Booting, Installing, Recovery, and Sharing in a vPars Environment from DVD / CDROM / TAPE / Network [1]

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I. Introduction

This white paper provides an explanation of the supported methods on how Virtual Partitions (vPars) can be created and booted. It also provides an explanation of sharing boot devices. This is not intended to replace the existing customer viewable document titled "**Installing and Managing HP-UX Virtual Partitions**" on the http://docs.hp.com website. This is intended to explain how you can use DVD/CDROM/Tape to create virtual partitions, when you can do it, and why it isn't supported under certain conditions.

II. Technology and Notes

Throughout this document there will be reference to "vPars Environments" and "non-vPars Environments". The key distinction is whether the vPars Monitor is running or not. When the vPars Monitor is NOT running, then you are in a standard non-vPars environment. When the vPars Monitor is running, then you are in a vPars environment, even if there is only one virtual partition.

There will also be references to vpars and potential vpars. Remember, just because there is an OS and the vPars software is installed, it is not an active vpar. With an OS and vPars software installed, it is a potential vpar, meaning the boot disk has the capabilities (i.e. potential) of being booted as a vpar. A potential vpar becomes an active vpar when the OS has been booted WHILE the vPars Monitor is running. Without the vPars Monitor running, the boot disk is a standard HP-UX boot disk with the vPars software installed but not running.

For brevity, a virtual partition may be typed here as "vpar" and virtual partitions as "vpars" (all lowercase letters). The product and software bundle name may be typed as "vPars" (with the "P" capitialized as in other outbound information).

- **A.** CD or CDROM – refers to Compact Disc or Compact Disc – Read Only Memory
- **B.** DVD – refers to Digital Video Disc
- **C.** DAT or DDS – refers to Digital Audio Tape or Digital Data Storage (Tape Drives)
- **D.** PDC – Processor Dependant Code (firmware)
- **E.** HBA – Host Bus Adaptor
- **F.** BCH – Boot Console Handler

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III. Booting to Install (CD/DVD, tape, and network boot servers)

The standard devices such as CD, DVD, TAPE, and Network are all supported for the creation of HP-UX boot disks and may be used to boot install media to begin the installation process for installing HP-UX and the vPars software bundle onto potential vpar boot disks. Remember that a vPars environment begins with standard HP-UX boot disks. The boot disks themselves may be created outside of a vPars environment through the devices mentioned above.

"No Tape, DVD or Network booting" mentioned in other documents refers to booting each vpar within a vPars environment via these boot devices. "Network booting" specifically means using bootp and does not mean booting across the network using Ignite-UX.

Please note the difference in Tape Boot functionality between A.03.02 and A.03.03 and the same difference between A.04.01 and A.04.02 as explained below.

A. Booting and Boot Devices During Installation

1. Non-vPars environment – Cold Install Process Background Information

a) The PDC traverses core IOs and external HBAs to find any available install devices. Devices such as boot disks can be booted assuming an OS exists. Other devices such as DVD, CDROM, and TAPE may be booted from if install media (or recovery media) is found. The network may also be used to install from if an Ignite-UX server has been set up.

b) The system will boot using the install media and take you through the standard HP-UX install process, asking questions about what to install and where to install it. Again, this is referred to as the "Cold Install Process".

2. vPars environment

a) Installing the first vpar (or rather potential vpar)

(1) The first installation of HP-UX is exactly the same as the installation for a non-vPars environment. You would use the standard cold install process (see above) to install the OS and then install the vPars software. At this point this is a potential but non-active vpar. After the first boot disk is created, then you have a choice on how subsequent potential vpar boot disks can be created (see options below).

Note for PA-systems: When planning the assignment of hardware paths to vpars, the first vpar must own the hardware path of the console.

b) Installing/Creating subsequent boot disks and/or potential vpars

(1) Option1: Installing from outside of vPars (non-vPars environment)

You can install additional boot disks and potential vpars outside of a vPars environment serially using the cold install method to create additional boot disks, each with the potential of being an active vpar. This method requires the system (or nPartition) to come down to the BCH or EFI for each install.

Using this method, you serially use the PDC to install to the boot disks of the additional potential vpars. This is the same as cold-installing on a non-vPars system, but you're switching the destination disk each time. All of this is performed from the BCH or EFI and not within a vPars environment. After installing the first vpar, you would bring the system back down to the BCH or EFI and start the HP-UX install process again, pointing to the same install media again but pointing to a different destination disk for each potential vpar. What you are doing is simply creating multiple boot disks in preparation for multiple vpars. But remember, at this time you are only creating standard HP-UX boot disks (that have vPars software installed).

(2) Option 2: Installing from within vPars (i.e. the vPars environment with the vPars Monitor running)

You can install additional vpars from within the vPars environment using Ignite-UX and starting with A.03.03 and A.04.02, from Tape, to install the additional vpars. This is performed from a running vpar. The benefit of this method is the system (or nPartition) does not need to come down to the BCH or EFI. All existing vpars can be up and running while you create the additional vpars.

