
Symphony MultiGrid Installation and Administration

Platform Symphony MultiGrid
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Contents

Symphony MultiGrid Concepts and Behavior	5
Scope	5
Symphony MultiGrid Overview	5
Repurposing Behavior	7
SMG Security	19
Repurpose plug-ins	21
Installation	24
Installing SMG: Quick Reference (Linux)	24
Installing SMG: Quick Reference (Windows)	27
Planning the Installation	30
Step 1: Install the SMG management system	32
Step 2: Add a Cluster to SMG	44
Uninstall SMG	46
Configuration and Troubleshooting	49
SMG Master Configuration	49
SMG Management System Failure Recovery	51
Troubleshooting	54
Command Reference	63
symadmin	63
symclusters	70
symhosts	71
sympeek	72
symrequests	72

Symphony MultiGrid Concepts and Behavior

Scope

Applicability	Details
Operating system (SMG and SMG proxy management hosts)	<ul style="list-style-type: none"> Linux RHEL4 and RHEL5 x86-64 Windows server 2003 Standard Edition sp1, sp2 Windows server 2003 Enterprise Edition sp1, sp2
Symphony	Versions 4.1 and 5.0
Limitations	Symphony MultiGrid does not support repurpose requests for hosts that belong to multiple resource groups.

Symphony MultiGrid Overview

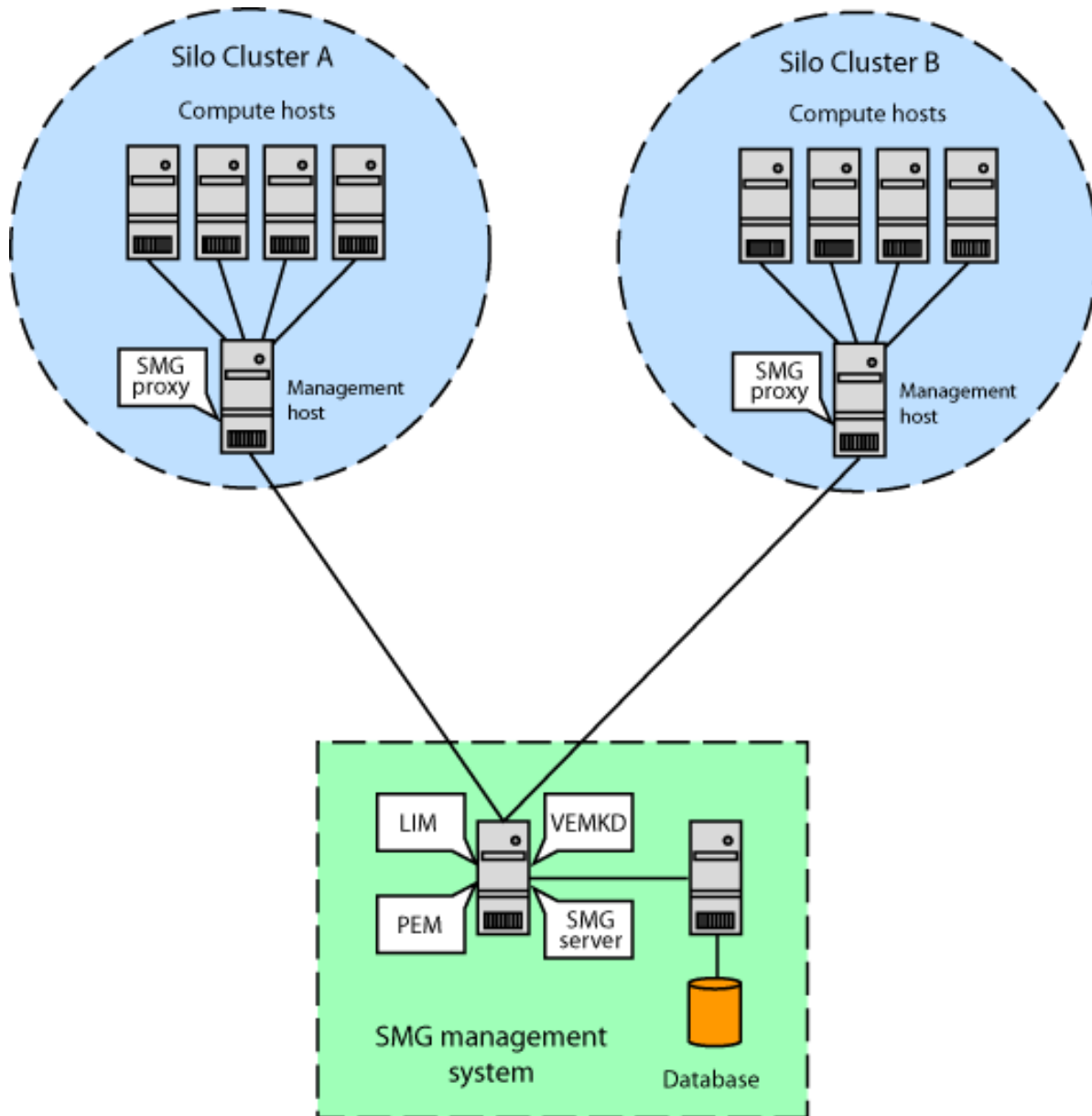
Symphony MultiGrid at a Glance

Symphony MultiGrid (SMG) is a collection of resources that span clusters and can be repurposed and changed based on need.

You install the SMG management system to repurpose hosts between clusters to satisfy peak load, and monitor all clusters from one central console.

The SMG management system is composed of software components that run outside of individual clusters to manage movement of resources between clusters and coordinate and track them. The SMG management system resides on a set of machines to ensure failover, and uses EGO technology for high availability and to manage services within SMG.

In each cluster that you want to manage, you install an SMG proxy. The SMG proxy is a program that discovers hosts in the cluster and triggers actions to repurpose them. There is one SMG proxy per cluster.



EGO Kernel Daemon (vemkd)

The EGO Kernel Daemon (vemkd) collects resource information collected by each SMG proxy, accepts repurpose requests, and invokes the SMG proxies to move resources. It also provides a cluster registration service for adding clusters to SMG or removing clusters from SMG.

Load Information Manager (lim)

The Load Information Manager (lim) starts vemkd on the master host.

Database

The SMG proxy in each cluster that is managed by SMG sends cluster data to the EGO Kernel Daemon (vemkd). vemkd updates the database. Once the database is updated, data can be displayed in the

command-line console and in the Platform Management Console. Data in the database is refreshed according to a preconfigured interval.

SMG Management Console (WEBGUI)

The SMG Management Console can be accessed through any web browser. The web server runs as the daemon WEBGUI.

The SMG Management Console has several areas:

- Resources Dashboard

The Resources Dashboard allows you to monitor all clusters in SMG. Each rectangle represents a cluster. Clusters are color-coded according to a defined threshold and metric.

- Consumers Dashboard

The Consumers Dashboard provides a table with total allocations by consumer, grouped by clusters.

- Global Resource View

The Global Resource view provides a single point of access to all the resource plans in all your clusters monitored in SMG. You can view planned allocations per time interval for all consumers.

- Repurpose requests

A repurpose request is a request to reuse a host for a different purpose. Submit a repurpose request to move hosts between clusters and monitor progress.

- SMG

View cluster and host information for each cluster that is monitored through SMG.

- User Configuration

Add users and assign roles.

SMG management system master and master candidate

There is only one SMG management system master host at a time. If the master host fails, one of the master candidate hosts automatically takes over the master host role. The master candidate is a host that can become the master host should the SMG management system master host fail.

Cluster groups

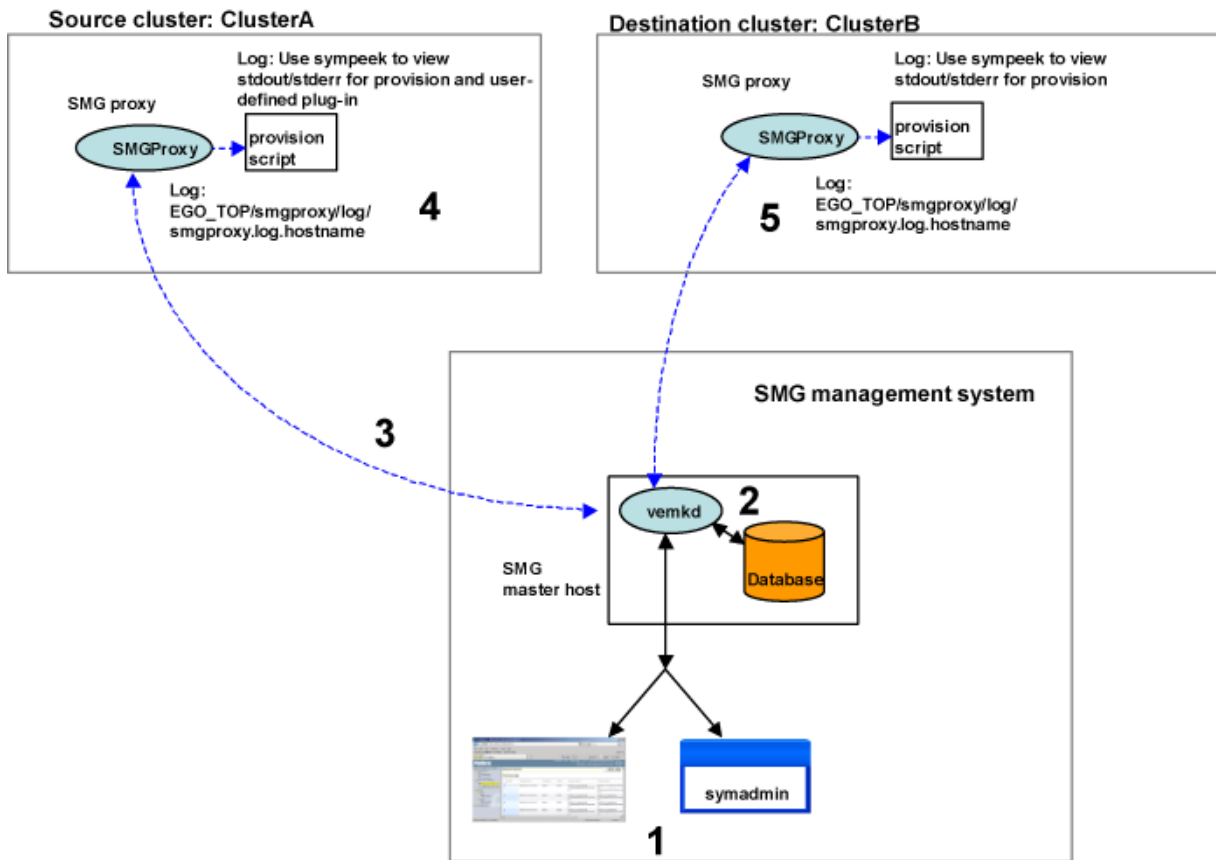
You can organize clusters in cluster groups. A cluster group is a hierarchical unit to organize related clusters. For example, a cluster group can represent a data center. Cluster groups can be nested. A cluster group is identified by a name that is unique across the hierarchy.

Repurposing Behavior

Repurposing: How it works

Let us use the example of two clusters: clusterA and clusterB.

You want to repurpose hosts from clusterA to clusterB.



1. You submit a repurpose request with the `symadmin movehosts` command or the SMG Platform Management Console.

When you submit a repurpose request with the SMG Platform Management Console, it is the equivalent of `symadmin movehosts` with the command-line.

2. `vemkd` handles the request, saves the information in the database, and returns a request ID.
3. `vemkd` connects to the SMG proxy in the source cluster to run the repurposing action.

The repurposing action is represented by an activity in `vemkd` and has its own ID.

4. The SMG proxy invokes the `provision` script.

The `provision` script:

- Changes cluster configuration by updating the resource plan (`ConsumerTrees.xml`) in the source cluster.
- Closes hosts that are selected for repurposing and checks that they are idle.
- Runs the user-defined plug-in through a pipe to capture its `stdout/stderr`.

5. When the `provision` script and user-defined plug-in are successful, `vemkd` connects to the SMG proxy in the target cluster to run the `provision` script in the target cluster.

The `provision` script in the target cluster changes cluster configuration (updates the resource plan).

Note:

While moving hosts from one cluster to another, if the remove operation succeeds but the add operation fails, the remove operation will not be rolled back.

How repurposing changes the resource plan

When a repurpose request is submitted, the system first evaluates if there are available slots for the consumer to perform the operation. The system calculates available slots for a consumer in this way:

Available = Owned - Used

If there are available slots to perform the operation (such as move slots from one consumer to another), the request goes through and resource plan changes take effect. If enough slots are not available, the repurpose request receives the status ERROR and no resource plan changes take effect.

If lending and borrowing occurs, the system calculates available slots by taking into account slots that are lent out.

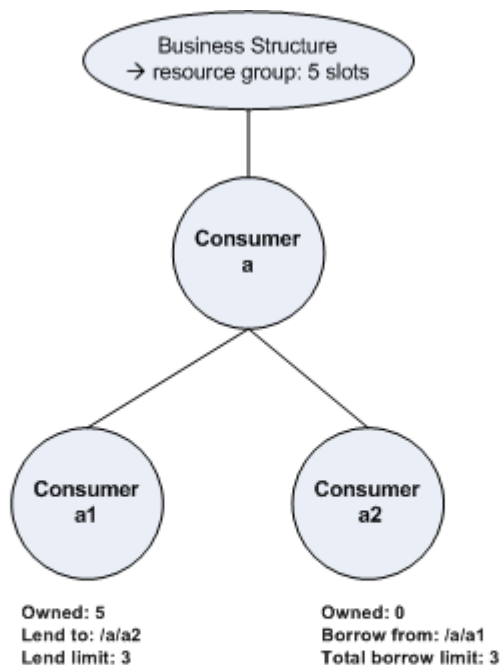
Available = Owned - Used - Lent out

The system also evaluates whether $\text{Owned} < \text{Lend limit}$ as a consumer cannot lend out more than it owns. If the Owned value is smaller than the Lend limit, lend limit is adjusted to be equal to Owned.

When $\text{Owned}=0$, lending is disabled for the consumer and any "lend to" relationships are also deleted. The system also looks into the relationship of any other consumers that have borrowing configured from this consumer and also deletes the "borrow from" relationships.

If the Owned value is not smaller than the Lend limit, no adjustments to the Lend limit are made.

Example: no lending and borrowing at runtime Configuration



Consumer	Owned slots	Lend to	Lend limit	Total Lend limit	Borrow from	Total Borrow limit
/a/a1	5	/a/a2	3			
/a/a2	0				/a/a1	3
Total	5					

Current situation

Consumer	Owned Slots (Current)	Use (Current)	Lent (Current)	Borrowed (Current)
/a/a1	5	2		
/a/a2	0			
Total Owned	5			

Repurpose request submitted

You submit the repurpose request through the SMG Platform Management Console or the command-line.

You are moving 3 slots from consumer /a/a1 in cluster swdev to consumer /a/a1 in cluster swprd.

On the command-line, you specify `symadmin movehosts`, which is the same action as submitting the request through the SMG Platform Management Console:

```
symadmin movehosts
-m "hostA hostB"
-user Admin
-x Admin
-e SMG_CONSUMER_UPDATES="3@/a/a1"
-E SMG_CONSUMER_UPDATES="3@/a/a1"
-e SMG_RESOURCE_GROUP=ComputeHosts
-E SMG_RESOURCE_GROUP=ComputeHosts
swdev
swprd
```

System behavior

When you submit the repurpose request, the system does the following:

1. Checks to see if there are available slots to move.

Calculate available hosts for consumer /a/a1 in swdev:

Available = Owned - Used

$3 = 5 - 2$

There are available slots to move, so the script goes to step 2.

If there were no available slots to move or not enough available slots to move, the request would receive the status ERROR and no further actions would be taken.

2. Evaluates if the new value of Owned < Lend limit since you cannot lend more than you own.

New value of Owned for /a/a1 = $5 - 3 = 2$

Lend limit for /a/a1 is 3.

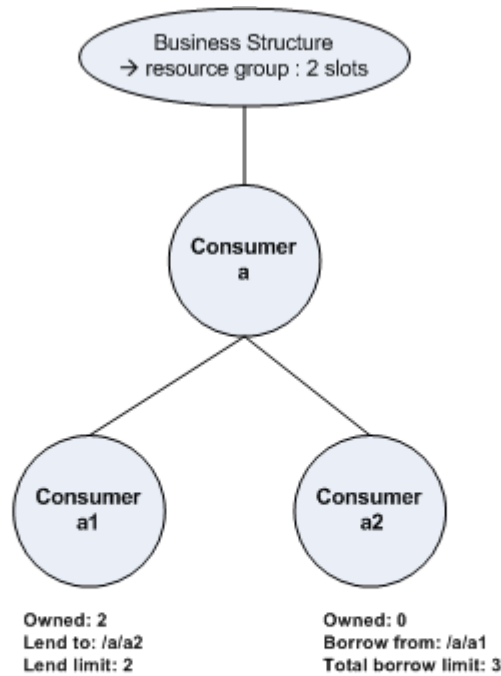
$2 < 3$

The value of Owned is smaller than the lend limit. As a result, the system will adjust the Lend limit to the same value as Owned, 2.

