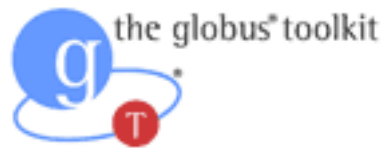
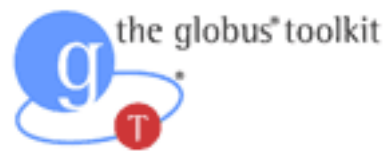


Grid Roll: Users Guide



Version 4.3 Edition



Grid Roll: Users Guide :

Version 4.3 Edition

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Preface

The Rocks Grid Roll is based on Globus 4.0.3 (GT4).

Chapter 1. Overview

Table 1-1. Summary

Name	grid
Version	4.3
Maintained By	Rocks Group
Architecture	i386, x86_64, ia64
Compatible with Rocks™	4.3

Table 1-2. Roll Compatibility

Roll	Requires ^a	Optional ^b	Conflicts
alpha		X	
area51		X	
base	X		
bio		X	
condor		X	
ganglia		X	
grid	X		
hpc	X		
java		X	
kernel	X		
os (disk 1)	X		
os (disk 2)	X		
os (disk 3)		X	
os (disk 4)		X	
pbs		X	
service-pack		X	
sge		X	
viz		X	
web-server		X	

Notes:

- a. You may also substitute your own OS CDs for the Rocks™ OS Roll CDs. In this case you must use all the CDs from your distribution and not use any of the Rocks™ OS Roll CDs.
- b. Only Rolls that have been verified as compatible with this Roll are listed. Other Rolls will likely work, but have not been tested by the maintainer of this Roll.

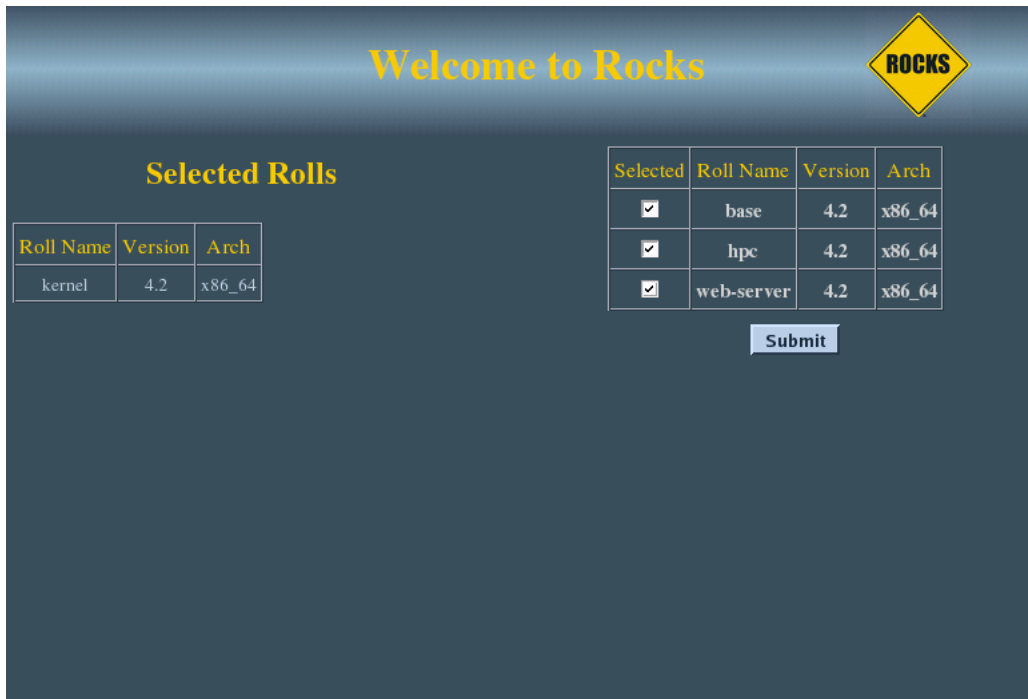
Chapter 2. Installing

2.1. Use the Correct Hostname

Globus and its openssl-based PKI tools require the hostname of your server to be the primary DNS fully-qualified domain name. You may also not name use DNS aliases, or an abbreviated hostname. This is because all certificate checks do a reverse DNS lookup and must resolve to the correct distinguished name (DN) used to build the certificate. To insure you configure your server correctly use the FQDN of your machine for the hostname when prompted during the Rocks installation.

