

# **HPCC Systems®**

## **Configuring the HPCC Systems® Platform**

**Boca Raton Documentation Team**

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Boca Raton Documentation Team

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# Using Configuration Manager

Configuration Manager is the utility with which we configure the HPCC Systems platform. The HPCC Systems platform's configuration is stored in an XML file named **environment.xml**. When you install a package, a default single-node environment.xml is generated. After that, you can use the Configuration Manager to modify it and add nodes and configure components.

The Configuration Manager Wizard creates a similar file, but after it is generated, you must rename it and put it into place on each node.

Configuration Manager also offers an **Advanced View** which allows you to add instances of components or change the default settings for components. Even if you plan to use Advanced View, it is a good idea to start with a wizard generated configuration and use Advanced View to finish it.

This document will guide you through configuring an HPCC Systems environment using the Configuration Manager.

# Running the Configuration Manager

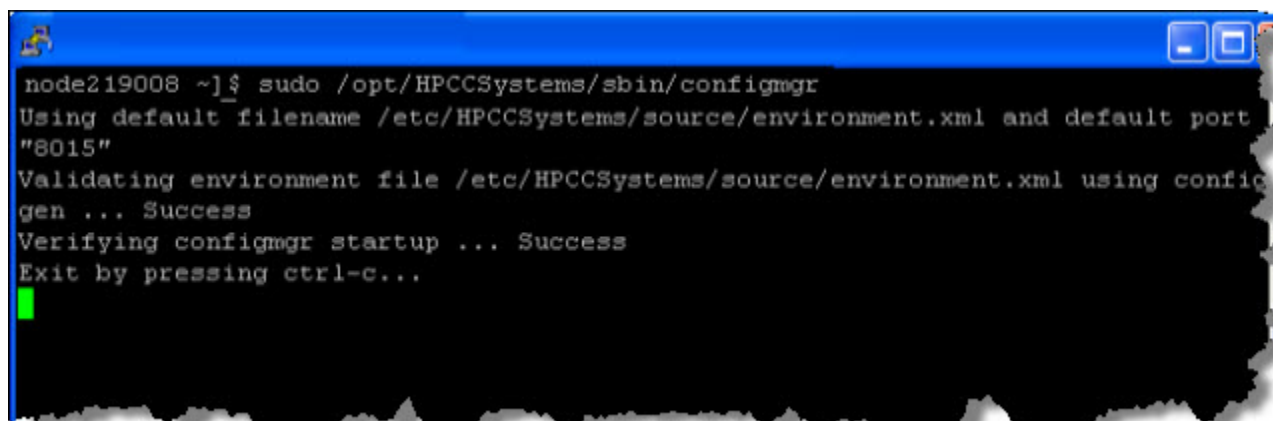
This document will guide you through configuring an HPCC Systems environment using the Configuration Manager.

The HPCC Systems package should already be installed on ALL nodes.

You can use any tool or shell script you choose.

1. SSH to a node in your environment and login as a user with sudo privileges. We would suggest that it would be the first node, and that it is a support node, however that is up to your discretion.
2. Start the Configuration Manager service on the node (again we would suggest that it should be on a support node, and further that you use the same node to start the Configuration Manager every time, but this is also entirely up to you).

```
sudo /opt/HPCCSystems/sbin/configmgr
```

A screenshot of a terminal window with a blue title bar. The terminal shows the command 'sudo /opt/HPCCSystems/sbin/configmgr' being executed on a node named 'node219008'. The output of the command is as follows:

```
node219008 ~]$ sudo /opt/HPCCSystems/sbin/configmgr
Using default filename /etc/HPCCSystems/source/environment.xml and default port
"8015"
Validating environment file /etc/HPCCSystems/source/environment.xml using config
gen ... Success
Verifying configmgr startup ... Success
Exit by pressing ctrl-c...
```

A green cursor is visible on the line following the last message.

3. Using a Web browser, go to the Configuration Manager's interface:

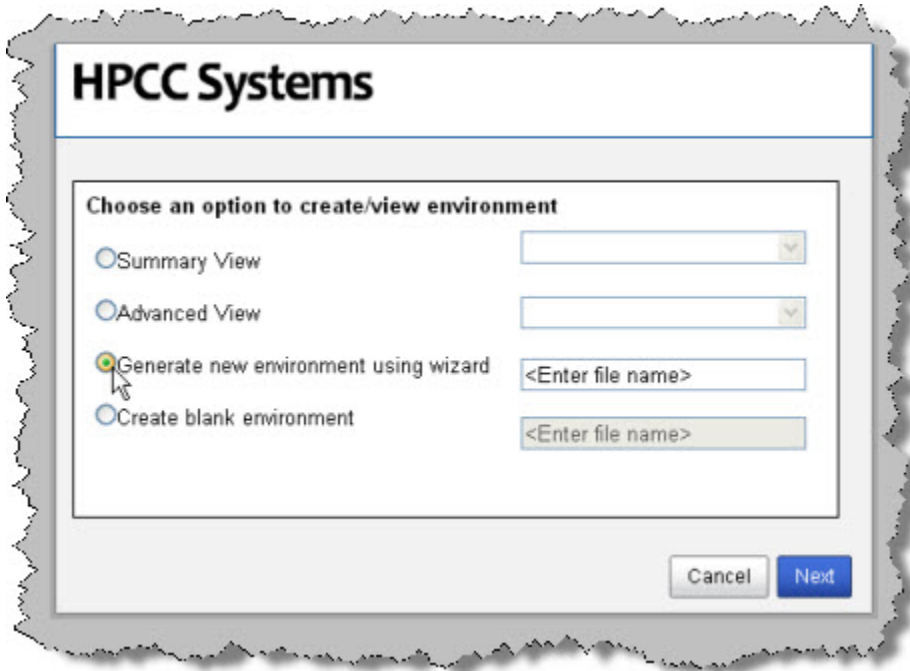
```
http://<ip of installed system>:8015
```

The Configuration Manager startup wizard displays.

There are different ways to configure your HPCC Systems platform. You can use the **Generate environment wizard** and use that environment or experienced users can then use the **Advanced View** for more specific customization. There is also the option of using **Create blank environment** to generate an empty environment that you could then go in and add only the components you would want.

## Environment Wizard

1. To use the wizard select the **Generate new environment using wizard** button.



2. Provide a name for the environment file.

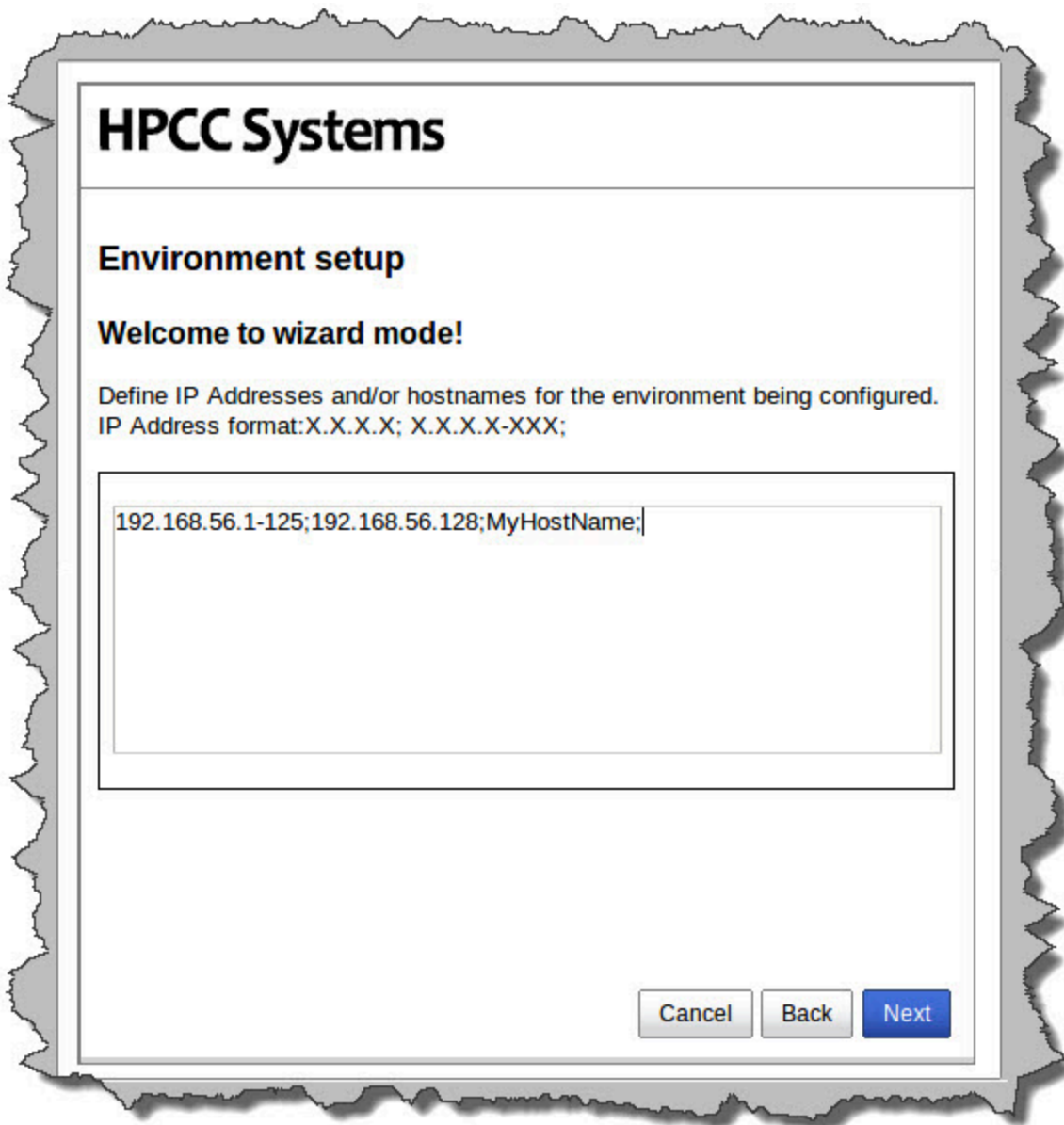
This will then be the name of the configuration XML file. For example, we will name our environment *NewEnvironment* and this will produce a configuration XML file named *NewEnvironment.xml* that we will use.

3. Press the Next button.

Next you will need to define the IP addresses that your HPCC Systems platform will be using.

4. Enter the IP addresses or hostname(s).

IP Addresses can be specified individually using semi-colon delimiters. You can also specify a range of IPs using a hyphen (for example, nnn.nnn.nnn.x-y). In the image below, we specified the IP addresses 10.239.219.1 through 10.239.219.100 using the range syntax, and also a single IP 10.239.219.111. Alternatively, you can enter the hostnames.



**HPCC Systems**

---

**Environment setup**

**Welcome to wizard mode!**

Define IP Addresses and/or hostnames for the environment being configured.  
IP Address format: X.X.X.X; X.X.X.X-XXX;

192.168.56.1-125;192.168.56.128;MyHostName;

Cancel Back Next

5. Press the Next button.

Now you will define how many nodes to use for the Roxie and Thor clusters.

6. Enter the appropriate values as indicated.

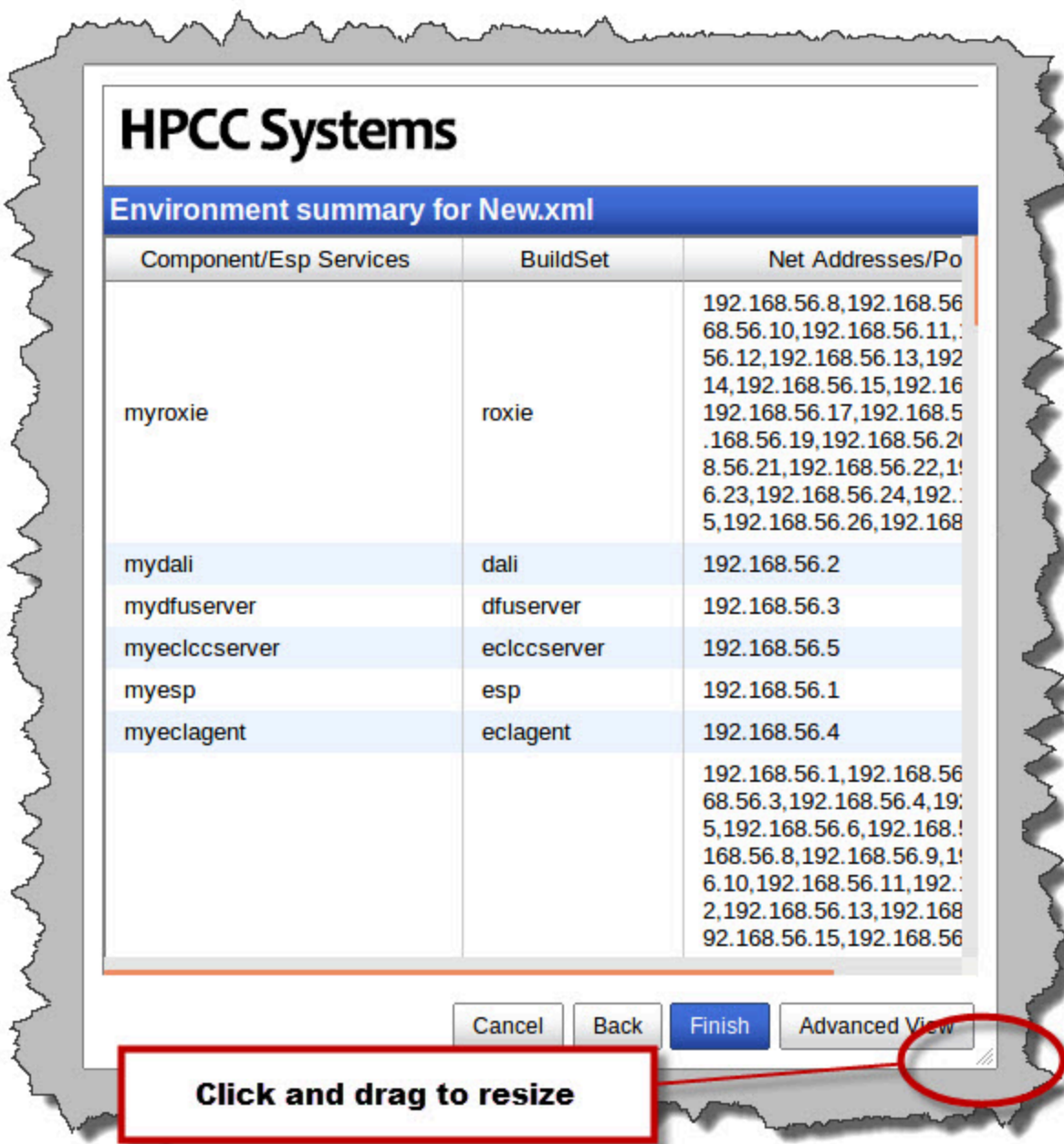
| HPCC Systems   |                                     |
|--|-------------------------------------|
| Environment setup  |                                     |
| Enter number of nodes for Roxie and Thor clusters. No Roxie/Thor cluster will be generated for zero (0) number of nodes. |                                     |
| Number of support nodes  | 7                                   |
| Number of nodes for Roxie cluster  | 20                                  |
| Number of slave nodes for Thor cluster<br>( A Thor Master will be added to the cluster and assigned to a support node)   | 100                                 |
| Number of Thor slaves per node (default 1)   | 1                                   |
| Enable Roxie on demand   | <input checked="" type="checkbox"/> |
| <div>Cancel Back Next</div>  |                                     |

|   |   |
|---|---|
| <b>Number of support nodes:</b>                   | Specify the number of nodes to use for support components. The default is 1.  |
| <b>Number of nodes for Roxie cluster:</b>         | Specify the number of nodes to use for your Roxie cluster. Enter zero (0) if you do not want a Roxie cluster.   |
| <b>Number of slave nodes for Thor cluster</b>     | Specify the number of slave nodes to use in your Thor cluster. A Thor master node will be added automatically. Enter zero (0) if you do not want any Thor slaves. |
| <b>Number of Thor slaves per node (default 1)</b> | Specify the number of Thor slave processes to instantiate on each slave node. Enter zero (0) if you do not want a Thor cluster.                                   |
| <b>Enable Roxie on demand</b>                     | Specify whether or not to allow queries to be run immediately on Roxie. (Default is true)   |

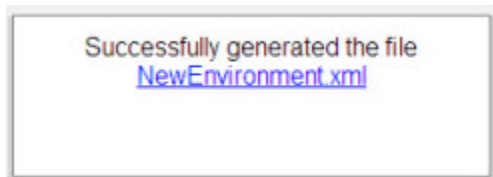
7. Press the **Next** button

The wizard displays the configuration parameters.

8. Press the **Finish** button to accept these values or press the **Advanced View** button to edit in advanced mode.



You will now be notified that you have completed the wizard.



At this point, you have created a file named NewEnvironment.xml in the `/etc/HPCCSystems/source` directory



Keep in mind, that your HPCC Systems configuration may be different depending on your needs. For example, you may not need a Roxie or you may need several smaller Roxie clusters. In addition, in a production [Thor] system, you would ensure that Thor and Roxie nodes are dedicated and have no other processes running on them. This document is intended to show you how to use the configuration tools. Capacity planning and system design is covered in a training module.

## Distribute the Configuration

1. Stop the HPCC Systems platform.

If it is running stop the HPCC Systems platform (on every node), using a command such as this:

```
sudo systemctl stop hpccsystems-platform.target
```

**Note:** You may have a multi-node system and a custom script such as the one illustrated in Appendix of the [Installing and Running the HPCC Systems Platform](#) document to start and stop your system. If that is the case please use the appropriate command for stopping your system on every node.



Be sure the HPCC Systems platform is stopped before attempting to copy the environment.xml file.

2. Back up the original environment.xml file.

```
# For example
sudo -u hpcc cp /etc/HPCCSystems/environment.xml /etc/HPCCSystems/source/environment-date.xml
```

**Note:** The live environment.xml file is located in your `/etc/HPCCSystems/` directory. ConfigManager works on files in `/etc/HPCCSystems/source` directory. You must copy from this location to make an environment.xml file active.

You can also choose to give the environment file a more descriptive name, to help differentiate any differences.

Having environment files under source control is a good way to archive your environment settings.

3. Copy the new .xml file from the source directory to the `/etc/HPCCSystems` and rename the file to *environment.xml*

```
# for example
sudo -u hpcc cp /etc/HPCCSystems/source/NewEnvironment.xml /etc/HPCCSystems/environment.xml
```

4. Copy the `/etc/HPCCSystems/environment.xml` to the `/etc/HPCCSystems/` on to *every* node.

You may want to use a script to push out the XML file to all nodes. See the *Example Scripts* section in the Appendix of the [Installing and Running the HPCC Systems Platform](#) document. You can use the scripts as a model to create your own script to copy the environment.xml file out to all your nodes.

5. Restart the HPCC Systems platform on all nodes.

# Configuration Manager Advanced View

For the advanced user, the Advanced View offers access to adding additional instances of components or making configuration settings for individual components.

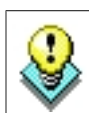
## Using ConfigMgr in Advanced Mode

This section shows some of the configuration options in Advanced Mode. There are a few different ways to configure your system. If you are not an experienced user you can use the Generate environment wizard discussed in the previous section. The following steps will detail the Advanced set up.

1. SSH to the first box in your environment and login as a user with sudo privileges.
2. If it is running, stop the HPCC Systems platform using this command on every node:

```
sudo systemctl stop hpccsystems-platform.target
```

**Note:** If you have a large system with many nodes, you may want to use a script to perform this step. See the *Example Scripts* section in the Appendix of the [Installing and Running the HPCC Systems Platform](#) document.

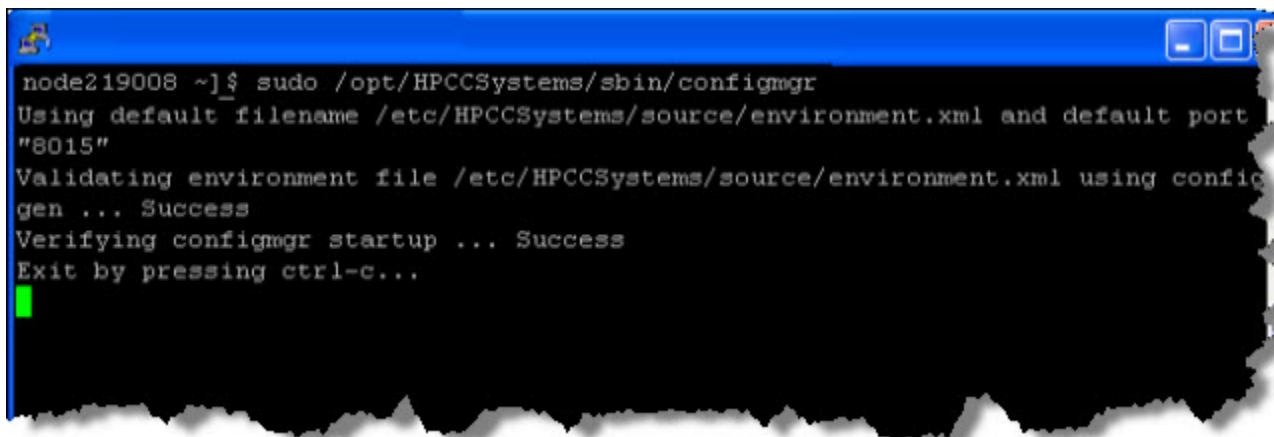


You can use this command to confirm HPCC Systems processes are stopped:

```
sudo systemctl status hpccsystems-platform.target
```

3. Start the Configuration Manager service on one node (usually the first node is considered the head node and is used for this task, but this is up to you).

```
sudo /opt/HPCCSystems/sbin/configmgr
```



```
node219008 ~]$ sudo /opt/HPCCSystems/sbin/configmgr
Using default filename /etc/HPCCSystems/source/environment.xml and default port
"8015"
Validating environment file /etc/HPCCSystems/source/environment.xml using config
gen ... Success
Verifying configmgr startup ... Success
Exit by pressing ctrl-c...
```

4. Using a Web browser, go to the Configuration Manager's interface:

```
http://<ip of installed system>:8015
```

The Configuration Manager startup wizard displays.

5. Select **Advanced View**, then press the **Next** button.

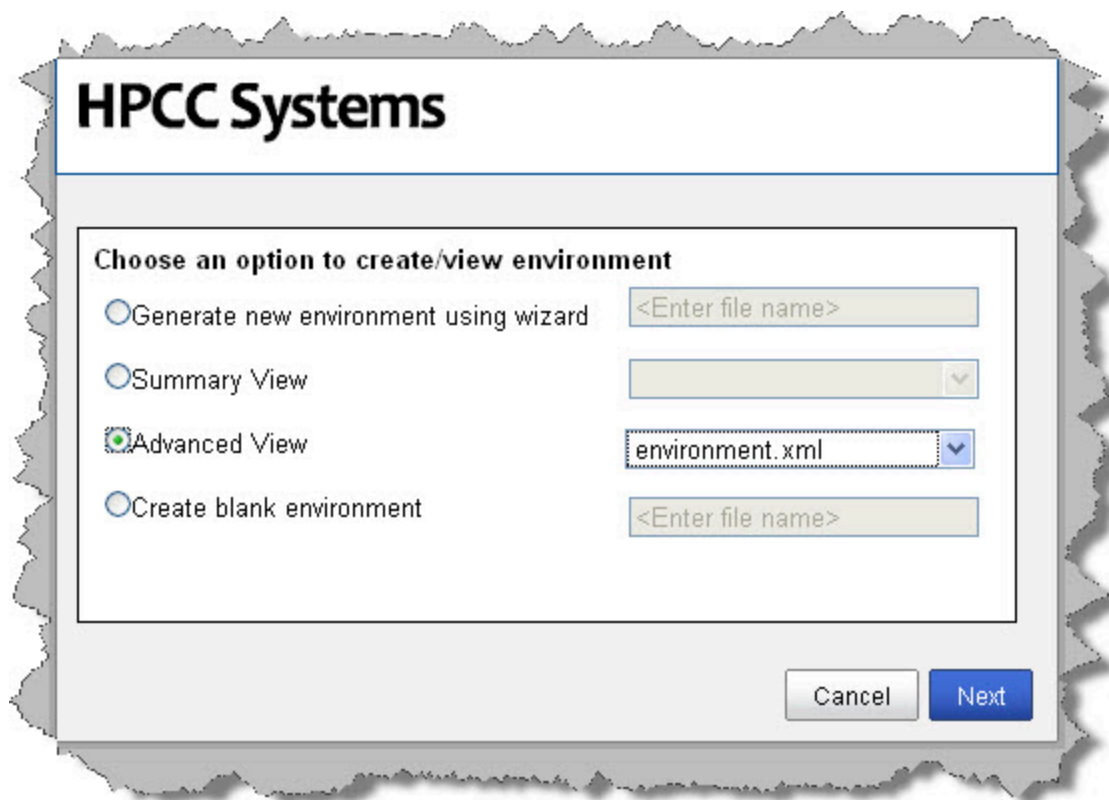
There are a few different ways to configure your system. If you are not an experienced user you can use the Generate environment wizard discussed in the previous section.

6. Select an XML file from the drop list.

This list is populated from versions of an environment XML file in your server's /etc/HPCCSystems/source/ directory.

The system will check the current environment file and if a match is found here it will highlight in blue the current environment file being used.

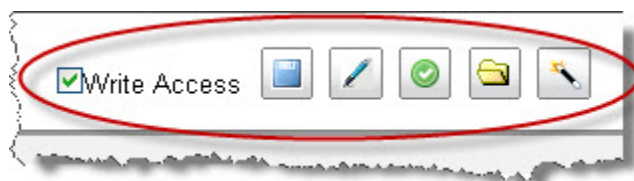
7. Press the **Next** button.





8. The Configuration Manager interface displays.


|  |   |
|--|---|
|  | <p>Default access is read-only. Many options are only available when write-access is enabled.</p> <p>Gain write access by checking the <b>Write Access</b> checkbox.</p> <p>Unchecking this box returns the environment to read-only mode. All menu items are disabled in read-only mode.</p> <p>Closing the web page automatically removes any write-access locks.</p> |
|--|---|


9. Check the **Write Access** box.




The **Save** button  validates and saves the environment.

The **Save Environment As** button  validates and lets you specify the environment filename to save.

The **Validate Environment** button  just validates the current environment including any changes that have not yet been saved.

The **Open Environment** button  allows you to open a new environment file to work on.

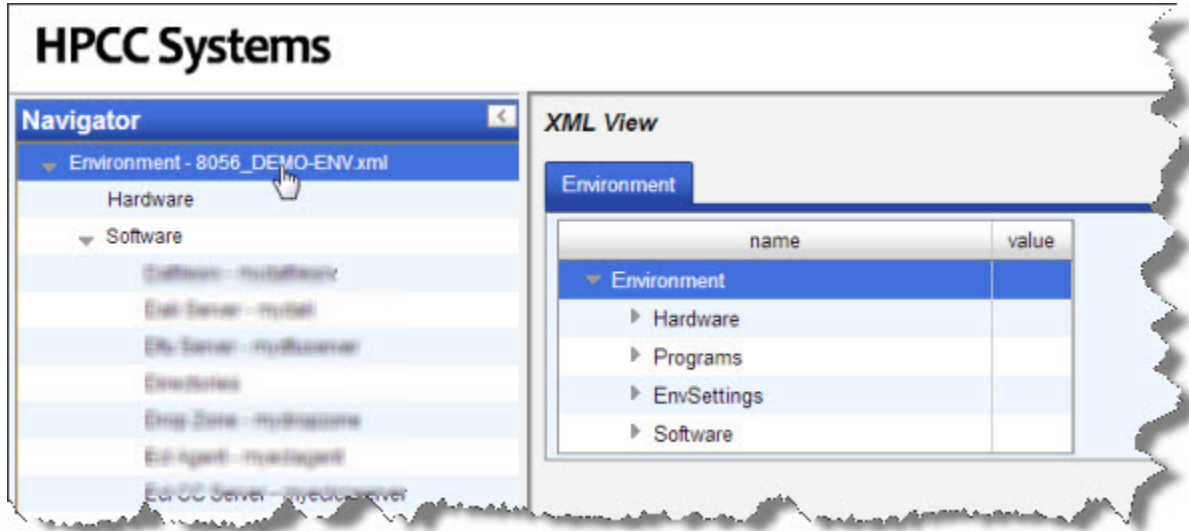
The **Wizard** button  will bring up the Configuration Manager chooser form which will allow you to create or view an environment file where you can also launch the configuration wizard.

These buttons are only enabled in Write Access mode.

## XML View

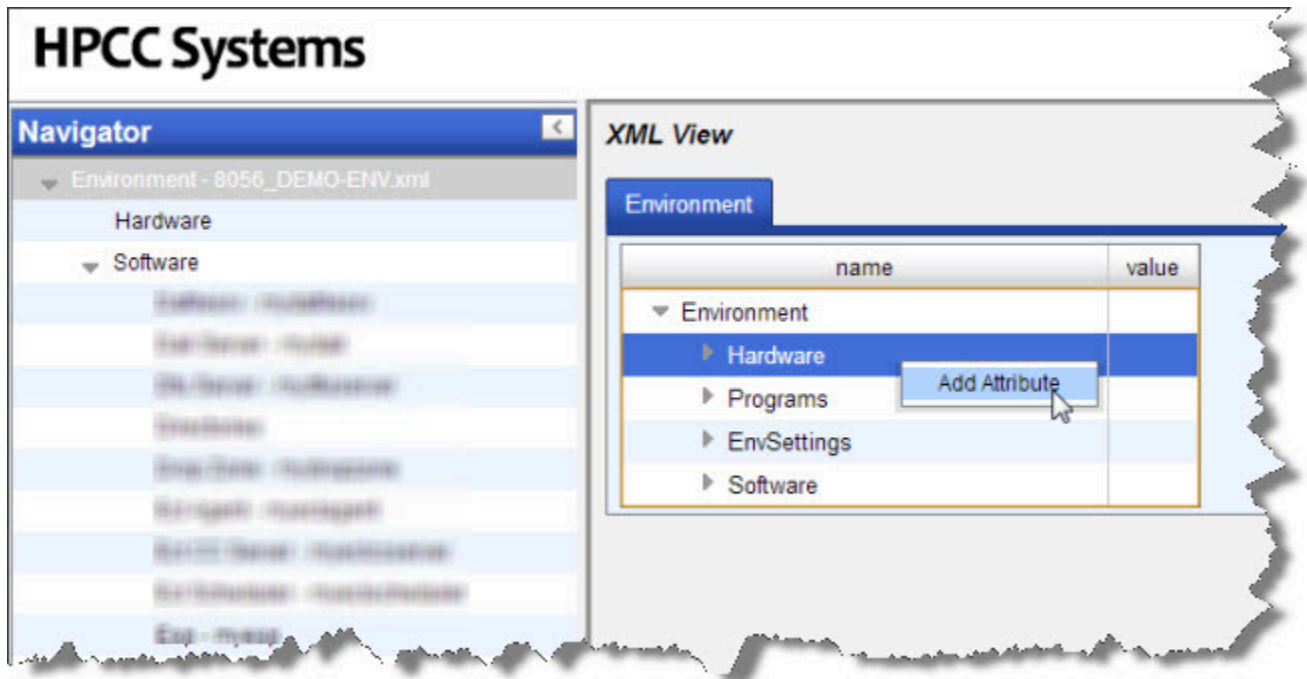
In the advanced view of Configuration Manager, you can optionally choose to work with the XML View.

To see the configuration in XML View, click on the Environment heading in the Navigator panel on the left side.



You can access all attributes through the XML view.

