

Purpose

Destroy a certified delivery transport.

Remarks

Destroying a certified delivery transport with a file-based ledger always leaves the ledger file intact; it neither erases nor removes a ledger file.



Warning

When calling this method to destroy a distributed queue transport, the distributed queue needs the listeners, queues and dispatchers (associated with the transport) to remain operational—otherwise the distributed queue can lose reliable (non-certified) task messages before they are processed. Programs must wait until after the transport has been completely destroyed before destroying these associated objects.

Destruction is asynchronous. Use a weak reference to determine when the garbage collector has completely destroyed the transport object.

See Also

[CMTransport](#)

CMTransport.DisallowListener

Method

Visual Basic

```
Public Sub DisallowListener(  
    ByVal cmName As String )
```

C#

```
public void DisallowListener(  
    string cmName );
```

Purpose

Cancel certified delivery to all listeners at a specific correspondent. Deny subsequent certified delivery registration requests from those listeners.

Remarks

Disallowed listeners still receive subsequent messages from this sender, but delivery is not certified. In other words:

- The first labeled message causes the listener to initiate registration. Registration fails, and the listener discards that labeled message.
- The listener receives a [REGISTRATION.NOT_CERTIFIED](#) advisory, informing it that the sender has canceled certified delivery of all subjects.
- If the sender's ledger contains messages sent to the disallowed listener (for which this listener has not confirmed delivery), then Rendezvous software removes those ledger items, and does not attempt to redeliver those messages.
- Rendezvous software presents subsequent messages (from the canceling sender) to the listener without a sequence number, to indicate that delivery is not certified.

Senders can promptly revoke the acceptance of certified delivery by calling [CMTransport.DisallowListener](#) within the callback method that processes the [REGISTRATION.REQUEST](#) advisory.

This method disallows a correspondent by name. If the correspondent terminates, and another process instance (with the same reusable name) takes its place, the new process is still disallowed by this sender.

To supersede the effect of [CMTransport.DisallowListener](#), call [CMTransport.AllowListener](#).

Parameter	Description
cmName	Cancel certified delivery to listeners of the transport with this name.

See Also

[Name](#)

[CMTransport.AllowListener](#)

[Disallowing Certified Delivery](#)

CmTransport.ExpireMessages()

Method

Visual Basic

```
Public Sub ExpireMessages(  
    ByVal subject As String,  
    ByVal sequenceNumber As UInt64 )
```

C#

```
public void ExpireMessages(  
    string subject,  
    ulong sequenceNumber );
```

Purpose

Mark specified outbound CM messages as expired.

Remarks

This call checks the ledger for messages that match *both* the subject and sequence number criteria, and *immediately* marks them as expired.

Once a message has expired, the CM transport no longer attempts to redeliver it to registered listeners.

Rendezvous software presents each expired message to the sender in a [DELIVERY.FAILED](#) advisory. Each advisory includes all the fields of an expired message. (This call can cause many messages to expire simultaneously.)



Warning

Use with extreme caution. This call exempts the expired messages from certified delivery semantics. It is appropriate only in very few

situations.

For example, consider an application program in which an improperly formed CM message causes registered listeners to exit unexpectedly. When the listeners restart, the sender attempts to redeliver the offending message, which again causes the listeners to exit. To break this cycle, the sender can expire the offending message (along with all prior messages bearing the same subject).

Parameter	Description
subject	Mark messages with this subject. Wildcards subjects are permitted, but must exactly reflect the send subject of the message. For example, if the program sends to A.* then you may expire messages with subject A.* (however, A.> does not resolve to match A.*).
sequenceNumber	Mark messages with sequence numbers <i>less than or equal</i> to this value.

See Also

[DELIVERY.FAILED](#)

CMTransport.RemoveListener

Method

Visual Basic

```
Public Sub RemoveListener(  
    ByVal cmName As String,  
    ByVal subject As String )
```

C#

```
public void RemoveListener(  
    string cmName,  
    string subject );
```

Purpose

Unregister a specific listener at a specific correspondent, and free associated storage in the sender's ledger.

Remarks

This method cancels certified delivery of the specific subject to the correspondent with this name. The listening correspondent may subsequently re-register for certified delivery of the subject. (In contrast, [CMTransport.DisallowListener](#) cancels certified delivery of *all* subjects to the correspondent, *and* prohibits re-registration.)

Senders can call this method when the ledger item for a listening correspondent has grown very large. Such growth indicates that the listener is not confirming delivery, and may have terminated. Removing the listener reduces the ledger size by deleting messages stored for the listener.

When a sending program calls this method, certified delivery software in the sender behaves as if the listener had closed the endpoint for the subject. The sending program deletes from its ledger all information about delivery of the subject to the correspondent

with this `cmName`. The sending program receives a [REGISTRATION.CLOSED](#) advisory, to trigger any operations in the callback method for the advisory.

