Space Details

Key:	VDI3
Name:	Sun Virtual Desktop Infrastructure
Description:	Securely access a virtual desktop from nearly any client on the network.
Creator (Creation Date):	stephanielewellen (Feb 02, 2009)
Last Modifier (Mod. Date):	stephanielewellen (Feb 02, 2009)

Available Pages

- The system is not reacting as expected.
- The VirtualBox host is crashing unexpectedly.
- The VirtualBox software never finishes installing due to an error.
- The VirtualBox Web Service cannot be contacted.
- The VMware virtual machine cloning process is not operating as expected.
- The window displaying the VMware-hosted virtual desktop is freezing.
- Unused VMware virtual machines are not being recycled.
- Users cannot log into their desktops using their User Principal Name (UPN), or email address.
- Users do not show up in the Admin GUI in the Users and Groups section.
- vda command reports that VDI is not running although cacaoadm and vda-db-status say it is.
- VDI database doesn't start during an Evaluation configuration.
- What are the differences between SRS in VDI 2 and VDI 3?
- What is the difference between Personal and Flexible desktop assignments?
- When I start a desktop I get this error - No suitable hosts to start a desktop for Desktop Provider sunvdi-demo.
- Which versions of JRE are supported?
- Why does my VMware virtual machine have an invalid IP address or cannot be pinged?

- JavaOne and VDI Success Story

This page last changed on Jun 11, 2009 by stephanielewellen.

About VDI

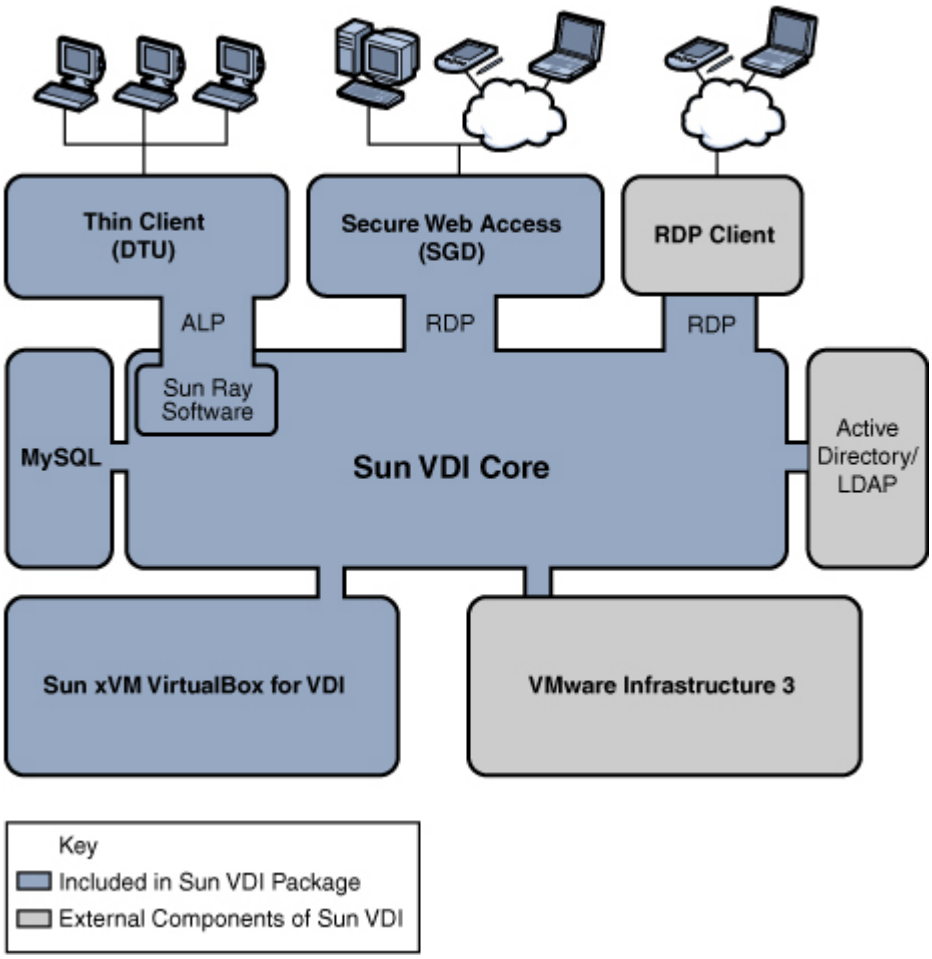
Features of VDI 3

Sun VDI 3.0 now includes the following features:

- Support for a wide variety of virtual desktop operating systems (XP, Vista, 2000, OpenSolaris, Ubuntu).
- Built-in virtualization (Sun xVM VirtualBox for VDI) or VMware Infrastructure.
- Integration with OpenSolaris and Sun Unified Storage Systems.
- Better support for VMware, allowing for larger deployments.
- Support for Active Directory.
- Users can have multiple virtual desktops and choose which one they want to access.
- Built-in support for RDP clients, meaning nearly any client device can connect directly to a Sun VDI Software server without installing any software on the client.
- Streamlined and simplified installation.

Architecture

Sun Virtual Desktop Infrastructure 3.0 (VDI) is made up of three main components layers - a virtualization platform, the Sun VDI Core, and a desktop access client.



Virtualization Platform
The basis for the architecture is the virtualization platform. In addition to creating and storing virtual machines the hypervisor provides the core functionality needed for virtual desktop management like starting, stopping, and snapshotting virtual machines. Sun VDI 3.0 supports the Sun xVM VirtualBox and VMware Virtual Infrastructure 3 virtualization platforms.

Sun VDI Core
The central component of the Sun VDI is the Sun VDI Core. The VDI Core provides all the functionality needed to build and manage large scale virtual machine deployments. In addition to its management capabilities, the VDI Core is also responsible for the brokering of virtual desktops on behalf of desktop access clients.

By integrating with Active Directory, the VDI Core is able to provide support for assignment of virtual desktops to existing users and groups within an organization. The VDI Core configuration data and runtime information is stored in a MySQL database which may be shared across multiple VDI Core instances on the network. This ensures access to the VDI Core even in failover scenarios.

Desktop Access
There are three distinct mechanisms supported for access to virtual desktops.

Sun Ray Thin Client Access - In this case, a custom Sun Ray Software Kiosk Session is initiated when a user inserts a token card into a Sun Ray thin client. This session uses the Sun VDI Core to request access to a virtual desktop on behalf of the user. Once a virtual desktop has been assigned to the user, a Remote Desktop Protocol (RDP) connection to the desktop is established for the session using the Sun Ray Windows Connector.

Secure Web Access with SGD - In this case, the browser is used to initiate a Sun Secure Global Desktop Software (SGD) session. SGD, in turn, uses the VDI Core's RDP redirection capability to establish a connection to an assigned virtual desktop.

RDP Client Access - (RDP redirection must be supported on the client side to use this mechanism). As with the previous case, the VDI Core's redirection capability is used to establish a connection to an assigned virtual desktop.

This page last changed on Jun 24, 2009 by stephanielewellen.

Contents

Getting Started - VDI Demo

The following information describes how to install and configure the VDI components (connection broker, virtualization platform, and storage) on a single host. A single host VDI setup is great for demoing and evaluation, but cannot support a large deployment.

> The VDI Demo configuration is not a supported production environment configuration. For more information about supported production environment VDI configurations, please see the Supported Configurations page.

You can also make a multi-host demo version of VDI, but you will have to refer mainly to the Installing document. In this case, the system requirements will be less strict than what this page describes, see the Supported Software tables in the Release Notes. Also refer to Supported Configurations to learn more about which hardware configurations will and will not work. When configuring the VDI Core software, make sure to choose the Evaluation configuration, see Step 6 below for more details.

Installing the Software

System Requirements

It is recommended to perform the installation on a physical machine ("bare metal"). Installing the VDI software in a virtual machine may work but is not officially supported.

The machine must meet the following requirements:

- x86 CPU
- At least 4 GB memory RAM
- At least 32 GB disk space - it is recommended to use a system with two disks so that the Solaris OS uses on one disk and the ZFS storage uses the other (see below).

Refer to the VDI 3 Release Notes for more details.