3. Performs actions.

- Adjust resource plan of /a/a1 in swdev to remove 3 slots Owned $(5 - 3) = 2$
- Adjust Lend limit to 2, to equal Owned.

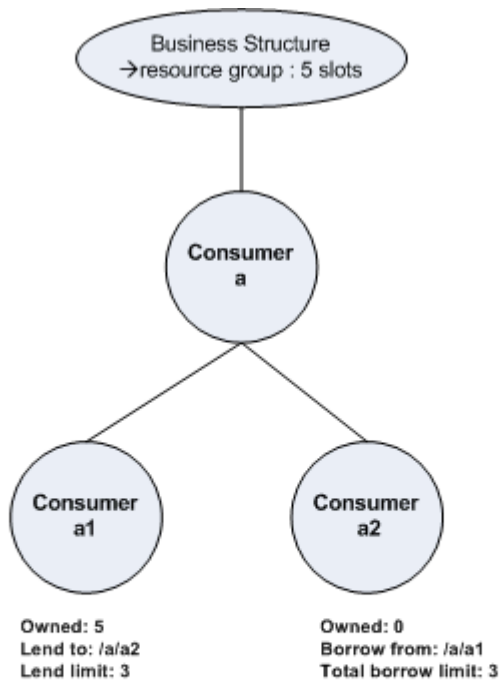
The resource plan of /a/a1 in swdev now looks like this:



Consumer	Owned slots	Lend to	Lend limit	Total Lend limit	Borrow from	Total Borrow limit
/a/a1	2	/a/a2	2			
/a/a2	0				/a/a1	3
Total	2					

4. Adjust the resource plan of /a/a1 in the target cluster swprd to add 3 to Owned.

Example: lending and borrowing at runtime Configuration



Consumer	Owned slots	Lend to	Lend limit	Total Lend limit	Borrow from	Total Borrow limit
/a/a1	5	/a/a2	3			
/a/a2	0				/a/a1	3
Total	5					

Current situation

Consumer	Owned Slots (Current)	Use (Current)	Lent (Current)	Borrowed (Current)
/a/a1	5	2	2	
/a/a2	0			2
Total Owned	5			

Repurpose request submitted

You submit the repurpose request through the SMG Platform Management Console or the command-line.

You are moving 2 slots from consumer /a/a1 in swdev to consumer /a/a1 in swprd.

On the command-line, you specify `symadmin movehosts`, which is the same action as submitting the request through the SMG Platform Management Console:

```
symadmin movehosts
-m "hostA hostB"
-user Admin
-x Admin
-e SMG_CONSUMER_UPDATES="2@/a/a1"
-E SMG_CONSUMER_UPDATES="2@/a/a1"
-e SMG_RESOURCE_GROUP=ComputeHosts
-E SMG_RESOURCE_GROUP=ComputeHosts
swdev
swprd
```

System behavior

When you submit the repurpose request, the system does the following:

1. Checks to see if there are available slots to move.

Calculate available hosts for consumer `/a/a1` in `swdev`.

Since there is lending/borrowing between `/a/a1` and `/a/a2`, the system takes into account the number of slots lent out:

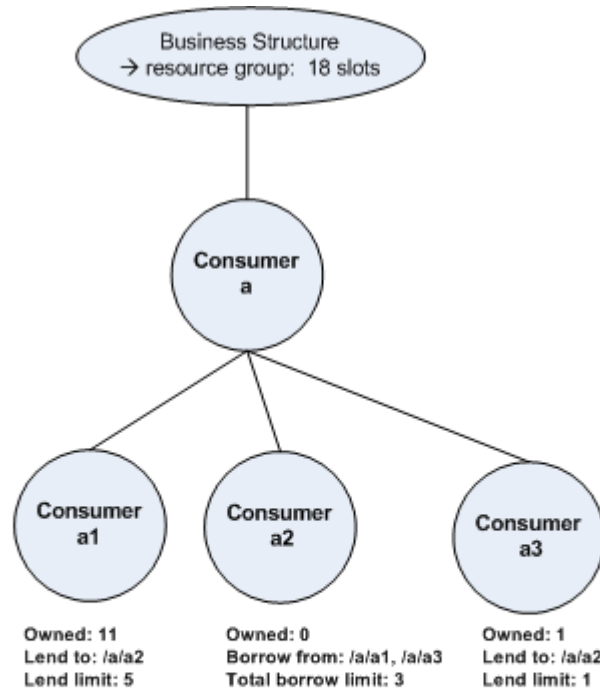
Available = Owned - Used - Lent out

$$1 = 5 - 2 - 2$$

There is only one available slot and the requested number of slots is 2. There are not enough available slots to move so the request receives the status `ERROR` and no resource plan changes are made.

Example: lending and borrowing at runtime when Owned reaches 0

Configuration



Consumer	Owned slots	Lend to	Lend limit	Total Lend limit	Borrow from	Total Borrow limit
/a/a1	11	/a/a2	5			
/a/a2	0				/a/a1, /a/a3	3
/a/a3	1	/a/a2	1			
Total	12					

Current situation

Consumer	Owned Slots (Current)	Use (Current)	Lent (Current)	Borrowed (Current)
/a/a1	11			
/a/a2	0			
/a/a3	1			
Total Owned	12			

Repurpose request submitted

You submit the repurpose request through the SMG Platform Management Console or the command-line.

You are moving 11 slots from consumer /a/a1 in swdev to consumer /a/a1 in swprd.

On the command-line, you specify `cadmind movehosts`, which is the same action as submitting the request through the SMG Platform Management Console:

```
symadmin movehosts  
-m "hostA hostB"  
-user Admin  
-x Admin  
-e SMG_CONSUMER_UPDATES="11@/a/a1"  
-E SMG_CONSUMER_UPDATES="11@/a/a1"  
-e SMG_RESOURCE_GROUP=ComputeHosts  
-E SMG_RESOURCE_GROUP=ComputeHosts  
swdev  
swprd
```

System behavior

When you submit the repurpose request, the system does the following:

1. Checks to see if there are available slots to move.

Calculate available hosts for consumer /a/a1 in swdev.

Available = Owned - Used

11 = 11 - 0

There are available slots to move, so the script goes to step 2.

If there were no available slots to move or not enough available slots to move, the request would receive the status `ERROR` and no further actions would be taken.

2. Evaluates if the new value of Owned < Lend limit since you cannot lend more than you own.

New value of Owned for /a/a1 = 11 - 11 = 0

Lend limit for /a/a1 is 5.

The value of Owned is smaller than the Lend limit.

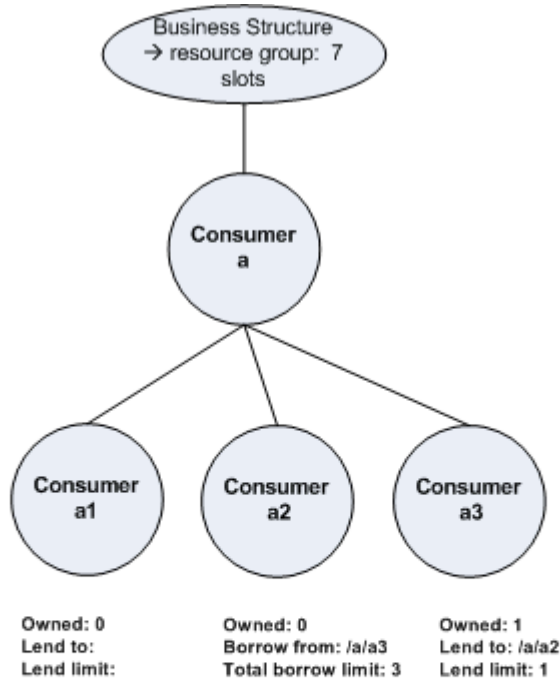
As a result, the system will disable lending for /a/a1.

3. Performs actions.

- Adjust resource plan of /a/a1 in swdev to remove 11 Owned (11 - 11) = 0
- Since Owned equals 0 for /a/a1, lending will be disabled by the system and the lend to /a/a2 relationship also deleted.

The system then examines /a/a2 and removes the borrow relationship from /a/a1 since /a/a2 can no longer borrow from /a/a1 as it owns 0.

The resource plan of /a/a1 in swdev now looks like this:



Consumer	Owned slots	Lend to	Lend limit	Total Lend limit	Borrow from	Total Borrow limit
/a/a1	0					
/a/a2	0				/a/a3	3
/a/a3	1	/a/a2	1			
Total	1					

4. Adjust the resource plan of /a/a1 in the target cluster swprd to add 7 to Owned.

Current situation

Consumer	Owned Slots (Current)	Use (Current)	Lent (Current)	Borrowed (Current)
/a/a1	0			
/a/a2	0			
/a/a3	1			
Total Owned	1			

Repurpose request submitted

You now submit a repurpose request to move 1 slot from /a/a3 in swdev to /a/a3 in swprd.

On the command-line, you specify `symadmin n movehost s`, which is the same action as submitting the request through the SMG Platform Management Console:

```
symadmin movehosts
-m "hostA"
-user Admin
-x Admin
```

```
-e SMG_CONSUMER_UPDATES="1 @/a/a3"  
-E SMG_CONSUMER_UPDATES="1 @/a/a3"  
-e SMG_RESOURCE_GROUP=ComputeHosts  
-E SMG_RESOURCE_GROUP=ComputeHosts  
swdev  
swprd
```

System behavior

When you submit the repurpose request, the system does the following:

1. Checks to see if there are available slots to move.

Calculate available slots for consumer /a/a3 in swdev.

Available = Owned - Used

1 = 1 - 0

There are available slots to move, so the script goes to step 2.

If there were no available slots to move or not enough available slots to move, the request would receive the status ERROR and no further actions would be taken.

2. Evaluates if the new value of Owned < Lend limit since you cannot lend more than you own.

New value of Owned for /a/a3 = 1 - 1 = 0

Lend limit for /a/a3 is 1.

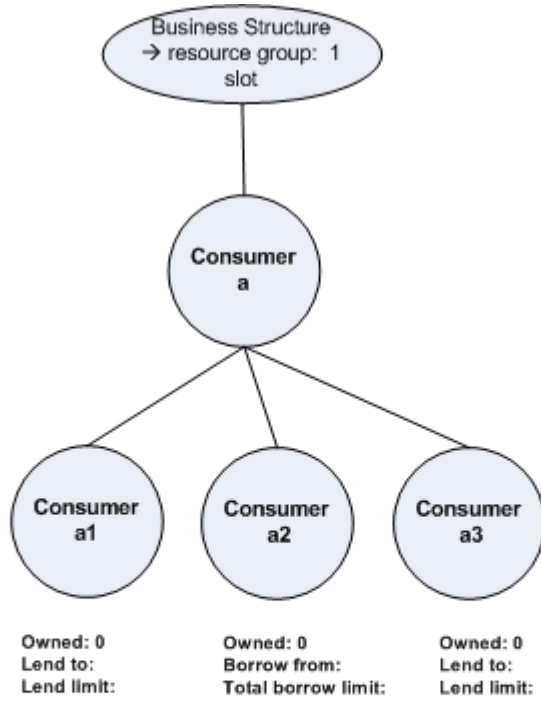
The value of Owned is smaller than the Lend limit.

As a result, the system will disable lending for /a/a3.

3. Performs actions.

- Adjust resource plan of /a/a3 in swdev to remove 1 Owned (1 - 1) = 0
- Since Owned equals 0 for /a/a3, the system disables the lending and deletes the lend to relationship to /a/a2. It then examines borrow relationships. Consumer /a/a2 borrows from /a/a3. Since /a/a3 now owns 0 and /a/a2 does not have any more potential consumers to borrow from, the system disables borrowing for /a/a2 and deletes the borrow from relationship to /a/a3.

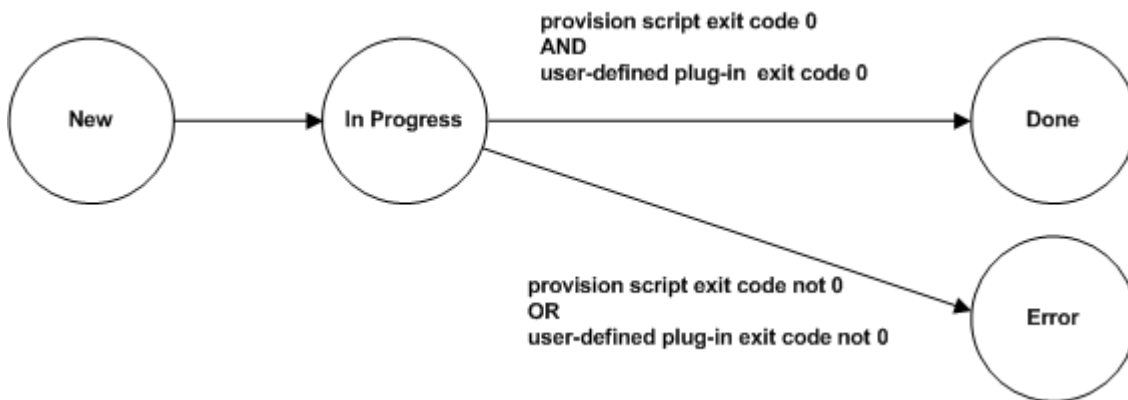
The resource plan in swdev now looks like this:



Consumer	Owned slots	Lend to	Lend limit	Total Lend limit	Borrow from	Total Borrow limit
/a/a1	0					
/a/a2	0					
/a/a3	0					
Total	0					

4. Adjust the resource plan of /a/a3 in the target cluster swprd to add 1 to Owned.

Repurpose request states



SMG Security

SiteMinder Integration

SMG security is similar to security in Symphony.

A subset of SiteMinder user accounts are imported into the SMG user database, and authenticated through SiteMinder.

User names and passwords are passed in the system in a credential. A credential is a data structure that contains the user name, encrypted password, and an expiry timestamp. The password is encrypted with AES-128 using a shared secret key.

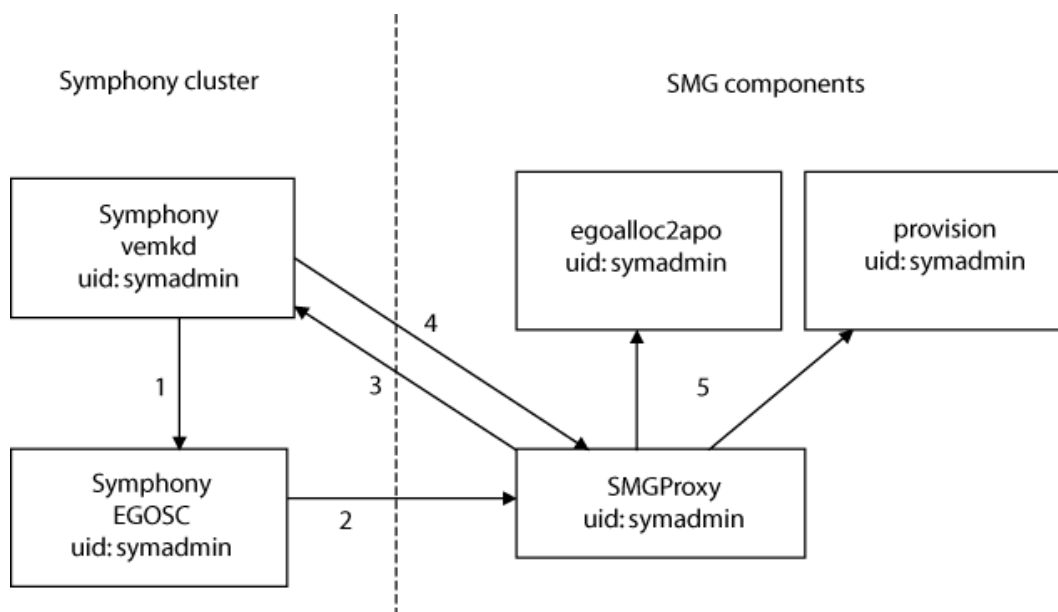
Security credentials for privileged operations

To perform privileged operations in Symphony clusters, SMG components require security credentials.

SMG components perform the following privileged operations:

- Query resource allocation information in the Symphony cluster. Performed by the `egoalloc2apo` script.
- Query and change the Symphony cluster resource plan. Performed by the `provision` script.

The following diagram shows how credential information is passed from the Symphony cluster to SMG components.



1. `vemkd` provides a credential for the Symphony cluster administrator user (Admin) to EGOSC at startup. `vemkd` runs as the Symphony OS cluster administrator user (`symadmin`).
2. `SMGProxy` runs as an EGO service in the cluster as the Symphony OS cluster administrator user (`symadmin`). `SMGProxy`'s service definition file specifies that it needs an administrative credential. When EGOSC starts `SMGProxy`, it provides it with a credential through the environment variable `EGO_SERVICE_CREDENTIAL`.
3. Since the default credential expires in 8 hours, `SMGProxy` uses the credential it received from EGOSC to authenticate with `vemkd` and obtain a credential that does not expire.
4. `vemkd` provides a credential that does not expire to `SMGProxy`. The credential is for the Symphony cluster administrator user (Admin).

