

webMethods EntireX

EntireX RPC Server for C

Version 10.9

April 2023

This document applies to webMethods EntireX Version 10.9 and all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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EntireX RPC Server for C

The EntireX RPC Server for C allows standard RPC clients to communicate with servers written in C. It works together with the C Wrapper and calls standard libraries (Windows DLLs or Linux shared objects/libraries).

The supported C development and runtime environments are described in the prerequisites for Linux and Windows in the Release Notes.

1

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Document Conventions

Convention	Description
Bold	Identifies elements on a screen.
Monospace font	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies: Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies: Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the symbol.
[]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

Online Information and Support

Product Documentation

You can find the product documentation on our documentation website at <https://documentation.softwareag.com>.

In addition, you can also access the cloud product documentation via <https://www.software-ag.cloud>. Navigate to the desired product and then, depending on your solution, go to “Developer Center”, “User Center” or “Documentation”.

Product Training

You can find helpful product training material on our Learning Portal at <https://knowledge.softwareag.com>.

Tech Community

You can collaborate with Software AG experts on our Tech Community website at <https://tech-community.softwareag.com>. From here you can, for example:

- Browse through our vast knowledge base.
- Ask questions and find answers in our discussion forums.
- Get the latest Software AG news and announcements.
- Explore our communities.
- Go to our public GitHub and Docker repositories at <https://github.com/softwareag> and <https://hub.docker.com/publishers/softwareag> and discover additional Software AG resources.

Product Support

Support for Software AG products is provided to licensed customers via our Empower Portal at <https://empower.softwareag.com>. Many services on this portal require that you have an account. If you do not yet have one, you can request it at <https://empower.softwareag.com/register>. Once you have an account, you can, for example:

- Download products, updates and fixes.
- Search the Knowledge Center for technical information and tips.
- Subscribe to early warnings and critical alerts.
- Open and update support incidents.
- Add product feature requests.

Data Protection

Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

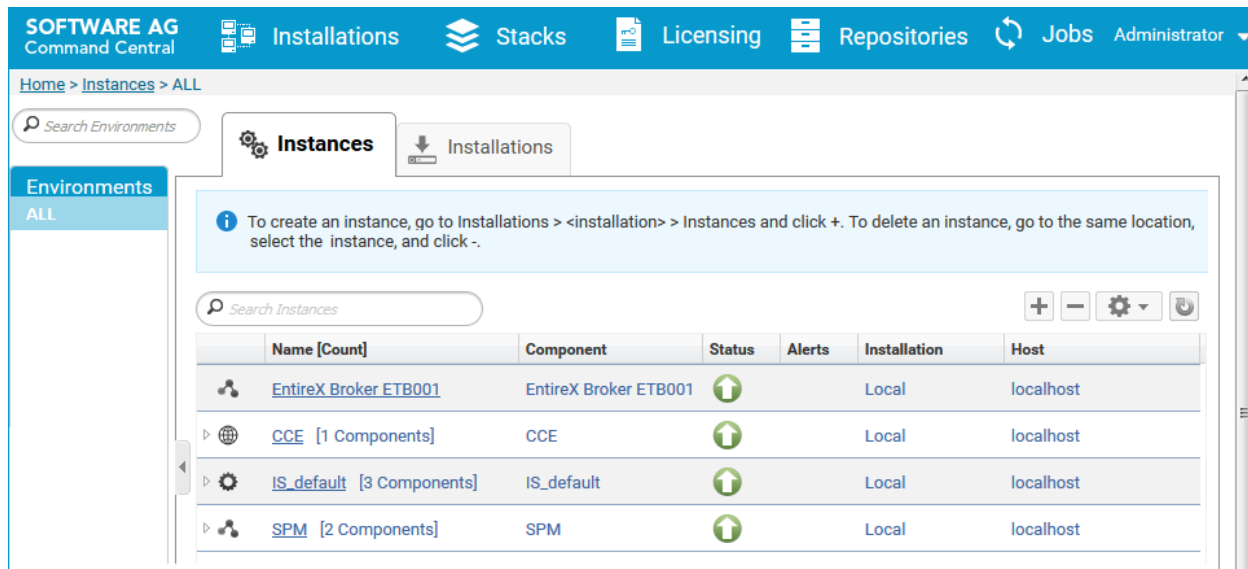
2 Introduction to the RPC Server for C

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The EntireX RPC Server for C allows standard RPC clients to communicate with servers written in C. It works together with the C Wrapper and calls standard libraries (Windows DLLs or Linux shared objects/libraries).

Administration using Command Central

Software AG Command Central is a tool that enables you to manage your Software AG products remotely from one location. Command Central offers a browser-based user interface, but you can also automate tasks by using commands to remotely execute actions from a terminal or custom script (for example CI servers such as Jenkins, or generic configuration management tools such as Puppet or Chef).



Command Central can assist with the following configuration, management, and monitoring tasks:

- Infrastructure engineers can see at a glance which products and fixes are installed, where they are installed, and compare installations to find discrepancies.
- System administrators can configure environments by using a single web user interface or command-line tool. Maintenance involves minimum effort and risk.
- Release managers can prepare and deploy changes to multiple servers using command-line scripting for simpler, safer lifecycle management.
- Operators can monitor server status and health, as well as start and stop servers from a single location. They can also configure alerts to be sent to them in case of unplanned outages.

The Command Central graphical user interface is described under [Administering the RPC Server for C using the Command Central GUI](#). For the command-line interface, see [Administering the RPC Server for C using the Command Central Command Line](#).

The core Command Central documentation is provided separately and is also available under **Guides for Tools Shared by Software AG Products** on the Software AG documentation website.

Server Interface Objects and C Server

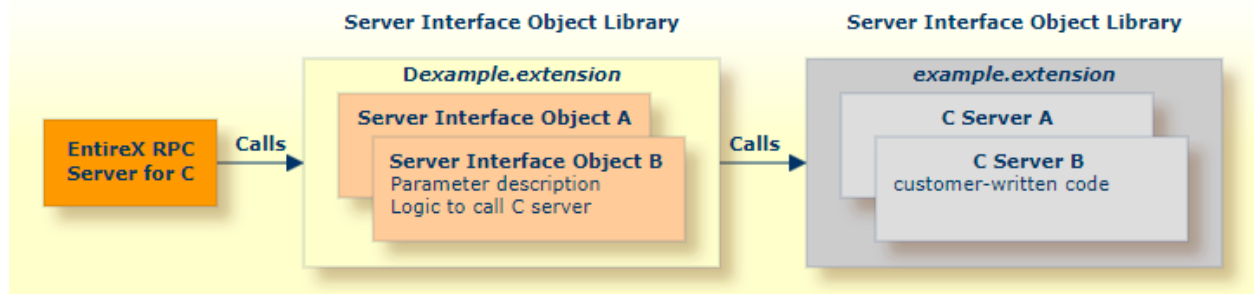
The RPC Server for C uses server interface objects to call the customer-written C server. The server interface objects contain, for example, version information, parameter descriptions and logic to call the C server. Both the server interface objects and C server skeletons are generated with the C Wrapper. All server interface objects are linked together to the library named *Dlibrary-name⁽¹⁾.extension⁽²⁾*. Similarly all C Server are linked together to the library with name *library-name⁽¹⁾.extension⁽²⁾*.

See also [Locating and Calling the Target Server](#).

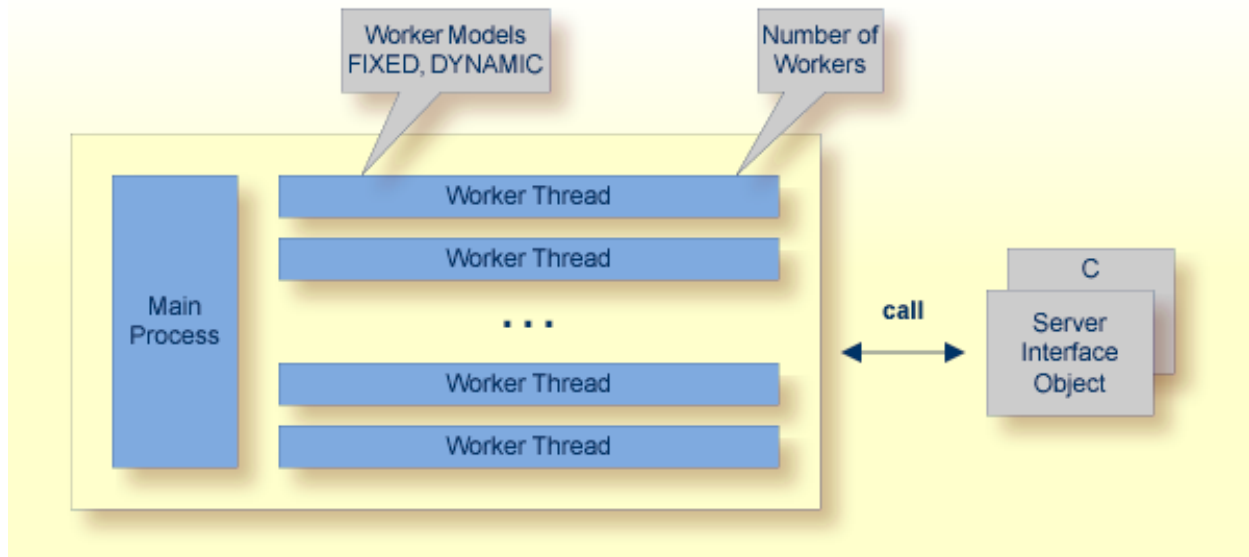


Notes:

1. *library-name* is formally the `library-name` of the `library-definition` of the Software AG IDL.
2. The extension is `.so` or `.sl` under Linux; `.dll` under Windows. Example for IDL library name *EXAMPLE*:
 - For Linux, the server interface object file name is *DEXAMPLE.so* or *DEXAMPLE.sl* and the C Server file name is *EXAMPLE.so* or *EXAMPLE.sl*.
 - For Windows, the server interface object file name is *DEXAMPLE.dll* and the C Server file name is *EXAMPLE.dll*.



Worker Models



RPC requests are worked off inside the RPC server in worker threads, which are controlled by a main thread. Every RPC request occupies during its processing a worker thread. If you are using RPC conversations, each RPC conversation requires its own thread during the lifetime of the conversation. The RPC server provides two worker models:

- **FIXED**

The *fixed* model creates a fixed number of worker threads. The number of worker threads does not increase or decrease during the lifetime of an RPC server instance.

- **DYNAMIC**

The *dynamic* model creates worker threads depending on the incoming load of RPC requests.

For configuration with the Command Central GUI, see [Worker Scalability](#) under *Configuration > Server*.

For technical details, see parameter [endworkers](#) under *Administering the RPC Server for C*.

3 Administering the RPC Server for C using the Command

Central GUI

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This chapter describes how to administer the EntireX RPC Server for C, using the Command Central graphical user interface.

See also [Administering the RPC Server for C using the Command Central Command Line](#). The core Command Central documentation is provided separately and is also available under **Guides for Tools Shared by Software AG Products** on the Software AG documentation website.

Logging in to Command Central

Open an Internet browser and specify the URL of the Command Central Server as follows: `http://<Command_Central_host>:<Command_Central_port>`. This takes you to the Command Central **Login** page.

On Windows you can also get to the **Login** page from the Command Central Start Menu entry.