1. Install the operating system.

- You must use Solaris 10 Update 7 (64-bit) as the operating system.
- Install the operating system on the first disk.
- You should perform a default installation using either UFS or ZFS as the file system.
- We recommend adapting the default partition layout:

- All of the VDI components will be installed under `/opt` - ensure that sufficient disk space is available here.
- Swap space must be equal to or greater than the physical memory - if you have 4 GB memory, your swap space must also be 4 GB or more.
- Templates for virtual machines will be stored under `/var/tmp` - you should reserve enough disk space for storing at least one or two virtual machine images.

Refer to the Solaris documentation for more details.

2. Configure the ZFS storage.

Sun VDI 3 (in combination with VirtualBox) uses the ZFS filesystem to create snapshots of virtual machine disk images or to clone/replicate virtual machine disks. The interaction with ZFS is handled automatically and is completely encapsulated within VDI. However, initially you must setup the ZFS storage (more precisely a ZFS storage pool aka zpool).

- As previously mentioned, the second disk should be configured as ZFS storage. Simply trigger the following command as root user:

```
# zpool create VDI <name of second disk>
```

(In this case, the name of the zpool is 'VDI', but you can also use any other name in your setup. If you do not know the name of your second disk, you can look it up using the `format` or `fdisk` command.)

- ZFS uses any memory available (up to the limit) for a so-called ARC cache. This can cause issues in a demo setup, because VDI may falsely report that there is not enough memory for starting up any virtual machine. To resolve this issue, adapt the max value used for the ARC cache.
  For example, to restrict the memory to 2GB, add the following line in `/etc/system`:

```
set zfs:zfs_arc_max = 2147483648
```

- Enable the SMF service for iSCSI access (iSCSI target daemon) with the command:

```
svcadm enable svc:/system/iscsitgt:default
```

3. Install the virtualization platform.

For the demo installation we will use Sun VirtualBox as the virtualization platform.

- You must use the VirtualBox archive (`vbox_2.0.zip`) that is bundled with Sun VDI 3. This archive includes Sun VirtualBox 2.0.8 together with an installation script (`vb-install`) that automates the necessary configuration steps.
- As root user, unzip the VirtualBox archive and execute the installation:

```
# unzip vbox_2.0.zip
# cd vbox_2.0
# ./vb-install
```

The installation script installs the VirtualBox packages and starts up the VirtualBox web service. In addition, the Apache web server (bundled with Solaris 10) will be configured to act as SSL proxy for the VirtualBox web service.

4. Install the VDI Connection Broker (aka VDI Core).

- As root user, unzip the VDI archive and execute the installation:

```
# unzip vda_3.0_amd64.zip
# cd image
# ./vda-install
```

After accepting the license agreement, the installation process begins, and all VDI components are installed. These components include:

- Sun Ray Server Software
- Sun Ray Connector for Windows Operating Systems
- Sun VDI Core
- MySQL Database
- Web Administration
- Apache Tomcat
- RDP Broker
- Sun Ray Kiosk session scripts

- After successful installation reboot your machine.

```
# reboot
```

5. Apply the VDI 3 Patch 1.

- Download VDI 3 patch 1 (141482-01) from sunsolve.
- Install the patch on your system. As root user, trigger the following command:

```
# patchadd /var/spool/patch/141482-01
```

6. Configure VDI for Evaluation.

As root user execute the vda-config script and choose the "`0 Evaluation Sun VDI Host`" configuration type:

```
# /opt/SUNWvda/sbin/vda-config
```

Now you've successfully installed and configured your VDI demo! For the remaining steps, use the VDI and VirtualBox administration tools.

Creating Virtual Machine Templates

After installing the software, you should prepare a couple of virtual machines that will later be assigned to users. This is a two step process: first, create virtual machines using tools from the VirtualBox virtualization platform. Then, import the prepared virtual machines into Sun VDI. The imported virtual machines can either be assigned to users or can act as templates for cloning additional machines.

VirtualBox provides some management tools for creating new virtual machines, which were installed on your demo machine when `vb-install` was executed. If you prefer to prepare and test virtual machines on a separate machine, for example using your laptop, then you can also download a compatible VirtualBox 2.0.8 version for your preferred operating system from here.

The following steps assume that you are running the VirtualBox tool directly from your demo machine.

