

GT 4.0 Tech Preview: Globus Teleoperations Control Protocol (GTCP)

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Overview

This component is a **technical preview** (commonly referred to as tech preview) for the GT 4.0 final distribution. As such, this documentation is not part of the GT 4.0 official documentation but is provided by the developer(s) to assist early adopters. This component also has very limited support.

Globus Teleoperations Control Protocol (GTCP) is a service interface for telecontrol. It is the WSRF version of the NEESgrid Teleoperations Control Protocol (NTCP), which is used to control heterogeneous physical and computational simulations coupled in geographically-distributed earthquake engineering experiments. It has also been used to control data acquisition systems (triggering the collection of data) and high-resolution cameras (triggering image acquisition) during earthquake engineering experiments, and, to a lesser extent, to control the positioning, focal length, etc. of electron microscopes in a neuroscience application.

GTCP exposes two interfaces: a WSRF-compliant service interface used by clients to control remote instruments and simulations, and a "plugin" interface to facilitate integrating new back ends (physical or computational simulation platforms) to the GTCP server. The plugin interface is a Java interface definition that includes methods for each platform-specific action; a new platform is integrated by writing a class that implements this interface definition

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Chapter 1. Key Concepts

See the [key concepts](#)¹ from Execution Management.

¹ <http://www.globus.org/toolkit/docs/4.0/execution/key>

Chapter 2. Globus Teleoperations Control Protocol (GTCP): System Administrator's Guide

1. Introduction

This guide contains advanced configuration information for system administrators working with GTCP. It provides references to information on procedures typically performed by system administrators, including installation, configuring, deploying, and testing the installation.

Important

This information is in addition to the basic Globus Toolkit prerequisite, overview, installation, security configuration instructions in the [GT 4.0 System Administrator's Guide](#)¹. Read through this guide before continuing!

2. Building and installing

To install GTCP:

1. Install the Globus Toolkit by doing one of the following:
 - If you do not want to use any other Globus services, install the Globus Core source or binary distribution, following the directions in the [GT4.0 Java WS Core System Administrator's Guide](#)².
 - If you want to use other Globus services, install the full Globus Toolkit, following the directions in the [GT4.0 System Administrator's Guide](#)³.
2. Set your GLOBUS_LOCATION environment variable to the directory in which the Globus Toolkit has been installed.
3. Install GTCP, either from a distribution file or from source:
 - To install from a distribution file (the GTCP distribution file can be found in the "contrib" directory in the full Globus distribution), run:

```
$GLOBUS_LOCATION/sbin/gpt-build gt4-gtcp-0.1-src_bundle.tar.gz
```

- To install from CVS, do the following:

```
setenv CVSROOT :pserver:anonymous@cvs.globus.org:/home/globdev/CVS/globus-packages
cvs co playground/telecontrol
cd playground/telecontrol/gtcp
ant
```

¹ ../admin/docbook/

² ../common/javawscore/admin-index.html

³ ../admin/docbook

3. Configuring

The following parameters, set in `$GLOBUS_LOCATION/etc/globus_telecontrol_gtcp_service/server-config.wsdd`, are used to configure GTCP:

Table 2.1. GTCP configuration parameters

Name	Meaning
<code>gtcpBackendFactory</code>	Name of the desired GTCP plugin class.
<code>isSecure</code>	If <code>true</code> , GTCP will allow only users in the <code>gridmap</code> file to perform operations that change system state.
<code>gridMapFile</code>	Name of the <code>gridmap</code> file to be used if <code>isSecure</code> is set.

