HP Superdome Hybrid Servers

Intel® Itanium® 2 and PA-RISC nPartition Mixing

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HP Superdome Hybrid Servers with Mixed Intel® Itanium® 2 and PA-RISC nPartitions

HP Superdome servers based on the HP sx1000 chipset can support configurations with both PA-RISC nPartitions and Intel® Itanium® 2 nPartitions in the same server. This document addresses the hardware, firmware, operating systems, and management tools required and supported for mixing PA-RISC nPartitions and Intel® Itanium® 2 nPartitions on Superdome hybrid servers.

Supported Processors

As Table 1 lists, the supported processors for Superdome hybrid servers are PA-8800, PA-8900, and the Intel® Itanium® 2 single-core processor with 9 MB cache. Older PA-RISC processors are not supported on the HP sx1000 chipset so they cannot be mixed with the Intel® Itanium® 2 single-core processor with 9 MB cache. Not supported for mixing are the Intel® Itanium® 2 single-core processor with 6 MB cache and the HP mx2 dual-processor module with Intel® Itanium® 2 processors; they have not been qualified in Superdome hybrid servers.

Table 1 Supported Processors for Superdome Hybrid Servers

Supported	Not Supported
PA-8800, PA-8900	PA-8600, PA-8700, PA-8700+
Intel® Itanium® 2 single-core processor with 9 MB cache (A1 stepping and A2 stepping)	Intel® Itanium® 2 single-core processor with 6 MB cache HP mx2 dual-processor module with Intel® Itanium® 2 processors

Mixing Scenarios

Table 2 lists operating systems supported on PA-8800, PA-8900, and the Intel® Itanium® 2 single-core processor with 9 MB cache. The two oldest HP-UX releases that support the PA-8800 processor are not supported in Superdome hybrid servers.

Table 2 Operating System Support for Superdome Hybrid Servers

Processor	Mixing Supported	Mixing Not Supported
PA-8800	HP-UX 11i v1 December 2004 Release HP-UX 11i v2 September 2004 Release HP-UX 11i v2 May 2005 Release	HP-UX 11i v1 December 2003 Release HP-UX 11i v1 June 2004 Release
PA-8900	HP-UX 11i v1 December 2004 Release HP-UX 11i v2 September 2004 Release HP-UX 11i v2 May 2005 Release	N/A

Table 2 Operating System Support for Superdome Hybrid Servers (Continued)

Processor	Mixing Supported	Mixing Not Supported
Intel® Itanium® 2 single-core processor with 9 MB cache	HP-UX 11i v2 September 2004 Release HP-UX 11i v2 May 2005 Release Red Hat Enterprise Linux 3 Update 3 (and higher) SuSE Linux Enterprise Server 9 (and higher) Windows Server 2003, Smart Setup 3.1 (and higher)	HP OpenVMS I64

Any of the supported operating systems listed in Table 2 can be used on a Superdome hybrid server. If you are running the HP-UX 11i v1 December 2003 Release or HP-UX 11i v1 June 2004 Release, you must upgrade to the HP-UX 11i v1 December 2004 Release (or later HP-UX 11i v1 releases) for mixing support.

NOTE In Superdome hybrid servers there are some limitations and restrictions with Instant Capacity (iCAP), Workload Manager (WLM), Global Workload Manager (gWLM), and Partition Manager on HP-UX 11i v1.

Firmware and application updates can resolve these limitations.

WLM and gWLM Limitation in All Mixing Scenarios

Workload Manager (WLM) version A.03.00 and lower uses the `uname -i` command to ensure that all the nPartitions it is managing are on the same Superdome server. WLM verifies that all the managed nPartitions have `uname -i` values that match. The Intel® Itanium® 2 nPartitions and PA-RISC nPartitions on the same Superdome hybrid server do not return the same `uname -i` values. This prevents WLM from properly managing all the nPartitions on a Superdome hybrid server with iCAP. This issue is fixed in WLM A.03.00.01 (released with HP-UX 11i v1 September 2005 Release). To use WLM in a Superdome hybrid server with iCAP, you must install/upgrade to WLM A.03.00.01. On a Superdome hybrid server with no iCAP components, using WLM A.02.x or WLM A.03.x does not require an upgrade.