5. When SMGProxy starts its plugins, it passes the credential to them through the environment variable EGO_SERVICE_CREDENTIAL. The credential is for the Symphony cluster administrator user (Admin).
 - `egoal1oc2apo` runs as the Symphony OS cluster administrator (`symadmin`). It uses the Symphony cluster administrator user (Admin) credential to perform queries on resource allocation in the cluster.
 - `provi sion` runs as the Symphony OS cluster administrator (`symadmin`). It uses the Symphony cluster administrator user (Admin) credential to make any required resource plan changes when repurposing occurs.

Repurpose plug-ins

Why do I need to write my own repurpose plug-ins?

Different user environments have totally different settings. SMG does not know how to correctly repurpose a host in a user's specific environment. Therefore, the repurpose operations must be performed by the plug-in programs written by users who are familiar with the cluster's unique characteristics. A valid plug-in is composed of a pair of Perl scripts named `movein` and `moveout` to move-in and move-out hosts, respectively. When a repurpose operation is requested, SMG invokes the corresponding plug-in program to execute the operation.

Plug-in requirements

- The script files must be readable for CLUSTERADMIN OS users of the silo clusters.
- Ensure that the Perl runtime environment is available on all the master hosts.

Plug-in location

The plug-ins are deployed on the host where the SMGProxy service is running. Different silo clusters may have different plug-in programs.

The default repurpose plug-in file should be stored at:

- Move-in-plugin:
 - `SEGO_TOP/SMGproxy/plugins/movein` (Linux)
 - `EGO_TOP\SMGproxy\plugins\movein` (Windows)
- Move-out-plugin:
 - `SEGO_TOP/SMGproxy/plugins/moveout` (Linux)
 - `EGO_TOP\SMGproxy\plugins\moveout` (Windows)

Alternatively, you can use `-e/-E SMGPROXY_PLUGIN_URL="/pluginPathName"` to specify the plugin full path/name when submitting a repurpose request through CLI. You must ensure that the repurpose plug-ins are accessible whether you use the default location or not.

Plug-in input arguments

Plug-in scripts are invoked by SMC proxy. Both plug-ins should accept command line arguments.

- The move-out plug-in should handle two arguments that can be specified through CLI:


```
./move-out-plugin $hostName $clusterName
```

- The move in plug-in should handle three arguments that can be specified through CLI:

```
./move-in-plugin $hostName $clusterName $resourceGroup
```

where:

- \$hostName is the host to be repurposed. Separate multiple host names with ' '.
- \$clusterName is the destination cluster.
- \$resourceGroup is the name of the resource group that the host will join.

Here is how it works: First, you need to determine which resource tag selects which resource group. The \$resourceGroup uses the expression `select(resourceTag)` in `ResourceGroups.xml` to specify hosts so you should know which tag is selected by \$resourceGroup. The move-in plug-in should then update the local `ego.conf` of the repurposed host with `EGO_LOCAL_RESOURCES="[resource tag]"` before starting EGO on the host. This will ensure that the repurposed host dynamically joins the right resource group without restarting the master lim.

Plug-in output format

The repurpose plug-ins must output the repurpose result (per host, per line) to stdout, according to the following format:

```
$host1 - Repurpose: Success
```

```
$host2 - Repurpose: Failure
```

```
$host3 - Repurpose: Success
```

The SMG proxy captures and reads the stdout of the repurpose plug-in to determine if the host repurpose is successful or not. Only the string " - Repurpose: Success", which follows the host name, signifies that the host repurpose was successful. For unsuccessful operation, the script does not need to output anything

Plug-in samples

The SMG proxy package contains plug-in samples that demonstrate the use of repurpose plug-in scripts. You can modify these samples to create your own plug-ins.

Behavior

Removing hosts from a cluster

The SMG administrator can submit the request through CLI or PMC. The PEM triggers the provision script on the SMG proxy host in the cluster.

The provision script:

- Changes cluster configuration by dynamically updating the resource plan (`ConsumerTrees.xml`) in the cluster (if resource plan changes were specified in the command).
- Closes hosts that are selected for repurposing and checks that they are idle. Hosts that have workload running will not be removed and the request will receive the status `ERROR` with the reason "Busy hosts".
- Invokes the move-out plug-in. After the plug-in is finished, the SMG proxy checks the result file to see if the repurpose is successful or not.

Adding hosts to a cluster

The SMG administrator can submit the request through CLI or PMC. The PEM triggers the provision script (on Proxy host) in the cluster. The provision script:

- Changes cluster configuration by dynamically updating the resource plan (ConsumerTrees.xml) in the cluster (if resource plan changes were specified in the command).
- Invokes the move-in plug-in. After the plug-in is finished, the SMG proxy checks the result file to see if the repurpose is successful or not.

Moving hosts from one cluster to another

The SMG administrator can submit the request through CLI or PMC:

- First, the SMG server gets the request from CLI or PMC. The SMG server triggers the PEM (on Proxy host) to start the provision script in the source cluster to do the remove-hosts request.
- Second, after the remove-hosts request finishes successfully, the SMG server connects to the PEM (on Proxy host) in the target cluster to do the add-hosts request.

Best practices

1. Use CLI to define your own environment variables and pass them into the plug-ins.
2. Move-in/out script should be granted privileges to install and uninstall Symphony on the target host with the objective of removing and adding hosts.
3. Move-in/out scripts should be granted privileges to execute remote operations like installation through SSH, etc, on the target host with the objective of removing and adding hosts.
4. Move-in/out scripts should be able to start/shut down different Symphony versions on the target host (in the case of parallel Symphony installation) with the objective of removing and adding hosts.
5. Move-in/out scripts should take into account any site security considerations.

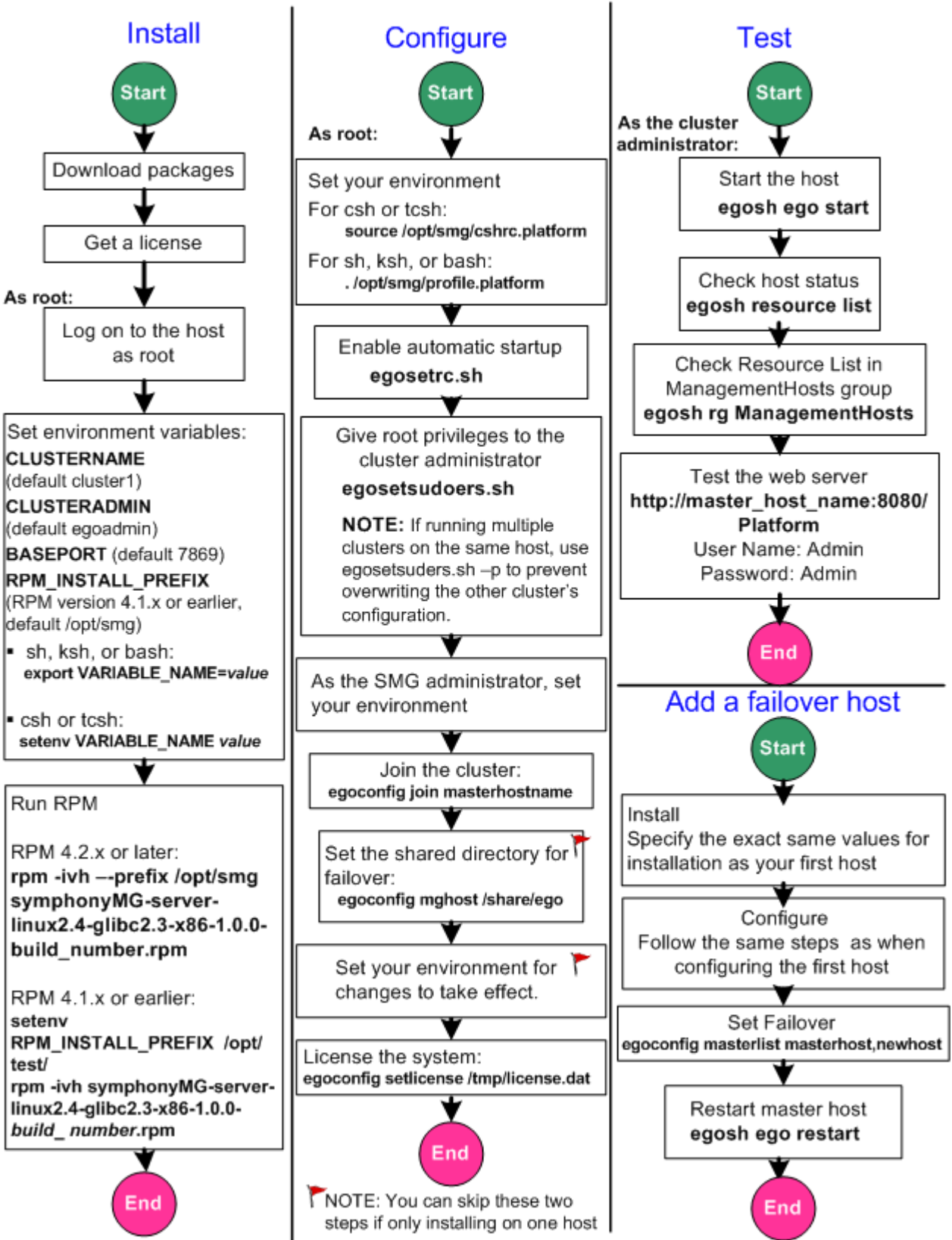
Installation

Installing SMG: Quick Reference (Linux)

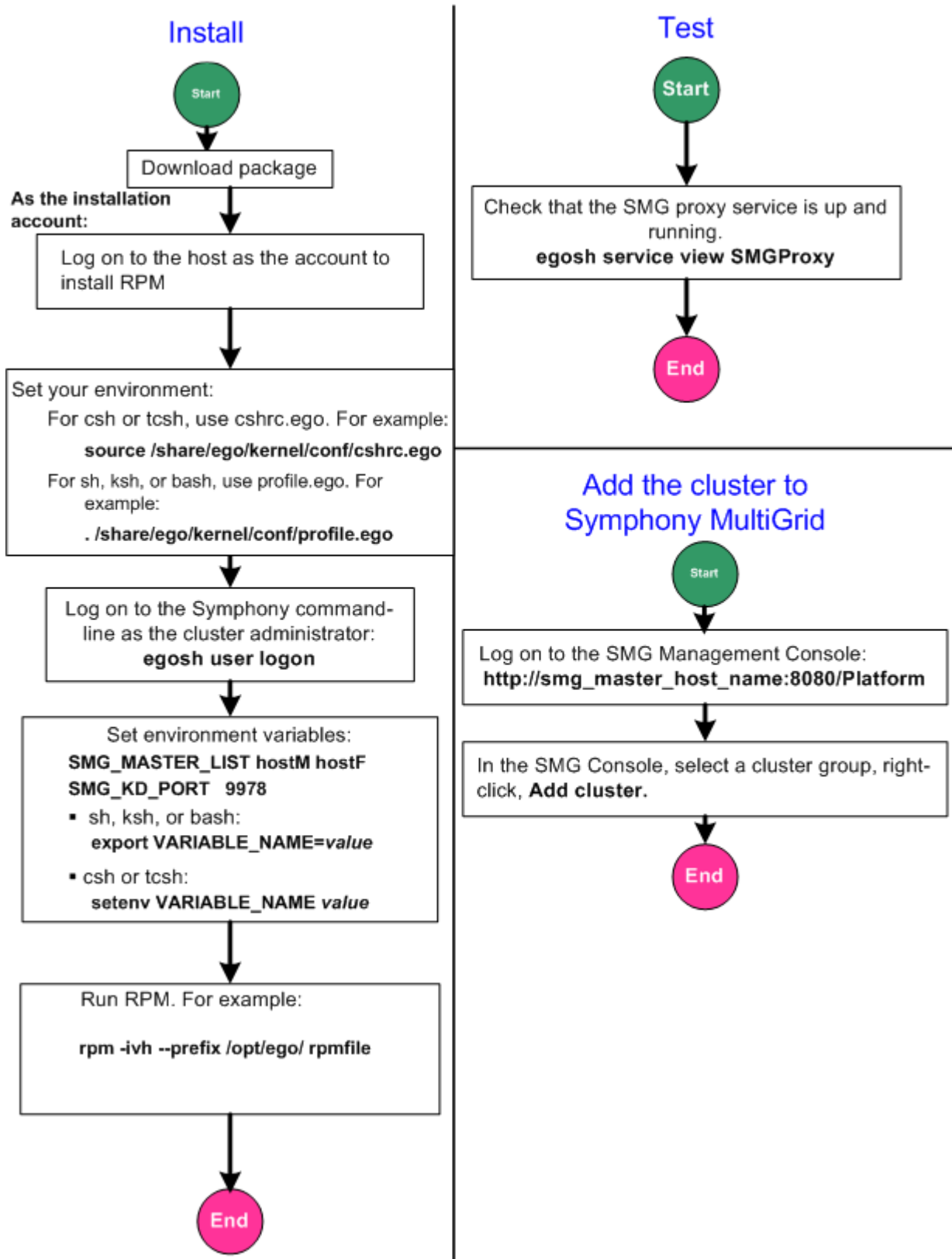
Step 1: Install the SMG management system

You want to install the SMG management system in your environment so that you can move hosts between clusters to satisfy peak load, and monitor all clusters from one central console.

You also want to bring an existing cluster into SMG.



Step 2: Install the SMG proxy in clusters you want to bring into SMG

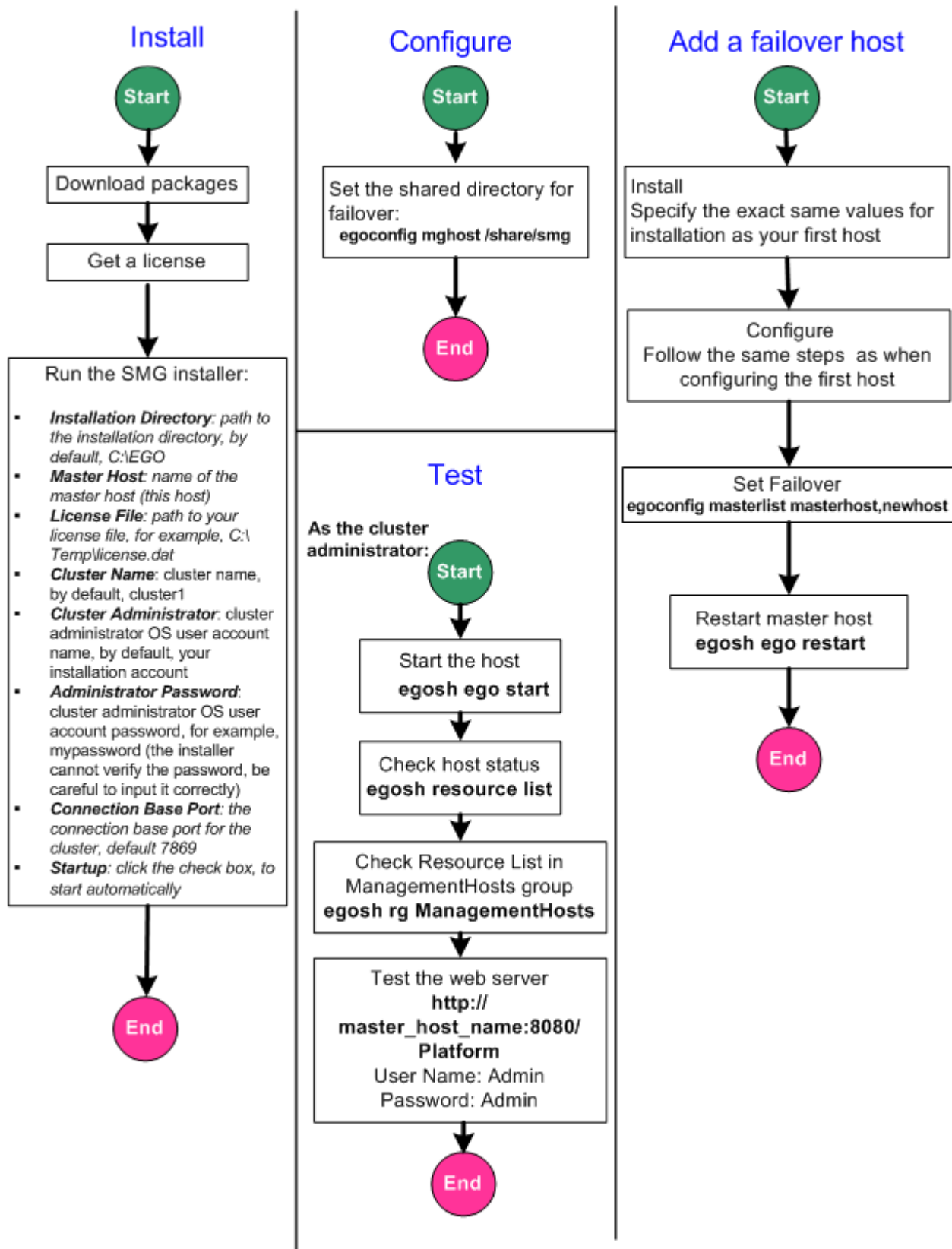


Installing SMG: Quick Reference (Windows)