3.1. Running without security (Version 4.0.4 and later)

If you wish to run GTCP completely without security, then you must follow two steps:

1. In the file `$GLOBUS_LOCATION/etc/globus_telecontrol_gtcp_service/server-config.wsdd`, make sure that the `isSecure` is set to `false` and that the `securityDescriptor` is set to `etc/globus_telecontrol_gtcp_service/security_descriptor_nosec.xml`. In other words, change:

```
<!-- For insecure operation, set "isSecure" to "false" and
      uncomment the securityDescriptor line. -->
<parameter name="isSecure" value="true"/>
<!-- <parameter name="securityDescriptor" value="etc/globus_telecontrol_gtcp_service
```

to:

```
<!-- For insecure operation, set "isSecure" to "false" and
      uncomment the securityDescriptor line. -->
<parameter name="isSecure" value="false"/>
<parameter name="securityDescriptor" value="etc/globus_telecontrol_gtcp_service
```

2. When you run `globus-start-container`, use the `-nosec` option, to tell Globus not to do transport-level security:

```
globus-start-container -nosec
```

3.2. Running without security (Version 4.0.3 and earlier)

Versions before 4.0.3 do not come with the `global_security_descriptor` file. In those versions, the easiest way to run without security is to make sure that the `isSecure` parameter is set to `false` as described above, and to make sure there is no global security descriptor set.

To make sure there is no global security descriptor set, look at the file `$GLOBUS_LOCATION/etc/globus_wsrf_core/server-config.wsdd`. If you see an entry that looks like this:

```
<parameter
  name="containerSecDesc"
  value="etc/globus_wsrp_core/global_security_descriptor.xml"/>
```

then you should comment it out:

```
<!--<parameter
  name="containerSecDesc"
  value="etc/globus_wsrp_core/global_security_descriptor.xml"/>-->
```

Then restart the container with the `-nosec` flag as described above.

4. Deploying

Once GTCP is installed, no further deployment steps are necessary.

5. Testing

To run the GTCP tests, make sure that `$GLOBUS_LOCATION` is set and, if you're running with security, that you have a valid proxy certificate. Then start the GTCP server and run the unit tests:

1. To start the GTCP server, do the following:

```
cd $GLOBUS_LOCATION
bin/globus-start-container
```

You may also want to use one or more of these command-line options

Table 2.2. Server command-line options

Option	Effect
<code>-nosec</code>	Tells the Globus container not to do transport-level security
<code>-p 1234</code>	Tells the Globus container to listen on port 1234 instead of the default port (which is 8443 if the <code>-nosec</code> option is specified, 8080 otherwise).

Note: the GTCP server will continue to run in the foreground. You can also redirect the output to a file and run it in the background if you wish.

2. To run the unit tests, in another window, make sure that `$GLOBUS_LOCATION` is set correctly and run:

```
ant -f ${GLOBUS_LOCATION}/etc/globus_telecontrol_gtcp_service/build.xml \
  -Dweb.server.url=your_container_base_url \
  test-installed
```

where *your_container_base_url* is the base url of your Globus container (for example, `https://127.0.0.1:8443/wsrp/services/`).

If the test output ends with:

```
[junit] Tests run: 2, Failures: 0, Errors: 0, Time elapsed: 16.556 sec
```

then the tests have passed. Note: because the test code checks that illegal requests fail, it may print some error messages and cause the container to print some error messages and/or stack traces. This is normal; as long as the test output reports that it ran 2 tests with 0 failures and 0 errors, the tests have passed.

6. Security considerations

In some applications, control of physical equipment carries the risk of serious property damage or injury. These applications should implement operational security procedures and not rely solely on software security.

7. Troubleshooting

If the unit tests fail, double-check the format of the URL specified on the `ant` line. The test code is somewhat unforgiving; if the trailing `/"` is omitted, then the tests will fail.

Chapter 3. GT 4.0 Component Fact Sheet: Globus Teleoperations Control Protocol (GTCP, Tech Preview)

1. Brief component overview

Globus Teleoperations Control Protocol (GTCP) is a service interface for telecontrol. It is the WSRF version of the NEESgrid Teleoperations Control Protocol (NTCP), which is used to control heterogeneous physical and computational simulations coupled in geographically-distributed earthquake engineering experiments. It has also been used to control data acquisition systems (triggering the collection of data) and high-resolution cameras (triggering image acquisition) during earthquake engineering experiments, and, to a lesser extent, to control the positioning, focal length, etc. of electron microscopes in a neuroscience application.