Global Workload Manager (gWLM) v1.1.1 was first released with the HP-UX 11i v2 May 2005 Release. It has the same issue with the `uname -i` command as WLM. This only affects gWLM iCAP shared resource domains (SRDs). Other gWLM shared resource domains (vPAR SRDs, Pset SRDs, and FSS group SRDs) work correctly in Superdome hybrid servers. A remedy for this issue will be in the first maintenance release of gWLM. Contact `gwlmfeedback@rsn.hp.com` for a workaround if you need to deploy gWLM v1.1.1 with an iCAP SRD on a Superdome hybrid server before the first maintenance release is available.

Firmware Requirements

The following sections describe the firmware requirements for different Superdome hybrid server configurations:

- “Mixing Scenario 1: Superdome with Only HP-UX 11i v2 on PA-RISC nPartitions” on page 9
- “Mixing Scenario 2: Superdome with Only HP-UX 11i v1 on PA-RISC nPartitions” on page 9
- “Mixing Scenario 3: Superdome with Both HP-UX 11i v1 PA-RISC and HP-UX 11i v2 PA-RISC

nPartitions” on page 10

These sections also describe limitations and the available ways to work around or resolve them. For simplicity, the first two scenarios assume that all the PA-RISC nPartitions in the Superdome are running the same version of HP-UX. The third scenario explains the more general case where the PA-RISC nPartitions are running different versions of HP-UX.

Mixing Scenario 1: Superdome with Only HP-UX 11i v2 on PA-RISC nPartitions

Table 3 lists the minimum firmware required to enable full functionality of system management tools (Partition Manager, iCAP, WLM, gWLM) on Superdome hybrid servers where all the PA-RISC nPartitions are running HP-UX 11i v2.

Table 3 Firmware Requirements for Only HP-UX 11i v2 on PA-RISC nPartitions

Processor	Minimum Required Firmware	Not Supported
PA-8800	PDC 22.1 (SMS rel_5.0)	PDC 20.8 PDC 21.2
PA-8900	PDC 22.1 (SMS rel_5.0)	N/A
Intel® Itanium® 2 single-core processor with 9 MB cache (A1 stepping)	IPF 2.50 (SMS rel_5.0)	N/A
Intel® Itanium® 2 single-core processor with 9 MB cache (A2 stepping)	IPF 2.52 (SMS rel_5.1)	N/A

As Table 3 lists, PDC 20.8 and PDC 21.2 do not contain the required enhancements for mixing in any scenario, so both of these PDC versions must be upgraded to PDC 22.1 to enable mixing when running only HP-UX 11i v2 on PA-RISC nPartitions. PDC 22.1 is also the minimum firmware required to support PA-8900. There are no known issues with system management tools other than the `uname -i` issue for WLM and gWLM (for details, refer to “WLM and gWLM Limitation in All Mixing Scenarios” on page 8).

Mixing Scenario 2: Superdome with Only HP-UX 11i v1 on PA-RISC nPartitions

Table 4 lists the minimum firmware required to enable full functionality of system management tools on Superdome hybrid servers where all PA-RISC nPartitions are running HP-UX 11i v1.

Table 4 Firmware Requirements for Only HP-UX 11i v1 on PA-RISC nPartitions

Processor	Minimum Required Firmware
PA-8800 PA-8900	PDC 22.3 (SMS rel_6.0)
Intel® Itanium® 2 single-core processor with 9 MB cache (A1 stepping and A2 stepping)	IPF 3.66 (SMS rel_6.0)

The PDC 22.1 and IPF 2.50/2.52 firmware does not properly report cell information to the management

software stack on PA-RISC nPartitions running HP-UX 11i v1. This causes the PA-RISC management stack to report errors for Intel® Itanium® 2 cells. These firmware issues are fixed in PDC 22.3 and IPF 3.66.

In addition to the firmware requirements in Table 4, the nPartition Provider (the "NPar" bundle) must be updated to version B.11.11.01.04 or higher in the PA-RISC nPartitions running HP-UX 11i v1. This version is released with the HP-UX 11i v1 September 2005 Release. The version of the nPartition Provider that shipped with HP-UX 11i v1 December 2004 Release does not properly handle the Intel® Itanium® 2 single-core processor with 9 MB cache.