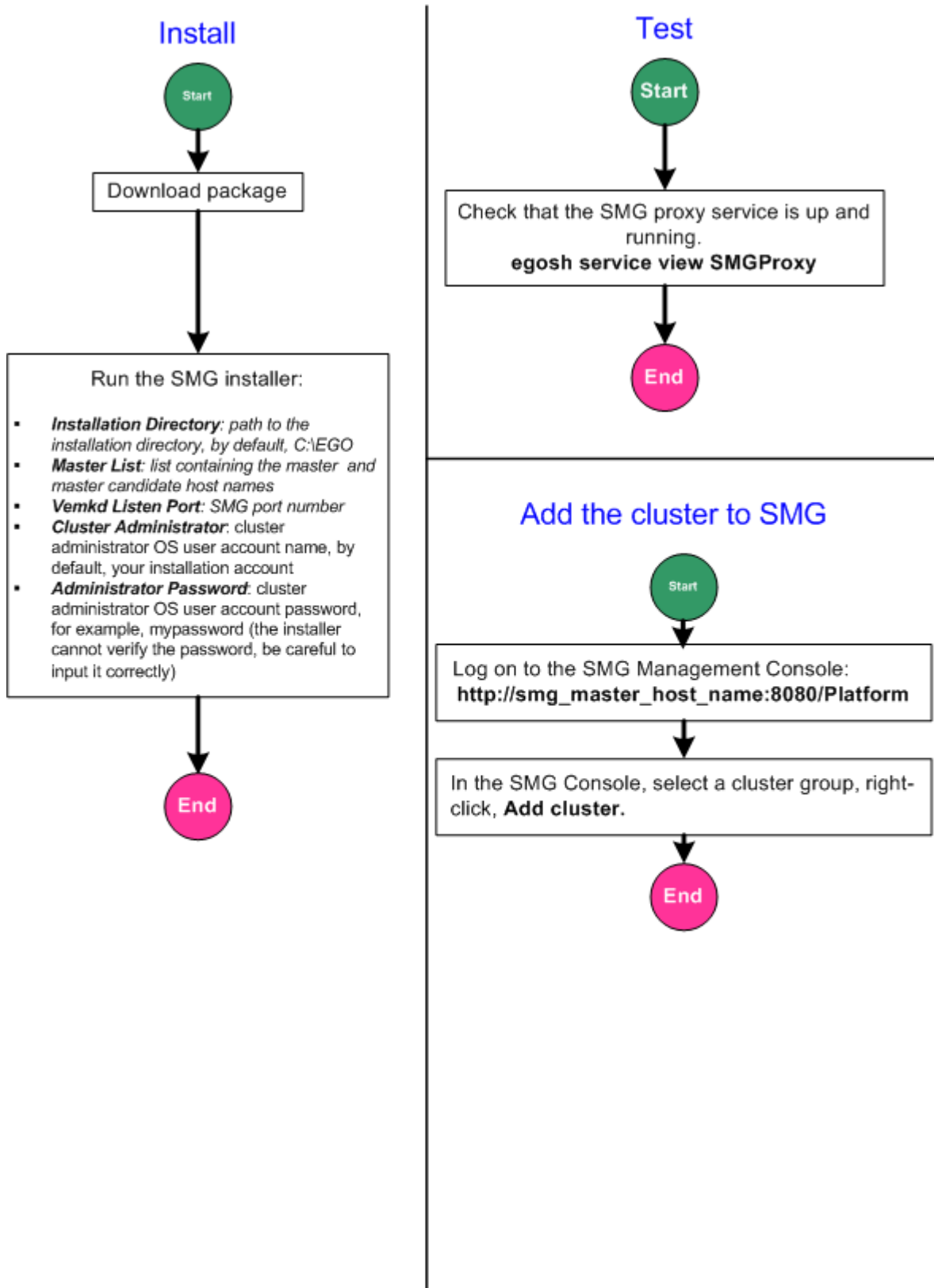
Step 1: Install the SMG management system

You want to install the SMG management system in your environment so that you can move hosts between clusters to satisfy peak load, and monitor all clusters from one central console.

You also want to bring an existing cluster into SMG.



Step 2: Install the SMG proxy in clusters you want to bring into SMG



Planning the Installation

Get a license

1. You need to install an EGO license to use Symphony MultiGrid. Obtain a license from Platform Computing.
2. Copy your license to a location that you can easily access from the host on which you are installing Symphony MultiGrid. You will need to locate this file to configure your license.

Download packages

Download the package for your platform.

The SMG management system package is to create your SMG infrastructure.

The SMG proxy package is to install in clusters that you want to bring into SMG. Download the package that matches the operating system of the management host in your cluster on which you want to install the SMG proxy.

Type of package	Platform	Package name
SMG management system	RHEL 4 and RHEL 5 64-bit, Linux 2.6 glibc 2.3 x86	symphonyMG-server-linux2.6-glibc2.3-x86_64-1.0.0-<build number>.rpm
SMG management system	Windows 2003 and Windows 2003 R2 x64	symphonyMG1.0.0-server_win-x64.msi
SMG proxy	RHEL 4 and RHEL 5 64-bit, Linux 2.6 glibc 2.3 x86	symphonyMG-proxy-linux2.6-glibc2.3-x86_64-1.0.0-<build number>.rpm
SMG proxy	Windows 2003 and Windows 2003 R2 x64	symphonyMG1.0.0-proxy_win-x64.msi

Requirements

Required hosts

	Requirement
Number of hosts	<p>2 hosts plus access to a shared directory.</p> <ul style="list-style-type: none"> • You need a minimum of 2 hosts for your SMG management system infrastructure so that you can enable failover. • You also need access to a shared directory on a file server. • The SMG management system master host must be able to resolve the master host name of clusters that are added to SMG.

	Requirement
Hardware	<p>Your hosts must have the following hardware:</p> <ul style="list-style-type: none"> • Number of CPUs — 1 or 2 • CPU power — minimum 2.4GHZ • RAM—4 GB • Disk space (to install)—600 MB • Additional disk space (for logs, events, etc.)— Can be 30 GB for monitoring many clusters
OS platforms	<ul style="list-style-type: none"> • SMG management system hosts <p>The following platforms are supported as SMG management system hosts:</p> <ul style="list-style-type: none"> • RHEL 4 and RHEL 5 64bit, Linux 2.6 glibc 2.3 x86 • Windows 2003 and Windows 2003 R2 64-bit <ul style="list-style-type: none"> • Cluster management hosts (existing cluster) <p>The following platforms are supported in management hosts for existing clusters that are to be monitored through SMG:</p> <ul style="list-style-type: none"> • RHEL 4 and RHEL 5 64-bit, Linux 2.6 glibc 2.3 x86 • Windows 2003 and Windows 2003 R2 64-bit

Required user accounts and security

	Requirement
SMG cluster administrator OS account	<p>This account is used to start up and shut down system daemons and perform configuration operations.</p> <p>The SMG cluster administrator account:</p> <ul style="list-style-type: none"> • Must exist on all your hosts • Must have a password. Recommended that the password not change frequently.
Installation account (root)	<ul style="list-style-type: none"> • You must have root privileges to install.
Firewalls	<p>There is no firewall between hosts in the SMG management system and management hosts in clusters that are going to be added to SMG.</p>

Required ports

	Requirement	Checklist
Ports	<ul style="list-style-type: none"> The same ports must be available on all hosts in the system. The following ports must be available: <p>Four consecutive ports starting from the base port.</p> <ul style="list-style-type: none"> If you use the default base port 7869, you will need ports 7869-7872. Web server ports 8080, 8005, 8009 If you are installing on the same hosts as Symphony, you need to take into account the Symphony port. You will need different base ports since Symphony uses the default base port 7869. 	Run <code>netstat -an</code> to see if ports are in use.

Required configuration

	Requirement
Resource groups	A host can only belong to one resource group. A host belonging to multiple resource groups is not supported.
Lending and borrowing	Only ownership with lending and borrowing is supported. Ownership and sharing at the same time is not supported.

Required directories

	Requirement
Shared directory	<p>This is the directory on a shared file server in which configuration and log files are stored. This is required for failover.</p> <p>Your shared directory:</p> <ul style="list-style-type: none"> Must be accessible from all your hosts Must be fully controlled by the SMG administrator account (read, write, execute privileges)
Installation directory	<ul style="list-style-type: none"> The installation directory name cannot contain spaces All hosts in the cluster must have the same installation directory. The installation directory must not be in use. The default installation directory is <code>/opt/smg</code>.

Step 1: Install the SMG management system

Linux Installation

1. Log on to one of the hosts you want to install as root.

2. Set environment variables for installation according to your login shell.

This is optional as default values are provided for you if you do not specify any options.

The default values are :

Customizable values	Default	Description
CLUSTERNAME	cluster1	<ul style="list-style-type: none"> The SMG management system is a cluster of hosts. You need a cluster name for internal system ID purposes. The default cluster name is cluster1. You can specify your own cluster name at installation. Note that your cluster name is permanent, and you cannot change it after installation. The cluster name must be 39 characters or less, and cannot contain any white spaces. Do not use the name of any host or user as the name of your cluster. <p>A suitable name contains:</p> <ul style="list-style-type: none"> Up to 39 characters Case-sensitive alphanumeric characters and underscore: <ul style="list-style-type: none"> London test_grid 2001 No spaces, or special characters: <ul style="list-style-type: none"> A&B (special character ampersand (&) is not allowed) grid 22 (space is not allowed)
CLUSTERADMIN	egoadmin	<p>The cluster administrator account. This is the account you are going to use to perform configurations and start and stop system daemons.</p> <ul style="list-style-type: none"> Create the account before you start the installation. The same cluster administrator account must exist on every host in the cluster. Must have a password. Recommended that the password not change frequently. The account is configured at installation. You cannot change the cluster administrator after installation. When you install, the default setting for the cluster administrator account is egoadmin. We strongly recommend that you create a dedicated egoadmin account, instead of using a personal user account for the cluster administrator
BASEPORT	7869	<ul style="list-style-type: none"> The same ports must be available on all hosts in the cluster. You need four consecutive ports starting from the base port. If you use the default base port 7869, you will need ports 7869-7872.
Installation directory	/opt/smg	<ul style="list-style-type: none"> The installation directory is the directory where the SMG binaries are installed on a host. The installation directory must be the same directory on every host. The installer creates the installation directory if it does not already exist. If it does exist, make sure it is not already in use.

- For sh, ksh, or bash: **export** *VARIABLE_NAME=value*
- For csh or tcsh: **setenv** *VARIABLE_NAME value*

For example:

```
setenv CLUSTERNAME cluster1
setenv CLUSTERADMIN user1
setenv BASEPORT 7869
```

3. Run RPM and specify the installation directory if you do not want the default value of /opt/smg:

- For RPM version 4.2.x or later, use the --prefix option:

For example:

```
rpm -ivh --prefix /opt/test/ symphonyMG-server-linux2.6-glibc2.3-x86_64-1.0.0-build_
number.rpm
```

- For RPM version 4.1.x or earlier, --prefix option is not supported. Set the RPM_INSTALL_PREFIX environment variable before running RPM:

For example:

```
setenv RPM_INSTALL_PREFIX /opt/test/
rpm -ivh symphonyMG-server-linux2.6-glibc2.3-x86_64-1.0.0-build_ number.rpm
```

Installation starts. Progress is displayed on-screen.

The installer will create the installation directory if it does not already exist.

Configure the host

After installation, you need to perform some configuration to set up your SMG management system.

1. As root, set your environment.

- For csh or tcsh, use cshrc.pl at form.

For example:

These examples assume the default installation directory /opt/smg.

```
source /opt/smg/cshrc.platform
```

- For sh, ksh, or bash, use profile.pl at form.

For example:

These examples assume the default installation directory /opt/smg.

```
./opt/smg/profile.platform
```

2. Set up automatic system startup.

Enable the SMG management system to start automatically when the host restarts.

Run the command:

```
egosetrc.sh
```

Enabling automatic system startup creates the ego executable under: /etc/rc.d/init.d

3. Grant root privileges to the cluster administrator.

Since you installed as root, only root can start or stop SMG system daemons. You need to configure so that the SMG cluster administrator can perform these operations.

Run the command:

egosetsudoers.sh

Note:

If you are running multiple clusters on the same host, use `egosetsudoers.sh -p` to prevent overwriting the other cluster's configuration.

When you run `egosetsudoers.sh`, it does the following:

- Creates the `/etc/ego.sudoers` file. The file owner is `root` and the permissions are set to `600` because you ran this command as `root`. Only the `root` user can edit this file.
 - `setuid` the `egosh` command and change the owner of `egosh` to `root`.
4. Configure the host as a management host.
- a) Log on to the host as the cluster administrator.
- This is required to perform specific host configuration.
- b) Source the environment.

For example:

These examples assume the default installation directory `/opt/smg`.

- For `cs`h or `tc`sh, use `cs`hrc.pl at form:


```
source /opt/smg/cshrc.platform
```
 - For `sh`, `ksh`, or `bash`, use `profile`.pl at form:


```
./opt/smg/profile.platform
```
- c) Create a cluster and specify the master host name with the `egoconfig join hostM` command.
- For example, if `hostM` is your master host:

egoconfig join hostM

When prompted to confirm, specify `y`.

- d) Specify the shared directory for configuration files to support failover.

Replace the directory name with your actual directory.

For example:

egoconfig mgghost /share/smg

When prompted to confirm, specify `y`.

After you run `egoconfig mgghost`, the host:

- Has access to important system files on the shared directory
 - Belongs to the `ManagementHosts` resource group.
- e) Set the environment to make changes take effect.

For example:

These examples assume the default installation directory `/opt/smg`.

- For `cs`h or `tc`sh, use `cs`hrc.pl at form:


```
source /opt/smg/cshrc.platform
```
- For `sh`, `ksh`, or `bash`, use `profile`.pl at form:


```
./opt/smg/profile.platform
```

License the system

1. Ensure you are logged on to the host as the cluster administrator.
2. Use the `egoconfig setlicense` command and specify the full path to your license file:

For example:

egoconfig setlicense /tmp/platform/license.dat

This command copies your license file from the location specified with the command to the `$EGO_CONFDIR` directory, names the file `license.dat`, and sets the license file path in `ego.conf`.

Windows Installation

1. When you run the .msi installer, the wizard will prompt you for the configuration values. The default values are :

Customizable values	Default	Description
Cluster name	cluster1	<ul style="list-style-type: none"> • The SMG management system is a cluster of hosts. You need a cluster name for internal system ID purposes. The default cluster name is cluster1. • You can specify your own cluster name at installation. Note that your cluster name is permanent, and you cannot change it after installation. • The cluster name must be 39 characters or less, and cannot contain any white spaces. Do not use the name of any host or user as the name of your cluster. <p>A suitable name contains:</p> <ul style="list-style-type: none"> • Up to 39 characters • Case-sensitive alphanumeric characters and underscore: <ul style="list-style-type: none"> • London • test_grid • 2001 • No spaces, or special characters: <ul style="list-style-type: none"> • A&B (special character ampersand (&) is not allowed) • grid 22 (space is not allowed)

Customizable values	Default	Description
Cluster administrator	egoadmin	<p>The cluster administrator account. This is the account you are going to use to perform configurations and start and stop system daemons.</p> <ul style="list-style-type: none"> • Create the account before you start the installation. The same cluster administrator account must exist on every host in the cluster. • Must have a password. Recommended that the password not change frequently. • The account is configured at installation. You cannot change the cluster administrator after installation. • When you install, the default setting for the cluster administrator account is <code>egoadmin</code>. We strongly recommend that you create a dedicated <code>egoadmin</code> account, instead of using a personal user account for the cluster administrator
Base port	7869	<ul style="list-style-type: none"> • The same ports must be available on all hosts in the cluster. • You need four consecutive ports starting from the base port. If you use the default base port 7869, you will need ports 7869-7872.
Installation directory	C:\smg\	<ul style="list-style-type: none"> • The installation directory is the directory where the SMG binaries are installed on a host. • The installation directory must be the same directory on every host. • The installer creates the installation directory if it does not already exist. If it does exist, make sure it is not already in use.

2. Run the installer. For example, run `symphonyMG1.0.0-server_wi n-x64.msi`.

Installation starts and the wizard guides you through the installation process.

The installer will create the installation directory if it does not already exist.

Configure the host for failover

After installation, you need to perform some configuration to set up your SMG management system.

1. Specify the shared directory for configuration files to support failover.

Replace the directory name with your actual directory.

For example:

```
egoconfig mghost \share\smg
```

When prompted to confirm, specify `y`.

After you run `egoconfig mghost`, the host has access to important system files on the shared directory.

Test

Start and test the host

1. Run `egosh` to start SMG on your host.

```
egosh ego start
```

2. Check that services have started.

egosh service list

It may take a couple of minutes for services to start up.

After a couple of minutes, you should be able to see the service WEBGUI with the status started.