If the listening correspondent is available (running and reachable), it receives a [REGISTRATION.NOTE_CERTIFIED](#) advisory, informing it that the sender no longer certifies delivery of the subject.

If the correspondent with this name does not receive certified delivery of the subject from this sender [CMTransport](#), then [CMTransport.RemoveListener](#) throws an exception with the status code [InvalidArgument](#).

Parameter	Description
<code>cmName</code>	Cancel certified delivery of the subject to listeners of this correspondent.
<code>subject</code>	Cancel certified delivery of this subject to the named listener. Wildcard subjects are illegal.

See Also

[Name](#)

[CMTransport.AddListener](#)

[CMTransport.DisallowListener](#)

[Canceling Certified Delivery](#)

CMTransport.RemoveSendState

Method

Visual Basic

```
Public Sub RemoveSendState(  
    ByVal subject As String )
```

C#

```
public void RemoveSendState(  
    string subject );
```

Purpose

Reclaim ledger space from obsolete subjects.

Background

In some programs subject names are useful only for a limited time; after that time, they are never used again. For example, consider a server program that sends certified reply messages to client inbox names; it only sends one reply message to each inbox, and after delivery is confirmed and complete, that inbox name is obsolete. Nonetheless, a record for that inbox name remains in the server's ledger.

As such obsolete records accumulate, the ledger size grows. To counteract this growth, programs can use this method to discard obsolete subject records from the ledger.

The [DELIVERY.COMPLETE](#) advisory is a good opportunity to clear the send state of an obsolete subject. Another strategy is to review the ledger periodically, sweeping to detect and remove all obsolete subjects.

**Warning**

Do not use this method to clear subjects that are still in use.

Parameter	Description
subject	Remove send state for this obsolete subject.

Remarks

As a side-effect, this method resets the sequence numbering for the subject, so the next message sent on the subject would be number 1. In proper usage, this side-effect is never detected, since obsolete subjects are truly obsolete.

See Also

[CMTransport.ReviewLedger](#)

[CMTransport.Send](#)

[DELIVERY.COMPLETE](#)

CMTransport.ReviewLedger

Method

Visual Basic

```
Public Sub ReviewLedger(  
    ByVal reviewLedgerDelegate As ReviewLedgerDelegate,  
    ByVal subject As String,  
    ByVal closure As Object)
```

C#

```
public void ReviewLedger(  
    ReviewLedgerDelegate reviewLedgerDelegate,  
    string subject,  
    object closure );
```

Purpose

Query the ledger for stored items related to a subject name.

Remarks

The callback method receives one message for each matching subject of outbound messages stored in the ledger. For example, when F00.* is the subject, [CMTransport.ReviewLedger](#) calls its callback delegate separately for each matching subject—once for F00.BAR, once for F00.BAZ, and once for F00.BOX.

However, if the callback method returns non-null, then [CMTransport.ReviewLedger](#) returns immediately.

If the ledger does not contain any matching items, [CMTransport.ReviewLedger](#) returns normally without calling the callback method.

For information about the content and format of the callback delegate, see [ReviewLedgerDelegate](#).

Parameter	Description
reviewLedgerDelegate	This delegate processes the review messages.
subject	Query for items related to this subject name. If this subject contains wildcard characters (* or >), then review all items with matching subject names. The callback method receives a separate message for each matching subject in the ledger.
closure	Pass this closure data to the review ledger delegate.

See Also

[ReviewLedgerDelegate](#)

CMTransport.Send

Method

Visual Basic

```
Overrides Public Sub Send (  
    ByVal message As Message )
```

C#

```
public override void Send (  
    Message message );
```

Purpose

Send a labeled message.

Remarks

This method sends the message, along with its certified delivery protocol information: the correspondent name of the [CMTransport](#), a sequence number, and a time limit. The protocol information remains on the message within the sending program, and also travels with the message to all receiving programs.

Programs can explicitly set the message time limit; see [TimeLimit](#). If a time limit is not already set for the outbound message, this method sets it to the transport's default time limit (see [DefaultTimeLimit](#)); if that default is not set for the transport, the default time limit is zero (no time limit).

Parameter	Description
message	Send this message.

Parameter	Description
	Wildcard subjects are illegal.

See Also

[DefaultTimeLimit](#)

[CMTransport.SendReply](#)

[CMTransport.SendRequest](#)

[TimeLimit](#)

CMTransport.SendReply

Method

Visual Basic

```
Overrides Public Sub SendReply (  
    ByVal reply As Message,  
    ByVal request As Message )
```

C#

```
public override void SendReply (  
    Message reply,  
    Message request );
```

Purpose

Send a labeled reply message.

Remarks

This convenience call extracts the reply subject of an inbound request message, and sends a labeled outbound reply message to that subject. In addition to the convenience, this call is marginally faster than using separate calls to extract the subject and send the reply.

