

**INSTALLING
GLOBUS TOOLKIT 1.1.3**

December 2001

A project for
BioInformatics Centre

by Ong Guan Sin
<guansin@bic.nus.edu.sg>

1. Overview

This document records the process of installing Globus Toolkit 1.1.3 on various systems of BIC. Globus Tool 1.1.3 System Administration Guide extensively documents the various information needed to install and deploy Globus. That should be the best source of information on installing Globus. This document does not intend to reinvent the wheel; rather, in addition to the simplified version of installation documentation, it has some undocumented information as well as lessons learned through out the process.

2. Introduction to Globus Installation

The Globus installation consists of the following stages:

1. Planning - plan and consider various system resources and software
2. Install pre-requisite software
3. Install Globus - Build and compile
4. Setup
5. Deploy - Globus installation which has been built and setup is copied to its final location.
6. Testing

3. Planning

- You need root access on the system to be installed with Globus.
- Make sure the system time, including the timezone, is properly configured. Failing that will cause problems especially to certificate-based authentication. It is therefore recommended that NTP server is run for system time synchronisation.
- Make sure the system's host configuration is properly done. DHCP-based configuration is not acceptable. The host itself must have an entry in /etc/hosts, otherwise Globus will not run satisfactorily.
- OpenSSL is not properly supported by Globus 1.1.3. Use SSLeay.
- Globus uses X.509 certificates for authentication of users and hosts. Prepare for a CA signing facility so that Globus host and user certificates can be issued and signed. I used the simple CA scripts bundled in SSLeay for this purpose.

4. Install pre-requisite software

- For each of the systems where Globus is to be installed, OpenLDAP and SSLeay must be installed. Follow the download link at Globus website to download the correct package:

<http://www.globus.org/toolkit/download/>

- Installation of SSLeay
 - SSLeay 0.9.0b, with the Globus patch for Irix, is used.
 - It is configured to install into /home/guansin/ssleay so not to interfere with existing system installation, if any. (perl util/ssldir.pl /home/guansin/ssleay before Configure is used for this purpose.)
 - In summary, the following is used to install SSLeay:


```
% cd SSLeay-0.9.0b
% patch -p0 < ../globus/ssleay-0.9.0-irix-patch (optional
only for Irix system)
% perl util/perlpath.pl /usr/bin (optional, to indicate where Perl
is installed)
% perl util/ssldir.pl /home/guansin/ssleay
% ./Configure {system-archi-to-configure}
% make clean
% make depend
% make
% make install
% make tests
```

- Installation of OpenLDAP
 - OpenLDAP 1.2.7 is used.
 - As in SSLeay, OpenLDAP is configured to install in user home directory.
 - In summary, the following is used to install OpenLDAP:


```
% ./configure --prefix=/home/guansin/openldap --
enable-slapd --enable-shell --disable-ldbm --without-
threads
% make depend
% make
% make install
```

5. Install Globus - Build and compile

- Create a user "globus", to be used as the user id in which the globus software will run as. (Ideally this user id should have the same numeric UID value across all Globus sites so that when [NFS-mounted] shared filesystem is used, there is no permission problem to be fixed.) /home/globus is created as the home directory of globus and the install directory of Globus.
- su globus
- In summary, the following is the command line(s) used to build Globus:


```
% ~guansin/src/globus/globus-install -prefix=/home/globus -
with-ssl-path=/home/guansin/ssleay -with-ldap-
path=/home/guansin/openldap -with-domain-
name=bic.nus.edu.sg
```

- Globus's directory structure supports heterogeneous platform within the same install directory. Binary of different OS platform and architecture will be built into and co-exist in the same directory structure. For each of the platforms where Globus is to be deployed, build it once and reuse the generated binary on other similar systems. In other words, `globus-install` should be run once for each platform.

6. Setup Globus

- Run `sbin/globus-setup` once to set up Globus prior to deployment on the systems.
- Use `globus-setup` to set up GIIS (Globus Information Index Services) for the Grid. Select a host (`exon.bic.nus.edu.sg` in this case) and a port (port 2136) to run the GIIS. We will use the new distributed model (available in 1.1.3) for the MDS of Globus. **Make sure the port used is a high number (>1024), otherwise it won't run!**
- Manually edit the following config files in `/home/globus/etc`:

- **globus-gatekeepers.conf**

Add an entry for each of the systems where Globus is to be deployed. For instance:

```
exon.bic.nus.edu.sg      inetd      2119
```

- **globus-services.conf**

Add an entry using fork manager type for each of the systems where Globus is to be deployed. For instance:

```
origin.bic.nus.edu.sg jobmanager stderr_log,local_cred -
${libexecdir}/globus-jobmanager globus-jobmanager -conf
${sysconfdir}/globus-jobmanager.conf -type fork -rdn
jobmanager -machine-type unknown
```

7. Deploy Globus

- On each of the systems where Globus is to be deployed, perform the following:
 - `su - globus`

The deployment will be owned by `globus`.

- `/home/globus/sbin/globus-local-deploy -email guansin@bic.nus.edu.sg /opt/globus`

This will deploy Globus to `/opt/globus`, with any notification sent to `guansin@bic.nus.edu.sg`

- At the end of `globus-local-deploy`, follow the final steps, paying attention to the following:
 - Make sure the ownership of `<deploy-dir>/etc/globus-gatekeeper.cert` and `<deply-dir>/etc/globus-gatekeeper.key` is changed to root. Failing to follow this step will make Globus refuse to work!
 - Send `<deploy-dir>/etc/globus-gatekeeper.request` to the local CA for signing request. See **Running Our Own CA** section.

NOTES

- On the GIIS host with Bash, `<deploy>/libexec/grid-info-site-backend` needs fixing. Otherwise, you will see "rejected registration" messages in `<deploy>/var/grid-info-system.log`. See http://www-unix.globus.org/mail_archive/discuss/msg00893.html for more details.