

OVO Operations Server Footprint Reduction WhitePaper (SUN)

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Overview:

This white paper provides a generalized approach for minimizing the footprint required for HP OpenView Operations for UNIX based on the steps I took to install OVO version 7.1 running Oracle 8.1.7 on a SPARCstation 5 with the following spec:

CPU: 170mhz
RAM: 196 MB
DISK: 2GB

Why? In my case it was to set up a development and test environment for OVO. In particular, I built my configuration to support template development and agent testing. I was stuck with this old hardware. Most of what I did could be generalized to work with other platforms/versions, and I will speak to that as much as possible here.

The general methodology is: 1) minimizing OS install by installing an "end user" type OS, then loading up the few requisite development libraries that would be missing from that for a) linking the Oracle executable, and b) OVO binary dependence; 2) shoehorning in the absolute minimum level of OS patches necessary; 3) minimizing Oracle DB by simply deleting anything having anything to do with JAVA in the Oracle install, all of which is totally unnecessary to the use of Oracle by OVO and 4) minimizing the OVO installation in several ways before, during, and after its installation and configuration.

My actual footprint reduction yield as compared with HP's stated minimums:

OVO 7.1 Solaris 2.7 OFO 8.1.7 Minimum system requirements per OVO DOC:

Swap:	600 MB	
SUN Solaris 2.7 DSS disk footprint:	1100 MB	
Required patches footprint	187 MB	
OVO w/ ORA 8.1.7 disk footprint:	2475 MB	
Total Disk Space for entire Platform:		4,362 MB

OVO 7.1 Solaris 2.7 OFO 8.1.7 Minimized per this document:

Swap:	206 MB	
SUN Solaris 2.7 minimized disk:	263 MB	
Minimized patches footprint:	26 MB	
OVO w/ ORA 8.1.7 disk footprint:	1222 MB	
Total Disk Space for entire Platform:		1,707 MB

Caveats

- OVO will not be supported by HP on platforms that do not meet minimum requirements.
- Some OVO, OS, and DB functions *will* be rendered inoperable so as to obtain minimization.
- SUN is preferred platform since OS footprint can be made *much* smaller than HP-UX without breaking it.
- OVO will install with a 60-day instant on license, and, in fact, any development operations will continue to work well after that period expires, but it is your responsibility to assure you and your company are in compliance with HP product licensing agreements.
- This document is not intended to deprive HP, SUN, Oracle, or any other struggling computer company of much needed hardware or software revenue.

OS minimization:

For Solaris, OVO 7.1 is supported on 2.7 and 2.8, and naturally 2.7 will have a smaller footprint than 2.8.

You must have the OS install disks for the version of OS you are dealing with because you might remove a critical OS dependency through this process, so you will need some media from which to re-install it.

Actually, forget about trying to work with an existing OS image altogether. Plan on wiping the target system and starting fresh. The biggest benefit to this is that you can set up the disk to minimize the number of filesystems. This procedure pretty much won't work unless you have a single filesystem for / and a single filesystem for swap. With a standard Solaris filesystem layout, you will have problems with 4GB of disk. With a single / filesystem, I was able to get his all to work on less than 2GB. Not convinced? See this note from the OVO 7.1 Installation Guide for Solaris:

NOTE If you have a Solaris system with small physical disks and you have chosen the "Automatic File System Layout" option during the installation of the Solaris OS, then the resulting file system layout will *not* meet VPO's disk space requirements listed in Table 1-3 on page 42. Automatic file system layout is *not* suitable for VPO, at least for systems with 4GB disks.

For Media, I used a Solaris 7 Software SPARC Platform edition "Server Configuration" CD dated 11/99

To load the new OS, put the install CD in the CDROM drive, reboot the server, and then during the system initialization sequence key in "Stop-A." This will get you to an "ok>" prompt.

Make note of your network address, gateway, netmask, and name server info. You must be on a network and have established name services for OVO to work right.

From here key in "boot cdrom" and the install will proceed. You will be prompted for a choice of base operation system types. OVO Install guide says to install the DSS type, but you are going to install the "end user type." Do not install the "minimal" type.

