osg roll: Users Guide

3.1.29 Edition

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Preface

The Rocks osg Roll uses the latest stable OSG Release to provide High Throughput Computing environment for Rocks clusters. The Rocks osg Roll builds on the very good work by the OSG team, to seamlessly install and configure the *de facto* standard grid middleware on Rocks Clusters.

Please visit the Open Science Grid site[1] to learn more about their release and the individual software components.

Notes

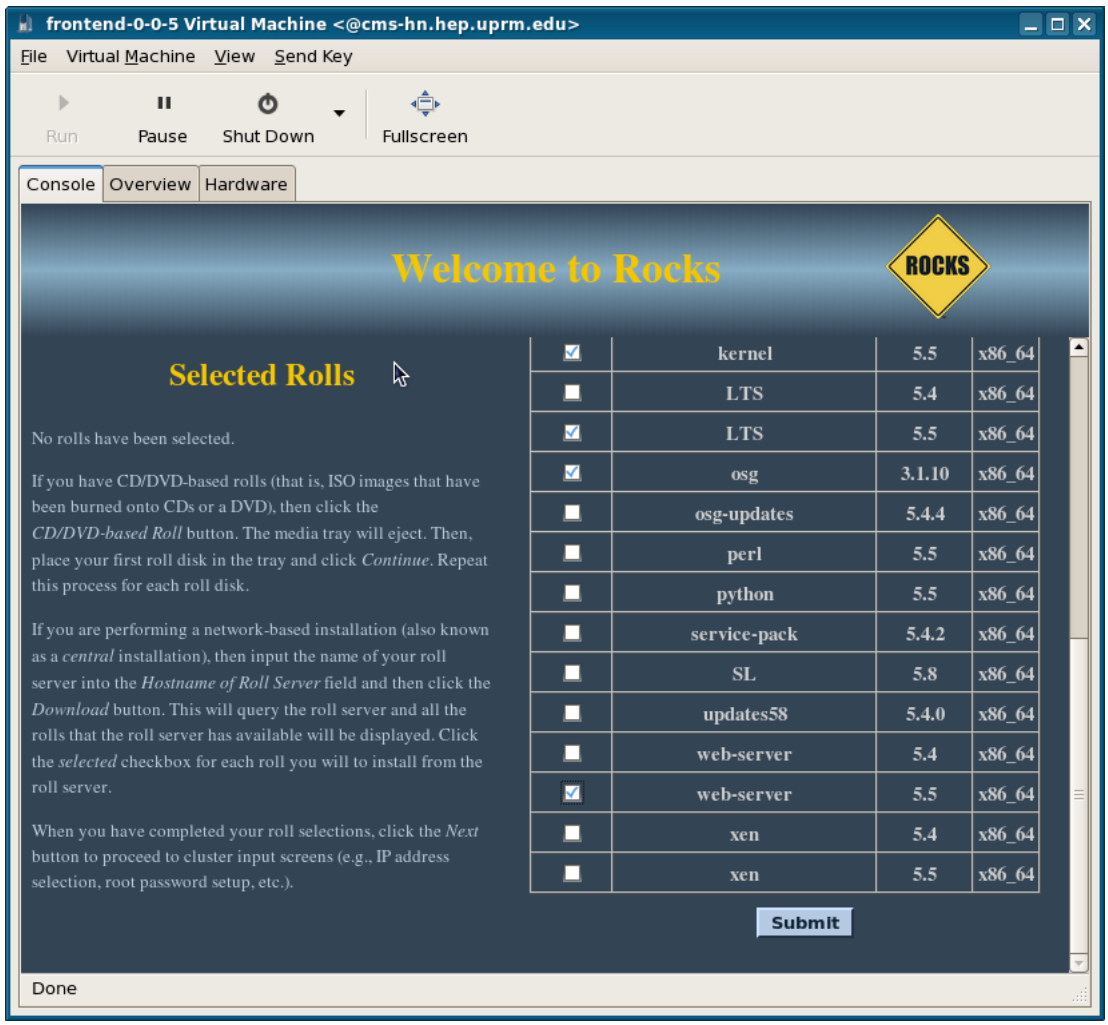
1. https://twiki.grid.iu.edu/bin/view/Documentation/Release3/

Chapter 1. Installing the osg Roll

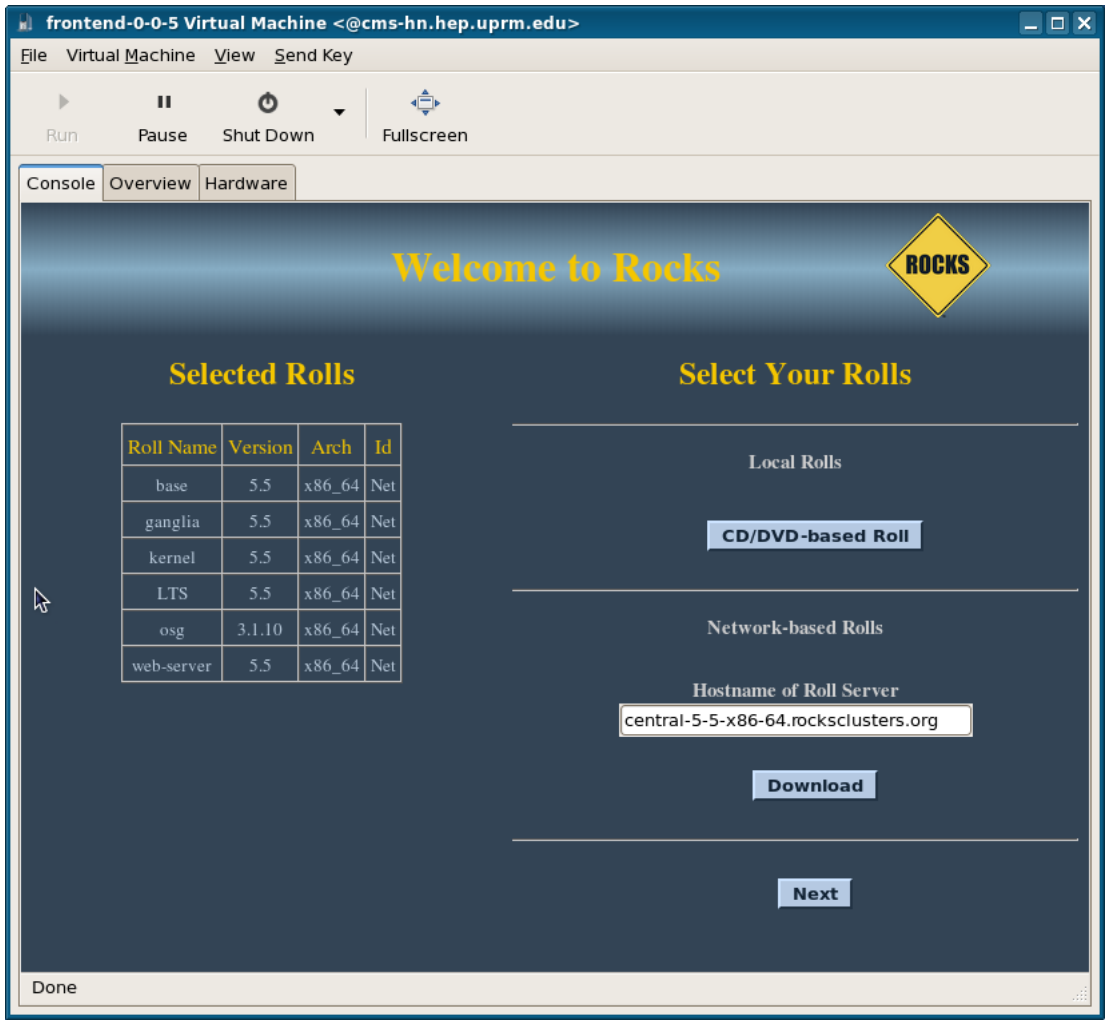
The osg roll can be installed during the Frontend installation or added to a running frontend. In either case, client nodes must be (re)installed.

