

# Migrating from WLM to gWLM



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## Overview

HP Global Workload Manager (gWLM) and HP-UX Workload Manager (WLM) provide the intelligent control for the HP Virtual Server Environment. They enable automated, dynamic allocation of server resources among applications according to defined policies—so resource utilization improves and service levels are maintained. While gWLM and WLM are best suited for different types of Virtual Server Environment deployments, they both provide the following capabilities:

- Management of real-time resource allocation of many soft partitions (HP-UX virtual partitions, HP Integrity virtual machines, or Secure Resource Partitions)
- Shifting of Instant Capacity usage rights for cores between hard partitions (nPars) or servers based on business priorities
- Resizing within or across servers based on demand by activating or deactivating Temporary Instant Capacity
- Synchronization of resource management policies to re-allocate server resources in the case of a failover

So how do they differ, and how are they positioned? As HP's strategic workload management product, HP gWLM is ideal for both a large-scale deployment with multiple servers, as well as for workloads on a single system or in a high-availability environment. A typical example is a shared IT deployment where a single IT department manages servers for multiple business units and many applications run on a large number of servers—each with several partitions. HP-UX Workload Manager is designed to manage workloads on a single system or in a high-availability cluster. HP-UX WLM is a suitable solution for a line-of-business (LOB) consolidation in which the LOB owns its servers but relies on an IT team to manage them. WLM also gives you the ability to fine-tune policies to support specialized resource management needs.

HP-UX WLM is intended for installations where it is already in use. HP gWLM should be considered for new installations as well as installations where growth, in terms of scale or complexity, are anticipated.

## Why migrate?

In addition to the positioning of gWLM discussed above, consider migrating to gWLM for benefits including:

- Simplified configuration, including a library of policies that are ready to use
- Centralized management using HP SIM that provides policy administration and reporting features that enable IT to easily set up, manage, and track resource usage
- Integration with HP VSE products
- Deeper integration with HP Integrity Virtual Machines
- Automatic discovery of systems to manage
- OwnBorrow policies (allow you to specify the amount of resources a workload owns, as well as exactly how much the workload can borrow and lend, in essence combining base and stretch goals into a single policy)

# gWLM terms to know

Here are some terms to know when using gWLM:

- **Workload**

The collection of processes that are within a single compartment. gWLM manages a workload by adjusting the system resource allocations for its compartment.
- **Compartment**

An entity with its resource allocation being managed by gWLM. A compartment can be an nPartition, a virtual partition, a virtual machine, a processor set (pset), or a Fair Share Scheduler (fss) group.

Multiple compartments are grouped to form a shared resource domain, or SRD. The compartments all share the resources within the SRD. Each compartment holds a workload and can be in only one deployed SRD. gWLM manages each workload by adjusting the resource allocation for its compartment.
- **Shared Resource Domain (SRD)**

A collection of compartments that share system resources.

gWLM creates SRDs when you use the Manage Systems and Workloads wizard.
- **Policy**

A policy is a collection of settings that instruct gWLM how to manage a compartment's resources—and thus the resources available to the workload within the compartment. For example, a policy can indicate the amount of CPU resources a workload owns (and is allocated when needed), how much of those resources the workload can lend to other workloads, and how much the workload can borrow from other workloads.

A single policy can be associated, or applied, to multiple workloads.
- **Mode**

gWLM offers two modes: advisory and managed. Advisory mode allows you to see what CPU resource requests gWLM would make for a compartment—without actually affecting resource allocation. You can use this mode when creating and fine-tuning your policies. Once you are comfortable with your policies, use managed mode to have gWLM automatically adjust the resource allocations for your defined compartments. (Advisory mode is not available for SRDs containing virtual machines, psets, or fss groups.)

You can only set the mode on the SRD level: All compartments within an SRD operate in the same mode, either advisory or managed.
- **Deploy**

Enable gWLM control of an SRD.

Deploying an SRD in managed mode enables gWLM control of resource allocation within the SRD. When deploying an SRD in advisory mode, gWLM simply reports what the allocation would be—without actually affecting resource allocations on a system.
- **Undeploy**

Disable gWLM's management of resources in a specified SRD.

If an SRD is in managed mode, undeploying stops the migration of system resources among compartments in the SRD. If the SRD is in advisory mode, gWLM no longer provides information on what requests would have been made.

## WLM-to-gWLM terminology comparison

The following table shows WLM terms and their corresponding gWLM terms.

WLM term	gWLM term
Service-level objective	Policy
Partition set	Shared resource domain (SRD)
Passive mode	Advisory mode (not available for HP Integrity Virtual Machines, psets, or fss groups)

## Availability of WLM features in gWLM

The table below lists various WLM features and then indicates whether the given feature is supported by gWLM.

Comparisons are based on the functionality available in WLM A.03.03 and gWLM A.04.00.

Feature	WLM A.03.03 support	gWLM A.04.00 support
CPU resource management	Yes	Yes
Memory resource management	Yes	No
Disk bandwidth resource management	Yes	No
Workload types	FSS groups, psets, virtual partitions, nPartitions that use Instant Capacity	FSS groups, psets, virtual partitions, nPartitions that use Instant Capacity, HP Integrity Virtual Machines, simulated psets on OpenVMS, OpenVMS soft partitions, workloads based on the OpenVMS class scheduler
SLO (policy) types	Fixed, utilization-based, metric-based (including shares-per-metric)	Fixed, utilization-based, metric-based (including shares-per-metric custom policies), OwnBorrow
Multiple SLOs (policies) per workload (stretch goals)	Yes	No However, OwnBorrow policies simulate a WLM base/stretch goal combination
Nested partitions	Yes	Yes
Time-based SLOs (policies)	Yes ( <code>condition</code> keyword)	Yes
Conditional SLOs (policies)	Yes ( <code>condition</code> keyword)	Yes (for Serviceguard events and file-based conditions)
Process placement based on binary name	Yes	Yes
Process placement based on user name	Yes	Yes
Process placement based on Unix group name	Yes	Yes (with a user-defined process map)
Process placement based on process maps	Yes ( <code>procmaps</code> keyword)	Yes
Monitoring process placement by workload with <code>ps</code>	Yes	Yes

<b>Feature</b>	<b>WLM A.03.03 support</b>	<b>gWLM A.04.00 support</b>
Smoothing of metric data available	Yes (cntl_smooth keyword)	Yes—if WLM Toolkits are installed (/opt/wlm/toolkits/oracle/bin/smooth)
WLM Toolkits	Yes	Yes—with customizations SAP integration paper: <i>Using HP Global Workload Manager with SAP</i> available from <a href="http://docs.hp.com/en/vse.html">http://docs.hp.com/en/vse.html</a>
Workload monitoring (on the command line and in a GUI)	Yes	Yes
Events/alarms	Event Monitoring Service (EMS)	HP Systems Insight Manager (SIM) Events
Data collector started when a configuration is activated	Yes	No No standard mechanism for starting a data collector; however, you can use gwlm send to supply data
Policy/SLO storage	SLO data is stored in configuration files on each node; identical SLOs are cut-and-paste copies of an original	Policies are stored in a centralized database; the same policy can be applied to multiple workloads without being replicated Can export or import in XML format
Data source integration (DSI) support, providing workload data to OpenView tools including OVPM	Yes	Yes
HP-UX Security Containment integration	Yes	No built-in integration; however, you can integrate as explained in the section “Integrating with Security Containment “ on page 31
Passive mode	Yes	Yes (Advisory mode) Advisory mode is not available for HP Integrity Virtual Machines, psets, or fss groups

# Command comparison

The following table lists all the WLM commands and their equivalent gWLM commands.

WLM A.03.03 command	Equivalent gWLM A.04.00 command
wlmaudit	gwmreport
wlmd	HP SIM interface; gwlm
wlmcw	HP SIM interface
wlmgui	HP SIM interface
wlmpard	HP SIM interface; gwlm
wlmcmd	Not needed
wlminfo	gwm monitor
wlmcert	HP SIM interface; gwlmsslconfig
wlmsend/wlmrcvdc	gwlm send/built-in standard out capture
glance_*	No equivalent
sg_pkg_active (Serviceguard integration)	Conditional policies use a built-in equivalent
prmrn/prmmove	gwlmplace

The manpages for these commands are available from the following websites:

- WLM: <http://www.hp.com/go/wlm>, in the "Information library"
- gWLM: <http://docs.hp.com/en/vse.html>

## System requirements for gWLM

gWLM is a component of the Virtual Server Environment Management Software suite. For information on system requirements for this suite, see the *VSE Management Software Installation and Update Guide* available from:

<http://docs.hp.com/en/vse.html>

## Common gWLM tasks

For information on how to accomplish common gWLM tasks, see the document *HP Global Workload Manager Version 4.0 User's Guide* available from:

<http://docs.hp.com/en/vse.html>

Examples of gWLM tasks discussed include:

- Fixing the amount of CPU resources a workload gets
- Resizing a workload's compartment as needed, based on the workload's utilization

# Migrating WLM configurations

The gWLM management model has a central management server, or CMS, and the managed systems, or nodes. The CMS must have HP Systems Insight Manager (SIM) and gWLM installed, while managed nodes need only gWLM agent software installed. To manage a system with gWLM, you define a shared resource domain (SRD) to contain workloads on that system. You can use existing workloads or create new ones. Each workload needs a policy to govern its resource allocation. You can choose a policy from the collection of policies that come with gWLM or create new ones. You can apply a single policy to multiple workloads. If you update a policy definition, that update is automatically used to govern resource allocations for all workloads associated with the policy. The gWLM interface in HP SIM provides a wizard to step you through the creation of SRDs, workloads, and policies.

