GT 4.0 Contribution: Java CoG Kit

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Chapter 1. GT 4.0 Release Notes: JGlobus module of the Java CoG Kit

1. Component Overview

The JGlobus library provides a client-side API and limited server side functionality to the GT2-based services such as GRAM and MDS. It also provides a client-side API for GridFTP, MyProxy and has extensive GSI support.

The JGlobus library is one of the main modules of the Java CoG Kit[1]. It is an integral part of the Globus Toolkit and has been part of the Globus Toolkit since version 3.

Please see the Java CoG Kit[2] web site for more information about the Java Commodity Grid Kit and other modules.

2. Feature Summary

Features new in release GT 4.0:

- Support for RFC3820[3].
- Improved gridmap code to handle DNs with different string representations of `UserID` and `Email` DN components.
- The Java version of `grid-proxy-init` does not display the password on the console anymore.
- Switched the code to use Apache Commons Logging API instead of Log4j API.
- Support for passing a specific user to the `GridFTPClient` to authenticate as.

Other Supported Features

- Support for Globus legacy and pre-draft proxy formats
- GT2 GRAM client library
- GT2 MDS client library
- GridFTP client library
- GT2 GASS library
- MyProxy client library

Deprecated Features

- None

3. Technology Dependencies

The JGlobus module of the Java CoG Kit depends on the following 3rd party software:

[1] http://www.cogkit.org/
[2] http://www.cogkit.org/
[3] http://www.faqs.org/rfcs/rfc3820.html

- PureTLS[4]
- BouncyCastle[5]
- Cryptix[6]
- Log4j[7]
- Commons Logging[8]

4. Supported Platforms

The JGlobus module of the Java CoG Kit should work on any platform that supports J2SE 1.3.1 or higher.

Tested Platforms for the JGlobus module of the Java CoG Kit:

- Linux (Red Hat 7.3)
- Windows 2000 and XP
- Solaris 9

Tested JVMs for the JGlobus module of the Java CoG Kit:

- Sun JVM[9] 1.3.1, 1.4.2 and 1.5.0
- IBM JVM[10] 1.3.1, and 1.4.2

JVM notes:

- GCJ[11] is not supported.

5. Backward Compatibility Summary

Protocol changes since GT version 3.2:

- None.

API changes since GT version 3.2:

- Added another `authenticate` method to the `GridFTPClient` to specify an username to authenticate as.
- Made `GlobusGSSName`, `GlobusGSSCredentialImpl`, `GlobusCredential`, `GlobusPrincipal`, and `PasswordCredential` classes implement the *Serializable* interface.

Exception changes since GT version 3.2:

- None.

[4] http://www.rtfm.com/puretls/
[5] http://www.bouncycastle.org/
[6] http://www.cryptix.org/
[7] http://jakarta.apache.org/log4j/
[8] http://jakarta.apache.org/commons/logging/
[9] http://java.sun.com/j2se/
[10] http://www-106.ibm.com/developerworks/java/jdk/
[11] http://gcc.gnu.org/java/

Schema changes since GT version 3.2:

- None.

6. For More Information

Please see JGlobus documentation[12] and API documentation[13] for more information.

Please see the Java CoG Kit[14] web site for more information about the entire Java Commodity Grid Kit.

[12] index.html
[13] http://www-unix.mcs.anl.gov/~gawor/jglobus-nightly/globus_4_0_branch/javadoc/
[14] http://www.cogkit.org/

Chapter 2. GT 4.0.1 Incremental Release Notes: JGlobus module of the Java CoG Kit

1. Introduction

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

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

2. Changes Summary

The following changes have occurred for JGlobus module of Java CoG Kit.