1. Create a new virtual machine using the VirtualBox GUI.

- As root startup the Sun VirtualBox GUI

```
# /opt/VirtualBox/VirtualBox
```

1. You can safely ignore the notification that a newer VirtualBox version is available.
2. Click New to launch the New Virtual Machine wizard.
3. The wizard will guide you through virtual machine creation.
   Be sure to choose the appropriate hard-disk and RAM space for the desired configuration (4 GB hard-disk and 384 MB RAM are recommended).
   For more information about virtual machine system requirements, refer to Chapter 3: Starting out with xVM VirtualBox in the Sun xVM VirtualBox User Manual.

2. Install an operating system in the virtual machine.

At this point you have an empty virtual machine, equivalent to a PC without an OS installed. The next step is to choose the boot medium for the OS and install it.

1. Select the newly created virtual machine and click Settings.
2. Open the Advanced tab in the Settings GUI.
3. Ensure that CD/DVD-ROM is set as the first boot device.
4. Select the CD/DVD-ROM option in the left panel of the Settings dialog.
5. Check the Mount CD/DVD Drive checkbox.
   a. Select the Host CD/DVD Drive radio button to install the OS from the CD-ROM drive.
   b. Select the ISO Image File radio button, with the appropriate path, to install the OS from a previously downloaded ISO file.
6. Click OK to save the changes and close the Settings GUI.
   At this point the new virtual machine must be started to trigger the OS installation.
7. Select the new virtual machine and click Start.
8. Follow the installation prompts, or seek further installation details from the OS manufacturer.

3. Install the VirtualBox Guest Additions.

After the OS is installed, the Sun VirtualBox Guest Additions must be installed.

1. With the virtual machine running and fully booted, click the Devices menu, then select Install Guest Additions.
   This will launch the xVM VirtualBox Guest Additions installer inside the virtual machine.
2. Install the Guest Additions according to the instructions in the wizard and reboot when asked.
3. Install all additional software for the desired virtual machine template.

If you plan to take advantage of the Windows Sysprep functionality, then you also need to install the Sysprep tool into your virtual machine. However, for a first demo setup we recommend to NOT execute the Sysprep tool, because it is hard to later detect any errors in this area. Instead, you should first become familiar with Sun VDI and then create a Sysprep-ed virtual machine in a later stage.

Please refer to Defining Virtual Machine Templates in Sun xVM VirtualBox for further details.

Manage Desktops with the VDI Web Administration

To manage desktops and users in VDI, refer to the following pages (these are also listed under Step 1 of Administering):

1. Access the Web Administration GUI.
2. Create desktop providers.
3. Create desktop pools.
4. Import virtual machine templates into the VDI Core.
5. Clone the virtual machine templates.
6. Set up a user directory.
7. Add test users to desktop pools.
8. Associate tokens to the test users.

Access a Desktop (as an End-User)

There are three VDI-compatible options for desktop access software: Sun Ray Software, Sun Secure Global Desktop Software, and Microsoft RDC Software.

Sun Ray software is automatically installed with the VDI Core installation, and is covered under the VDI demo licensing. To read more about how to adapt Sun Ray software, and access a desktop as and end-user with a Sun Ray DTU, use the following links:

- Adapting Sun Ray Software
- Accessing Desktops with a Sun Ray DTU

For desktop SGD, and MS RDC information, refer to Steps 2-3 of Administering.

Congratulations!

You should have a fully functional VDI Demo. If you have run into problems setting up VDI, please look for answers in some of the following places:

- Troubleshooting and FAQs
- The VDI Forum

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Planning the Installation

This section outlines the minimum requirements for a standard VDI 3 configuration. We recommend that you read the following pages for more information about supported software and VDI deployment options:

- Release Notes
- Supported Configurations
- Deployment Guide

System Requirements for a Standard Configuration of Sun VDI

Sun VirtualBox Virtualization Platform

The VirtualBox setup requires three VDI hosts, one VirtualBox host, and one storage host. The Sun VDI 3.0 Software is installed on the VDI hosts, and Sun VirtualBox for VDI is installed on the VirtualBox host. The storage host is used to store the virtual disks of the desktops which run on the VDI host.
You can use any x86 host (even your laptop) to create a VirtualBox virtual machine which will be used by Sun VDI as a template for the desktops. Templates must be created in VirtualBox for VDI (version 2.0.8), which is available on the VDI download page.