1.1. On a New Server

When the osg roll is installed during the initial installation of your server (or cluster), the procedure is documented in section 1.2 of Rocks® usersguide. You should reach a screen as shown below.

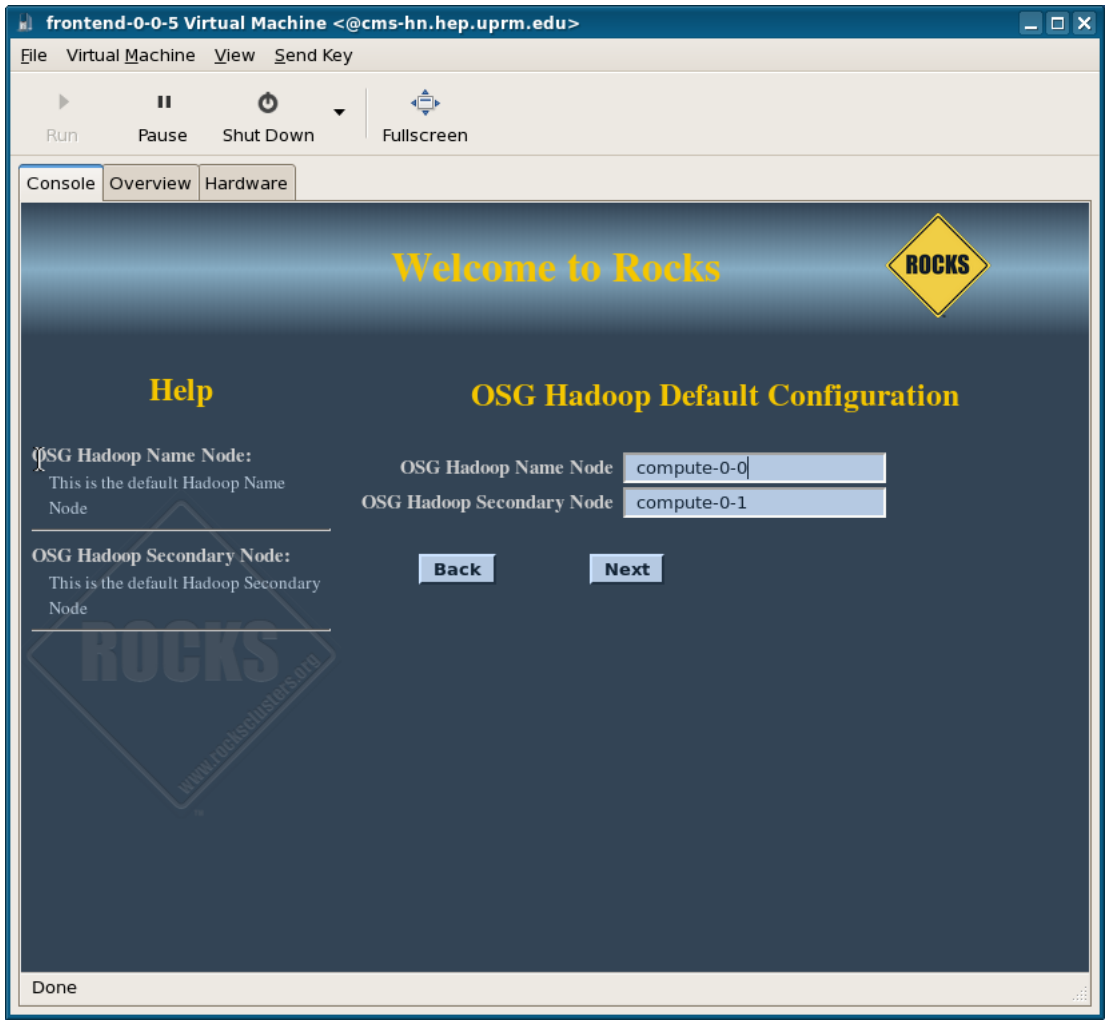


Select the osg rool from the list of available rolls when you see a screen like shown below:

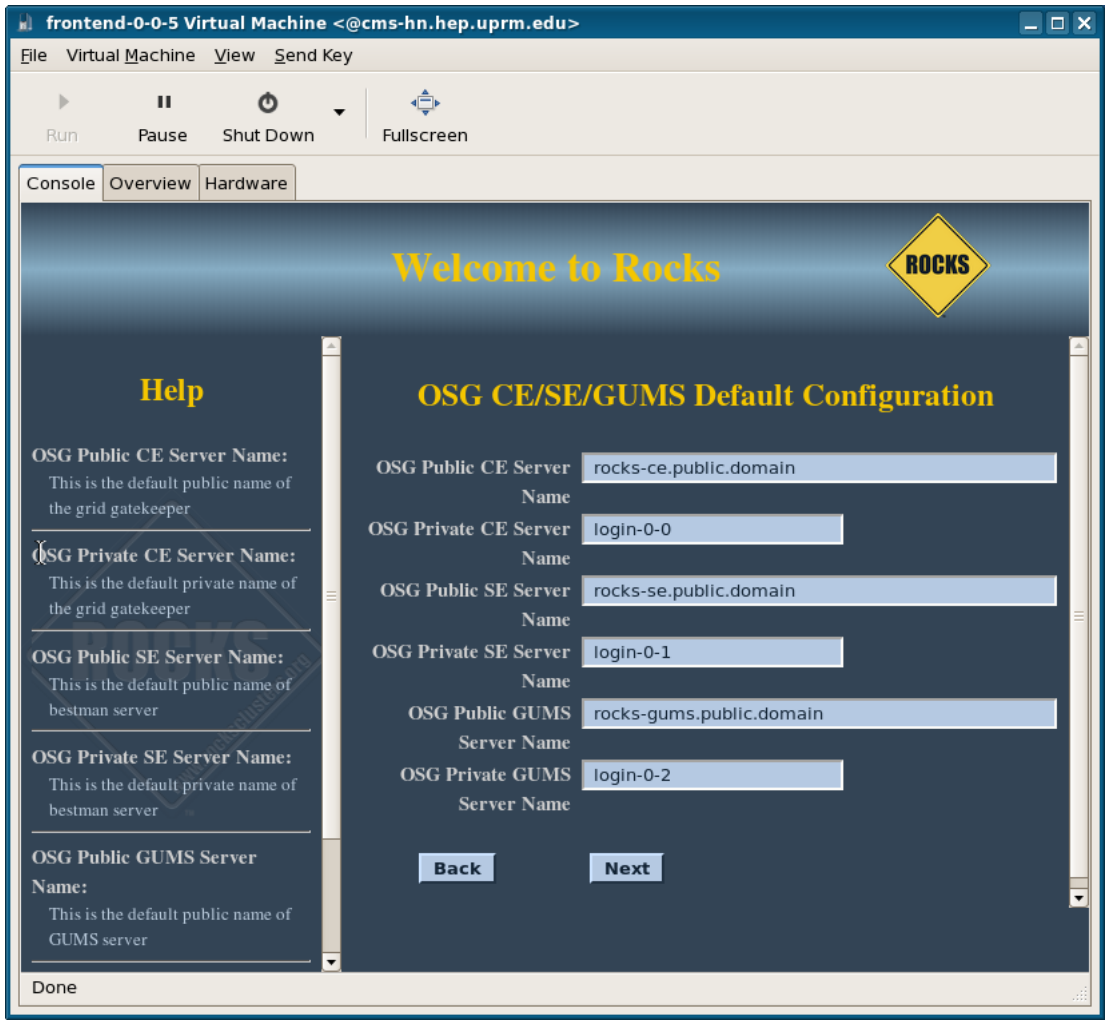


During the installation process, there will be two screens related to the osg roll. As shown below.