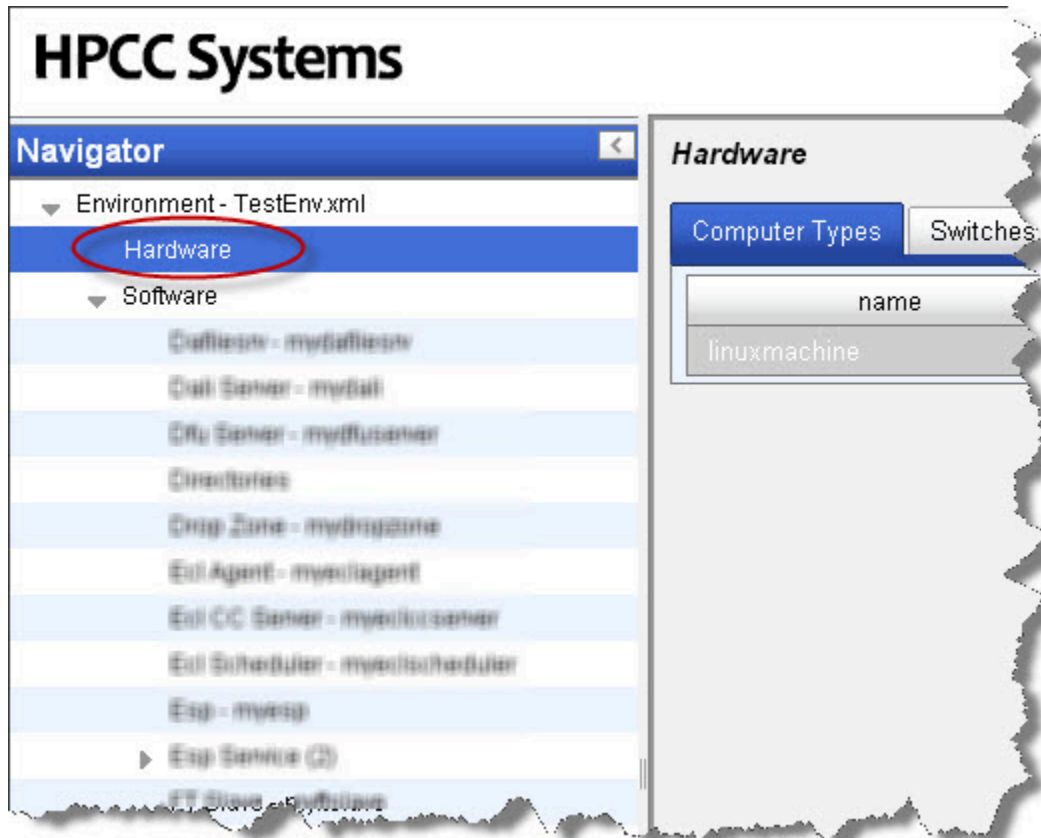
If you wish to add an attribute that does not exist, right-click on one of the components then you can choose to add an attribute.



## Hardware Section

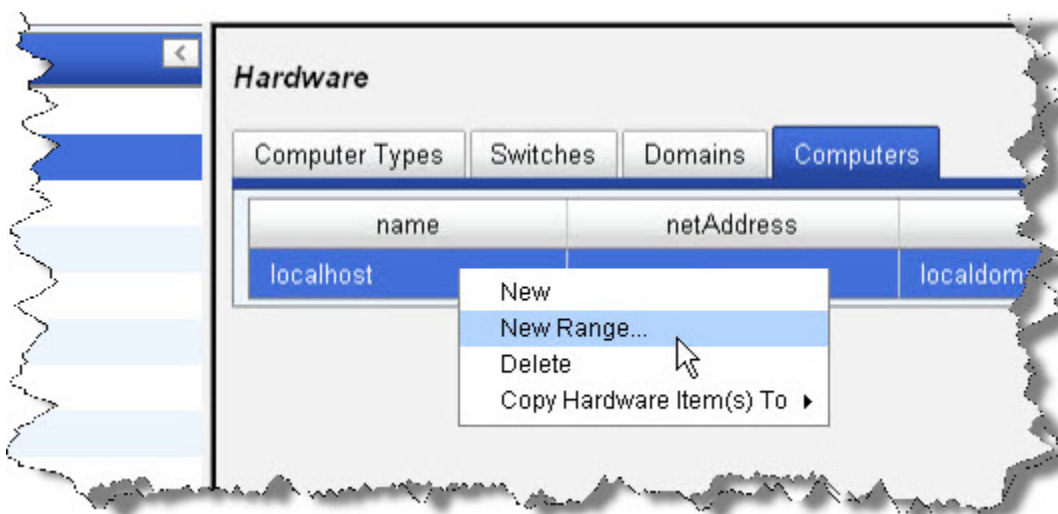
This section allows you to define your list of servers. When defining instances of components, you will choose from servers in this list.

1. Select **Hardware** in the Navigator panel on the left side.



2. Select the **Computers** tab.

3. right-click on one of computers listed, then select New Range.



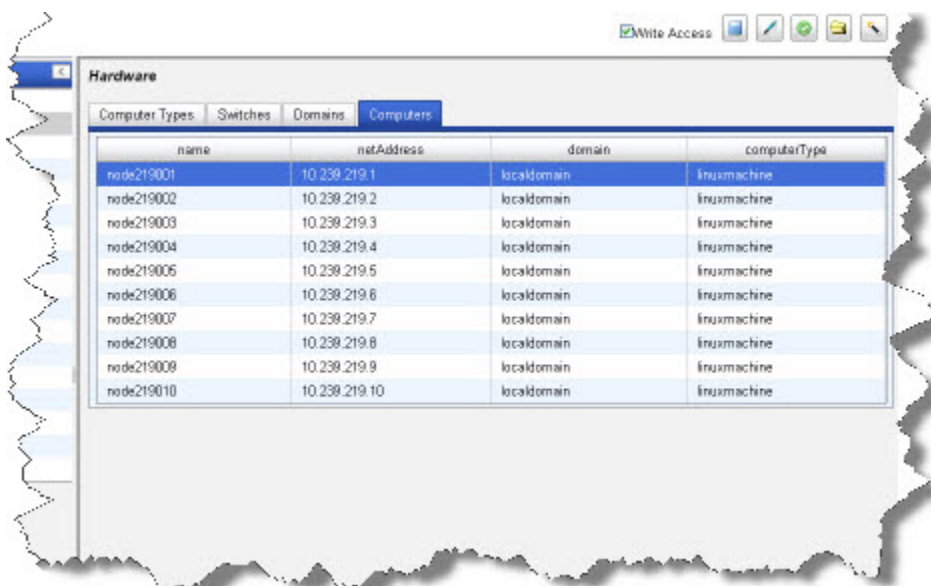
4. Specify the following:

- Name Prefix - any name that will help you to identify the node or range
- Start IP Address
- Stop IP Address

The IP Addresses can be specified in a range if all your host IP addresses are consecutively numbered. If the IP addresses are not sequential you should repeat the process for each individual IP address and just add the IP address in both the start and stop IP address field. You will then need to repeat the process for each node.

5. Press the **OK** button.

The list of nodes now displays with the nodes that you just added.



Next, edit each System Server component instance and set it to a newly defined node.

6.

Click the  disk icon to save

7. Expand the **Software** section, if necessary, in the Navigator panel on the left side, by clicking on the ► button.

## Software Section

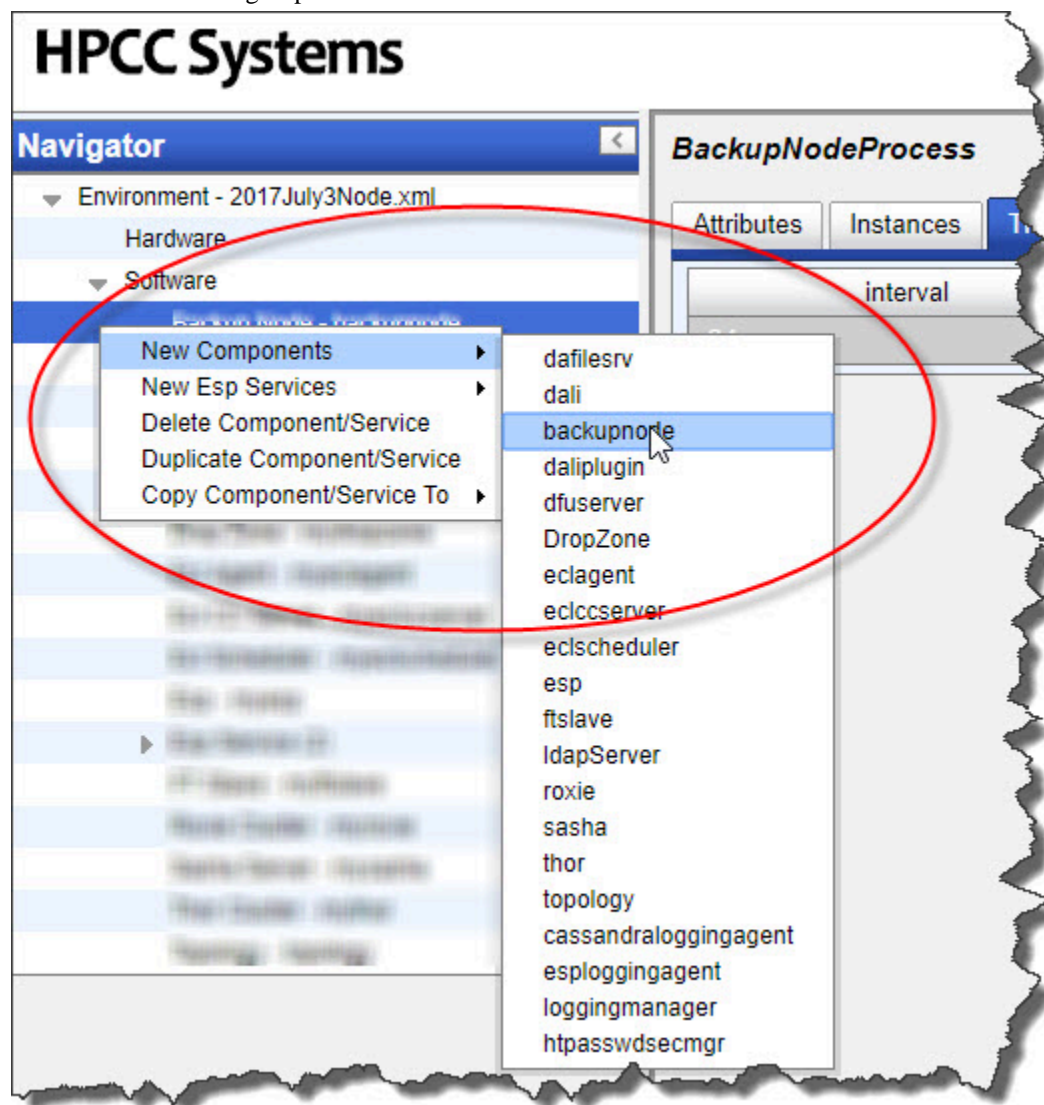
Use the software components section to configure software components of the HPCC Systems platform. Most software components are actual running processes; however, some are just definitions used by the system. These definitions are used by the configuration generator.

Items that appear in **red** indicate optional values. They are only written to the environment if you add to or change that value. If untouched, they will not appear in the environment XML file.

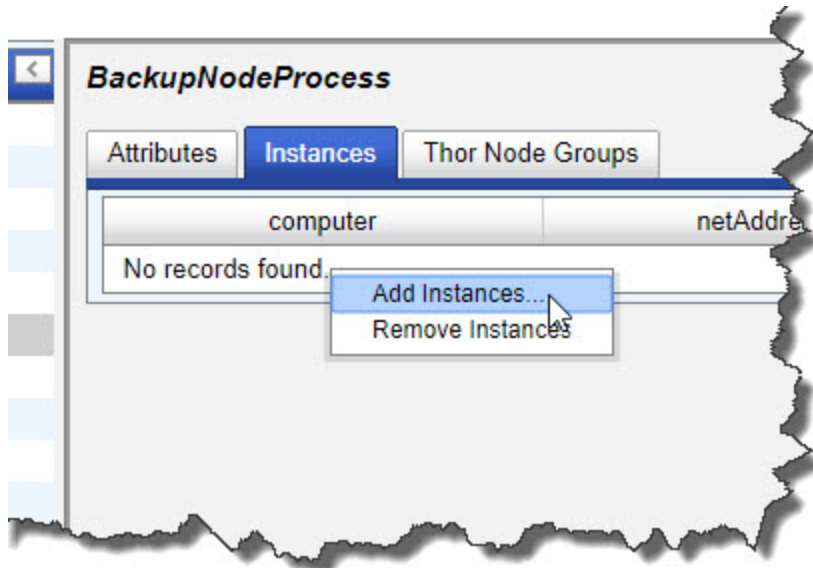
## Backupnode

Backupnode allows you to back up Thor clusters at regular intervals. The Backupnode component is a way to allow administrators to manage the backupnode process without using a cron job.

To configure scheduled Thor node backups, add the backupnode component, choose the hardware instance to run it on and then add Thor groups to it.



1. Right click on the **Software** component in the **Navigator** panel (on the right side), choose **New Components** then **backupnode** from the drop list.
2. From the tabs on the right side, select the **Instances** tab.
3. Right click on the **computer** column and choose **Add Instances...**



4. Select the computer for the backupnode component, or press **Add Hardware** to add a new computer instance. You would always want to run backupnode on the Thor master of the cluster.

5. Select the **Thor Node Groups** tab.

6. Right click on the the **Interval** column and choose the interval and/or Thor group to back up.

7.

Click the  disk icon to save

The default backup locations are:

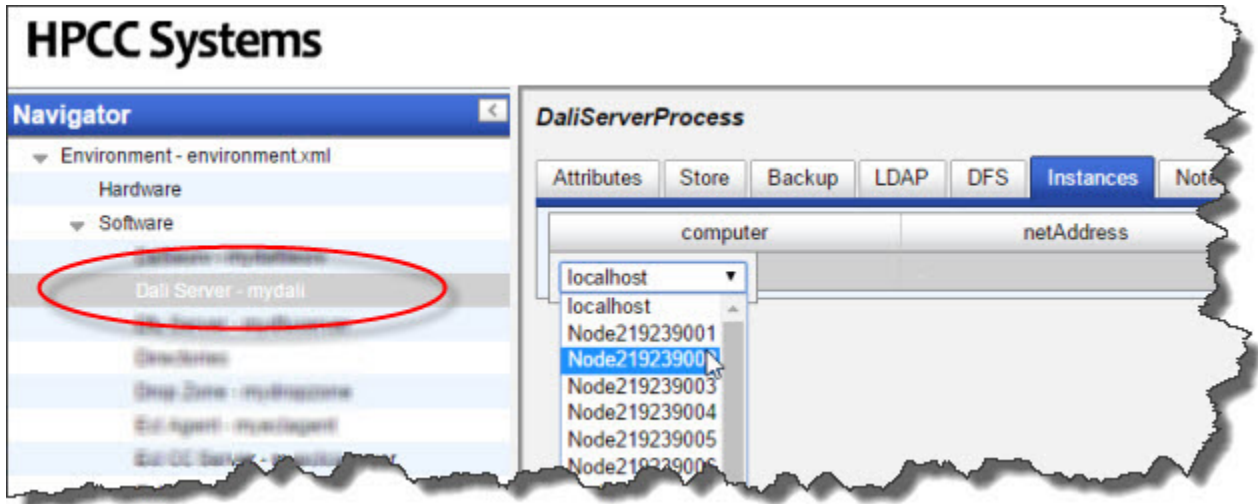
```
/var/lib/HPCCSystems/hpcc-data/backupnode/<thorname>/last_backup
```

The interval attribute of the backupnode component determines how many hours between backups.

## Dali

### Instances

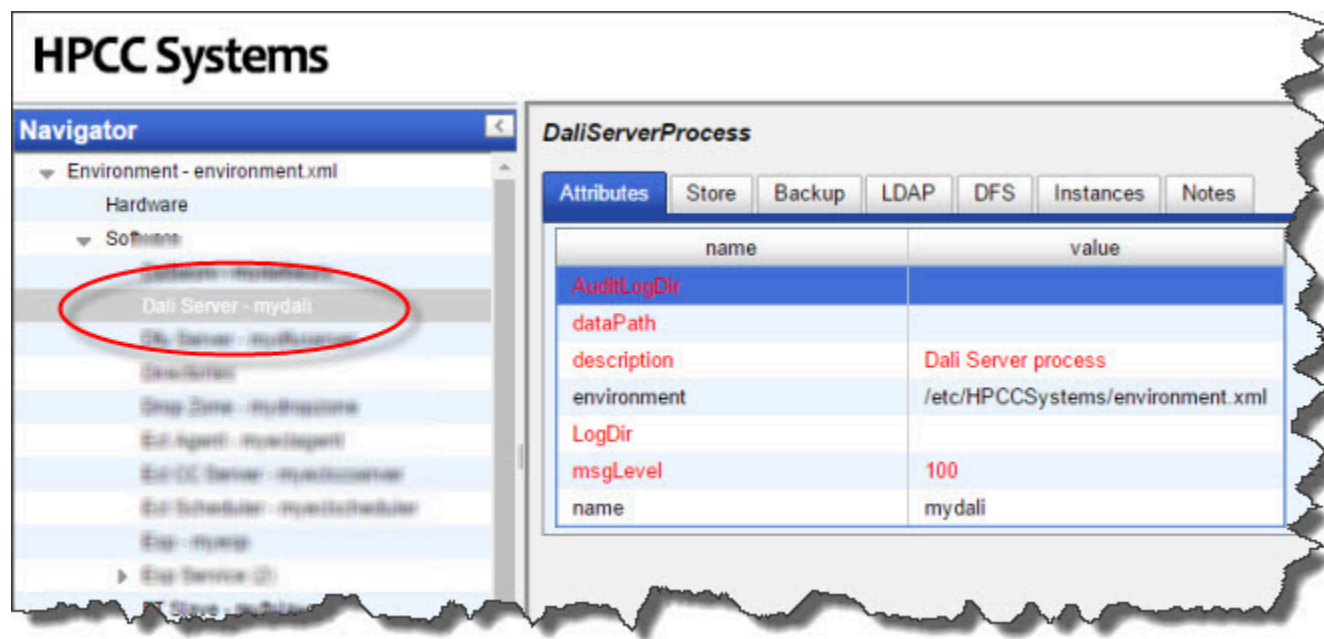
1. Select **Dali Server** in the Navigator panel on the left side.
2. Select the Instances tab.
3. In the computer column, choose a node from the drop list as shown below:



4. Click the  disk icon to save

## DaliServer attributes

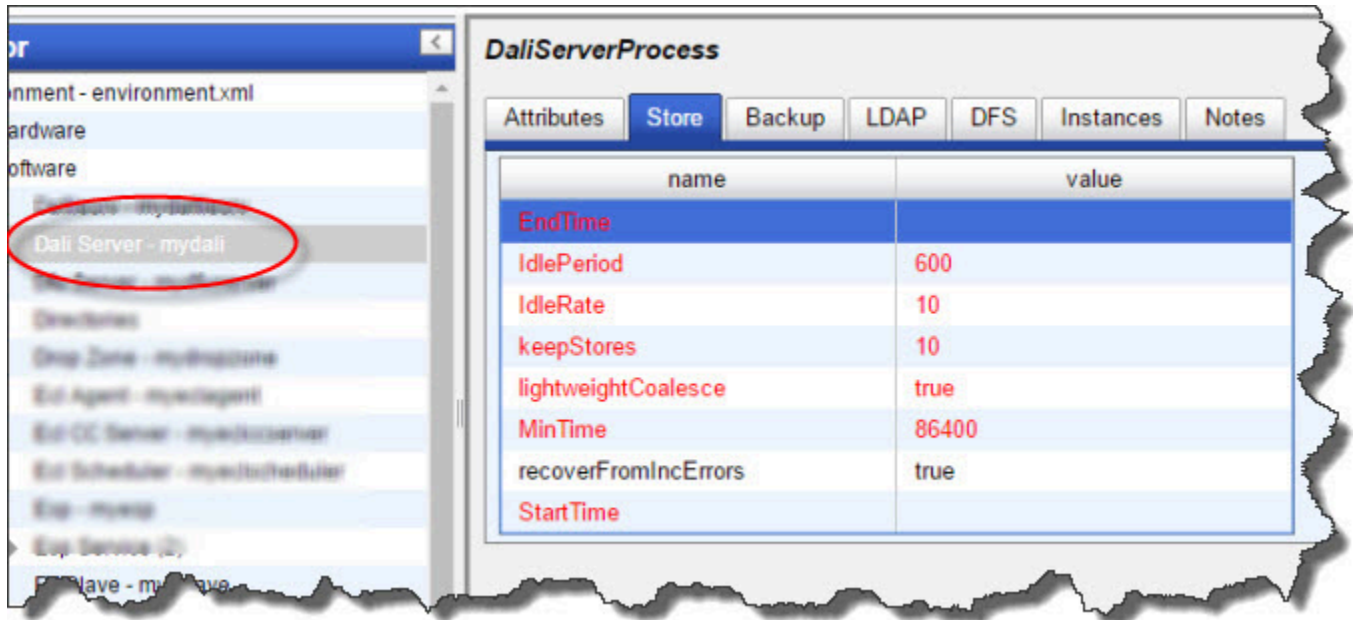
This section describes the DaliServer attributes.



| attribute   | description   | values              | required |
|-------------|---|---------------------|----------|
| name        | Name for this process                                   |                     | required |
| description | Description for this process                            | Dali Server process | optional |
| msgLevel    | Severity threshold for reporting errors in log file     | 100                 | optional |
| dataPath    | Directory in which dali's data files will be written to |                     | optional |
| LogDir      | Directory in which to store server log files            |                     | optional |
| AuditLogDir | Directory in which to store audit log files             |                     | optional |
| environment | Path to an xml file containing an Environment to use    |                     | optional |

## DaliServer store

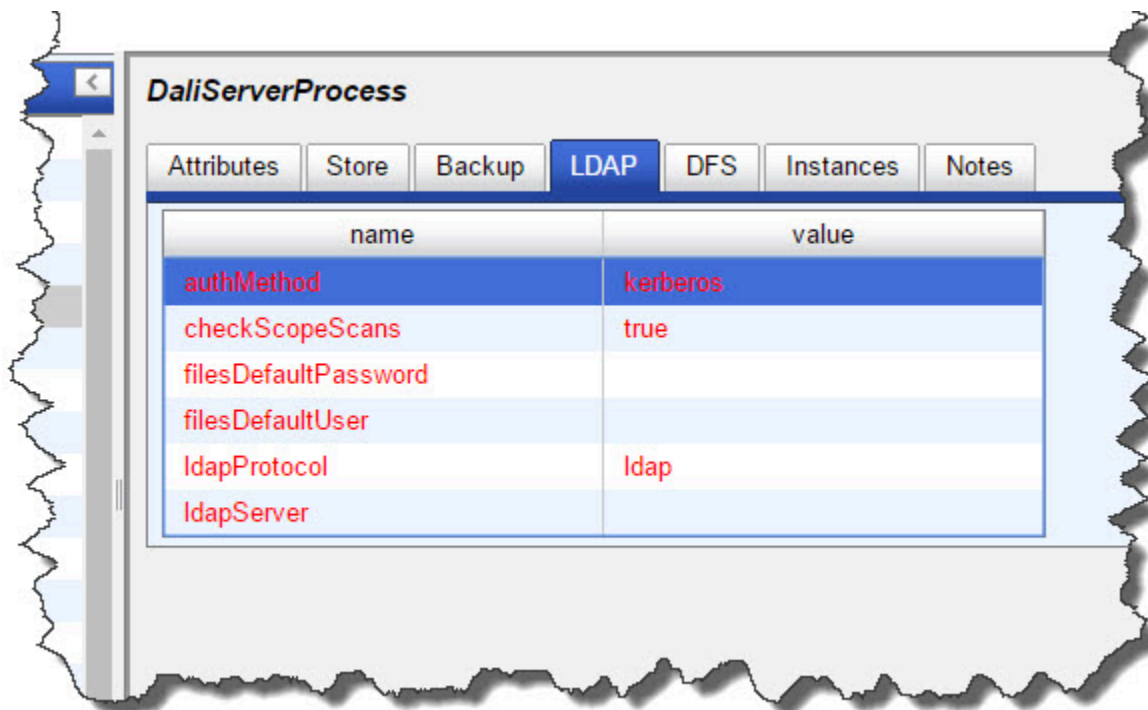
This section describes the attributes configuring how Dali handles the system data store.



| attribute            | description  | values | required |
|----------------------|--|--------|----------|
| lightweightCoalesce  | Enable non memory loaded consolidation of store                  | true   | optional |
| IdlePeriod           | Period of client to server quiet time to trigger store save      | 600    | optional |
| IdleRate             | Number of transaction per minute to be considered quiet time     | 10     | optional |
| MinTime              | Minimum amount of time between lightweight store saves           | 86400  | optional |
| StartTime            | Start time of lightweight coalesce checking                      |        | optional |
| EndTime              | End time of lightweight coalesce checking                        |        | optional |
| keepStores           | Number of old saved stores to keep                               | 10     | optional |
| recoverFromIncErrors | Switch on to auto recover from corruption to delta files on load | true   | optional |

## DaliServer LDAP options

This section describes the DaliServer LDAP tab.



| attribute            | description  | values   | required |
|----------------------|--|----------|----------|
| ldapServer           | The ldap server to be used for authentication.           |          | optional |
| ldapProtocol         | The protocol to use - standard ldap or ldap over SSL.    | ldap     | optional |
| authMethod           | The protocol to use for LDAP authentication.             | kerberos | optional |
| filesDefaultUser     | The default username for Files access (ActiveDirectory). |          | optional |
| filesDefaultPassword | The default password for filesDefaultUser.               |          | optional |
| checkScopeScans      | Enable LDAP checking for all logical file listings       | true     | optional |

## DaliServer Notes

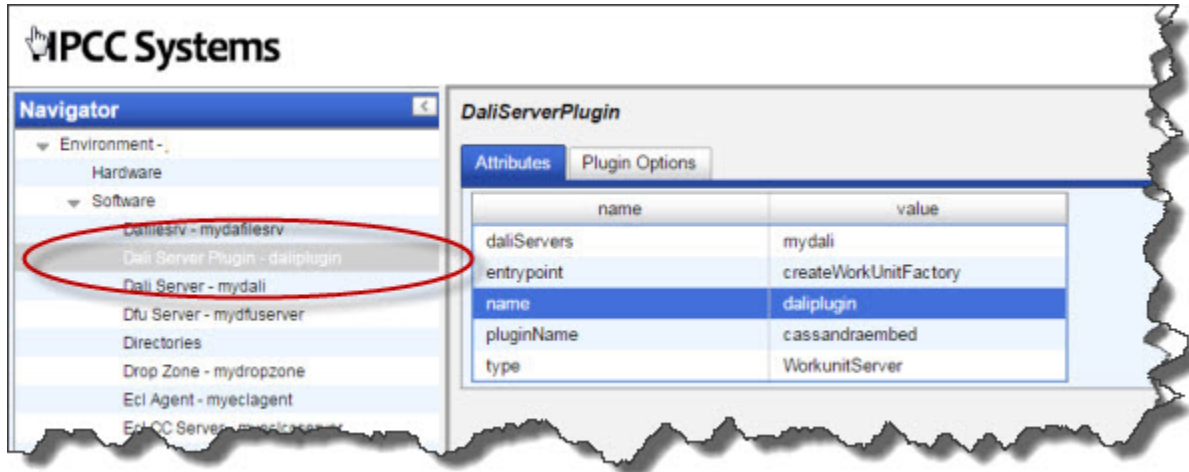
This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## DaliServerPlugin

DaliServerPlugin allows you to add plugin functionality to a Dail server.

### DaliServerPlugin attributes

This section describes the DaliServerPlugin attributes.



| attribute   | description  | values                | required |
|-------------|--|-----------------------|----------|
| name        | Name for this dali server plugin                                   |                       | required |
| entrypoint  | Plugin entrypoint method   | createWorkUnitFactory | required |
| daliServers | Specifies the dali server to which this plugin is associated with. |                       | required |
| pluginName  | name of the plugin   |                       | required |
| type        | Specifies the type of the plugin                                   |                       | optional |
| entrypoint  | Name for this dali server plugin                                   | createWorkUnitFactory | required |

## DaliServerPlugin Options

This section describes the DaliServerPlugin options

These options are available for the DaliServerplugin when configuring a Casandra server. See the System Administrator's Guide for more details about configuring a Cassandra server as a system datastore.

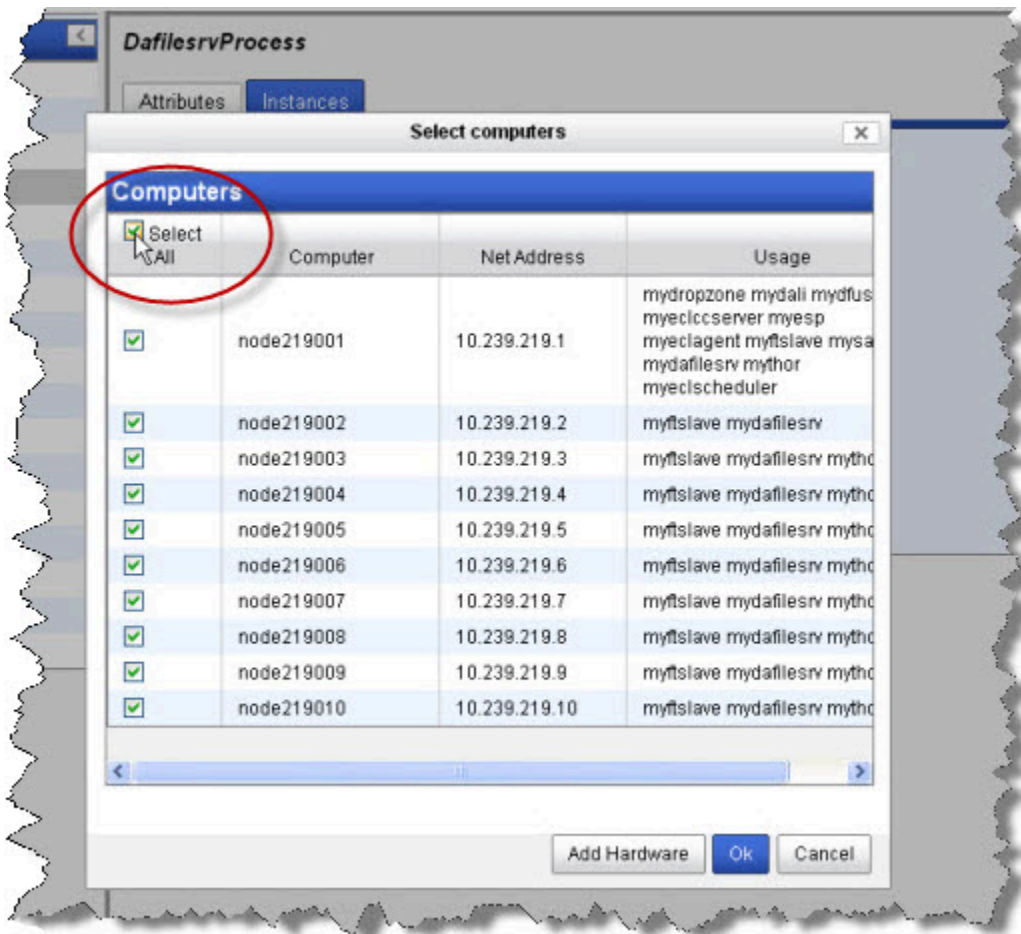
|                  |  |
|------------------|--|
| randomWuidSuffix | An integer value indicating how many randomized digits to append to workunits. Set this if you need to create workunits at a high rate to reduce the risk of collisions (which would slow down the process of creating a new unique workunit id).  |
| traceLevel       | An integer value indicating how much tracing to output from Cassandra workunit operations. Set to zero or do not set in normal usage.  |
| partitions       | An integer value indicating how many ways to partition the data on a Cassandra cluster. The default is 2. The value only takes effect when a new Cassandra workunit repository is created. Larger values permit scaling to a more distributed store but at the expense of some overhead on smaller stores where the scaling is not needed. |
| prefixsize       | An integer value specifying the minimum number of characters that must be provided when wildcard searching in the repository. Larger values will be more efficient but also more restrictive on users. The default is 2. As with partitions, this value only takes effect when a new Cassandra workunit repository is created.             |
| keyspace         | The name of the Cassandra keyspace to use for the HPCC Systems data store. The default is <i>hpcc</i> .  |
| user             | The username to use if the Cassandra server is configured to require credentials.  |
| password         | The password to use if the Cassandra server is configured to require credentials.  |

## Dafilesrv Process

### Dafilesrv Instances

Dafilesrv is a helper process that every node needs.