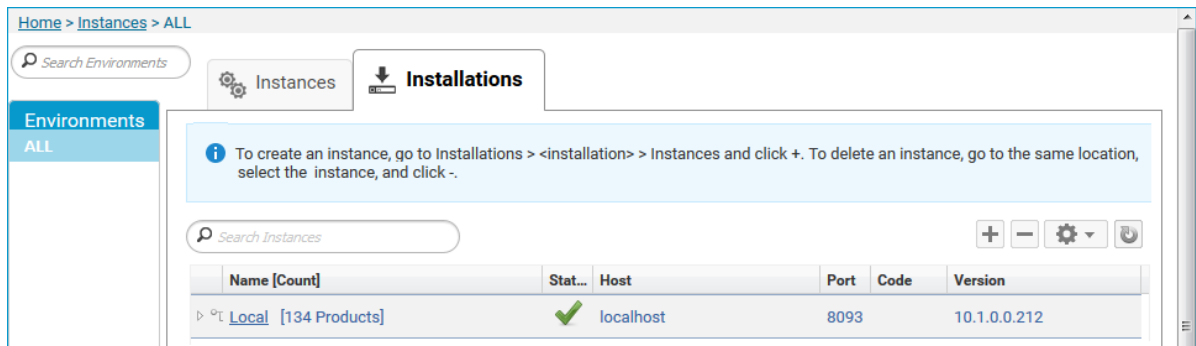
Provide your user credentials in the **Login** page and click **Log In**. This takes you to the page **Home > Instances**:

Name [Count]	Component	Status	Alerts	Installation	Host
EntireX Broker ETB001	EntireX Broker ETB001	↑		Local	localhost
▶ CCE [1 Components]	CCE	↑		Local	localhost
▶ IS_default [3 Components]	IS_default	↑		Local	localhost
▶ SPM [2 Components]	SPM	↑		Local	localhost

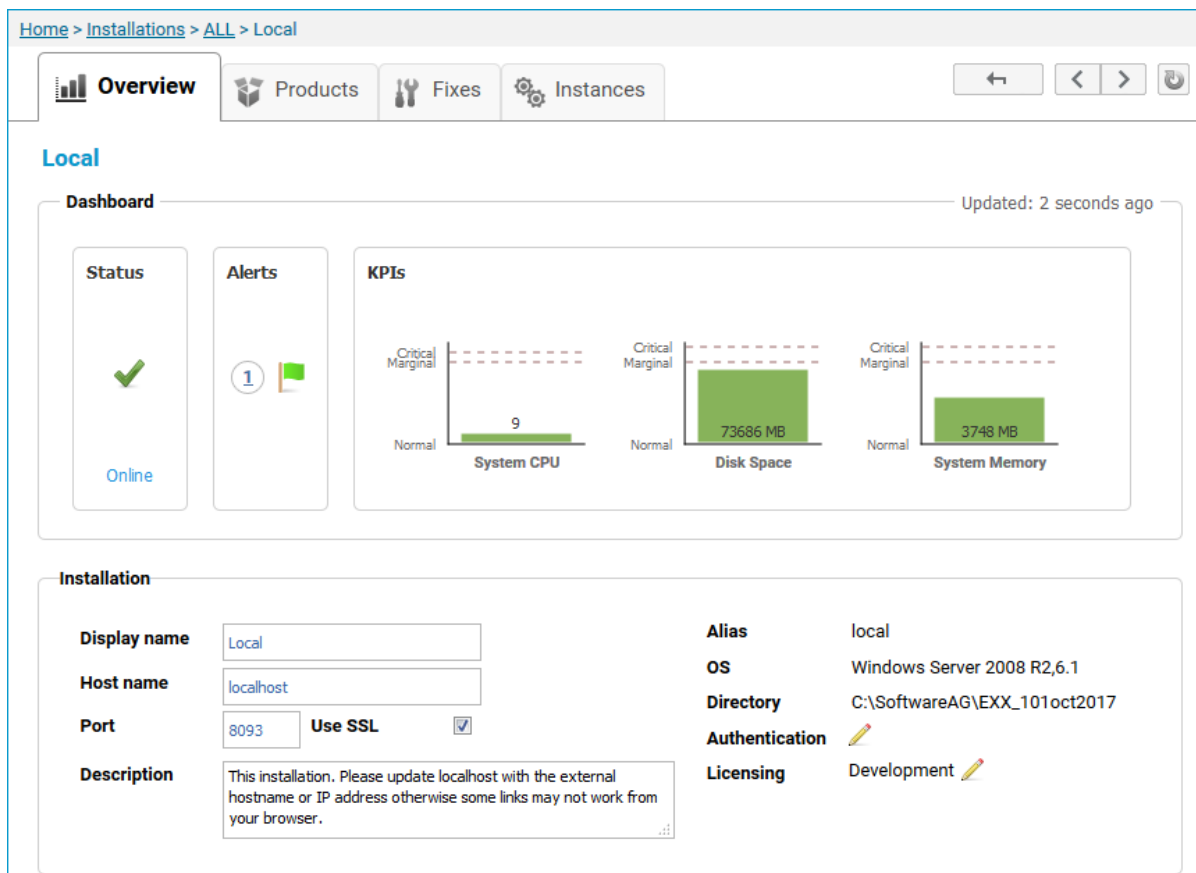
Creating an RPC Server Instance

➤ To create an RPC Server for C instance

- 1 In the Command Central home page, click the **Installations** tab.



- 2 Click on the desired installation, for example **Local**, where you want to add an RPC Server for C instance.



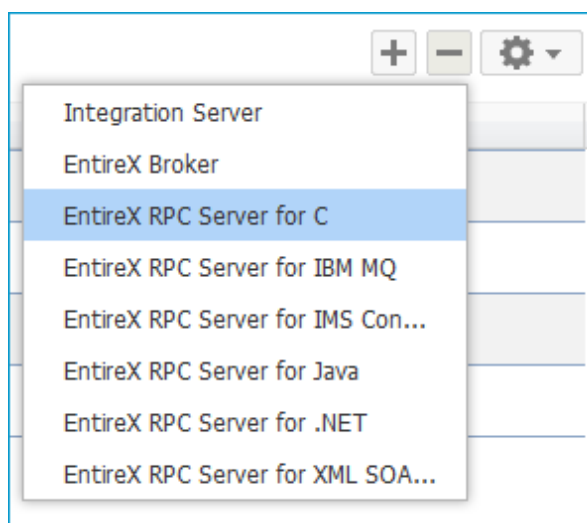
- 3 Click the **Instances** tab.

Local

Search Instances

	Name [Count]	Component	Status	Alerts	Installation	Host
	EntireX Broker ETB001	EntireX Broker ETB001			Local	localhost
	CCE [1 Components]	CCE			Local	localhost
	IS_default [3 Components]	IS_default			Local	localhost
	SPM [2 Components]	SPM			Local	localhost

- 4 Click the button in the upper right corner above the list and choose **EntireX RPC Server for C**.



- 5 In the **Create Instance** wizard, fill in the fields in the main screen and in the **Server**, **Broker** and **Library Locations** tabs.

Local

Search Instances

	Name [Count]
	EntireX Broker ET8001
	EntireX Broker SCL1974
	EntireX Broker SEC1972
	EntireX Broker SSL1973
	EntireX RPC Server for C RPC4
	EntireX RPC Server for C SCL4
	EntireX RPC Server for C SEC4
	EntireX RPC Server for C SSL4
	CCE [1 Components]
	SPM [1 Components]

Create Instance - EntireX RPC Server for C

Specify Properties Summary

Please specify input parameters for all property tabs (Server, Broker, Library Location)

Instance name *

☐ Register Windows service for automatic startup

Server **Broker** **Library Location**

RPC Server address * ?

Administration port * ?

Next **Cancel**

Main Screen

Parameter	Description
Instance name	Required. Name of the runtime component, for example "MyRpcServer".
Register Windows Service for automatic startup	Optional. Register Windows Service for automatic startup. Default is not checked. If this parameter is checked, the RPC server can be controlled by the Windows Service Control Manager.

Server Tab

Parameter	Description
RPC Server address	Required. The case-sensitive RPC server address has the format: CLASS/SERVER/SERVICE.
Administration port	Required. The administration port in range from 1025 to 65535.

Broker Tab

Parameter	Description
Connection	
Transport	Transport over TCP or SSL. Default is TCP.
Broker host	Required. EntireX Broker host name or IP address. See <i>Using the Broker ID in Applications</i> in the RPC Programming documentation.
Broker port	Required. Port number in range from 1025 to 65535.
SSL trust store	Optional. Specifies the location of the SSL trust store.
Credentials	
User	Optional. The user ID for secured access to the broker.
Password	Optional. The password for secured access to the broker.

Library Locations Tab

Here you can specify the full path of the directories where the C server programs are located. You can view/edit the library directory list of the RPC Server for C.

Parameter	Description
Directory	Required. Path to the library containing the C server programs.

- 6 Press **Next** to get to the **Summary** page to verify your input.
- 7 Press **Finish**.

The screenshot shows the 'Local' tab in the Command Central GUI. At the top, there is a search bar labeled 'Search Instances'. Below it is a table with columns: Name [Count], Component, Status, Alerts, Installation, and Host. The table lists four components: 'EntireX Broker ETB001', 'CCE [1 Components]', 'IS_default [3 Components]', and 'SPM [2 Components]'. All components have a green upward arrow in the Status column, indicating they are running. A modal dialog titled 'Operation triggered' is overlaid on the table, with the message 'Job operation is started successfully.' and buttons for 'View Job' and 'Finish'.

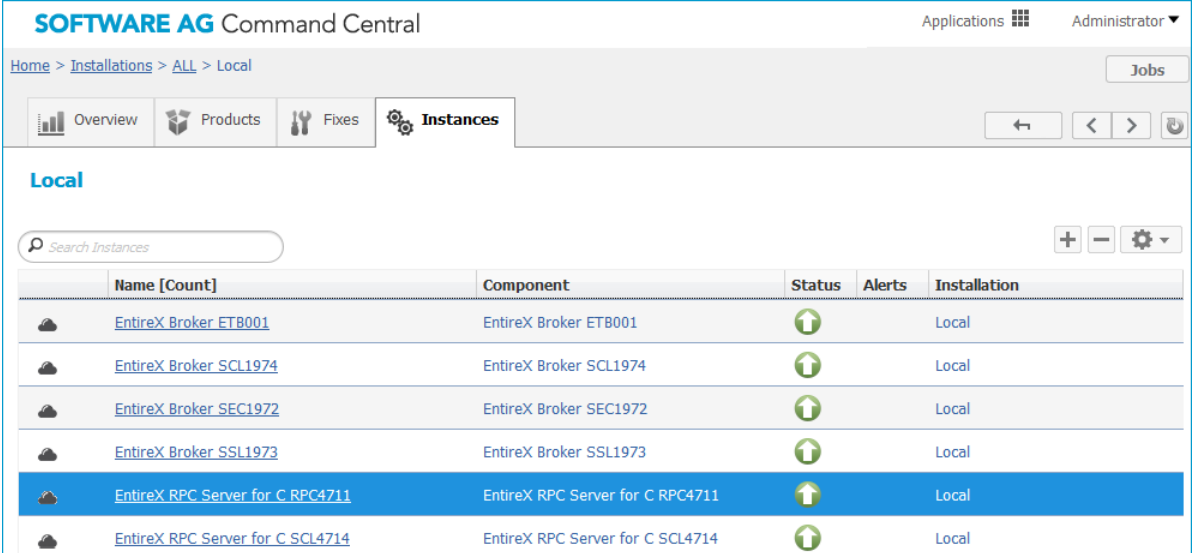
Name [Count]	Component	Status	Alerts	Installation	Host
EntireX Broker ETB001	EntireX Broker ETB001	↑		Local	localhost
▶ CCE [1 Components]	CCE	↑		Local	localhost
▶ IS_default [3 Components]	IS_default	↑		Local	localhost
▶ SPM [2 Components]	SPM	↑		Local	localhost

The new instance *myRpcServer* appears in the list.