The first to choose the default hadoop primary and secondary servers.



The second to choose the default gridservers CE (gatekeeper), SE (bestman), GUMS servers.



If not sure leave it as is, these default can be changed later any time.

Once the osg roll is loaded the installer will continue installation automatically with no further user input.

Other appliances can be made part of the execution pool through setting an appliance attribute and reinstalling those nodes.

1.2. Install on Running System

The osg roll can be installed on a running system. The following assumes that roll is available in .iso form and is called "osg.iso".

```
$ su - root
# rocks add roll osg.iso
# rocks enable roll osg
# rocks create distro
# rocks run roll osg | bash
```

```
# shutdown -r now
```

Chapter 2. Customizing the OSG Roll -- Attributes

2.1. Customizing the OSG Roll

This section describes the default OSG configuration and some simple customizations that can be applied in Rocks with version >= 5.4

By default, Hadoop, Condor and WorkerClient with glexec are installed on Rocks *compute* appliances, while Gridftp and gatekeper server on *login-0-0* host and Gridftp hadoop and bestman2 on *login-0-1* host. For Rocks 5.2 and newer, the OSG roll makes use of *attributes* to enable Hadoop, Condor and WorkerClient with glexec, Bestman2 server, Gridftp server, hdfs gridftp server, gatekeeper (CE) server to be installed on any appliance. This may be particularly useful to groups who are including the Xen/KVM roll and would like OSG servers to install on VM Container appliances.

The basic customizations that can be applied without and scripting/programming by setting global, appliance, or host attributes. Please see the commands `rocks set attr help` and `rocks list attr help`

Table 2-1. Attributes Used in OSG Roll

Attibute Name	Description
OSG_GumsServer	Configure Gums server name used on any particular Appliance or Host installation. Default: rocks-gums.&Kickstart_PublicDNSDomain; (rocks-gums.public.domain on a New Cluster Server install)
OSGGUMSPrivate	Configure which cluster node is the gums server node (private domain). Default: login-0-2
OSG_CEServer	Configure Grid gatekeeper server name used on any particular Appliance or Host or gatekeeper installation. Default: rocks-ce.&Kickstart_PublicDNSDomain; (rocks-ce.public.domain on a New Cluster Server install)
OSGCEPrivate	Configure which cluster node is the Grid gatekeeper server node (private domain). Default: login-0-0
OSG_SEServer	Configure bestman server name used on any particular Appliance or Host or bestaman server installation. Default: rocks-se.&Kickstart_PublicDNSDomain; (rocks-se.public.domain on a New Cluster Server install)
OSGSEPrivate	Configure which cluster node is the bestman server node (private domain). Default: login-0-1

Attibute Name	Description
OSG_GFTPServer	Configure gridftp server name (non-hdfs) used on any particular Appliance or Host installation. Default: rocks-ce.&Kickstart_PublicDNSDomain;
OSG_HadoopNameNode	Configure Hadoop NodeName server name used on any particular Appliance or Host installation. Check for a line like this: HADOOP_NAMENODE=compute-0-0 in /etc/sysconfig/hadoop Default: compute-0-0
OSG_HadoopSecondaryNode	Configure Hadoop SecondaryName server name used on any particular Appliance or Host installation. Check for a line like this: HADOOP_SECONDARY_NAMENODE=compute-0-1 in /etc/sysconfig/hadoop Default: compute-0-1
OSG_HadoopDataDir	Configure Hadoop base data dir used on any particular Appliance or Host installation. Check for a line like this: HADOOP_DATADIR=/hadoop in /etc/sysconfig/hadoop Default: /hadoop
OSG_HadoopData	Configure Hadoop data dir used on any particular Appliance or Host installation. Check for a line like this: HADOOP_DATA=/hadoop/data in /etc/sysconfig/hadoop Default: /hadoop/data
OSG_HadoopCheckPointDirs	Configure Hadoop check point dirs used on any particular Appliance or Host installation. Check for a line like this: HADOOP_CHECKPOINT_DIRS=/home/hadoop,/scratch/hadoop in /etc/sysconfig/hadoop Default: /home/hadoop,/scratch/hadoop
OSG_HadoopCheckPointPeriod	Configure Hadoop check point period used on any particular Appliance or Host installation. Check for a line like this: HADOOP_CHECKPOINT_PERIOD=600 in /etc/sysconfig/hadoop Default: 600
OSG_HadoopUpdateFstab	Configure Hadoop for update fstab used on any particular Appliance or Host installation. Check for a line like this: HADOOP_UPDATE_FSTAB=1 in /etc/sysconfig/hadoop Default: 1
OSG_GlobusPortRange	Configure Globus Port Range used on any particular Appliance or Host installation. This entry is used for setting iptable firewall on grid servers. Default: 20000:25000
OSG_GlobusTcpPortRange	Configure Globus TCP Port Range used on any particular Appliance or Host installation. This entry is used for setting GLOBUS_TCP_PORT_RANGE on grid servers. (note change : by , compared with OSG_GlobusPortRange) Default: 20000,25000

Attibute Name	Description
OSG_GlobusTcpSourceRange	Configure Globus TCP Source Range used on any particular Appliance or Host installation. This entry is used for setting GLOBUS_TCP_SOURCE_RANGE on grid servers. (note change : by , compared with OSG_GlobusPortRange) Default: 20000,25000
OSG_SRMlocalPathListAllowed	Configure localPathListAllowed used on any particular Appliance or Host installation of bestman server. Check for a line like this: localPathListAllowed=/mnt/hadoop;/data/se in /etc/bestman2/conf/bestman2.rc Default: /mnt/hadoop;/data/se
OSG_SRMsupportedProtocolList	Set supportedProtocolList used on any particular Appliance or Host installation of bestman server. This is the default gridftp server. Check for a line like this: gsiftp://rocks-ce.&Kickstart_PublicDNSDomain;:2811 in /etc/bestman2/conf/bestman2.rc Default: gsiftp://rocks-ce.&Kickstart_PublicDNSDomain;:2811
OSG_Client	Enable/Disable OSG worker node Client Installation on any particular Appliance or Host. Install includes glexec. Default: true (on compute appliance)
OSG_CE	Enable/Disable osg-ce-condor (="condor") or osg-ce-sge (="sge") Installation on any particular Appliance or Host. Default: condor (on login-0-0)
OSG_SE	Enable/Disable bestman-server Installation on any particular Appliance or Host. Default: true (on login-0-1)
OSG_GRIDFTP	Enable/Disable standalone gridftp server Installation on any particular Appliance or Host. Default: true (on login-0-0)
OSG_GFTP_HDFS	Enable/Disable hadoop gridftp server Installation on any particular Appliance or Host. Default: true (on login-0-1)
OSG_StoredCertsDir	Set Base Dir where grid certs are stored for Appliance or Host installation. During installation of CE or SE hostcert.pem and hostkey.pem are copied to /root. Default: /root/certs
OSG_Condor_Client	Enable/Disable Condor Client Installation on any particular Appliance or Host. Default: true (on compute appliance)
OSG_Condor_Master	Redefine the Condor Master that nodes use. Default: public frontend name
OSG_Condor_Network	Define which network interface is used for Condor traffic. Default: frontends are set to public, clients are set to private.