HP recommends using the gWLM interface in HP SIM to configure gWLM. However, you can also configure gWLM using XML-based files. You create these files according to the syntax described in the `gwlmxml(4)` manpage and then import and deploy them using the `/opt/gwlm/bin/gwlm` command, described in the `gwlm(1M)` manpage.

To convert WLM configurations:

1. Determine whether the systems designated to be the CMS and managed nodes can support the system requirements of HP SIM and gWLM (for the CMS) or just gWLM (for the managed nodes). Find alternate systems if needed. Install HP SIM and gWLM.
2. Determine the policies to use in place of the SLOs in your WLM configurations.

Both WLM and gWLM provide:

- Fixed SLOs (policies)
- Utilization SLOs (policies)
- Metric-based SLOs (policies) (In gWLM, metric-based policies are available as custom policies.)

gWLM also provides an OwnBorrow policy type, which is based on utilization, that lets you explicitly indicate how much of a resource a workload should own as well as how much it should be allowed to borrow and lend.

gWLM comes with a library of policies (SLOs) for you to use. Check whether the provided policies meet your needs. If not, create the appropriate policies.

3. Create your SRD using the gWLM Manage Systems and Workloads wizard.

For each system to be managed by gWLM, use the wizard to enter the system name and define the workloads and policies. The wizard produces an SRD and immediately begins managing the workloads for the specified system.

To access the wizard in HP SIM:

- a. Select  
Tools → VSE Management
- b. Click the Shared Resource Domain tab
- c. Select the menu item  
Create → Shared Resource Domain

Once you have an SRD deployed, you can monitor your workloads by selecting items in the Reports menu. You can also monitor workloads on the command line using `gwlm monitor`. (In WLM, when you are working with FSS-based workload groups or PSET-based workload groups, you have a default group, `PRM_SYS`, for system processes. gWLM monitoring tools do not show `PRM_SYS`. However, activity in `PRM_SYS` may still affect the resources available to the workloads you define.)

# Migration example: FSS-based workloads with usage goals

WLM and gWLM both provide usage goals. However, in gWLM, the usage goal is known as a utilization policy.

## The WLM configuration

The example below splits an 8-core server into two FSS-based workload groups, each sized by CPU utilization. Each group gets a minimum of one core and maximum of seven cores. Application records place a few applications in the workload groups.

```
prm {
    groups = app_dev_grp : 2,
           db_dev_grp   : 3;

    # place a custom binary and perl script into app_dev_grp,
    # shell script and oracle instance into g3
    apps = app_dev_grp : /opt/perl/bin/perl "myperlscript.pl",
           app_dev_grp : /opt/myapp/bin/myapp,
           db_dev_grp  : /bin/sh "myscript.sh",
           db_dev_grp  :
/oracle/u01/app/oracle/product/10.2.0/db_dev_1/bin/oracle "ora*MYINST*";
}

slo slo2 {
    pri = 1;
    goal = usage_CPU;
    mincpu = 100;
    maxcpu = 700;
    entity = PRM group app_dev_grp;
}

slo slo3 {
    pri = 1;
    goal = usage_CPU;
    mincpu = 100;
    maxcpu = 700;
    entity = PRM group db_dev_grp;
}

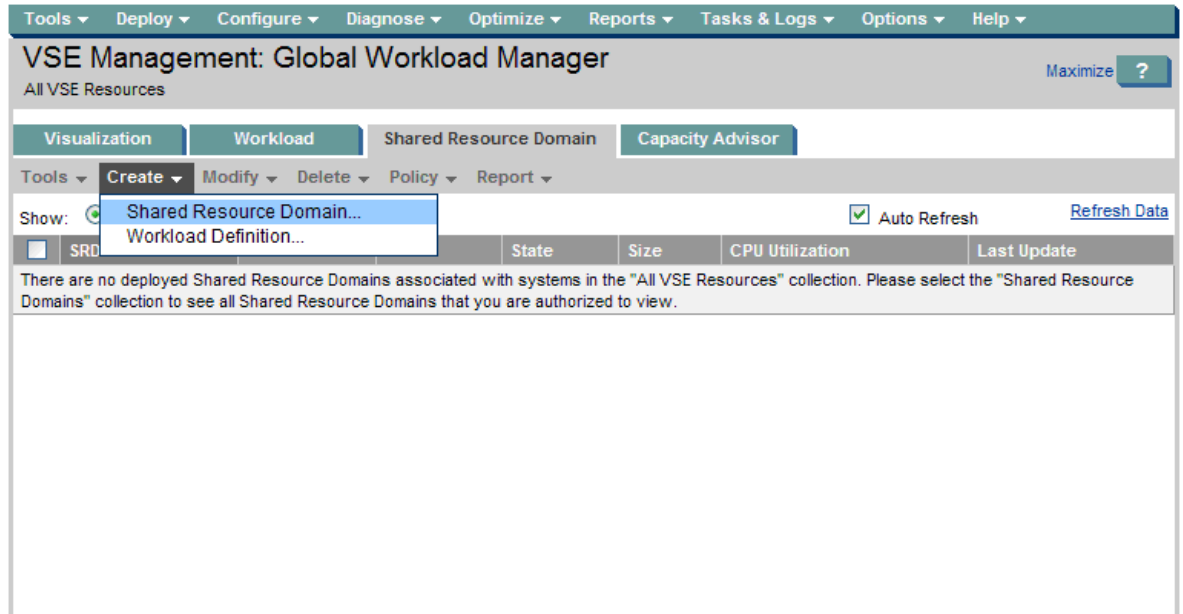
tune {
    absolute_cpu_units=1; # 100 units is 100% of 1 CPU, not the whole server
}
```

## Creating an equivalent gWLM configuration

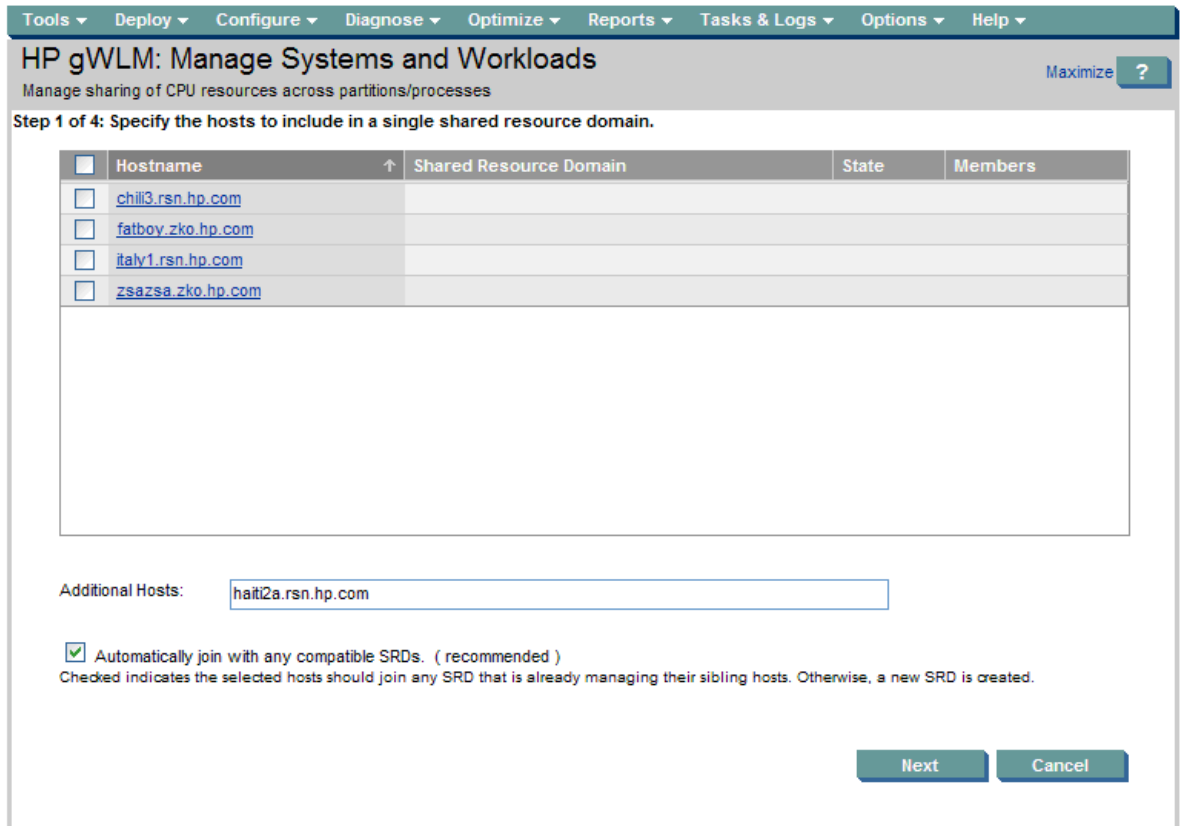
To create an equivalent gWLM configuration, follow the steps below in HP Systems Insight Manager. (For information on installing, configuring, and accessing VSE Management Software, such as gWLM, in HP Systems Insight Manager, see the *VSE Management Software Installation and Update Guide*, available from <http://docs.hp.com/en/vse.html>.)