This method can send a labeled reply to an ordinary message.

This method automatically registers the requesting CM transport, so the reply message is certified.

Parameter	Description
reply	Send this <i>outbound</i> reply message.

Parameter	Description
request	<p>Send a reply to this <i>inbound</i> request message; extract its reply subject to use as the subject of the outbound reply message.</p> <p>If this message has a wildcard reply subject, the method produces an error.</p>

**Warning**

Give special attention to the order of the arguments to this method. Reversing the inbound and outbound messages can cause an infinite loop, in which the program repeatedly resends the inbound message to itself (and all other recipients).

See Also

[CMTransport.Send](#)

[CMTransport.SendRequest](#)

CMTransport.SendRequest

Method

Visual Basic

```
Overrides Public Function SendRequest (  
    ByVal request As Message,  
    ByVal timeout As Double )  
    As Message
```

C#

```
public override Message SendRequest (  
    Message request,  
    double timeout );
```

Purpose

Send a labeled request message and wait for a reply.

Blocking can Stall Event Dispatch



Warning

This call blocks all other activity on its program thread. If appropriate, programmers must ensure that other threads continue dispatching events on its queues.

Parameter	Description
request	Send this request message. Wildcard subjects are illegal.

Parameter	Description
timeout	Maximum time (in seconds) that this call can block while waiting for a reply.

Remarks

Programs that receive and process the request message cannot determine that the sender has blocked until a reply arrives.

The sender and receiver must already have a certified delivery agreement, otherwise the request is not certified.

The request message must have a valid destination subject; see [SendSubject](#).

A certified request does not necessarily imply a certified reply; the replying program determines the type of reply message that it sends.

Operation

This method operates in several synchronous steps:

Procedure

1. Create a [CMListener](#) that listens for messages on the reply subject of msg.
2. Label and send the outbound message.
3. Block until the listener receives a reply; if the time limit expires before a reply arrives, then return null. (The reply event uses a private queue that is not accessible to the program.)
4. Return the reply message as the value of the method call.

See Also

[CMTransport.Send](#)

[CMTransport.SendReply](#)

CMTransport.SynchronizeLedgerNow

Method

Visual Basic

```
Public Sub SynchronizeLedgerNow()
```

C#

```
public void SynchronizeLedgerNow();
```

Purpose

Synchronize the ledger to its storage medium.

Remarks

When this method returns, the transport's current state is safely stored in the ledger file.

Transports that use synchronous ledger files need not call this method, since the current state is automatically written to the storage medium before returning. Transports that use process-based ledger storage need not call this method, since they have no ledger file.

Errors

The error code [InvalidArgument](#) can indicate that the transport does not have a ledger file.

See Also

[Ledger File](#)

[CMTransport](#)

[SynchronizeLedger](#)

ReviewLedgerDelegate

Delegate

Visual Basic

```
Public Delegate Function ReviewLedgerDelegate(  
    ByVal cmTransport As CMTransport,  
    ByVal subject As String,  
    ByVal message As Message,  
    ByVal closure As Object )  
    As Boolean
```

C#

```
public delegate bool ReviewLedgerDelegate(  
    CMTransport cmTransport,  
    string subject,  
    Message message,  
    object closure)
```

Purpose

Programs define this delegate to process ledger review messages.

Remarks

[CMTransport.ReviewLedger](#) calls this callback method once for each matching subject stored in the ledger.

To continue reviewing the ledger, return false from this callback method. To stop reviewing the ledger, return true from this callback method; [CMTransport.ReviewLedger](#) cancels the review and returns immediately.

Parameter	Description
cmTransport	This parameter receives the transport.
subject	This parameter receives the subject for this ledger item.
message	This parameter receives a summary message describing the delivery status of messages in the ledger. The table below describes the fields of the summary message.
closure	This parameter receives closure data that the program supplied to CMTransport.ReviewLedger .

Review Message

The following table presents the fields that review messages can contain.

Field Name	Description
subject	<p>The subject that this message summarizes.</p> <p>This field has (wire format) datatype <code>TIBRVMSG_MSG</code>.</p>
seqno_last_sent	<p>The sequence number of the most recent message sent with this subject name.</p> <p>This field has (wire format) datatype <code>TIBRVMSG_U64</code>.</p>
total_msgs	<p>The total number of messages stored at this subject name.</p> <p>This field has (wire format) datatype <code>TIBRVMSG_U32</code>.</p>
total_size	<p>The total storage (in bytes) occupied by all messages with this subject name.</p> <p>If the ledger contains several messages with this subject name, then this field sums the storage space over all of them.</p> <p>This field has (wire format) datatype <code>TIBRVMSG_U64</code>.</p>