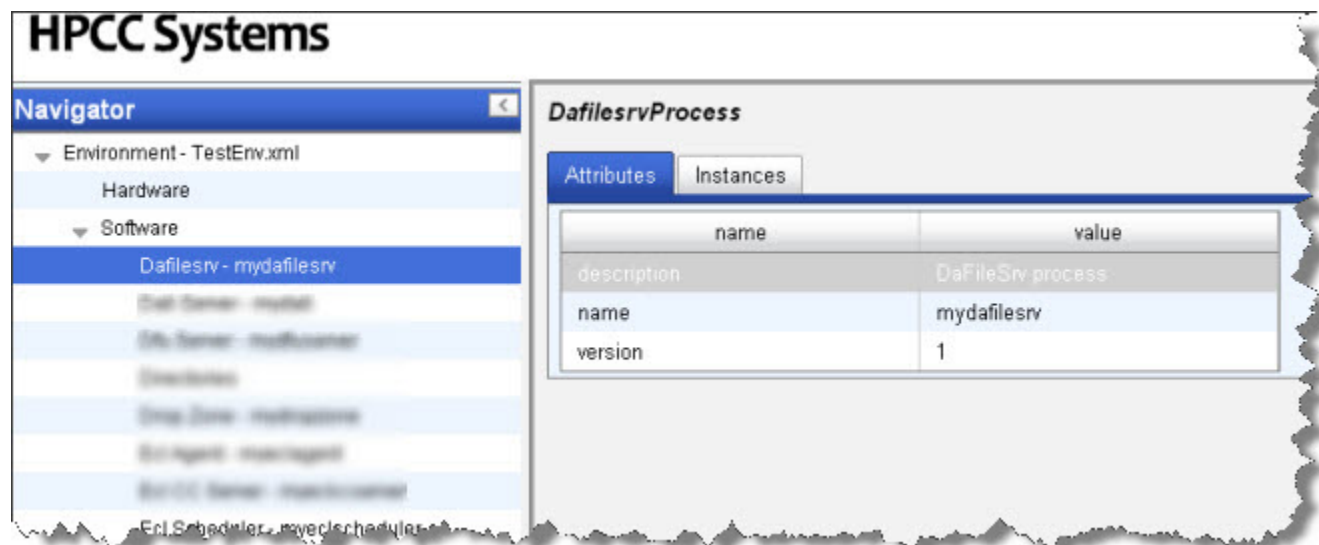
1. Select Dafilesrv in the Navigator panel on the left side.
2. Select the Instances tab.
3. Right-click on a computer in the computer column, and select Add Instance .
4. Select all computers in the list by checking the **Select All** box, then press the **OK** button.



5. Click the  disk icon to save

## Dafilesrv attributes

This section describes the Dafilesrv attributes.

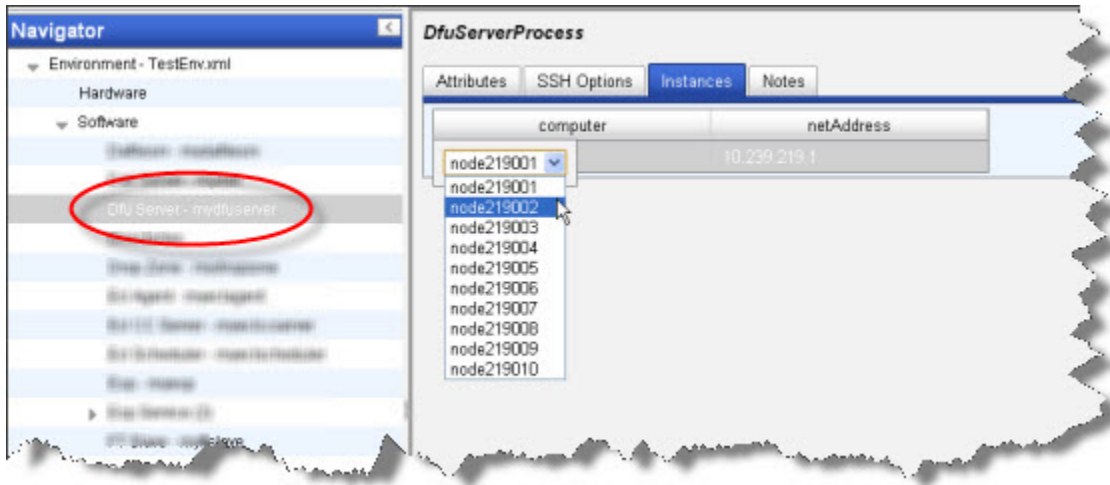


| attribute            | description   | values            | required |
|----------------------|---|-------------------|----------|
| name                 | Name for this process   |                   | required |
| description          | Description for this process  | DaFileSrv process | optional |
| version              | Version identifier used to select which process will be started   | 1                 | optional |
| parallelRequestLimit | Defines the maximum number of concurrent dafilesrv requests allowed. Requests that exceed the limit will be delayed. A value of 0 disables throttling. This a global setting. | 20                | optional |
| throttleDelayMs      | Defines how many milliseconds delayed requests will be delayed by. This a global setting.   | 5000              | optional |
| throttleCPULimit     | If after the initial delay, the CPU % falls below this setting, the transaction will be allowed to continue, i.e. the limit can be exceeded this way. This a global setting.  | 75                | optional |

## DFU Server

### DfuServer Instances

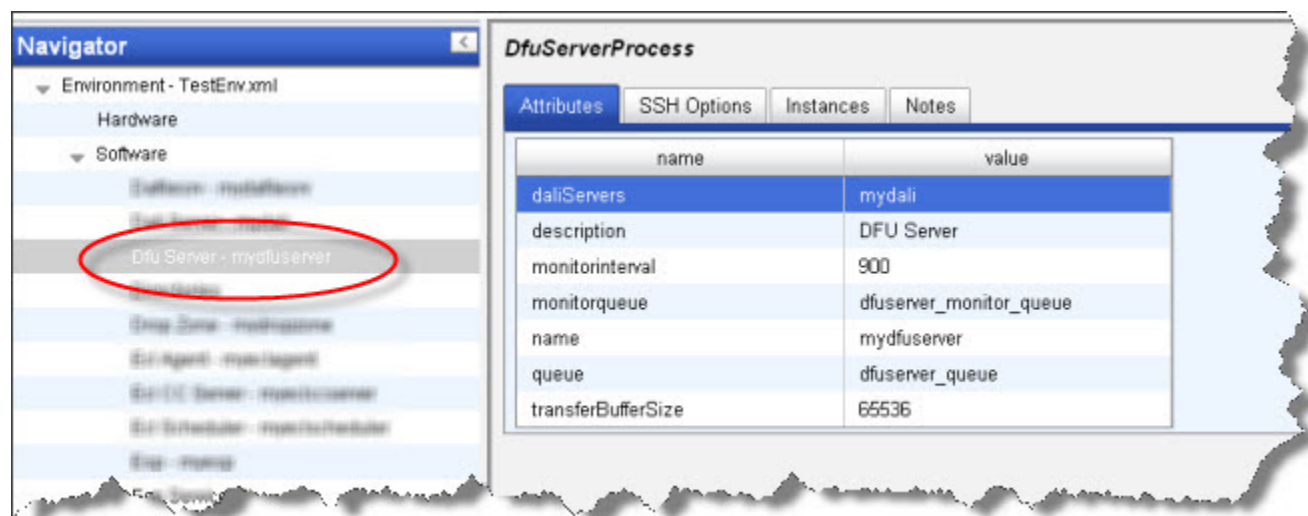
1. Select **DFU Server** in the Navigator panel on the left side.
2. Select the Instances tab.
3. In the computer column, choose a node from the drop list as shown below:



4. Click the  disk icon to save

## DfuServer Attributes Tab

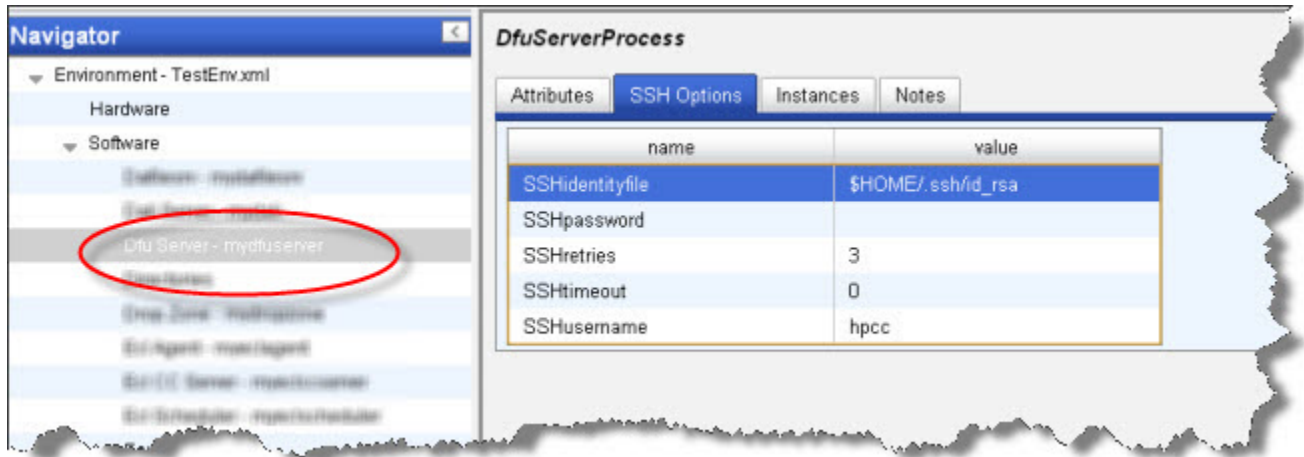
This section describes the DfuServer attributes.



| attribute          | description   | values                  | required |
|--------------------|---|-------------------------|----------|
| name               | Name for this process   | dfuserver               | required |
| description        | Description for this process                                    | DFU Server              | optional |
| daliServers        | Specifies the dali server to which this DFU server is attached. |                         | required |
| queue              | Specifies the queue name to send DFU Server jobs to.            | dfuserver_queue         | required |
| monitorqueue       | Specifies the queue name to send DFU monitoring jobs to.        | dfuserver_monitor_queue | required |
| monitorinterval    | Specifies the polling interval for DFU monitoring (in seconds). | 900                     | optional |
| transferBufferSize | Default buffer size used when transferring data.                | 65536                   | optional |

## DfuServer SSH Options

This section describes the DfuServer SSH Options..



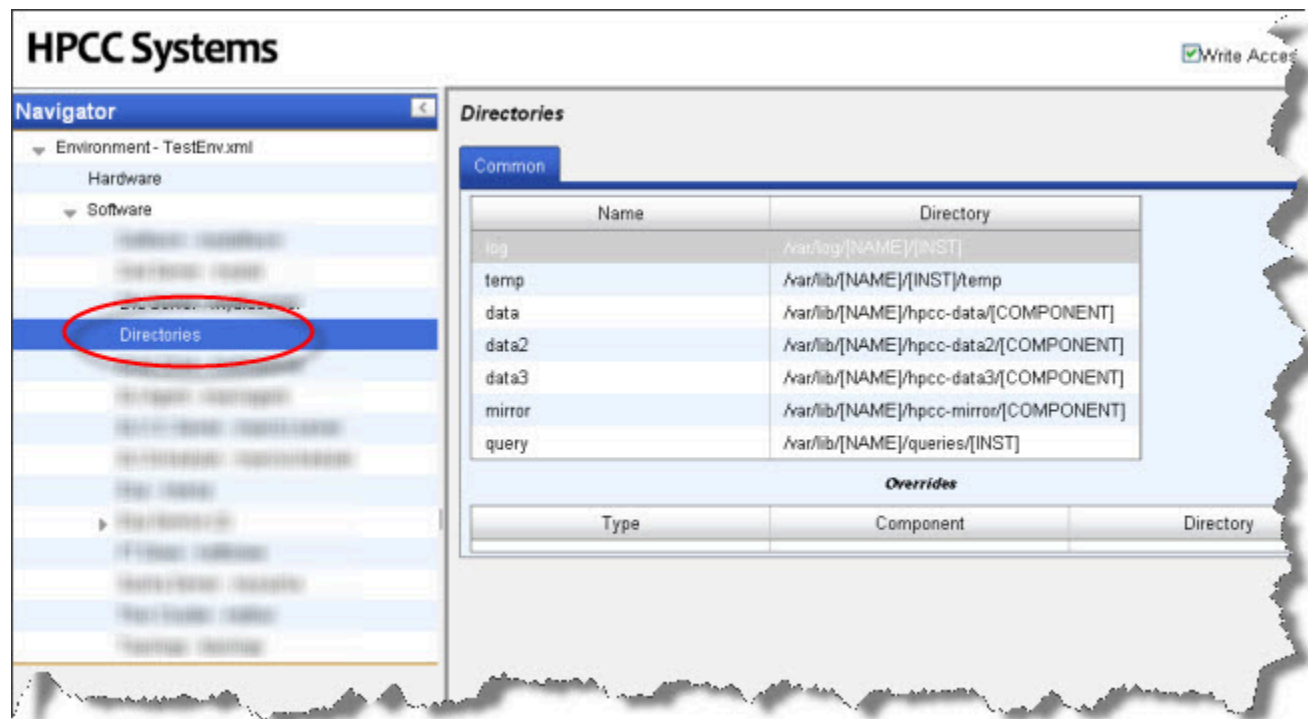
| attribute       | description   | values             | required |
|-----------------|---|--------------------|----------|
| SSHidentityfile | location of identity file (private key) on Thor master                            | \$HOME/.ssh/id_rsa | optional |
| SSHusername     | Username to use when running Thor slaves  | hpcc               | optional |
| SSHpassword     | Fixed password - only required if no identity file present NB <b>**insecure**</b> |                    | optional |
| SSHtimeout      | Timeout in seconds for SSH connects   | 0                  | optional |
| SSHretries      | Number of times to retry failed connect   | 3                  | optional |

## DfuServer Notes

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## Directories

The Directories component is a global definition used by other components to determine the directories they will use for various functions.



| Name          | Directory                   | Description                              |
|---------------|-----------------------------|--|
| <b>log</b>    | /var/log/[NAME]/[INST]      | Location for Log files                   |
| <b>temp</b>   | /var/lib/[NAME]/[INST]/temp | Location for temp files                  |
| <b>data</b>   |                             | Base Location for data files             |
| <b>data2</b>  |                             | Base Location for 2nd copy of roxie data |
| <b>data3</b>  |                             | Reserved for future use                  |
| <b>mirror</b> |                             | Base Location for mirror data files      |
| <b>query</b>  |                             | Base Location for Queries                |

## Drop Zone

A Drop Zone (or landing zone) is a location where files can be transferred to or from your HPCC Systems installation. The drop zone is a logical combination of a path and one or more servers.

Multiple drop zones allow you to configure different top level folders for one or more servers. Multiple servers for a single drop zone provides a logical grouping of distinct locations. Multiple drop zones are useful to allow different permissions for users or groups.

To add a drop zone:

1. Right-click on the Navigator panel on the left side and choose **New Components**
2. Select **Drop Zone**

## Drop Zone Attributes

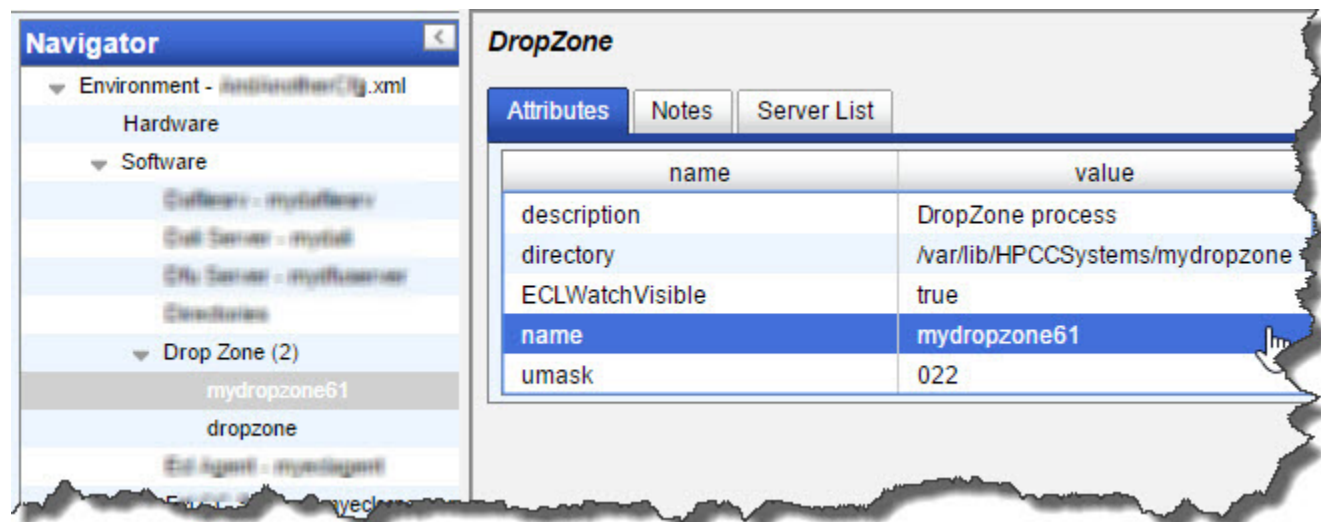
You can change the configuration of your drop zone using the attributes tab. If you have multiple drop zones, select the drop zone to configure from the Navigator panel on the left side.

To change the drop zone attributes:

1. On the **Attributes** tab, select the Attribute to modify.
2. Double-click on the value on the right side of the attribute table for the value you wish to modify.

For example, select the **name** attribute, double click on the **value** column and provide the drop zone with a more meaningful name.

3. Click the disk icon to save.



| attribute   | description                                   | values                          | required |
|-------------|---|---------------------------------|----------|
| name        | Name for this process                         | dropzone                        | required |
| description | Description for this process                  | DropZone process                | optional |
| directory   | The directory where the drop zone is located. | /var/lib/HPCCSystems/mydropzone | required |

| attribute       | description                   | values | required |
|-----------------|-------------------------------|--------|----------|
| umask           | umask for desprayed files     | 022    | optional |
| ECLWatchVisible | Allow access from ECLWatch UI | true   | optional |

## Drop Zone Server List

This tab allows you to add any servers that you wish to configure as a part of the selected drop zone.

To add a server to the current drop zone:

1. Select the **Drop Zone** to configure from the Navigator panel on the left side.
2. Select the **Server List** tab, right-click on the Server Address field and choose **Add**.
3. Enter the hostname or IP address of the server.
4. Click the disk icon to save.

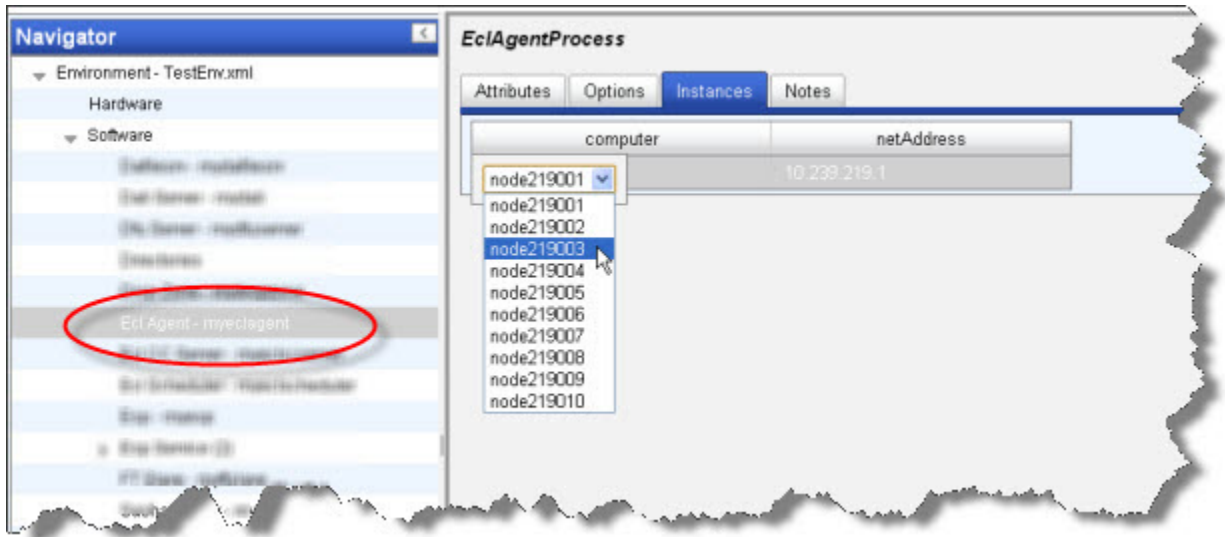
## Drop Zone Notes

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## ECL Agent

### Instances

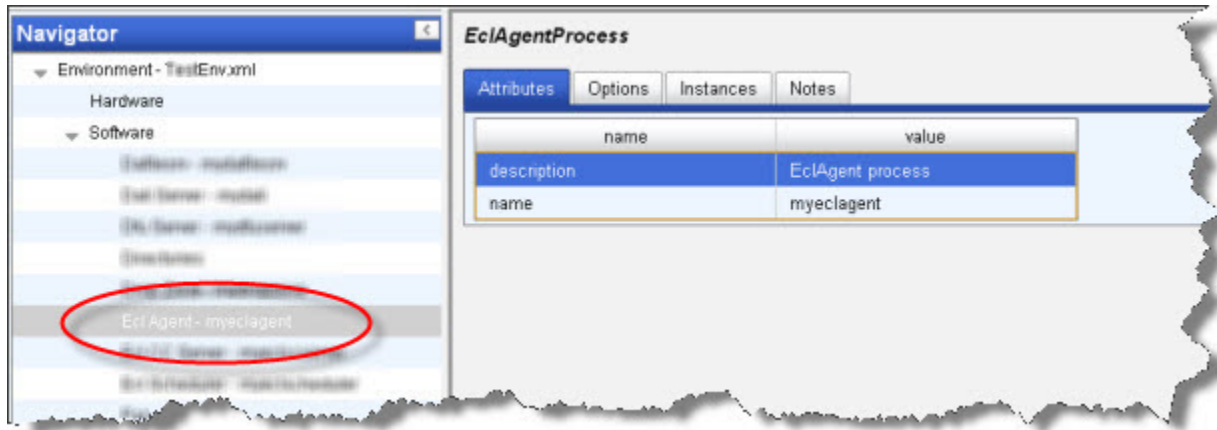
1. Select ECL Agent in the Navigator panel on the left side.
2. Select the Instances tab.
3. In the computer column, choose a node from the drop list as shown below:



4. Click the  disk icon to save

## EclAgent Attributes Tab

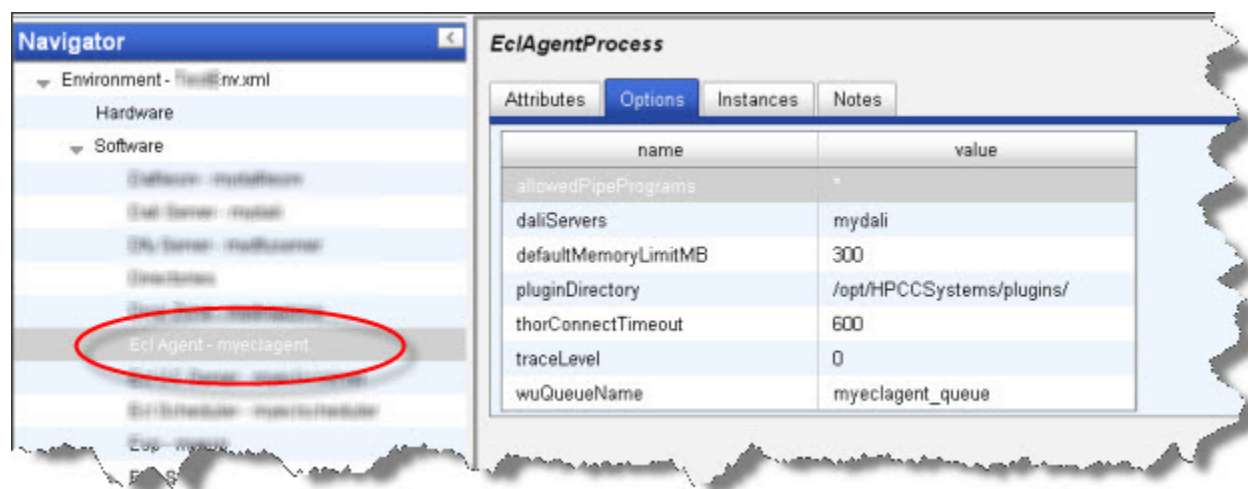
This section describes the EclAgent Attributes tab.



| attribute   | description                  | values           | required |
|-------------|------------------------------|------------------|----------|
| name        | Name for this process        |                  | required |
| description | Description for this process | EclAgent process | optional |

## EclAgent Options Tab

This section describes the EclAgent Options tab.



| attribute                   | description   | values                    | required |
|-----------------------------|---|---------------------------|----------|
| allowedPipePrograms         | Comma separated list of allowed PIPE programs (* for allow all)   | *                         | optional |
| daliServers                 | Specifies the dali server to which this eclagent is attached.   |                           | required |
| defaultMemoryLimitMB        | Default memory limit in MB for eclagent   | 300                       | optional |
| fieldTranslationEnabled     | Enables translation (where possible) of mismatched file layouts on-the-fly. Specify 'payload' to attempt to translate payload fields only | payload                   | optional |
| heapUseHugePages            | Use memory from huge pages if they have been configured.  | false                     | optional |
| heapUseTransparentHugePages | Use memory from transparent huge pages.   | true                      | optional |
| heapRetainMemory            | Retain and do not return unused memory to the operating system.   | false                     | optional |
| pluginDirectory             | Directory where plugins are located   | /opt/HPCCSystems/plugins/ | optional |
| traceLevel                  | Trace level   | 0                         | optional |
| thorConnectTimeout          | Default connection timeout when sending query to Thor   | 600                       | optional |
| wuQueueName                 | eclAgent Workunit Execution Queue Name  |                           | optional |
| analyzeWorkunit             | eclAgent analyzes workunit post-execution   | true                      | optional |
| httpCallerIdHeader          | HTTP Header field to use for sending and receiving CallerId   | HPCC-Caller-Id            | optional |
| httpGlobalIdHeader          | HTTP Header field to use for sending and receiving GlobalId   | HPCC-Global-Id            | optional |

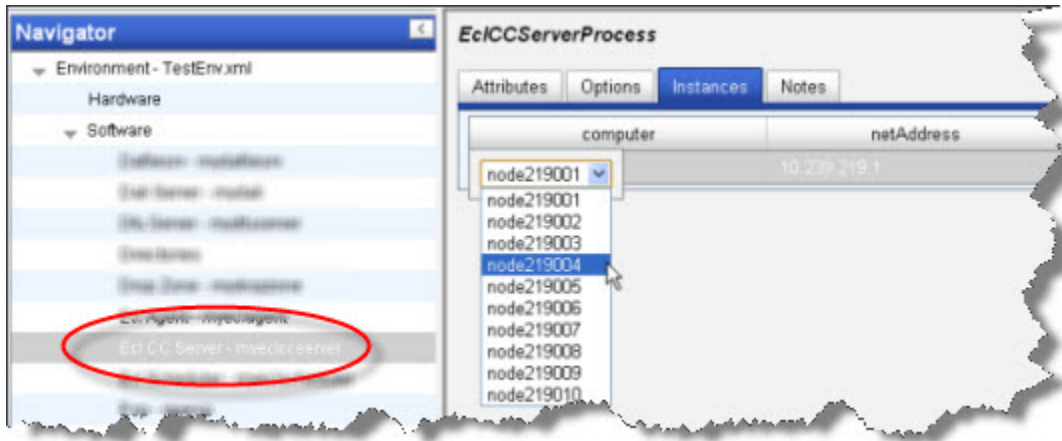
## **EclAgentProcessNotes**

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## ECL CC Server Process

### Ecl CC Server Instances

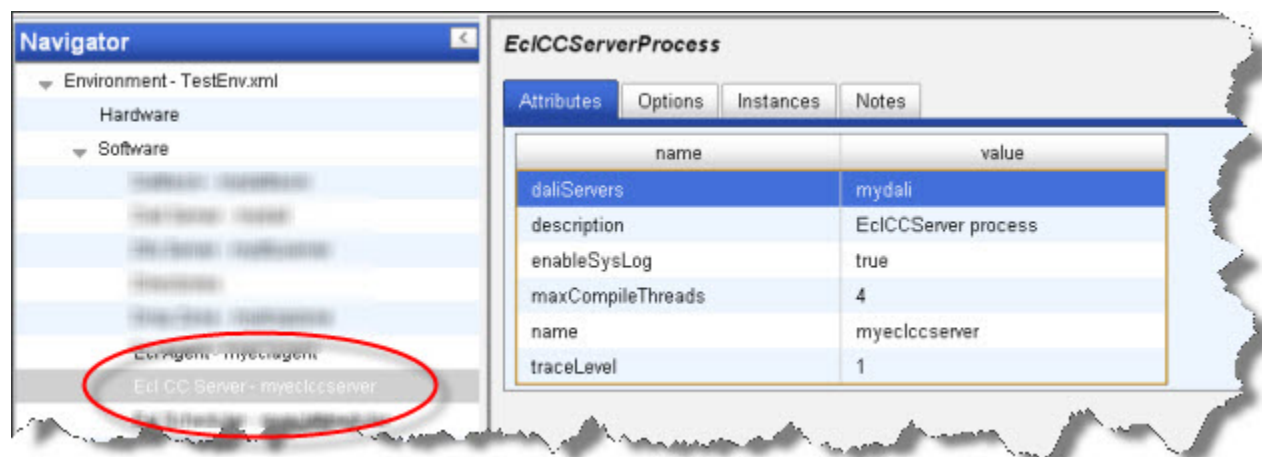
1. Select Ecl CC Server - myeclccserver in the Navigator panel on the left side.
2. Select the Instances tab.
3. In the computer column, choose a node from the drop list as shown below:



4.  Click the disk icon to save

## Ecl CC Server Attributes Tab

This section describes the Ecl CC Server Attributes tab.



| attribute                 | description   | values              | required |
|---------------------------|---|---------------------|----------|
| name                      | Name for this process   | ecclccserver        | required |
| description               | Description for this process  | EclCCServer process | optional |
| daliServers               | Specifies the dali server to which this eclccserver is attached.                |                     | required |
| enableEclccDali           | Enables passing Dali address to eclcc for compile-time file resolution.         | true                | optional |
| enableSysLog              | Enables syslog monitoring of the eclcc-server process.                          | true                | optional |
| generatePrecompiledHeader | Generate precompiled header when eclcc-server starts.                           | true                | optional |
| traceLevel                |   | 1                   | optional |
| maxEclccProcesses         | Maximum number of instances of eclcc that will be launched in parallel.         | 4                   | optional |
| monitorInterval           | Interval (in seconds) for reporting of memory usage stats. Set to 0 to disable. | 60                  | optional |

## EclCC Server Process Options

To add a custom option, right-click and select add. These options are passed to the eclcc compiler.

See the ECL Compiler chapter in the [Client Tools](#) manual for details.