Attibute Name	Description
OSG_Condor_Daemons	Define which Condor execution daemons are installed. Default: [MASTER (global)], [MASTER, SCHEDD, COLLECTOR, NEGOTIATOR (frontends)], [MASTER, SCHEDD (login appliance)], [MASTER, STARTD (compute appliance)]
OSG_Condor_PortLow	Lower Port range that Condor will use to communicate among daemons. Removal of this Attribute will result in removal of the LOWPORT entry in 01_rocks_condor_config.local after syncing the configuration. Default: 40000
OSG_Condor_PortHigh	Upper Port range that Condor will use to communicate among daemons. Removal of this Attribute will result in removal of the HIGHPORT entry in 01_rocks_condor_config.local after syncing the configuration. Default: 50000
OSG_Condor_HostAllow	Comma separates list of allowed readers/writers for Condor. Translates to HOSTALLOW directive in Condor Configuration file. Default: + rocks-ce
OSG_Condor_PasswordAuth	Use a shared pool password, instead of host-based authentication. Default: no.
OSG_Condor_EnableMPI	Configure a local scheduler for MPI Universe Support. Default: no
OSG_Condor_EnableAMAZON_EC2	Configure a local scheduler for AMAZON_EC2 Support. Default: no
OSG_Condor_EnableT3GRID_SUBMIT	Configure a local grid submitter for interactive nodes (I use to called it CRAB submit). Default: no
OSG_Condor_EnableT3GRID_CMSSW	Configure a local compute nodes for CMS jobs. Default: yes
OSG_GUMSBackupDir	Configure the directory in which is located the backup config files and database for gums. Default: /path/to/gums/backup
OSG_GUMSDNADMIN	Configure the admin DN for gums used in the configuration scripts. Default: /DC=org/DC=doegrids/OU=People/CN=Name M LastName 123456
OSG_condoruid	Configure uid for condor user. Default: 407
OSG_condorgid	Configure gid for condor user (group). Default: 407
OSG_squiduid	Configure uid for squid user. Default: 450
OSG_squidgid	Configure gid for squid user (group). Default: 450
OSG_cvmfsuid	Configure uid for cvmfs user. Default: 470
OSG_cvmfsgid	Configure gid for cvmfs user (group). Default: 470
OSG_fusegid	Configure gid for fuse group. Default: 408

Attibute Name	Description
OSG_CVMFS_REPOSITORIES	Configure CVMFS_REPOSITORIES for cvmfs. Default: cms.cern.ch
OSG_CVMFS_CACHE_BASE	Configure CVMFS_CACHE_BASE for cvmfs. Default: "/var/cache/cvmfs"
OSG_CVMFS_QUOTA_LIMIT	Configure CVMFS_QUOTA_LIMIT for cvmfs (in MB). Default: 10000
OSG_CVMFS_HTTP_PROXY	Configure CVMFS_HTTP_PROXY for cvmfs. Default: "http://login-0-2:3128"
OSG_CMS_LOCAL_SITE	Configure CMS_LOCAL_SITE for cvmfs. Default: "T3_US_PuertoRico"

Chapter 3. Customizing the OSG Roll

3.1. Examples of Hadoop Configuration

The following are short examples of how to customize Hadoop using Rocks commands.

- Change default Hadoop Node Name on all compute Appliances: `rocks set appliance attr compute OSG_HadoopNameNode value=hadoop-0-0`
- Change default Hadoop Secondary Name on all compute Appliances: `rocks set appliance attr compute OSG_HadoopSecondaryNode value=hadoop-0-1`
- Change default Hadoop Data Dir on all compute Appliances, for example two data disks: `rocks set appliance attr compute OSG_HadoopData value="/hadoop/data,/hadoop2/data"`

3.2. How to set new Gums server

The following are short examples of how to customize gums server using Rocks commands before kickstarting.

- Change default Gums server Name on all compute Appliances: `rocks set appliance attr compute OSG_GumsServer value="my-gums.my.edu."`
- Change default Gums server Name on a host: `rocks set host attr se-0-0 OSG_GumsServer value="my-gums.my.edu."`
- Change default Gums server Name global: `rocks set attr OSG_GumsServer value="my-gums.myglobal.edu."`

3.3. How to set Default Gridftp server used for Bestman

The following are short examples of how to customize default gridftp server using Rocks commands.

- Change default Gridftp server Name global: `rocks set attr OSG_SRMsupportedProtocolList value="gsiftp://mygridftp.my.edu:2811"`

3.4. Examples of Condor Configuration

The following are short examples of how to customize Condor using Rocks commands.

- Enable Condor install on all VM-Containers Appliances: `rocks add appliance attr vm-container OSG_Condor_Client true`
- Disable Condor install on particular node: `rocks set host attr compute-0-0 OSG_Condor_Client false`
- Define a New Condor Master: `rocks set attr OSG_Condor_Master central-master.my.edu`
- Enable MPI/Dedicated Scheduler: `rocks set attr OSG_Condor_EnableMPI true`.

  Actively-running Condor daemons must be reconfigured for this attribute to take affect. This can be achieved dynamically on compute and frontend appliances using `rocks sync host osg condor frontend compute`.

  Reinstalled nodes will build the correct configuration.

3.5. Reconfiguring CE/gatekeeper after Installation

A primitive configuratation of CE is done during the install, the resulting configuration files are located in /etc/osg/config.d and is based on available information at install. To reconfigure a CE node changes on the ini files located in /etc/osg/config.d is needed followed by running the command osg-configure -c. This part is automatized by running the command

```
# rocks sync host osg CE <hostname>
```

This will rewrite 10-misc.ini, 10-storage.ini, 15-managedfork.ini, 20-condor.ini (or 20-sge.ini), 30-gip.ini, 40-network.ini, 40-siteinfo.ini and run the osg command `/usr/sbin/osg-configure -c`

To view the script of changes for the inifiles before making changes, use `rocks report host osg CE config <hostname>`

To generate the script, login on the CE node and run `rocks report host osg CE config <hostname> | rocks report script | bash` the output script will be writen in `/tmp/Reconfigure_CE_ini_files`

To find information about CE configuration please see the OSG documentation at OSG twiki page[1].

3.6. Reconfiguring Condor after Installation

The configuration of Condor is done during the install, the resulting configuration files are located in /etc/condor/config.d/. To reconfigure Condor on a node, make appropriate attribute using the commands above and then run

```
# rocks sync host osg condor <hostname>
```

This will rewrite the 01_rocks_condor_config.local on the file and then calls the Condor command `/usr/sbin/condor_reconfig`


To view the contents of the 01_rocks_condor_config.local before making changes, use `rocks report host osg condor config <hostname>`

To find information about administrating and using Condor Pools please see the original Condor manual at Condor manuals[2] or locally [3].