When prompted for file system layout, unclick all but the / and swap filesystems. Remove the entry for /export/home. It is important to combine all filesystems into one under root to maximize available disk space. Use math to figure out how many blocks to add space back into /. I just stuck with the amount of swap that the system calculated. Here's my slices:

```
/          1880 MB
swap      147 MB
overlap   2028 MB
```

Choose CDE vs Openwin when prompted. Once system build is complete and comes up, the network config. may need tweaking.. Check the /etc/defaultrouter, /etc/netmasks, etc/hosts, /etc/resolv.conf, and hostname file and test network connectivity. Make sure the system can resolve its own name via DNS with an nslookup hostname. Reboot may be needed if network config changes are made.

Core OS "end user" footprint:

Filesystem	kbytes	used	avail	capacity	Mounted on
/proc	0	0	0	0%	/proc
/dev/dsk/c0t3d0s3	1865662	262554	1547139	15%	/
fd	0	0	0	0%	/dev/fd
swap	268994	548	268392	1%	/tmp

With the Solaris CD still mounted, load the following packages to get the development libraries minimally required to install Oracle and OVO:

SUNWsprout SUNWtoo SUNWhea SUNWbtool SUNWarc SUNWlibm SUNWlibms

To install these packages, enter (copy and paste) the above package names after the following command:

```
pkgadd -d /cdrom/cdrom0/s0/Solaris_2.7/Product
```

Solaris Patches

The OVO Installation Guide for Solaris lists a big set of pre-requisite Solaris patches. My approach was to install none of them and see what breaks. Turns out that nothing in Oracle broke, only one thing broke in OVO. After installing OVO, I received an error from invoking the OVO binary complaining about libCstd.so.1. I traced this to the following patch: 106327.20, which I installed after installing its prerequisite, 106950-22.

There was a CD with my Solaris 2.7 cd with contained an earlier version of the patch I was after, but I was unable to install it successfully. I had much better luck pulling the patch from one of the various archive sites on the net. I Googled “7_recommended.zip,” downloaded, then blew this out on a machine with space (the zip is ~80MB). The system I did this on was a wintel box, and I used cygwin with no problems (cygwin.org). Then I tarred up the specific patches I was after (e.g. cd 106950-22; tar cvf ../106950-22.tar *), then ftp’d them to my target, created a temporary directory with the patch name as the directory name (required), untar’d them in those directories (e.g. mkdir /opt/106950-22; cd /opt/106950-22; tar xvf ../106950-22.tar), and ran “patchadd filename”, (e.g. patchadd /opt/106950-22).

I have run into this issue with other OVO installations on Sun where OVO spits out an error about a particular library. In general, one has to google the library to the right patch version. Note the patches that are listed in the OVO Installation guide as prerequisites are almost always impossible to find in the exact version that is advertized. If you install a particular version and are unable to clear the error, just back out he patch with pachrm and try another version.

Once the patches are installed, the tarballs and the directories create for the patch installs should be deleted. The net net for installing these two patches and the above development libraries was ~ 2M of disk growth.

Oracle Minimization

The Installation Guide for Operations explicitly lists the pre-requisite Oracle products required. What it doesn’t say is what products are NOT required. In essence, selecting products in the Oracel Installer automatically selects a whole host of sub products that are not needed, and these can simply be deselected from the products selection screen. The installer will warn you and disallow the deselection of any pre-requisite sub-products to the major products you selected.