2.2. On a New Server

The grid Roll should be installed during the initial installation of your server (or cluster). This procedure is documented in section 1.2 of the Rocks™ usersguide. You should select the grid Roll from the list of available rolls when you see a screen similar to the one below.



2.3. On an Existing Server

The grid Roll may also be added onto an existing server (or frontend). For sake of discussion, assume that you have an iso image of the roll called `grid.iso`. The following procedure will install the Roll, and after the server reboots

the Roll should be fully installed and configured.

```
$ su - root
# mount -o loop grid.iso /mnt/cdrom
# cd /home/install
# rocks-dist --install copyroll
# umount /mnt/cdrom
# rocks-dist dist
# kroll grid | bash
# init 6
```

2.4. Root Login

The Grid Roll installs the Globus Simple Certificate Authority (CA), to allow you to generate, and manage certificates. The first time you log into the Frontend as root you will be prompted for the passphrase for your newly installed CA. This passphrase should be secure, and different from your root account password.

```
Enter CA passphrase:
Enter CA passphrase (again):
Installing Globus CA (takes a few minutes)
Done.
Stopping xinetd:                [ OK ]
Starting xinetd:                [ OK ]
Stopping MDS                    [ OK ]
Starting MDS                    [ OK ]
```



You must configure the Simple CA, even if you wish to use an different CA system. After providing a passphrase, you may modify your Globus configuration to use your preferred CA system. The Simple CA is provided as a starting point, for users to setup there own grid testbeds quickly as possible. Production grids may require a different CA configuration.

2.5. Globus Usage Statistics

The Globus Team has a policy¹ of collecting usage statistics from all installations of Globus. The version of Globus on this roll is configured by default to opt-in for this reporting from your system. If you wish to opt-out of this you must reconfigure the firewall rules on your frontend. Edit the file `/etc/sysconfig/iptables` and a new **DROP** in the following section of the file.

```
*filter
:INPUT ACCEPT [0:0]
:FORWARD DROP [0:0]
:OUTPUT ACCEPT [0:0]
```



```
# Preamble
-A FORWARD -i eth1 -o eth0 -m state --state NEW,RELATED,ESTABLISHED -j ACCEPT
-A FORWARD -i eth0 -j ACCEPT
-A INPUT -i eth0 -j ACCEPT
-A INPUT -i lo -j ACCEPT

# Disable Globus Usage Statistics Reporting from this host
-A OUTPUT -d usage-stats.globus.org -j DROP
```

Notes

1. http://www-unix.globus.org/toolkit/docs/4.0/Usage_Stats.html

Chapter 3. Using

3.1. Managing Certificates

This section discusses how to use the Globus Simple CA, and Rocks software to manage user certificates. If you plan to use a different CA system please refer to the documentation for that CA.

Creating a Globus User Certificate, regardless of the CA system, involves the following steps:

1. User creates a certificate request.
2. Certificate Request is sent to the CA system. The Grid Roll skips this step, and the root account directly reads the Certificate Request out of the user's home directories.
3. The CA system creates a Globus User Certificate and returns it to the user.

The advantage of using the Simple CA (and the Rocks Grid Roll) to provide CA services is that these steps can be completed in minutes, rather than the standard practice of waiting hours to days for a certificate.

3.1.1. Requesting a Certificate

Users may request certificates using the Globus command **grid-cert-request**. In the following sample output a certificate request is generated for the user with a Common Name (CN) of "Spaceman Spiff". The rest of the DN is picked up from the configuration of the CA, which was done at installation time.



Although the **grid-cert-request** command instructs that you email you certificate request this step is not necessary when using the Grid Roll.

```
$ grid-cert-request
Enter your name, e.g., John Smith: Spaceman Spiff
A certificate request and private key is being created.
You will be asked to enter a PEM pass phrase.
This pass phrase is akin to your account password,
and is used to protect your key file.
If you forget your pass phrase, you will need to
obtain a new certificate.

Using configuration from /etc/grid-security/globus-user-ssl.conf
Generating a 1024 bit RSA private key
.....++++++
.....++++++
writing new private key to '/home/gridboy/.globus/userkey.pem'
Enter PEM pass phrase:
Verifying password - Enter PEM pass phrase:
```

you are about to be asked to enter information that will be incorporated into your certificate request.