3.7. Reconfiguring Hadoop after Installation

The configuration of Hadoop is done during the install, the resulting configuration file is /etc/sysconfig/hadoop. To reconfigure Hadoop on a node, make appropriate attribute using the commands above and then run

```
# rocks sync host osg hadoop <hostname>
```

This will rewrite the file /etc/sysconfig/hadoop and then calls the Hadoop command `service hadoop-firstboot start`


To view the contents of the /etc/sysconfig/hadoop before making changes, use `rocks report host osg hadoop config <hostname>`

3.8. Reconfiguring Frontier Squid after Installation

The default customization of Squid is done during the install, the resulting configuration file is /etc/squid/customize.sh. To reconfigure squid on a node, make appropriate attribute using the commands above and then run

```
# rocks sync host osg squid <hostname>
```

This will rewrite the file /etc/squid/customize.sh then you can start the service with the command `service frontier-squid start`

To view the contents of the /etc/squid/customize.sh before making changes, use `rocks report host osg squid config <hostname>`

3.9. Reconfiguring CVMFS

The default customization of CVMFS is done at the OS install, the resulting configuration files are: /etc/cvmfs/default.local, /etc/cvmfs/config.d/cms.cern.ch.local, /etc/cvmfs/domain.d/cern.ch.local and /etc/fuse.conf To reconfigure cvmfs on a node, make appropriate attribute using the commands above and then run

```
# rocks sync host osg cvmfs <hostname>
```

In case cvmfs was not installed at kickstart, it is possible to install in a node or appliance after kickstart by setting OSG_CVMFS on a host or appliance and then syncing as shown below

```
# rocks set host attr <hostname> OSG_CVMFS value=true
# rocks sync host osg cvmfs install <hostname>
```

This will rewrite the above files then you can reload the service with the command `cvmfs_config reload`

To view the contents of the files /etc/cvmfs/default.local, /etc/cvmfs/config.d/cms.cern.ch.local, /etc/cvmfs/domain.d/cern.ch.local and /etc/fuse.conf before making changes, use `rocks report host osg cvmfs config <hostname>`

3.10. Programatically changing the Contents of 01_rocks_condor_config.local

Condor configuration is localized into /etc/condor/config.d/01_rocks_condor_config.local. This file is generated programatically from the output of `rocks report host osg condor config <hostname>`.

The command `rocks report host osg condor config` is defined by the OSG roll and is written in Python. This report command is extensible through Rocks command plugins.

To see a sample Condor plugin, view the file in location `/opt/rocks/lib/python2.4/site-packages/rocks/commands/report/host/osg/condor/config/plugin_sample.py` which is reproduced here.

```
# $Id$
import rocks.commands

class Plugin(rocks.commands.Plugin):

 def provides(self):
  return 'sample'

 def run(self, argv):
  # Argv contains the hostname and the in memory key-value store
        # that is eventually written to
  # /etc/condor/config.d/01_rocks_condor_config.local
  # plugins can add/change/remove keys from the store

  # 1. Get the hostname and the key-value store, which
  #    is a python dictionary
  host, kvstore = argv

  # The following would add CONDOR_SAMPLE=Sample Plugin
  # the key = value dictionary (kvstore)  that is written out
  #
  # Example 1. Read an attribute from the database and set
  # the values
  value = self.db.getHostAttr(host, 'Condor_HostAllow')
  kvstore['CONDOR_SAMPLE'] = value

  # Example 2. Set the key CONDOR_SAMPLE to the hostname
  kvstore['CONDOR_SAMPLE'] = host

  # Example 3. Remove a key from the dictionary
  if 'CONDOR_SAMPLE' in kvstore:
   del kvstore['CONDOR_SAMPLE']

RollName = "condor"
```

Users/Roll Developers can add their own plugins for the "report host condor config" command to overwrite, add, and/or delete key,value pairs that are written into /etc/condor/config.d/01_rocks_condor_config.local.

In the above code sample, the Condor report command driver passes the hostname and the dictionary of already defined key,value pairs (kvstore in the sample code). The sample code shows several different examples of changing the key 'CONDOR_SAMPLE'.

Plugins are written in Python, are called in random order, and must be named "plugin_<name>.py".

Plugins also enable any desired configurations to be properly applied with the command `rocks sync host osg condor config`.

Notes

1. https://twiki.grid.iu.edu/bin/view/Documentation/Release3/InstallComputeElement#7_Configuration_Instructions
2. http://www.cs.wisc.edu/condor/manual

3. condor-Manual

Chapter 4. Using the osg Roll

4.1. Example Install ce server (condor)

ce-condor can be installed as follow.

```
$ su - root
#
###set public interface
#
#rocks set host interface ip ce-0-0 iface=eth1 ip=1.2.3.5
#rocks set host interface name ce-0-0 iface=eth1 name=rocks-ce
#rocks set host interface subnet ce-0-0 eth1 public
#rocks set host attr ce-0-0 primary_net public
#rocks add host route ce-0-0 0.0.0.0 1.2.3.1 netmask=0.0.0.0
#rocks add host attr ce-0-0 OSG_CE value="condor"
#rocks add host attr ce-0-0 OSG_Condor_Daemons value="MASTER, SCHEDD"
#
###sample of customizing/changing attribute
#rocks set host attr ce-0-0 OSG_SRMsupportedProtocolList value="gsiftp://rocks-ce.mypublic.edu:2811"
###place where grid certs are stored
###this example needs hostcert, httpcert
###    /my/nfs/path/for/certs/ce-0-0/httpcert.pem
###    /my/nfs/path/for/certs/ce-0-0/httpkey.pem
#rocks set host atrr ce-0-0 OSG_StoredCertsDir value="/my/nfs/path/for/certs"
###setting service certs
#rocks 5.5
#  rocks add host sec_attr ce-0-0 attr=hostcert value="`cat /path/to/cert/hostcert.pem`" crypted=tru
#  rocks add host sec_attr ce-0-0 attr=hostkey value="`cat /path/to/certkey/hostkey.pem`" crypted=tr
#rocks 5.6
#  rocks add host sec_attr ce-0-0 attr=hostcert value="/path/to/cert/hostcert.pem" crypted=true
#  rocks add host sec_attr ce-0-0 attr=hostkey value="/path/to/certkey/hostkey.pem" crypted=true

#
# reinstall
#
#shoot-node ce-0-0

#
# post install
#
#rocks sync host sec_attr ce-0-0
#rocks run host ce-0-0 command='/root/install_ce_cert.sh'
##Manual config
#edit for your site /etc/osg/config.d/30-gip.ini
#edit for your site /etc/osg/config.d/40-siteinfo.ini
#rocks run host ce-0-0 command='configure-osg -v'
#rocks run host ce-0-0 command='configure-osg -c'
##OR
##Automatic throughout attributes (survive reinstalls)
```

```
##Example
## Attrs used to fill gip (only need to set one time)
#rocks add host attr ce-0-0 OSG_CE_gip_multicluster value=2
#rocks add host attr ce-0-0 OSG_CE_gip_SubCluster1 value="MyClusterID"
#rocks add host attr ce-0-0 OSG_CE_gip_ClusterName1 value="MyClusterName"
#rocks add host attr ce-0-0 OSG_CE_gip_SubCluster2 value="MyClusterID2"
#rocks add host attr ce-0-0 OSG_CE_gip_ClusterName2 value="MyClusterName2"
## Attrs used to fill siteinfo
#rocks add host attr ce-0-0 OSG_CE_siteinfo_sponsor value="uscms"
#rocks add host attr ce-0-0 OSG_CE_siteinfo_contact value="Your Admin Name"
#rocks add host attr ce-0-0 OSG_CE_siteinfo_email value="your_admin@mail.edu"
#rocks add host attr ce-0-0 OSG_CE_siteinfo_OIM_name value="your resource OIM registered"
#rocks add host attr ce-0-0 OSG_CE_siteinfo_OIM_group value="your resource group OIM registered"
#rocks sync host osg CE ce-0-0

#rocks run host ce-0-0 command='chkconfig condor on'
#rocks run host ce-0-0 command='chkconfig globus-gatekeeper on'
#rocks run host ce-0-0 command='chkconfig fetch-crl3-cron on'
#rocks run host ce-0-0 command='chkconfig fetch-crl3-boot on'

#services for ce-condor
#rocks run host ce-0-0 command='service condor start'
#rocks run host ce-0-0 command='service globus-gatekeeper start'
```