GTCP exposes two interfaces: a WSRF-compliant service interface used by clients to control remote instruments and simulations, and a "plugin" interface to facilitate integrating new back ends (physical or computational simulation platforms) to the GTCP server. The plugin interface is a Java interface definition that includes methods for each platform-specific action; a new platform is integrated by writing a class that implements this interface definition

2. Summary of features

Features new in release GT 4.0:

- GTCP is a new component; all features are new

Other Supported Features

- GTCP is a new component; all features are new

Deprecated Features

- None

3. Backward compatibility summary

Protocol changes since GT version 3.2:

- GTCP is a new technology preview and was not present in GT version 3.2

API changes since GT version 3.2:

- GTCP is a new technology preview and was not present in GT version 3.2

Exception changes since GT version 3.2:

- GTCP is a new technology preview and was not present in GT version 3.2

Schema changes since GT version 3.2:

- GTCP is a new technology preview and was not present in GT version 3.2

4. Technology dependencies

GTCP depends on the following GT components:

- Globus Java WS Core

GTCP does not depend on any 3rd party software

5. Tested platforms

Tested Platforms for GTCP

- Linux (i386)

6. Associated standards

Associated standards for GTCP:

- WS-ResourceProperties

7. For More Information

Click [here](#)¹ for more information about this component.

¹ [index.html](#)

Chapter 4. GT 4.0.8 Incremental Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Introduction

These release notes are for the incremental release 4.0.8. It includes a summary of changes since 4.0.7, bug fixes since 4.0.7 and any known problems that still exist at the time of the 4.0.8 release. This page is in addition to the top-level 4.0.8 release notes at <http://www.globus.org/toolkit/releasenotes/4.0.8>.

For release notes about 4.0 (including feature summary, technology dependencies, etc) go to the [GTCP 4.0 Release Notes](#)¹.

2. Changes Summary

No changes have been made since the previous release.

3. Bug Fixes

No bugs have been fixed since the previous release.

4. Known Problems

No problems are known to exist for Globus Teleoperations Control Protocol (GTCP) at the time of this release.

5. For More Information

Click [here](#)² for more information about this component.

¹ http://www.globus.org/toolkit/docs/4.0/techpreview/gtcp/GTCP_Release_Notes.html

² [index.html](#)

Chapter 5. GT 4.0.7 Incremental Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Introduction

These release notes are for the incremental release 4.0.7. It includes a summary of changes since 4.0.6, bug fixes since 4.0.6 and any known problems that still exist at the time of the 4.0.7 release. This page is in addition to the top-level 4.0.7 release notes at <http://www.globus.org/toolkit/releasenotes/4.0.7>.

For release notes about 4.0 (including feature summary, technology dependencies, etc) go to the [GTCP 4.0 Release Notes](#)¹.

2. Changes Summary

No changes have been made since the previous release.

3. Bug Fixes

No bugs have been fixed since the previous release.

4. Known Problems

No problems are known to exist for Globus Teleoperations Control Protocol (GTCP) at the time of this release.

5. For More Information

Click [here](#)² for more information about this component.

¹ http://www.globus.org/toolkit/docs/4.0/techpreview/gtcp/GTCP_Release_Notes.html

² [index.html](#)

Chapter 6. GT 4.0.6 Incremental Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Introduction

These release notes are for the incremental release 4.0.6. It includes a summary of changes since 4.0.5, bug fixes since 4.0.5 and any known problems that still exist at the time of the 4.0.6 release. This page is in addition to the top-level 4.0.6 release notes at <http://www.globus.org/toolkit/releasenotes/4.0.6>.