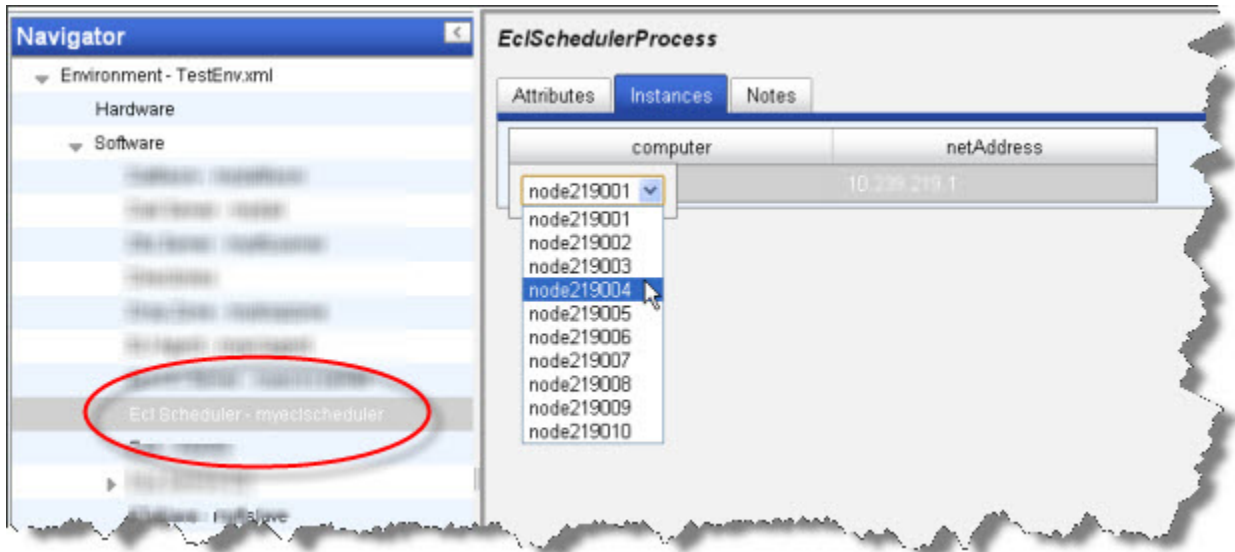
## EclCC Server Process Notes

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## ECL Scheduler

### Instances

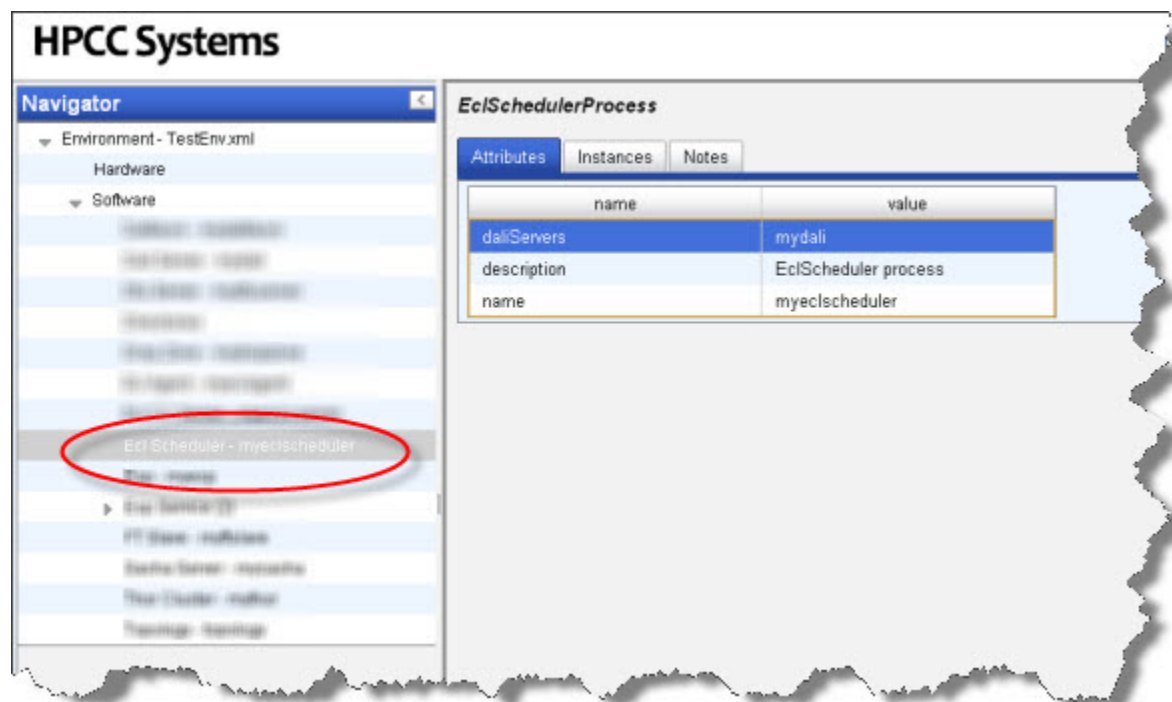
1. Select **ECL Scheduler** in the Navigator panel on the left side.
2. Select the Instances tab.
3. In the computer column, choose a node from the drop list as shown below:



4. Click the  disk icon to save

## EclScheduler Attributes Tab

This section describes the EclScheduler Attributes tab.



| attribute   | description   | values               | required |
|-------------|---|----------------------|----------|
| name        | Name for this process   | eclscheduler         | required |
| description | Description for this process                                      | EclScheduler process | optional |
| daliServers | Specifies the dali server to which this eclscheduler is attached. |                      | required |

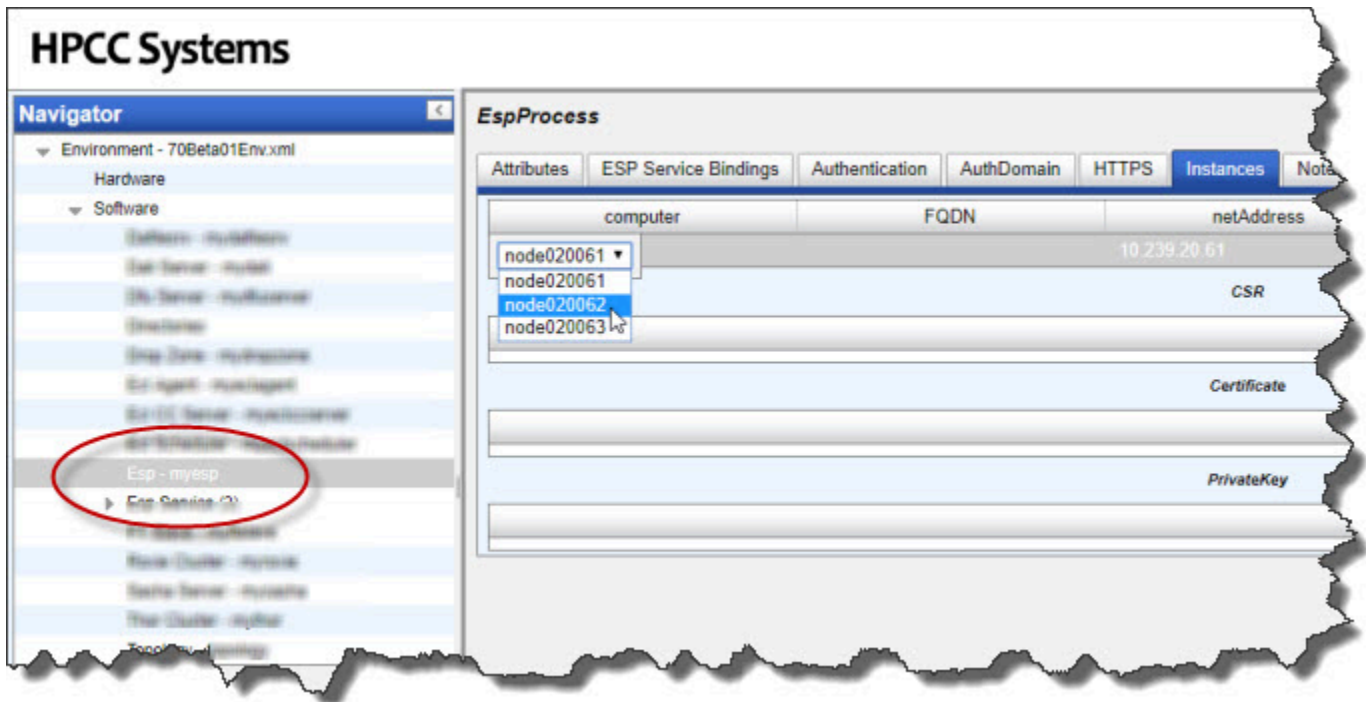
## EclScheduler Notes

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## ESP Server

### Esp Process Instances

1. Select **ESP - myesp** in the Navigator panel on the left side.
2. Select the Instances tab.
3. In the computer column, choose a node from the drop list as shown below:



4. Click the  disk icon to save

## Esp - myesp Attributes Tab

This section describes the Esp - myesp Attributes tab.

The screenshot shows the HPCC Systems Configuration Manager interface. On the left, the 'Navigator' pane shows a tree view under 'Environment - 70Beta01Env.xml' > 'Software'. The 'Esp - myesp' item is selected and circled in red. The main panel, titled 'EspProcess', shows the 'Attributes' tab. It contains a table with the following data:

| name                       | value                           |
|----------------------------|---------------------------------|
| checkSessionTimeoutSeconds |                                 |
| componentfilesDir          | /opt/HPCCSystems/componentfiles |
| controlPort                | 8010                            |
| daliServers                | mydali                          |
| description                | ESP server                      |
| enableSEHMapping           | true                            |
| ensureESPCache             | false                           |
| espCacheInitString         |                                 |
| formOptionsAccess          | false                           |
| httpConfigAccess           | true                            |
| logLevel                   | 1                               |
| logRequests                | true                            |
| logResponses               | false                           |
| maxBacklogQueueSize        | 200                             |
| maxConcurrentThreads       | 0                               |
| MaxPageCacheItems          | 1000                            |
| maxRequestEntityLength     | 8000000                         |
| name                       | myesp                           |
| PageCacheTimeoutSeconds    | 600                             |
| perfReportDelay            | 60                              |

| attribute              | description  | values     | required |
|------------------------|--|------------|----------|
| name                   | Name for this process  |            | required |
| description            | Description for this process                                 | ESP server | optional |
| daliServers            | Specifies the dali server to which this ESP is attached.     |            | required |
| enableSEHMapping       | Enables SEH to exception mapping.                            | true       | optional |
| enableSysLog           | Enables SysLog logging.                                      | false      | optional |
| httpConfigAccess       | Allows esp config file to be viewed via a web browser.       | true       | optional |
| formOptionsAccess      | Allows show Options in test form page.                       | false      | optional |
| maxRequestEntityLength | The maximum length of request entity allowed                 | 8000000    | optional |
| maxConcurrentThreads   | The maximum number of concurrent threads. 0 means unlimited. | 0          | optional |

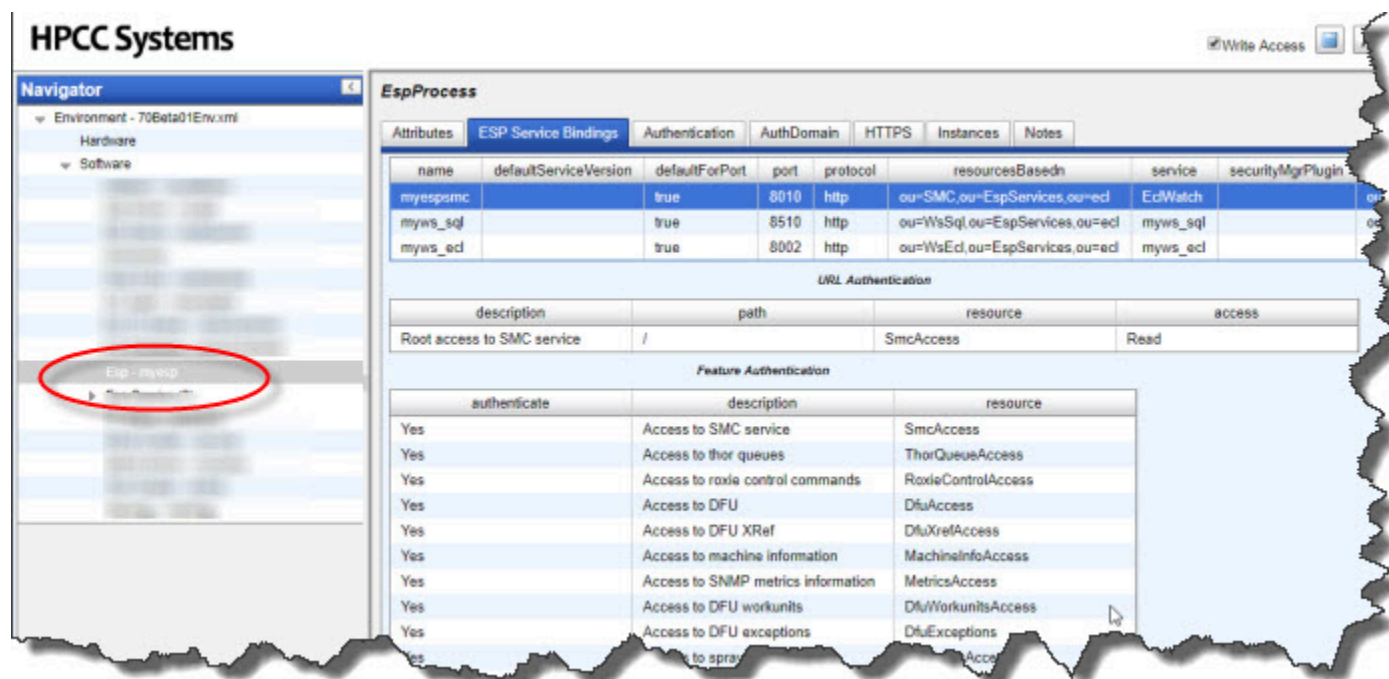
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| attribute                  | description   | values                          | required |
|----------------------------|---|---------------------------------|----------|
| maxBacklogQueueSize        | Sets the sockets parameter for the maximum number of backlogged requests.                           | 200                             | optional |
| perfReportDelay            | Sets the frequency for logging resource usage stats.  | 60                              | optional |
| controlPort                | Sets the network port for ESP control   | 8010                            | optional |
| logLevel                   | Sets the log level [0: none, 1: min, 5: noraml, 10: max]  | 1                               | optional |
| componentfilesDir          | Sets the componentfiles directory.  | /opt/HPCCSystems/componentfiles | optional |
| logRequests                | never only-ones-with-issues all   | never                           | optional |
| logResponses               |   | false                           | optional |
| txSummaryLevel             | Sets the TxSummary level [0: none, 1: min, 5: noraml, 10: max]                                      | 1                               | optional |
| txSummaryResourceReq       | Log TxSummary for Resource Requests   | false                           | optional |
| espCacheInitString         | String used for initializing ESP cache client.  |                                 | optional |
| checkSessionTimeoutSeconds | Check Session Timeout in every given seconds.   |                                 | optional |
| urlAlias                   | The URL alias for this ESP. This can be used to detect Cross-Origin Resource Sharing (CORS) access. |                                 | optional |
| PageCacheTimeoutSeconds    | Paging data timeout in the given seconds.   | 600                             | optional |
| MaxPageCacheItems          | The maximum number of cached items inside one page cache. 0 means no cache.                         | 1000                            | optional |
| maxPersistentIdleTime      | The maximum idle time in seconds (-1 for unlimited, 0 to disable).                                  | 60                              | optional |
| maxPersistentRequests      | Maximum number of query requests per persistent http connection. (-1 for unlimited, 0 to disable).  | 100                             | optional |
| namespaceScheme            | The scheme used to generate dynamic service namespaces.   | basic                           | optional |
| MaxFileAccessExpirySeconds | Maximum time a file access request is valid for   | 86400                           | optional |
| dafilesrvConnectTimeout    | Remote file access connect timeout in seconds   | 10                              | optional |
| dafilesrvReadTimeout       | Remote file access read timeout in seconds  | 10                              | optional |

Persistent HTTP connections can cause backwards compatibility issues with non-standard HTTP clients. You can disable this feature by setting *maxPersistentRequests* to 0.

## Esp - myesp Service BindingsTab

This section describes the Esp - myesp Service Bindings tab. This tab requires additional steps to configure the service bindings.



You must first add the service bindings in the first table (Right-click, add). Then you would configure the attributes in the other tables on that tab. The next table describes the **URL Authentication** table.

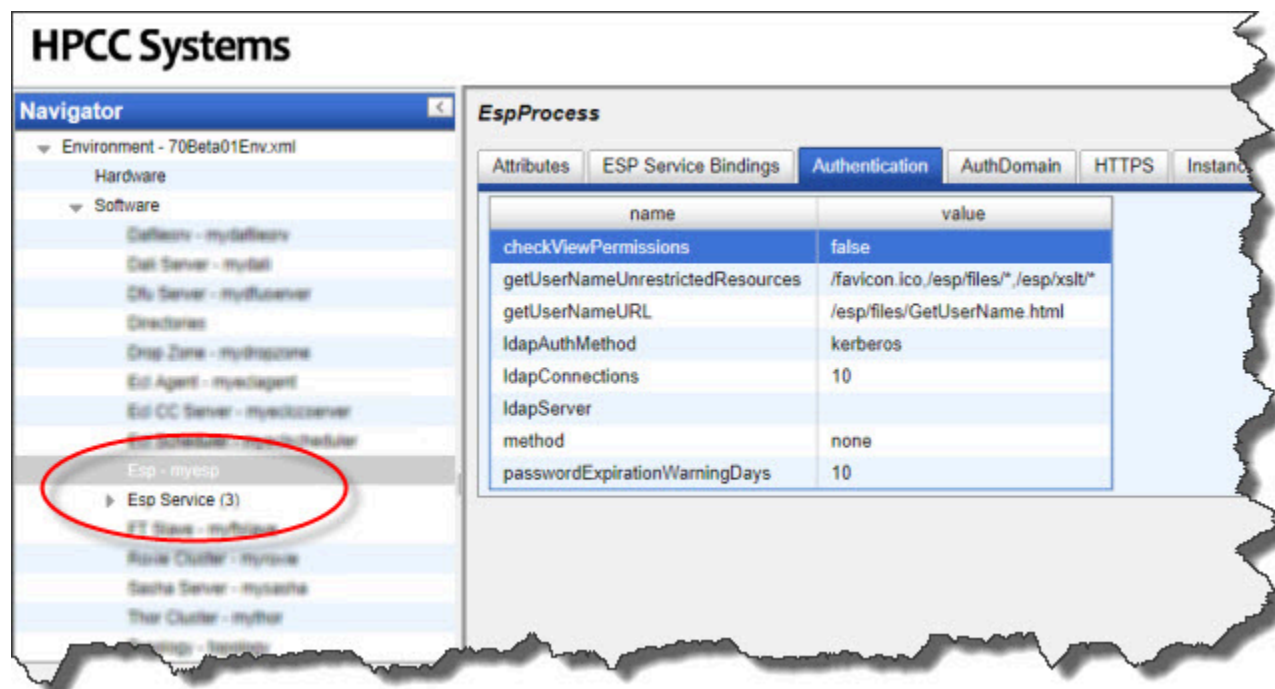
| attribute   | description   | values | required |
|-------------|---|--------|----------|
| description |   |        | optional |
| path        | The logical path of a resource used for authentication. | /      | required |
| resource    | The physical resource for which access is checked.      |        | required |
| access      | The access level required to the specified resource.    | Read   | optional |

The following tables describe the ESPPProcess Service Bindings, **Feature Authentications**.

| attribute    | description   | values | required |
|--------------|---|--------|----------|
| authenticate | Validate access rights for this capability?             | Yes    | optional |
| description  |   |        | optional |
| path         | The logical path of a resource used for authentication. | /      | required |
| resource     | The physical resource for which access is checked.      |        | required |

## Esp - myesp AuthenticationTab

This section describes the Esp - myesp Service Authentication tab.



| attribute                        | description  | values                                | required |
|----------------------------------|--|---------------------------------------|----------|
| method                           | The protocol to use for authenticating the service                             | none                                  | required |
| ldapServer                       | The ldap server to be used for authentication.                                 |                                       | optional |
| ldapAuthMethod                   | The protocol to use for LDAP authentication (kerberos or simple).              | kerberos                              | optional |
| ldapConnections                  | The maximum number of connections to the LDAP server.                          | 10                                    | optional |
| passwordExpirationWarningDays    | In this time period, ESP displays a warning about password expiration.         | 10                                    | optional |
| checkViewPermissions             | Enable file and column access permission checking for all view enabled queries | false                                 | optional |
| loginLogoURL                     | URL to Login Logo  | /esp/files/eclwatch/img/Loginlogo.png | optional |
| getUserNameURL                   | URL to getUserName   | /esp/files/GetUserName.html           | optional |
| getUserNameUnrestrictedResources | unrestricted resources for getUserNameURL                                      | /favicon.ico,/esp/files/*,/esp/xslt/* | optional |

Additional information about the available Authentication methods:

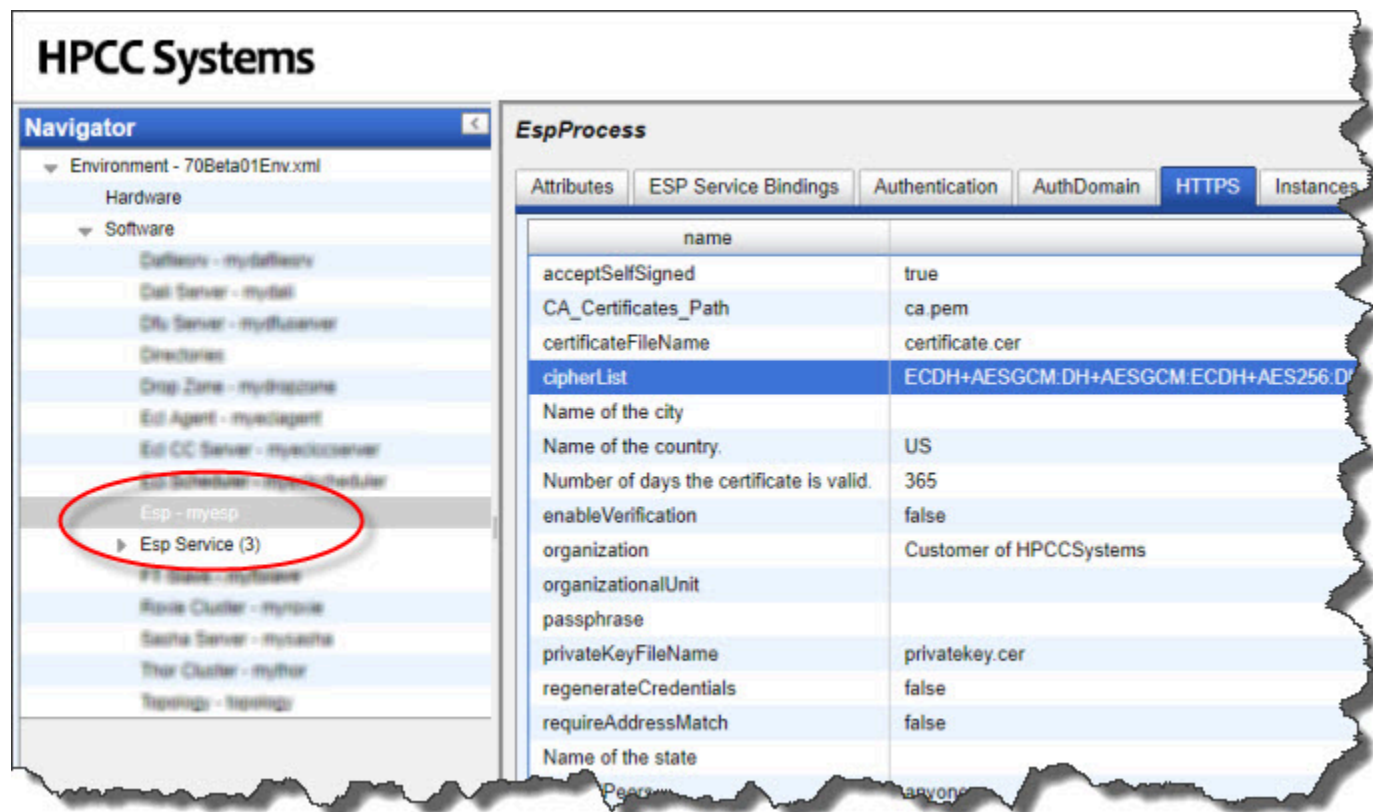
|              |   |
|--------------|---|
| none         | uses no authentication  |
| ldap         | uses Lightweight Directory Access Protocol for authentication |
| ldaps        | similar to LDAP but uses a more secure (TLS) protocol         |
| secmgrPlugin | uses the security manager plug-in                             |

## Esp - AuthDomain Tab

The **AuthDomain** attribute allows you to configure the settings used for session management.

## Esp - myesp HTTPS Tab

This section describes the Esp - myesp HTTPS tab.



The **cipherList** attribute allows you to set the ordered list of available ciphers for use by openssl. See the documentation at [openssl.org](https://www.openssl.org) for more information about ciphers.

| attribute           | description  | values   | required |
|---------------------|--|--|----------|
| cipherList          | Sets the ordered list of available ciphers for use by openssl. See openssl documentation on ciphers for information on use and formatting. | ECDH<br>+AESGCM:DH<br>+AESGCM:ECDH<br>+AES256:DH<br>+AES256:ECDH<br>+AES128:DH<br>+AES:ECDH<br>+3DES:DH<br>+3DES:RSA<br>+AESGCM:RSA<br>+AES:RSA+3DES:!<br>aNULL:!MD5 | optional |
| certificateFileName | Name of destination file in which the certificate will be written.   | /home/hpcc/certificate/certificate.pem   | optional |

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| attribute             | description   | values                         | required |
|-----------------------|---|--------------------------------|----------|
| privateKeyFileName    | Name of destination file in which the private key will be written.                  | /home/hpcc/certificate/key.pem | optional |
| passphrase            | The passphrase used to generate the private key.                                    |                                | optional |
| enableVerification    | whether to enable verification or not.  | false                          | optional |
| requireAddressMatch   | whether to require the source address of the request match that of the certificate. | false                          | optional |
| acceptSelfSigned      | whether to accept self-signed certificates.   | true                           | optional |
| CA_Certificates_Path  | path to the file that contains CA certificates.                                     | /home/hpcc/certificate         | optional |
| trustedPeers          | List of trusted peers, in smartsocket format.                                       | anyone                         | optional |
| organization          | Name of company or organization   | Customer of HPC-<br>CSysytems  | optional |
| organizationalUnit    |   |                                | optional |
| city                  |   |                                | optional |
| state                 |   |                                | optional |
| country               |   | US                             | optional |
| daysValid             |   | 365                            | optional |
| regenerateCredentials | Set this to true to regenerate the private key, certificate and CSR.                | false                          | optional |

## EspProcess Notes

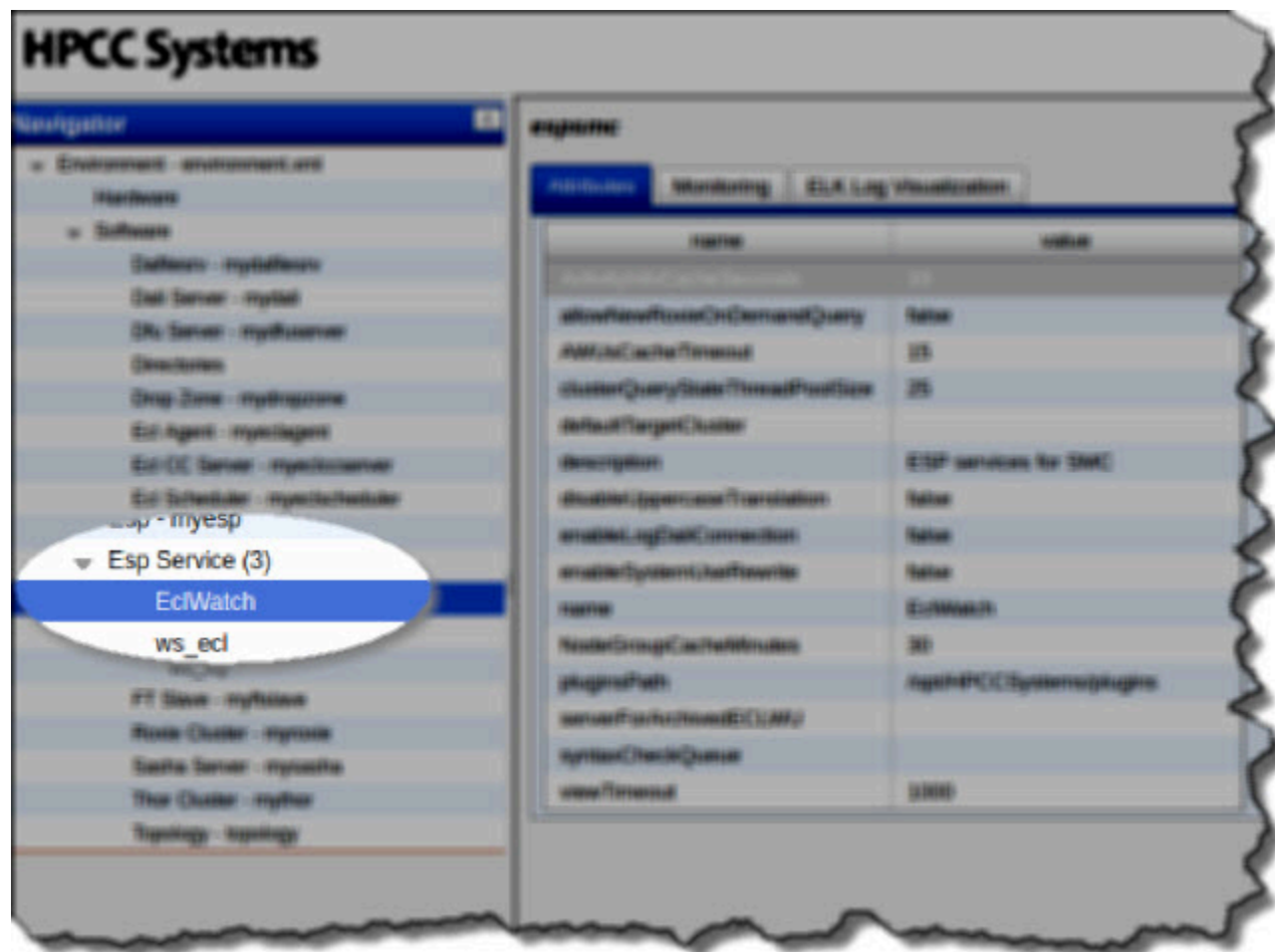
This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## ESP Services

ESP Services provide a means to add functionality to an ESP Server.

### ECL Watch Service

Ecl Watch allows you to configure options for the ECL Watch utility.



#### ECL Watch Attribute definitions

| attribute        | description   | values                   | required |
|------------------|---|--------------------------|----------|
| name             | Name for this ESP service                                   | espsmc                   | required |
| description      | Description for this process                                | ESP services for SMC     | optional |
| syntaxCheckQueue | Queue Name of ECL server which is used for ECL Syntax Check |                          | optional |
| pluginsPath      | Path where plugin files are deployed                        | /opt/HPCCSystems/plugins | optional |
| viewTimeout      | timeout for XXXX (in seconds).                              | 1000                     | optional |

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| attribute                       | description  | values | required |
|---------------------------------|--|--------|----------|
| clusterQueryStateThreadPoolSize | Default thread pool size for checking query state on clusters                | 25     | optional |
| AWUsCacheTimeout                | timeout for archived WU search cache (in minutes).                           | 15     | optional |
| NodeGroupCacheMinutes           | timeout for node group cache (in minutes).                                   | 30     | optional |
| ActivityInfoCacheSeconds        | timeout for activity info cache (in seconds).                                | 10     | optional |
| MachineUsageCacheMinutes        | timeout for Component/TargetCluster/NodeGroup usage cache (in minutes).      | 3      | optional |
| serverForArchivedECLWU          | Specify Sasha server for archiving ECL workunits                             |        | optional |
| enableSystemUseRewrite          | To disable ESP Service links for System Servers that use rewrite rules.      | false  | optional |
| defaultTargetCluster            | Default target for published queries   |        | optional |
| disableUppercaseTranslation     | To disable upper case translation for filter values in ViewKeyFile function. | false  | optional |
| ZAPEmailTo                      | Default email address to receive ZAP Report email                            |        | optional |
| ZAPEmailFrom                    | Default email address to send ZAP Report email from                          |        | optional |
| ZAPEmailServer                  | Default Email Server URL to handle ZAP Report email                          |        | optional |
| ZAPEmailServerPort              | Default Email Server port to handle ZAP Report email                         |        | optional |
| ZAPEmailMaxAttachmentSize       | Maximal attachment size in ZAP Report email                                  |        | optional |
| ThorSlaveLogThreadPoolSize      | Thread pool size for getting thor slave logs.                                |        | optional |
| enableLogDaliConnection         | Enable ESP/Dali Connection ID to be logged into esp.xml.                     | false  | optional |
| allowNewRoxieOnDemandQuery      | allow new queries to be used by roxie on demand and roxie browser            | false  | optional |

**ECL Watch Monitoring attributes**

| attribute             | description   | values             | required |
|-----------------------|---|--------------------|----------|
| monitorDaliFileServer | Warn if dafilesrv process is not running on computers                                     | false              | required |
| excludePartitions     | Comma, space or semicolon delimited list of partitions not to be monitored for free space | /dev*,/sys,/proc/* | optional |
| warnIfCpuLoadOver     | CPU load over this value is flagged as warning in monitoring output                       | 95                 | optional |

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| attribute              | description  | values | required |
|------------------------|--|--------|----------|
| warnIfFreeStorageUnder | Available disk storage space under this value is flagged as warning in monitoring output | 5      | optional |
| warnIfFreeMemoryUnder  | Available memory under this value is flagged as warning in monitoring output             | 5      | optional |

### Configuring ELK Log Visualization integration

HPCC Systems provides a mechanism to integrate ELK (ElasticSearch, Logstash, and Kibana) based visualizations into ECL Watch. This feature can be configured and enabled through the HPCC Systems Configuration manager.