In a WLM configuration, you can optionally specify the default user workload group OTHERS. In the gWLM configuration though, the workload must be specified. It takes a name of the form *hostname.OTHER*. The steps below reflect this requirement. Although gWLM provides a number of policies you can use, the procedure below creates a new policy to match the behavior of the SLOs in the WLM configuration. While the WLM configuration explicitly uses absolute CPU units, gWLM uses such units by default.

1. From the Shared Resource Domain tab, select Create followed by Shared Resource Domain to start the Manage Systems and Workloads wizard.



2. Specify, using the table or the Additional Hosts field, the host that will be divided into fss-based workloads. Then select the Next button.



- Set Mode to Managed and select the Next button.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

## HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes

Maximize ?

**Step 2 of 4: Set properties for the shared resource domain.**

Shared Resource Domain Name:   
The name used to identify a group of systems sharing resources.

Mode:    Allows you to see what resource requests would be made--without affecting on. Managed mode automatically adjusts the resource allocations.

Use TiCAP cores to satisfy the policies in the SRD:   The On option causes TiCAP cores to be activated as necessary to satisfy the resource request for all workloads in this Shared Resource Domain regardless of policy settings. The Off option limits TiCAP activation only to workloads that explicitly enable use of TiCAP in their associated policy settings.

Resource Allocation Interval:   
The time period in seconds during which resource utilization is measured and resource allocation decisions are made and carried out. The default value is set based on the compartment selection made for the SRD.

- Select (new...) in the Policy column dropdown to create a new policy.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

## HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes

Maximize ?

**Step 3 of 4: Specify workload/policy settings.**

[Refresh Data](#)

Hostname	Workload	Policy	Compartment Type	Add/Remove Sub-OS Workload	Compartment Min/Size/Max (Cores)
<input checked="" type="checkbox"/> <input type="button" value="i"/> haiti2a.rsn.hp.com	<input type="text" value="haiti2a"/>	<input type="button" value="(select policy)"/> <input type="button" value="(new...)"/> CPU_Utilization Fixed_1 Fixed_2 Fixed_3 Fixed_4 Fixed_8	<input type="button" value="vpar"/>	<input type="button" value="Add"/>	1 / 8 / 8

Total Size=

- Name the new policy and set its type to Utilization. Here the name chosen is CPUUtil\_Min1\_Max7. Set the Min Size value to 1.0 to represent one core. Set the Max Size value to 7.0 for seven cores. Then select the OK button. (Although WLM requires you to specify a priority through the `pri` keyword, gWLM assigns a default priority of 100. You can change the priority after selecting the 'Show advanced policy configuration options' checkbox.)

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

### HP gWLM: Create or Edit Policies

New Policy Maximize ?

Policy Name:\*

Policy Description:

Policy Type:  Fixed  Utilization  OwnBorrow  Custom  Conditional

Policy Settings:

Min Size (cores):\*

Max Size (cores):\*

\* required field  Show advanced policy configuration options.

- Set Compartment Type to fss. The workload field, which used to be haiti2a, is now haiti2a.OTHER.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

### HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes Maximize ?

Step 3 of 4: Specify workload/policy settings. [Refresh Data](#)

Hostname	Workload	Policy	Compartment Type	Add/Remove Sub-OS Workload	Compartment Min/Size/Max (Cores)
<input checked="" type="checkbox"/> <input type="info"/> haiti2a.rsn.hp.com	<input type="text" value="haiti2a.OTHER"/>	<input type="text" value="CPUUtil_Min1_Max7"/>	<input type="text" value="fss"/>	<input type="button" value="Add"/>	0.05 / 8 / 8

Total Size=

- Change the policy for the workload to the CPU\_Utilization policy.

HP gWLM: Manage Systems and Workloads  
Manage sharing of CPU resources across partitions/processes

Step 3 of 4: Specify workload/policy settings.

[Refresh Data](#)

Hostname	Workload	Policy	Compartment Type	Add/Remove Sub-OS Workload	Compartment Min/Size/Max (Cores)
✔️ ⓘ haiti2a.rsn.hp.com	haiti2a.OTHER	CPU_Utilization	fss	Add	0.05 / 8 / 8

Total Size= 8

Previous Next Cancel

- Select the Add button to add a row for another workload. Set the policy for the new workload to the new policy CPUUtil\_Min1\_Max7. Select (new...) in the Workload column dropdown to create the new workload.

HP gWLM: Manage Systems and Workloads  
Manage sharing of CPU resources across partitions/processes

Step 3 of 4: Specify workload/policy settings.

[Refresh Data](#)

Hostname	Workload	Policy	Compartment Type	Add/Remove Sub-OS Workload	Compartment Min/Size/Max (Cores)
✔️ ⓘ haiti2a.rsn.hp.com	haiti2a.OTHER	CPU_Utilization	fss	Add	0.05 / 7.95 / 7.95
	(select workload) (select workload) (new...)	CPUUtil_Min1_Max7	fss	Remove	0.05 / 0.05 / 7.95

Total Size= 8

Previous Next Cancel

- Specify a name for the new workload, `app_dev_wkld`. To add application records for the workload, set workload definition criteria to 'by executable' in the dropdown. Then fill in the fields and select [Add to definition]. The graphic below shows one application record, for `/opt/perl/bin/perl` with an alternate name of `myperlscript.pl`, has already been added. A second record, `/opt/myapp/bin/myapp`, is being added. When finished defining the workload, select OK.

Tools Deploy Configure Diagnose Optimize Reports Tasks & Logs Options Help

### Create gWLM Managed Workload Definition

A gWLM managed workload definition specifies the users and processes whose utilization is being managed. Maximize ?

Workload Name: \*

Note: The workload name is a short identifier for the workload. It must be unique across the CMS.

Workload Description:

Note: This can be the same as the workload name or it can be any other descriptive text used to provide more information about the workload.

Specify Workload Definition Criteria:

Enter the full path to the executable, including wildcards in the filename portion of the path. Enter the alternate name of the executable (optional). [What is this?](#)

Criteria Used To Define Workload:

	Type	Value	Alternate Name(s)	
●	by executable	/opt/perl/bin/perl	myperlscript.pl	<input type="button" value="Remove from definition"/>

Note: A process that meets one or more of the specified criteria will be counted as part of the workload.

\* required field

10. You will see the same screen you saw in step 8. As in step 8, select the Add button to add a row for the workload. Set the policy for the new workload to CPUUtil\_Min1\_Max7. Select (new...) in the Workload column dropdown to go to the page to create the new workload. Name the workload db\_dev\_wkld. This workload, shown below, has application records for a shell script and for an Oracle instance. Select OK after defining the workload.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

### Create gWLM Managed Workload Definition

A gWLM managed workload definition specifies the users and processes whose utilization is being managed. Maximize ?

Workload Name: \*

Note: The workload name is a short identifier for the workload. It must be unique across the CMS.

Workload Description:

Note: This can be the same as the workload name or it can be any other descriptive text used to provide more information about the workload.

Specify Workload Definition Criteria:

Enter the full path to the executable, including wildcards in the filename portion of the path. [What is this?](#) Enter the alternate name of the executable (optional).

Criteria Used To Define Workload:

Type	Value	Alternate Name(s)	<input type="button" value="Remove from definition"/>
<input type="radio"/> by executable	/bin/sh	myscript.sh	
<input checked="" type="radio"/> by executable	/oracle/u01/app/oracle/product/10.2.0/db_dev_1/bin/oracle	ora*MYINST*	

Note: A process that meets one or more of the specified criteria will be counted as part of the workload.  
\* required field

11. Now continue creating the SRD. The workloads and policies are set, so select the Next button.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

### HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes Maximize ?

Step 3 of 4: Specify workload/policy settings. Refresh Data

Hostname	Workload	Policy	Compartment Type	Add/Remove Sub-OS Workload	Compartment Min/Size/Max (Cores)
<input checked="" type="checkbox"/> <input type="info"/> haiti2a.rsn.hp.com	<input type="text" value="haiti2a.OTHER"/>	<input type="text" value="CPU_Utilization"/>	<input type="text" value="fss"/>	<input type="button" value="Add"/>	0.05 / 7.9 / 7.9
	<input type="text" value="db_dev_wkld"/>	<input type="text" value="CPUUtil_Min1_Max7"/>	<input type="text" value="fss"/>	<input type="button" value="Remove"/>	0.05 / 0.05 / 7.9
	<input type="text" value="app_dev_wkld"/>	<input type="text" value="CPUUtil_Min1_Max7"/>	<input type="text" value="fss"/>	<input type="button" value="Remove"/>	0.05 / 0.05 / 7.9

Total Size=

12. The final step of the wizard allows you to review the SRD. Select Finish to begin managing the workloads.

**HP gWLM: Manage Systems and Workloads**  
Manage sharing of CPU resources across partitions/processes

Step 4 of 4: Review and confirm.