Note:

If the WEBGUI service has not started, check the Web server log file in EGO_TOP/gui /logs/wsm.webgui.log. host_name (Linux) or EGO_TOP\gui\logs\wsm.webgui.log. host_name (Windows). If there is a port conflict, edit the parameter CATALINA_START_PORT and CATALINA_STOP_PORT in the file EGO_TOP/gui /conf/wsm.webgui.conf (Linux) or EGO_TOP\gui\conf\wsm.webgui.conf (Windows) and restart daemons with the command egosh ego restart.

3. Check that the host has the status ok.

The host may have the status unavailable for a minute or so, then should have the status ok.

egosh resource list

You should be able to see the host.

4. Check that the host is a management host.

egosh rg ManagementHosts

In Resource List, if you can see the host name, the host is successfully added to the cluster and configured as a management host.

Note:

If you do not see the host name in Resource List, rerun the command egoconfig mghost.

Test the web server

1. Use the following command to retrieve the URL for the Platform Management Console in your cluster.

egosh client view GUIURL_1

The description contains the Platform Management Console URL.

Note:

If you configured SSL, the URL should contain https, not http. Make sure you replace the http in the URL with https.

2. Launch any web browser and go to the Platform Management Console page.

If you see the Platform Management Console web page, your web server is running.

3. Log on to the Console .

The following are the default user name and password for the SMG administrator:

- User Name: Admin
- Password: Admin

Add a failover host

Install

1. Follow the same steps you followed to install the first host.
Make sure you use the exact same parameters as with your original installation.
Use the command `egosh ego info` to get your cluster name.

Configure the host

1. Follow the same steps you followed when configuring the master host.

Start and test the host

1. Follow the same steps you followed when configuring the master host.

Configure failover

In order to have failover among your hosts should your master host go down, you need to configure the master candidate list. This is the list of hosts that take over should the master fail. The first host on your list is the master.

1. On the host that you just added, use the command `egoconfig masterlist` and specify your master host as the first host, and your new host as the second host.

Note:

This procedure applies to in-data center failover, not to cross-data center recovery.

This means that the failover host is only for a master in the same cluster. Cross-data center recovery involves two separate clusters.

For example, if your master host is `hostM` and your additional host is `hostX`:

```
egoconfig masterlist hostM,hostX
```

2. Log on to the master host as the cluster administrator and restart daemons.

```
egosh ego restart
```

3. Check that your new host is part of the cluster:

```
egosh resource list
```

Change ports so as not to conflict with Symphony ports

If you install the SMG management system on hosts on which Symphony is already running, you will need to change the ports used by the SMG management system to start at a different base port from Symphony.

Ports used by Symphony are defined with the base port at installation. The default base connection port is 7869. Symphony always uses seven consecutive ports starting from the base port at installation. By default, Symphony uses ports 7869-7875.

1. Log on to your SMG master host as the SMG administrator OS account.
2. On Linux, set your environment.

- For `csh` or `tcsh`, use `cshrc.platform`.

For example:

These examples assume the default installation directory `/opt/smg`.

```
source /opt/smg/cshrc.platform
```

- For `sh`, `ksh`, or `bash`, use `profile.platform`.

For example:

These examples assume the default installation directory `/opt/smg`.

```
./opt/smg/profile.platform
```

3. Stop your SMG management system.

```
egosh ego shutdown
```

4. Set the base port for the SMG management system.

For example, to set your base port to 8869:

```
egoconfig setbaseport 8869
```

All other port numbers will be sequentially assigned.

5. Start your SMG management system.

```
egosh ego start
```

Change web server ports

1. Log on to your SMG master host as the SMG administrator OS account.
2. On Linux, set your environment.

- For `csh` or `tcsh`, use `cshrc.platform`.

For example:

These examples assume the default installation directory `/opt/smg`.

```
source /opt/smg/cshrc.platform
```

- For `sh`, `ksh`, or `bash`, use `profile.platform`.

For example:

These examples assume the default installation directory `/opt/smg`.

```
./opt/smg/profile.platform
```

3. With a text editor, open `SEGO_CONFDIR/. . . /gui/conf/wsm_webgui.conf` (Linux) or `%EGO_CONFDIR%\ . . . \gui\conf\wsm_webgui.conf` (Windows).
4. Change the values of the parameters `CATALINA_START_PORT` and `CATALINA_STOP_PORT` as desired.
5. If you are using SSL, change the value of the connector port:
 - a) Open `SEGO_CONFDIR/. . . /gui/conf/server.xml` (Linux) or `%EGO_CONFDIR%\ . . . \gui\conf\server.xml` (Windows).
 - b) Uncomment the following text and change the value of Connector port 8443 to a desired value.

```
<!-- Define a SSL HTTP/1.1 Connector on port 8443 -->
<!--
<Connector port="8443" maxHttpHeaderSize="8192" maxThreads="150"
minSpareThreads="25" maxSpareThreads="75" enableLookups="false"
```



```
di sabl eUpl oadTi meout="true" acceptCount="100" scheme="https" secure="true"
clientAuth="false" sslProtocol="TLS" />
-->
```

- Restart the web server for changes to take effect.

```
egosh service stop WEBGUI
```

```
egosh service start WEBGUI
```

Configure HTTPS for the web server (Linux)

- Log on to your SMG master host as the SMG administrator OS account.
- Set your environment.

- For csh or tcsh, use cshrc.pl at form.

For example:

These examples assume the default installation directory /opt/smg.

```
source /opt/smg/cshrc.platform
```

- For sh, ksh, or bash, use profile.pl at form.

For example:

These examples assume the default installation directory /opt/smg.

```
./opt/smg/profile.platform
```

- Stop the web server service.

```
egosh service stop WEBGUI
```

- Generate a self-signed certificate.

```
cd $EGO_TOP/jre/linux/bin
./keytool -genkey -keyalg RSA -alias tomcat
```

Use the default password for tomcat: changeit.

- Export the certificate.

```
./keytool -export -alias tomcat -file tomcat.cert
```

- As root, import the certificate.

```
./keytool -import -alias tomcat -keystore $EGO_TOP/jre/linux/lib/security/cacerts -file
tomcat.cert
```

On 64-bit platforms:

```
./keytool -import -alias tomcat -keystore $EGO_TOP/jre/linux-x86_64/lib/security/cacerts -file
tomcat.cert
```

- Enable SSL.

a) Open SEGO_CONFDIR/. . . /gui /conf /server.xml .

b) Uncomment the SSL connector element by removing the comment tags <!-- and -->.

The SSL connector element can be found below this line in the file:

```
<!-- Define a SSL HTTP/1.1 Connector on port 8443 -->
```

- Disable the non-SSL port.

Disable the non-SSL port by commenting out the connector element below this line in the file:

```
<!-- Define a non-SSL HTTP/1.1 Connector on port 8080 -->
```

Your file should look like the following with SSL enabled and non-SSL disabled:

```
<!-- Define a non-SSL HTTP/1.1 Connector on port 8080 -->
<!--
<Connector port="{CATALINA_START_PORT}" maxHttpHeaderSize="8192"
maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
enableLookups="false" redirectPort="8443" acceptCount="100"
connectionTimeout="20000" disableUploadTimeout="true" />
-->
<...>
<!-- Define a SSL HTTP/1.1 Connector on port 8443 -->
<Connector port="8443" maxHttpHeaderSize="8192"
maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
enableLookups="false" disableUploadTimeout="true"
acceptCount="100" scheme="https" secure="true"
clientAuth="false" sslProtocol="TLS" />
```

- Open the SMG navigation file `$EGO_CONFDIR/./././gui/conf/navigation/spring.xml`.

Find the following:

```
<property name="serviceUrl" value="http://{serverName}:{serverPort}/
smggui/remoting/ClientUserCategoryPlugin?{serverParam}" />
```

Replace it with:

```
<property name="serviceUrl" value="https://{serverName}:8443/smggui/remoting/
ClientUserCategoryPlugin?{serverParam}" />
```

- Open `$EGO_CONFDIR/./././gui/conf/wsm_webgui.conf` and change `CATALINA_START_PORT` from 8080 to 8443.
- Start the web server service.

```
egosh service start WEBGUI
```

Configure HTTPS for the web server (Windows)

- Log on to your SMG master host as the SMG administrator OS account.
- Stop the web server service.

```
egosh service stop WEBGUI
```

- Generate a self-signed certificate.

```
cd %EGO_CONFDIR%\.\.\jre\bin
keytool -genkey -keyalg RSA -alias tomcat
```

Use the default password for tomcat: changeit.

- Export the certificate.

```
keytool -export -alias tomcat -file tomcat.cert
```

- Import the certificate.

```
keytool -import -alias tomcat -keystore %EGO_CONFDIR%\.\.\jre\lib\security\cacerts -file
tomcat.cert
```

- Enable SSL.

a) Open `%EGO_CONFDIR%\.\.\.\gui\conf\server.xml`.

b) Uncomment the SSL connector element by removing the comment tags `<!--` and `-->`.

The SSL connector element can be found below this line in the file:

```
<!-- Define a SSL HTTP/1.1 Connector on port 8443 -->
```

7. Disable the non-SSL port.

Disable the non-SSL port by commenting out the connector element below this line in the file:

```
<!-- Define a non-SSL HTTP/1.1 Connector on port 8080 -->
```

Your file should look like the following with SSL enabled and non-SSL disabled:

```
<!-- Define a non-SSL HTTP/1.1 Connector on port 8080 -->
```

```
<!--
```

```
<Connector port="{CATALINA_START_PORT}" maxHttpHeaderSize="8192"
```

```
maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
```

```
enableLookups="false" redirectPort="8443" acceptCount="100"
```

```
connectionTimeout="20000" disableUploadTimeout="true" />
```

```
-->
```

```
<...>
```

```
<!-- Define a SSL HTTP/1.1 Connector on port 8443 -->
```

```
<Connector port="8443" maxHttpHeaderSize="8192"
```

```
maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
```

```
enableLookups="false" disableUploadTimeout="true"
```

```
acceptCount="100" scheme="https" secure="true"
```

```
clientAuth="false" sslProtocol="TLS" />
```

8. Open the SMG navigation file %EGO_CONFDIR%\..\..\gui\conf\navigation\spring.xml.

Find the following:

```
<property name="serviceUrl" value="http://{serverName}:{serverPort}/smggui/remoting/ClusterCategoryPlugin?{serverParam}" />
```

Replace it with:

```
<property name="serviceUrl" value="https://{serverName}:8443/smggui/remoting/ClusterCategoryPlugin?{serverParam}" />
```

9. Open %EGO_CONFDIR%\..\..\gui\conf\wsm_webgui.conf and change CATALINA_START_PORT from 8080 to 8443.

10. Start the web server service.

```
egosh service start WEBGUI
```

Configure HTTPS for specific silo clusters

Follow these steps when you want to enable HTTPS (disable HTTP) for a specific silo cluster.

1. Manually add the following elements to the clusterConnector.xml file on the SMG master host. For example, to enable HTTPS for cluster1:

```
<Cluster name="cluster1">
<Connector protocol="https" port="8443"/>
</Cluster>
```

Note that if you disable HTTP for all silo clusters, you can also manually change the global setting as follows:

```
<Global>
<Connector protocol="https"/>
```

Step 2: Add a Cluster to SMG

Install the SMG proxy package in existing Linux clusters

Prerequisites

- SMG proxy installation package. Choose the package for the operating system on your cluster's management host. For example: `symphonyMG-proxy-linux2.6-glibc2.3-x86_64-1.0.0-build_number.rpm`
- Make sure that your Symphony cluster is running.
- Information you need for the installation:

Information you need	Description	Environment variable for installation
Cluster administrator account	<p>Required.</p> <p>Cluster administrator account for the cluster that you want to add to SMG. This is the cluster administrator account used to log on to the Platform Management Console and command-line interface for your cluster.</p> <p>You will need this account to log on to your cluster before starting the installation. This is required so that the installer can add the SMG proxy service to your cluster.</p>	No environment variable
SMG master host and master candidate hosts	<p>Required.</p> <p>SMG master host and master candidate hosts, separated by spaces. Defined in your SMG installation with the parameter <code>EGO_MASTER_LIST</code> in <code>\$EGO_CONFDIR/ego.conf</code>.</p>	<code>SMG_MASTER_LIST</code>
SMG port number	<p>Required.</p> <p>SMG port number. Defined in your SMG installation with the parameter <code>EGO_KD_PORT</code> in <code>\$EGO_CONFDIR/ego.conf</code>.</p>	<code>SMG_KD_PORT</code>

Install SMG proxy

In order to monitor your cluster or be able to move hosts among clusters, you need to install the SMG proxy on management hosts in your existing cluster.

1. As the user account you want to use to run RPM, log on to a management host in your cluster.
2. Set your environment to your Symphony cluster environment.
 - For `csch` or `tcsh`, use `cschrc.ego`.
For example:
`source /share/ego/kernel/conf/cschrc.ego`
 - For `sh`, `ksh`, or `bash`, use `profile.ego`.
For example:

```
./share/ego/kernel/conf/profile.ego
```

- Log on to the command-line interface of your cluster as the cluster administrator.

egosh user logon

This is required so that the installation can install the SMG proxy service in your cluster.

- Set environment variables for installation.
 - For sh, ksh, or bash: **export** *VARIABLE_NAME=value*
 - For csh or tcsh: **setenv** *VARIABLE_NAME value*

For example:

```
setenv SMG_MASTER_LIST hostM hostF
setenv SMG_KD_PORT 9876
```

- Run RPM.

For example:

```
rpm -ivh --prefix /opt/ego/rpmfile
```

Install the SMG proxy package in existing Windows clusters

Prerequisites

- SMG proxy installation package symphonyMG1.0.0-server_win-x64.msi.
- Make sure that your Symphony cluster is running.
- Information you need for the installation:

Information you need	Default	Description
Cluster administrator account	egoadmin	Required. Cluster administrator account for the cluster that you want to add to SMG. This is the cluster administrator account used to log on to the Platform Management Console and command-line interface for your cluster. You will need this account to log on to your cluster before starting the installation. This is required so that the installer can add the SMG proxy service to your cluster.
SMG Master List		Required. SMG master host and master candidate hosts, separated by spaces. Defined in your SMG installation with the parameter EGO_MASTER_LIST in %EGO_CONFDIR%\ego.conf.
SMG Listen Port		Required. SMG port number. Defined in your SMG installation with the parameter EGO_KD_PORT in %EGO_CONFDIR%\ego.conf.
Installation Directory	C:\EGO\	The installation directory is the directory where the Symphony binaries are installed on a host.

Install SMG proxy

In order to monitor your cluster or be able to move hosts among clusters, you need to install the SMG proxy on management hosts in your existing cluster.

1. On a management host in your cluster, log on to the command-line interface as the cluster administrator.

egosh user logon

This is required so that the installation can install the SMG proxy service in your cluster.

2. Run the installer. For example, run `symphonyMG1.0.0-proxy_wi n-x64.msi`.

Installation starts and the wizard guides you through the installation process.

Test the Installation

1. Check that the SMG proxy service is up and running.

- On Linux:

```
egosh service list |grep SMG
ps -efww |egrep "SMGProxy|ego.*2apo"
```

- On Windows:

```
egosh service view SMGProxy
```

If SMG proxy is not running, check the log file in your cluster `$EGO_ESRVDIR/smgproxy/log/smgproxy.log`. *host_name* (Linux) or `EGO_TOP\smgproxy\log\smgproxy.log`. *host_name* (Windows) to find out more details.

Add the cluster

- You must have installed the SMG proxy package in your cluster and it must be up and running.

1. Log on to the Platform Management Console.
2. Right-click on a Cluster Group and select Add cluster.

The Add cluster window is displayed

3. Enter the name of your cluster.

You must specify the exact name of your cluster.

You should be able to see the cluster name in the navigation tree.

Uninstall SMG

Remove Linux hosts from the SMG management system

1. Log on to the host with root permissions.
2. Shut down the host.

egosh ego shutdown

3. Run the command `egoremove c. sh` as root.

Doing this prevents automatic startup when the host reboots, and keeps the host from being re-added dynamically to the cluster.

4. Follow the steps depending on whether you are removing the master host or the master candidate host.

- If you are removing the master host:

Manually remove the host name from the file
`$EGO_CONFDIR/ego.cluster.cluster_name`

- If you are removing the master candidate host:

1. Redefine the list of master candidate hosts by specifying just the master host with `egoconfig master list`.

For example:

```
egoconfig masterlist hostM
```

2. Run `egoconfig unsetmghost` to remove the host from the management host group.

```
egoconfig unsetmghost
```

Running this command removes the host entry from `ego.cluster.cluster_name`.

5. Uninstall the SMG package.

Files are in the following format: `SMG-server-platform-1.0.0-build_number`

For example:

```
rpm -e SMG-server-linux2.4-glibc2.3-x86-1.0.0-090223
```

Remove Windows hosts from the SMG management system

1. Log on to the host as cluster administrator.
2. Shut down the host.

egosh ego shutdown

3. Follow the steps depending on whether you are removing the master host or the master candidate host.

- If you are removing the master host:

Manually remove the host name from the file
`%EGO_CONFDIR%\ego.cluster.cluster_name`

- If you are removing the master candidate host:

1. Redefine the list of master candidate hosts by specifying just the master host with `egoconfig master list`.

For example:

```
egoconfig masterlist hostM
```

2. Run `egoconfig unsetmghost` to remove the host from the management host group.

egoconfig unsetmghost

Running this command removes the host entry from `ego.cluster.cluster_name`.