If these firmware and nPartition Provider upgrades are not possible, or if you begin mixing before they are available, then be aware of the following known limitations and workarounds.

Limitation with Partition Manager on HP-UX 11i v1 December 2004 Release with PDC 22.1 and IPF 2.50/2.52 Partition Manager Version 2.0 for HP-UX 11i v1 first shipped with HP-UX 11i v1 December 2004 Release. This release of Partition Manager generates error messages when trying to access Intel® Itanium® 2 cells and display information about them when using PDC 22.1 and IPF 2.50/2.52. However, upgrades to firmware and the nPartition Provider mentioned previously will make this version of Partition Manager fully functional and capable of managing Intel® Itanium® 2 nPartitions. If the upgrades are not possible, desirable, or practical, then the alternatives that follow can be used instead of Partition Manager on the nPartition running HP-UX 11i v1 December 2004 Release.

Alternatives to Running Partition Manager on HP-UX 11i v1 December 2004 Release with Firmware PDC 22.1 and IPF 2.50/2.52

- Intel® Itanium® 2 nPartitions (and PA-RISC nPartitions) can be managed by Partition Manager on the Support Management Station (SMS)
- Intel® Itanium® 2 nPartitions (and PA-RISC nPartitions) can be managed by nPartition Commands on any nPartition
- Intel® Itanium® 2 nPartitions (and PA-RISC nPartitions) can be managed by Partition Manager on any Intel® Itanium® 2 nPartition

Limitation with iCAP on HP-UX 11i v1 December 2004 Release with PDC 22.1 and IPF 2.50/2.52

To correctly determine the state of the machine and administer iCAP, the iCAP software requires cell information for all cells in the server. The PDC 22.1 and IPF 2.50/2.52 firmware does not properly report cell information back to the nPartition Provider on PA-RISC nPartitions running HP-UX 11i v1. iCAP software running in such an environment cannot properly manage iCAP processors in all nPartitions. If you depend on iCAP on a Superdome hybrid server, you must install firmware (PDC 22.3 and IPF 3.66 or higher) and upgrade the nPartition Provider (B.11.11.01.04 or higher).

Limitation with WLM and gWLM on HP-UX 11i v1 December 2004 Release with PDC 22.1 and IPF 2.50/2.52 WLM and gWLM depend on iCAP for system configuration information. This is the case whether or not there are any iCAP components in the system. iCAP does not work properly on PA-RISC nPartitions running HP-UX 11i v1 with the PDC 22.1 and IPF 2.50/2.52 firmware. Because WLM and gWLM are dependent on iCAP, in this situation they cannot perform processor migrations among virtual partitions or nPartitions in the PA-RISC nPartitions running HP-UX 11i v1. Other WLM and gWLM functionality (such as Psets) works properly. If you depend on the processor migration features of WLM and gWLM on a Superdome hybrid server, you must install firmware (PDC 22.3 and IPF 3.66 or higher) and upgrade the nPartition Provider (B.11.11.01.04 or higher).

Mixing Scenario 3: Superdome with Both HP-UX 11i v1 PA-RISC and HP-UX 11i v2 PA-RISC nPartitions

Table 5 lists the minimum required firmware for full functionality of system management tools on all nPartitions in Superdome hybrid servers with both HP-UX 11i v1 and HP-UX 11i v2 PA-RISC nPartitions.

Table 5 Firmware Requirements for Both HP-UX 11i v1 PA-RISC and HP-UX 11i v2 PA-RISC nPartitions

Processor	Minimum Required Firmware
PA-8800, PA-8900 (with HP-UX 11i v2)	PDC 22.1 (SMS rel_5.0)
PA-8800, PA-8900 (with HP-UX 11i v1)	PDC 22.3 (SMS rel_6.0)
Intel® Itanium® 2 single-core processor with 9 MB cache (A1 stepping and A2 stepping)	IPF 3.66 (SMS rel_6.0)

If it is not possible to upgrade the firmware in the PA-RISC HP-UX 11i v1 nPartitions to PDC 22.3 then the limitations and workarounds in scenario 2 apply (refer to “Mixing Scenario 2: Superdome with Only HP-UX 11i v1 on PA-RISC nPartitions” on page 9).