Configuring an RPC Server Instance

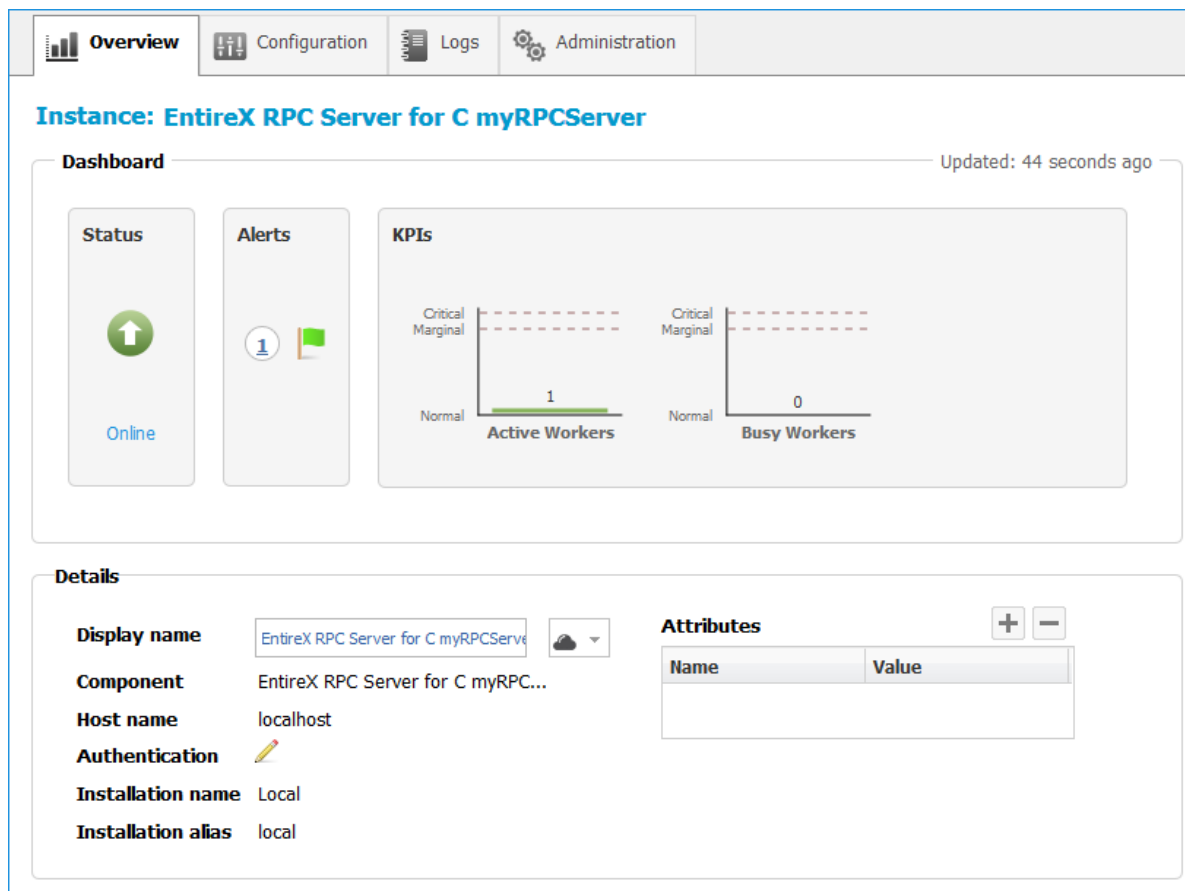
> To configure an RPC Server for C instance

- 1 In the Command Central home page, click the **Instances** tab.

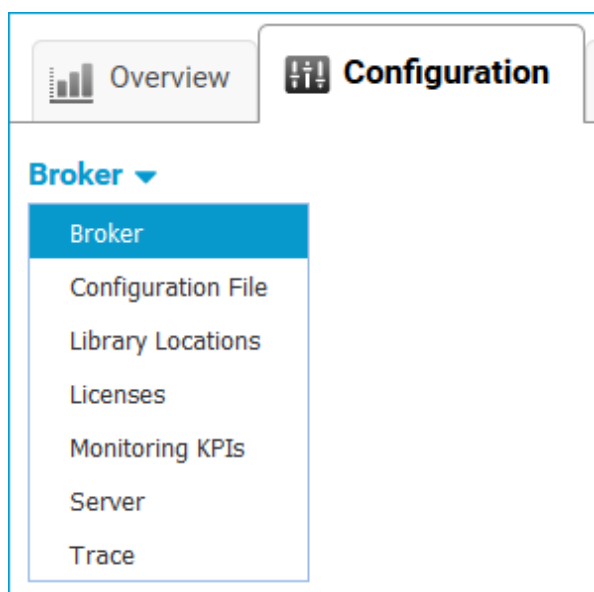


Name [Count]	Component	Status	Alerts	Installation
EntireX Broker ET8001	EntireX Broker ET8001	↑		Local
EntireX Broker SCL1974	EntireX Broker SCL1974	↑		Local
EntireX Broker SEC1972	EntireX Broker SEC1972	↑		Local
EntireX Broker SSL1973	EntireX Broker SSL1973	↑		Local
EntireX RPC Server for C RPC4711	EntireX RPC Server for C RPC4711	↑		Local
EntireX RPC Server for C SCL4714	EntireX RPC Server for C SCL4714	↑		Local

- 2 Click on the link associated with this instance to select the RPC server instance you want to configure.



- Click the **Configuration** tab. EntireX supports the following configuration types, which are presented in a drop-down box when you click the down arrow below the **Configuration** tab label:





Note: All configuration changes require a restart of the instance to take effect.

- 4 Click **Edit** to modify the parameters on your selected configuration type.
- 5 Click **Test** to check the correctness of your input or **Apply** to save your changes.

The configuration options are described in more detail below:

- [Broker](#)
- [Configuration File](#)
- [Library Locations](#)
- [Licenses](#)
- [Monitoring KPIs](#)
- [Server](#)
- [Trace Level](#)

Broker

Parameter	Description
Connection	
Transport	Transport over TCP or SSL. Default is TCP.
Broker host	Required. EntireX Broker host name or IP address. See <i>Using the Broker ID in Applications</i> in the RPC Programming documentation.
Broker port	Required. Port number in range from 1025 to 65535.
Encoding	Required. Encoding used for the communication between the RPC server and EntireX Broker.
SSL trust store	Optional. Specifies the location of the SSL trust store.
SSL trust password	Optional. The password of the SSL trust store.
SSL verify server	Optional. The RPC server as SSL client checks the identity of the broker as SSL server.
Credentials	
User	Optional. The user ID for secured access to the broker.
Password	Optional. The password for secured access to the broker.

Configuration File

Here you can view/edit the configuration file of the RPC Server for C.

Library Locations

Here you can specify the full path of the directories where the C server programs are located. You can view/edit the library directory list of the RPC Server for C.

Parameter	Description
Directory	Required. Path to the library containing the C server programs.

Licenses

Here you can view/set the license file in the EntireX installation. For details see *Import Product License Keys for Instances or Components* under *Getting Started with Command Central* in the separate Command Central documentation under Software AG Suite & Cross-Product Guides.



Note: The license file is used for all EntireX instances in this installation.

Monitoring KPIs

Here you can modify margins of monitored key performance indicators (KPIs) available for the RPC Server for C: Active Workers and Busy Workers.

Key performance indicators (KPIs) enable you to monitor the health of your RPC Server for C. The following KPIs help you administer, troubleshoot, and resolve performance issues:

KPI	Setting
Absolute number of Active Workers	entirex.generic.kpi.1.max=20
Critical alert relative to maximum	entirex.generic.kpi.1.critical=0.95
Marginal alert relative to maximum	entirex.generic.kpi.1.marginal=0.80
Absolute number of Busy Workers	entirex.generic.kpi.2.max=20
Critical alert relative to maximum	entirex.generic.kpi.2.critical=0.95
Marginal alert relative to maximum	entirex.generic.kpi.2.marginal=0.80

Do not change the other properties!

Server

Here you can specify the RPC Server settings.

Parameter	Description
RPC Server	
RPC Server address	Required. The case-sensitive RPC server address has the format: CLASS/SERVER/SERVICE.
Administration port	Required. The administration port in range from 1025 to 65535.
Reconnection attempts	Required. Number of reconnection attempts to the broker. When the number of attempts is reached and a connection to the broker is not possible, the RPC Server for C stops.
Worker Scalability	
Worker model	You can either have a fixed or dynamic number of workers. Default is dynamic (<code>true</code>). For more information see Worker Models .
Fixed number	Required. Fixed number of workers. Must be a number in range from 1 to 255.
Minimum number	Required. Minimum number of workers. Must be a number in range from 1 to 255.
Maximum number	Required. Maximum number of workers. Must be a number in range from 1 to 255.

Trace Level

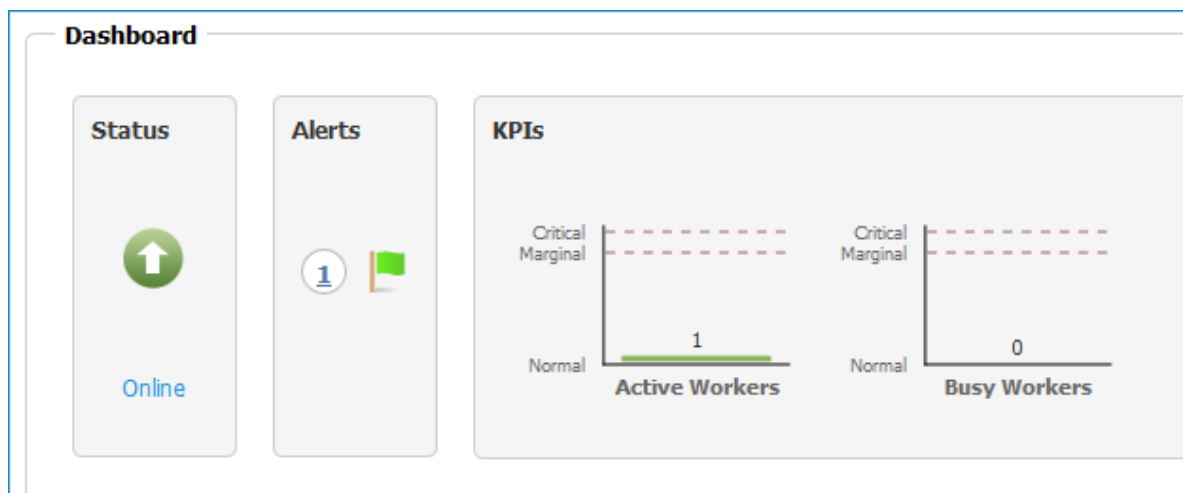
Here you can set the trace level of the RPC Server for C.

Parameter	Value	Description
Trace level	0 - 3	One of the following levels: 0 - None - No trace output (default). 1 - Standard - Minimal trace output. 2 - Advanced - Detailed trace output. 3 - Support - Support diagnostic. Use only when requested by Software AG Support.

Viewing the Runtime Status

➤ To view the runtime status of the RPC server instance

- In the Command Central **Home** page, click the **Instances** tab and select the RPC Server for C instance for which you want to see the runtime status (same as Step 1 under *Configuring a Broker Instance*).



The visual key performance indicators (KPIs) and alerts enable you to monitor the RPC Server for C's health.

KPI	Description
Active Workers	Number of active workers.
Busy Workers	Number of busy workers.

Starting an RPC Server Instance

➤ To start an RPC Server for C instance from the Instances tab

- 1 In the Command Central home page, click the **Instances** tab.

Component	Status	Alerts	Installation	Host
EntireX Broker ETB...	↑		Local	localhost
EntireX RPC Server	↓		Local	localhost
CCE	↑			localhost
IS_default	↑			localhost
SPM	↑			localhost

Lifecycle Actions

- Start
- Stop
- Pause
- Resume

- 2 Select the status, and from the context menu choose **Start**.