4. Uninstall the SMG package.
 - a) In the Add or Remove Programs window, select Platform Symphony MultiGrid Server 1.0.0.
 - b) Click Remove.

The uninstaller removes installed binaries and local conf files. The shared location is not affected.

Remove the SMG proxy from your Linux cluster

- Make sure your Symphony cluster is running.
1. Log on to the management host in your cluster in which you installed the SMG proxy package as the user account that will uninstall the RPM.
 2. Set the environment for your cluster.

For example:

These examples assume the default installation directory `/opt/ego`.

- For `csch` or `tcsh`, use `cschrc.platform`:


```
source /opt/ego/cschrc.platform
```
- For `sh`, `ksh`, or `bash`, use `profile.platform`:

```
./opt/ego/profile.platform
```

3. Log on to the command-line interface of your cluster as the cluster's cluster administrator.

egosh user logon

This is required so that the installation can uninstall the SMG proxy service from your cluster.

4. Uninstall the SMG proxy package from your cluster.

For example:

```
rpm -e SMG-proxy-platform-1.0.0-build_number
```

Remove the SMG proxy from your Windows cluster

- Make sure your Symphony cluster is running.
1. Log on to the management host in your cluster on which you installed the SMG proxy package.
 2. Uninstall the SMG proxy package from your cluster.
 - a) In the Add or Remove Programs window, select Platform Symphony MultiGrid Proxy 1.0.0.
 - b) Click Remove.

The uninstaller removes installed binaries and local conf files. The shared location is not affected.

Configuration and Troubleshooting

SMG Master Configuration

How to change the SMG master

Install and configure the new master

1. In your SMG management system, shut down the SMG daemons.
 - a) Log on to the SMG master host as the SMG administrator
 - b) Source the environment.
 - c) Shut down the daemons with the command:


```
egosh ego shutdown
```
2. Install SMG RPM packages on your new machine.
3. Copy all directories and files under `$EGO_CONFDIR`, `$EGO_CONFDIR/. . /work`, `$EGO_ESRVDIR/esc/conf`, `$EGO_CONFDIR/. . . /gui/conf` from the SMG master host to the new SMG master host to overwrite the newly installed files.
4. Manually edit `$EGO_CONFDIR/ego.conf` and change the value of `EGO_MASTER_LIST` to indicate the host name of the new SMG master.

Note:

The SMG master should be listed first.

5. Manually edit `$EGO_CONFDIR/ego.cluster.cluster_name` and add the new SMG master host as an entry.
6. Shut down and restart the SMG daemons.

```
egosh ego shutdown
egosh ego start
```

Configure the SMG proxy to point to the new master

1. Log on to your Symphony master host.
2. Set your environment.
3. Stop the SMG proxy service.


```
egosh service stop SMGProxy
```
4. Go to `$EGO_ESRVDIR/esc/conf/services`.
5. Open `SMGProxy.xml`.
 - a) Change the value of the environment variable `SMG_MASTER_LIST` to specify the new master first.
 - b) If you changed the port number for your master, change the value of `SMG_KD_PORT` also.
6. Start the SMG proxy service.

```
egosh service start SMGProxy
```

Note:

If there is a running repurpose request while you are specifying a new SMG master, the request will receive the status ERROR.

7. Shut down and restart Symphony master daemons.

```
egosh ego shutdown
egosh ego start
```

Purge old repurpose request events

By default, repurpose requests are kept by the SMG management system indefinitely. As a result, after a certain period of time, there could be hundreds of repurpose requests in your system.

You can choose to periodically delete old DONE and ERROR repurpose requests.

1. Log on to your SMG management system master host as the SMG administrator.
2. Set your environment.

- For `csh` or `tcsh`, use `cshrc.pl` at form.

For example:

These examples assume the default installation directory `/opt/smg`.

```
source /opt/smg/cshrc.platform
```

- For `sh`, `ksh`, or `bash`, use `profile.pl` at form.

For example:

These examples assume the default installation directory `/opt/smg`.

```
./opt/smg/profile.platform
```

3. Open the `SEGO_CONFDIR/ego.conf` file and add the parameter `EGO_DB_CLEANPERIOD`.

For example:

```
EGO_DB_CLEANPERIOD=10
```

The parameter is set in days. With the above configuration, the system will periodically delete any ERROR or DONE repurpose requests that are more than 10 days old. As a result, you will only be able to view repurpose requests that were submitted within the last 10 days.

4. Restart your SMG management system to make changes take effect.

```
egosh ego shutdown
egosh ego start
```

Starting and stopping the SMG Management Console

Stop the SMG Management Console

1. Log on to your SMG management system master host as the SMG administrator.
2. Set your environment.

- For `csh` or `tcsh`, use `cshrc.pl` at form.

For example:

These examples assume the default installation directory `/opt/smg`.

```
source /opt/smg/cshrc.platform
```

- For `sh`, `ksh`, or `bash`, use `profile.pl` at form.

For example:

These examples assume the default installation directory `/opt/smg`.

```
./opt/smg/profile.platform
```

3. Stop the SMG Management Console.

```
egosh service stop WEBGUI
```

Start the SMG Management Console

1. Log on to your SMG management system master host as the SMG administrator.
2. Set your environment.

- For `csch` or `tcsh`, use `cschrc.pl` at form.

For example:

These examples assume the default installation directory `/opt/smg`.

```
source /opt/smg/cschrc.platform
```

- For `sh`, `ksh`, or `bash`, use `profile.pl` at form.

For example:

These examples assume the default installation directory `/opt/smg`.

```
./opt/smg/profile.platform
```

3. Start the SMG Management Console.

```
egosh service start WEBGUI
```

SMG Management System Failure Recovery

Recovery procedure for SMG management system failure

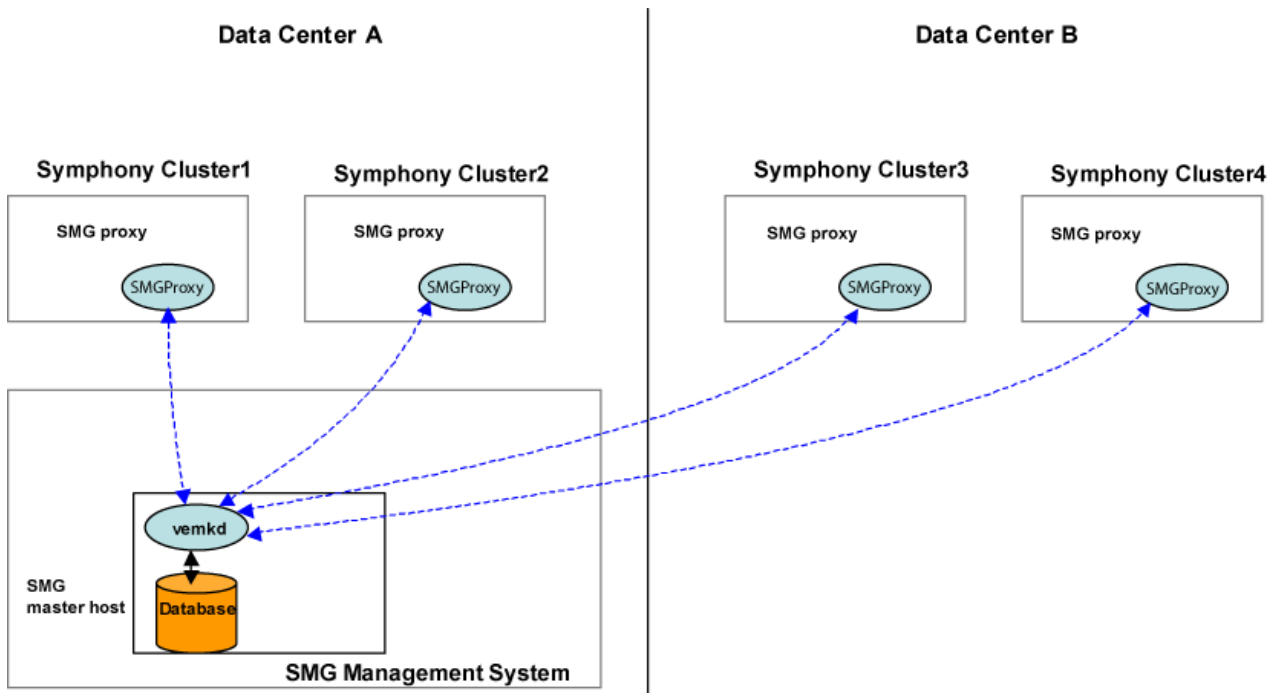
The following procedure outlines manual steps to create a backup SMG management system should failure occur. This backup SMG management system is not up until failure occurs. This is when you manually start it up.

Scenario covered by this procedure

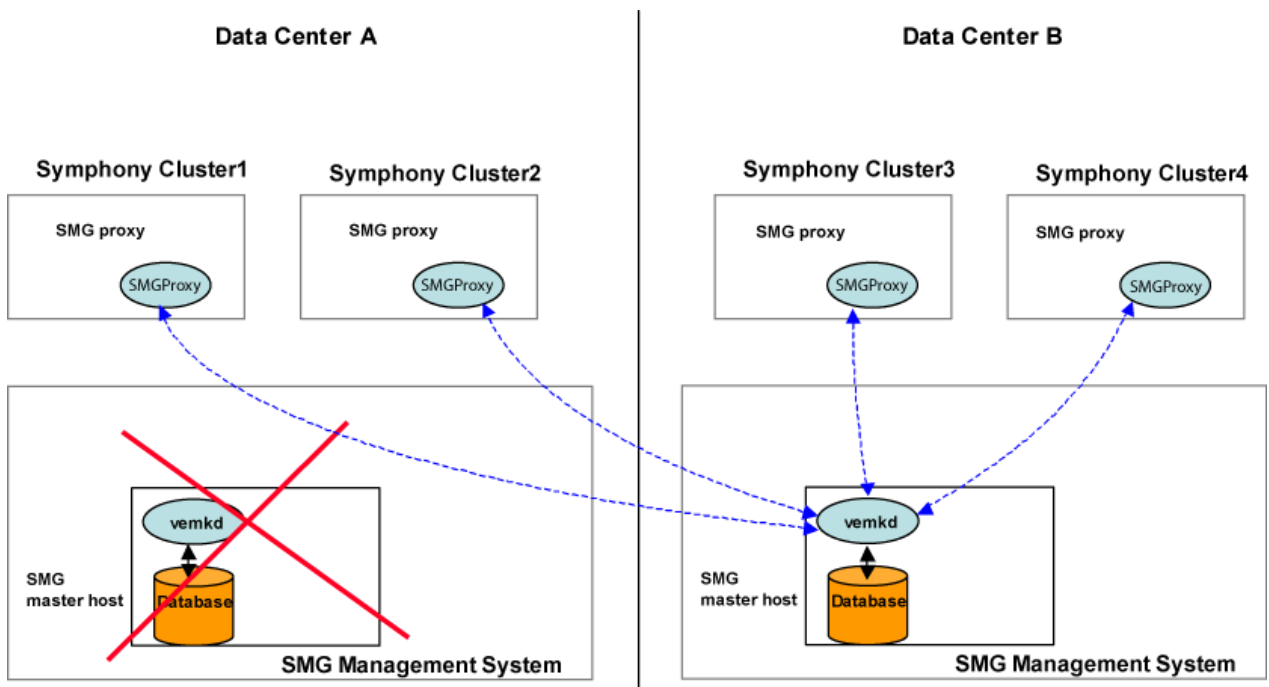
You have two data centers: A and B.

Your SMG management system resides in the data center A.

All Symphony clusters, in both A and B are configured to connect to the SMG management system in A.



Should the SMG management system in A experience total failure (meaning that not even the failover master takes over), you want to ensure Symphony clusters can connect to a backup SMG management system set up in data center B.



System is down

After you complete this procedure

Your Symphony clusters connect to the new SMG management system in data center B.

You should be able to recover current configuration (clusters that were added), and repurpose request status.

For any repurpose request that has the status Done or Error, you can assume the host has moved and the resource plan changes have been made.

For any repurpose request that has the status In Progress, you will need to manually track it and figure out if the request completed or not.

Step 1: Prepare for failure

1. Install a new SMG management system in data center B.
 - Do not start up any daemons.
 - After you have added all your Symphony clusters to your SMG management system in data center A, copy over to your SMG management system in data center B:
 - All files and subdirectories from `$EGO_CONFDIR/. . . /gui /conf`
 - All files and subdirectories from `$EGO_ESRVDIR/esc/conf`
 - The file `$EGO_CONFDIR/ConsumerTrees.xml`
 - The file `$EGO_CONFDIR/admin.xml`
 - The file `$EGO_CONFDIR/users.xml`

These files only need to be updated in the SMG management system in data center B if you add more clusters or users to the SMG management system in data center A.

2. At regular intervals, copy from your SMG management system in data center A `$EGO_CONFDIR/. . . /work` to your SMG management system in data center B.

These files contain system status about requests and the database. You will need them to recover your SMG management system status should failure occur.

3. If you configured HTTPS for your web server in data center A, configure HTTPS for your web server in data center B.
 - a) Log on to your SMG master host in data center B as the SMG administrator OS account.
 - b) Set your environment.

- For `cs`h or `tc`sh, use `cs`hrc. `pl`at form.

For example:

These examples assume the default installation directory `/opt/smg`.

```
source /opt/smg/cshrc.platform
```

- For `sh`, `ksh`, or `bash`, use `profi`le. `pl`at form.

For example:

These examples assume the default installation directory `/opt/smg`.

```
./opt/smg/profile.platform
```

- c) Generate a self-signed certificate.

```
cd $EGO_TOP/jre/linux/bin  
./keytool -genkey -keyalg RSA -alias tomcat
```

Use the default password for tomcat: `changeit`.

- d) Export the certificate.

```
./keytool -export -alias tomcat -file tomcat.cert
```

- e) As root, import the certificate.

```
./keytool -import -alias tomcat -keystore $EGO_TOP/jre/linux/lib/security/cacerts -file tomcat.cert
```

On 64-bit Platforms, use the following:

```
./keytool -import -alias tomcat -keystore $EGO_TOP/jre/linux-x86_64/lib/security/cacerts -file tomcat.cert
```

Step 2: After failure occurs

Configure each SMG proxy to point to the new master in data center B

Repeat the steps below for each Symphony cluster in data center A and data center B.

1. Log on to your Symphony master host.
2. Set your environment.
3. Stop the service.

```
egosh service stop SMGProxy
```

4. Go to `$EGO_ESRVDIR/esc/conf/services`.
5. Open `SMGProxy.xml`.
 - a) Change the value of the environment variable `SMG_MASTER_LIST` to indicate the new master in data center B.
 - b) If you changed the port number for your master, change the value of `SMG_KD_PORT` also.
6. Shut down and restart Symphony master daemons.

```
egosh ego shutdown  
egosh ego start
```

Start up the SMG management system in data center B

1. Log on to your SMG management system master host in data center B.
2. Set your environment.
3. Start SMG management system daemons.

```
egosh ego start
```

Troubleshooting

Log files

Log files contain important runtime information about the general health of daemons and system events.

The naming convention for most log files is the name of the daemon plus the host name the daemon is running on.

The following table outlines SMG daemons and their associated log files.

List of log files to use for troubleshooting SMG

Daemon or Script	Component	Log file name	Linux/UNIX	Use it to
SMGProxy	Symphony MultiGrid proxy	smgproxy.log. <i>host_name</i>	\$EGO_TOP/smgproxy/ log on the management host in the cluster that you added to SMG	Check that the SMG proxy in each cluster is working properly.
egosc	EGO Service Controller	egoservice.audit.log	\$EGO_TOP/audits	Logs all events related to the starting and stopping of all services. Must be enabled first.
egosc	EGO Service Controller	esc.log. <i>host_name</i>	\$EGO_TOP/eservice/ esc/log	Logs service failures and service instance restarts based on availability plans. Errors surrounding Platform Management Console startup are logged here.
lim	Load Information Manager (lim)	• lim.log. <i>host_name</i>	\$EGO_TOP/kernel / log	Logs static and dynamic attribute information about individual hosts. Logs any error warnings generated while lim was running. If log class set to debug, logs information that helps to locate the encountered problem.
pem	Process Execution Manager(pem)	• pem.log. <i>host_name</i>	\$EGO_TOP/kernel /log	Logs remote operations (start, stop, control activities, failures). Logs tracked results for resource utilization of all processes associated with the host, and information for accounting or chargeback.
pim	Process Information Manager	• pim.log. <i>host_name</i>	\$EGO_TOP/kernel / log	Logs resource usage information about processes running on the host.
vemkd	EGO kernel daemon	ego.audit.log	\$EGO_TOP/kernel / log	Logs all events related to the host, consumer, and user, including opening and closing a host, adding, modifying, deleting a consumer or resource plan, user role changes and user logging actions. Must be enabled first.