- Added support for auto flush functionality to `GssOutputStream`.
- Made `GlobusURL` to ignore white spaces (in front or the back) of the string URL argument.
- Added support for controlling local (source) ports of TCP and UDP sockets. The source ports can be controlled via the `GLOBUS_TCP_SOURCE_PORT_RANGE` and `GLOBUS_UDP_SOURCE_PORT_RANGE` environment variables. All of the CoG libraries will obey the TCP source port range if set (there is no library in the JGlobus module that currently uses UDP sockets).
- Added support for AES encrypted private keys.
- Improved the FTP library: added support for IPv6, NLST, ALLO, and CKSM operations. Also, added API for setting the protection level on the control channel. Exposed a new `extendedTransfer` function that allows for partial 3rd party transfers. Also, fixed problems handing error conditions involving a data channel.

3. Bug Fixes

The following bugs were fixed for JGlobus module of the Java CoG Kit:

- Bug 3194:[2] Support for controlling local (source) ports ranges for TCP and UDP sockets
- Bug 3329:[3] Support for AES encrypted private keys
- Bug 3486:[4] FTP library problems handling error conditions involving data channel

[1] http://www.globus.org/toolkit/docs/4.0/contributions/javacog/JavaCoG_Release_Notes.html
[2] http://bugzilla.globus.org/globus/show_bug.cgi?id=3194
[3] http://bugzilla.globus.org/globus/show_bug.cgi?id=3329
[4] http://bugzilla.globus.org/globus/show_bug.cgi?id=3486

4. Known Problems

The following problems are known to exist for JGlobus module of the Java CoG Kit at the time of the 4.0.1 release:

- Bug 1056:[5] FTP client in extended block mode after receiving EODC does not wait for EOD on the same channel
- Bug 2277:[6] GridFTPClient bug Parallel, Passive, EBlockImageDCReader does not receive EOF
- Bug 2345:[7] Allow for a way to set cert and key location using environment variables
- Bug 2413:[8] A rare decrypt error
- Bug 3299:[9] Extended Key Usage certificate extension not supported

5. For More Information

Please see JGlobus documentation[10] and API documentation[11] for more information.

Please see the Java CoG Kit[12] web site for more information about the entire Java Commodity Grid Kit.

[5] http://bugzilla.globus.org/globus/show_bug.cgi?id=1056
[6] http://bugzilla.globus.org/globus/show_bug.cgi?id=2277
[7] http://bugzilla.globus.org/globus/show_bug.cgi?id=2345
[8] http://bugzilla.globus.org/globus/show_bug.cgi?id=2413
[9] http://bugzilla.globus.org/globus/show_bug.cgi?id=3299
[10] index.html
[11] http://www-unix.mcs.anl.gov/~gawor/jglobus-nightly/globus_4_0_branch/javadoc/
[12] http://www.cogkit.org/

Chapter 3. GT 4.0.2 Incremental Release Notes: JGlobus module of the Java CoG Kit

1. Introduction

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

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

2. Changes Summary

The following changes have occurred for JGlobus module of Java CoG Kit.

- Added support for HTTP `POST` operation for the https/httpg URL connection handler.
- The proxy refresh code was updated to reload the proxy file automatically whenever the file changes in any way.
- The GridFTP client library was optimized to use one less thread during data transfer and to use buffered I/O.
- Fixed the `getDefault()` methods in `TrustedCertificates` and `CertificationRevocationList` classes to differentiate scenarios when the default certificate locations are used vs. when non-default locations are used.
- Updated `GssSocket` to automatically close itself if `getOutputStream()` or `getInputStream()` fails with an error.

3. Bug Fixes

The following bugs were fixed for JGlobus module of the Java CoG Kit:

- Bug 3623:[2] org.globus.gsi.CertUtil functionality/comment problem
- Bug 3669:[3] org/globus/util/I18n.java classloader issues
- Bug 3819:[4] DN parsing error
- Bug 3963:[5] Tabs in the grid-mapfile cause errors for secure services
- Bug 4188:[6] Container fails on expired proxy and cannot recover