Field Name	Description
listener	<p>Each summary message can contain one or more fields named <code>listener</code>. Each <code>listener</code> field contains a nested submessage with details about a single registered listener.</p> <p>This field has (wire format) datatype <code>TIBRVMSG_MSG</code>.</p>
listener.name	<p>Within each <code>listener</code> submessage, the <code>name</code> field contains the name of the listener transport.</p> <p>This field has (wire format) datatype <code>TIBRVMSG_STRING</code>.</p>
listener.last_confirmed	<p>Within each <code>listener</code> submessage, the <code>last_confirmed</code> field contains the sequence number of the last message for which the listener confirmed delivery.</p> <p>This field has (wire format) datatype <code>TIBRVMSG_U64</code>.</p>

See Also

[CMTransport.ReviewLedger](#)

CMMessage

Class

Superclasses

System.Object

Message

CMMessage

Visual Basic

Public Class CMMessage

Inherits Message

C#

public class CMMessage : Message

Purpose

Represent labeled messages.

Method	Description	Page
Message Life Cycle and Properties		
CMMessage	Create a CM message object.	CMMessage

Member	Description	
Public Instance Properties		
FieldCount	uint	Get
	<p>The number of fields in the message. (Inherited from Message.)</p> <p>This count includes only the immediate fields of the message; it does not include fields within recursive submessages.</p>	
ReplySubject	string	Get
	<p>The reply subject of the message. (Inherited from Message.)</p> <p>For more information, see Subjects.</p>	
Sender	string	Get
	<p>The correspondent name of the sender transport that sent the certified message.</p>	
SendSubject	string	Get
	<p>The destination subject of the message. (Inherited from Message.)</p> <p>When this property is null, the message is unsendable.</p> <p>For more information, see Subjects.</p>	
SequenceNumber	ulong	Get
	<p>The sequence number of the certified message. For details, see Sequence Number.</p>	
Size	uint	Get
	<p>The size of the message (in bytes). (Inherited from Message.)</p>	

Member	Description	
TimeLimit	double	Get
	The message time limit of the certified message. For details, see Sequence Number .	Set

Inherited Methods

[Message.AddField](#)

[Message.Expand](#)

[Message.GetField](#)

[Message.GetFieldByIndex](#)

[Message.GetFieldInstance](#)

[Message.RegisterCustomDataType](#)

[Message.RemoveField](#)

[Message.RemoveFieldInstance](#)

[Message.Reset](#)

[Message.ToByteArray](#)

[Message.UpdateField](#)

Sequence Number

Rendezvous certified delivery sending methods automatically generate positive sequence numbers for outbound labeled messages.

In receiving programs, the sequence number property indicates whether an inbound message is certified:

- If the message is from a CM sender, *and* the CM listener is registered for certified delivery with that sender, then the [SequenceNumber](#) property is a valid sequence number.
- If the message is from a CM sender, but the listener is *not* registered for certified delivery, then attempting to get the [SequenceNumber](#) property throws an exception with the status code [NotFound](#).

Notice that the first labeled message that a program receives on a subject might not be certified; that is, the sender has not registered a certified delivery agreement with the listener. If appropriate, the certified delivery library automatically requests that the sender register the listener for certified delivery. (See Discovery and Registration for Certified Delivery in TIBCO Rendezvous Concepts.)

An uncertified CM message can also result when the sender explicitly disallows or removes the listener.

**Note****Release 5 Interaction**

In release 6 (and later) the sequence number is a 64-bit unsigned integer, while in older releases (5 and earlier) it is a 32-bit unsigned integer.

When 32-bit senders overflow the sequence number, behavior is undefined.

When 64-bit senders send sequence numbers greater than 32 bits, 32-bit receivers detect malformed label information, and process the message as an ordinary reliable message (uncertified and unlabeled).

Time Limit

Every labeled message has a time limit, after which the sender no longer certifies delivery. Time limits represent the minimum time that certified delivery is in effect.

Outbound Messages

Sending programs can explicitly set the message time limit property (before sending a CM message). If the time limit property is not already set for the outbound message, [CMTransport.Send](#) sets it to the transport's default time limit (see [DefaultTimeLimit](#)); if that default is not set for the transport, the default time limit is zero (no time limit).

Time limit values must be non-negative, and represent a whole number seconds.

It is meaningful to set this property only on outbound messages.

Inbound Messages

Zero is a special value, indicating no time limit.

This value represents the total time limit of the message, *not* the time remaining.

See Also

[Message](#)

CMMessage

Constructor

Visual Basic

```
Overloads Public Sub New()  
Overloads Public Sub New(  
    ByVal initialSize As UInt32)  
Overloads Public Sub New(  
    ByVal bytes As Byte() )  
Overloads Public Sub New(  
    ByVal message As Message)
```

C#

```
public CMMessage();  
public CMMessage(uint initialSize);  
public CMMessage(byte[] bytes);  
public CMMessage(Message message);
```

Purpose

Create a CM message object.