Warning: gWLM communications are not secure. For security information see the [Secure gWLM Communications help page](#).

Shared Resource Domain Name	haiti2a.srd
Size	8
Mode	Managed
Resource Allocation Interval	15
Use TiCAP cores to satisfy the policies in the SRD	Off

Workload	Hostname	Type	Policy	Min/Size/Max
haiti2a.OTHER	haiti2a.rsn.hp.com	fss	CPU_Utilization	0.05 / 7.9 / 7.9
db_dev_wkld	haiti2a.rsn.hp.com	fss	CPUUtil_Min1_Max7	0.05 / 0.05 / 7.9
app_dev_wkld	haiti2a.rsn.hp.com	fss	CPUUtil_Min1_Max7	0.05 / 0.05 / 7.9

Previous Finish Cancel

13. After you select Finish, you are taken to the Shared Resource Domain tab.

**VSE Management: Global Workload Manager**  
All VSE Resources

Visualization Workload Shared Resource Domain Capacity Advisor

Tools Create Modify Delete Policy Report

Show:  Deployed SRDs  Undeployed SRDs  Auto Refresh [Refresh Data](#)

SRD Name	Status	Mode	State	Size	CPU Utilization	Last Update
haiti2a.srd	<input checked="" type="checkbox"/>	Managed	Deployed	8	0.2%	Fri, 4/11/2008 1:54 PM EDT

Details for SRD: haiti2a.srd

Shared Resource Domain [haiti2a.srd \(Modify SRD\)](#)

Mode Managed

TiCAP Off [\(Turn TiCAP on for SRD\)](#)

State Deployed [\(Undeploy SRD\)](#)

CPU Utilization 0.2%

Workload	CPU Utilization	Type	Policy (Active)	Status	Request	Allocation	Size	Hostname
<a href="#">app_dev_wkld</a>	0.2%	fss	<a href="#">CPUUtil_Min1_Max7</a>	<input checked="" type="checkbox"/>	1	2.65	2.65	haiti2a.rsn.hp.com
<a href="#">db_dev_wkld</a>	0.2%	fss	<a href="#">CPUUtil_Min1_Max7</a>	<input checked="" type="checkbox"/>	1	2.65	2.65	haiti2a.rsn.hp.com
<a href="#">haiti2a.OTHER</a>	0.2%	fss	<a href="#">CPU_Utilization</a>	<input checked="" type="checkbox"/>	0.05 (+0.05)	2.7	2.7	haiti2a.rsn.hp.com

Totals: Req = 2.05 Alloc = 8 Size = 8

## The gWLM configuration file

gWLM can display an XML version of the configuration file using `gwlms export`. (You can also configure gWLM using XML. For more information, see the `gwlmsxml(4)` manpage.)

The following command was used to display the XML for this configuration:

```
gwlms export \  
  --srd=haiti2a.srd \  
  --workload=haiti2a.OTHER \  
  --workload=app_dev_wkld \  
  --workload=db_dev_wkld \  
  --policy=CPUUtil_Min1_Max7 \  
  --policy=CPU_Utilization
```

The XML file is:

```
<?xml version="1.0" encoding="UTF-8"?>  
<!DOCTYPE dataStore SYSTEM "file:/opt/gwlms/dtd/config.dtd">  
<dataStore>  
  <policyDefinition name="Owns_3-Max_8" ticapByPolicy="false" time="0"  
type="OwnBorrow">  
    <cpu>  
      <minimum>1.0</minimum>  
      <maximum>8.0</maximum>  
      <own>3.0</own>  
      <target>75.0</target>  
      <weight>3.0</weight>  
      <convergenceRate>1.0</convergenceRate>  
    </cpu>  
    <priority>100</priority>  
  </policyDefinition>  
  <policyDefinition name="Owns_2-Max_4" ticapByPolicy="false" time="0"  
type="OwnBorrow">  
    <cpu>  
      <minimum>0.0</minimum>  
      <maximum>4.0</maximum>  
      <own>2.0</own>  
      <target>75.0</target>  
      <weight>2.0</weight>  
      <convergenceRate>0.0</convergenceRate>  
    </cpu>  
    <priority>100</priority>  
  </policyDefinition>  
  <workloadDefinition name="haiti2a.OTHER">  
    <policyReference name="Owns_2-Max_4"/>  
  </workloadDefinition>  
  <workloadDefinition name="app_dev_wkld">  
    <application>  
      <path>/opt/perl/bin/perl</path>  
      <alternateName>myperlscript.pl</alternateName>  
    </application>  
    <application>  
      <path>/opt/myapp/bin/myapp</path>  
    </application>  
    <policyReference name="Owns_3-Max_8"/>  
  </workloadDefinition>  
  <workloadDefinition name="db_dev_wkld">  
    <application>  
      <path>/bin/sh</path>  
      <alternateName>myscript.sh</alternateName>  
    </application>  
    <application>  
      <path>/oracle/u01/app/oracle/product/10.2.0/db_dev_1/bin/oracle</path>  
      <alternateName>ora*MYINST*</alternateName>  
    </application>  
    <policyReference name="Owns_3-Max_8"/>  
  </workloadDefinition>
```

```

    <sharedResourceDomain interval="15" mode="Managed" name="haiti2a.srd"
    ticapMode="off" time="1207935831325">
      <compartment id="127" name="default" type="fss">
        <cpu>
          <minimum>0.05</minimum>
          <maximum>7.90</maximum>
          <size>2.00</size>
        </cpu>
        <hostName>haiti2a.rsn.hp.com</hostName>
        <nativeId>1</nativeId>
        <parentId>0</parentId>
        <workloadReference name="haiti2a.OTHER"/>
      </compartment>
      <compartment id="128" name="" type="fss">
        <cpu>
          <minimum>0.05</minimum>
          <maximum>7.90</maximum>
          <size>3.00</size>
        </cpu>
        <hostName>haiti2a.rsn.hp.com</hostName>
        <nativeId>2</nativeId>
        <parentId>0</parentId>
        <workloadReference name="db_dev_wkld"/>
      </compartment>
      <compartment id="129" name="" type="fss">
        <cpu>
          <minimum>0.05</minimum>
          <maximum>7.90</maximum>
          <size>3.00</size>
        </cpu>
        <hostName>haiti2a.rsn.hp.com</hostName>
        <nativeId>3</nativeId>
        <parentId>0</parentId>
        <workloadReference name="app_dev_wkld"/>
      </compartment>
    </sharedResourceDomain>
  </dataStore>

```

# Migration example: FSS-based workloads with stretch goals

In WLM, you can create a stretch goal for a workload by defining multiple SLOs, at distinct priorities, for the workload.

## The WLM configuration

In this example, we have another 8-core server split into two FSS-based workload groups sized by CPU utilization. Each group has a CPU resource allocation at priority 1 and at priority 2. The priority 1 SLOs guarantee the workloads four cores each. The priority 2 SLOs (stretch goals) allow a workload to borrow any resources that go unused after the priority 1 SLOs are satisfied. The configuration also sets a minimum allocation of one core and a maximum allocation of seven cores for both workloads. It also has several application records.

```
prm {
    groups = apps_grp : 2,
           db_grp    : 3;

    # place a custom binary and perl script into apps_grp,
    # shell script and oracle instance into g3
    apps = apps_grp : /opt/perl/bin/perl "myperlscript.pl",
           apps_grp : /opt/myapp/bin/myapp,
           db_grp  : /bin/sh "myscript.sh",
           db_grp  : /oracle/u01/app/oracle/product/10.2.0/db_dev_1/bin/oracle
"ora*MYINST*";
}

slo apps_base_slo {
    pri = 1;
    goal = usage _CPU;
    mincpu = 100;
    maxcpu = 400;
    entity = PRM group apps_grp;
}

slo db_base_slo {
    pri = 1;
    goal = usage _CPU;
    mincpu = 100;
    maxcpu = 400;
    entity = PRM group db_grp;
}

slo apps_stretch_slo {
    pri = 2;
    goal = usage _CPU;
    mincpu = 100;
    maxcpu = 700;
    entity = PRM group apps_grp;
}

slo db_stretch_slo {
    pri = 2;
    goal = usage _CPU;
    mincpu = 100;
    maxcpu = 700;
    entity = PRM group db_grp;
}

tune {
    absolute_cpu_units=1; # 100 units is 100% of 1 CPU, not the whole server
}
```