➤ To start an RPC Server for C instance from its Overview tab

- 1 In the Command Central home page, click the **Instances** tab and select the RPC Server for C instance you want to start (same as Step 1 under *Configuring a Broker Instance*).

Home > Instances > ALL > EntireX RPC Server myRpcServer

Overview Configuration Logs Administration

Instance: EntireX RPC Server myRpcServer

EntireX RPC Server myRpcS...

Dashboard

Status Alerts KPIs

↓ 0

Lifecycle Actions

- Start
- Stop
- Pause

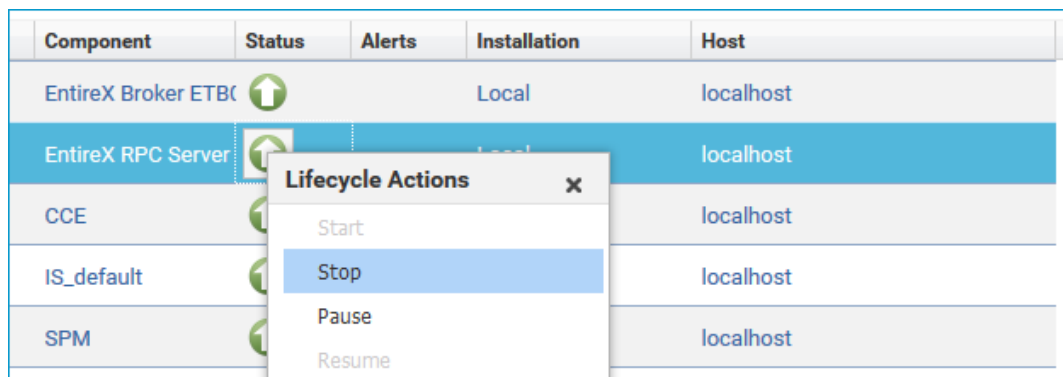
KPIs are not available w...

- 2 Select the status, and from the context menu choose **Start**.

Stopping an RPC Server Instance

➤ To stop an RPC Server for C instance from the Instances tab

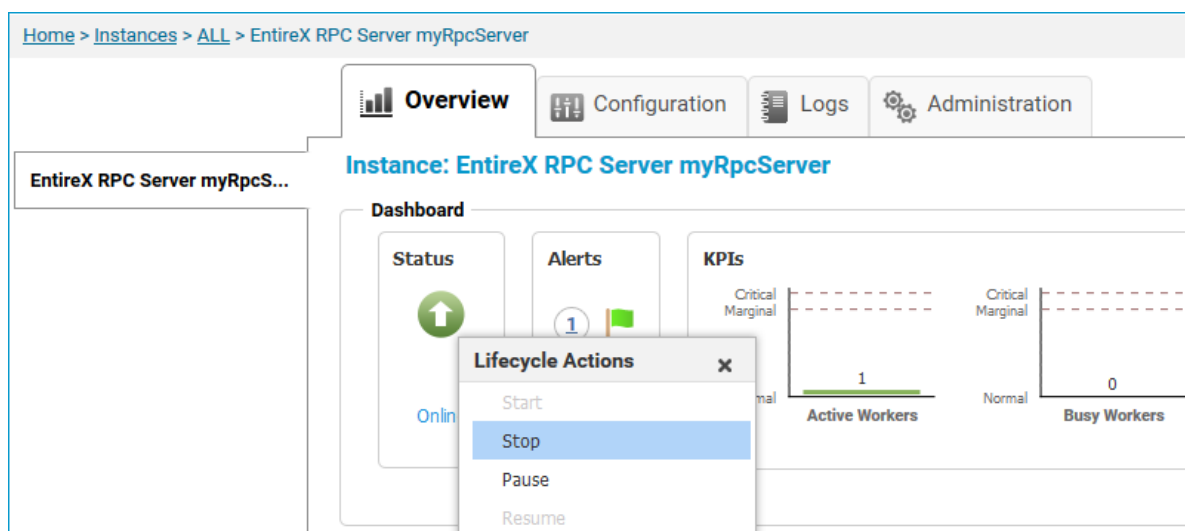
- 1 In the Command Central home page, click the **Instances** tab.



- 2 Select the status, and from the context menu choose **Stop**.

➤ To stop an RPC Server for C instance from its Overview tab

- 1 In the Command Central home page, click the **Instances** tab and select the RPC Server for C instance you want to stop (same as Step 1 under *Configuring a Broker Instance*).

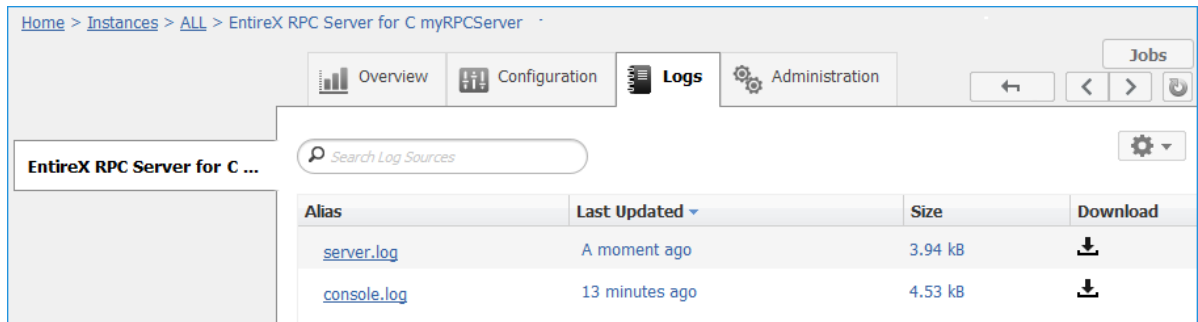


- 2 Select the status, and from the context menu choose **Stop**.

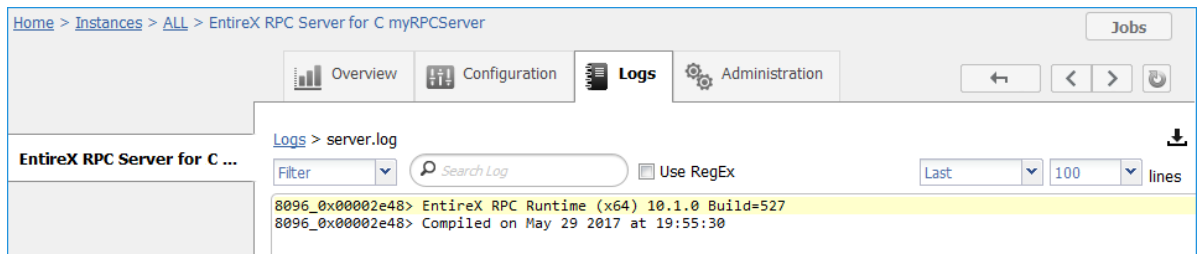
Inspecting the Log Files

➤ To inspect the log files of an RPC Server for C instance

- 1 In the Command Central home page, click the **Instances** tab, then click the link associated with the RPC Server for C instance for which you want to inspect the log files (same as Step 1 under *Configuring a Broker Instance*).
- 2 Click the **Logs** tab:



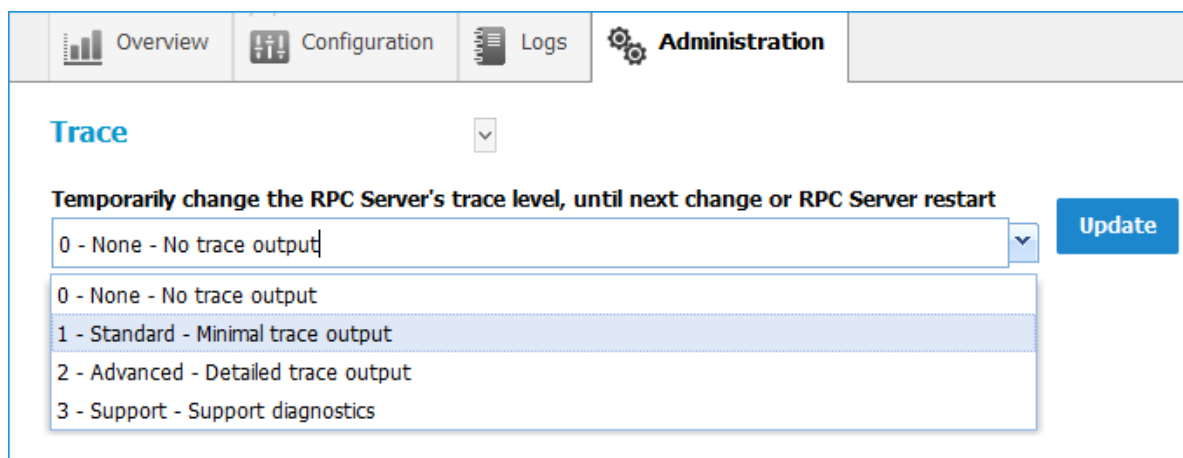
- 3 In the **Alias** column, click the link of the log file you want to inspect, for example *server.log*:



Changing the Trace Level Temporarily

> To temporarily change the trace level of an RPC Server for C instance

- 1 In the Command Central home page, click the **Instances** tab then click the link associated with the RPC Server for C instance for which you want change the trace level temporarily (same as Step 1 under *Configuring a Broker Instance*).
- 2 In the **Administration** tab, select the trace level and press **Update**.




The screenshot shows the 'Administration' tab in the Command Central GUI. Under the 'Trace' section, there is a dropdown menu titled 'Temporarily change the RPC Server's trace level, until next change or RPC Server restart'. The dropdown is open, showing four options: '0 - None - No trace output', '1 - Standard - Minimal trace output' (which is highlighted), '2 - Advanced - Detailed trace output', and '3 - Support - Support diagnostics'. To the right of the dropdown is a blue 'Update' button.

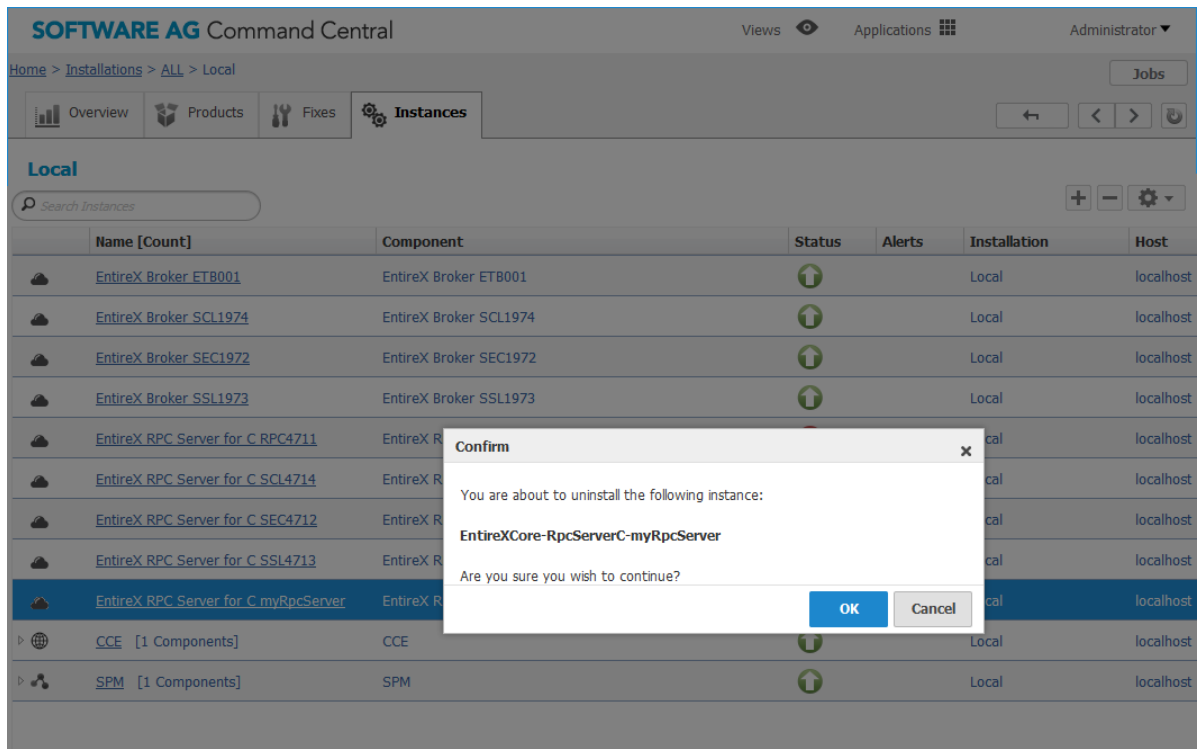


Note: If you want to set the trace level permanently, see [Trace Level](#) under *Configuring an RPC Server Instance*.