To configure the ELK Log Visualization component, click and expand the **ESP Service** link on the left side then select the **EclWatch** link. Then select the **Elk Log Visualization** tab from the right side.

The ELK Log Visualization tab in ECL Watch:

| attribute              | description   | values    | required |
|------------------------|---|-----------|----------|
| integrateKibana        | Declare if Kibana dashboard is to be integrated in ECLWatch                       | false     | required |
| kibanaAddress          | Address (ip/hostname) of Kibana server  | localhost | optional |
| kibanaPort             | Port number of target Kibana server   | 5601      | optional |
| kibanaEntryPointURI    | Declares the ECLWatch integration entry point URI for the target Kibana dashboard |           | optional |
| reportLogStashHealth   | Declare if connectivity to LogStash nodes is to be reported in ECLWatch           | true      | required |
| logStashAddresses      | Declares the target LogStash nodes' addresses (semicolon seperated)               |           | optional |
| logStashPort           | Declares the target LogStash nodes' port  |           | optional |
| reportElasticHealth    | Declare if connectivity to Elastic Search nodes is to be reported in ECLWatch     | true      | required |
| elasticSearchAddresses | Declares the target ElasticSearch nodes' addresses (semicolon seperated)          |           | optional |
| elasticSearchPort      | Declares the target LogStash nodes' port  | 9200      | optional |

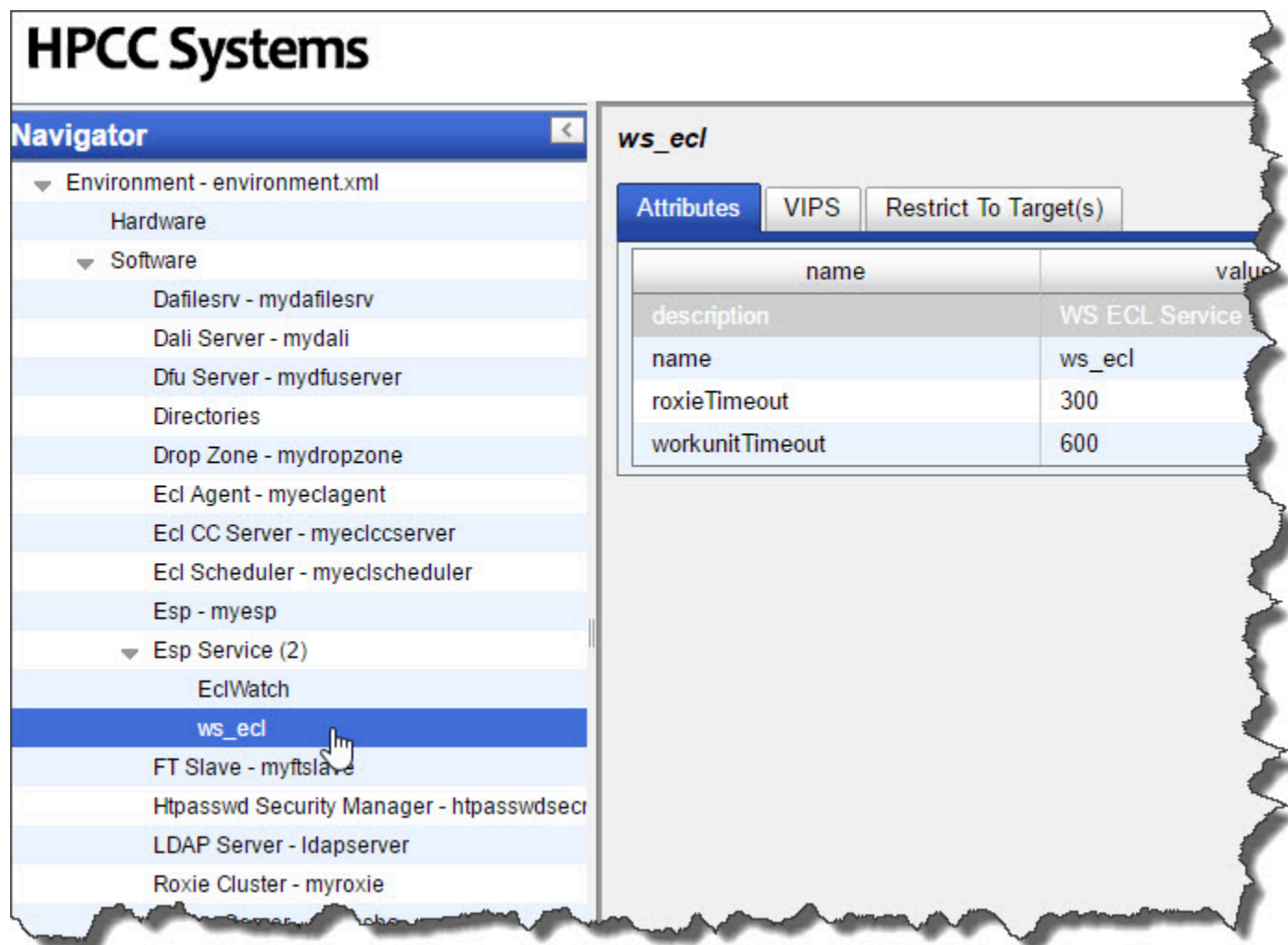
To configure the ELK visualization integration, provide the following information:

1. In the *kibanaAddress* field, supply the IP address for your Kibana component.. For example: http://123.123.123.123
2. In the *kibanaPort* field, supply the Kibana port number. For example: 5601
3. In the *kibanaEntryPointURI* field, enter the Kibana URI pointing to your shared Kibana dashboard.

For example: /app/kibana#/dashboard/etc. (obtained from the "share" tab in Kibana)

## WsECL Service

The WsECL service allows you to configure options for the WsECL utility.



The Ws ECL configuration attributes.

| attribute         | description   | values | required |
|-------------------|---|--------|----------|
| roxie             |   |        | required |
| vip               |   |        | required |
| dnsInterval       | DNS lookup cache timeout in seconds. Set to 0 to resolve DNS for every transaction. Set to -1 (default) to keep DNS lookup cached indefinitely. | -1     | optional |
| sendTargetToRoxie | Send roxie the target from which to run query (disable for backward compatibility issues)   | true   | optional |

Ws ECL VIPS option attributes.

| attribute | description  | values | required |
|-----------|--|--------|----------|
| name      | WsEcl will only display specified targets, if none specified WsEcl will display all targets. |        | required |

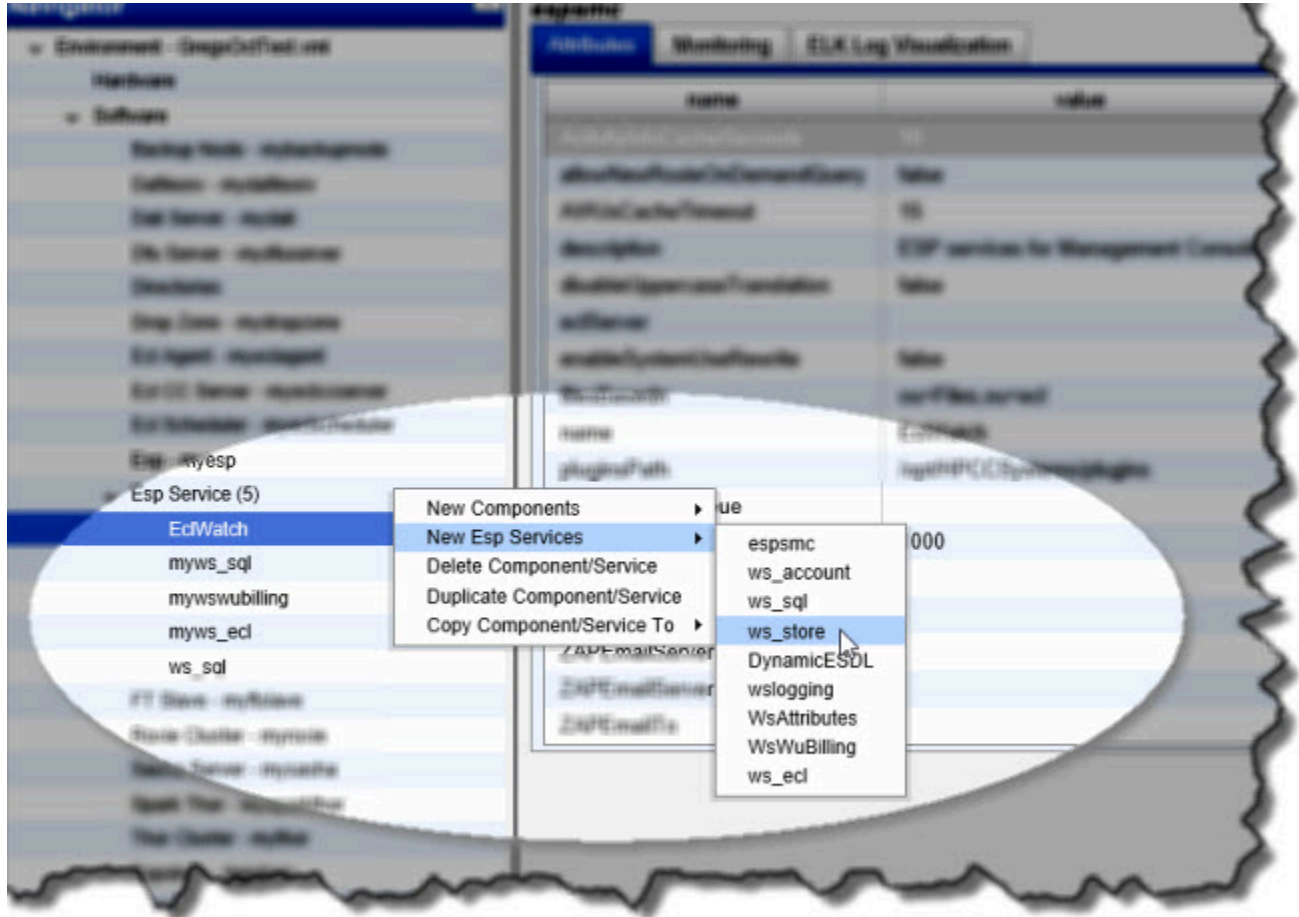
Ws ECL Target Restrictions table.

| attribute          | description   | values         | required |
|--------------------|---|----------------|----------|
| name               | Name for this ESP service   | ws_ecl_service | required |
| description        | Allows creation of web services using ECL language  | WS ECL Service | optional |
| roxieTimeout       | Timeout (in seconds) for WsEcl connections to roxie (0 == wait forever)                                     | 300            | optional |
| workunitTimeout    | Timeout (in seconds), for WsEcl to wait for workunit to complete (0 == wait forever)                        | 600            | optional |
| xsltMaxDepth       | Maximum libxslt stylesheet template depth (affects size and complexity of dataset that can be rendered)     | 100000         | optional |
| xsltMaxVars        | Maximum libxslt stylesheet template variables (affects size and complexity of dataset that can be rendered) | 1000000        | optional |
| httpCallerIdHeader | HTTP Header field to use for sending and receiving CallerId   | HPCC-Caller-Id | optional |
| httpGlobalIdHeader | HTTP Header field to use for sending and receiving GlobalId   | HPCC-Global-Id | optional |

## Ws\_Store

One instance of ws\_store is included with ECL Watch, but you can choose to add another ws\_store ESP Service to your HPCC Systems platform.

To add the ws\_store service.



1. Right click on the **Software** component in the **Navigator** panel (on the right side), choose **New ESP Services** then **ws\_store** from the drop list.

2. Configure the ws\_store attributes as required.

3.  Click the disk icon to save

The following values are the configurable attributes for ws\_store:

| attribute                  | description   | values           | required |
|----------------------------|---|------------------|----------|
| name                       | Name for this WsStore instance  | ws_store_service | required |
| description                | Dali based WsStore  |                  | optional |
| StoreProviderLibraryName   | The store provide library name<br>lib'providername'.so                  |                  | required |
| StoreProviderFactoryMethod | Method used to instantiate the store<br>provider - default: newEspStore |                  | optional |

## Ws\_SQL

You can choose to add the ws\_sql ESP Service to your HPCC Systems platform.

To add the ws\_sql service:

1. Right click on the **Software** component in the **Navigator** panel (on the right side), choose **New ESP Services** then **ws\_sql** from the drop list.
2. Configure the ws\_sql by providing the name of the service.

3.

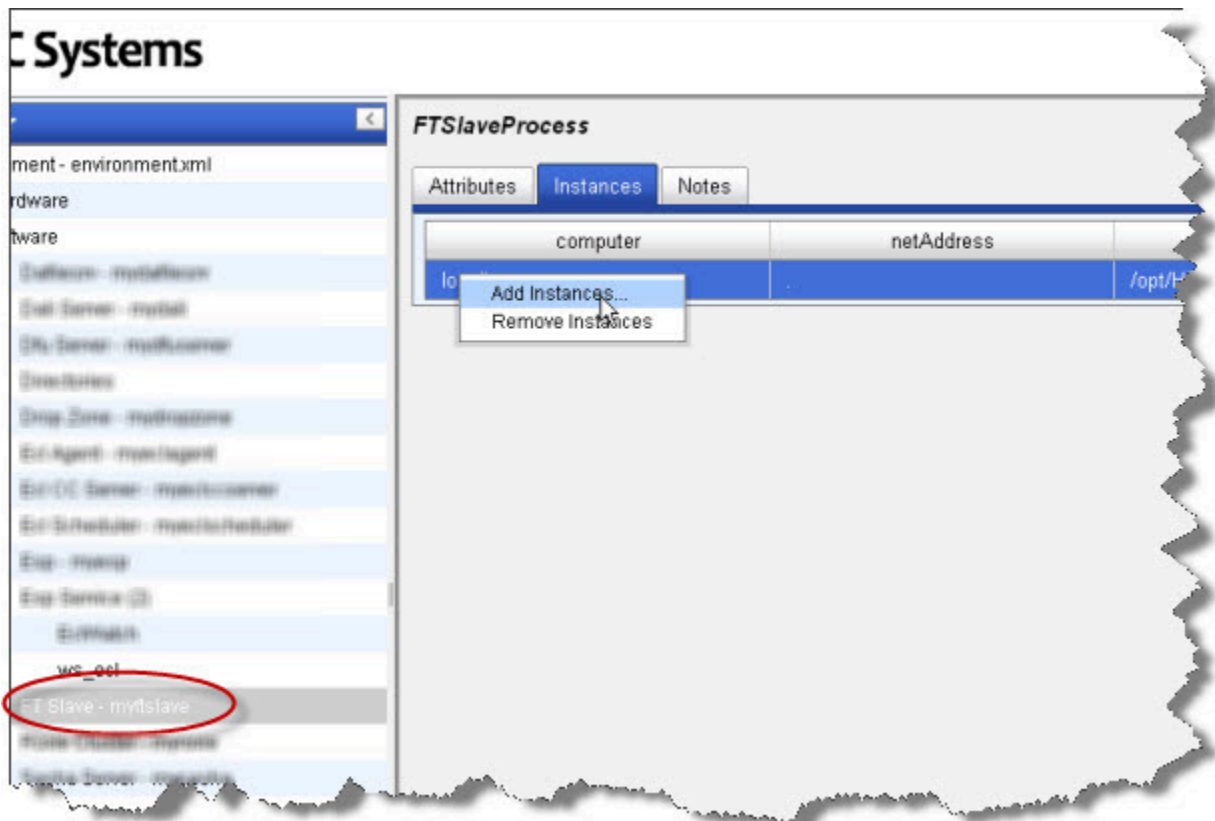
Click the  disk icon to save

## FTSlave Process

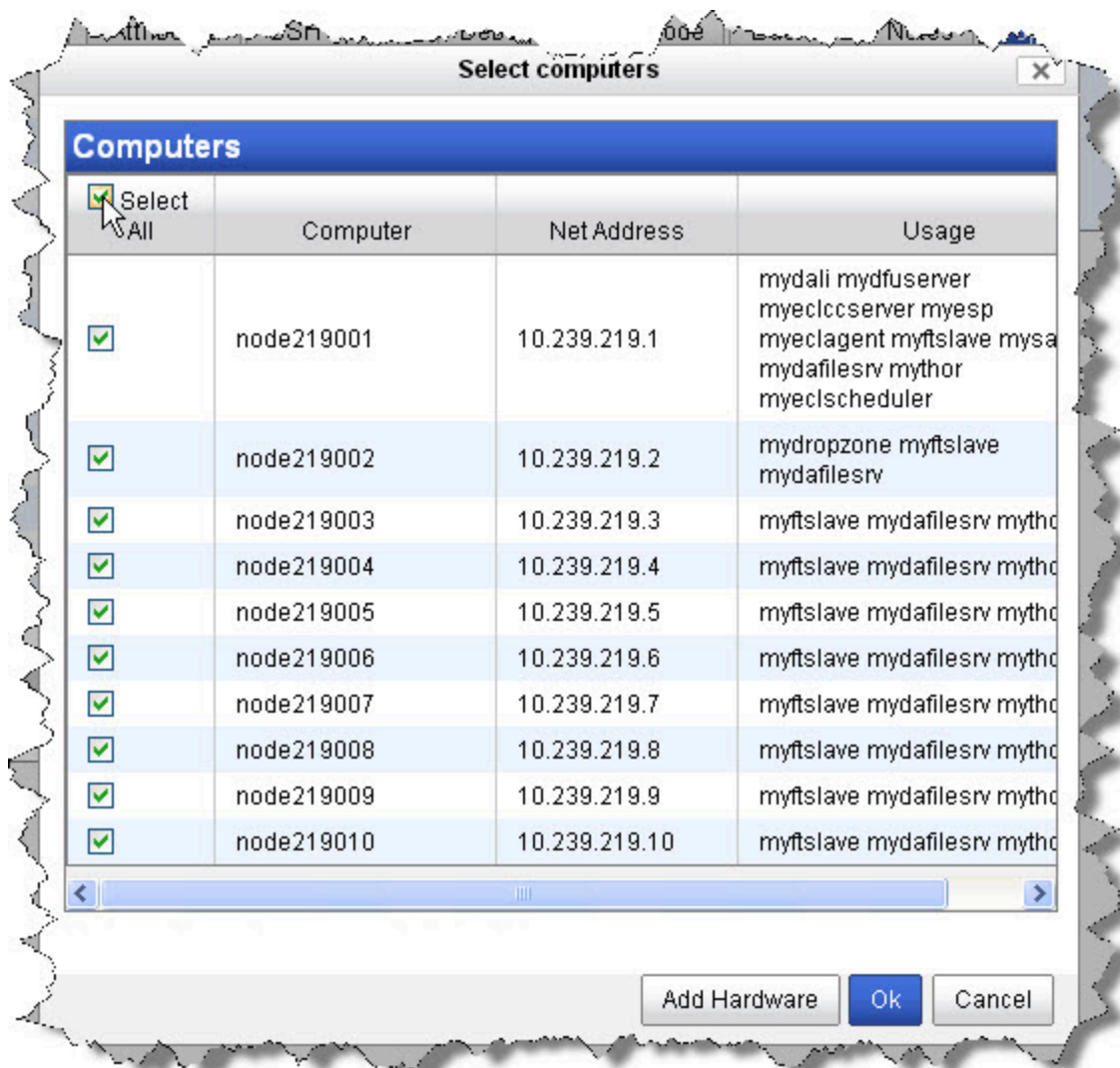
FTSlave is a helper process that every node needs. This section depicts an FTSlave installation.

### Instances

1. Select FTSlave in the Navigator panel on the left side.
2. Select the Instances tab.
3. Right-click on a computer in the computer column, and select Add Instance.



4. Select all computers in the list, then press the **OK** button.



5.  Click the disk icon to save

## FtSlave attributes

This section describes an FTSlaveProcess attributes tab.

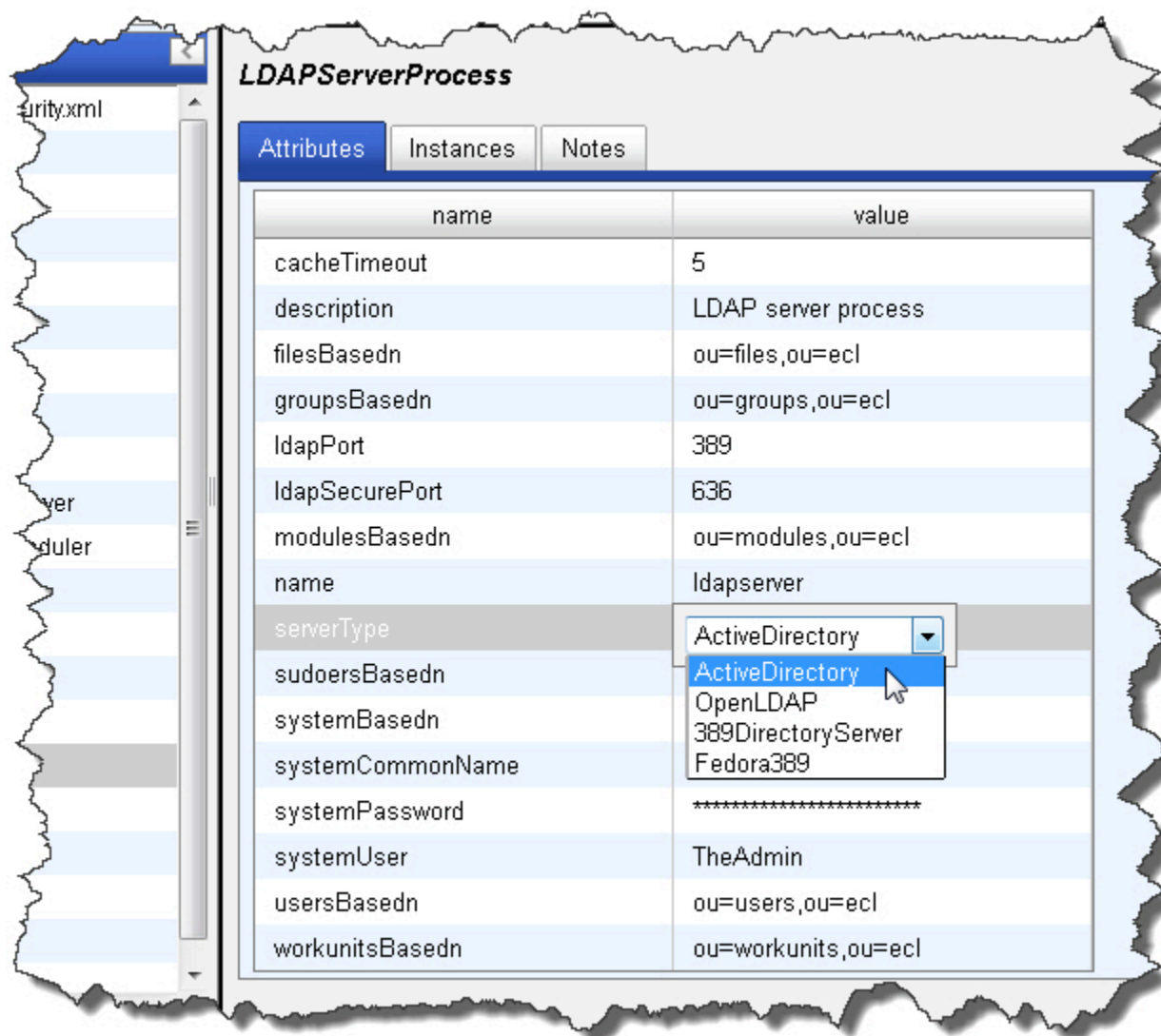
| attribute   | description   | values          | required |
|-------------|---|-----------------|----------|
| name        | Name for this process   |                 | required |
| description | Description for this process                                    | FTSlave process | optional |
| version     | Version identifier used to select which process will be started | 1               | optional |

## **FtSlave Process Notes**

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## LDAP Server Process

This section describes the configuration attributes of an LDAPServer Installation in ConfigManager. For a complete description of how to add LDAP Authentication see *Using LDAP Authentication* section in the [Installing and Running The HPCC Systems Platform](#) document.



| attribute      | description   | values              | required |
|----------------|---|---------------------|----------|
| name           | Name for this process                                     |                     | required |
| description    | Description for this process                              | LDAP server process | optional |
| adminGroupName | The Active Directory group containing HPCC Administrators | Administrators      | optional |
| ldapPort       | The port of the ldap (Active Directory) server.           | 389                 | required |
| ldapSecurePort | The port of the ldap (Active Directory) server.           | 636                 | required |

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| attribute        | description  | values              | required |
|------------------|--|---------------------|----------|
| ldapTimeoutSecs  | The maximum number of seconds to wait for most LDAP calls.   | 60                  | required |
| cacheTimeout     | Time in minutes after which the cached security information should expire.   | 60                  | optional |
| sharedCache      | Use a single, shared LDAP cache.   | true                | optional |
| systemUser       | An LDAP administrator account id to be used by HPCC to create and manage HPCC-specific LDAP branches.                                |                     | optional |
| systemPassword   | The password for the systemUser.   |                     | optional |
| systemCommonName | Required if systemUser is specified. The LDAP Common Name (cn) for the systemUser account as specified on the LDAP server.           |                     | optional |
| systemBasedn     | The ldap "base distinguished name" of the systemUser.  | cn=Users            | required |
| groupsBasedn     | The ldap "base distinguished name" that ecl server should use when looking up groups in the ldap (Active Directory) server.          | ou=groups,ou=ecl    | required |
| viewsBasedn      | The ldap "base distinguished name" that ecl server should use when looking up views in the ldap (Active Directory) server.           | ou=views,ou=ecl     | required |
| usersBasedn      | The ldap "base distinguished name" that ecl server should use when looking up users in the ldap (Active Directory) server.           | ou=users,ou=ecl     | required |
| modulesBasedn    | The ldap "base distinguished name" that ecl server should use when looking up modules in the ldap (Active Directory) server.         | ou=modules,ou=ecl   | required |
| workunitsBasedn  | The ldap "base distinguished name" that ecl server should use when looking up workunit scopes in the ldap (Active Directory) server. | ou=workunits,ou=ecl | required |
| filesBasedn      | The ldap "base distinguished name" that ecl server should use when looking up file scopes in the ldap (Active Directory) server.     | ou=files,ou=ecl     | required |
| sudoersBasedn    | The place to hold the sudoers entries.   | ou=SUDOers          | optional |
| serverType       | LDAP Server Implementation Type  | ActiveDirectory     | required |

## LDAP Server Process Instances

This tab allows you to add instances to your LDAP Configuration. In order to add instances you would have previously added the LDAP computers in the Hardware section. For a complete description of how to add LDAP Authentication see *Using LDAP Authentication* section in the [Installing and Running The HPCC Systems Platform](#) document.

1. On the **Instances** tab, right-click on the table on the right hand side, choose **Add Instances...**

2. Select the computer to use by checking the box next to it.

This is the computer you added in the **Hardware / Add New Computers** portion earlier.

## The HPCC Systems Administrator's account

You can set up an HPCC Systems Administrator's account with limited administrative rights. The HPCC Systems Administrator does not have to be an LDAP Administrator's account. This allows the HPCC Systems Administrator to be able to set up users, groups, and set permissions in HPCC Systems without having rights to perform other LDAP administrative functions. To use this feature:

1. Create an LDAP group to contain all the HPCC Administrator users. For example: "HPCCAdminGroup"
2. In the HPCC Systems configuration manager navigate to this (LDAP Server Process) page and enter the HPCC Systems Administrator group name as the value in the **adminGroupName** field.
3. Add (HPCC Systems Administrator) users to this new group.
4. Save and deploy the new configuration file, then restart ESP to apply the new configuration.

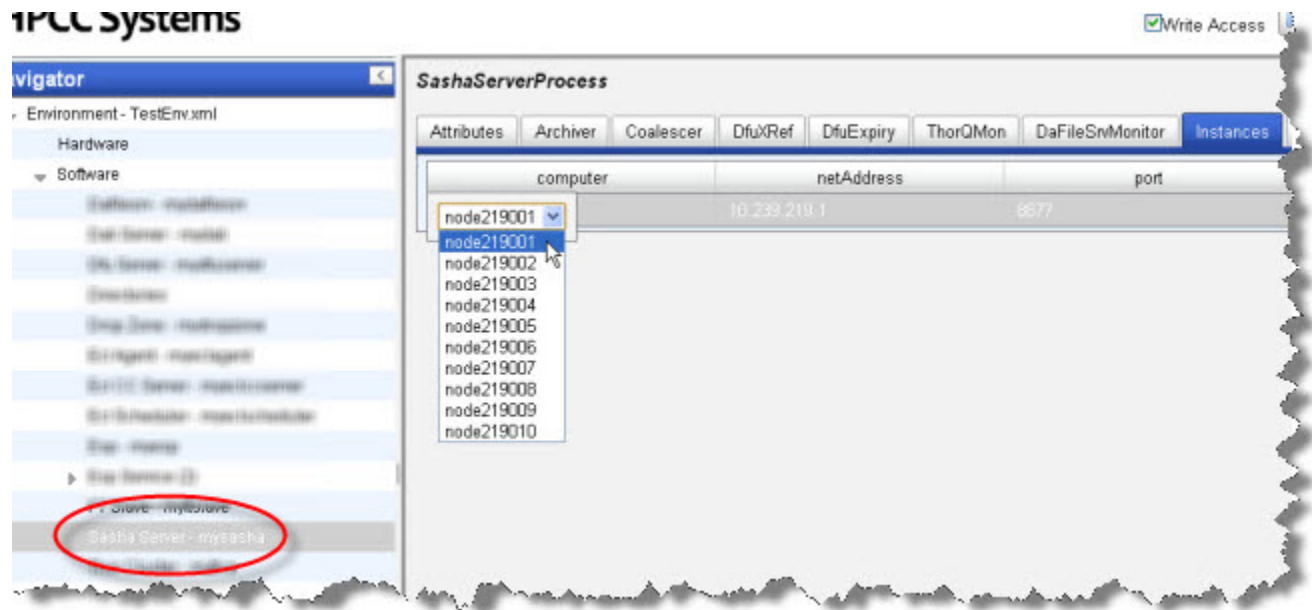
## LDAP Server Process Notes

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## Sasha Server

### Instances

1. Select Sasha Server in the menu on the left side.
2. Select the Instances tab.
3. In the computer column, choose a node from the drop list as shown below:



## Sasha Server Attributes

This section described the SashaServerProcess **Attribute** tab values.

### HPCC Systems

The screenshot shows the HPCC Systems Configuration Manager. On the left, the 'Navigator' pane displays a tree view of the environment. Under 'Software', 'Sasha Server - mysasha' is selected and highlighted with a red circle. On the right, the 'SashaServerProcess' configuration window is open, showing the 'Attributes' tab. The attributes are listed in a table:

| name                | value                |
|---------------------|----------------------|
| autoRestartInterval | 0                    |
| daliServers         | mydali               |
| description         | Sasha Server process |
| LDSroot             | LDS                  |
| logDir              | .                    |
| name                | mysasha              |

| attribute           | description   | values               | required |
|---------------------|---|----------------------|----------|
| name                | Name for this process   |                      | required |
| description         | Description for this process  | Sasha Server process | optional |
| daliServers         | Specifies the Dali server to which this Sasha server is attached.                         |                      | required |
| logDir              | Specifies the Sasha server log directory.   | .                    | required |
| autoRestartInterval | Specifies interval between sasha server auto-restart (hours, 0 no auto restart (default)) | 0                    | optional |
| LDSroot             | Specifies the Sasha data store root directory.  | LDS                  | optional |

## SashaServer Process Archiver

This section describes the SashaServer Process Archiver tab.