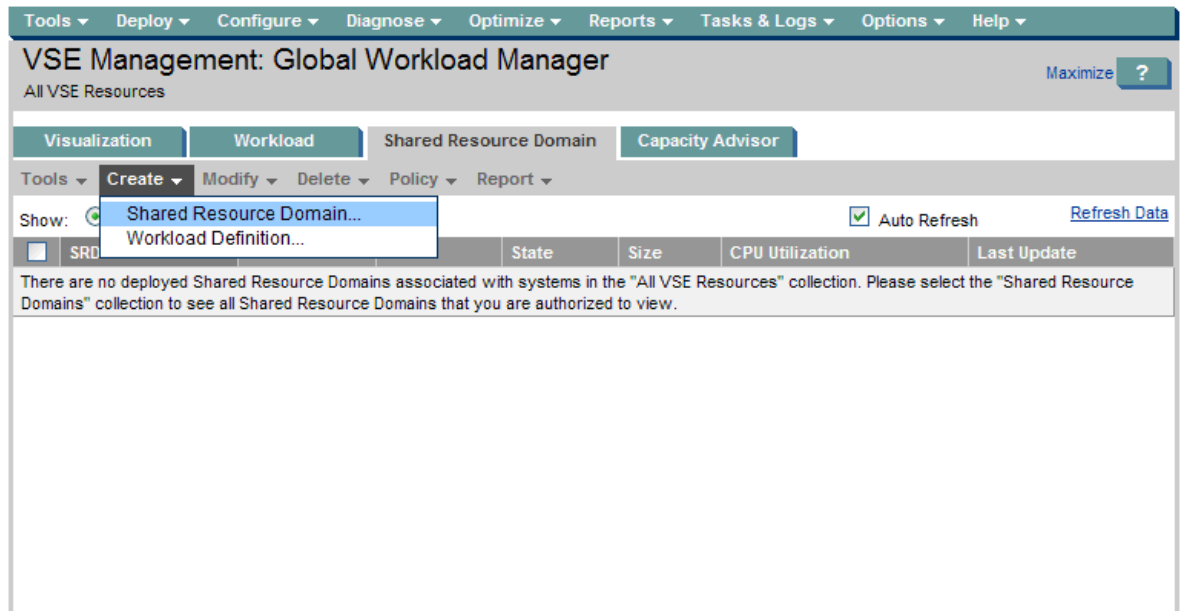
## Creating an equivalent gWLM configuration

To create an equivalent gWLM configuration, follow the steps below in HP Systems Insight Manager. (For information on installing, configuring, and accessing VSE Management Software, such as gWLM, in HP Systems Insight Manager, see the *VSE Management Software Installation and Update Guide*, available from <http://docs.hp.com/en/vse.html>.)

In a WLM configuration, you can optionally specify the default user workload group OTHERS. In the gWLM configuration though, the workload must be specified. It takes a name of the form *hostname.OTHER*.

In this configuration, use an OwnBorrow policy. This type of policy behaves similar to WLM's combination of a base goal and a stretch goal. We will use a gWLM-provided policy for the *hostname.OTHER* workload and create a policy for the two user-defined workloads. (Although WLM requires you to specify a priority through the `pri` keyword, gWLM assigns a default priority of 100. You can change the priority after selecting the 'Show advanced policy configuration options' checkbox when setting up policies. However, HP recommends accepting the default priority.) Also, while the WLM configuration explicitly uses absolute CPU units, gWLM uses such units by default.

1. From the Shared Resource Domain tab, select Create followed by Shared Resource Domain to start the Manage Systems and Workloads wizard.



The screenshot displays the VSE Management: Global Workload Manager interface. The top navigation bar includes menus for Tools, Deploy, Configure, Diagnose, Optimize, Reports, Tasks & Logs, Options, and Help. The main header shows "VSE Management: Global Workload Manager" and "All VSE Resources". Below the header, there are tabs for Visualization, Workload, Shared Resource Domain, and Capacity Advisor. The "Shared Resource Domain" tab is active, and a dropdown menu is open under the "Create" button, showing options for "Shared Resource Domain..." and "Workload Definition...". The interface also features a "Show:" filter, an "Auto Refresh" checkbox, and a "Refresh Data" link. A table with columns for SRD, State, Size, CPU Utilization, and Last Update is visible, but it is currently empty. A message at the bottom of the table area states: "There are no deployed Shared Resource Domains associated with systems in the 'All VSE Resources' collection. Please select the 'Shared Resource Domains' collection to see all Shared Resource Domains that you are authorized to view."

- Specify, using the table or the Additional Hosts field, the host that will be divided into fss-based workloads. Then select the Next button.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

## HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes Maximize ?

**Step 1 of 4: Specify the hosts to include in a single shared resource domain.**

<input type="checkbox"/>	Hostname	Shared Resource Domain	State	Members
<input type="checkbox"/>	<a href="#">chili3.rsn.hp.com</a>			
<input type="checkbox"/>	<a href="#">fatboy.zko.hp.com</a>			
<input type="checkbox"/>	<a href="#">italv1.rsn.hp.com</a>			
<input type="checkbox"/>	<a href="#">zsazsa.zko.hp.com</a>			

Additional Hosts:

Automatically join with any compatible SRDs. (recommended)  
 Checked indicates the selected hosts should join any SRD that is already managing their sibling hosts. Otherwise, a new SRD is created.

Next Cancel

- Set Mode to Managed and select the Next button.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

## HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes Maximize ?

**Step 2 of 4: Set properties for the shared resource domain.**

Shared Resource Domain Name:   
 The name used to identify a group of systems sharing resources.

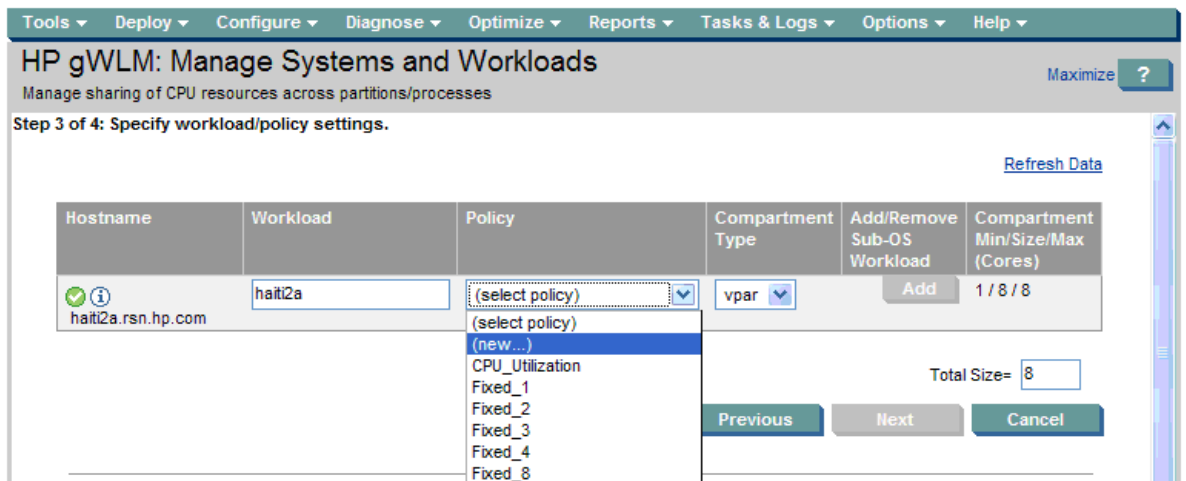
Mode:     
 Advisory allows you to see what resource requests would be made--without affecting on. Managed mode automatically adjusts the resource allocations.

Use TiCAP cores to satisfy the policies in the SRD:   
 The On option causes TiCAP cores to be activated as necessary to satisfy the resource request for all workloads in this Shared Resource Domain regardless of policy settings. The Off option limits TiCAP activation only to workloads that explicitly enable use of TiCAP in their associated policy settings.