[1] http://www.globus.org/toolkit/docs/4.0/contributions/javacog/JavaCoG_Release_Notes.html
[2] http://bugzilla.globus.org/globus/show_bug.cgi?id=3623
[3] http://bugzilla.globus.org/globus/show_bug.cgi?id=3669
[4] http://bugzilla.globus.org/globus/show_bug.cgi?id=3819
[5] http://bugzilla.globus.org/globus/show_bug.cgi?id=3963
[6] http://bugzilla.globus.org/globus/show_bug.cgi?id=4188

4. Known Problems

The following problems are known to exist for JGlobus module of the Java CoG Kit at the time of the 4.0.2 release:

- Bug 1056:[7] FTP client in extended block mode after receiving EODC does not wait for EOD on the same channel
- Bug 2277:[8] GridFTPClient bug Parallel, Passive, EBlockImageDCReader does not receive EOF
- Bug 2345:[9] Allow for a way to set cert and key location using environment variables
- Bug 2413:[10] A rare decrypt error
- Bug 3299:[11] Extended Key Usage certificate extension not supported

5. For More Information

Please see JGlobus documentation[12] and API documentation[13] for more information.

Please see the Java CoG Kit[14] web site for more information about the entire Java Commodity Grid Kit.

[7] http://bugzilla.globus.org/globus/show_bug.cgi?id=1056
[8] http://bugzilla.globus.org/globus/show_bug.cgi?id=2277
[9] http://bugzilla.globus.org/globus/show_bug.cgi?id=2345
[10] http://bugzilla.globus.org/globus/show_bug.cgi?id=2413
[11] http://bugzilla.globus.org/globus/show_bug.cgi?id=3299
[12] index.html
[13] http://www-unix.mcs.anl.gov/~gawor/jglobus-nightly/globus_4_0_branch/javadoc/
[14] http://www.cogkit.org/

Chapter 4. GT 4.0.3 Incremental Release Notes: JGlobus module of the Java CoG Kit

1. Introduction

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

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

2. Changes Summary

The following changes have occurred for JGlobus module of Java CoG Kit.

- Fixed handling of SSLv23 hello messages.
- Optimized way of getting a default credential in GlobusGSSManagerImpl.
- Increased the default transfer timeout in the GridFTP library to 30 seconds for FTP transfers and 60 seconds for GridFTP transfers.
- Fixed potential security hole to ensure that files that are opened to write are created securely. Added createFile() method in the org.globus.util.Util class to do relevant checks. Also, ensured that appropriate permissions are set on created files before a write is done.

3. Bug Fixes

The following bugs were fixed for JGlobus module of the Java CoG Kit:

- Bug 4414:[2] clarify lifetime parameter in myproxy docs
- Bug 4568:[3] UserNamePrincipal is not serializable
- Bug 4558:[4] ws failure on corrupt grid-mapfile

4. Known Problems

The following problems are known to exist for JGlobus module of the Java CoG Kit at the time of the 4.0.3 release:

- Bug 1056:[5] FTP client in extended block mode after receiving EODC does not wait for EOD on the same channel

[1] http://www.globus.org/toolkit/docs/4.0/contributions/javacog/JavaCoG_Release_Notes.html
[2] http://bugzilla.globus.org/globus/show_bug.cgi?id=4414
[3] http://bugzilla.globus.org/bugzilla/show_bug.cgi?id=4568
[4] http://bugzilla.globus.org/globus/show_bug.cgi?id=4558
[5] http://bugzilla.globus.org/globus/show_bug.cgi?id=1056

- Bug 2277:[6] GridFTPClient bug Parallel, Passive, EBlockImageDCReader does not receive EOF
- Bug 2345:[7] Allow for a way to set cert and key location using environment variables
- Bug 2413:[8] A rare decrypt error
- Bug 3299:[9] Extended Key Usage certificate extension not supported

5. For More Information

Please see JGlobus documentation[10] and API documentation[11] for more information.

Please see the Java CoG Kit[12] web site for more information about the entire Java Commodity Grid Kit.