4.2. Example Install bestman server + gridftp hadoop

Bestman can be installed as follow.

```
$ su - root
#
###set public interface
#
#rocks set host interface ip se-0-0 iface=eth1 ip=1.2.3.4
#rocks set host interface name se-0-0 iface=eth1 name=rocks-se
#rocks set host interface subnet se-0-0 eth1 public
#rocks set host attr se-0-0 primary_net public
#rocks add host route se-0-0 0.0.0.0 1.2.3.1 netmask=0.0.0.0
#rocks add host attr se-0-0 OSG_SE value=true
#rocks add host attr se-0-0 OSG_GFTP_HDFS value=true
###sample of customizing/changing attribute
#rocks set host attr se-0-0 OSG_SRMsupportedProtocolList value="gsiftp://rocks-se.mypublic.edu:2811"
###setting service certs
###rocks 5.5
#  rocks add host sec_attr se-0-0 attr=hostcert value="`cat /path/to/cert/hostcert.pem`" crypted=tru
#  rocks add host sec_attr se-0-0 attr=hostkey value="`cat /path/to/certkey/hostkey.pem`" crypted=tr
###rocks 5.6
#  rocks add host sec_attr se-0-0 attr=hostcert value="/path/to/cert/hostcert.pem" crypted=true
#  rocks add host sec_attr se-0-0 attr=hostkey value="/path/to/certkey/hostkey.pem" crypted=true

#
### reinstall
```

```
#
#shoot-node se-0-0

#
### post install
#
#cp hostcert.pem and hostkey.pem to /root/.
#rocks sync host sec_attr se-0-0
#rocks run host se-0-0 command='/root/install_se_cert.sh'
#rocks run host se-0-0 command='chkconfig bestman2 on'
#rocks run host se-0-0 command='chkconfig globus-gridftp-server on'
```

4.3. Example Install ce server (condor) + gridftp + rsv

ce-condor + gridftp + rsv can be installed as follow. (rsv is configured like in OSG 1.2)

```
$ su - root
#
###set public interface
#
#rocks set host interface ip ce-0-0 iface=eth1 ip=1.2.3.5
#rocks set host interface name ce-0-0 iface=eth1 name=rocks-ce
#rocks set host interface subnet ce-0-0 eth1 public
#rocks set host attr ce-0-0 primary_net public
#rocks add host route ce-0-0 0.0.0.0 1.2.3.1 netmask=0.0.0.0
#rocks add host attr ce-0-0 OSG_CE value="condor"
#rocks add host attr ce-0-0 OSG_GRIDFTP value=true
#rocks add host attr ce-0-0 OSG_RSV value=true
#rocks add host attr ce-0-0 OSG_Condor_Daemons value="MASTER, SCHEDD"
#
###sample of customizing/changing attribute
#rocks set host attr ce-0-0 OSG_SRMsupportedProtocolList value="gsiftp://rocks-ce.mypublic.edu:2811"
###place where grid certs are stored
###this example needs hostcert, httpcert, rsvcert
###    /my/nfs/path/for/certs/ce-0-0/rsvcert.pem
###    /my/nfs/path/for/certs/ce-0-0/rsvkey.pem
###    /my/nfs/path/for/certs/ce-0-0/httpcert.pem
###    /my/nfs/path/for/certs/ce-0-0/httpkey.pem
#rocks set host atrr ce-0-0 OSG_StoredCertsDir value="/my/nfs/path/for/certs"
###setting service certs
#rocks 5.5
#  rocks add host sec_attr ce-0-0 attr=hostcert value="`cat /path/to/cert/hostcert.pem`" crypted=tru
#  rocks add host sec_attr ce-0-0 attr=hostkey value="`cat /path/to/certkey/hostkey.pem`" crypted=tr
#rocks 5.6
#  rocks add host sec_attr ce-0-0 attr=hostcert value="/path/to/cert/hostcert.pem" crypted=true
#  rocks add host sec_attr ce-0-0 attr=hostkey value="/path/to/certkey/hostkey.pem" crypted=true

#
# reinstall
#
#shoot-node ce-0-0
```

```
#
# post install
#
#rocks sync host sec_attr ce-0-0
#rocks run host ce-0-0 command='/root/install_ce_cert.sh'
#rocks run host ce-0-0 command='/root/install_rsv_cert.sh'
#edit for your site /etc/osg/config.d/30-gip.ini
#edit for your site /etc/osg/config.d/40-siteinfo.ini
#rocks run host ce-0-0 command='configure-osg -v'
#rocks run host ce-0-0 command='configure-osg -c'

#rocks run host ce-0-0 command='chkconfig condor on'
#rocks run host ce-0-0 command='chkconfig globus-gatekeeper on'
#rocks run host ce-0-0 command='chkconfig fetch-crl3-cron on'
#rocks run host ce-0-0 command='chkconfig fetch-crl3-boot on'
#rocks run host ce-0-0 command='chkconfig globus-gridftp-server on'
#rocks run host ce-0-0 command='chkconfig condor-cron on'
#rocks run host ce-0-0 command='chkconfig rsv on'

#services for ce-condor
#rocks run host ce-0-0 command='service condor start'
#rocks run host ce-0-0 command='service globus-gatekeeper start'
#services for gridftp
#rocks run host ce-0-0 command='service globus-gridftp-server start'
#services for rsv
#rocks run host ce-0-0 command='service condor-cron start'
#rocks run host ce-0-0 command='service rsv start'
#rocks run host ce-0-0 command='service http start'
```

4.4. Example Install gums server + squid + cvmfs

gums + squid + cvmfs can be installed as follow.

```
$ su - root
#
###set public interface
#
#rocks set host interface ip gums-0-0 iface=eth1 ip=1.2.3.6
#rocks set host interface name gums-0-0 iface=eth1 name=rocks-gums
#rocks set host interface subnet gums-0-0 eth1 public
#rocks set host attr gums-0-0 primary_net public
#rocks add host route gums-0-0 0.0.0.0 1.2.3.1 netmask=0.0.0.0
#rocks add host attr gums-0-0 OSG_GUMS value=true
#rocks add host attr gums-0-0 OSG_SQUID value=true
#rocks add host attr gums-0-0 OSG_CVMFS value=true
#
#
###sample of customizing/changing attribute
#rocks set host attr gums-0-0 OSG_GUMSBackupDir value=/home/myusers/mygumsbackups
#rocks set host attr gums-0-0 OSG_SquidCacheDir value=/scratch/squid
```

```
#rocks set host attr gums-0-0 OSG_SquidCacheDirSize value=30000
#rocks set host attr gums-0-0 OSG_CMS_LOCAL_SITE value=T3_US_MySite
#rocks set host attr gums-0-0 OSG_CVMFS_CACHE_BASE value=/scratch/cvmfs
#rocks set host attr gums-0-0 OSG_CVMFS_HTTP_PROXY value="http://mysquid-0-0:3128"
###setting service certs
#rocks set host atrr gums-0-0 OSG_StoredCertsDir value="/my/nfs/path/for/certs"
#rocks 5.5
#  rocks add host sec_attr gums-0-0 attr=hostcert value="`cat /path/to/cert/hostcert.pem`" crypted=t
#  rocks add host sec_attr gums-0-0 attr=hostkey value="`cat /path/to/certkey/hostkey.pem`" crypted=

#
# reinstall
#
#shoot-node gums-0-0

#
# post install
#
#for services gums
#https://twiki.grid.iu.edu/bin/view/Documentation/Release3/InstallGums
#rocks sync host sec_attr gums-0-0
#rocks run host gums-0-0 command='/root/install_gums_cert.sh'
#rocks run host gums-0-0 command='/root/ConfigureGumsUpgradeFromPacman.sh'
#rocks run host gums-0-0 command='fetch-crl3'
#rocks run host gums-0-0 command='service fetch-crl3-boot start'
#rocks run host gums-0-0 command='service fetch-crl3-cron start'
#rocks run host gums-0-0 command='service tomcat5 start'
#rocks run host gums-0-0 command='chkconfig fetch-crl3-cron on'
#rocks run host gums-0-0 command='chkconfig fetch-crl3-boot on'
#rocks run host gums-0-0 command='chkconfig tomcat5 on'
#rocks run host gums-0-0 command='chkconfig mysqld on'
#
#services frontier squid
#https://twiki.grid.iu.edu/bin/view/Documentation/Release3/InstallFrontierSquid
#rocks sync host osg squid gums-0-0
#rocks run host gums-0-0 command='service frontier-squid start'
#rocks run host gums-0-0 command='chkconfig frontier-squid on'
#
#services cvmfs
#https://twiki.grid.iu.edu/bin/view/Documentation/Release3/InstallCvmfs
#rocks 5.5/6.0 (maybe 5.6/6.1)#rocks run host gums-0-0 command='usermod -G fuse cvmfs'
#rocks run host gums-0-0 command='service autofs restart'
```