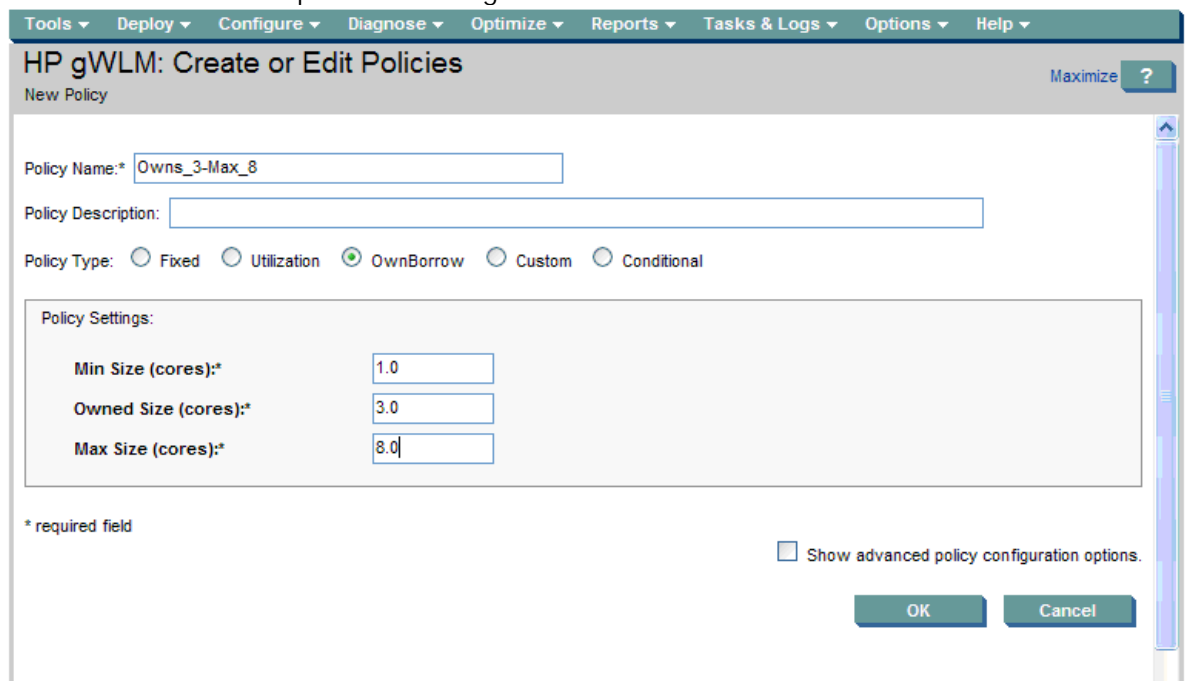
Resource Allocation Interval:   
 The time period in seconds during which resource utilization is measured and resource allocation decisions are made and carried out. The default value is set based on the compartment selection made for the SRD.

Previous Next Cancel

4. Select (new...) in the policy dropdown to create a new policy.



5. Name the new policy and set its type to OwnBorrow. Here the name chosen is Owns\_3-Max\_8. This policy is for the user-defined workloads. Set the Min Size value to 1.0 for one core. Any workload with this policy will get at least one core. Set the Owned Size (cores) value to 3.0 for three cores. The associated workload gets these three cores whenever needed. Set Max Size (cores) to 8.0. If other workloads are not using their resources, the associated workload can borrow those resources up to a total of eight cores. Select OK when done.



6. Set Compartment Type to fss. (The name for the workload changes to haiti2a.OTHER.)
7. Set the policy for the .OTHER workload to the gWLM-provided policy Owns\_2-Max\_4.
8. Select the Add button to add a row for another workload. Set the policy for the second workload to Owns\_3-Max\_8.

- Select (new...) to define the new workload. Define the workload (app\_dev\_wkld) in the same manner as in the section "Migration example: FSS-based workloads with usage goals" on page 8. Select the Add button to add a row for another workload. Set the policy for this workload to Owns\_3-Max\_8 as well. Select (new...) to define the new workload (db\_dev\_wkld) also in the same manner as the example just cited. Then select the Next button.

Tools Deploy Configure Diagnose Optimize Reports Tasks & Logs Options Help

### HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes

Step 3 of 4: Specify workload/policy settings. [Refresh Data](#)

Hostname	Workload	Policy	Compartment Type	Add/Remove Sub-OS Workload	Compartment Min/Size/Max (Cores)
haiti2a.rsn.hp.com	haiti2a.OTHER	Owns_2-Max_4	fss	Add	0.05 / 7.9 / 7.9
	db_dev_wkld	Owns_3-Max_8	fss	Remove	0.05 / 0.05 / 7.9
	app_dev_wkld	Owns_3-Max_8	fss	Remove	0.05 / 0.05 / 7.9

Total Size= 8

Previous Next Cancel

- The final step of the wizard allows you to review the SRD. Select Finish to begin managing the workloads.

Tools Deploy Configure Diagnose Optimize Reports Tasks & Logs Options Help

### HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes

Step 4 of 4: Review and confirm.

Warning: gWLM communications are not secure. For security information see the [Secure gWLM Communications help page](#).

Shared Resource Domain Name	haiti2a.srd
Size	8
Mode	Managed
Resource Allocation Interval	15
Use TiCAP cores to satisfy the policies in the SRD	Off

Workload	Hostname	Type	Policy	Min/Size/Max
haiti2a.OTHER	haiti2a.rsn.hp.com	fss	Owns_2-Max_4	0.05 / 7.9 / 7.9
db_dev_wkld	haiti2a.rsn.hp.com	fss	Owns_3-Max_8	0.05 / 0.05 / 7.9
app_dev_wkld	haiti2a.rsn.hp.com	fss	Owns_3-Max_8	0.05 / 0.05 / 7.9

Previous Finish Cancel

11. After you select Finish, you are taken to the Shared Resource Domain tab.

The screenshot displays the VSE Management: Global Workload Manager interface. The main heading is "VSE Management: Global Workload Manager" with a "Maximize" button. Below the heading, there are tabs for "Visualization", "Workload", "Shared Resource Domain", and "Capacity Advisor". The "Shared Resource Domain" tab is active, showing a table of SRDs. The table has columns for SRD Name, Status, Mode, State, Size, CPU Utilization, and Last Update. One SRD, "haiti2a.srd", is listed with a green checkmark status, Mode: Managed, State: Deployed, Size: 8, and CPU Utilization: 0.2%. Below the table, there is a "Details for SRD: haiti2a.srd" section with fields for Shared Resource Domain, Mode, TiCAP, State, and CPU Utilization. A table of workloads is also shown with columns for Workload, CPU Utilization, Type, Policy (Active), Status, Request, Allocation, Size, and Hostname. The workloads listed are "app\_dev\_wkld", "db\_dev\_wkld", and "haiti2a\_OTHER". A "Totals" section at the bottom right shows "Req = 2.05", "Alloc = 8", and "Size = 8".

## The gWLM configuration file

gWLM can display an XML version of the configuration file using `gwm export`. (You can also configure gWLM using XML. For more information, see the `gwmxml(4)` manpage.)

The following command was used to display the XML for this configuration:

```
gwm export \
  --srd=haiti2a.srd \
  --workload=haiti2a.OTHER \
  --workload=app_dev_wkld \
  --workload=db_dev_wkld \
  --policy=Owms_3-Max_8 \
  --policy=Owms_2-Max_4
```

The XML file is:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE dataStore SYSTEM "file:/opt/gwlm/dtd/config.dtd">
<dataStore>
  <policyDefinition name="CPUUtil_Min1_Max7" ticapByPolicy="false" time="0"
type="Utilization">
    <cpu>
      <minimum>1.0</minimum>
      <maximum>7.0</maximum>
      <target>75.0</target>
      <weight>1.0</weight>
      <convergenceRate>1.0</convergenceRate>
    </cpu>
    <priority>100</priority>
  </policyDefinition>
  <policyDefinition name="CPU_Utilization" ticapByPolicy="false" time="0"
type="Utilization">
    <cpu>
      <minimum>0.0</minimum>
      <maximum>2048.0</maximum>
      <target>75.0</target>
      <weight>1.0</weight>
      <convergenceRate>1.0</convergenceRate>
    </cpu>
```

```

    <priority>100</priority>
  </policyDefinition>
  <workloadDefinition name="haiti2a.OTHER">
    <policyReference name="CPU_Utilization"/>
  </workloadDefinition>
  <workloadDefinition name="app_dev_wkld">
    <application>
      <path>/opt/perl/bin/perl</path>
      <alternateName>myperlscript.pl</alternateName>
    </application>
    <application>
      <path>/opt/myapp/bin/myapp</path>
    </application>
    <policyReference name="CPUUtil_Min1_Max7"/>
  </workloadDefinition>
  <workloadDefinition name="db_dev_wkld">
    <application>
      <path>/bin/sh</path>
      <alternateName>myscript.sh</alternateName>
    </application>
    <application>
      <path>/oracle/u01/app/oracle/product/10.2.0/db_dev_1/bin/oracle</path>
      <alternateName>ora*MYINST*</alternateName>
    </application>
    <policyReference name="CPUUtil_Min1_Max7"/>
  </workloadDefinition>
  <sharedResourceDomain interval="15" mode="Managed" name="haiti2a.srd"
ticapMode="off" time="1207934367420">
    <compartment id="124" name="default" type="fss">
      <cpu>
        <minimum>0.05</minimum>
        <maximum>7.90</maximum>
        <size>2.70</size>
      </cpu>
      <hostName>haiti2a.rsn.hp.com</hostName>
      <nativeId>1</nativeId>
      <parentId>0</parentId>
      <workloadReference name="haiti2a.OTHER"/>
    </compartment>
    <compartment id="125" name="" type="fss">
      <cpu>
        <minimum>0.05</minimum>
        <maximum>7.90</maximum>
        <size>2.65</size>
      </cpu>
      <hostName>haiti2a.rsn.hp.com</hostName>
      <nativeId>2</nativeId>
      <parentId>0</parentId>
      <workloadReference name="db_dev_wkld"/>
    </compartment>
    <compartment id="126" name="" type="fss">
      <cpu>
        <minimum>0.05</minimum>
        <maximum>7.90</maximum>
        <size>2.65</size>
      </cpu>
      <hostName>haiti2a.rsn.hp.com</hostName>
      <nativeId>3</nativeId>
      <parentId>0</parentId>
      <workloadReference name="app_dev_wkld"/>
    </compartment>
  </sharedResourceDomain>
</dataStore>

```

# Migration example: vPar-based workloads with usage goals

As with WLM, you can manage virtual partitions with gWLM. gWLM greatly simplifies the configuration however.

## The WLM configurations

WLM requires two configurations to manage partitions: one for `wlmd` and one for `wlmpard`.

The two configurations below are based on the files `par_usage_goal.wlm` and `par_usage_goal.wlmpar`, both available in `/opt/wlm/examples/wlmconf/` on systems with WLM installed.

First, we have the `wlmd` configuration file. This file is used in every virtual partition.