Daemon or Script	Component	Log file name	Linux/UNIX	Use it to
vemkd	EGO kernel daemon	vemkd. l og. <i>host_name</i>	\$EGO_TOP/kernel / l og	Logs aggregated host information about the state of individual resources, status of allocation requests, consumer hierarchy, resources assignment to consumers, and started operating system-level process.
WEBGUI	Platform management console/WEBGUI	cat al i na. out	\$EGO_TOP/gui /l ogs	Logs system errors and debug information from Tomcat web server startup.
WEBGUI	Platform management console/WEBGUI	wsm. l og. <i>host_name</i>	\$EGO_TOP/gui /l ogs	Logs information collected by the web server monitor daemon. Failures of the WEBGUI service that runs the Platform Management Console are logged here.
provision	Script used for repurposing to update resource plans	<i>request_ID</i> . out	\$EGO_TOP/smgproxy/ work/spool / <i>request_ID</i>	
egoalloc2apo	Script used to query resource allocation data from a Symphony cluster	egoal l oc2apo. l og	\$EGO_TOP/smgproxy/ l og	
egocluster2apo	Script used to query cluster information from a Symphony cluster	egocl uster2apo. l og	\$EGO_TOP/smgproxy/ l og	
egoconsumer2apo	Script used to query resource plan information from a Symphony cluster	egoconsumer2apo. l og	\$EGO_TOP/smgproxy/ l og	
egohost2apo	Script used to query hosts information from a Symphony cluster	egohost 2apo. l og	\$EGO_TOP/smgproxy/ l og	
egorg2apo	Script used to query resource group information from a Symphony cluster	egorg2apo. l og	\$EGO_TOP/smgproxy/ l og	

Daemon or Script	Component	Log file name	Linux/UNIX	Use it to
	scripts used for repurposing		\$EGO_ESRVDIR/ smgproxy/work/spool/ request_ID	

Log entry format

The standard format for log file entries is:

date time_zone log_level [process_id:thread_id] action:description/message

where the date is expressed in YYYY-MM-DD hh:mm:ss.sss.

For example, 2006-03-14 11:02:44.000 Eastern Standard Time ERROR [2488:1036] vemkdexit: vemkd is halting.

How often should I maintain log files?

We recommend using a log file rotation utility to do unattended maintenance of your log files. Failure to do timely maintenance could result in a full file system, which hinders system performance and operation.

Audit logs

SMG monitors and logs security-sensitive events related to SMG services and to hosts and users. By default, auditing of these events is disabled.

To collect information to better monitor system security, enable logging by configuring the `ego.conf` and `engosc.conf.xml` files.

Audit logs can be enabled independently of each other.

Audit log format

<i>Date and time request submitted</i>	<i>CONFIG User who submitted request</i>	<i>CLUSTER source cluster/ target cluster</i>	<i>requested DETAIL: Request details</i>	<i>[SPECIFICATION N]: REMOVE task details</i>	<i>[SPECIFICATION N]: ADD task details</i>
--	--	---	--	---	--

For example:

```
2009-02-13 11:16:58.000 EST CONFIG Admin CLUSTER LDNDEV/LDNPRD requested DETAIL:
RequestjobID is <7>, submit client is <Admin_redomain>, description is <This is the
description>, flag is <8>; [SPECIFICATION 1] client is <LDNDEV>, URL is <${
{SMG_PLUGINDIR}/provision>, template is <>, environment variable is <PERL5LIB=${
{APO_PLUGINDIR}/perl5lib; APO_TASKTYPE=REMOVE_TASK; APO_CONSUMERUPDATES=1@/
SampleApplications/
EclipseSamples; VT_NUMBER=31337; APO_HOSTGROUP=ComputeHosts; APO_TASKUSER=Admin; APO_HOSTS
=rh3_2; DEST_CLUSTER=LDNPRD; DST_CLUSTER_DOMAIN=eng; KILL_WORKLOAD=0; DST_SYM_VERSION=3.1;
>, flags is <0>; [SPECIFICATION 2] client is <LDNPRD>, URL is <${APO_PLUGINDIR}/
provision>, template is <>, environment variable is <PERL5LIB=${SMG_PLUGINDIR}/
perl5lib; APO_TASKTYPE=ADD_TASK; APO_CONSUMERUPDATES=1@/SampleApplications/
EclipseSamples; VT_NUMBER=31337; APO_HOSTGROUP=ComputeHosts; APO_TASKUSER=Admin; APO_HOSTS
=rh3_2; SRC_CLUSTER=LDNDEV; SRC_SYM_VERSION=3.1; SRC_CLUSTER_DOMAIN=eng; KILL_WORKLOAD=0; >
, flags is <0>
```

Enable event logging for auditing purposes

You must be the SMG administrator to perform this task.

1. To enable logging for auditing of core SMG functions (for example, security):

- a) Open `ego.conf`.
 - On Linux/UNIX: `SEGO_CONFDIR/ego.conf`
- b) Turn on EGO audit logging by adding the following parameter:
`EGO_AUDIT_LOG=Y`
- c) You may also want to define an audit log directory by configuring the `EGO_AUDIT_LOGDIR` parameter. This is the default directory location and name:
 - On Linux/UNIX: `EGO_AUDIT_LOGDIR=$SEGO_CONFDIR/audit`Once defined, the `vemkd` and `egosc` daemons automatically create the directory.
- d) Save and close the file.

Note:

Note that there is no automatic file roll-over or audit log cleanup. Ensure that you manually manage the file size.

2. To enable audit logging for the service controller:
 - a) Open `egosc.conf.xml`
 - On Linux/UNIX: `EGO_TOP//eservice/esc/conf/egosc.conf.xml`
 - b) Turn on the EGO service controller log (`egoservice.audit.log`) by adding the following element:
`<ESC_AUDIT_LOG>ON</ESC_AUDIT_LOG>`
 - c) Save and close the file.
3. Restart SMG on the master host.

egosh ego restart

Miscellaneous

If you change the SiteMinder Administrator password

If you change the SiteMinder Administrator password in a SiteMinder domain, you will need to restart the SMGProxy service in all clusters that use that SiteMinder domain with the command `egosh service stop` and `egosh service start`. This is required so that information collection works properly.

Repurpose request errors

Repurpose requests that would cause a consumer's owned slots to be reduced by more than the consumer's idle owned slots are rejected. This is because running workload would need to be terminated to satisfy the request.

Data collection

The data collection script in Symphony clusters (`egoalloc2apo`) cannot collect an accurate slot count if you have overridden the compute host's slot count by editing `ResourceGroups.xml`.

Host does not display in repurpose request host selection page

If a host is part of multiple resource groups, it will not display in the Platform Management Console's host selection page when you create a repurpose request.

To fix this problem, ensure your host only belongs to one resource group.

As a workaround, if for some reason the host must belong to multiple resource groups, you can configure to filter out the resource groups that are not the host's primary resource group.

Note:

If you filter out a resource group, all hosts that also belongs to that resource group will not be displayed in the repurpose request host selection page.

To filter out resource groups from the host selection page when you create a repurpose request:

1. As your Symphony OS cluster administrator account, log on to a management host in your cluster.
2. Set your environment to your Symphony cluster environment.
 - For `csh` or `tcsh`, use `cshrc.ego`.
For example:
`source /share/ego/kernel/conf/cshrc.ego`
 - For `sh`, `ksh`, or `bash`, use `profile.ego`.
For example:
`source /share/ego/kernel/conf/profile.ego`
3. With a text editor, open the file `$EGO_TOP/smgproxy/plugins/egoshost2apo/run`.
4. In the `%managementGroups` section, add the resource group name you want to be filtered out of the repurpose request host selection page.

For example, if we wanted to filter out `hostgroupB`:

```
%managementGroups = (
    "ManagementHosts" => 1,
    "InternalResourceGroup" => 1,
    "PTWriterBackupGroup" => 1,
    "hostgroupB"=> 1,
    "LOST_AND_FOUND" => 1
);
```

Note:

If you filter out a resource group, any host that also belongs to that resource group will not be displayed in the repurpose request host selection page.

5. With a text editor, open the file `$EGO_TOP/smgproxy/plugins/egoal1oc2apo/run`.
6. In the `%managementGroups` section, add the resource group name you want to be filtered out of the repurpose request host selection page.

For example, if we wanted to filter out `hostgroupB`:

```
%managementGroups = (
    "ManagementHosts" => 1,
    "InternalResourceGroup" => 1,
    "PTWriterBackupGroup" => 1,
    "hostgroupB"=> 1,
    "LOST_AND_FOUND" => 1
);
```

7. Restart SMG proxy.

```
egosh service stop SMGProxy
```

```
egosh service start SMGProxy
```

Get "database is locked" message when you start the SMG server with a shared directory on NFS

The `vemkd` logs the following error message: 2010-03-03 19:51:32.000 CST ERROR [22633] makeTables(): SQL error for create table if not exists clients (time long, name varchar, state int, flags int, ttl int, ztime int, description varchar, user varchar, status varchar) database is locked

This problem may be caused by the system's `nfslock` service not being started. Manually start the `nfslock` service by entering `service nfslock start` or set the service to start automatically at system startup in full multi-user mode by entering `chkconfig --level 3 nfslock on`.

Plug-in processes constantly restart after installing SMG proxy on 64-bit Windows

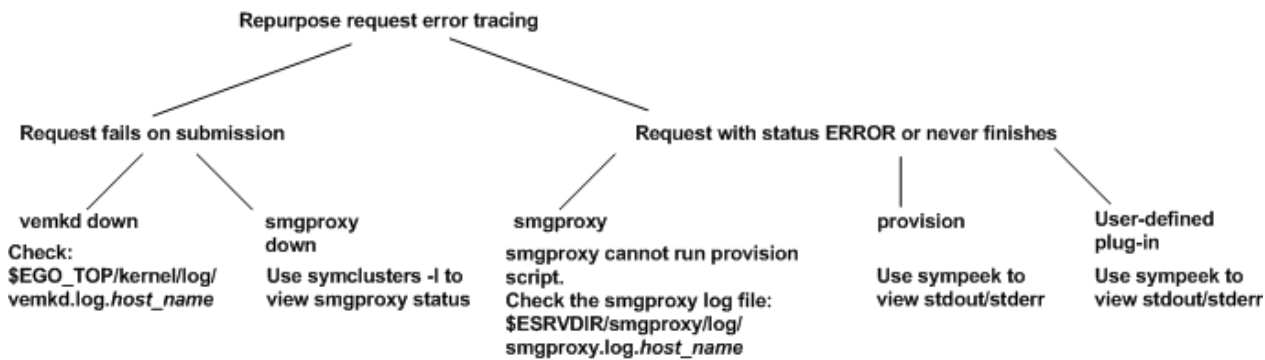
If `proxy.log` indicates that the plug-in processes are being restarted it may be due to having multiple Perl distributions installed on the same host. The SMG proxy expects to use Activeperl to run the plug-in processes but another Perl distribution, such as MKS, may be running instead.

You can specify the path for the proper Perl distribution using the `PLUGIN_PARSER_PATH` environment variable in `SMGProxy.xml`. If `PLUGIN_PARSER_PATH` is not specified, SMG proxy will use the first `perl.exe` searched in `$PATH`.

Example:

```
<sc: ActivityDescription>
  <ego: Attribute name="hostType" type="xsd:string">NTX86</ego: Attribute>
  <ego: ActivitySpecification>
    <ego: Command>F:\soam_pro\ego\kernel\apod\smgproxy.exe</ego: Command>
    <ego: EnvironmentVariable
      name="SMGPROXY_TOP">${EGO_TOP}/smgproxy</ego: EnvironmentVariable>
    ...
    <ego: EnvironmentVariable
      name="PLUGIN_PARSER_PATH">c:/perl/bin/perl.exe</ego: EnvironmentVariable>
    <ego: WorkingDirectory>${EGO_TOP}/smgproxy</ego: WorkingDirectory>
    <ego: Umask>0022</ego: Umask>
  </ego: ActivitySpecification>
</sc: ActivityDescription>
```

Troubleshooting: Identifying why a repurpose request failed



If you cannot submit the request

Possible causes

- `vemkd` is down
- `SMGProxy` service is down

How to check

- If `vemkd` is down, you cannot use the `symadmin` command. Your request is rejected.
Check the `vemkd` log file: `SEGO_TOP/kernel/1og/vemkd.1og`, *host_name* on the SMG master host.
- If `SMGProxy` is down, confirm this with the `symclusters -l` command.
The `proxy_status` field indicates whether SMG proxy is down or ok.

For example:

symclusters -l

```
CLUSTER_NAME      : swprd
LAST_HEARTBEAT    : 2009-01-21T18:20:11
symversion        : 3.1
status            : OK
proxy_status      : OK
err_detail        : -
GUI_URL           : http://egodev05:27280/platform
vemkd_status      : OK
```

- If `proxy_status` is OK: `SMGProxy` is ready to serve repurpose requests.
- If `proxy_status` is ERROR: `SMGProxy` is unreachable.
 - Check the network connection between the SMG management system master host and the host on which `SMGProxy` is running
 - Check whether the `SMGProxy` service has been started in your Symphony cluster.
Log on to the Symphony master host, source the environment, and check whether the `SMGProxy` service has been started with the command `egosh service list`.

If you can submit the request but it never finishes or the status is ERROR

Possible causes

- If `SMGProxy` is running, there are problems with the `provision` script or the user-defined plug-in.

How to check

- Check the SMG proxy log file in the Symphony source and target clusters: `SEGO_TOP/smgproxy/1og/smgproxy.1og`, *host_name*
- Use the command `sympeek` to look at the `stdout/stderr` of the request (`provision` script and user-defined plug-in) to find out more details.

For example:

```
sympeek -c LDNPRD 49
Fri Feb 6 13:14:52 2009 REMOVE_TASK<96> 30317 /userA/ego123_1/eservice/apo/script/provision:
started by <userA> at Fri Feb 6 13:14:52 2009
```

```
Fri Feb 6 13:14:53 2009 REMOVE_TASK<96> 30317 checkHosts(): This REMOVE task specifies a host <rh3_1> that is either not part of the cluster, or is in the unavail state. This host will not be redomained.
Fri Feb 6 13:14:53 2009 REMOVE_TASK<96> 30317 checkHosts(): This REMOVE task specifies a host <rh3_2> that is either not part of the cluster, or is in the unavail state. This host will not be redomained.
Fri Feb 6 13:14:53 2009 REMOVE_TASK<96> 30317 checkHosts(): All hosts are busy or unavailable. This redomain task will fail.
Fri Feb 6 13:14:53 2009 REMOVE_TASK<96> 30317 doExit(): Switch_domain FAILED for the hosts: rh3_1 rh3_2
Fri Feb 6 13:14:53 2009 REMOVE_TASK<96> 30317 doExit(): Switch_domain FAILED for the following number of cores: 0
Fri Feb 6 13:14:53 2009 REMOVE_TASK<96> 30317 doExit(): The resource plan was not changed.
Fri Feb 6 13:14:53 2009 REMOVE_TASK<96> 30317 doExit(): Some hosts were either failed or busy. Resource plan changes in the destination cluster will not be made.
```

Troubleshooting: Completing an incomplete repurpose request

If for some reason a repurpose request did not fully move hosts from the source to target cluster, you can manually complete the incomplete request.

1. Check that the hosts moved to the target cluster.

Use the Symphony cluster command-line or Platform Management Console to see if the hosts are in the target cluster.

If the hosts were not moved, submit a new repurpose request to move the hosts.

2. Check that resource plan changes occurred in the source and target clusters.

Use the Symphony Platform Management Console to check the current resource plan. Update it if necessary.

You can cross-check the Symphony cluster's resource plan against the SMG resource plan.

FAQ

While performing the `addhosts` or `movehosts` operation, why does the "Capacity unit (Cores)" column on the "Repurpose Requests" page of the PMC only show "-" instead of values?

The "-" can also be observed in the "Capacity unit (Cores)" and Host Type columns when you view the "Repurpose Requests" details page. The host's capacity unit value and host type can only be retrieved when the host already belongs to the cluster. (The capacity unit value can be configured in the cluster rather than being a physical host's fixed configuration.) These values can be determined once the host is displayed in the "egosh resource list" command output). While performing the `addhost` or `move` operation, the host does not yet belong to the cluster, so the value is set to "-".

Command Reference

symadmin

Submits requests to remove hosts from a cluster, add hosts to a cluster, and to move hosts between clusters.

Synopsis

symadmin *subcommand* [*options*]

symadmin -h | **help**

symadmin -V

Description

Use `symadmin` to submit repurpose requests.

-h | **help**

Prints command usage to `stdout` and exits.

-V

Prints product version to `stdout` and exits.

Subcommand synopsis

symadmin movehosts

symadmin movehosts

[-c *comment*]

-m "*host_name host_name...*" | **-i** *hostfile*

-s *src_cluster_name*

-d *dst_cluster_name*

-e `SMC_CONSUMER_UPDATES="slots@consumer slots@consumer ..."`

-E `SMC_CONSUMER_UPDATES="slots@consumer slots@consumer ..."`

[-e `SMC_LOG_LEVEL=number`]

[-E `SMC_LOG_LEVEL=number`]

-e `SMC_RESOURCE_GROUP=resource_group_name`

-E `SMC_RESOURCE_GROUP=resource_group_name`

-e "`VAR=value`"

-E "`VAR=value`"

-e `KILL_WORKLOAD=1`

-u *user_account*

-x *password*

symadmin addhosts

symadmin addhosts

[-c *comment*]

-d *cluster_name*

-m "*host_name host_name...*" | **-i** *hosts_file*

[-e "VAR=*value*"] ...