Deleting an RPC Server Instance

➤ To delete an RPC Server for C instance

- 1 In the list of EntireX RPC Server for C instances for your selected installation (for example Local), select the instance you want to delete and click the  button in the upper right corner above the list.



- 2 Click **OK** to confirm the uninstall of this RPC Server for C instance.
- 3 In the next window, click **Finish**. The selected instance is removed from the list.

4 Administering the RPC Server for C using the Command

Central Command Line

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This chapter describes how to administer the EntireX RPC Server for C, using the Command Central command-line interface.

Administering the RPC Server for C using the Command Central GUI is described under [Administering the RPC Server for C using the Command Central GUI](#). The core Command Central documentation is provided separately and is also available under **Guides for Tools Shared by Software AG Products** on the Software AG documentation website.

Creating an RPC Server Instance

The following table lists the parameters to include when creating an EntireX RPC instance, using the Command Central `create instances` commands.

Command	Parameter	Value	Opt/Req	Description
sagcc create instances	<i>node_alias</i>	<i>name</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>type</i>	RpcServerC	R	Required. EntireXCore instance type of RPC server. Must be "RpcServerC".
	<i>product</i>	EntireXCore	R	Required. Must be set to "EntireXCore".
	<i>instance.name</i>	<i>name</i>	R	Required. Name of the runtime component, for example "MyRpcServer".
	<i>install.service</i>	true <u>false</u>	O	Optional. Register Windows Service for automatic startup. Default is false. If this parameter is true, the RPC server can be controlled by the Windows Service Control Manager.
	<i>server.address</i>	<i>class/server/service</i>	R	Required. The case-sensitive RPC server address has the format: CLASS/SERVER/SERVICE.
	<i>server.adminport</i>	1025-65535	R	Required. The administration port in range from 1025 to 65535.
	<i>broker.transport</i>	ssl <u>tcp</u>	R	Transport over TCP or SSL. Default is TCP.
	<i>broker.host</i>	<i>name</i>	R	Required. EntireX Broker host name or IP address. See <i>Using the Broker ID in Applications</i> in the RPC Programming documentation.

Command	Parameter	Value	Opt/ Req	Description
	broker.port	1025-65535	R	Required. Port number in range from 1025 to 65535.
	broker.user	<i>user</i>	O	Optional. The user ID for secured access to the broker.
	broker.password	<i>password</i>	O	Optional. The password for secured access to the broker.
	broker.truststore	<i>name</i>	O	Optional. Specifies the location of the SSL trust store.
	library.dir	<i>path</i>	O	Required. Path to library containing the server programs.

Example

- To create a new instance for an installed EntireX of the type "RpcServerC", with name "MyRpcServer", with server address "RPC/SRV1/CALLNAT", using administration port 5757, with broker host name "localhost", listening on broker port 1971, with the C server programs containing directory "c:/myServer", in the installation with alias name "local":

```
sagcc create instances local EntireXCore type=RpcServerC instance.name=MyRpcServer
server.address=RPC/SRV1/CALLNAT server.adminport=5757 broker.host=localhost
broker.port=1971 library.dir=c:/myServer
```

Information about the creation job - including the job ID - is displayed.

Configuring an RPC Server Instance

Here you can administer the parameters of the RPC Server for C. Any changes to parameters will be used the next time you start the RPC server.

- [Broker](#)
- [Configuration File](#)
- [Library Locations](#)
- [Monitoring KPIs](#)
- [Server](#)
- [Trace](#)

Broker

Here you can administer the parameters used for communication between the RPC Server for C and EntireX Broker.

- [Parameters](#)
- [Displaying the Broker Settings of the RPC Server](#)
- [Updating the Broker Settings of the RPC Server](#)

Parameters

Parameter	Value	Opt/ Req	Description
BrokerTransport	<i>TCP SSL</i>	R	Transport over TCP or SSL. Default is TCP.
BrokerHost	<i>name</i>	R	Required. EntireX Broker host name or IP address. See <i>Using the Broker ID in Applications</i> in the RPC Programming documentation.
BrokerPort	<i>1025-65535</i>	R	Required. Port number in range from 1025 to 65535.
BrokerUser	<i>user</i>	O	Optional. The user ID for secured access to the broker.
BrokerPassword	<i>password</i>	O	Optional. The password for secured access to the broker.
BrokerEncoding	<i>codepage</i>	R	Required. Encoding used for the communication between the RPC server and EntireX Broker.
BrokerSslTrustStore	<i>filename</i>	O	Optional. Specifies the location of the SSL trust store.
BrokerSslTrustStorePassword	<i>password</i>	O	Optional. The password of the SSL trust store.
BrokerSslVerifyServer	<i>true false</i>	O	Optional. The RPC server as SSL client checks the identity of the broker as SSL server.

Displaying the Broker Settings of the RPC Server

Command	Parameter	Opt/ Req	Description
sagcc get configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "BROKER".
	<i>-o file</i>	O	Optional. Specifies the file where you want the output written.

Example 1

- To display the Broker parameters of the RPC Server for C "MyRpcServer" in the installation with alias name "local":

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer BROKER
```

Example 2

- To store the Broker parameters in the file *broker.json* in the current working directory:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer BROKER -o broker.json
```

Resulting output file in JSON format:

```
{
  "BrokerHost": "localhost",
  "BrokerPort": "1971",
  "BrokerTransport": "TCP",
  "BrokerUser": "testuser",
  "BrokerPassword": "",
  "BrokerEncoding": "Cp1252",
  "BrokerSslTrustStore": "",
  "BrokerSslVerifyServer": "true",
  "BrokerFipsMode": "no"
}
```

Updating the Broker Settings of the RPC Server

Command	Parameter	Opt/ Req	Description
sagcc update configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "BROKER".
	<i>-i file</i>	O	Optional. Specifies the file from where you want the input read.

Example

- To load the Broker parameters of the RPC Server for C "MyRpcServer" in the installation with alias name "local" from the file *broker.json* in the current working directory:

```
sagcc update configuration data local EntireXCore-RpcServerC-MyRpcServer BROKER  
-i broker.json
```

See [Example 2](#) above for sample input file.

Configuration File

Here you can administer the configuration file of the RPC Server for C. Any changes will take effect after the next restart.

- [Displaying the Content of the RPC Server Configuration File](#)
- [Updating the Content of the RPC Server Configuration File](#)

Displaying the Content of the RPC Server Configuration File

Command	Parameter	Opt/ Req	Description
sagcc get configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "CONFIGURATION".
	<i>-o file</i>	O	Optional. Specifies the file where you want the output written.

Example 1

- To display the configuration file of the RPC Server for C "MyRpcServer" in the installation with alias name "local":

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer CONFIGURATION
```

Example 2

- To store the contents of the configuration file in the text file *configuration.txt* in the current working directory:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer CONFIGURATION
-o configuration.txt
```

Updating the Content of the RPC Server Configuration File

Command	Parameter	Opt/ Req	Description
sagcc update configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "CONFIGURATION".
	<i>-i file</i>	O	Optional. Specifies the file from where you want the input read.

Example

- To load the contents of configuration file *configuration.json* in the current working directory:

```
sagcc update configuration data local EntireXCore-RpcServerC-MyRpcServer  
CONFIGURATION -i configuration.json
```


Library Locations

Here you can administer the library location from which the RPC Server for C loads the server implementations.

- [Parameters](#)
- [Displaying the Library Locations of the Server Implementation](#)
- [Updating the Library Locations of the Server Implementation](#)

Parameters

Parameter	Description
LibraryDirectories	Enclosing parameter for list of items. The parameter has no value.
Directory	Directory to the RPC Server implementation. Note: The list of Directory items is enclosed by parameter LibraryDirectories.

Displaying the Library Locations of the Server Implementation

Command	Parameter	Opt/Req	Description
sagcc get configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "LIBRARY-LOCATIONS".
	<i>-o file</i>	O	Optional. Specifies the file where you want the output written.

Example 1

- To display the library location parameters of the RPC Server for C "MyRpcServer" in the installation with alias name "local":

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer
LIBRARY-LOCATIONS
```

Example 2

- To store the library location parameters in the file *library_locations.json* in the current working directory:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer
LIBRARY-LOCATIONS -o library_locations.json
```

Resulting output file in JSON format:

```
{ "LibraryDirectories":
{ "Directory": "C:/mydir" }
}
```

Updating the Library Locations of the Server Implementation

Command	Parameter	Opt/ Req	Description
sagcc update configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "LIBRARY-LOCATIONS".
	<i>-i file</i>	O	Optional. Specifies the file from where you want the input read.

Example

- To load the library location parameters of the RPC Server for C "MyRpcServer" in the installation with alias name "local" from the file *library_locations.json* in the current working directory:

```
sagcc update configuration data local EntireXCore-RpcServerC-MyRpcServer
LIBRARY-LOCATIONS -i library_locations.json
```

See [Example 2](#) above for sample input file.

Monitoring KPIs

Here you can administer margins of monitored key performance indicators (KPIs) available for the RPC Server for C: Active Workers and Busy Workers.

- [Parameters](#)
- [Displaying the Monitoring KPIs](#)
- [Updating the Monitoring KPIs](#)

Parameters

Key performance indicators (KPIs) enable you to monitor the health of your RPC Server for C. The following KPIs help you administer, troubleshoot, and resolve performance issues:

KPI	Setting
Absolute number of Active Workers	entirex.generic.kpi.1.max=20
Critical alert relative to maximum	entirex.generic.kpi.1.critical=0.95
Marginal alert relative to maximum	entirex.generic.kpi.1.marginal=0.80
Absolute number of Busy Workers	entirex.generic.kpi.2.max=20
Critical alert relative to maximum	entirex.generic.kpi.2.critical=0.95
Marginal alert relative to maximum	entirex.generic.kpi.2.marginal=0.80

Do not change the other properties!

Displaying the Monitoring KPIs

Command	Parameter	Opt/Req	Description
sagcc get configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "EXX-MONITORING-KPIS".
	<i>-o file</i>	O	Optional. Specifies the file where you want the output written.