Remarks

The constructor without an argument allocates 512 bytes of unmanaged storage and initializes it as a new CM message.

None of these constructors place address information on the new CM message object.

This class has no `destroy()` method. Instead, the garbage collector reclaims storage automatically.

Parameter	Description
initialSize	Allocate unmanaged storage of this size (in bytes) for the new CM message.
bytes	<p>Fill the new CM message with data from this byte array.</p> <p>For example, programs can create such byte arrays from messages using the method Message.ToByteArray, and store them in files; after reading them from such files, programs can reconstruct a message from its byte array.</p>
message	<p>Create an independent copy of this message. Field values are also independent copies.</p> <p>Notice that the original can be either a Message or a CMMessage; either way, the copy is a CMMessage.</p>

See Also

[Message.ToByteArray](#)

Distributed Queue

Programs can use distributed queues for *one of n* certified delivery to a group of worker processes.

A distributed queue is a group of [CMQueueTransport](#) objects, each in a separate process. From the outside, a distributed queue appears as though a single transport object; inside, the group members act in concert to process inbound task messages. Ordinary senders and CM senders can send task messages to the group. Notice that the senders are not group members, and do not do anything special to send messages to a group; rather, they send messages to ordinary subject names. Inside the group, the member acting as scheduler assigns each task message to exactly one of the other members (which act as workers); only that worker processes the task message. Each member uses CM listener objects to receive task messages.

Distributed queues depend upon the certified delivery methods and the fault tolerance methods.

**Note**

We do not recommend sending messages across network boundaries to a distributed queue, nor distributing queue members across network boundaries. However, when crossing network boundaries in either of these ways, you must configure the Rendezvous routing daemons to exchange `_RVCM` and `_RVCMQ` administrative messages. For details, see [Distributed Queue](#).

See Also

[Distributed Queue](#)

CMQueueTransport

Class

Superclasses

```
System.Object  
  Transport  
    CMTransport  
      CMQueueTransport
```

Visual Basic

```
Public Class CMQueueTransport  
    Inherits CMTransport
```

C#

```
public class CMQueueTransport : CMTransport
```

Purpose

Coordinate a distributed queue for *one-of-n* delivery.

Remarks

Each [CMQueueTransport](#) object employs a [NetTransport](#) for network communications. The [CMQueueTransport](#) adds the accounting and coordination mechanisms needed for one-of-n delivery.

Several [CMQueueTransport](#) objects can employ one [NetTransport](#), which also remains available for its own ordinary listeners and for sending ordinary messages.

Programs must explicitly destroy each [CMQueueTransport](#) object. Destroying a [CMQueueTransport](#) invalidates any certified listeners using that transport (while preserving their certified delivery agreements).

Whether explicitly or implicitly, programs must destroy instances of this class. Rendezvous software keeps internal references to these objects, so the garbage collector does not delete them automatically.

All members of a distributed queue must listen to exactly the same set of subjects. See [Enforcing Identical Subscriptions in TIBCO Rendezvous Concepts](#).

Scheduler recovery and task rescheduling are available only when the task message is a certified message (that is, a certified delivery agreement is in effect between the task sender and the distributed queue transport scheduler).

Disabled Methods

Although [CMQueueTransport](#) is a subclass of [CMTransport](#), all methods related to sending messages are disabled in [CMQueueTransport](#). These disabled methods throw an `NotSupportedException`; for a list, see [Disabled Methods](#). See also [Certified Delivery Behavior in Queue Members in TIBCO Rendezvous Concepts](#).

Member	Type & Value
Public Static Fields	
<code>DefaultWorkerWeight</code>	<code>uint 1</code>
<code>DefaultWorkerTasks</code>	<code>uint 1</code>
<code>DefaultSchedulerWeight</code>	<code>ushort 1</code>
<code>DefaultSchedulerHeartbeat</code>	<code>double 1.0</code>
<code>DefaultSchedulerActivation</code>	<code>double 3.5</code>

Member	Description
Public Instance Properties	

Member	Description	
BaseTransport	NetTransport The transport employed by the certified delivery transport; see CMTransport . (Inherited from CMTransport .)	Get
CompleteTime	double The worker complete time limit (in seconds) of a distributed queue member. For details, see Complete Time .	Get Set
DefaultTimeLimit	double The default message time limit (in whole seconds) for all outbound certified messages from the transport. (Inherited from CMTransport .) For details, see DefaultTimeLimit .	Get Set
Description	string The description identifies programs and their transports to Rendezvous components. Browser administration interfaces display the description string. (Inherited from Transport .) As a debugging aid, we recommend setting a unique description string for each transport. Use a string that distinguishes both the application and the role of the transport within it.	Get Set
LedgerName	string The name of the ledger file; see CMTransport . When getting this property, an exception with the error code ArgumentsConflict can indicate that the transport does not have a ledger file.	Get
Name	string	Get