[6] http://bugzilla.globus.org/globus/show_bug.cgi?id=2277
[7] http://bugzilla.globus.org/globus/show_bug.cgi?id=2345
[8] http://bugzilla.globus.org/globus/show_bug.cgi?id=2413
[9] http://bugzilla.globus.org/globus/show_bug.cgi?id=3299
[10] index.html
[11] http://www-unix.mcs.anl.gov/~gawor/jglobus-nightly/globus_4_0_branch/javadoc/
[12] http://www.cogkit.org/

Chapter 5. GT 4.0.4 Incremental Release Notes: JGlobus module of the Java CoG Kit

1. Introduction

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

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

2. Changes Summary

- Fixed some old GUI components for generating proxy credentials and uploading them to MyProxy server.
- Optimized the performance of refreshing the CA certificates and CRL files.
- Removed old/unsupported PKCS11 code.

3. Bug Fixes

- Bug 1865:[2] longer proxy lifetime
- Bug 1895:[3] -help option, visual proxy
- Bug 4808:[4] RFT with GridFTP .NET

4. Known Problems

- Bug 1056:[5] FTP client in extended block mode after receiving EODC does not wait for EOD on the same channel
- Bug 2277:[6] GridFTPClient bug Parallel, Passive, EBlockImageDCReader does not receive EOF
- Bug 2345:[7] Allow for a way to set cert and key location using environment variables
- Bug 2413:[8] A rare decrypt error

[1] http://www.globus.org/toolkit/docs/4.0/contributions/javacog/JavaCoG_Release_Notes.html
[2] http://bugzilla.globus.org/globus/show_bug.cgi?id=1865
[3] http://bugzilla.globus.org/bugzilla/show_bug.cgi?id=1895
[4] http://bugzilla.globus.org/globus/show_bug.cgi?id=4808
[5] http://bugzilla.globus.org/globus/show_bug.cgi?id=1056
[6] http://bugzilla.globus.org/globus/show_bug.cgi?id=2277
[7] http://bugzilla.globus.org/globus/show_bug.cgi?id=2345
[8] http://bugzilla.globus.org/globus/show_bug.cgi?id=2413

- Bug 3299:[9] Extended Key Usage certificate extension not supported
- Bug 4303:[10] Class does not represent an RSA key

5. For More Information

Please see JGlobus documentation[11] and API documentation[12] for more information.

Please see the Java CoG Kit[13] web site for more information about the entire Java Commodity Grid Kit.

[9] http://bugzilla.globus.org/globus/show_bug.cgi?id=3299
[10] http://bugzilla.globus.org/globus/show_bug.cgi?id=4303
[11] index.html
[12] http://www-unix.mcs.anl.gov/~gawor/jglobus-nightly/globus_4_0_branch/javadoc/
[13] http://www.cogkit.org/

Chapter 6. GT 4.0 Java CoG Kit: System Administrator's Guide

1. Introduction

This guide contains installation and configuration information for system administrators installing the Java CoG Kit. It explains how to install, configure and test 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

Java CoG Kit is distributed as part of a default GT 4.0 installation. For basic installation instructions, see the GT 4.0 System Administrator's Guide[2]. No extra installation steps are required for this component.

The following are optional instructions for more advanced types of installations. These are for those advanced users who want to build the latest code from CVS or are just interested in the Java CoG Kit.

2.1. Building from source

1. Obtain the source code for Java CoG Kit:

   From CVS.

   1. To get the latest source from CVS execute:

      ```
      cvs -d :pserver:anonymous@cvs.globus.org:/home/dsl/cog/CVS \
          checkout jglobus
      ```

      Optionally specify `-r globus_4_0_branch` revision to get the latest source code for GT 4.0.x releases.

   2. Change into the `jglobus` directory.

      ```
      cd jglobus
      ```

   From source distribution.