[-e SMC_LOG_LEVEL=*number*]

-e SMC_CONSUMER_UPDATES="*slots@consumer slots@consumer ...*"

-e SMC_RESOURCE_GROUP=*resource_group_name*

-u *user_account*

-x *password*

symadmin rmhosts

symadmin rmhosts

[-c *comment*]

-m "*host_name host_name...*" | **-i** *hosts_file*

[-e "VAR=*value*"] ...

[-e SMC_LOG_LEVEL=*number*]

-e SMC_CONSUMER_UPDATES="*slots@consumer slots@consumer ...*"

-e SMC_RESOURCE_GROUP=*resource_group_name*

-e KILL_WORKLOAD=1

-s *cluster_name*

-u *user_account*

-x *password*

symadmin movehosts

Moves hosts from one specified cluster to another.

When the request is submitted, the SMC proxy invokes the provision script in the source cluster. The provision script:

- Changes cluster configuration by updating the resource plan (ConsumerTrees.xml) in the source cluster (if resource plan changes were specified in the command).
- Closes hosts that are selected for repurposing and checks that they are idle.

Hosts that have workload running will not be removed and the request will receive the status ERROR with the reason "Busy hosts".

- Runs the "move out" plug-in script. The result is written to a log file (result file), which is verified by the SMC proxy for successful completion.

When the provision script and "move-out" plug-in script are successful, vemkd connects to the SMC proxy in the target cluster to run the provision script in the target cluster. The provision script in the target

cluster changes cluster configuration (updates the resource plan if resource plan changes were specified in the command) and runs the "move in" plug-in script. Once the plug-in script is finished, the SMC proxy checks the result file to see if the repurposing was successful.

-c "comment"

Any descriptive comment that you want to attach to the request for your own purposes

-m "host_name host_name..." | -i hosts_file

Names of hosts to move from the source cluster to the target cluster. Host names are separated by spaces.

You can also specify host names in a text file and indicate the path and file name with the -i option. Separate host names with any space character (spaces or line breaks).

-e SMC_LOG_LEVEL=number

Log level at which the SMC proxy in the source cluster logs messages. The level is in numeric format. The default log level is 4 (LOG_WARNING). The higher the number, the more detail is logged in the log file.

Possible log levels:

- 0—LOG_EMERG: Logs only those messages in which the system is unusable.
- 1—LOG_ALERT: Logs those messages for which action must be taken immediately.
- 2—LOG_CRIT: Logs those messages that are critical.
- 3—LOG_ERR: Logs those messages that indicate error conditions.
- 4—LOG_WARNING: Logs those messages that are warnings or more serious messages. This is the default level of debug information.
- 5—LOG_NOTICE: Logs those messages that indicate normal but significant conditions or warnings and more serious messages.
- 6—LOG_INFO: Logs all informational messages and more serious messages.
- 7—LOG_DEBUG: Logs all debug-level messages.

-E SMC_LOG_LEVEL=number

Log level at which the SMC proxy in the target cluster logs messages. The level is in numeric format. The default log level is 4 (LOG_WARNING). The higher the number, the more detail is logged in the log file.

Possible log levels are the same as -e SMC_LOG_LEVEL.

-e SMC_CONSUMER_UPDATES="slots@consumer slots@consumer..."

Specifies from which consumers slots are to be taken in the source cluster and updates the resource plan.

To indicate multiple consumers, separate entries with a space.

If you specify an empty string "", it indicates that you do not want to make updates to any consumer's resource plan in the source cluster. Hosts are removed from an unowned set of resources in the source cluster.

-e SMC_RESOURCE_GROUP=resource_group_name

Name of the resource group in the source cluster from which slots are to be removed.

The resource group must exist in your source cluster.

-E SMC_RESOURCE_GROUP=*resource_group_name*

Name of the resource group in the target cluster to which slots are to be added.

The resource group must exist in your target cluster.

-e KILL_WORKLOAD=1

Only the value of 1 specifies that the workload will be killed if the host is busy. Any other value will not abort the workload.

-e "VAR=value"

Specifies other user-defined environment variables for the "move-out" plug-in. (-e can be specified multiple times.)

-E "VAR=value"

Specifies other user-defined environment variables for the "move-in" plug-in. (-E can be specified multiple times.)

-u *user_account*

SMC administrator account that you use to log on to the Platform Management Console. This account must have SMC administrator privileges.

-x *password*

Password for the SMC administrator account.

-s *src_cluster_name*

Cluster from which hosts are to be removed.

-d *dst_cluster_name*

Cluster to which hosts are to be added.

symadmin addhosts

Adds hosts to a specified cluster. Use this command when you have previously used `symadmin rmhosts` to remove hosts.

When the request is submitted, the SMC proxy invokes the provision script in the specified cluster. The provision script:

- Changes cluster configuration by updating the resource plan (ConsumerTrees.xml) in the specified cluster (if resource plan changes were specified in the command)
- Runs the "move in" plug-in script. Once the plug-in script is finished, the SMC proxy checks the result file to see if the repurposing was successful.

-c "*comment*"

Any descriptive comment that you want to attach to the request for your own purposes.

-m "*host_name host_name...*" | -i *hosts_file*

Names of hosts to add to the specified cluster. Host names are separated by spaces.

You can also specify host names in a text file and indicate the path and file name with the -i option. Separate host names with any space character (spaces or line breaks).

-e SMC_LOG_LEVEL=*number*

Log level at which the SMC proxy in the specified cluster logs messages. The level is in numeric format. The default log level is 4 (LOG_WARNING). The higher the number, the more detail is logged in the log file.

Possible log levels:

- 0—LOG_EMERG: Logs only those messages in which the system is unusable.
- 1—LOG_ALERT: Logs those messages for which action must be taken immediately.
- 2—LOG_CRIT: Logs those messages that are critical.
- 3—LOG_ERR: Logs those messages that indicate error conditions.
- 4—LOG_WARNING: Logs those messages that are warnings or more serious messages. This is the default level of debug information.
- 5—LOG_NOTICE: Logs those messages that indicate normal but significant conditions or warnings and more serious messages.
- 6—LOG_INFO: Logs all informational messages and more serious messages.
- 7—LOG_DEBUG: Logs all debug-level messages.

-e SMC_CONSUMER_UPDATES="*slots@consumer slots@consumer ...*"

Specifies to which consumers slots are to be added in the specified cluster and updates the resource plan.

To indicate multiple consumers, separate entries with a space.

If you specify an empty string " ", it indicates that you do not want to make updates to any consumer's resource plan in the specified cluster. The hosts will be added to the specified cluster as unowned resources.

-e SMC_RESOURCE_GROUP=*resource_group_name*

Name of the resource group in the specified cluster to which slots are to be added.

The resource group must exist in your specified cluster.

-e "*VAR=value*"

Specifies other user-defined environment variables for the "move-in" plug-in. (-e can be specified multiple times.)

-u *user_name*

SMC administrator account that you use to log on to the Platform Management Console. This account must have SMC administrator privileges.

-x *password*

Password for the SMC administrator account.

-d *cluster_name*

Cluster to which hosts are to be added.

symadmin rmhosts

Removes hosts from a specified cluster. Does not uninstall software from removed hosts.

Use this command when you want to close hosts and remove them from a cluster.

When the request is submitted, the SMC proxy invokes the provision script in the source cluster. The provision script:

- Changes cluster configuration by updating the resource plan (ConsumerTrees.xml) in the source cluster (if resource plan updates were specified in the command).
- Closes hosts that are selected for removal and checks that they are idle.

Hosts that have workload running will not be removed and the request will receive the status ERROR with the reason "Busy hosts".

- Runs the "move out" plug-in script. The result is written to a log file (result file), which is verified by the SMC proxy for successful completion.

-c "comment"

Any descriptive comment that you want to attach to the request for your own purposes.

-m "host_name host_name..." | -i hosts_file

Names of hosts to remove from the source cluster. Host names are separated by spaces.

You can also specify host names in a text file and indicate the path and file name with the -i option. Separate host names with any space character (spaces or line breaks).

-e SMC_LOG_LEVEL=number

Log level at which the SMC proxy in the source cluster logs messages. The level is in numeric format. The default log level is 4 (LOG_WARNING). The higher the number, the more detail is logged in the log file.

Possible log levels:

- 0—LOG_EMERG: Logs only those messages in which the system is unusable.
- 1—LOG_ALERT: Logs those messages for which action must be taken immediately.
- 2—LOG_CRIT: Logs those messages that are critical.
- 3—LOG_ERR: Logs those messages that indicate error conditions.
- 4—LOG_WARNING: Logs those messages that are warnings or more serious messages. This is the default level of debug information.
- 5—LOG_NOTICE: Logs those messages that indicate normal but significant conditions or warnings and more serious messages.
- 6—LOG_INFO: Logs all informational messages and more serious messages.
- 7—LOG_DEBUG: Logs all debug-level messages.

-e SMC_CONSUMER_UPDATES="slots@consumer slots@consumer ..."

Specifies from which consumers slots are to be removed in the source cluster and updates the resource plan.

To indicate multiple consumers, separate entries with a space.

If you specify an empty string "", you are indicating to not make any updates to any consumer's resource plan in the source cluster. Hosts are removed from an unowned set of resources in the source cluster.

-e SMC_RESOURCE_GROUP=resource_group_name

Name of the resource group in the source cluster from which slots are to be removed.

The resource group must exist in your cluster.

-e KILL_WORKLOAD=1

Only the value of 1 specifies that the workload will be killed if the host is busy. Any other value will not abort the workload.

-u *user_name*

The SMC administrator account that you use to log on to the Platform Management Console. This account must have SMC administrator privileges.

-x *password*

Password for the SMC administrator account.

-s *cluster_name*

Cluster from which slots are to be removed.

Examples

Move slots from several consumers in cluster1 to one consumer in cluster2

Move 12 slots from cluster1 to cluster2. Move host1 and host2.

Take 5 slots from consumer /a/b, 7 slots from consumer /a/c in the source cluster. Add the 12 slots to consumer /a/b in the target cluster.

Update the resource group ComputeHosts in both source and target clusters.

```
symadmin movehosts
-m "host1 host2"
-e SMC_CONSUMER_UPDATES="5@/a/b 7@/a/c"
-E SMC_CONSUMER_UPDATES="12@/a/b"
-e SMC_RESOURCE_GROUP=ComputeHosts
-E SMC_RESOURCE_GROUP=ComputeHosts
-u Admin
-x Admin
-s cluster1
-d cluster2
```

Move slots from several consumers in cluster1 to unowned slots in cluster2

Move 12 slots from cluster1 to cluster2. Move host1 and host2.

Take 5 slots from consumer /a/b, 7 slots from consumer /a/c in the source cluster. Add the 12 slots to the target cluster as unowned slots.

Update the resource group ComputeHosts in the source cluster.

Notice that in this example, since the slots are going to be unowned, -E SMC_CONSUMER_UPDATES is left blank. This indicates that you do not want to update the resource plan of any consumer in the target cluster.

```
symadmin movehosts
-m "host1 host2"
-e SMC_CONSUMER_UPDATES="5@/a/b 7@/a/c"
-E SMC_CONSUMER_UPDATES=" "
-e SMC_RESOURCE_GROUP=ComputeHosts
-E SMC_RESOURCE_GROUP=ComputeHosts
```

```
-u Admin
-x Admin
-s cluster1
-d cluster2
```

Move unowned slots in cluster1 to cluster2

Move 12 slots from cluster1 to cluster2. Move host1 and host2.

In this case, there is no need to specify the number of slots because the system will move the total number of slots on both hosts. There is no need to specify to which consumers slots are going since they are all going to be unowned. As a result, both `-e SMC_CONSUMER_UPDATES` and `-E SMC_CONSUMER_UPDATES` are left blank.

```
symadmin movehosts
-m "host1 host2"
-e SMC_CONSUMER_UPDATES=" "
-E SMC_CONSUMER_UPDATES=" "
-e SMC_RESOURCE_GROUP=ComputeHosts
-E SMC_RESOURCE_GROUP=ComputeHosts
-u Admin
-x Admin
-s cluster1
-d cluster2
```

Add hosts to cluster1 and update the resource plan

Add two hosts to cluster1 and run the "move-in" plug-in script on them. Update the resource plan to add 5 slots to /a/b, 7 slots to /a/c in the specified cluster.

```
symadmin addhosts
-m "host1 host2"
-e SMC_CONSUMER_UPDATES="5@/a/b 7@/a/c"
-e SMC_RESOURCE_GROUP=ComputeHosts
-u Admin
-x Admin
-d cluster1
```

Remove hosts from cluster1 and do not update the resource plan

Close and remove hosts from cluster1. Do not update any resource plans as these hosts are unowned.

```
symadmin rmhosts
-m "host1 host2"
-e SMC_CONSUMER_UPDATES=" "
-e SMC_RESOURCE_GROUP=ComputeHosts
-u Admin
-x Admin
-s cluster1
```

symclusters

Displays a list of clusters monitored through the SMG management system.

Synopsis

```
symclusters [-l]
```

```
symclusters -h | -V
```

Description

Displays a list of clusters monitored through the SMG management system.

By default, the command displays cluster name and last communication with the cluster.

- h**
Prints command usage to `stdout` and exits.
- v**
Prints product version to `stdout` and exits.

Options

- l**
Displays cluster information in long multiline format. In addition to the default fields, displays cluster status, SMG proxy status and any errors.

symhosts

Displays hosts in the specified cluster.

Synopsis

symhosts [-l] [-f] -c *cluster_name*

symhosts -h | -v

Description

Displays a list of hosts in the specified cluster.

Default output includes host name, host status, the total number of slots on the hosts, slots used, and resource group.

The cluster must have been added to the SMG management system.

- h**
Prints command usage to `stdout` and exits.
- v**
Prints product version to `stdout` and exits.

Options

- c**
Specifies the name of the cluster for which you want to view the host list.
- l**
Displays host information in a long multi-line format.
- f**
Displays only hosts that have no workload running on them.

See also

Use the command `symclusters` to get a list of all clusters in the SMG management system.

sympeek

Displays the `stdout` and `stderr` output of the provision script for the repurpose requests.

Synopsis

```
sympeek -c cluster_name -i request_ID
```

```
sympeek -h | -V
```

Description

Displays the standard output and standard error output that have been produced by the provision script for the specified repurpose request, up to the time that this command is invoked.

This command is useful for finding out why a repurpose request received the status `ERROR`.

-h

Prints command usage to `stdout` and exits.

-V

Prints product version to `stdout` and exits.

Options

-c *cluster_name*

Specifies the cluster name for the cluster for which you want to view the logs.

-i *request_ID*

Specifies the request ID for which you want to view the logs.

See also

`symclusters` to view a list of all clusters in your SMG management system

`symrequests` to view a list of all repurpose requests in the SMG management system

Examples

View the log for move repurpose request 18

For a move repurpose request, you would take a look at the log file in both the source and target clusters. The request ID would be the same.

For example, to view the log for the move request from cluster `cluster1` to `cluster2`, request 18:

```
sympeek -c cluster1 18
```

```
sympeek -c cluster2 18
```

symrequests

Displays repurpose requests that have been submitted along with their status.

Synopsis

symrequests [-l] [-i *request_ID*]

symrequests -h | **-V**

Description

Displays all repurpose requests that have been submitted for all clusters monitored in the SMG management system.

By default, displays request ID, request status, request type, source and target clusters, and number of hosts.

Repurpose request states:

- **NEW**—Request has been submitted but has not yet been dispatched to the SMG proxy daemon.
- **INPROGRESS**—The SMG proxy daemon has started the request.
- **DONE**—The provision script exited with a 0.
- **ERROR**—The provision script exited with a non-zero value. If you see an Error state with a "Busy host" reason, it indicates some hosts could not be moved as there was workload running on them. Resource plan changes were made to the source cluster but resource plan changes were not made to the target cluster.

Request types:

- **ADD**—Request to add hosts to a target cluster. This type of request can only be submitted with the `symadmin addhosts` command.
- **MOVE**—Request to remove hosts from a specific cluster, and add hosts to another cluster. This type of request is submitted through the command `symadmin movehosts` or through the SMG Platform Management Console. This request takes actions in both the source and target clusters: **REMOVE** in the source cluster, **ADD** in the target cluster.
- **REMOVE**—Request to remove hosts from a source cluster. This type of request can only be submitted with the `symadmin rmhosts` command.

-h

Prints command usage to `stdout` and exits.

-V

Prints product version to `stdout` and exits.

Options

-l

Displays information in multi-line format. In addition to the default fields, displays host names, resource groups, and detailed resource plan updates.

-i request_ID

Displays information about the specified repurpose request.

See also

`sympeek` to view more details for any requests that have the status **ERROR**.