Member	Description	
	The correspondent name; see CMTransport . (Inherited from CMTransport .)	
RequestOld	bool	Get
	The request old messages flag of the certified delivery transport; see CMTransport . (Inherited from CMTransport .)	
SynchronizeLedger	bool	Get
	The sync ledger flag of a certified delivery transport; see CMTransport . (Inherited from CMTransport .)	
	When getting this property, an exception with the error code ArgumentsConflict can indicate that the transport does not have a ledger file.	
TaskBacklogLimitInBytes	uint	Set
	The maximum size (in bytes) of the scheduler task queue. For background information, see Scheduler Task Backlog Limits .	
TaskBacklogLimitInMessages	uint	Set
	The maximum size (in messages) of the scheduler task queue. For background information, see Scheduler Task Backlog Limits .	
UnassignedMessageCount	uint	Get
	The number of unassigned task messages.	
	An unassigned task message is a message received by the scheduler, but not yet assigned to any worker in the distributed queue.	
	This property is a valid count only within a scheduler process. Within a worker process, this	

Member	Description	
	value is always zero.	
WorkerTasks	uint	Get
	The worker task capacity of the distributed queue member. For details, see Worker Tasks .	Set
WorkerWeight	uint	Get
	The worker task capacity of the distributed queue member. For details, see Worker Weight .	Set

Method	Description	Page
CMQueueTransport	Create a transport as a distributed queue member.	CMQueueTransport

Inherited Methods

Legal Methods

- [CMTransport.Destroy](#)
- [System.Object.Equals](#)
- [System.Object.GetType](#)
- [System.Object.GetHashCode](#)
- [System.Object.ToString](#)

Disabled Methods

- [CMTransport.AddListener](#)
- [CMTransport.AllowListener](#)
- [CMTransport.DisallowListener](#)
- [CMTransport.RemoveListener](#)
- [CMTransport.RemoveSendState](#)
- [CMTransport.ReviewLedger](#)
- [CMTransport.Send](#)
- [CMTransport.SendReply](#)

Inherited Methods

[CMTransport.SendRequest](#)
[CMTransport.SynchronizeLedgerNow](#)
[Transport.CreateInbox](#)
[Transport.Send](#)
[Transport.SendReply](#)
[Transport.SendRequest](#)

Complete Time

The complete time property influences scheduler behavior.

If the complete time is non-zero, the scheduler waits for a worker member to complete an assigned task. If the complete time elapses before the scheduler receives completion from the worker member, the scheduler reassigns the task to another worker member.

Zero is a special value, which specifies no limit on the completion time—that is, the scheduler does not set a timer, and does not reassign tasks when task completion is lacking. All members implicitly begin with a default complete time value of zero.

The complete time must be non-negative.

Scheduler Task Backlog Limits

The scheduler stores tasks in a queue. Two properties limit the maximum size of that queue—by number of bytes or number of messages (or both). When no value is set for these properties, the default is no limit.

When the task messages in the queue exceed either of these limits, Rendezvous software deletes new inbound task messages.

Programs may set each of these methods at most once. Those calls must occur before the transport assumes the scheduler role; after a transport acts as a scheduler, these values are fixed, and subsequent attempts to change them throw exceptions with status code [NotPermitted](#).

Worker Tasks

Task capacity is the maximum number of tasks that a worker can accept. When the number of accepted tasks reaches this maximum, the worker cannot accept additional tasks until it completes one or more of them.

When the scheduler receives a task, it assigns the task to the worker with the greatest worker weight—unless the pending tasks assigned to that worker exceed its task capacity. When the preferred worker has too many tasks, the scheduler assigns the new inbound task to the worker with the next greatest worker weight.

The default worker task capacity is 1.

Zero is a special value, indicating that this distributed queue member is a dedicated scheduler (that is, it never accepts tasks).

**Warning**

Tuning task capacity to compensate for communication time lag is more complicated than it might seem. Before setting this value to anything other than 1.

Worker Weight

Relative worker weights assist the scheduler in assigning tasks. When the scheduler receives a task, it assigns the task to the available worker with the greatest worker weight.

The default worker weight is 1; programs can set this parameter at creation using [CMQueueTransport](#), or change it dynamically.

Related Classes

[Transport](#)

[NetTransport](#)

[CMTransport](#)

CMQueueTransport

Constructor

Visual Basic

```
Overloads Public Sub New(  
    ByVal netTransport As NetTransport,  
    ByVal cmName As String )  
Overloads Public Sub New(  
    ByVal netTransport As NetTransport,  
    ByVal cmName As String,  
    ByVal workerWeight As UInt32,  
    ByVal workerTasks As UInt32,  
    ByVal schedulerWeight As UInt16,  
    ByVal schedulerHeartbeat As double,  
    ByVal schedulerActivation As double )
```

C#

```
CMQueueTransport(  
    NetTransport netTransport,  
    string cmName );  
CMQueueTransport(  
    NetTransport netTransport,  
    string cmName,  
    uint workerWeight,  
    uint workerTasks,  
    ushort schedulerWeight,  
    double schedulerHeartbeat,  
    double schedulerActivation );
```


Purpose

Create a transport as a distributed queue member.