For release notes about 4.0 (including feature summary, technology dependencies, etc) go to the [GTCP 4.0 Release Notes](#)¹.

2. Changes Summary

No changes have been made since the previous release.

3. Bug Fixes

No bugs have been fixed since 4.0.5.

4. Known Problems

No problems are known to exist for Globus Teleoperations Control Protocol (GTCP) at the time of the 4.0.6 release.

5. For More Information

Click [here](#)² for more information about this component.

¹ http://www.globus.org/toolkit/docs/4.0/techpreview/gtcp/GTCP_Release_Notes.html

² [index.html](#)

Chapter 7. GT 4.0.5 Incremental Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Introduction

These release notes are for the incremental release 4.0.5. It includes a summary of changes since 4.0.4, bug fixes since 4.0.4 and any known problems that still exist at the time of the 4.0.5 release. This page is in addition to the top-level 4.0.5 release notes at <http://www.globus.org/toolkit/releasenotes/4.0.5>.

For release notes about 4.0 (including feature summary, technology dependencies, etc) go to the [GTCP 4.0 Release Notes](#)¹.

2. Changes Summary

No changes have been made since 4.0.4.

3. Bug Fixes

No bugs have been fixed since 4.0.3.

4. Known Problems

No problems are known to exist for Globus Teleoperations Control Protocol (GTCP) at the time of the 4.0.5 release.

5. For More Information

Click [here](#)² for more information about this component.

¹ http://www.globus.org/toolkit/docs/4.0/techpreview/gtcp/GTCP_Release_Notes.html

² [index.html](#)

Chapter 8. GT 4.0.4 Incremental Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Introduction

These release notes are for the incremental release 4.0.4. It includes a summary of changes since 4.0.3, bug fixes since 4.0.3 and any known problems that still exist at the time of the 4.0.4 release. This page is in addition to the top-level 4.0.4 release notes at <http://www.globus.org/toolkit/releasenotes/4.0.4>.

For release notes about 4.0 (including feature summary, technology dependencies, etc) go to the [GTCP 4.0 Release Notes](#)¹.

2. Changes Summary

Simplified switching from secure to insecure operations.

3. Bug Fixes

No bugs have been fixed for Globus Teleoperations Control Protocol (GTCP) since 4.0.3.

4. Known Problems

No problems are known to exist for Globus Teleoperations Control Protocol (GTCP) at the time of the 4.0.4 release.

5. For More Information

Click [here](#)² for more information about this component.

¹ http://www.globus.org/toolkit/docs/4.0/techpreview/gtcp/GTCP_Release_Notes.html

² [index.html](#)

Chapter 9. GT 4.0.3 Incremental Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Introduction

These release notes are for the incremental release 4.0.3. It includes a summary of changes since 4.0.2, bug fixes since 4.0.2 and any known problems that still exist at the time of the 4.0.3 release. This page is in addition to the top-level 4.0.3 release notes at <http://www.globus.org/toolkit/releasenotes/4.0.3>.

For release notes about 4.0 (including feature summary, technology dependencies, etc) go to the [GTCP 4.0 Release Notes](#)¹.

2. Changes Summary

No changes have been made for the Globus Teleoperations Control Protocol (GTCP) since 4.0.2.

3. Bug Fixes

No bugs have been fixed for Globus Teleoperations Control Protocol (GTCP) since 4.0.2.

4. Known Problems

No problems are known to exist for Globus Teleoperations Control Protocol (GTCP) at the time of the 4.0.3 release.

5. For More Information

Click [here](#)² for more information about this component.

¹ http://www.globus.org/toolkit/docs/4.0/techpreview/gtcp/GTCP_Release_Notes.html

² [index.html](#)

Chapter 10. GT 4.0.2 Incremental Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Introduction

These release notes are for the incremental release 4.0.2. It includes a summary of changes since 4.0.1, bug fixes since 4.0.1 and any known problems that still exist at the time of the 4.0.2 release. This page is in addition to the top-level 4.0.2 release notes at <http://www.globus.org/toolkit/releasenotes/4.0.2>.