The screenshot shows the HPCC Systems Configuration Manager interface. On the left, the 'Navigator' pane displays a tree view of the environment. Under 'Software', 'Sasha Server - mysasha' is selected and circled in red. On the right, the 'SashaServerProcess' configuration pane is shown with the 'Archiver' tab active. It contains a table of attributes and their values.

| name                | value |
|---------------------|-------|
| cachedWUat          | ***** |
| cachedWUinterval    | 24    |
| cachedWUlimit       | 100   |
| DFUrecoveryAt       | ***** |
| DFUrecoveryCutoff   | 4     |
| DFUrecoveryInterval | 12    |
| DFUrecoveryLimit    | 20    |
| DFUWUat             | ***** |
| DFUWUcutoff         | 14    |
| DFUWUduration       | 0     |
| DFUWUinterval       | 24    |
| DFUWUlimit          | 1000  |
| DFUWUthrottle       | 0     |
| keepResultFiles     | false |
| WUat                | ***** |
| WUbackup            | 0     |
| WUcutoff            | 8     |
| WUduration          | 0     |
| WUinterval          | 6     |
| WUlimit             | 1000  |
| WUretryinterval     | 7     |
| WUthrottle          | 0     |

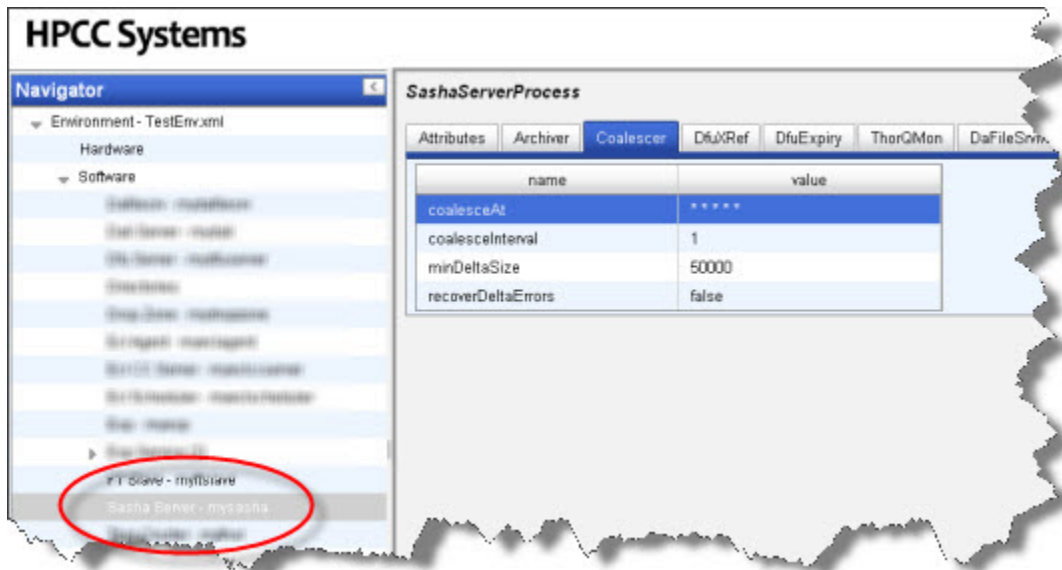
| attribute  | description   | values    | required |
|------------|---|-----------|----------|
| WUlimit    | threshold number of workunits before archiving starts (0 disables).       | 1000      | optional |
| WUcutoff   | minimum workunit age to archive (days).                                   | 8         | optional |
| WUbackup   | minimum workunit age to backup (days, 0 disables).                        | 0         | optional |
| WUinterval | minimum interval between running WorkUnit archiver(in hours, 0 disables). | 6         | optional |
| WUat       | schedule to run WorkUnit archiver (cron format).                          | * * * * * | optional |

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| attribute           | description   | values    | required |
|---------------------|---|-----------|----------|
| WUduration          | maximum duration to run WorkUnit archiving session (hours, 0 unlimited).        | 0         | optional |
| WUthrottle          | throttle ratio (0-99, 0 no throttling, 50 is half speed).                       | 0         | optional |
| WUretryinterval     | minimal time before retrying archive of failed WorkUnits (days).                | 7         | optional |
| keepResultFiles     | option to keep result files owned by workunits after workunit is archived       | false     | optional |
| DFUrecoveryLimit    | threshold number of DFU recovery items before archiving starts (0 disables).    | 20        | optional |
| DFUrecoveryCutoff   | minimum DFU recovery item age to archive (days).                                | 4         | optional |
| DFUrecoveryInterval | minimum interval between running DFU recovery archiver(in hours, 0 disables).   | 12        | optional |
| DFUrecoveryAt       | schedule to run DFU recovery archiver (cron format).                            | * * * * * | optional |
| DFUWUlimit          | threshold number of DFU workunits before archiving starts (0 disables).         | 1000      | optional |
| DFUWUcutoff         | minimum DFU workunit age to archive (days).                                     | 14        | optional |
| DFUWUinterval       | minimum interval between running DFU recovery archiver (in hours, 0 disables).  | 24        | optional |
| DFUWUat             | schedule to run DFU workunit archiver (cron format).                            | * * * * * | optional |
| DFUWUduration       | maximum duration to run DFU WorkUnit archiving session (hours, 0 unlimited).    | 0         | optional |
| DFUWUthrottle       | throttle ratio (0-99, 0 no throttling, 50 is half speed).                       | 0         | optional |
| cachedWUlimit       | threshold number of cached workunits before removal starts (0 disables).        | 100       | optional |
| cachedWUinterval    | minimum interval between running cached workunit removal(in hours, 0 disables). | 24        | optional |
| cachedWUat          | schedule to run cached workunit removal (cron format).                          | * * * * * | optional |

## SashaServer Process Coalescer

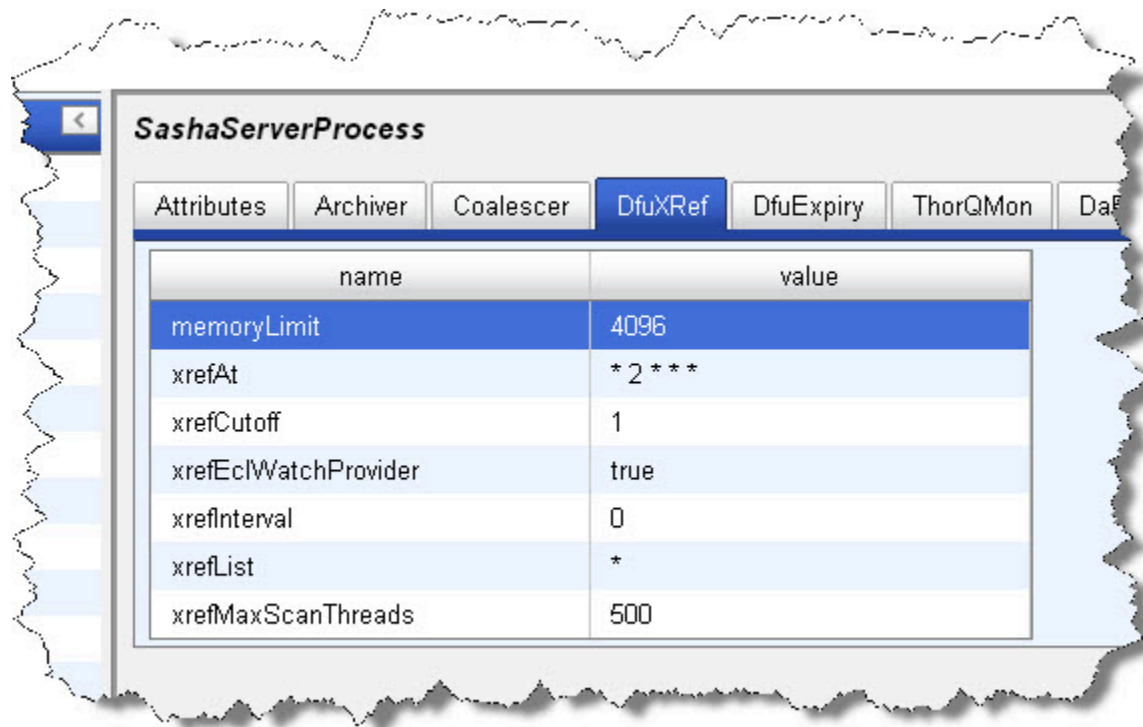
This section describes the SashaServer Process Coalescer tab.



| attribute          | description   | values    | required |
|--------------------|---|-----------|----------|
| coalesceInterval   | minimum interval between running Dali datastore coalescer (in hours, 0 disables). | 1         | optional |
| coalesceAt         | schedule to run Dali datastore coalescer (cron format).                           | * * * * * | optional |
| minDeltaSize       | Coalescing will only begin, if the delta size is above this threshold (K)         | 50000     | optional |
| recoverDeltaErrors | Switch on to auto recover from corruption to delta files on load                  | false     | optional |

## SashaServer Process DfuXRef

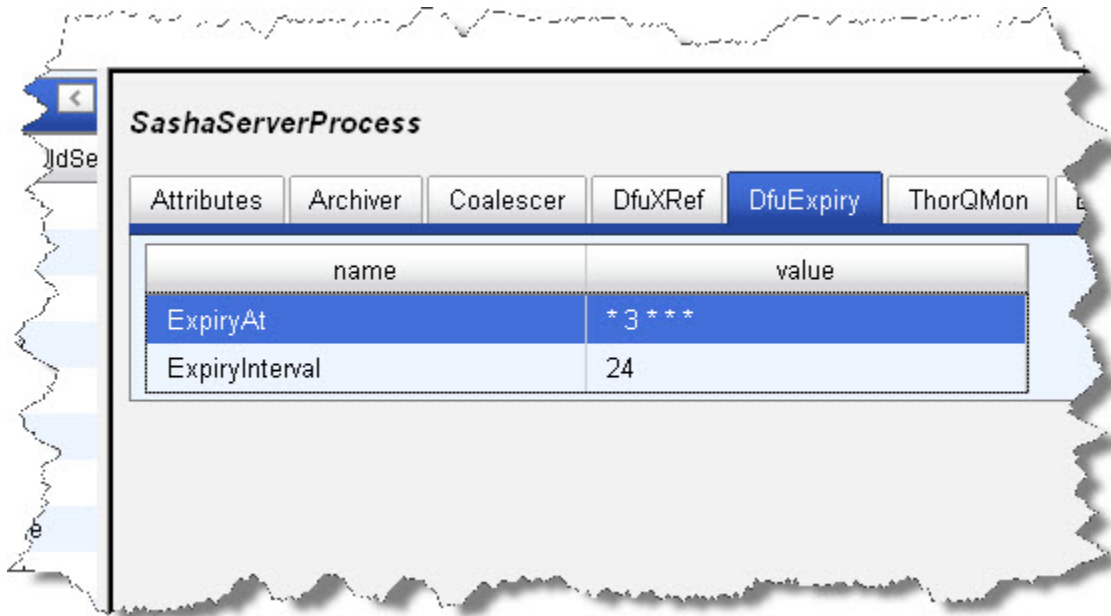
This section describes the SashaServer Process DfuXRef tab.



| attribute                  | description   | values    | required |
|----------------------------|---|-----------|----------|
| xrefInterval               | minimum interval between running DFU XREF (in hours, 0 disables). | 672       | optional |
| xrefAt                     | schedule to run DFU XREF (cron format).                           | * 2 * * * | optional |
| xrefList                   | comma separated list of clusters to xref (* for all clusters).    | *         | optional |
| xrefCutoff                 | cutoff (in days) to ignore recent files.                          | 1         | optional |
| xrefMaxScanThreads         | maximum thread count for scanning directories                     | 500       | optional |
| xrefEclWatchProvider       | use sasha for EclWatch initiated xref.                            | true      | optional |
| xrefMaxMemory              | The upper memory limit that xref can use.                         | 4096      | optional |
| suspendCoalescerDuringXref | Suspend the coalescer whilst xrefing.                             | true      | optional |

## SashaServer Process DfuExpiry

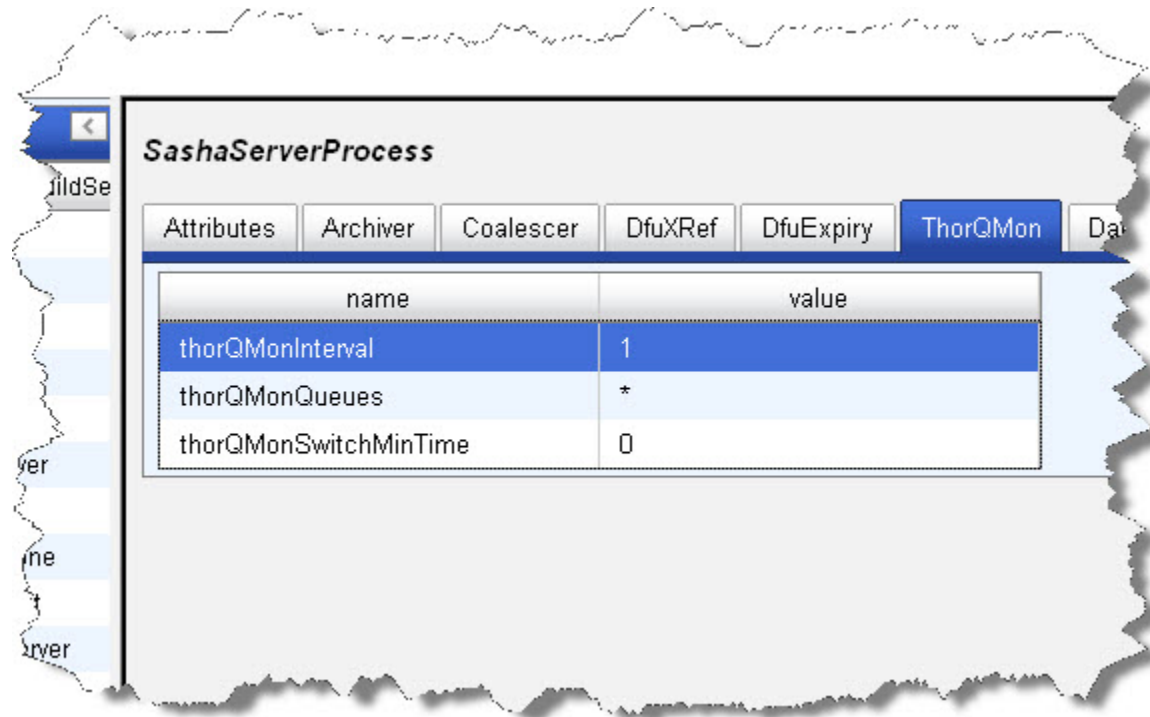
This section describes the SashaServer Process DfuExpiry tab.



| attribute            | description   | values    | required |
|----------------------|---|-----------|----------|
| ExpiryInterval       | minimum interval between checking for distributed file expiry (in hours, 0 disables). | 24        | optional |
| ExpiryAt             | schedule to check for distributed file expiry (cron format).                          | * 3 * * * | optional |
| PersistExpiryDefault | Default number of days to delete unused persist files                                 | 7         | optional |
| ExpiryDefault        | Default number of days to delete unused standard files that are flagged with EXPIRY   | 14        | optional |

## SashaServer Process ThorQMon

This section describes the SashaServer Process ThorQMon tab.



| attribute             | description   | values | required |
|-----------------------|---|--------|----------|
| thorQMonQueues        | comma separated list of Thor queues to monitor (* for all).               | *      | optional |
| thorQMonInterval      | interval to monitor and log queue activity (in minutes).                  | 1      | optional |
| thorQMonSwitchMinTime | minimum idle time before job will switch queues. (in minutes, 0 disables) | 0      | optional |

## SashaServer Process DaFileSrvMonitor

This section describes the SashaServer Process DaFileSrvMonitor tab.



| attribute       | description  | values    | required |
|-----------------|--|-----------|----------|
| dafsmonInterval | minimum interval between running DaFileSrv monitor (in hours, 0 disables). | 0         | optional |
| dafsmonAt       | schedule to run DaFileSrv monitor (cron format).                           | * * * * * | optional |
| dafsmonList     | comma separated list of clusters and IPs to monitor (* for all clusters).  | *         | optional |

## SashaServer Process Notes

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

## Thor

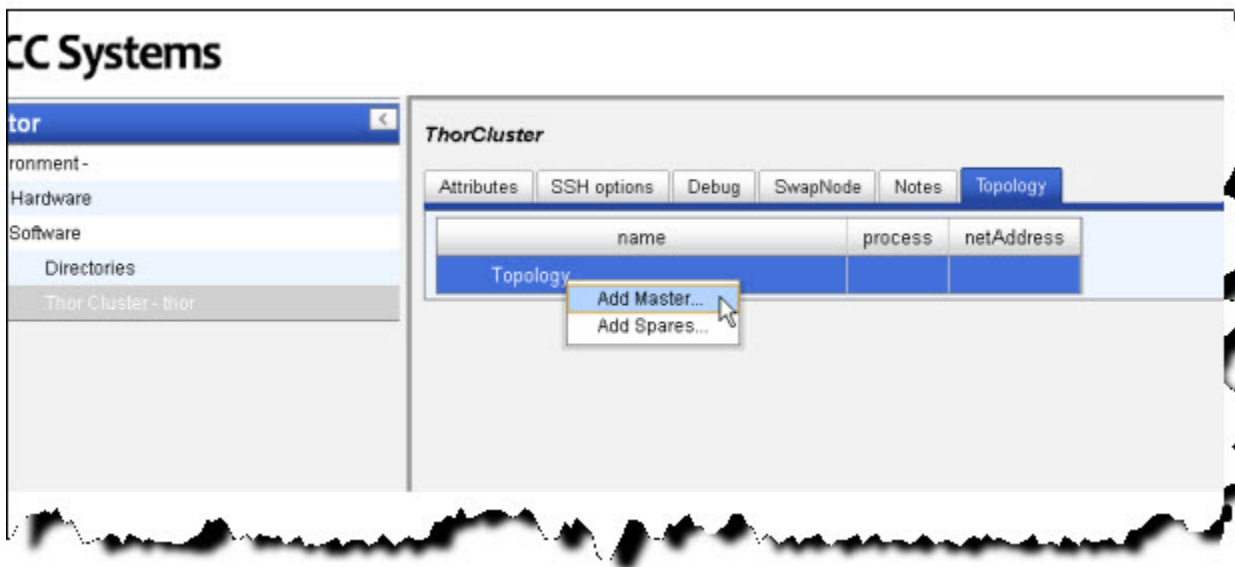
This section details how to define a Data Refinery (Thor) cluster. Before you begin, you should decide the width of the cluster (i.e., how many slave nodes will you have).

1. Select **Thor Cluster - mythor** in the Navigator panel on the left side.
2. Select the **Topology** tab.
3. Expand the Topology, if needed, then right-click the Master and select Delete.

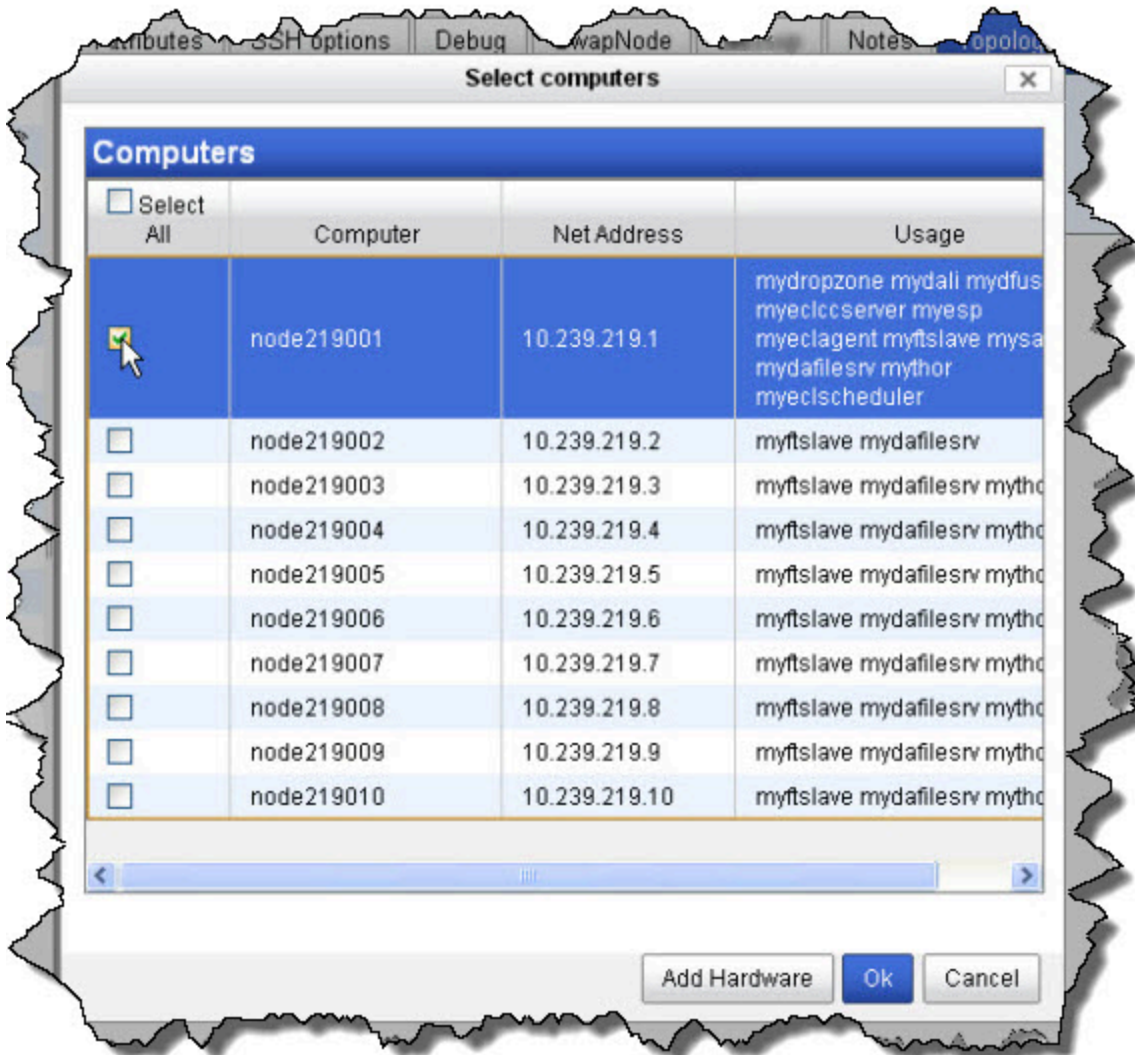
This deletes the sample one-node Thor.

You will replace this with a multi-node cluster.

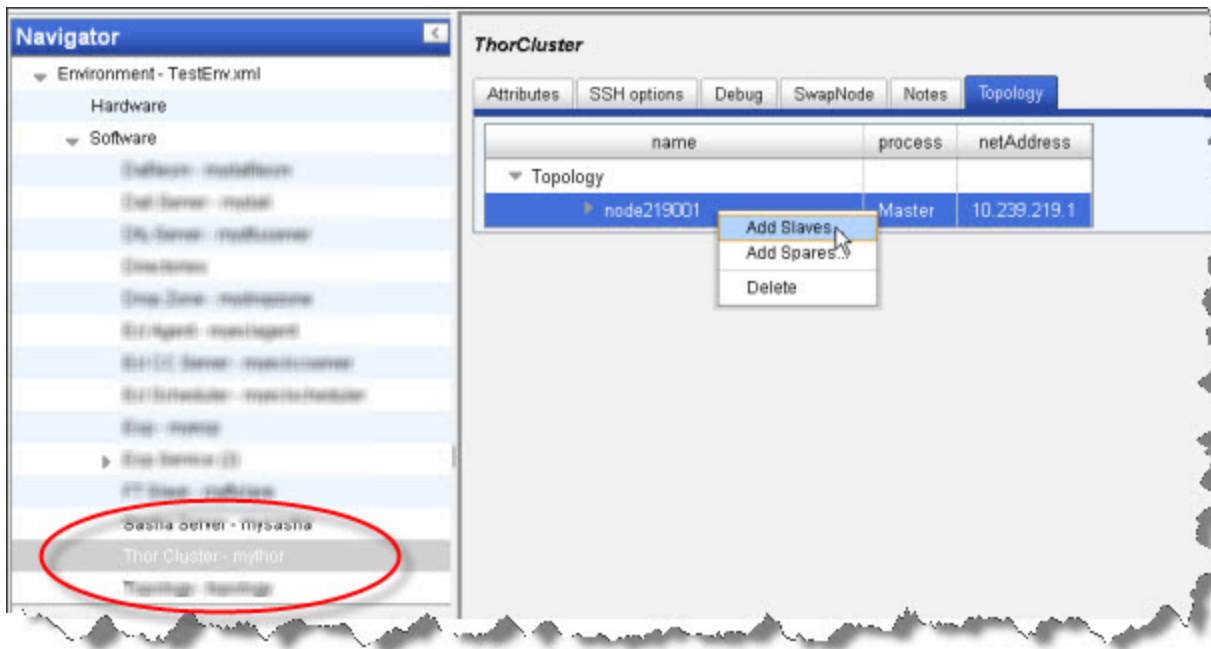
1. right-click on the Topology and select Add Master.



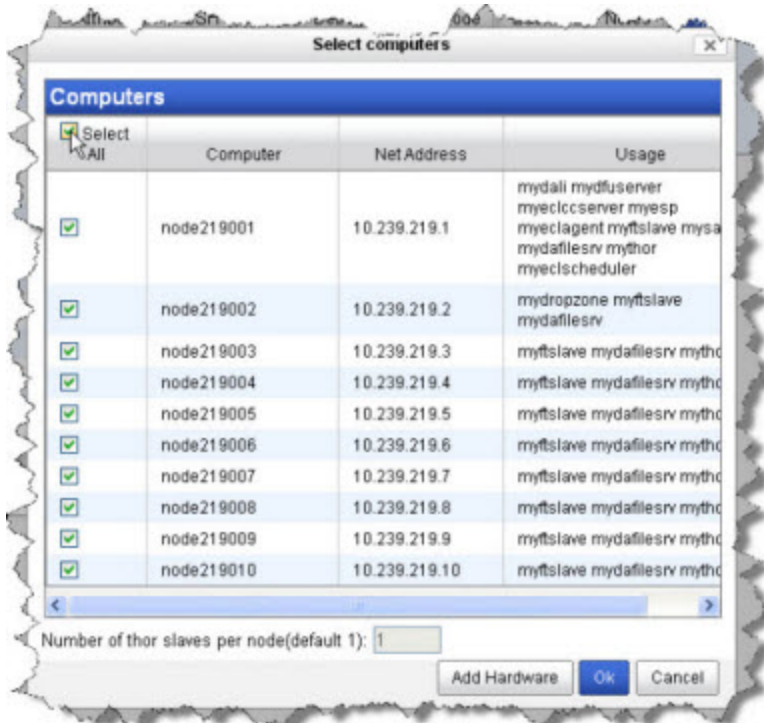
2. Select a computer from the list, then press the OK button.



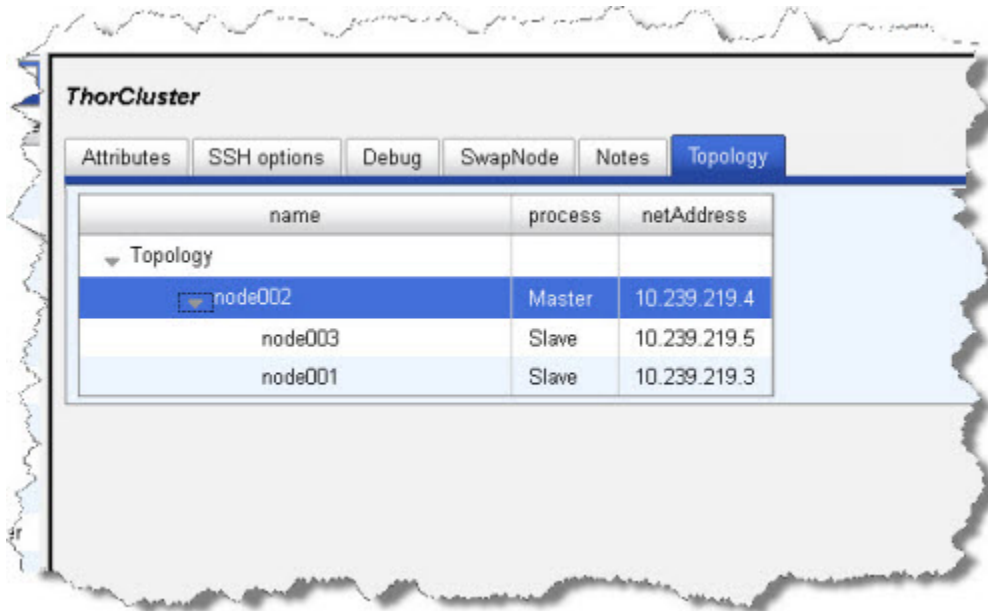
3. Right-click on the Master and select Add Slaves.



4. Select the computers to use as slaves from the list, then press the OK button. Use CTRL+CLICK to multi-select or SHIFT+CLICK to select a range.

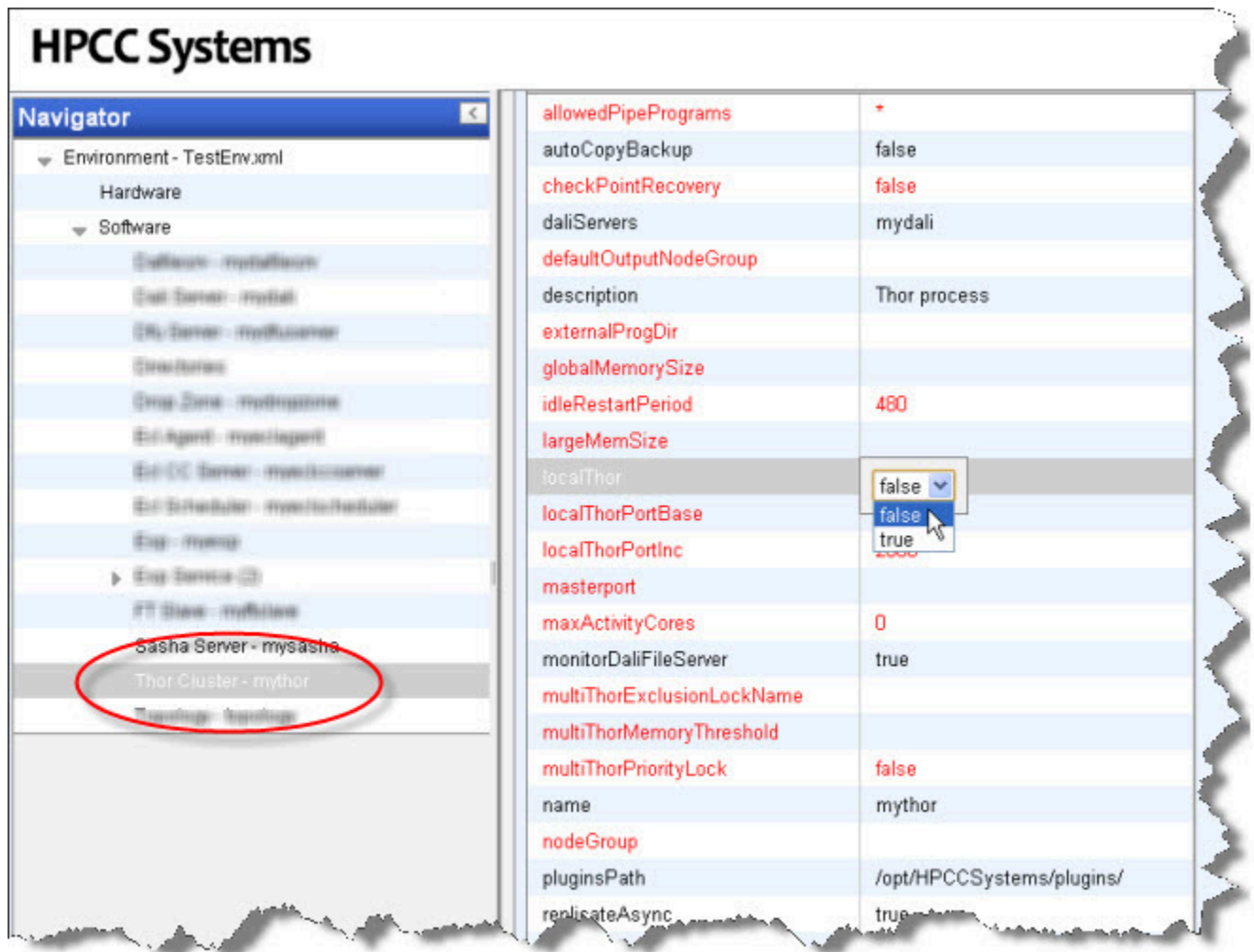


The Nodes now display below the Thor Master node.