Remarks

The new [CMQueueTransport](#) must employ a valid [NetTransport](#) for network communications.

Parameter	Description
netTransport	<p>The new CMQueueTransport employs this NetTransport object for network communications.</p> <p>Destroying the CMQueueTransport does not affect this transport.</p>
cmName	<p>Bind this reusable name to the new transport object, which becomes a member of the distributed queue with this name.</p> <p>The name must be non-null, and conform to the syntax rules for Rendezvous subject names. It cannot begin with reserved tokens. It cannot be a non-reusable name generated by a call to CMTransport. It cannot be the empty string.</p> <p>For more information, see Reusable Names in TIBCO Rendezvous Concepts.</p>
workerWeight	<p>When the scheduler receives a task, it assigns the task to the available worker with the greatest worker weight.</p> <p>A worker is considered available unless either of these conditions are true:</p> <ul style="list-style-type: none">• The pending tasks assigned to the worker member exceed its task capacity.• The worker is also the scheduler. (The scheduler assigns tasks to its own worker role only when no other workers are available.) <p>When omitted, the default value is 1.</p>
workerTasks	<p>Task capacity is the maximum number of tasks that a worker can accept. When the number of accepted tasks reaches this maximum, the worker cannot accept additional tasks until it completes one or more of them.</p>

Parameter	Description
	<p>When the scheduler receives a task, it assigns the task to the worker with the greatest worker weight—unless the pending tasks assigned to that worker exceed its task capacity. When the preferred worker has too many tasks, the scheduler assigns the new inbound task to the worker with the next greatest worker weight.</p> <p>The value must be a non-negative integer. When omitted, the default value is 1.</p> <p>Zero is a special value, indicating that this distributed queue member is a dedicated scheduler (that is, it never accepts tasks).</p> <p> Warning</p> <p>Tuning task capacity to compensate for communication time lag is more complicated than it might seem. Before setting this value to anything other than 1, see Task Capacity in TIBCO Rendezvous Concepts.</p>
schedulerWeight	<p>Weight represents the ability of this member to fulfill the role of scheduler, relative to other members with the same name. Cooperating members use relative scheduler weight values to elect one member as the scheduler; members with higher scheduler weight take precedence.</p> <p>When omitted, the default value is 1.</p> <p>Acceptable values range from 0 to 65535. Zero is a special value, indicating that the member can never be the scheduler. For more information, see Rank and Weight in TIBCO Rendezvous Concepts.</p>
schedulerHeartbeat	<p>The scheduler sends heartbeat messages at this interval (in seconds).</p> <p>All CMQueueTransport objects with the same name must specify the same value for this parameter. The value must be strictly positive. To determine the correct value, see Step 4: Choose the Intervals in TIBCO Rendezvous Concepts.</p>

Parameter	Description
	When omitted, the default value is 1.0.
schedulerActivation	<p>When the heartbeat signal from the scheduler has been silent for this interval (in seconds), the cooperating member with the greatest scheduler weight takes its place as the new scheduler.</p> <p>All CMQueueTransport objects with the same name must specify the same value for this parameter. The value must be strictly positive. To determine the correct value, see Step 4: Choose the Intervals in TIBCO Rendezvous Concepts.</p> <p>When omitted, the default value is 3.5.</p>

See Also

[CMTransport.Destroy](#)

Distributed Queue, in TIBCO Rendezvous Concepts

Exceptions and Errors

RendezvousException

Class

Superclasses

```
System.Object  
  System.Exception  
    System.ApplicationException  
      RendezvousException
```

Visual Basic

```
Public Class RendezvousException  
  Inherits ApplicationException
```

C#

```
public class RendezvousException : ApplicationException
```

Purpose

Rendezvous software throws exceptions of this class.

Remarks

Rendezvous software can also throw exceptions defined as part of the .NET framework.

Member	Description
--------	-------------

Public Instance Properties

Status	Status An error or status code, indicating the reason for the exception; see Status .	Get
--------	--	-----

Inherited Public Instance Properties

HelpLink	Inherited from Exception.	Get
InnerException		Get
Message		Get
Source		Get
InnerException		Get
StackTrace		Get
TargetSite		Get

Method	Description	Page
--------	-------------	------

Public Static Methods

RendezvousException.GetStatusText	Return the descriptive string corresponding to a status code.	RendezvousException.GetStatusText
---	---	---

Inherited Methods

SystemException.GetBaseException
SystemException.GetObjectDataSystemException.ToString

See Also

[Status](#)

RendezvousException.GetStatusText

Method

Visual Basic

```
Public Shared Function GetStatusText(  
    ByVal status As Status )  
    As String
```

C#

```
public static string GetStatusText(  
    Status status );
```

Purpose

Return the descriptive string corresponding to a status code.