   1. Untar or unzip the distribution archive.

      ```
      tar xvfz cog-XXX-src.tar.gz
      ```

   2. Change into the unpacked distribution directory.

[1] ../../admin/docbook/
[2] ../../admin/docbook/

```
cd cog-XXX
```

2. Run:

```
ant all
```

2.2. Installing binary distribution

1. Untar or unzip the distribution archive.

```
tar xvfz cog-XXX-tar.gz
```

2. Change into the unpacked distribution directory.

```
cd cog-XXX
```

3. Set the `COG_INSTALL_PATH` environment variable to the unpacked distribution directory.

On Windows:

```
set COG_INSTALL_PATH=c:\cog-1.2
```

On Unix/Linux:

```
setenv COG_INSTALL_PATH /soft/cog-1.2/
```

or

```
export COG_INSTALL_PATH=/soft/cog-1.2/
```

3. Configuring

In general no extra configuration is required to use Java CoG Kit. However, in certain cases additional configuration might be required. The Java CoG Kit configuration file is placed in `$HOME/.globus/cog.properties` on Unix/Linux machines or `%USERPROFILE%\.globus\cog.properties` on Windows machines.

3.1. Proxy file location

By default Java CoG Kit will try to use the same proxy file as used by the C tools. However, in certain cases Java CoG Kit might fail to determine the right proxy file location. In these cases a proxy file location might need to be specified in the configuration file. To set a specific proxy file location just add the following line to the configuration file:

```
proxy=<proxy location>
```

This has the same effect as setting the `X509_USER_PROXY` environment property or Java system property.

3.2. Public IP address

Sometimes, especially on machines with DHCP enabled, the local IP address of the machine might be incorrectly detected by Java or the wrong non-public IP address might be used if behind a NAT router or on VPN. To configure the public IP address used by Java CoG Kit, add the following line to the configuration file:

```
ip=<current ip>
```

This has the same effect as setting the `GLOBUS_HOSTNAME` environment property or Java system property.

3.3. TCP Port Range

Sometimes it is necessary to restrict the listening port numbers that Java CoG Toolkit will use. To set the port range in the configuration file, just add the following line:

```
tcp.port.range=<min>,<max>
```

This has the same effect as setting the `GLOBUS_TCP_PORT_RANGE` environment property or Java system property.

4. Deploying

This section does not apply to the Java CoG Kit.

5. Testing

There are no tests to test the Java CoG installation. However, the unit tests are available with the source distribution. Since some of the unit tests rely on GT2 services to be running, first make sure that they are running ok. Also, you will need to configure the tests (look for various `test.properties` files) in the source distribution with the appropriate information (for example the right service port, hostname, etc.). Finally, to run the tests do:

```
ant test
```

6. Security considerations

6.1. Functions that execute an external program

Under some circumstances, the `org.globus.util.Util.setFilePermissions()` and the `org.globus.util.ConfigUtil.getUID()` functions execute an external program; thus, its behavior is influenced by environment variables such as the caller's PATH and the environment variables that control dynamic loading. Care should be used if calling these functions from a program that will be run as a Unix setuid program, or in any other manner in which the owner of the Unix process does not completely control its runtime environment.

6.2. Permissions of proxy files

Since Java does not provide an API for setting the permissions of a file, the JGlobus module will attempt to execute the `/bin/chmod` program in the background to set the permissions of the given file. If that program cannot be executed for any reason or fails to execute correctly, a proxy file might end up with incorrect file permissions (depending on `umask` setting). Usually a warning will be displayed if that occurs (especially on Windows since `/bin/chmod` is not supported on that platform).

7. Troubleshooting

Please see the FAQ[3] and the web page[4] for any problems concerning Java CoG Kit. Also, you can send email describing your problem to the java@globus.org[5] mailing list (must subscribe first[6]) or search for the problem in the archives[7].

[3] http://www.globus.org/cog/distribution/1.2/FAQ.TXT
[4] http://www.globus.org/cog/java/
[5] mailto:java@globus.org
[6] http://www.globus.org/subscriptions.php
[7] http://www.globus.org/mail_archive/java/threads.html

Chapter 7. GT 4.0 Component Fact Sheet: JGlobus module of the Java CoG Kit (Contribution)

1. Brief component overview

The JGlobus library provides a client-side API and limited server side functionality to the GT2-based services such as GRAM and MDS. It also provides a client-side API for GridFTP, MyProxy and has extensive GSI support.