```
primary_host = myserver;           # Change this value
tune {
    wlm_interval = 5;
}
slo slo_myslo {
    pri = 1;                       # Change this value
    goal = usage _CPU;
}
```

Next, consider the `wlmpard` configuration file.

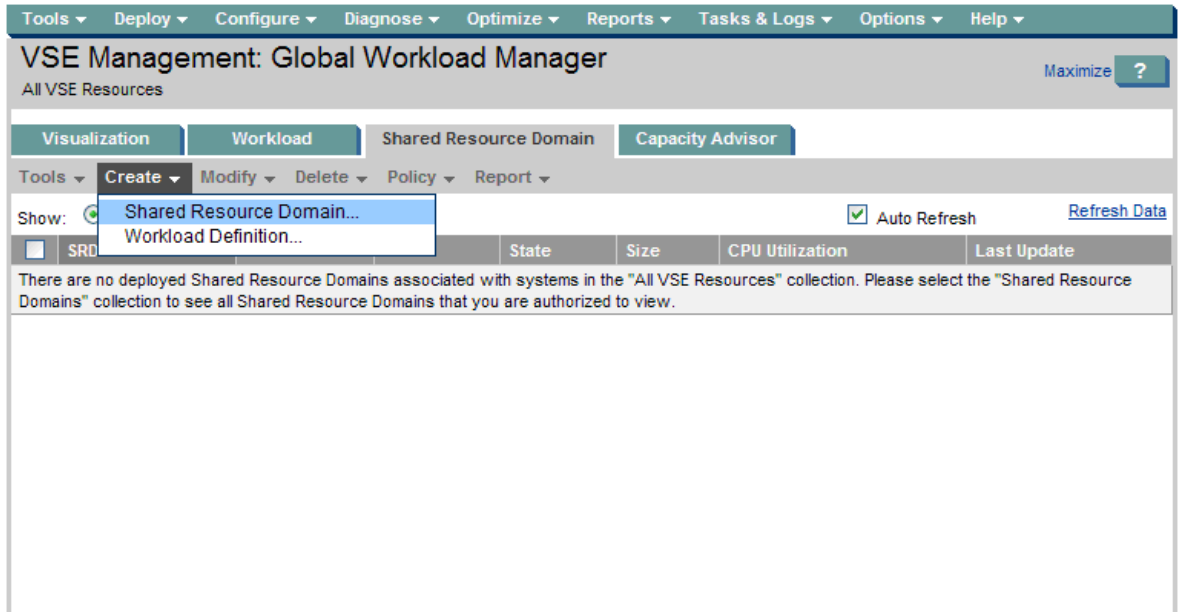
```
par {
    interval = 10;
}
```

## Creating an equivalent gWLM configuration

To create an equivalent gWLM configuration, follow the steps below in HP Systems Insight Manager. (For information on installing, configuring, and accessing VSE Management Software, such as gWLM, in HP Systems Insight Manager, see the *VSE Management Software Installation and Update Guide*, available from <http://docs.hp.com/en/vse.html>.)

gWLM does not require the multiple configuration files that WLM does. Also, there is no need to set a priority; you can simply accept the default.

1. From the Shared Resource Domain tab, select Create followed by Shared Resource Domain to start the Manage Systems and Workloads wizard.



2. Specify the host and all the remaining virtual partitions in the server or nPartition. Here, there are six virtual partitions specified. Select the Next button when done.



- Set the Mode to Managed. (Notice that gWLM automatically changed the Resource Allocation Interval to 85. gWLM changes the interval based on the type of workloads being managed.) Select the Next button.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

## HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes Maximize ?

**Step 2 of 4: Set properties for the shared resource domain.**

Shared Resource Domain Name:   
The name used to identify a group of systems sharing resources.

Mode:    
Allows you to see what resource requests would be made--without affecting on. Managed mode automatically adjusts the resource allocations.

Use TICAP cores to satisfy the policies in the SRD:   
The On option causes TiCAP cores to be activated as necessary to satisfy the resource request for all workloads in this Shared Resource Domain regardless of policy settings. The Off option limits TiCAP activation only to workloads that explicitly enable use of TiCAP in their associated policy settings.

Resource Allocation Interval:   
The time period in seconds during which resource utilization is measured and resource allocation decisions are made and carried out. The default value is set based on the compartment selection made for the SRD.

- Set the policy for each workload to the CPU\_Utilization policy provided by gWLM. Select the Next button.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

## HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes Maximize ?

**Step 3 of 4: Specify workload/policy settings.** [Refresh Data](#)

Hostname	Workload	Policy	Compartment Type	Add/Remove Sub-OS Workload	Compartment Min/Size/Max (Cores)
<input checked="" type="checkbox"/> <input type="button" value="i"/> haiti2a.rsn.hp.com	<input type="text" value="haiti2a"/>	<input type="button" value="CPU_Utilization"/>	<input type="button" value="vpar"/>	<input type="button" value="Add"/>	1 / 8 / 8
<input checked="" type="checkbox"/> <input type="button" value="i"/> haiti2b.rsn.hp.com	<input type="text" value="haiti2b"/>	<input type="button" value="CPU_Utilization"/>	<input type="button" value="vpar"/>	<input type="button" value="Add"/>	1 / 1 / 8
<input checked="" type="checkbox"/> <input type="button" value="i"/> haiti2c.rsn.hp.com	<input type="text" value="haiti2c"/>	<input type="button" value="CPU_Utilization"/>	<input type="button" value="vpar"/>	<input type="button" value="Add"/>	1 / 1 / 8
<input checked="" type="checkbox"/> <input type="button" value="i"/> haiti2d.rsn.hp.com	<input type="text" value="haiti2d"/>	<input type="button" value="CPU_Utilization"/>	<input type="button" value="vpar"/>	<input type="button" value="Add"/>	1 / 1 / 8
<input checked="" type="checkbox"/> <input type="button" value="i"/> haiti2e.rsn.hp.com	<input type="text" value="haiti2e"/>	<input type="button" value="CPU_Utilization"/>	<input type="button" value="vpar"/>	<input type="button" value="Add"/>	1 / 1 / 8
<input checked="" type="checkbox"/> <input type="button" value="i"/> haiti2f.rsn.hp.com	<input type="text" value="haiti2f"/>	<input type="button" value="CPU_Utilization"/>	<input type="button" value="vpar"/>	<input type="button" value="Add"/>	1 / 1 / 8

Total Size=

- The final step of the wizard allows you to review the SRD. Select Finish to manage the workloads.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

## HP gWLM: Manage Systems and Workloads

Manage sharing of CPU resources across partitions/processes

Step 4 of 4: Review and confirm.

Warning: gWLM communications are not secure. For security information see the [Secure gWLM Communications help page](#).

Shared Resource Domain Name	haiti2a.srd
Size	13
Mode	Managed
Resource Allocation Interval	85
Use TiCAP cores to satisfy the policies in the SRD	Off

Workload	Hostname	Type	Policy	Min/Size/Max
haiti2a	haiti2a.rsn.hp.com	vpar	CPU_Utilization	1 / 8 / 8
haiti2b	haiti2b.rsn.hp.com	vpar	CPU_Utilization	1 / 1 / 8
haiti2c	haiti2c.rsn.hp.com	vpar	CPU_Utilization	1 / 1 / 8
haiti2d	haiti2d.rsn.hp.com	vpar	CPU_Utilization	1 / 1 / 8
haiti2e	haiti2e.rsn.hp.com	vpar	CPU_Utilization	1 / 1 / 8
haiti2f	haiti2f.rsn.hp.com	vpar	CPU_Utilization	1 / 1 / 8

Previous Finish Cancel

- After you select Finish, you are taken to the Shared Resource Domain tab.

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾

## VSE Management: Global Workload Manager

All VSE Resources

Visualization Workload **Shared Resource Domain** Capacity Advisor

Tools ▾ Create ▾ Modify ▾ Delete ▾ Policy ▾ Report ▾

Show:  Deployed SRDs  Undeployed SRDs  Auto Refresh [Refresh Data](#)

<input type="checkbox"/>	SRD Name	Status	Mode	State	Size	CPU Utilization	Last Update
<input type="checkbox"/>	haiti2a.srd	✔	Managed	Deployed	13	0.5%	Fri, 4/11/2008 2:18 PM EDT

Details for SRD: haiti2a.srd

Shared Resource Domain haiti2a.srd ([Modify SRD](#))

Mode Managed ([Change SRD to advisory mode](#))

TiCAP Off ([Turn TiCAP on for SRD](#))

State Deployed ([Undeploy SRD](#))

CPU Utilization 0.5%

<input type="checkbox"/>	Workload	CPU Utilization	Type	Policy (Active)	Status	Request	Allocation	Size	Hostname
<input type="checkbox"/>	haiti2a	0.4%	vpar	CPU Utilization	✔	1 (+1)	3	3	haiti2a.rsn.hp.com
<input type="checkbox"/>	haiti2b	1.3%	vpar	CPU Utilization	✔	1 (+1)	2	2	haiti2b.rsn.hp.com
<input type="checkbox"/>	haiti2c	0.9%	vpar	CPU Utilization	✔	1 (+1)	2	2	haiti2c.rsn.hp.com
<input type="checkbox"/>	haiti2d	0.0%	vpar	CPU Utilization	✔	1 (+1)	2	2	haiti2d.rsn.hp.com
<input type="checkbox"/>	haiti2e	0.3%	vpar	CPU Utilization	✔	1 (+1)	2	2	haiti2e.rsn.hp.com
<input type="checkbox"/>	haiti2f	0.0%	vpar	CPU Utilization	✔	1 (+1)	2	2	haiti2f.rsn.hp.com

Totals: Req = 6 Alloc = 13 Size = 13

## The gWLM configuration file

gWLM can display an XML version of the configuration file using `gwm export`. (You can also configure gWLM using XML. For more information, see the `gwmxml(4)` manpage.)

The following command was used to display the XML for this configuration:

```
gwm export \  
  --srd=haiti2a.srd \  
  --workload=haiti2a \  
  --workload=haiti2b \  
  --workload=haiti2c \  
  --workload=haiti2d \  
  --workload=haiti2e \  
  --workload=haiti2f \  
  --policy=CPU_Utilization
```

The XML file is:

```
<?xml version="1.0" encoding="UTF-8"?>  
<!DOCTYPE dataStore SYSTEM "file:/opt/gwm/dtd/config.dtd">  
<dataStore>  
  <policyDefinition name="CPU_Utilization" ticapByPolicy="false" time="0"  
    type="Utilization">  
    <cpu>  
      <minimum>0.0</minimum>  
      <maximum>2048.0</maximum>  
      <target>75.0</target>  
      <weight>1.0</weight>  
      <convergenceRate>1.0</convergenceRate>  
    </cpu>  
    <priority>100</priority>  
  </policyDefinition>  
  <workloadDefinition name="haiti2a">  
    <policyReference name="CPU_Utilization"/>  
  </workloadDefinition>  
  <workloadDefinition name="haiti2b">  
    <policyReference name="CPU_Utilization"/>  
  </workloadDefinition>  
  <workloadDefinition name="haiti2c">  
    <policyReference name="CPU_Utilization"/>  
  </workloadDefinition>  
  <workloadDefinition name="haiti2d">  
    <policyReference name="CPU_Utilization"/>  
  </workloadDefinition>  
  <workloadDefinition name="haiti2e">  
    <policyReference name="CPU_Utilization"/>  
  </workloadDefinition>  
  <workloadDefinition name="haiti2f">  
    <policyReference name="CPU_Utilization"/>  
  </workloadDefinition>  
  <sharedResourceDomain interval="85" mode="Managed" name="haiti2a.srd"  
    ticapMode="off" time="1207937886836">  
    <compartment id="133" name="haiti2a" type="vpar">  
      <cpu>  
        <minimum>1</minimum>  
        <maximum>8</maximum>  
        <size>3</size>  
      </cpu>  
      <hostName>haiti2a.rsn.hp.com</hostName>  
      <nativeId>Z3e11d5b8fdef7289_P2_V00</nativeId>  
      <parentId>Haiti_Complex_USE4514JRL_P2</parentId>  
      <workloadReference name="haiti2a"/>  
    </compartment>
```

```

<compartment id="134" name="haiti2b" type="vpar">
  <cpu>
    <minimum>1</minimum>
    <maximum>8</maximum>
    <size>2</size>
  </cpu>
  <hostName>haiti2b.rsn.hp.com</hostName>
  <nativeId>Z3e11d5b8fdef7289_P2_V01</nativeId>
  <parentId>Haiti_Complex_USE4514JRL_P2</parentId>
  <workloadReference name="haiti2b"/>
</compartment>
<compartment id="135" name="haiti2c" type="vpar">
  <cpu>
    <minimum>1</minimum>
    <maximum>8</maximum>
    <size>2</size>
  </cpu>
  <hostName>haiti2c.rsn.hp.com</hostName>
  <nativeId>Z3e11d5b8fdef7289_P2_V02</nativeId>
  <parentId>Haiti_Complex_USE4514JRL_P2</parentId>
  <workloadReference name="haiti2c"/>
</compartment>
<compartment id="136" name="haiti2d" type="vpar">
  <cpu>
    <minimum>1</minimum>
    <maximum>8</maximum>
    <size>2</size>
  </cpu>
  <hostName>haiti2d.rsn.hp.com</hostName>
  <nativeId>Z3e11d5b8fdef7289_P2_V03</nativeId>
  <parentId>Haiti_Complex_USE4514JRL_P2</parentId>
  <workloadReference name="haiti2d"/>
</compartment>
<compartment id="137" name="haiti2e" type="vpar">
  <cpu>
    <minimum>1</minimum>
    <maximum>8</maximum>
    <size>2</size>
  </cpu>
  <hostName>haiti2e.rsn.hp.com</hostName>
  <nativeId>Z3e11d5b8fdef7289_P2_V04</nativeId>
  <parentId>Haiti_Complex_USE4514JRL_P2</parentId>
  <workloadReference name="haiti2e"/>
</compartment>
<compartment id="138" name="haiti2f" type="vpar">
  <cpu>
    <minimum>1</minimum>
    <maximum>8</maximum>
    <size>2</size>
  </cpu>
  <hostName>haiti2f.rsn.hp.com</hostName>
  <nativeId>Z3e11d5b8fdef7289_P2_V05</nativeId>
  <parentId>Haiti_Complex_USE4514JRL_P2</parentId>
  <workloadReference name="haiti2f"/>
</compartment>
</sharedResourceDomain>
</dataStore>

```

# Integrating with Security Containment

The HP-UX feature Security Containment provides file and process isolation and is available starting with HP-UX 11i v2. Combining that isolation with gWLM workloads based on psets or fss groups, you can form Secure Resource Partitions, which give your workloads both isolation and automatic resource allocation.

To integrate the two products:

1. Configure Security Containment compartments outside gWLM and activate them.
2. Create your gWLM workloads.

The processes in the Security Containment compartments will go in these workloads. You have two options to create the workloads:

- Use Application Discovery to add an application to a monitored workload that you then manage. This application should be the same one running in the Security Containment compartment that you want to manage.
- Define your workload using a process map you create. (A process map is an executable that returns a set of process IDs separated by white space. The identified processes are placed in the workload.) The process map should return a list of all the processes in the Security Containment compartment.

Each Security Containment compartment will have a process map associated with it to identify its processes.

3. Deploy an SRD that uses the new workloads.

## Licensing and availability

WLM and gWLM are both licensed on a per-core basis. Both are in the VSE Suite for Integrity Servers bundle. Additionally:

WLM is available through the:

- Mission-critical Operating Environment (HP-UX 11i v2)
- VSE Operating Environment and Data Center Operating Environment (HP-UX 11i v3)
- Quarterly AR media

gWLM is available through the:

- Foundation Operating Environment (HP-UX 11i v2) (includes the trial agent)
- VSE Operating Environment and Data Center Operating Environment (HP-UX 11i v3)
- Quarterly AR media (includes the CMS, as part of the VSEMgrt bundle, and the trial agent)

For information on obtaining gWLM, contact your HP sales representative or your HP authorized partner.

## For more information

The following sites provide high-level product information:

<http://www.hp.com/go/wlm>

<http://www.hp.com/go/gwlm>

<http://www.hp.com/go/vse>

The following white paper, *HP Global Workload Manager—Improving server CPU utilization technical overview*, provides a number of use cases:

<http://h71028.www7.hp.com/ERC/downloads/5983-0505EN.pdf>

The following site provides technical documentation for WLM, gWLM, and VSE Management Software:

<http://docs.hp.com/en/vse.html>