For release notes about 4.0 (including feature summary, technology dependencies, etc) go to the [GTCP 4.0 Release Notes](#)¹.

2. Changes Summary

There's been a bug fix for Globus Teleoperations Control Protocol (GTCP) since 4.0.1.

3. Bug Fixes

The following bug was fixed for Globus Teleoperations Control Protocol (GTCP) since 4.0.1:

- [4322](#)² Compile errors with Java 1.5

4. Known Problems

No problems are known to exist for Globus Teleoperations Control Protocol (GTCP) at the time of the 4.0.2 release.

5. For More Information

Click [here](#)³ for more information about this component.

¹ http://www.globus.org/toolkit/docs/4.0/techpreview/gtcp/GTCP_Release_Notes.html

² http://bugzilla.globus.org/bugzilla/show_bug.cgi?id=4322

³ [index.html](#)

Chapter 11. GT 4.0.1 Incremental Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Introduction

These release notes are for the incremental release 4.0.1. It includes a summary of changes since 4.0.0, bug fixes since 4.0.0 and any known problems that still exist at the time of the 4.0.1 release. This page is in addition to the top-level 4.0.1 release notes at <http://www.globus.org/toolkit/releasenotes/4.0.1>.

For release notes about 4.0 (including feature summary, technology dependencies, etc) go to the [GTCP 4.0 Release Notes](#)¹.

2. Changes Summary

No changes have occurred for Globus Teleoperations Control Protocol (GTCP).

3. Bug Fixes

No bugs were fixed for Globus Teleoperations Control Protocol (GTCP).

4. Known Problems

No problems are known to exist for Globus Teleoperations Control Protocol (GTCP) at the time of the 4.0.1 release.

5. For More Information

Click [here](#)² for more information about this component.

¹ http://www.globus.org/toolkit/docs/4.0/techpreview/gtcp/GTCP_Release_Notes.html

² [index.html](#)

Chapter 12. GT 4.0 Release Notes: Globus Teleoperations Control Protocol (GTCP)

1. Component Overview

Globus Teleoperations Control Protocol (GTCP) is a service interface for telecontrol. It is the WSRF version of the NEESgrid Teleoperations Control Protocol (NTCP), which is used to control heterogeneous physical and computational simulations coupled in geographically-distributed earthquake engineering experiments. It has also been used to control data acquisition systems (triggering the collection of data) and high-resolution cameras (triggering image acquisition) during earthquake engineering experiments, and, to a lesser extent, to control the positioning, focal length, etc. of electron microscopes in a neuroscience application.

GTCP exposes two interfaces: a WSRF-compliant service interface used by clients to control remote instruments and simulations, and a "plugin" interface to facilitate integrating new back ends (physical or computational simulation platforms) to the GTCP server. The plugin interface is a Java interface definition that includes methods for each platform-specific action; a new platform is integrated by writing a class that implements this interface definition

2. Feature Summary

Features new in release GT 4.0:

- GTCP is a new component; all features are new

Other Supported Features

- GTCP is a new component; all features are new

Deprecated Features

- None

3. Technology Dependencies

GTCP depends on the following GT components:

- Globus Java WS Core

GTCP does not depend on any 3rd party software

4. Supported Platforms

Tested Platforms for GTCP

- Linux (i386)

5. Backward Compatibility Summary

Protocol changes since GT version 3.2:

- GTCP is a new technology preview and was not present in GT version 3.2

API changes since GT version 3.2:

- GTCP is a new technology preview and was not present in GT version 3.2

Exception changes since GT version 3.2:

- GTCP is a new technology preview and was not present in GT version 3.2

Schema changes since GT version 3.2:

- GTCP is a new technology preview and was not present in GT version 3.2

6. For More Information

Click [here](#)¹ for more information about this component.

¹ [index.html](#)