The JGlobus library is one of the main modules of the Java CoG Kit[1]. It is an integral part of the Globus Toolkit and has been part of the Globus Toolkit since version 3.

Please see the Java CoG Kit[2] web site for more information about the Java Commodity Grid Kit and other modules.

2. Summary of features

Features new in release GT 4.0:

- Support for RFC3820[3].
- Improved gridmap code to handle DNs with different string representations of `UserID` and `Email` DN components.
- The Java version of `grid-proxy-init` does not display the password on the console anymore.
- Switched the code to use Apache Commons Logging API instead of Log4j API.
- Support for passing a specific user to the `GridFTPClient` to authenticate as.

Other Supported Features

- Support for Globus legacy and pre-draft proxy formats
- GT2 GRAM client library
- GT2 MDS client library
- GridFTP client library
- GT2 GASS library
- MyProxy client library

Deprecated Features

- None

[1] http://www.cogkit.org/
[2] http://www.cogkit.org/
[3] http://www.faqs.org/rfcs/rfc3820.html

3. Backward compatibility summary

Protocol changes since GT version 3.2:

- None.

API changes since GT version 3.2:

- Added another `authenticate` method to the `GridFTPClient` to specify an username to authenticate as.
- Made `GlobusGSSName`, `GlobusGSSCredentialImpl`, `GlobusCredential`, `GlobusPrincipal`, and `PasswordCredential` classes implement the *Serializable* interface.

Exception changes since GT version 3.2:

- None.

Schema changes since GT version 3.2:

- None.

4. Technology dependencies

The JGlobus module of the Java CoG Kit depends on the following 3rd party software:

- PureTLS[4]
- BouncyCastle[5]
- Cryptix[6]
- Log4j[7]
- Commons Logging[8]

5. Tested platforms

The JGlobus module of the Java CoG Kit should work on any platform that supports J2SE 1.3.1 or higher.

Tested Platforms for the JGlobus module of the Java CoG Kit:

- Linux (Red Hat 7.3)
- Windows 2000 and XP
- Solaris 9

Tested JVMs for the JGlobus module of the Java CoG Kit:

[4] http://www.rtfm.com/puretls/
[5] http://www.bouncycastle.org/
[6] http://www.cryptix.org/
[7] http://jakarta.apache.org/log4j/
[8] http://jakarta.apache.org/commons/logging/

- Sun JVM[9] 1.3.1, 1.4.2 and 1.5.0
- IBM JVM[10] 1.3.1, and 1.4.2

JVM notes:

- GCJ[11] is not supported.

6. Associated standards

Associated standards for JGlobus module of Java CoG Kit:

- RFC 959[12] FTP
- RFC 2251[13] LDAP
- RFC 2222[14] SASL
- RFC 2853[15] GSSAPI: Java Bindings
- RFC 3820[16] Proxy Certificates
- RFC 2818[17] TLS

7. For More Information

Please see JGlobus documentation[18] and API documentation[19] for more information.

Please see the Java CoG Kit[20] web site for more information about the entire Java Commodity Grid Kit.

[9] http://java.sun.com/j2se/
[10] http://www-106.ibm.com/developerworks/java/jdk/
[11] http://gcc.gnu.org/java/
[12] http://www.faqs.org/rfcs/rfc959.html
[13] http://www.faqs.org/rfcs/rfc2251.html
[14] http://www.faqs.org/rfcs/rfc2222.html
[15] http://www.faqs.org/rfcs/rfc2853.html
[16] http://www.faqs.org/rfcs/rfc3820.html
[17] http://www.faqs.org/rfcs/rfc2246.html
[18] index.html
[19] http://www-unix.mcs.anl.gov/~gawor/jglobus-nightly/globus_4_0_branch/javadoc/
[20] http://www.cogkit.org/