5. Select Thor Cluster - mythor in the Navigator panel on the left side.

6. Select the Attributes tab.



| Attribute                  | Value                     |
|----------------------------|---------------------------|
| allowedPipePrograms        | *                         |
| autoCopyBackup             | false                     |
| checkPointRecovery         | false                     |
| daliServers                | mydali                    |
| defaultOutputNodeGroup     |                           |
| description                | Thor process              |
| externalProgDir            |                           |
| globalMemorySize           |                           |
| idleRestartPeriod          | 480                       |
| largeMemSize               |                           |
| localThor                  | false                     |
| localThorPortBase          | false                     |
| localThorPortInc           | true                      |
| masterport                 |                           |
| maxActivityCores           | 0                         |
| monitorDaliFileServer      | true                      |
| multiThorExclusionLockName |                           |
| multiThorMemoryThreshold   |                           |
| multiThorPriorityLock      | false                     |
| name                       | mythor                    |
| nodeGroup                  |                           |
| pluginsPath                | /opt/HPCCSystems/plugins/ |
| replicateAsync             | true                      |

7. Change the value of the localThor to **false**

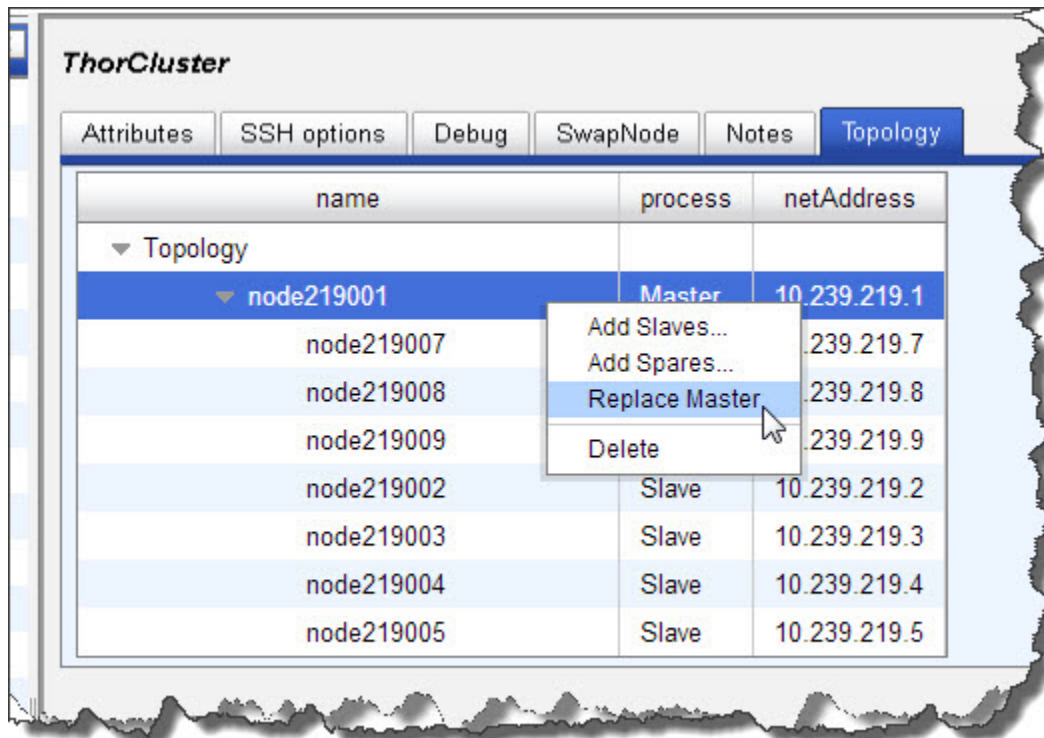
8.

Click the  disk icon to save

## Changing Thor topology

If you want to designate a different node as the Thor master when setting up a multi-node system, follow these steps.

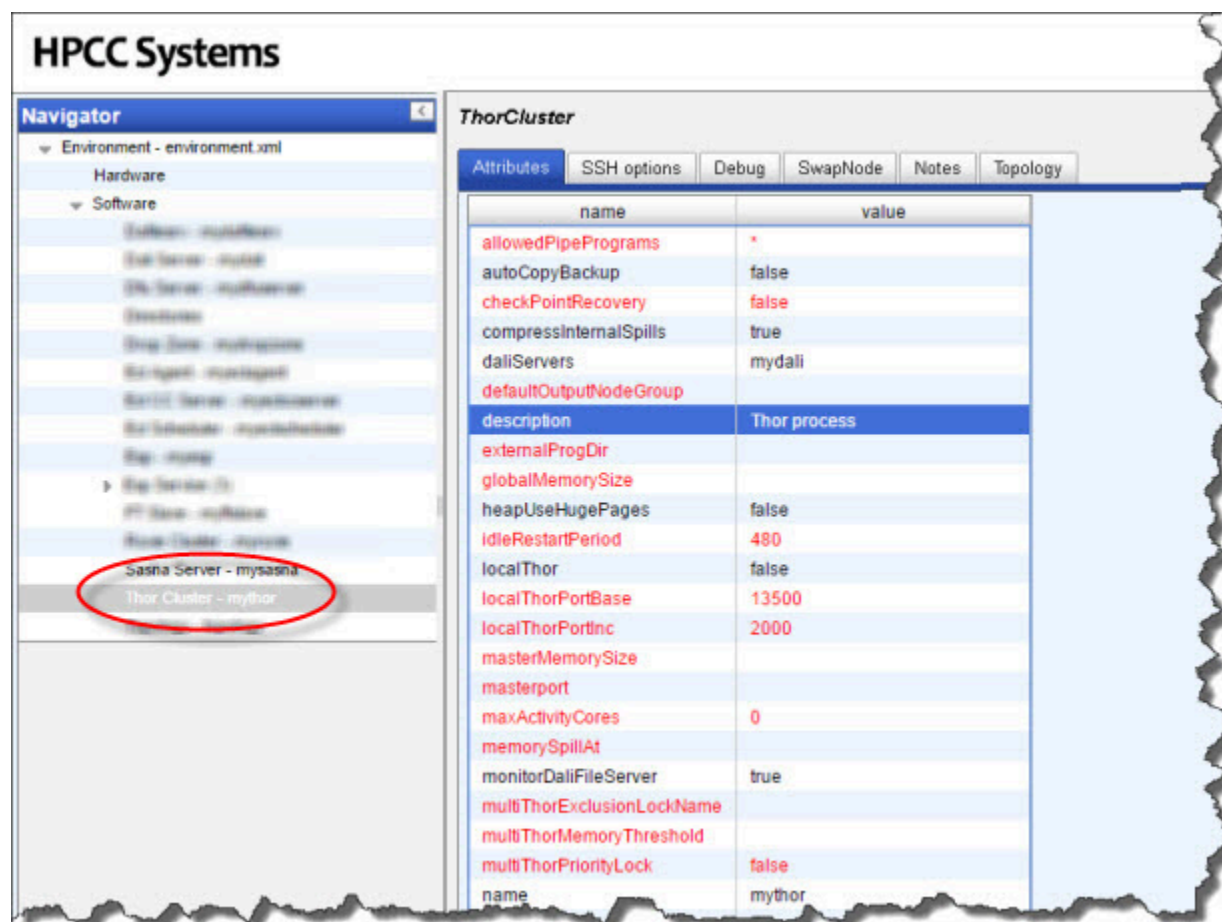
1. Select **Thor Cluster - mythor** in the Navigator panel on the left side.
2. Select the **Topology** tab.
3. Right-click on the Master node
4. Select the **Replace Master** option.



You should only use this feature when initially setting up your system. If there is data on the nodes when attempting to Swap Master, you run the risk of losing or corrupting some data.

## ThorCluster Attributes

This section describes the Thor Cluster Attributes tab.



## Thor Memory Settings

When the **globalMemorySize** is left unset, Thor[master] detects total physical memory and allocates 75% of it. If there are multiple slaves per node (`slavesPerNode`>1) it divides the total among the slaves. If `globalMemorySize` is defined, then it allocates that amount of memory to each slave. The `masterMemorySize` attribute allocates memory for the Thor master. If omitted, Thor master uses `globalMemorySize`, or the default 75% of memory.

On systems with a lot of memory, the default 75% of physical memory is probably too conservative and reserving total physical minus 2GB (for the OS and other processes) is sensible. You should then divide that number by the number of `slavesPerNode`.

If there are multiple Thors sharing the same nodes, then `globalMemorySize` must be configured to take that into account.

For example, if there are 2 Thors each with 2 slaves per box, that will mean there are 4 slaves per physical node. So you should use a formula similar to the following in your calculations when configuring `globalMemorySize`:

```
globalMemorySize = (total-physical-memory)-2GB / (2*2)
```

Without any specified setting, Thor assumes it has exclusive access to the memory and would therefore use too much (because each Thor is unaware of the other's configuration and memory usage).

If **localThor** is set to true and **masterMemorySize** and **globalMemorySize** are unspecified, then the defaults will be 50% for **globalMemorySize** (divided by **slavesPerNode**) and 25% for **masterMemorySize**.

Although a configuration may be set using upper memory limits that exceed total physical memory, Thor will not actually reserve the memory ahead of time and will only hit memory problems when and if your jobs use all of memory. So, for example, two Thors that are configured to use all available memory could peacefully co-exist until a query on each are simultaneously using more memory than the node has available.

| attribute                   | description   | values                    | required |
|-----------------------------|---|---------------------------|----------|
| name                        | Name for this process   |                           | required |
| description                 | Description for this process  | Thor process              | optional |
| daliServers                 | Specifies the dali server to which this thor is attached.   |                           | required |
| externalProgDir             | If specified, external programs executed via PIPE will be started in the named directory                            |                           | optional |
| masterMemorySize            | Memory (in MB) to use for rows on thor master. It will default to globalMemorySize if unset                         |                           | optional |
| fileCacheLimit              | File Cache limit (in MB). It will default to 1800 if unset  | 1800                      | optional |
| globalMemorySize            | Memory (in MB) to use for rows per Thor slave process. If unset, default = [75% of physical memory] / slavesPerNode |                           | optional |
| memorySpillAt               | Threshold that the memory manager should start requesting memory to be freed (percentage)                           |                           | optional |
| heapUseHugePages            | Allow Thor master and slave to use memory from huge pages if they have been configured.                             | false                     | optional |
| heapMasterUseHugePages      | Allow heapUseHugePages to be overridden for the master. Useful to disable if running on a single machine.           |                           | optional |
| heapUseTransparentHugePages | Allow Thor master and slave to use memory from transparent huge pages.  | true                      | optional |
| heapRetainMemory            | Retain and do not return unused memory to the operating system.   | false                     | optional |
| pluginsPath                 |   | /opt/HPCCSystems/plugins/ | optional |
| nodeGroup                   | Name of a node group running Thor slaves. (if omitted uses same name as Thor)                                       |                           | optional |
| defaultOutputNodeGroup      | Default group to output to. Leave blank if output defaults to local cluster.  |                           | optional |
| masterport                  | Base port to use for master   | 20000                     | optional |
| slaveport                   | Base port to use for slaves   | 20100                     | optional |

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| attribute                    | description  | values | required |
|------------------------------|--|--------|----------|
| localThor                    | Assume all slaves are local to this machine rather than started via agent  | false  | optional |
| slavesPerNode                | Defines how many slave processes there are on each node  | 1      | optional |
| channelsPerSlave             | Defines how many slave channels per slave process  | 1      | optional |
| localThorPortInc             | Port increment between slaves on same node   | 20     | optional |
| multiThorMemoryThreshold     | Memory usage (in MB) beneath which multiple Thors will run in parallel. Leave blank if no limit.                         |        | optional |
| multiThorPriorityLock        | If set true, prevents lower priority jobs starting on a multithor  | false  | optional |
| multiThorExclusionLockName   | Prevents other thors (on any queue) sharing the same multiThorExclusionLock-Name name from running jobs at the same time |        | optional |
| replicateOutputs             | Replicate output files   | true   | optional |
| replicateAsync               | Perform output replication in the background, allowing thor to process next task   | true   | optional |
| autoCopyBackup               | If files at primary location are missing, copy into place from backup location   | false  | optional |
| checkPointRecovery           | Enable support for continuing failed workunits from point of failure   | false  | optional |
| watchdogEnabled              | Enable/disable watchdog process (periodically checking slaves are still alive)   | true   | optional |
| watchdogProgressEnabled      | Enable/Disable graph progress reporting in watchdog process  | true   | optional |
| watchdogProgressInterval     | Graph progress reporting interval (seconds)  | 30     | optional |
| slaveDownTimeout             | A slave will be marked down after the specified elapsed time period (seconds)  | 300    | optional |
| verifyDaliConnectionInterval | Interval between verification of thor to dali connection (seconds)   | 300    | optional |
| idleRestartPeriod            | Period of idle time after which to initiate an auto restart (minutes)  | 480    | optional |
| smallSortThreshold           | Sort size threshold for thor global sorting on multiple nodes (MB)   | 1024   | optional |
| maxActivityCores             | Maximum number of cores to use per activity (only currently used by sorting activities). Default equals all available    | 0      | optional |
| monitorDaliFileServer        | Warn if dafilesrv process is not running on computers  | true   | optional |

| attribute              | description   | values         | required |
|------------------------|---|----------------|----------|
| allowedPipePrograms    | Comma separated list of allowed PIPE program (* for allow all)  | *              | optional |
| compressInternalSpills | Compress internal writes to disk when spilling  | true           | optional |
| affinity               | A comma separated list of cpu ids (and ranges) to bind all thor slaves to   |                | optional |
| autoAffinity           | Automatically bind slave processes to a single cpu socket, if multiple slaves are running on a multi socket machine | true           | optional |
| numaBindLocal          | Restrict allocations to memory attached to the cpu sockets the slave process is bound to                            | false          | optional |
| httpCallerIdHeader     | HTTP Header field to use for sending and receiving CallerId   | HPCC-Caller-Id | optional |
| httpGlobalIdHeader     | HTTP Header field to use for sending and receiving GlobalId   | HPCC-Global-Id | optional |

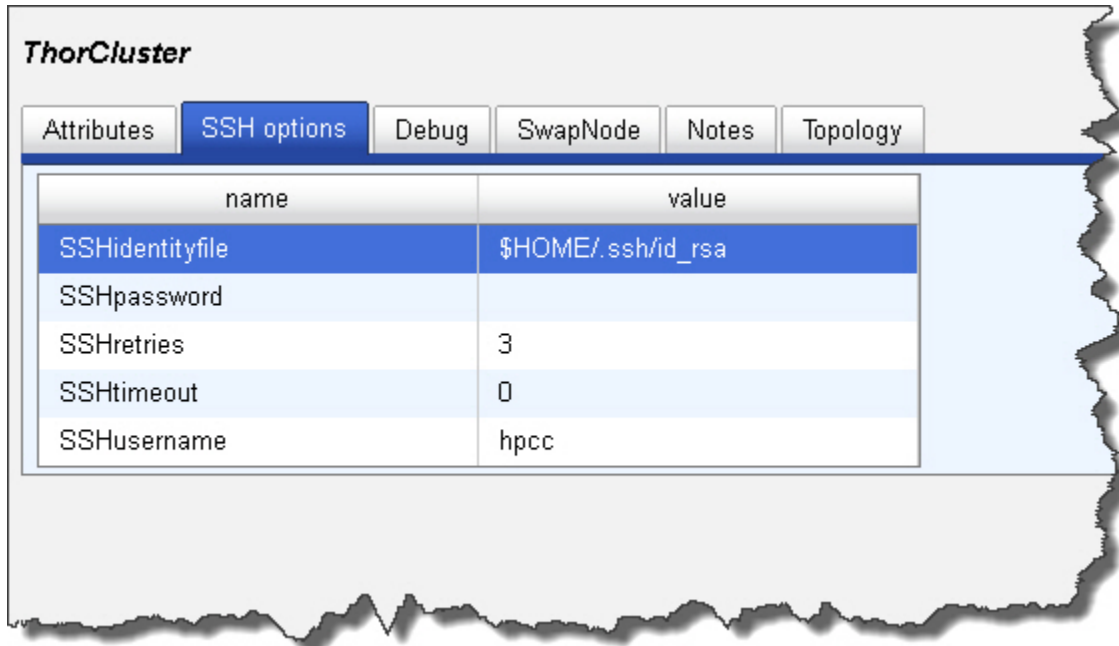
## XREF with multiple Thor clusters

XREF runs on the primary Thor cluster. For a configuration with more than one Thor cluster on the same physical node group, ECL Watch only displays the primary Thor and not any other Thor that shares the same node group. This is the Thor cluster whose name matches the *nodeGroup* in the configuration.

To allow XREF to run in an environment with multiple Thor clusters, set the *nodeGroup* to the same value for all Thor clusters.

## ThorCluster SSH Options

This section describes the ThorCluster SSH Options tab.



| name            | value              |
|-----------------|--------------------|
| SSHidentityfile | \$HOME/.ssh/id_rsa |
| SSHpassword     |                    |
| SSHretries      | 3                  |
| SSHtimeout      | 0                  |
| SSHusername     | hpcc               |

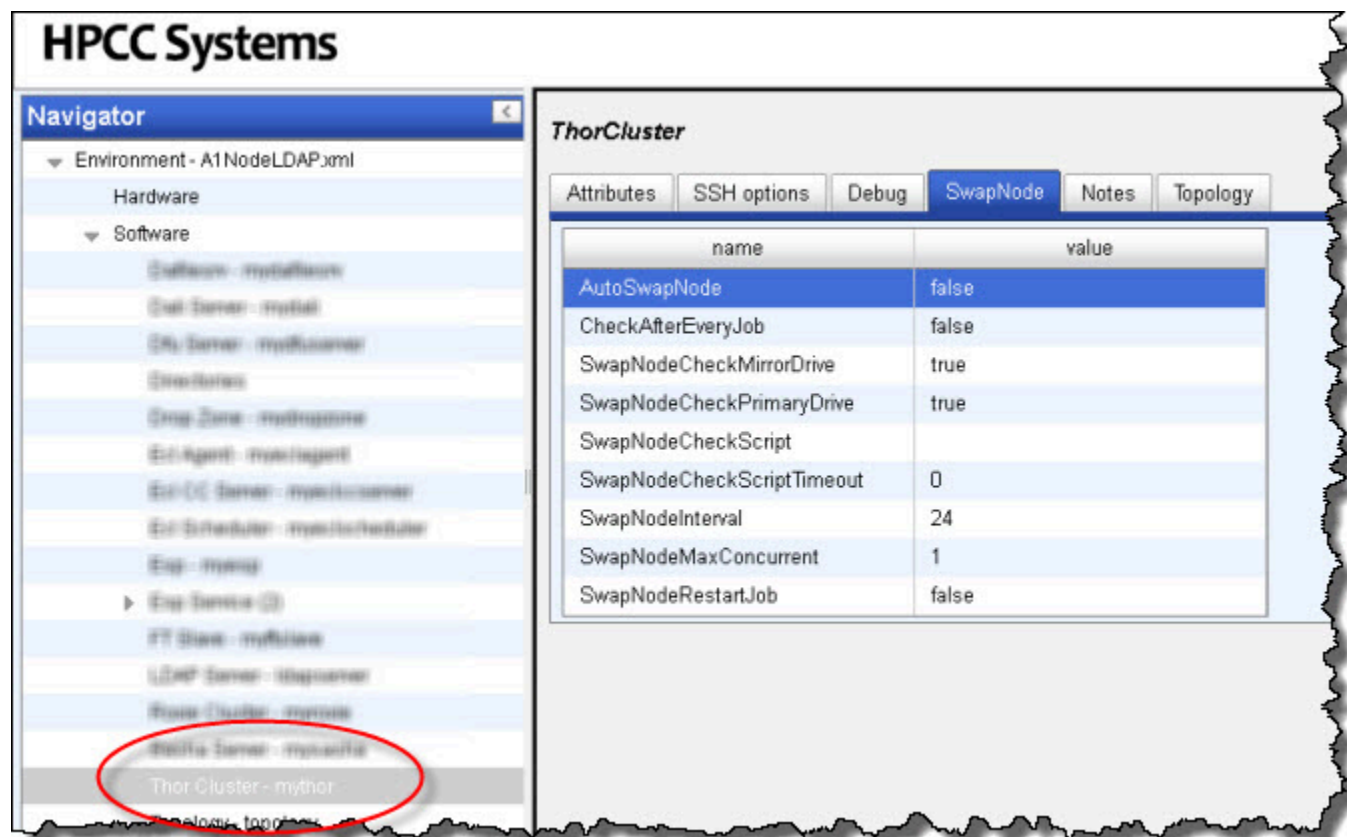
| attribute       | description   | values             | required |
|-----------------|---|--------------------|----------|
| SSHidentityfile | location of identity file (private key) on Thor master                            | \$HOME/.ssh/id_rsa | optional |
| SSHusername     | Username to use when running Thor slaves  | hpcc               | optional |
| SSHpassword     | Fixed password - only required if no identity file present NB <b>**insecure**</b> |                    | optional |
| SSHtimeout      | Timeout in seconds for SSH connects   | 0                  | optional |
| SSHretries      | Number of times to retry failed connect   | 3                  | optional |

## ThorCluster Debug

The debug tab is for internal use only

## ThorCluster Swap Node

This section describes the ThorCluster Swap Node tab.



| attribute                 | description   | values | required |
|---------------------------|---|--------|----------|
| AutoSwapNode              | Failing nodes will be automatically swapped for spare nodes             | false  | optional |
| SwapNodeCheckPrimaryDrive | Primary drive is checked for read/write                                 | true   | optional |
| SwapNodeCheckMirrorDrive  | Mirror drive is checked for read/write                                  | true   | optional |
| SwapNodeMaxConcurrent     | Maximum number of concurrent automatic swaps (within the swap interval) | 1      | optional |
| SwapNodeInterval          | Interval (in hours) for maximum concurrent swaps                        | 24     | optional |
| SwapNodeRestartJob        | Restart job that failed prior to swap                                   | false  | optional |
| CheckAfterEveryJob        | Check nodes after every job (if false, only check after failed jobs)    | false  | optional |

## ThorCluster Notes

This tab allows you to add any notes pertinent to the component's configuration. This can be useful to keep a record of changes and to communicate this information to peers.

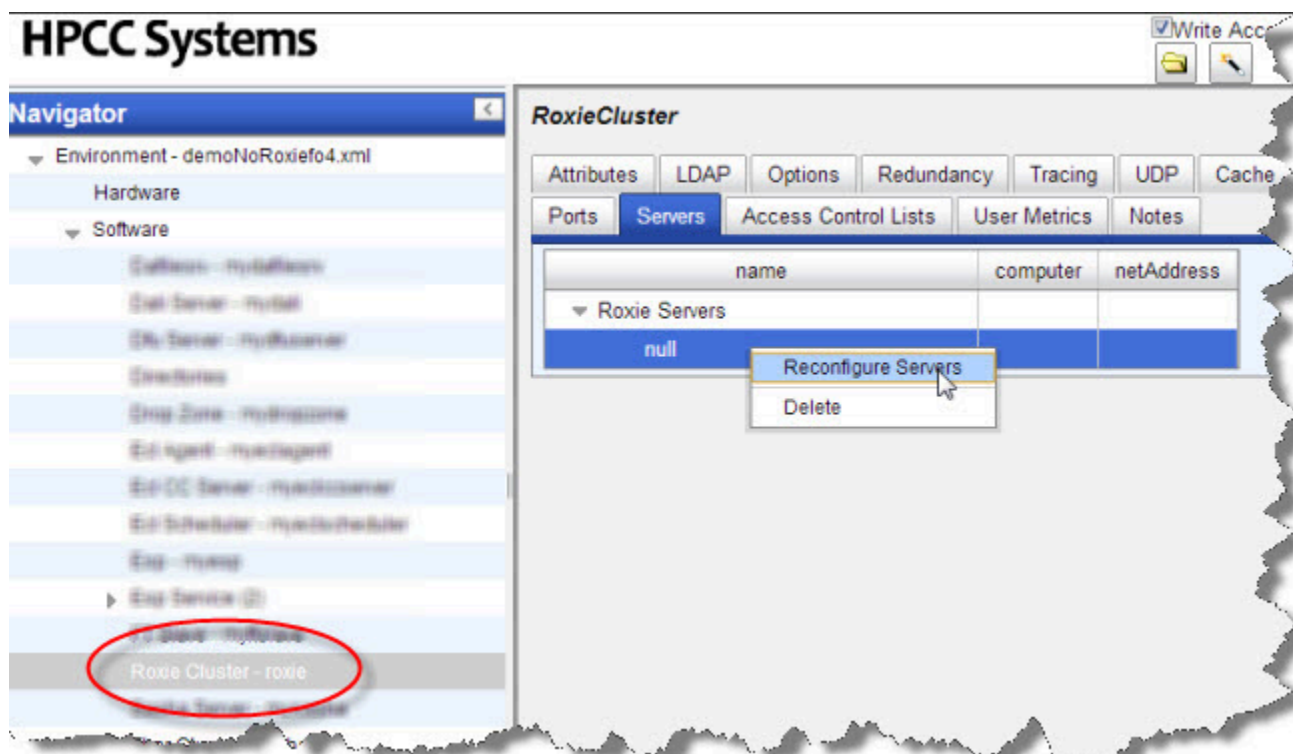
## Roxie

This section details how to define a Rapid Data Delivery Engine (Roxie) cluster. Before you begin, you should decide the width of the cluster (i.e., how many agent nodes will you have).

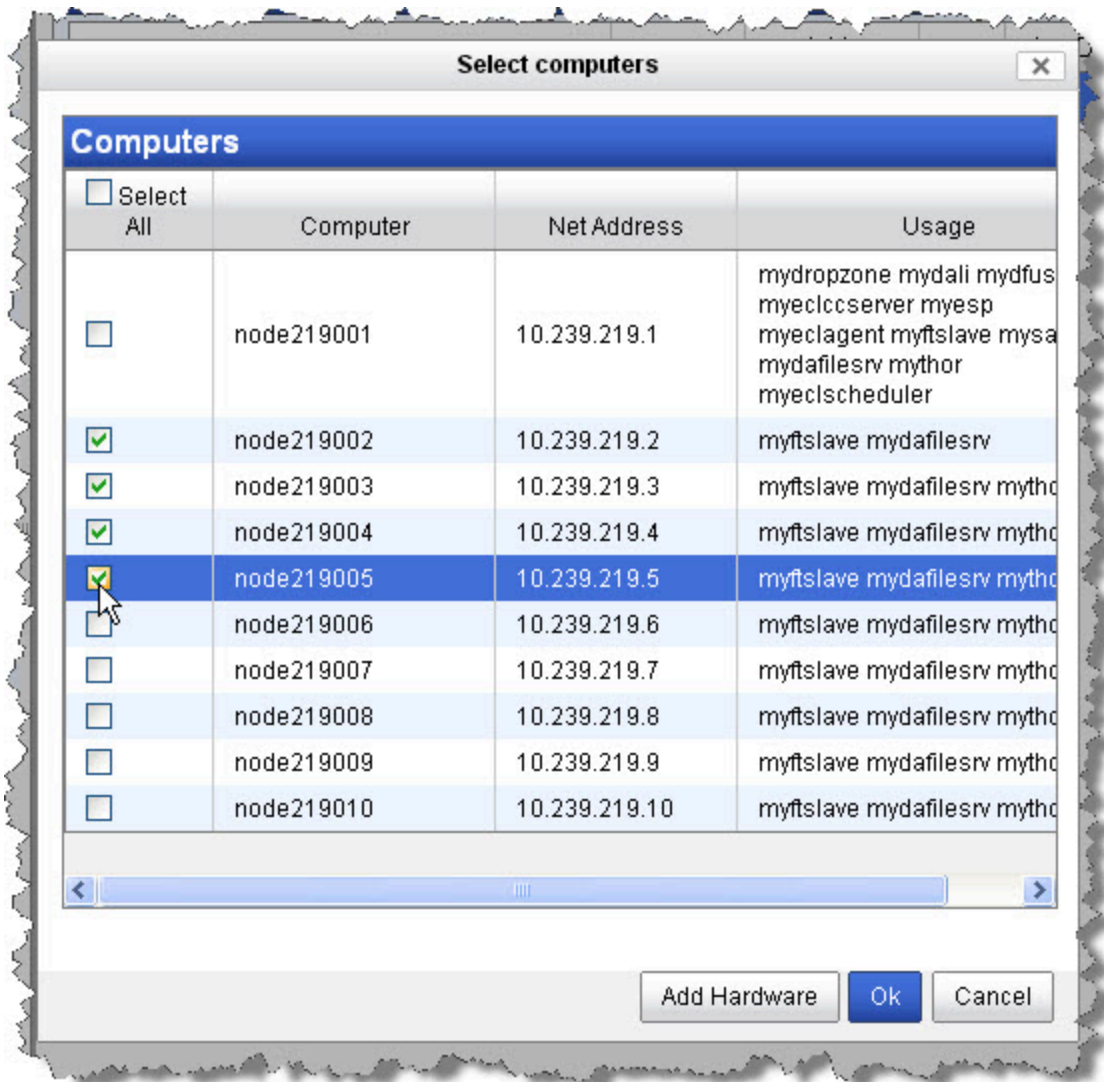
1. Select **Roxie Cluster** in the Navigator panel on the left side.

**Note:** If you did not specify a value in the *Number of nodes for Roxie cluster* field when you first set up your environment, you will not have a Roxie Cluster. To add a Roxie Cluster component: Right-click on the **Software** component in the Navigator Panel, then select **New Components** then **roxie** from the drop lists.

2. Select the **Servers** tab.
3. Right-click the Roxie Servers and select Reconfigure Servers.

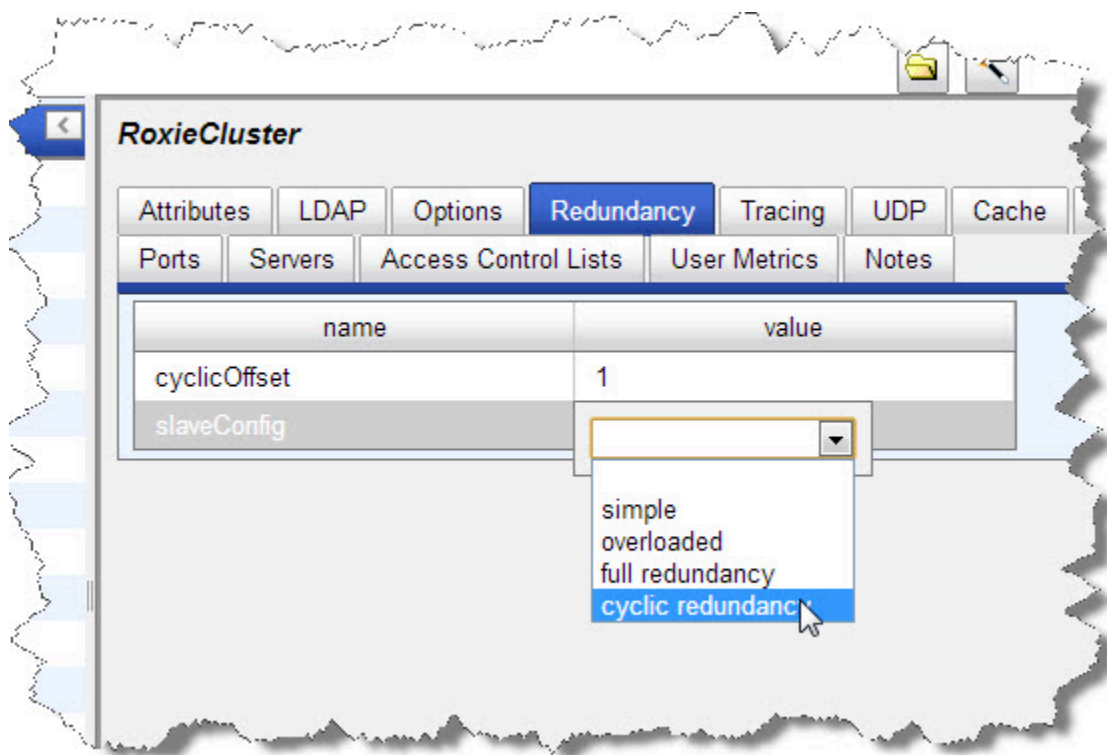


4. Select the computers to use as Servers from the list, then press the OK button.



5. Select the **Redundancy** tab.

6. Select the redundancy scheme to use. Typically, this is cyclic redundancy, as shown below.



7.  Click the disk icon to save

8. Close Configuration Manager by pressing ctrl+C in the command window where it is running.

## Roxie Configuration Attributes

Roxie has many configurable attributes which can be used to for customizing and tuning to your specific needs. The following section expands on each of the Roxie tabs and the available attributes. There is additional Roxie configuration information in the section immediately following these tables.