Example 1

- To display the monitoring KPI properties of RPC Server for C "MyRpcServer" in the installation with alias name "local" on stdout:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer
MONITORING-KPI
```

Example 2

- To store the monitoring KPI properties in the file *my.properties* in the current working directory:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer
MONITORING-KPI -o my.properties
```

Resulting output file in text format:

```
entirex.entirex.spm.version=10.9.0.0.473
entirex.generic.kpi.1.critical=0.95
entirex.generic.kpi.1.id=\#1
entirex.generic.kpi.1.marginal=0.80
entirex.generic.kpi.1.max=20
entirex.generic.kpi.1.name=Active Workers
entirex.generic.kpi.1.unit=
entirex.generic.kpi.1.value=0
entirex.generic.kpi.2.critical=0.95
entirex.generic.kpi.2.id=\#2
entirex.generic.kpi.2.marginal=0.80
entirex.generic.kpi.2.max=20
entirex.generic.kpi.2.name=Busy Workers
entirex.generic.kpi.2.unit=
entirex.generic.kpi.2.value=0
```

Updating the Monitoring KPIs

Command	Parameter	Opt/ Req	Description
sagcc update configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "EXX-MONITORING-KPIS".
	<i>-i file</i>	O	Optional. Specifies the file from where you want the input read.

Example

- To load the contents of file *my.properties* in the current working directory:

```
sagcc update configuration data local EntireXCore-RpcServerC-MyRpcServer  
MONITORING-KPI -i my.properties
```

Server

Here you can administer the parameters defining the registration name, the administration port and the behavior of the RPC Server for C.

- [Parameters](#)
- [Displaying the Server Settings](#)
- [Updating the Server Settings](#)

Parameters

Parameter	Value	Opt/ Req	Description
ServerAddress	<i>class/server/service</i>	R	Required. The case-sensitive RPC server address has the format: CLASS/SERVER/SERVICE.
ServerAdminport	1025-65535	R	Required. The administration port in range from 1025 to 65535.
ReconnectionAttempts	<i>n</i>	R	Required. Number of reconnection attempts to the broker. When the number of attempts is reached and a connection to the broker is not possible, the RPC Server for C stops.
WorkerScalability	<i>true</i> <i>false</i>	R	You can either have a fixed or dynamic number of workers. Default is dynamic (<i>true</i>). For more information see Worker Models .
FixNumber	1-255	R	Required. Fixed number of workers. Must be a number in range from 1 to 255.
MinWorkers	1-255	R	Required. Minimum number of workers. Must be a number in range from 1 to 255.
MaxWorkers	1-255	R	Required. Maximum number of workers. Must be a number in range from 1 to 255.

Displaying the Server Settings

Command	Parameter	Opt/ Req	Description
sagcc get configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "SERVER".
	<i>-o file</i>	O	Optional. Specifies the file where you want the output written.

Example 1

- To display the server parameters of RPC Server for C "MyRpcServer" in the installation with alias name "local" on stdout:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer SERVER
```

Example 2

- To store the server parameters in the file *server.json* in the current working directory:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer SERVER -o server.json
```

Resulting output file in JSON format:

```
{
  "ServerAddress": "RPC/SRV1/CALLNAT",
  "ServerAdminport": "4711",
  "ReconnectionAttempts": "15",
  "WorkerScalability": "true",
  "FixNumber": "5",
  "MinWorkers": "1",
  "MaxWorkers": "10"
}
```

Updating the Server Settings

Command	Parameter	Opt/Req	Description
sagcc update configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "SERVER".
	<i>-i file</i>	O	Optional. Specifies the file from where you want the input read.

Example

- To load the server parameters from the file *server.json* in the current working directory:

```
sagcc update configuration data local EntireXCore-RpcServerC-MyRpcServer SERVER  
-i server.json
```

See [Example 2](#) above for sample input file.

Trace

Here you can set the trace level of the RPC Server for C.

- [Parameters](#)
- [Displaying the Trace Level](#)
- [Updating the Trace Level](#)

Parameters

Command	Parameter	Opt/ Req	Description
TraceLevel	0 1 2 3	R	One of the following levels: 0 - None - No trace output (default). 1 - Standard - Minimal trace output. 2 - Advanced - Detailed trace output. 3 - Support - Support diagnostic. Use only when requested by Software AG Support.

Displaying the Trace Level

Command	Parameter	Opt/ Req	Description
sagcc get configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "TRACE".
	<i>-o file</i>	O	Optional. Specifies the file where you want the output written.

Example 1

- To display the trace level of RPC Server for C "MyRpcServer" in the installation with alias name "local" on stdout:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer TRACE
```

Example 2

- To store the trace level in the file *trace.json* in the current working directory:

```
sagcc get configuration data local EntireXCore-RpcServerC-MyRpcServer TRACE -o
trace.json
```

Resulting output file in JSON format:

```
{
  "TraceLevel": "0"
}
```

Updating the Trace Level

Command	Parameter	Opt/ Req	Description
sagcc update configuration data	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	<i>instanceid</i>	R	Required. Must be "TRACE".
	<i>-i file</i>	O	Optional. Specifies the file from where you want the input read.

Example

- To load the trace level parameters from the file *trace.json* in the current working directory:

```
sagcc update configuration data local EntireXCore-RpcServerC-MyRpcServer TRACE
-i trace.json
```

See [Example 2](#) above for sample input file.

Displaying the EntireX Inventory

Listing all Inventory Components

The following table lists the parameters to include, when listing all EntireX instances, using the Command Central `list inventory` commands.

Command	Parameter	Opt/ Req	Description
sagcc list inventory components	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".

Example

- To list inventory components of instance EntireX in the installation with alias name "local":

```
sagcc list inventory components local EntireXCore*
```

A list of all EntireX RPC Server runtime components will be displayed.

Viewing the Runtime Status

The following table lists the parameters to include when displaying the state of an EntireX component, using the Command Central `get monitoring` commands.

Command	Parameter	Opt/ Req	Description
sagcc get monitoring state	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".

Example

- To display state information about the RPC Server for C:

```
sagcc get monitoring state local EntireXCore-RpcServerC-MyRpcServer
```

Runtime status and runtime state will be displayed.

- Runtime *status* indicates whether a runtime component is running or not. Examples of a runtime status are ONLINE or STOPPED.
- Runtime *state* indicates the health of a runtime component by providing key performance indicators (KPIs) for the component. Each KPI provides information about the current use, marginal use, critical use and maximum use.

Starting an RPC Server Instance

The following table lists the parameters to include when starting an EntireX RPC Server for C, using the Command Central `exec lifecycle` commands.

Command	Parameter	Opt/ Req	Description
sagcc exec lifecycle start	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".

Example

- To start the RPC Server for C "MyRpcServer" in the installation with alias name "local":

```
sagcc exec lifecycle start local EntireXCore-RpcServerC-MyRpcServer
```

Information about the job - including the job ID - will be displayed.

Stopping an RPC Server Instance

The following table lists the parameters to include when stopping an EntireX RPC Server for C, using the Command Central `exec lifecycle` commands.

Command	Parameter	Opt/ Req	Description
sagcc exec lifecycle stop	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".

Example

- To stop the RPC Server for C "MyRpcServer" in the installation with alias name "local":

```
sagcc exec lifecycle stop local EntireXCore-RpcServerC-MyRpcServer
```

Information about the job - including the job ID - will be displayed.

Inspecting the Log Files

Here you can administer the log files of the RPC Server for C. The following table lists the parameters to include when displaying or modifying parameters of the RPC server, using the Command Central `list` commands.

- [List all RPC Server Log Files](#)
- [Getting Content from or Downloading RPC Server Log Files](#)

List all RPC Server Log Files

Command	Parameter	Opt/Req	Description
sagcc list diagnostics logs	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".

Example

- To list the log files of RPC Server for C "MyRpcServer" in the installation with alias name "local" on stdout:

```
sagcc list diagnostics logs local EntireXCore-RpcServerC-MyRpcServer
```

Getting Content from or Downloading RPC Server Log Files

Command	Parameter	Opt/Req	Description
sagcc get diagnostics logs	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	full tail head	O	Optional. Shows full log file content, or only tail or head.
	export -o <i>file</i>	O	Optional. Creates a zip file of the logs.

Example 1

- To list the tail of the log file content in the current working directory:

```
sagcc get diagnostics logs local EntireXCore-RpcServerC-MyRpcServer server.log  
tail
```

Example 2

- To create a zip file *myfile.zip* of the logs:

```
sagcc get diagnostics logs local EntireXCore-RpcServerC-MyRpcServer export -o  
myfile.zip
```

Changing the Trace Level Temporarily

Here you can temporarily change the trace level of a running RPC server. The following table lists the parameters to include when displaying or modifying parameters of an EntireX component, using the Command Central `exec administration` command. The change is effective immediately; there is no need to restart the RPC server.



Note: If you want to set the trace level permanently, see [Trace](#) under *Configuring an RPC Server Instance*.

Displaying the Trace Level of a Running RPC Server

Command	Parameter	Opt/Req	Description
sagcc exec administration	component	R	Required. Specifies that a component will be administered.
	node_alias	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	Trace	R	Required. Specifies what is to be administered.
	load tracelevel=?	R	Required. Get the trace level.
	-f xml json	R	Required. Specifies XML or JSON as output format.

Example 1

- To display the current trace level of the RPC Server for C "MyRpcServer" in the installation with alias name "local" in JSON format on stdout:

```
sagcc exec administration component local EntireXCore-RpcServerC-MyRpcServer
Trace load tracelevel=? -f json
```

Example 2

- To display the current trace level of the RPC Server for C "MyRpcServer" in the installation with alias name "local" in XML format on stdout:

```
sagcc exec administration component local EntireXCore-RpcServerC-MyRpcServer
Trace load tracelevel=? -f xml
```


Updating the Trace Level of a Running RPC Server

Command	Parameter	Opt/ Req	Description
sagcc exec administration	component	R	Required. Specifies that a component will be administered.
	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".
	Trace	R	Required. Specifies what is to be administered.
	update tracelevel	R	Required. Update temporarily the trace level of a running RPC server.
	-f xml json	R	Required. Specifies XML or JSON as output format.

Example

- To change the current trace level of the running RPC Server with the name "MyRpcServer" in the installation with alias name "local":

```
sagcc exec administration component local EntireXCore-RpcServerC-MyRpcServer
Trace update tracelevel=2 -f json
```

Deleting an RPC Server Instance

The following table lists the parameters to include when deleting an EntireX RPC Server instance, using the Command Central `delete instances` commands.

Command	Parameter	Opt/ Req	Description
sagcc delete instances	<i>node_alias</i>	R	Required. Specifies the alias name of the installation in which the runtime component is installed.
	<i>componentid</i>	R	Required. The component identifier. The prefix is "EntireXCore-RpcServerC-".

Example

- To delete an instance of an EntireX RPC Server for C with the name "MyRpcServer" in the installation with alias name "local":