Install oracle per the OVO Installation guide. Steps are: 1) modify /etc/system per section on kernel params and reboot; 2) create dba group; 3) create oracle user with homedir /oracle/product/8.1.7, in group dba, Korn shell; 4)umask 022; 5) mkdir /oracle/oraInventory; 6) chown -R oracle:dba /oracle; 7) add to ~oracle/.profile and /.profile:

```
PATH=$PATH:/usr/ucb:/usr/openwin/bin:$ORACLE_HOME/bin:/opt/OV/bin/OpC:/opt/OV/bin
export PATH
PS1="hostname | cut -d"." -f1 `(whoami)` $"
export ORACLE_BASE=/oracle
export ORACLE_HOME=/oracle/product/8.1.7
export ORACLE_SID=openview
export ORACLE_TERM=xterm
export NLS_LANG=american_america.WE8ISO8859P15
./opt/OV/bin/ov.envvars.sh
```

8) xhost + (if not found, set PATH as above); 10) su – oracle; 11) export DISPLAY=hostname:0; 10) /cdrom/cdrom0/runInstaller; 11) follow prompts per OVO install guide, and run orainstRoot.sh; 12) “Installation Types” = custom; 13) under “Available Product Components,” select all but Oracle 8i Server, Net8 Products, Oracle Utilities, and Oracle Installation Products; 14) Note “total required diskspace” in “Component Locations” screen. You should have enough but if not, you may need to remove some of the directories the install creates on the fly. See paragraph below; 15) create database = no; 16) summary window: install: go and get a cup of coffee while waiting for the prompt for CD 2. When that happens, you may have to change the path to “/cdrom/cdrom0”; 17) when prompted to run root.sh, do, and follow install guide instructions for prompt, except, for path to bin directory, where OVO install guide instructs to use /opt/bin, use /bin; 18) cancel net8 assistant and ignore errors; 19) next, then at “end of Installation” window, exit installer.

Base Oracle 8.1.7 footprint:

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s3	1865662	1305634	504059	73%	/

Oracle installation contains many elements that are not needed by the OVO application. Do this:

```
cd $ORACLE_HOME ; rm -r jdbc jis javavm jlib xdk jsp classes starterdb
```

df –k / and now look at the base Oracle 8.1.7 footprint!

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s3	1865662	748537	1061156	42%	/

Following the successful installation of Oracle, I was able to remove some particularly large Solaris packages. Here is the command I used:

```
pkgrm SUNWarc SUNWdthev SUNWdthj SUNWj2rt SUNWjvrt SUNWolbk SUNWploc1 SUNWoldcv
```

Savings:

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s3	1865662	668607	1141086	37%	/

OVO Installation

The Install Guide install process worked fine for me with the space I had available, but only after some experience with this process. The first time I went through this, I had less space available and had to be more creative. If you have enough space available to install ITOEngOraAll (>743MB), then:

1) mount the OVO 7.1 cd volume 2; 2) cd /cdrom/cdrom0/OV_DEPOT; 3) ./install

If the above procedure fails disk space analysis, use the following procedure:

(NOTE: I tried to install ITOEngOraMin instead, which requires only about 580 MB, but I couldn't get opcagtdbcfg to upload the node defaults properly when I subsequently tried to add needed OVO filesets for agent platforms. There are a lot of different approaches, here, but the procedure that follows worked pretty well):

1) Before starting the install, run a df –k and figure out how much disk space is available. Note that “no space” console messages will be generated when the filesystem is 90% full (df's “capacity” column goes up to 110%); 2) Calculate exactly how much space you'll need to free up while the install is happening, then wait until the install completes to delete additional stuff; 3) Use “du –sk dirname” before issuing the rm's to determine the size of the directories you delete so you can track how you are doing; 4) mount cd; 5) swinstall –s /cdrom/cdrom0/OV_DEPOT/OVDEPOT –x enforce_dsa=false ITOEngOraAll ; 6) While the above command is running, you are going to watch disk space and then delete unneeded directories. To monitor disk space, launch a terminal window and issue this command: while a=0 ; do ; df -k / ; sleep 5 ; clear ; done ; 7) Then, when you've seen a few hundred MB worth of stuff has been loaded, look for the following directories and delete them while the OVO install is still commencing.

Load up any SPI's you may need from the OVO install media. Some of these bundles consume a lot disk space on install, so watch this.

Note: I had poor luck attempting to use swremove to delete specific filesets as this command will automatically select and remove dependent filesets that will very likely be very important.