Requirements for two desktops with 512 MB memory and a 10 GB disk each:

Host	CPU	Memory	Disk space	System
Three VDI hosts	all x86 or all SPARC CPU	2 GB	1 GB	• Solaris 10 Update 6 (64-bit) • Solaris 10 Update 7 (64-bit)
VirtualBox host	x86 CPU	2 GB	1 GB	• Solaris 10 Update 6 (64-bit) • Solaris 10 Update 7 (64-bit)
Storage host	x86 CPU	1 GB	32 GB	• Solaris 10 Update 7 • OpenSolaris 2008.11 • OpenSolaris 2009.06 • 7000 Series 2008.Q4.2.1 (1.0.5) • 7000 Series 2008.Q4.2.0 (1.0.4)

				• 7000 Series 2008.Q4.1.1 (1.0.3) • 7000 Series 2008.Q4.1.0 (1.0.2) • 7000 Series 2009.Q2 Releases

Refer to the Deployment Guide for an in-depth discussion of hardware requirements for production deployments.

Sun VDI 3 embedded database hosts need to be of the same architecture.
Sun VDI 3 core with embedded database requires (at least) VDI hosts to be of the same architecture either all x86 or all SPARC. See the Release Notes for more details.

VMware Infrastructure Virtualization Platform

The VMware setup requires at least three VDI hosts, one VMware vCenter host, and one VMware ESX host. Most VDI deployments will probably require and additional storage host. All required VDI components (VDI Core) are installed on the VDI hosts. The VMware vCenter host and the VMware ESX host are used to maintain the virtual machines. We recommend that you set up the system from scratch to avoid problems.

Requirements for 2 desktops with 512 MB memory and a 10 GB disk each:

Host	CPU	Memory	Disk space	System
Three VDI hosts	all x86 or all SPARC CPU	2 GB	1 GB	• Solaris 10 Update 6 (64-bit) • Solaris 10 Update 7 (64-bit)
VMware vCenter host	x86 CPU	2 GB	1 GB	• VMware VirtualCenter 2.5 (Update 1, 2, 3, 4) supported hosts
VMware ESX host	x86 CPU	2 GB	32 GB	• VMware ESX Server 3.5 (Update 1, 2, 3, 4) • VMware vSphere (ESX 4.0)

The required number of VDI hosts and ESX hosts as well as their CPU and memory complement vary with the number of virtual machines you want to support. For further information on sizing and an exact list of compatible ESX hosts refer to the sizing documentation and the hardware compatibility lists at www.vmware.com.

Sun VDI 3 embedded database hosts need to be of the same architecture.
Sun VDI 3 core with embedded database requires (at least) VDI hosts to be of the same architecture either all x86 or all SPARC. See the Release Notes for more details.

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Contents

Release Notes

These notes contain important information about the Sun VDI Core at the time of revenue release, including requirements and supported platforms as well as issues and workarounds. Be sure to read this document before you begin using Sun VDI 3.

Package Software

The VDI 3.0 software package includes the following components:

- Sun Virtual Desktop Infrastructure Software 3.0, including
    - Sun VDI Core
    - Sun Ray Server Software 4.1 (SRSS)
    - Sun Ray Connector for Windows OS, Version 2.1 (SRWC)
- Sun VirtualBox for VDI 3.0 (Solaris 10 x86 only)

- Additional software
    - Sun Secure Global Desktop 4.41 (SGD)
    - Sun VirtualBox for VDI 3.0 (additional platforms for creating desktop templates)

Patches

The first patch for VDI 3 was released on May 30. The patch addresses many of the bugs listed below - for more details see: VDI Patches.

Third-Party Software

Sun VDI 3 includes software originating from third parties that is subject to GPL/LGPL, or CDDL licenses. The corresponding source code is available via the links below:

- TopLink Essentials (licensed under CDDL) is a persistence API used by Sun VDI core.
  The library source code is available at: http://download.java.net/javaee5/v2ur2/promoted/source/glassfish-v2ur2-b04-src.zip
- Sun xVM VirtualBox for VDI contains modified GPL code.
  The source code is available at: http://download.virtualbox.org/virtualbox/2.0.8/VirtualBox-2.0.8-OSE.tar.bz2

Supported Software

This section includes support tables for VDI Core host operating systems, virtualization platforms, storage servers, desktop guest systems, and Java Runtime Environments. For more about VDI Support, see Supported Configurations.