What you are about to enter is what is called a Distinguished Name or a DN.

There are quite a few fields but you can leave some blank

For some fields there will be a default value,

If you enter '.', the field will be left blank.

Level 0 Organization [Grid]:Level 0 Organizational Unit [San Diego Supercomputer Center]:Level 1 Org

A private key and a certificate request has been generated with the subject:

/O=Grid/OU=San Diego Supercomputer Center/OU=rocks12.sdsc.edu/OU=sdsc.edu/CN=Spaceman Spiff

If the CN=Spaceman Spiff is not appropriate, rerun this

script with the `-force -cn "Common Name"` options.

Your private key is stored in `/home/gridboy/.globus/userkey.pem`

Your request is stored in `/home/gridboy/.globus/usercert_request.pem`

Please e-mail the request to the Globus Simple CA root

You may use a command similar to the following:

```
cat /home/gridboy/.globus/usercert_request.pem | mail root
```

Only use the above if this machine can send AND receive e-mail. if not, please mail using some other method.

Your certificate will be mailed to you within two working days.

If you receive no response, contact Globus Simple CA at root

3.1.2. Creating User Certificates

Only the root account is permitted to issue user certificates using the locally installed Simple CA. After one, or more, users have run **grid-cert-request**, the root user must log in and run **local-ca-sign**. In the following example, a certificate request is found, a certificate issued, and the grid-mapfile populated with an entry for the user.

```
# local-ca-sign
```

```
Enter CA passphrase:
```

```
Enter password for the CA key:
```

```
The new signed certificate is at: /root/.globus/simpleCA//newcerts/03.pem
```

```
/etc/grid-security/grid-mapfile does not exist... Attempting to create /etc/grid-security/grid-mapfi
```

```
(1) entry added
```

3.2. Using Certificates

You can verify Globus is correctly installed by running a few simple Globus commands from your Frontend. Although this is only a simple loopback-grid this will verify the installation. The following will run `grid-hostname` over loopback on your Frontend node.

1. Create a proxy certificate.

```
$ grid-proxy-init
Your identity: /O=Grid/OU=San Diego Supercomputer Center/OU=rocks12.sdsc.edu/OU=sdsc.edu/CN=Space
Enter GRID pass phrase for this identity:
Creating proxy ..... Done
Your proxy is valid until: Tue Sep  9 10:53:51 2003
```

2. Run `hostname` over Globus

```
$ globus-job-run localhost /bin/hostname
rocks12.sdsc.edu
```

To start building a grid you will need to exchange certificate and grid-mapfile information with other hosts and users. Please visit the Globus site documentation¹ to learn how to do this.

3.3. Testing

1. Login to the frontend as a non-root user and create a certificate for that user by executing:

```
$ grid-cert-request
```

2. Now you'll sign the certificate. Logout as the user and login back in as root and execute:

```
# local-ca-sign
```

3. Now you'll need to log back in as a non-root user in order to run the following test job:

```
$ grid-proxy-init
$ globus-job-run localhost /bin/hostname
```

This should output the hostname for the frontend.

If you installed the SGE roll, then you can test the SGE/Grid roll integration by using Globus to submit an interactive job to SGE:

```
$ globus-job-run localhost/jobmanager-sge /bin/hostname
```

This should return the name of one of the compute nodes.

Notes

1. <http://www-unix.globus.org/toolkit/documentation.html>

Appendix A. Rocks Copyright

Appendix B. Third Party Copyrights and Licenses

This section enumerates the licenses from all the third party software components of this Roll. A "best effort" attempt has been made to insure the complete and current licenses are listed. In the case of errors or omissions please contact the maintainer of this Roll. For more information on the licenses of any components please consult with the original author(s) or see the Rocks CVS repository¹.

B.1. Globus Toolkit

The following is the software license for the version of Globus included in this Roll. Globus also is subject to dozens of third party licenses, please see their site² for a complete list of licenses.

Apache License
Version 2.0, January 2004
<http://www.apache.org/licenses/>

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Notes

1. <http://cvs.rocksclusters.org>
2. <http://www.globus.org/toolkit/legal/4.0>