4.5. Example for installing cvmfs on wn nodes after OS install

Cvmfs can be installed as follow.

```
$ su - root
#
```

```
###sample of customizing/changing attribute
#
#rocks add appliance attr compute OSG_CVMFS value=true
#rocks set appliance attr compute OSG_CVMFS_QUOTA_LIMIT value=30000
#rocks set appliance attr compute OSG_CMS_LOCAL_SITE value=T3_US_MySite
#rocks set appliance attr compute OSG_CVMFS_CACHE_BASE value=/scratch/cvmfs
#rocks set appliance attr compute OSG_CVMFS_HTTP_PROXY value="http://mysquid-0-0:3128"
#
###install cvmfs on nodes
#rocks sync host osg cvmfs install compute
#rocks run host compute command="service autofs restart"
#
```

4.6. Example for setting hostproxy on wn nodes

Hostproxy requires access the whole cluster, you need to set a pair key or just reuse the frontend node. Also the certs used to proxy by default are located in /etc/grid-security (hostcert.pem,hostkey.pem).

```
#
#in frontend cp pair keys to ce-0-0
#
$ su - root
#scp -p .ssh/id_rsa ce-0-0:.ssh/.
#scp -p .ssh/id_rsa.pub ce-0-0:.ssh/.
#ssh ce-0-0

#
# in ce-0-0
#
#yum install hostproxy
#cd /opt/hostproxy

#
# set list of worker nodes
#
#rocks report host attr attr=OSG_Client | grep true | sed s/:\ true/.local/g >> host_dist.nodes

#
# set cron to renew proxys
#
#cp update-hostproxy.cron /etc/cron.d/.

#
# or run manually
#
#/opt/hostproxy/host_dist
```

4.7. How to Update OSG packages

OSG can be updated creating a local mirror as follow.

```
$ su - root
#cd /export/rocks/install
#rocks create mirror http://repo.grid.iu.edu/3.0/el5/osg-release/x86_64 rollname=osg-updates version
##this creates an iso file osg-updates-5.5.1-0.x86_64.disk1.iso

#rocks remove roll osg-updates
#rocks add roll osg-updates-5.5.1-0.x86_64.disk1.iso
#rocks enable roll osg-updates
#rocks create distro

#in SE for example
yum update bestman-server
```

4.8. Using a pool password to secure Condor Communications

The default Rocks configuration is to use host-based authentication. This is a good and simple choice for a cluster with a private network. With the Rocks 5.4 version of the Condor Roll, it is straightforward to set up a "Pool Password" that utilizes a shared secret among pool members. This is especially useful when allowing remote systems to report directly to the Condor collector on your cluster. The EC2 Roll can utilize a pool password for a higher security.

The following, straightforward will create, copy and enable a system-wide shared-secret pool password.

1. Create a pool password. Use `rocks create osg condor password`
2. Enable pool password security. Use `rocks set attr OSG_Condor_Password yes`
3. Reconfigure Condor Daemons and copy new pool password. Use `rocks sync host osg condor syncpassword=yes localhost compute`

Chapter 5. Command Reference

5.1. create

5.1.1. create osg condor password

rocks create osg condor password [add=*bool*] [keyfile=*string*]

Create a pool password for Condor. Requires Condor Credd to be up and running.

parameters

[add=*bool*]

add the newly created key to the condor credential daemon. Default: yes

[keyfile=*string*]

The filename that will be used to store the password. Default: /var/lib/condor/pool_password

5.1.2. create osg download

rocks create osg download {path} [arch=*string*] [version=*string*]

Download the OSG packages found in the repository located at 'URL'.

arguments

path

The network location of the repository of packages.

parameters

[arch=*string*]

Architecture of the mirror to download. (default = the architecture of of the OS running on this machine).

[version=*string*]

The OS version number to download. (default = the version of Rocks running on this machine).

examples

rocks create osg download http://repo.grid.iu.edu/osg/3.1/el6/release/x86_64 version=6.5 arch=x86_64

Will mirror(download) all the packages found under the URL http://repo.grid.iu.edu/osg/3.1/el6/release/x86_64 and will create a tree of dirs 6/x86_64 6/noarch 6/debug with latest version of osg packages ready to create osg roll.

5.2. report

5.2.1. report host osg condor config

rocks report host osg condor config {host} [ConfigFile=*string*] [UIDdomain=*string*] [type=*string*]

Output the OSG Condor Local Configuration Uses Rocks Attributes: OSG_Condor_Master, OSG_Condor_MasterNetwork, OSG_Condor_ClientNetwork, Kickstart_PrivateDNSDomain

arguments

host

One host name.

parameters

[ConfigFile=*string*]

Defaults to: /etc/condor/config.d/01_rocks_condor_config.local

[UIDdomain=*string*]

Override UIDdomain of the Rocks Kickstart_PrivateDNSDomain attribute

[type=*string*]

How this node will function - [Manager, Worker] - Default: Worker

examples

$ rocks report host osg condor config compute-0-0 type=Worker

Create the OSG Condor Configuration for compute-0-0 as a Worker Node

5.2.2. report host osg condor interface

rocks report host osg condor interface {host} {subnet}

Output the host IP address associated with a named subnet on a particular host.

arguments

host

One host name.

subnet

subnet to match

examples

$ rocks report host osg condor interface compute-0-0 private

Output the the IP Address of the private interface on compute-0-0. Suitable for using in OSG Condor Configuration Files

$ rocks report host osg condor interface vm-container-0-0 private

Output the the IP Address of the private interface on vm-container-0-0. If multiple interfaces are attached to the private interface (e.g. VLAN bridges) pick the interface with a configured address in the named subnet.