## RoxieCluster

### RoxieCluster

#### Attributes

| attribute     | description  | values                      | required |
|---------------|--|-----------------------------|----------|
| name          | Name for this process  |                             | required |
| description   | Description for this process   | Roxie cluster               | optional |
| daliServers   | Specifies the dali server to which this roxie is attached.   |                             | optional |
| lockDali      | If set, Roxie will use cached info from dali only, and will not connect to dali or refresh the cache.  | false                       | optional |
| multicastBase | The base multicast IP for this roxie cluster. Multicast ranges must not overlap for any roxie clusters in the same multicast domain.           | 239.1.1.1                   | optional |
| multicastLast | The last multicast IP available for this roxie cluster. Multicast ranges must not overlap for any roxie clusters in the same multicast domain. | 239.1.254.254               | optional |
| multicastTTL  | The multicast TTL (Time To Live) setting for this roxie cluster. Zero means do not explicitly set TTL, and use the default OS setting.         | 1                           | optional |
| directory     | Specifies the directory to which the software will be deployed.  | /var/lib/HPCCSystems/roxie/ | optional |
| pluginsPath   | Alternate path where plugin files are deployed (./plugins is assumed if not specified)   | /opt/HPCCSystems/plugins    | optional |

### RoxieCluster RoxieFarmProcess

#### Attributes

| attribute           | description  | values | required |
|---------------------|--|--------|----------|
| port                | the network port on which the Roxie servers accept connections                               | 9876   | required |
| numThreads          | Number of simultaneous queries Roxie servers will accept on this port                        | 30     | optional |
| listenQueue         | Number of pending connections that can be accepted   | 200    | optional |
| requestArrayThreads | Number of simultaneous queries Roxie servers will process using the MERGE option of SOAPCALL | 5      | optional |
| aclName             | Name of any Access Control List to use   |        | optional |
| protocol            | Protocol to use  | native | optional |
| passphrase          | Pass phrase for cert   |        | optional |

| attribute           | description                  | values | required |
|---------------------|------------------------------|--------|----------|
| certificateFileName | Path to certificate filename |        | optional |
| privateKeyFileName  | Path to private key filename |        | optional |

#### RoxieCluster RoxieServerProcess

##### Attributes

| attribute  | description | values | required |
|------------|-------------|--------|----------|
| computer   |             |        | required |
| netAddress |             |        | optional |

#### RoxieCluster ACL

##### Attributes

| attribute | description                       | values | required |
|-----------|-----------------------------------|--------|----------|
| name      | Name of this Access Control List. | acl    | required |

#### RoxieCluster ACL BaseList

##### Attributes

| attribute | description                                   | values | required |
|-----------|---|--------|----------|
| name      | Name of another Access Control List to extend |        | required |

#### RoxieCluster ACL Access

##### Attributes

| attribute | description  | values          | required |
|-----------|--|-----------------|----------|
| allow     | Whether or not to allow the access                 | Yes             | required |
| ip        | I.P. Address                                       | 0.0.0.0         | optional |
| mask      | Internet address mask                              | 255.255.255.255 | optional |
| query     | wildcard for queries to allow/disallow             | .*              | optional |
| errorCode | optional error code to associate with the query    |                 | optional |
| name      | Name of this Access Control Rule.                  | ACLrule         | required |
| error     | optional error message to associate with the query |                 | optional |

#### RoxieCluster PreferredCluster

##### Attributes

| attribute | description                    | values | required |
|-----------|--------------------------------|--------|----------|
| name      | Name of the cluster            |        | required |
| priority  | Priority (negative to disable) |        | required |

#### RoxieCluster UserMetric

##### Attributes

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| attribute | description          | values | required |
|-----------|----------------------|--------|----------|
| name      | Name of this metric. |        | required |
| regex     | Expression to match. |        | required |

### RoxieCluster Notes

#### Attributes

| attribute | description                                   | values | required |
|-----------|---|--------|----------|
| severity  | Significance of this note.                    | Minor  | optional |
| date      | Date and time this note was entered           |        | optional |
| computer  | Computer from which this note was entered     |        | optional |
| user      | User account from which this note was entered |        | optional |

### LDAP

| attribute    | description  | values | required |
|--------------|--|--------|----------|
| ldapUser     | Specifies the user name for LDAP file access checking. | roxie  | optional |
| ldapPassword | Specifies the password for LDAP file access checking.  |        | optional |

### Options

| attribute                | description  | values | required |
|--------------------------|--|--------|----------|
| affinity                 | If non-zero, binds the roxie process to use the specified cores only (bitmask)                     | 0      | optional |
| allFilesDynamic          | If enabled, files will be resolved per-query and not locked between queries                        | false  | optional |
| backgroundCopyClass      | Specify an IONICE class for the background copy thread.  | none   | optional |
| backgroundCopyPrio       | Specify an IONICE value for the background copy thread, if backgroundCopyClass set to best-effort. | 0      | optional |
| callbackRetries          | Number of retries before callbacks from agents to server are aborted                               | 3      | optional |
| callbackTimeout          | Timeout (in ms) before callbacks from agents to server are resent                                  | 5000   | optional |
| checkFileDate            | Compare file dates of physical files with the information in DFS.                                  | true   | optional |
| collectFactoryStatistics | Accumulate summary statistics for all queries  | true   | optional |
| copyResources            | Copies any missing data files/keys from the position they were in when query was deployed.         | true   | optional |

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| attribute                      | description   | values         | required |
|--------------------------------|---|----------------|----------|
| coresPerQuery                  | If non-zero, binds each incoming query to use the specified number of cores only  | 0              | optional |
| debugPermitted                 | Allow the ECL query debugger to attach to queries on this Roxie   | true           | optional |
| defaultHighPriorityTimeLimit   | Maximum run time (in ms) for any single active high-priority query (if not overridden)  | 0              | optional |
| defaultHighPriorityTimeWarning | Time (in ms) before generating SNMP warning for a high-priority query (if not overridden)   | 5000           | optional |
| defaultLowPriorityTimeLimit    | Maximum run time (in ms) for any single active low-priority query (if not overridden)   | 0              | optional |
| defaultLowPriorityTimeWarning  | Time (in ms) before generating SNMP warning for a low-priority query (if not overridden)  | 0              | optional |
| defaultMemoryLimit             | Maximum amount of memory available for row data in any single active query (if not overridden)  | 0              | optional |
| defaultSLAPriorityTimeLimit    | Maximum run time (in ms) for any single active SLA-high-priority query (if not overridden)  | 0              | optional |
| defaultSLAPriorityTimeWarning  | Time (in ms) before generating SNMP warning for a SLA-high-priority query (if not overridden)   | 5000           | optional |
| defaultStripLeadingWhitespace  | Default value for stripping leading white-space in input XML values   | 1              | optional |
| enableKeyDiff                  | Enable / Disable key diff functionality in roxie.   | true           | optional |
| enableSysLog                   | Enable use of syslog for monitoring.  | true           | optional |
| flushJHtreeCacheOnOOM          | Should the index node memory allocation flush the cache and retry if memory allocation fails  | true           | optional |
| fieldTranslationEnabled        | Enables translation (where possible) of mismatched file layouts on-the-fly. Specify 'payload' to attempt to translate payload fields only | payload        | optional |
| highTimeout                    | Timeout (in ms) before high priority requests are resent to agents  | 2000           | optional |
| httpCallerIdHeader             | HTTP Header field to use for sending and receiving CallerId   | HPCC-Caller-Id | optional |
| httpGlobalIdHeader             | HTTP Header field to use for sending and receiving GlobalId   | HPCC-Global-Id | optional |
| ignoreOrphans                  | Treat out-of-date local files as if they were not present.  | true           | optional |
| lazyOpen                       | Delay opening files until first use. Select smart to use lazy mode only after a restart   | smart          | optional |

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| attribute                 | description  | values     | required |
|---------------------------|--|------------|----------|
| localFilesExpire          | Period (in ms) of inactivity before a local datafile handle is closed                        | -1         | optional |
| localSlave                | All Roxie servers talk only to their embedded agent.   | false      | optional |
| lockSuperFiles            | If enabled, superfiles will be locked while queries that use them are loaded                 | false      | optional |
| lowTimeout                | Timeout (in ms) before low priority requests are resent to agents                            | 10000      | optional |
| maxHttpConnectionRequests | Max number of query requests per persistent http connection                                  | 10         | optional |
| maxHttpKeepAliveWait      | Max number of miliseconds to wait for additional requests on a persistent http connection    | 5000       | optional |
| maxLocalFilesOpen         | Maximum number of local files to keep open   | 4000       | optional |
| maxRemoteFilesOpen        | Maximum number of remote files to keep open  | 1000       | optional |
| minFreeDiskSpace          | Minimum amount of disk space needed to be available for file copy to succeed                 | 1073741824 | optional |
| minLocalFilesOpen         | Minimum number of local files to keep open   | 2000       | optional |
| minRemoteFilesOpen        | Minimum number of remote files to keep open  | 500        | optional |
| monitorDaliFileServer     | Warn if dafilesrv process is not running on computers  | false      | optional |
| preferredSubnet           | Preferred subnet to use for multi-NIC machines   |            | optional |
| preferredSubnetMask       | Preferred subnet mask to use for multi-NIC machines  |            | optional |
| preloadOnceData           | Evaluate : ONCE sections of queries at query load time                                       | true       | optional |
| prestartSlaveThreads      | Prestart slave worker threads at startup   | true       | optional |
| reloadRetriesFailed       | Retry loading of failed queries whenever QuerySet reloads                                    | true       | optional |
| remoteFilesExpire         | Period (in ms) of inactivity before a remote datafile handle is closed                       | 3600000    | optional |
| serverThreads             | Default number of threads processing Roxie server requests (if not specified on Servers tab) | 30         | optional |
| siteCertificate           | Name of the site certificate component that is used for security                             |            | optional |
| slaTimeout                | Timeout (in ms) before SLA high priority requests are resent to agents                       | 2000       | optional |

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| attribute                     | description  | values     | required |
|-------------------------------|--|------------|----------|
| slaveQueryReleaseDelaySeconds | Delay before unregistering slave queries to allow in-flight to complete. Files are locked until query is unregistered. | 60         | optional |
| slaveThreads                  | Number of threads processing agent requests  | 30         | optional |
| statsExpiryTime               | Time (in seconds) that detailed reporting stats are kept   | 3600       | optional |
| totalMemoryLimit              | Maximum amount of memory available for row data in all active queries  | 1073741824 | optional |
| heapUseHugePages              | Allow roxie to use memory from huge pages if they have been configured.  | false      | optional |
| heapUseTransparentHugePages   | Allow roxie to use memory from transparent huge pages.   | true       | optional |
| heapRetainMemory              | Retain and do not return unused memory to the operating system.  | false      | optional |
| trapTooManyActiveQueries      | should an SNMP trap get sent when too many active query error occurs   | true       | optional |
| useHardLink                   | If the data file exists on the current machine but in a different directory than roxie expects - create a hard link    | false      | optional |
| useMemoryMappedIndexes        | Using memory-mapped files when merging multiple result streams from row-compressed indexes.                            | false      | optional |
| useRemoteResources            | Reads any missing data files/keys from the position they were in when deployed.  | true       | optional |

### Redundancy

| attribute       | description   | values | required |
|-----------------|---|--------|----------|
| cyclicOffset    | Offset for cyclic redundancy mode                                     | 1      | optional |
| channelsPerNode | Number of channels/data locations to use per node, in overloaded mode | 1      | optional |
| numDataCopies   | Number of copies of the data in redundant modes                       | 1      | optional |
| slaveConfig     | Roxie data redundancy mode  |        | optional |

### Tracing

| attribute      | description  | values | required |
|----------------|--|--------|----------|
| traceLevel     | Level of detail in reporting (set to 0 for none, 1 for normal, > 1 or more for extended) | 1      | optional |
| logFullQueries | Log full text (unless blindLogging) and resource usage of all queries received           | false  | optional |

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| attribute           | description  | values | required |
|---------------------|--|--------|----------|
| blindLogging        | Suppress all logging of any data or query text   | false  | optional |
| memTraceLevel       | Level of detail in reporting mem mgr information(set to 0 for none, 1 for normal, >1 or more for extended)                       | 1      | optional |
| miscDebugTraceLevel | Level of miscellaneous debug tracing unrelated to all other tracing(set to 0 for none, 1 for normal, >1 or more for extended)    | 0      | optional |
| soapTraceLevel      | Level of detail in reporting SOAPCALL information(set to 0 for none, 1 for normal, >1 or more for extended)                      | 1      | optional |
| traceTranslations   | Trace record layout translations to log file"  | true   | optional |
| traceEnabled        | TRACE activity output enabled by default (can be overridden in workunit or query)  | false  | optional |
| traceLimit          | Number of rows output by TRACE activity  | 10     | optional |
| udpTraceLevel       | Level of detail in reporting udp information(set to 0 for none, 1 for normal, >1 or more for extended)                           | 1      | optional |
| useLogQueue         | Queue logs messages  | true   | optional |
| logQueueDrop        | Specifies the number of log messages which will be dropped if the maximum length of the queue of unhandled messages is exceeded. | 32     | optional |
| logQueueLen         | Specifies the maximum length of the queue of unhandled log messages. Messages will be dropped if this is exceeded.               | 512    | optional |

## UDP

| attribute                     | description   | values | required |
|-------------------------------|---|--------|----------|
| roxieMulticastEnabled         | Controls whether multicast is used to communicate between nodes   | true   | optional |
| udpFlowSocketsSize            | Controls the read socket buffer size of the UDP layer flow control sockets                                      | 131071 | optional |
| udpInlineCollation            | Controls whether UDP packets are collated on the reading thread or queued up for collation on a separate thread | false  | optional |
| udpInlineCollationPacketLimit | Controls how many UDP packets requested at once when inline collation selected                                  | 50     | optional |
| udpLocalWriteSocketSize       | Controls the write socket buffer size of the local UDP sockets (Agent to Server on same node)                   | 131071 | optional |
| udpMaxRetryTimeoutReqs        | Controls the Max number of agent "request to send" to be retried. 0 means keep retrying forever                 | 0      | optional |

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| attribute                    | description   | values     | required |
|------------------------------|---|------------|----------|
| udpMaxSlotsPerClient         | UDP transport layer slots per client  | 2147483647 | optional |
| udpMulticastBufferSize       | Controls the read socket buffer size of the UDP multicast sockets   | 131071     | optional |
| udpOutQsPriority             | Turns on/off Priority weight-based for output queues (0 round-robin no priority - old logic, 1 round-robin new logic, 2 and higher is factor of priority) | 0          | optional |
| udpQueueSize                 | UDP transport layer receive queue size  | 100        | optional |
| udpRequestToSendTimeout      | Controls the timeout value agent udp will wait for permission to send from a Roxie server, in milliseconds. Specify 0 to calculate automatically.         | 0          | optional |
| udpResendEnabled             | UDP transport layer packet resend ability   | false      | optional |
| udpRetryBusySenders          | Controls the number of times Roxie server will repeat search for an idle sender when requesting new data  | 0          | optional |
| udpSendQueueSize             | UDP transport layer send queue size   | 50         | optional |
| udpSnifferEnabled            | Enable the UDP multicast sniffer for tracking which senders are busy  | true       | optional |
| udpSnifferReadThreadPriority | If non-zero, run the sniffer read thread at elevated priority level   | 3          | optional |
| udpSnifferSendThreadPriority | If non-zero, run the sniffer send thread at elevated priority level   | 3          | optional |

## Cache

| attribute                | description  | values | required |
|--------------------------|--|--------|----------|
| blobCacheMem             | Size (in Mb) of blob index page cache  | 0      | optional |
| serverSideCacheSize      | Number of agent results to cache on Roxie server                                 | 0      | optional |
| leafCacheMem             | Size (in Mb) of leaf index page cache  | 50     | optional |
| nodeCachePreload         | Prefill the node cache with all non-leaf pages from all indexes                  | false  | optional |
| nodeCacheMem             | Size (in Mb) of non-leaf index page cache  | 100    | optional |
| mysqlCacheCheckPeriod    | Time to wait (ms) between checking if any cached MySQL connections can be closed | 10000  | optional |
| mysqlCacheTimeoutPeriod  | Time to wait (ms) before closing a cached MySQL connection                       | 60000  | optional |
| mysqlConnectionCacheSize | Number of MySQL connections to hold in cache                                     | 10     | optional |

## SSH

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| attribute       | description   | values             | required |
|-----------------|---|--------------------|----------|
| SSHidentityfile | location of identity file (private key) on Thor master                            | \$HOME/.ssh/id_rsa | optional |
| SSHusername     | Username to use when running Thor slaves  | hpcc               | optional |
| SSHpassword     | Fixed password - only required if no identity file present NB <b>**insecure**</b> |                    | optional |
| SSHtimeout      | Timeout in seconds for SSH connects   | 0                  | optional |
| SSHretries      | Number of times to retry failed connect   | 3                  | optional |

## Ports

| attribute      | description  | values | required |
|----------------|--|--------|----------|
| multicastPort  | Port used for multicast (server->slave) data                   | 8887   | optional |
| serverFlowPort | Port used for UDP (slave->server) server flow control messages | 9000   | optional |
| dataPort       | Port used for UDP (slave->server) data                         | 9001   | optional |
| clientFlowPort | Port used for UDP (slave->server) client flow control messages | 9002   | optional |
| snifferPort    | Port used for UDP (slave->server) sniffer                      | 9003   | optional |

## Debug

| attribute                     | description  | values | required |
|-------------------------------|--|--------|----------|
| checkCompleted                | Check pending replies when agent gets a retry request  | true   | optional |
| dafilesrvLookupTimeout        | Maximum time (in milliseconds) dafilesrv will wait before timing out the first time through the list | 10000  | optional |
| defaultConcatPreload          | Default concat preload   | 0      | optional |
| defaultFetchPreload           | Default fetch preload  | 0      | optional |
| defaultFullKeyedJoinPreload   | Default full keyed join preload  | 0      | optional |
| defaultKeyedJoinPreload       | Default keyed join preload   | 0      | optional |
| defaultParallelJoinPreload    | Default parallel join preload  | 0      | optional |
| defaultPrefetchProjectPreload | Default prefetch value for PROJECT,PREFETCH activity   | 10     | optional |
| diskReadBufferSize            | Default buffer size for disk read operations   | 65536  | optional |
| doIbytiDelay                  | Enables the IBYTI delay logic in the agents.   | true   | optional |
| enableHeartBeat               | Enable HeartBeat messages to clients   | true   | optional |
| fastLaneQueue                 | special fast-lane queue for simple queries.  | true   | optional |
| forceStdLog                   | Force log output to stderr even when redirected to null  | false  | optional |

Configuring the HPCC Systems® Platform  
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| attribute                   | description   | values   | required |
|-----------------------------|---|----------|----------|
| ignoreMissingFiles          | Ignore missing files  | false    | optional |
| indexReadChunkSize          | Break up results from indexRead (and other remote activities) every N bytes   | 60000    | optional |
| initIbytiDelay              | Initial time (in milliseconds) a secondary agent will wait for an IBYTI packet from a primary peer.   | 100      | optional |
| jumboFrames                 | Set to true if using jumbo frames (MTU=9000) on the network.  | false    | optional |
| linuxYield                  | Yield to scheduler in some tight loops. May help latency on uniprocessor machines   | false    | optional |
| maxBlockSize                | Max size of block read from client socket   | 10000000 | optional |
| maxLockAttempts             | Number of retries to get lock for global queries  | 5        | optional |
| memoryStatsInterval         | Interval (in seconds) between reports on Roxie heap usage   | 60       | optional |
| memTraceSizeLimit           | Generate stacktrace whenever a request is made for a row larger than this threshold (0 to disable)  | 0        | optional |
| parallelAggregate           | Number of parallel threads to use for in-memory aggregate processing. Set to 0 to use one per CPU, 1 to disable parallel processing of in-memory aggregates | 0        | optional |
| perChannelFlowLimit         | Number of pending queries permitted per channel (per active activity) before blocking   | 10       | optional |
| pingInterval                | Interval (in seconds) between Roxie server ping tests   | 60       | optional |
| preabortIndexReadsThreshold | Use seek to precheck keyed limits (i.e. assume ,COUNT) on index reads if limit greater than this value  | 100      | optional |
| preabortKeyedJoinsThreshold | Use seek to precheck limits on keyed joins if limit greater than this value   | 100      | optional |
| simpleLocalKeyedJoins       | Enable single-threaded local keyed joins  | true     | optional |
| socketCheckInterval         | Interval (in milliseconds) between checks that client socket is still open  | 5000     | optional |
| systemMonitorInterval       | How often to send an "alive" message  | 60000    | optional |

## Additional Roxie Configuration items

### Persistent Connections to Roxie

Persistent connections can cause backwards compatibility issues with non-standard HTTP clients. You can disable this feature by setting *maxHttpConnectionRequests* to either 0 or 1.

In addition, persistent connections can affect Roxie load balancing. If this is a concern, you can adjust *maxHttpRequests* and *maxHttpKeepAliveWait* values to optimize how long all the transactions from a particular persistent connection go to a single node rather than being distributed across the cluster.

### Add Servers to Roxie Farm

To add servers to a Roxie farm

1. Select the **Roxie Cluster - myroxie** (default) from the Navigator window on the left side.
2. Select the **Servers** tab.
3. Right-click on **Roxie Servers**.
4. Select **Reconfigure Servers**.
5. Press the **Add Hardware** button.
6. Enter the values for the new server(s) in the dialog then press OK.

All configured servers are then used when you create a port to listen on.

**NOTE** If working with an older environment file this process has changed. You no longer have to specify for a server to use a specific port.

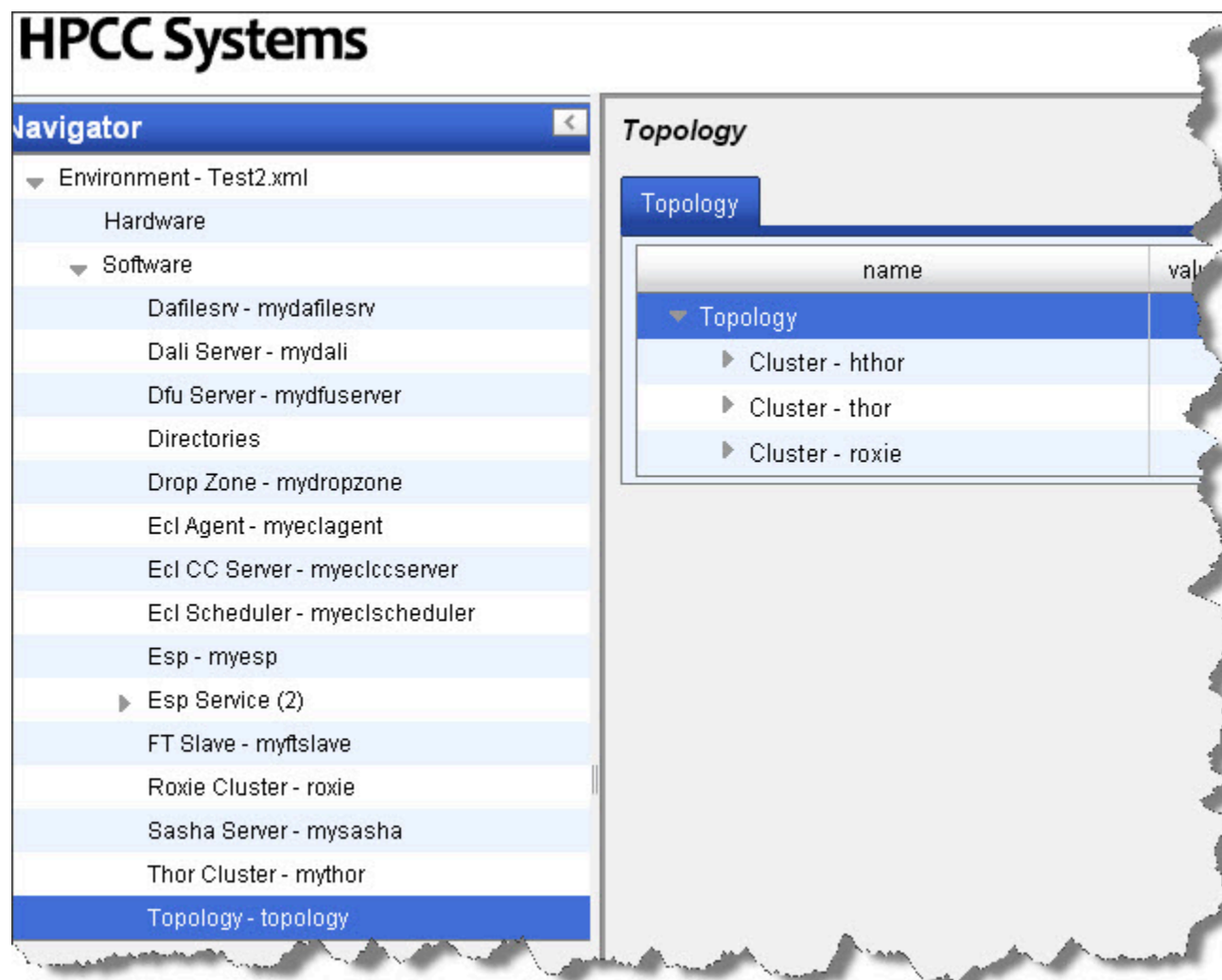
## Redundancy

Roxie can be configured to utilize a few different redundancy models.

- Simple Redundancy - One channel per slave. Most commonly used for a single node Roxie.
- Full Redundancy - More slaves than the number of channels. Multiple slaves host each channel.
- Overloaded Redundancy - There are multiple channels per slave.
- Cyclic Redundancy - Each node hosts multiple channels in rotation. The most commonly used configuration.

## Topology

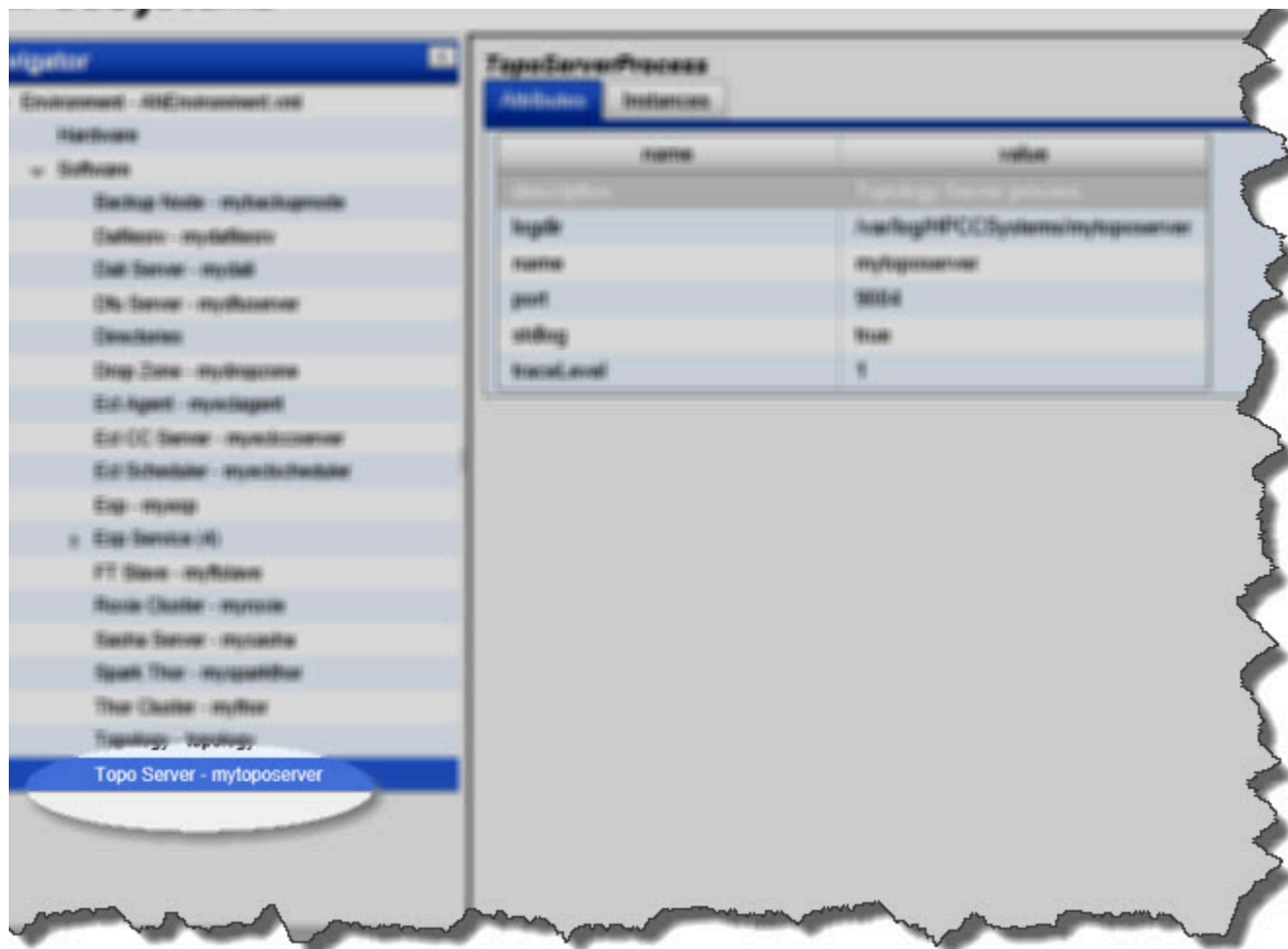
This section describes the topology tab.



| Attribute name         | Definition                    |
|------------------------|-------------------------------|
| <i>Topology</i>        | describes the system topology |
| <i>Cluster - thor</i>  | describes the Thor clusters   |
| <i>Cluster - hthor</i> | describes the hthor clusters  |
| <i>Cluster - roxie</i> | describes the Roxie clusters  |

## Topo Server

This TopoServer Process is configured through the *Topo Server - mytoposerver* from configuration manager. You define the instances and then set the configuration attributes.



| attribute   | description                  | values                            | required |
|-------------|------------------------------|-----------------------------------|----------|
| name        | Name for this process        | mytoposerver                      | required |
| description | Description for this process | Topology Server process           | optional |
| port        | Base port to use for master  | 9004                              | optional |
| traceLevel  | Trace level for logging      | 1                                 | optional |
| stdlog      | Standard log                 | true                              | optional |
| logdir      | Default log directory        | /var/log/HPCCSystems/mytoposerver | optional |

## Distribute Configuration Changes to all Nodes

Once your environment is set up as desired, you must copy the configuration file to the other nodes.

1. If it is running,, stop the system



Be sure system is stopped before attempting to copy the Environment.xml file.

2. Back up the original environment.xml file

```
# for example  
sudo -u hpcc cp /etc/HPCCSystems/environment.xml /etc/HPCCSystems/environment.bak
```

Note: the "live environment.xml file is located in your **/etc/HPCCSystems/** directory. ConfigManager works on files in **/etc/HPCCSystems/source** directory. You must copy from this location to make an environment.xml file active.

3. Copy the NewEnvironment.xml file from the source directory to the /etc/HPCCSystems and rename the file to environment.xml

```
# for example  
sudo -u hpcc cp /etc/HPCCSystems/source/NewEnvironment.xml /etc/HPCCSystems/environment.xml
```

4. Copy the /etc/HPCCSystems/environment.xml to the /etc/HPCCSystems/ on every node.

5. Restart the HPCC Systems platform

You might prefer to script this process, especially if you have many nodes. See the Example Scripts section in the Appendix of the *Installing\_and\_RunningtheHPCCPlatform* document. You can use the scripts as a model to create your own script to copy the environment.xml file out to all your nodes.