VDI Core Host Operating Systems

VDI Host OS	Supported in VDI 3
Solaris 10 Update 6 SPARC and x86 (64-bit)	X
Solaris 10 Update 7 SPARC and x86 (64-bit)	X

Virtualization Platforms

Virtualization Software	Supported in VDI 3	VirtualBox Virtualization Platforms	VMware Infrastructure Virtualization Platforms	Not Supported
Sun VirtualBox for VDI (VirtualBox 2.0.8)	X	X		
All other VirtualBox Versions				X
VMware VirtualCenter 2.5 (Update 1, 2, 3, 4)	X		X	
VMware ESX server 3.5 (Update 1, 2, 3, 4)	X		X	
VMware vSphere (ESX server 4.0)	X		X	

Storage Servers

Storage Software	Supported in VDI 3	VirtualBox Virtualization Platforms	VMware Infrastructure Virtualization Platforms	Not Supported
Solaris 10 Update 7	X	X	X	

OpenSolaris 2008.11	X	X	X	
OpenSolaris 2009.06	X	X	X	
Sun Unified Storage Series 7000: • 2008.Q4.2.1 (1.0.5) • 2008.Q4.2.0 (1.0.4) • 2008.Q4.1.1 (1.0.3) • 2008.Q4.1.0 (1.0.2) • 2009.Q2	X	X	X	

Desktop Guest Systems

Desktop OS	Supported in VDI 3	VirtualBox Virtualization Platforms	VMware Infrastructure Virtualization Platforms	Not Supported
Windows XP SP2 and higher	X	X	X	
Windows Vista Enterprise	X	X	X	
Windows 2000	X	X		
Ubuntu 8.10	X	X		
OpenSolaris 2008.11	X	X		

Known Issues and Limitations

Solaris hosts must have adequate swap space. (Bug ID 1225025)

Solaris hosts running xVM VirtualBox must have swap space equal to, or greater than the host's physical memory size. For example, 16GB physical memory would require at least 16GB swap. This can be configured during a Solaris 10 install by choosing a 'custom install' and changing the default partitions.
For existing Solaris 10 installs you will need to create a swap image file on the local filesystem and mount it. The swap file image size should be: Physical Memory - Current Swap = Additional Swap Required. For example, 16GB physical memory - 1GB = 15GB of additional swap required. To add the swap to your system:
For ZFS:

```
# zfs create -V 16gb _<ZFS volume>_/swap
# swap -a /dev/zvol/dsk/_<ZFS volume>_/swap
```

To have the swap mounted after a reboot, add the following line to `/etc/vfstab`:

```
/dev/zvol/dsk/_<ZFS volume>_/swap - - swap - no -
```

For UFS:

```
# mkfile 15g /path/to/swap.img
# swap -a /path/to/swap.img
```

To have the swap mounted after a reboot, add the following line to `/etc/vfstab`:

```
/path/to/swap.img - - swap - no -
```

Memory for ARC cache should be restricted to a lower limit when using ZFS on S10u7. (Bug ID 6844780)

When all VDI components (VDI host, xVM VirtualBox host, and ZFS storage) are installed on a single box (x86 platform, running S10u7), xVM VirtualBox will not be able to start any desktops.
Cause - ZFS uses any memory available (up to the limit) for an ARC cache. If other programs try to access the memory, ZFS should release it. Unfortunately, VDI evaluates the memory before trying to start a virtual machine and recognizes that not enough memory is available to start the virtual machine. Full details are available here http://www.solarisinternals.com/wiki/index.php/ZFS_Evil_Tuning_Guide#ARCSIZE.

Solution - The memory for the ARC cache can be limited to a max value by adding an entry in /etc/systems file.
For example, to restrict the memory to 2GB, in `/etc/system` add:

```
set zfs:zfs_arc_max = 2147483648
```

It has been verified that keeping this value to as low as 512MB and importing a file of 2.7G will work as desired.

Desktops cannot use 'Host Networking' unless xVM VirtualBox has been configured to run as root. (Bug ID 6839450)

Virtual machines cannot be started with host networking unless the xVM VirtualBox web service runs as root.

During log-off, xVM VirtualBox desktops do not go into idle state when settings are 'Host Networking - WinRDP'. (Bug ID 6837283)

Desktop never go to the idle state and remain in used state forever and hence do not get recycled.