Parameter	Description
status	Return the string for this status code.

See Also

[Status](#)

Status

Enumeration

Visual Basic

```
Public Enum Status
```

C#

```
public enum Status
```

Purpose

These enumerated constants define the status codes within exceptions.

Status	Description
InitFailure	Cannot create the network transport.
InvalidTransport	The transport has been destroyed, or is otherwise unusable.
InvalidArgument	An argument is invalid. Check arguments other than messages, subject names, transports, events, queues and queue groups (which have separate status codes).
NotInitialized	The method cannot run because the Rendezvous environment is not initialized (open).
ArgumentsConflict	Two arguments that require a specific relation are in conflict. For example, the upper end of a

Status	Description
	numeric range is less than the lower end.
ServiceNotFound	Transport creation failed; cannot match the service name using <code>getservbyname()</code> .
NetworkNotFound	Transport creation failed; cannot match the network name using <code>getnetbyname()</code> .
DaemonNotFound	Transport creation failed; cannot match the daemon port number.
NoMemory	The method could not allocate dynamic storage.
InvalidSubject	The method received a subject name with incorrect syntax.
DaemonNotConnected	The Rendezvous daemon process (<code>rxd</code>) exited, or was never started. This status indicates that the program cannot start the daemon and connect to it.
VersionMismatch	The library, header files and Rendezvous daemon are incompatible.
SubjectCollision	It is illegal to create two certified worker events on the same CM transport with overlapping subjects.
VCNotConnected	A virtual circuit terminal was once complete, but is now irreparably broken.
NotPermitted	<ol style="list-style-type: none"> 1. The program attempted an illegal operation. 2. Cannot create ledger file.
InvalidName	The field name is too long; see Field Name Length .

Status	Description
InvalidType	<ol style="list-style-type: none"> 1. The field type is not registered. 2. Cannot update field to a type that differs from the existing field's type.
InvalidSize	The explicit size in the field does not match its explicit type.
InvalidCount	The explicit field count does not match its explicit type.
NotFound	Could not find the specified field in the message.
IDInUse	Cannot add this field because its identifier is already present in the message; identifiers must be unique.
IDConflict	After field search by identifier fails, search by name succeeds, but the actual identifier in the field is non-null (so it does not match the identifier supplied).
ConversionFailed	Found the specified field, but could not convert it to the desired datatype.
ReservedHandler	The datatype handler number is reserved for Rendezvous internal datatype handlers.
EncoderFailed	The program's datatype encoder failed.
DecoderFailed	The program's datatype decoder failed.
InvalidMessage	The method received a message argument that is not a well-formed message.
InvalidField	The program supplied an invalid field as an argument.

Status	Description
InvalidInstance	The program supplied zero as the field instance number (the first instance is number 1).
CorruptMessage	The method detected a corrupt message argument.
Timeout	<p>A timed dispatch call returned without dispatching an event.</p> <p>A send request call returned without receiving a reply message.</p> <p>A virtual circuit terminal is not yet ready for use.</p>
Interrupted	Interrupted operation.
InvalidDispatchable	The method received an event queue or queue group that has been destroyed, or is otherwise unusable.
InvalidDispatcher	The dispatcher thread is invalid or has been destroyed.
InvalidEvent	The method received an event that has been destroyed, or is otherwise unusable.
InvalidCallback	The method received null instead of a callback method delegate.
InvalidQueue	The method received a queue that has been destroyed, or is otherwise unusable.
InvalidQueueGroup	The method received a queue group that has been destroyed, or is otherwise unusable.
InvalidTimeInterval	The method received a negative timer interval.
SocketLimit	The operation failed because of an operating

Status	Description
	system socket limitation.
OSError	Environment.Open encountered an operating system error.
InsufficientBuffer	The call received a buffer argument that is too small to contain the result.
EOF	End of file.
InvalidFile	<ol style="list-style-type: none"> 1. A certificate file or a ledger file is not recognizable as such. 2. SDContext.SetUserCertificateWithKey could not complete a certificate file operation; this status code can indicate either disk I/O failure, or invalid certificate data, or an incorrect password.
FileNotFound	Rendezvous software could not find the specified file.
IOFailed	Cannot write to ledger file.
NotFileOwner	<p>The program cannot open the specified file because another program owns it.</p> <p>For example, ledger files are associated with correspondent names.</p>
IPMOnly	The call is not available because the IPM library is not linked (that is, the call is available only when IPM is linked).

See Also

[RendezvousException](#)

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Product-Specific Documentation

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