(a) A.04.xx IPF systems and PRE-A.03.03 and PRE-A.04.02 PA-systems: Reasons You Cannot Install Subsequent Boot Disks using DVD/CDROM or TAPE Drives from within a vPars Environment

(i) PDC: The vPars Monitor resides between the PDC and the OS. Unlike the PDC, the vPars Monitor cannot traverse the core I/O and HBAs looking for boot devices. This is the key reason the statement has been made that you cannot boot vpars (while the vPars Monitor is running) from DVD, CDROM, or TAPE.

(ii) Drivers: The OS requires drivers in the kernel to access boot devices, but a new vpar within a vPars

environment doesn't have an OS yet if you're using this option; therefore there are no drivers available.

(iii) Kernel: You can not use the kernel from another vpar since neither the kernels nor the boot disks are shared among vpars.

(b) Starting with A.03.03 and A.04.02 for PA-systems: You Can Install Subsequent Boot Disks using TAPE Drives from within a vPars Environment. DVD/CDROM functionality remains unchanged

The A.03.03 and A.04.02 vPars Monitor provides the capability to now see a bootable tape device. This is accomplished through an additional path attribute of "TAPE" as shown in section IV below. This functionality only applies to tape. The DVD/CDROM boot limitations still remain.

(c) Use Ignite-UX

Ignite-UX works differently and is supported for booting within a vPars environment. From within a running vpar, you can use the "vparboot" command and point to an existing Ignite-UX server. The Ignite-UX Server is accessed through the drivers of the *running* vpar for PA-systems and the target vpar for IPF systems and the respective mini-kernel (WINSTALL or IINSTALL) is loaded into memory. The running vpar then gives the mini-kernel to the vPars Monitor. The vPars Monitor can then use it to boot the *target* vpar. The vPars Monitor does not access the Ignite-UX server directly nor does it access any boot install devices directly. From this point, you can follow the standard Ignite process.

IV. Archiving / Backing-up and Recovering vpars

A. Archiving /Backing-up

vpars can be archived or backed-up to tape (make_tape_recovery) or to an Ignite-UX server (make_net_recovery). Both of these methods may be done while in a vPars environment and while other vpars are up and running.

B. Recovering vpars

vpars can be recovered from either a tape image or a network image.

1. Tape Image

a) Prior to A.03.03 and A.04.02, a vpar may be recovered from a tape image. However this must be done from the BCH or EFI. Recovering a vpar from a tape image can not be done while the system is up and running, similar to the cold install method. So if you have one or more vpars to recover, you must bring the system down, recover one vpar, bring the system down again, and recover another vpar, and so on.

b) For PA-systems, starting with A.03.03 and A.04.02, a vpar may be recovered from tape while the system is up and running in a vPars envionment. An I/O path attribute of "TAPE" may now be specified with the hardware path for a tape device similar to that of a standard disk boot device. For example:

vparmodify –p <vparname> -a io:<path>:TAPE

When a tape device is specified in this manner, the *vparload* (from the monitor prompt) or *vparboot* (from a running vPar) commands will initiate a boot from tape.

2. Network Image

A vpar may be recovered from a network image. Recovering a vpar from a network image may be done while in a vPars environment. This method uses Ignite-UX and is similar to installing an OS to a vpar boot disk from an Ignite-UX server. This method does not require the system and/or any vpars to be shut down prior to the recovery process.

V. Sharing CDROM/DVD and TAPE Tape Drives

A. Sharing Defined

The concept of "sharing" needs to be clarified for the purposes of this document. Within a vPars environment, I/O, including CD/DVDs and Tape drives, may not be shared internally across vpars. This means that I/O is assigned to one and only one vpar and other vpars can not see or access it through any internal means, such as the vPars software.

However, it is possible for vpars to access the same CD/DVD or Tape drives through standard network methods (e.g. NFS), available with HP-UX. This is only possible after the vpars involved are up and running and on the network. The following examples only point out a few ways (commands) these devices can be accessed across a network.

B. CDROM and DVD Drives

For CD and DVD drives, access is accomplished through the network using the standard HP-UX mounting process. On the vpar that owns the CD/DVD device, mount the actual CD/DVD, then export the filesystem so other systems on the network can access it, and then from any other vpar on the network you can remote mount the CD/DVD filesystem. For example to use vpar1's CD/DVD on vpar2, you may use something like:

```
vpar1# mount /dev/dsk/c1t2d0 /cdrom
```

```
vpar1# exportfs /cdrom
vpar2# mount vpar1:/cdrom /cdrom
```

C. Tape Drives

For Tape Drives, you cannot mount them, but standard HP-UX shell commands may be used to remotely transfer data to a Tape drive from one vpar across the network to another vpar. For example to transfer data from vpar2 to vpar1's tape drive, you may use something like:

```
vpar2# tar cvf - * | remsh vpar1 "dd of=/dev/rmt/0m"
```