After installing ITOEngOraALL , the footprint looked like this:

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s3	1865662	1528457	281236	85%	/

Before running opconfg, assure there is **425 MB** of free space for the openview database **plus** the 10% overhead for the OS. The openview instance can be configured to be much smaller, but that's a bit complicated and I've not bothered with that because I didn't need to. The opconfg *will* fail if disk space grows to 100%, which is really 90%. To easily free up space before running opconfg, see below:

The following directories can safely be removed from the OVO installation. The procedure I used to find these files was to cd to interesting directories and run the following command to list all the files larger than 5 MB:

```
find . -size +5000000c -xdev -exec ls -la {} \;
```

```
rm -r /opt/OV/contrib - 74 MB
rm -r /var/opt/OV/share/snmp_mibs - 23 MB
rm -r /opt/OV/www/htdocs/ito_op (Java GUI) - 182 MB
rm -r /opt/OV/www/htdocs/ito_doc (OVO Docs) - 42 MB
rm -r /var/opt/OV/share/databases/subagent (perf agents) - 65 MB
cd /var/opt/OV/share/databases/OpC/mgd_node/vendor ;
rm -r dec hp ibm linux novell sgi - 98 MB
```

After performing the above rm's, this yielded plenty of room for running the opconfg:

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/dsk/c0t3d0s3	1865662	1045184	764509	58%	/

The final footprint after the openview database instance is fully created and the OVO GUI is running:

Filesystem	kbytes	used	avail	capacity	Mounted on
/proc	0	0	0	0%	/proc
/dev/dsk/c0t3d0s3	1865662	1469471	340222	82%	/
fd	0	0	0	0%	/dev/fd
swap	37300	12364	24936	34%	/tmp

Note that with one OVO Admin GUI running with the message browser and message source templates windows up, the swap utilization is 34%. After running this config for a while, VM will get all used up depending on what's doing. Heavy DB operations like running opccfgdwn's and opccfgupld's would fail once and a while, but work fine after a reboot. Good news is that because this configuration is so "lite," a reboot takes only a minute or two – even on this ancient hardware...

Additional Tools:

You may want to load up some supporting tools that do not ship with Solaris.

Get the gzip tool from www.sunfree.com. Netscape navigator can be downloaded from netscape or found on some CD somewhere. V4.7 was last version ported to Solaris 2.7. You will need gzip to unbundle it. These two bundles add 11 MB of space. Adobe Acrobat can be downloaded from Adobe.com, but you won't need it much if you deleted all the product documentation in the above steps. ☺

CDE Issues:

Before invoking any Motif GUI, you must open up access for X with:

```
/usr/openwin/bin/xhost +
```

I was unable to get the font server to load after the steps I had taken above. I was able to set the font paths so as to avoid the following error:

```
Warning: Missing charsets in String to FontSet Conversion
```

Clear this with the following commands:

```
Sun: xset +fp tcp/server_node_ip_address:7100
HP:  xset +fp tcp/server_node_ip_address:7000
xset fp rehash
```

Conclusion:

Level of effort here was a full day. With this White Paper in hand, it could perhaps be done in about half a day.

Could this config be crammed onto an even smaller disk? Probably!

Actually, finding files that could be safely deleted was a fairly straightforward process, and had I taken it further, I could reduce the footprint significantly more. Things I know I left on the machine are: all the man pages, large files and utilities I know I'll never use, and dozens of smaller Solaris packages that as a group would add up to over 200 MB. /opt/OV/newconfig is a directory I wanted to keep around; you may not. The Openview database instance can be reconfigured to use a much smaller footprint by playing with the dbs files and running opcdbsetup with options. – there's probably 300 MB you could safely take off that if you don't plan on dealing with a lot of templates/messages/ etc. That procedure is a pain because you have to create the DB with defaults, then drop the tables, tweak the dbs files, then run opcdbsetup to repopulate the tables. Problem is that opcdbsetup is a finicky beast and bails out without cleaning things up very nicely. Have a good oracle DB admin handy in case you get into trouble and remember that HP won't help you at all as none of these scenarios are "supported."

Feedback is welcome and encouraged by send email to me at mike@fognet.com