```
sagcc delete instances local EntireXCore-RpcServerC-MyRpcServer
```

Information about the deletion job - including the job ID - is displayed.

5

Administering the RPC Server for C with Local Scripts

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The EntireX RPC Server for C allows standard RPC clients to communicate with servers written in C. It works together with the C Wrapper and calls standard libraries (Windows DLLs or Linux shared objects/libraries).

This chapter describes how to administer the RPC Server for C with local scripts as in earlier versions of EntireX.

See also *Administering the RPC Server for C* with the Command Central [GUI](#) | [Command Line](#).

Customizing the RPC Server

The following elements are used for setting up the RPC Server for C:

- [Configuration File](#)
- [Start Script](#)

Configuration File

The name of the delivered example configuration file is `cserver` provided in the `config` folder. The configuration file contains the configuration for the RPC Server for C. The following settings are important:

- connection information such as broker ID, server address (class, name, service)
- scalability parameters
- trace settings
- etc.

For more information see [Configuring the RPC Server](#).

Start Script

The start script for the RPC Server for C is called `cserver.bsh` (Linux) or `cserver.bat` (Windows) and is provided in the `bin` folder of the installation directory. You may customize this file. The start script contains the following:

- paths to the called C server
- the configuration file used; see [Configuration File](#)
- etc.

Configuring the RPC Server

The following rules apply:

- In the configuration file:
 - Comments must be on a separate line.
 - Comment lines can begin with '*', '/' and ';'.
 - Empty lines are ignored.
 - Headings in square brackets [<topic>] are ignored.
 - Keywords are case-insensitive.
- Underscored letters in a parameter indicate the minimum number of letters that can be used for an abbreviated command.

For example, in `brokerid=localhost`, `brok` is the minimum number of letters that can be used as an abbreviation, that is, the commands/parameters `broker=localhost` and `brok=localhost` are equivalents.

Parameter	Default	Values	Req/Opt
<code>brokerid</code>	<code>localhost</code>	Broker ID used by the server. See <i>Using the Broker ID in Applications</i> in the RPC Programming documentation. Example: <code>brokerid=myhost.com:1971</code>	R
<code>class</code>	<code>RPC</code>	Server class part of the server address used by the server. The server address must be defined as a service in the broker attribute file (see <i>Service-specific Attributes</i>). Case-sensitive, up to 32 characters. Corresponds to <code>CLASS</code> attribute of the broker attribute file. Example: <code>class=MyRPC</code>	R
<code>codepage</code>		The codepage tells the broker the encoding of the data. The application must ensure the encoding of the data matches the codepage. The RPC server itself does not convert your application data. The application's data is shipped and received as given. Often, the codepage must also match the encoding used in the RPC server environment for file and terminal IO, otherwise unpredictable results may occur. Under the Linux operating system:	R/O

Parameter	Default	Values	Req/ Opt
		<ul style="list-style-type: none"> ■ By default, no codepage is transferred to the broker. ■ It is assumed the broker's locale string defaults match. See <i>Locale String Mapping</i>. If they do not match, provide the codepage here. <p>Example: codepage=iso-8859-1</p> <p>Under the Windows operating system:</p> <ul style="list-style-type: none"> ■ By default, the Windows ANSI codepage configured for your system is automatically transferred to tell the broker how the data is encoded. ■ If you want to adapt the Windows ANSI codepage, see the Regional Settings in the Windows Control Panel and your Windows documentation. ■ If you want to encode the data different to your Windows ANSI codepage, convert the data in the application and provide the codepage name here. <p>Example: codepage=windows-1256</p> <p>During receive, decode the data accordingly.</p> <p>Enable character conversion in the broker by setting the service-specific attribute <code>CONVERSION</code> to "SAGTRPC". See also <i>Configuring ICU Conversion</i> under <i>Configuring Broker for Internationalization</i> in the platform-specific Administration documentation. More information can be found under <i>Internationalization with EntireX</i>.</p>	
<code>compresslevel</code>	N	<p>Enforce compression when data is transferred between broker and server. See <i>Data Compression in EntireX Broker</i> in the platform-independent Administration documentation.</p> <p><code>compresslevel=0 1 2 3 4 5 6 7 8 9 Y N</code></p> <p>0-9 0=no compression 9=max. compression</p> <p>N no compression Y compression level 6</p> <p>Example: <code>compresslevel=6</code></p>	O

Parameter	Default	Values	Req/ Opt
<u>endworkers</u>	timeout	<p>NEVER Defines worker model FIXED with a fixed number of worker threads. The number of worker threads is defined with minworkers. It does not increase or decrease during the lifetime of an RPC server instance.</p> <p>TIMEOUT Defines slow-shrinking worker model DYNAMIC, where the number of worker threads is adjusted to the current number of client requests. With value TIMEOUT, all worker threads not used are stopped in the time specified by the timeout, except for the minimum number of active workers specified with minworkers. The upper limit of workers parallel active is restricted with maxworkers.</p> <p>IMMEDIATE Defines fast-shrinking worker model DYNAMIC, where the number of worker threads is adjusted to the current number of client requests. With value IMMEDIATE, worker threads not used are stopped immediately as soon as they have finished their conversation, except for the minimum number of active workers defined with minworkers. The upper limit of workers active in parallel is restricted with maxworkers.</p> <p>Example: endworkers=timeout minworkers=2 maxworkers=6 timeout=60</p>	O
<u>library</u>	library =PREFIX(D) - PREFIX()	<p>library = <i>search_logic</i> [- <i>library</i>]</p> <p>where <i>search_logic</i> is one of FIX(<i>dllname</i>) PREFIX(<i>prefix</i>) PREFIX(), and <i>library</i> can be repeated up to four times, that is, five entries are possible.</p> <p>FIX(<i>dllname</i>) The IDL library name coming from the RPC client is ignored. You have to define the library names (Windows</p>	O

Parameter	Default	Values	Req/ Opt
		<p>DLLs or Linux shared objects/libraries).</p> <p><code>PREFIX(prefix)</code> The IDL library name coming from the RPC client is used to form the library name (Windows DLLs or Linux shared objects/libraries). As prefix you can define any character. If an RPC client sends, for example, "SYSTEM" as the IDL library name and "D" is defined as prefix, the library name derived is "DSYSTEM".</p> <p><code>PREFIX()</code> The IDL library name coming from the RPC client is used as library name (Windows DLLs or Linux shared objects/libraries).</p> <p>Example FIX configuration: <code>library=FIX(MYSTUBS) - FIX(MYRPCS)</code></p>	
<u>logon</u>	YES	<p>Execute broker functions LOGON/LOGOFF in worker threads. Must match the setting of the broker attribute AUTOLOGON. Reliable RPC requires logon set to YES. See <i>Reliable RPC</i>.</p> <p>NO No logon/logoff functions are executed.</p> <p>YES Logon/logoff functions are executed.</p> <p>Example: <code>logon=no</code></p>	O
<u>minworkers</u>	1	<p>Minimum limit of worker threads.</p> <ul style="list-style-type: none"> ■ For worker model DYNAMIC: minimum number of active worker threads, even if no RPC client requests have to be processed. This allows you to define a certain number of worker threads - not used by the currently executing RPC request - to wait for new RPC client requests to process. In this way the RPC server is ready to handle many RPC client requests arriving at the same time. Do not set a value higher than maxworkers. ■ For worker model FIXED: number of active worker threads. Do not set a value higher than 256. <p>See also endworkers.</p> <p>Example:</p>	O

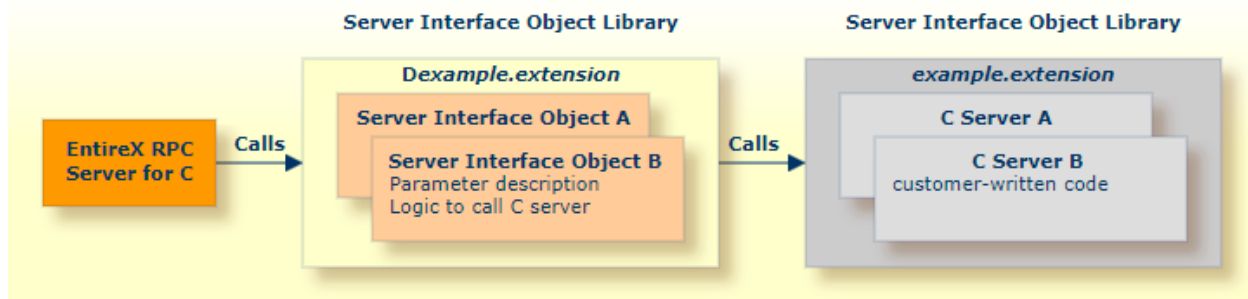
Parameter	Default	Values	Req/ Opt
		minworkers=2	
maxworkers	10	Upper limit of all tasks concurrently. Do not set a value higher than 256. See also endworkers . Example: maxworkers=2	O
password	no default	The password for secured access to the broker. If possible (write access) the password is encrypted and written to parameter password.e. The parameter password is removed. To change the password, add the parameter password with the new password as value. Example: password=MyPwd	O
restartcycles	15	Number of restart attempts if the broker is not available. This can be used to keep the RPC Server for C running while the broker is down for a short time. A restart cycle will be repeated every 60 seconds. Note: Internally, the server waits in periods of 10 seconds (performing six times more cycles), which you can see in the server output. When the number of specified cycles is reached and a connection to the broker is not possible, the RPC Server for C stops. Example: restartcycles=30 The server waits up to 30 minutes (30*6*10 seconds) before it terminates due to a missing broker connection.	O
servername	SRV1	Server name part of the server address used by the server. The server address must be defined as a service in the broker attribute file. See <i>Service-specific Attributes</i> . Case-sensitive, up to 32 characters. Corresponds to SERVER of the broker attribute file. Example: servername=mySrv	R
service	CALLNAT	Service part of the server address used by the server. The server address must be defined as a service in the broker attribute file. See <i>Service-specific Attributes</i> . Case-sensitive, up to 32 characters. Corresponds to SERVICE attribute of the broker attribute file. Example:	R

Parameter	Default	Values	Req/ Opt																								
		service=MYSERVICE																									
ssl_file	no default	Set the SSL parameters. See Using SSL/TLS with the RPC Server for examples and more information.	O																								
timeout	60	Timeout in seconds, used by the server to wait for broker requests. See WAIT under <i>Broker ACI Fields</i> for more information. Also influences restartcycles and worker model DYNAMIC . Example: timeout=300	O																								
tracedestination	ERXTrace.nnn.log	<p>The name of the destination file for trace output. By default the main trace file name is ERXTrace.nnn.log, where <i>nnn</i> can be in the range from 001 to 005. See also Activating Tracing for the RPC Server.</p> <ul style="list-style-type: none">■ Under Linux, the trace file is located in the current working directory.■ Under Windows, the trace file is located in a subfolder of the windows folder <i>My Documents</i>. <p>If the default is not used and a tracedestination is specified, you can use the following variables depending on the operating system:</p> <table><tr><td>%...%</td><td>Windows</td><td>Environment variable.</td></tr><tr><td>\$(...)</td><td>Linux</td><td>Environment variable.</td></tr><tr><td>@PID</td><td>Linux, Win</td><td>Process ID.</td></tr><tr><td>@TID</td><td>Linux, Win</td><td>Thread ID.</td></tr><tr><td>@RANGE[<i>n</i>, <i>m</i>]</td><td>Linux, Win</td><td><i>m</i> must be greater than <i>n</i>, range is from 0 - 999</td></tr><tr><td>@CSIDL_PERSONAL</td><td>Windows</td><td>The user's home directory. The variable will be resolved by Windows shell functions.</td></tr><tr><td>@CSIDL_APPDATA</td><td>Windows</td><td>The <i>Application Data Directory</i>. The variable will be resolved by Windows shell functions.</td></tr><tr><td>@CSIDL_LOCAL_APPDATA</td><td>Windows</td><td>The <i>Local Application Data Directory</i>. The variable will be resolved</td></tr></table>	%...%	Windows	Environment variable.	\$(...)	Linux	Environment variable.	@PID	Linux, Win	Process ID.	@TID	Linux, Win	Thread ID.	@RANGE[<i>n</i> , <i>m</i>]	Linux, Win	<i>m</i> must be greater than <i>n</i> , range is from 0 - 999	@CSIDL_PERSONAL	Windows	The user's home directory. The variable will be resolved by Windows shell functions.	@CSIDL_APPDATA	Windows	The <i>Application Data Directory</i> . The variable will be resolved by Windows shell functions.	@CSIDL_LOCAL_APPDATA	Windows	The <i>Local Application Data Directory</i> . The variable will be resolved	O
%...%	Windows	Environment variable.																									
\$(...)	Linux	Environment variable.																									
@PID	Linux, Win	Process ID.																									
@TID	Linux, Win	Thread ID.																									
@RANGE[<i>n</i> , <i>m</i>]	Linux, Win	<i>m</i> must be greater than <i>n</i> , range is from 0 - 999																									
@CSIDL_PERSONAL	Windows	The user's home directory. The variable will be resolved by Windows shell functions.																									
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@CSIDL_LOCAL_APPDATA	Windows	The <i>Local Application Data Directory</i> . The variable will be resolved																									

Parameter	Default	Values	Req/ Opt
		<p>by Windows shell functions.</p> <p>See also Activating Tracing for the RPC Server.</p> <p>Example: tracedestination=ERXTrace.log</p>	
<u>tracelevel</u>	None	<p>Trace level for the server. See also Activating Tracing for the RPC Server.</p> <p>tracelevel=<u>None</u> Standard Advanced Support</p> <p>None No trace output.</p> <p>Standard For minimal trace output.</p> <p>Advanced For detailed trace output.</p> <p>Support This trace level is for support diagnostics. Use only when requested by Software AG Support.</p> <p>Example: tracelevel=standard</p>	O
<u>traceoption</u>	None	<p>Additional trace option if trace is active. See also Activating Tracing for the RPC Server.</p> <p>None No additional trace options.</p> <p>STUBLOG If tracelevel is Advanced or Support, the trace additionally activates the broker stublog.</p> <p>NOTRUNC Normally if a data buffer larger than 8 KB is traced, the buffer trace is truncated. Set this option to write the full amount of data without truncation.</p> <p>Note: This can increase the amount of trace output data dramatically if you transfer large data buffers.</p> <p>Example: traceoption=(STUBLOG,NOTRUNC)</p>	O
<u>userid</u>	ERX - SRV	<p>The user ID for access to the broker. The default ERX - SRV will be used if this parameter is omitted or specified without a value: "userid=".</p> <p>Example: userid=MyUid</p>	O

Locating and Calling the Target Server

The IDL library and IDL program names that come from the RPC client are used to locate the server interface objects and your customer-written C servers. See [library-definition](#) and [program-definition](#). This two-level concept (library and program) has to be mapped to the RPC Server for C environment. The called C servers and server interface objects are implemented as libraries (shared objects/libraries under Linux; DLLs under Windows). Those libraries also have a two-level concept: file name and entry point name.



See also *Server Interface Objects and C Server* in the [Introduction](#).

As an example, assume the RPC client sends the IDL library name "EXAMPLE" and IDL program "CALC":

■ Server interface object

For the file name⁽²⁾, the character "D" is used as a prefix to the IDL library name sent from the RPC client. The resulting name is "DEXAMPLE". For the entry point name⁽³⁾, the character "D" is used as a prefix to the IDL program name sent from the RPC client. The resulting name is "DCALC".

- Under Linux: A shared library/object with file name⁽¹⁾ DEXAMPLE.so|sl and entry point DCALC must be accessible through the standard Linux shared library load mechanism.
- Under Windows: A DLL named DEXAMPLE.DLL and entry point DCALC must be accessible through the standard Windows DLL load mechanism.

■ C Server file (written by customer)

For the file name⁽²⁾, the IDL library name sent from the RPC client is used directly. The resulting name is "EXAMPLE". For the entry point (written by customer) name⁽⁴⁾, the IDL program name sent from the RPC client is used directly. The resulting name is "CALC".

- Under Linux: A shared library/object with file name⁽¹⁾ EXAMPLE.so|sl and entry point CALC must be accessible through the standard Linux shared library load mechanism.
- Under Windows: A DLL named EXAMPLE.DLL and entry point CALC must be accessible through the standard Windows DLL load mechanism.

**Notes:**

1. Under Linux, file names are case sensitive. The IDL library name must exactly match the name of the shared library/object.
2. The mechanism to form the file names can be modified with the `library` parameter. The description here assumes default settings with `PREFIX(D) - PREFIX()`. These match the standard names produced by the C Wrapper.
3. The prefix for the entry point name of the server interface object is always “D”. It does not depend on the `library` parameter.
4. The entry point name for the called C server must match the IDL program name.

Using SSL/TLS with the RPC Server

RPC servers can use Secure Sockets Layer/Transport Layer Security (SSL/TLS) as the transport medium. The term “SSL” in this section refers to both SSL and TLS. RPC-based servers are always SSL clients. The SSL server can be either the EntireX Broker, Broker SSL Agent, or Direct RPC in webMethods Integration Server (IS inbound). For an introduction see *SSL/TLS, HTTP(S), and Certificates with EntireX* in the platform-independent Administration documentation.

➤ To use SSL

- 1 To operate with SSL, certificates need to be provided and maintained. Depending on the platform, Software AG provides sample certificates, but we strongly recommend that you create your own. See *SSL/TLS Sample Certificates Delivered with EntireX* in the EntireX Security documentation.
- 2 Specify the Broker ID, using one of the following styles:

- *URL Style*, for example:

```
ssl://localhost:2010
```

- *Transport-method Style*, for example:

```
ETB024:1609:SSL
```

If no port number is specified, port 1958 is used as default.

- 3 Specify SSL parameters, using one of the methods below:

■ As part of the Broker ID

The simplest way to specify short SSL parameters is to add them to the Broker ID.

Example with URL-style Broker ID:

```
ssl://localhost:2010?VERIFY_SERVER=N&TRUST_STORE=c:\\certs\\CaCert.pem
```

Example with transport-method-style Broker ID:

```
ETB024:1609:SSL?VERIFY_SERVER=N&TRUST_STORE=c:\\certs\\CaCert.pem
```

■ In the SSL file

Complex SSL parameters can be specified in a so-called SSL file, a text file containing the parameters.

1. Define the SSL file with the SSL parameters, for example file *mySSLParms.txt* with the following contents:

```
VERIFY_SERVER=N
TRUST_STORE=c:\\certs\\CaCert.pem
```

2. Define the SSL file in the configuration file of the RPC Server for C. See parameter `ssl_file` under [Configuring the RPC Server](#). Example:

```
brokerid=ssl://localhost:2010
.
.
ssl_file=C:\\mySSLdirectory\\mySSLParms.txt
```

If the SSL client checks the validity of the SSL server only, this is known as *one-way SSL*. Two SSL parameters must be specified on the SSL client side: `trust_store` and `trust_passwd`. The mandatory `trust_store` parameter specifies the file name of a PKCS#12 certificate store that must contain the certificate chain of the trusted certificate authority (CA) that issued the SSL server's certificate.

To unlock this certificate store, the password has to be set with SSL parameter `trust_passwd`. By default a check is made that the certificate of the SSL server is issued for the hostname specified in the Broker ID. The common name of the subject entry in the server's certificate is checked against the hostname. If they do not match, the connection will be refused. You can disable this check with SSL parameter `verify_server=no`.

If the SSL server additionally checks the identity of the SSL client, this is known as *two-way SSL*. In this case the SSL server requests a client certificate (the parameter `verify_client=yes` is defined in the configuration of the SSL server). Two additional SSL parameters must be specified on the SSL client side: `key_store` and `key_passwd`. This keystore must contain the private key of the SSL client. The password that protects the private key is specified with `key_passwd`.

The ampersand (&) character cannot appear in the password.

SSL parameters are separated by ampersand (&). See also *SSL/TLS Parameters for SSL Clients*.

- 4 Make sure the SSL server to which the RPC Server for C connects is prepared for SSL connections as well. The SSL server can be EntireX Broker, Broker SSL Agent, or Direct RPC in webMethods Integration Server (IS inbound). See:
 - *Running Broker with SSL/TLS Transport* in the platform-specific Administration documentation
 - Broker SSL Agent in the platform-specific Administration documentation
 - *Support for SSL/TLS* in the EntireX Adapter documentation (for Direct RPC)

Starting the RPC Server

Before starting, make sure all your server interface objects and (customer-written) C servers are accessible through the standard Windows DLL or Linux shared library/object load mechanism. See also [Locating and Calling the Target Server](#).

➤ To start the RPC Server for C

- Use the [Start Script](#).

Or:

Use the following format:

```
rpcserver CFG=name [-option] [brokerid] [class] [servername] [service]
```

Here are some sample options. See [Configuring the RPC Server](#) for full list.

<code>-serverlog file</code>	Defines an alternative log file. Under Windows, this is typically used by Windows Services. See Running an EntireX RPC Server as a Windows Service .
<code>-s[ilent]</code>	Run the RPC server in silent mode, that is, no terminal input will be required (for example to acknowledge error messages). The batch scripts will terminate automatically. Under Linux, this is recommended when running in background mode.
<code>-TraceDestination file</code>	Set the trace destination parameter.
<code>-TraceLevel None Standard Advanced</code>	Set the trace level parameter.



Note: The server input arguments are resolved from left to right. Parameters defined in the configuration file may be overridden by parameters applied on the command line and vice versa. See [Configuring the RPC Server](#) for full list of options.

Or:

Under Windows you can use the RPC Server for C as a Windows Service. See [Running an EntireX RPC Server as a Windows Service](#).

Stopping the RPC Server

➤ To stop the RPC Server for C

- Use the command `stopService`. See *Stop Running Services* in Command Central's Command-line Interface.

Or:

Stop the service using Command Central's Graphical User Interface. See *Stopping a Service*.

Or:

Use the command-line utility `etbcmd`. See `etbcmd` under *Broker Command-line Utilities* in the platform-specific Administration documentation.

Or:

Use `CTRL-C` in the session where you started the RPC server instance.

Or:

Under Linux, enter command `kill -process-id`.

Pinging the RPC Server

➤ To ping the RPC Server for C

- Enter the following command:


```
java -classpath "$EXXDIR/classes/entirex.jar" ↵
com.softwareag.entirex.rpcping.RPCServerPing -p <admin_port>
```

where *admin_port* is the number of the administration port.

The `ping` command returns "0" if the server is reachable, and "1" if the server cannot be accessed.

Running an EntireX RPC Server as a Windows Service

For general information see *Running an EntireX RPC Server as a Windows Service* in the Windows Administration documentation.

➤ To run the RPC Server for C as a Windows Service

- 1 Customize the *Start Script* according to your system installation.



Note: The script file must pass external parameters to the RPC server and use the option `-silent`:

```
rpcserver CFG=..\config\cserver.cfg -s %*
```

See also *Starting the RPC Server*.

- 2 Test your RPC server to see whether it will start if you run your script file.
- 3 Use the *EntireX RPC Service Tool* and install the `RPCService` with some meaningful extension, for example `MyServer`. If your *Start Script* is `cserver.bat`, the command will be

```
RPCService -install -ext MyServer -script install_path\EntireX\bin\cserver.bat
```

The log file will be called *RPCservice_MyServer.log*.

- 4 In **Windows Services** menu (**Control Panel** > **Administrative Tools** > **Services**) select the service: `Software AG EntireX RPC Service [MyServer]` and change the property `Startup Type` from "Manual" to "Automatic".

Activating Tracing for the RPC Server

➤ To switch on tracing for the RPC Server for C

- 1 Set the parameters `tracelevel`, `traceoption` and `tracedestination`. See [Configuring the RPC Server](#).
- 2 Start the RPC Server for C. See [Starting the RPC Server](#).
- 3 To evaluate the RPC server return codes, see *EntireX RPC Server Return Codes* in the Error Messages and Codes documentation.

➤ To switch off tracing

- Set the `tracelevel` parameter to `None`.

6

Scenarios

■ Writing a New C Server	70
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Writing a New C Server

> To write a new C server

- 1 Use the C Wrapper to generate a C server skeleton and a C server interface object. Write your C server and proceed as described under *Using the C Wrapper for the Server Side (z/OS, Linux, Windows, BS2000)*.
- 2 Build an EntireX RPC client using any EntireX wrapper. For a quick test you can:
 - use the IDL Tester; see *EntireX IDL Tester* in the Designer documentation
 - generate an XML mapping file (XMM) and use the XML Tester for verification; see *EntireX XML Tester* in the XML/SOAP Wrapper documentation