5.2.3. report host osg cvmfs config

rocks report host osg cvmfs config
{host} [CMSConfigFile=*string*] [CVMFSServerConfigFile=*string*] [ConfigFile=*string*]

Output the OSG cvmfs Configuration Uses Rocks Attributes: OSG_CVMFS_REPOSITORIES, OSG_CVMFS_CACHE_BASE, OSG_CVMFS_QUOTA_LIMIT, OSG_CVMFS_HTTP_PROXY, OSG_CMS_LOCAL_SITE,
OSG_CVMFS_SERVER_URL,OSG_CVMFS_NFS_SOURCE,OSG_CVMFS_MEMCACHE_SIZE

arguments

host

One host name.

parameters

[CMSConfigFile=*string*]

Defaults to: /etc/cvmfs/config.d/cms.cern.ch.local

[CVMFSServerConfigFile=*string*]

Defaults to: /etc/cvmfs/domain.d/cern.ch.local

[ConfigFile=*string*]

Defaults to: /etc/cvmfs/default.local

examples

$ rocks report host osg cvmfs config compute-0-0

Create/Modify the OSG cvmfs Configuration for compute-0-0

$ rocks report host osg cvmfs config compute-0-0 ConfigFile=/etc/cvmfs/test.local

Create the OSG cvmfs Configuration for compute-0-0 on files /etc/cvmfs/test.local, /etc/cvmfs/config.d/cms.cern.ch.local and /etc/cvmfs/domain.d/cern.ch.local

$ rocks report host osg cvmfs config compute-0-0 ConfigFile=/etc/cvmfs/test.local CVMFSServerConfigFile=/etc/cvmfs/CvmfsServerTest.local

Create the OSG cvmfs Configuration for compute-0-0 on files /etc/cvmfs/test.local, /etc/cvmfs/config.d/cms.cern.ch.local and /etc/cvmfs/CvmfsServerTest.local

5.2.4. report host osg cvmfs install

rocks report host osg cvmfs install {host}

Output the OSG cvmfs wrapper install script

arguments

host

One host name.

examples

$ rocks report host osg cvmfs install compute-0-0

Create wrapper script to install OSG cvmfs for compute-0-0

5.2.5. report host osg hadoop config

rocks report host osg hadoop config {host} [ConfigFile=*string*]

Output the OSG Hadoop Local Configuration Uses Rocks Attributes: OSG_HadoopNameNode, OSG_HadoopDataDir, OSG_HadoopData, OSG_HadoopSecondaryNode, OSG_HadoopCheckPointDirs, OSG_HadoopCheckPointPeriod, OSG_HadoopReplicationDefault, OSG_HadoopUpdateFstab, ganglia_address, Kickstart_PrivateDNSDomain

arguments

host

One host name.

parameters

[ConfigFile=*string*]

Defaults to: /etc/sysconfig/hadoop

examples

$ rocks report host osg hadoop config compute-0-0

Create the OSG Hadoop Configuration for compute-0-0

$ rocks report host osg hadoop config compute-0-0 ConfigFile=/etc/sysconfig/hadooptest

Create the OSG Hadoop Configuration for compute-0-0 on file /etc/sysconfig/hadooptest

5.2.6. report host osg installaction

rocks report host osg installaction [host...]

Report the current boot installaction for hosts. For each host supplied on the command line, this command prints the hostname, boot action and installaction for that host. The boot action describes what the host will do the next time it is booted. The installaction describes with installaction will be used.

arguments

[host]

Zero, one or more host names. If no host names are supplied, info about all the known hosts is listed.

examples

$ rocks report host osg installaction compute-0-0

List the current boot action and installaction for compute-0-0.

$ rocks report host osg installaction

List the current boot action and installaction for all known hosts.

5.2.7. report host osg squid config

rocks report host osg squid config {host} [ConfigFile=*string*]

Output the OSG frontier squid Local Configuration Uses Rocks Attributes: Kickstart_PublicNetmaskCIDR, Kickstart_PublicNetwork, Kickstart_PrivateNetmaskCIDR, Kickstart_PrivateNetwork, OSG_SquidCacheMem, OSG_SquidCacheDir, OSG_SquidCacheDirSize

arguments

host

One host name.

parameters

[ConfigFile=*string*]

Defaults to: /etc/squid/customize.sh

examples

$ rocks report host osg squid config squid-0-0

Create/Modify the OSG frontier squid Configuration for squid-0-0

$ rocks report host osg squid config squid-0-0 ConfigFile=/etc/squid/test.sh

Create the OSG frontier squid Configuration for squid-0-0 on file /etc/squid/test.sh

5.2.8. report host osg vm config

rocks report host osg vm config {host...}

Reports the XML Configuration for VM that will be handed to libvirt for startup.

arguments

host

One or more VM host names.

examples

$ rocks report host vm config compute-0-0-0

list the XML configuration of Report XML Config of VM compute-0-0-0.

5.3. sync

5.3.1. sync host osg condor

rocks sync host osg condor [syncpassword=*bool*] [test=*bool*]

Reconfigure OSG Condor daemon on the named hosts.

parameters

[syncpassword=*bool*]

If set and the attribute OSG_Condor_PasswordAuth is True, this will will copy the condor pool password the the host. Default is no.

[test=*bool*]

If want to test output set this parameter. Default is no.

examples

rocks sync host osg condor compute-0-0

Rewrite /etc/condor/config.d/01_rocks_condor_config.local and call condor_reconfigure on host compute-0-0

rocks sync host osg condor compute-0-0 syncpassword=yes

Rewrite /etc/condor/config.d/01_rocks_condor_config.local, copy the OSG Condor pool password file if OSG_Condor_PasswordAuth host atrribute is set, and finally call condor_reconfigure on host compute-0-0

5.3.2. sync host osg cvmfs

rocks sync host osg cvmfs [test=*bool*]

Configure/Reconfigure OSG cvmfs on the named hosts.

parameters

[test=*bool*]

If want to test output set this parameter. Default is no.

examples

rocks sync host osg cvmfs compute-0-0

Rewrites /etc/cvmfs/default.local, /etc/cvmfs/config.d/cms.cern.ch.local, /etc/cvmfs/domain.d/cern.ch.local, /etc/fuse.conf, on host compute-0-0 if attr OSG_CVMFS is set in this host.

rocks sync host osg cvmfs compute-0-0 test=yes

Show the bash script that will run to rewrite the four config files on host compute-0-0

5.3.3. sync host osg cvmfs install

rocks sync host osg cvmfs install [test=*bool*]

Install OSG cvmfs on the named hosts.

parameters

[test=*bool*]

If want to test output set this parameter. Default is no.

examples

rocks sync host osg cvmfs install compute-0-0

add cvmfs user, add cvmfs group, add fuse group and install cvmfs on host compute-0-0 if attr OSG_CVMFS is set in this host.

rocks sync host osg cvmfs compute-0-0 test=yes

Show the bash script that will run to install cvmfs on host compute-0-0

5.3.4. sync host osg hadoop

rocks sync host osg hadoop [test=*bool*]

Reconfigure OSG Hadoop on the named hosts.

parameters

[test=*bool*]

If want to test output set this parameter. Default is no.

examples

rocks sync host osg hadoop compute-0-0

Rewrite /etc/sysconfig/hadoop and call hadoop firstboot on host compute-0-0

rocks sync host osg hadoop test=yes compute-0-0

Show the bash script that will run to rewrite /etc/sysconfig/hadoop on host compute-0-0

5.3.5. sync host osg squid

rocks sync host osg squid [test=*bool*]

Reconfigure OSG Frontier Squid on the named hosts.

parameters

[test=*bool*]

If want to test output set this parameter. Default is no.

examples

rocks sync host osg squid squid-0-0

Rewrites /etc/squid/customize.sh on host squid-0-0 if attr OSG_SQUID is set in this host.

rocks sync host osg squid squid-0-0 test=yes

Show the bash script that will run to rewrite /etc/squid/customize.sh on host squid-0-0

5.3.6. sync osg condor

rocks sync osg condor

This command is syntactic sugar for "rocks sync host osg condor localhost"

examples

rocks rocks sync osg condor

Rebuild the Condor Configuration

Chapter 6. Copyrights

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