VDI Host Overload (Bug ID 6810444)

In case you see a blank page when login in to the administration ui it's likely that database problems are the root cause.
You may for instance see "Error 157" in the database log files in '/var/opt/SUNWvda/mysql-cluster' of the primary or one of your secondary hosts.
Cause- When using the VDI MySQL Cluster database, the first two VDI secondary hosts run the MySQL Cluster data nodes in addition to a MySQL SQL node, SRSS, SRWC, VDI, etc. MySQL Cluster is sensitive to resource shortages. The expected load to the MySQL Cluster data nodes is small, so the MySQL processes should be able to cope under typical loading. However, if you have too many Sun Ray sessions on each of the first two Sun Ray secondaries, you may see this error.
Solution- Check the load on the concerned hosts and if it is high, reduce the load on this host e.g. by reducing the number of SRSS sessions hosted. Restart the SQL node running on the concerned host

Using the VDI CLI in parallel with the Admin Web GUI. (Bug ID 6770476)

Using the vda CLI to modify some data, while having an Admin Web UI session running, might generate errors in the Web Admin UI and log you out. At following login, the Web Admin UI will be working fine again.

Limitations with VDI hosts running on SPARC. (Bug ID 6812848)

- Only one storage is supported with Solaris SPARC VDI hosts.
- The 'duplicate' action fails with Solaris SPARC VDI hosts.

Cause- Sun VDI 3.0 does not support copying one iSCSI volume to another iSCSI volume via Java in Solaris SPARC VDI hosts.

Sun Open Storage fails after a software update. (Bug ID 6826006)

- Do not update the software of a Sun Open Storage after it has been added to VDI 3.0. Any management action of VDI 3.0 fails afterwards.

OpenSolaris Update causes SSH to the storage box to fail. (Bug ID 6812829)

After doing a 'pkg image-update' on an OpenSolaris host used for xVM VirtualBox storage, VDI can no longer SSH to the box. The following error is seen:

```
Caused by: com.jcraft.jsch.JSchException: Algorithm negotiation fail
        at com.jcraft.jsch.Session.receive_kexinit(Session.java:510)
        at com.jcraft.jsch.Session.connect(Session.java:285)
        at com.sun.vda.service.vbox.SshServer.executeCommand(SshServer.java:331)
        ... 40 more
```

Normal SSH via the command line continues to work fine.
Cause- Changes have been made to how the sshd negotiates the ciphers between version 101b and 108 of OSOL.
Solution- We require the customer to use the release version of OSOL 2008.11 (101b). Any upgrades are not supported and need to get clearance from us first.
A fix in this particular case is to activate the 'Ciphers' line in `/etc/ssh/sshd_config` and to restart the ssh service.

vb-install script fails to install xVM VirtualBox package. (Bug ID 6814023)

If you uninstall xVM VirtualBox and want to reinstall it, the installation may fail.
Cause- Some xVM VirtualBox processes may still remain even after removal.
Solution- Reboot the xVM VirtualBox host to kill any remaining processes.

Cloned virtual machines have lower resolution than the xVM VirtualBox virtual machine templates. (Bug ID 6815380)

The cloned VM has a blurry desktop image because it has a lower (8-bit) resolution compared to the original (32-bit) virtual machine.

Migrating large numbers of pools from VDI 2.0 to 3.0 fails. (Bug ID 6819562)

Sometimes when migrating two or more pools from VDI 2.0 to VDI 3.0 the first pool will succeed and the next ones will fail.
Cause- A misconfiguration in the vda-migrate tool.
Solution- It is recommended not to migrate several pools simultaneously from VDI 2.0 to VDI 3.0 (a patch for this issue will be available soon).

Importing VDI 2.0 data into VDI 3.0 fails if pool's recycle policy is 'Destroy'. (Bug ID 6818383)

Cause- The "Recycling Policy" value 'destroy' in VDI 2.0 became 'delete' for VDI 3.0.
Solution- Edit the exported text properties file ('migrate_svdc_1.?'). It should be located in the directory which was used to export previous Sun VDI data. Find all the lines which end with "pool.recyclepolicy=Destroy" and modify them to "pool.recyclepolicy=Delete".

Reporting Problems and Providing Feedback

To report a bug in the software, please send an email to the VDI Team

If you are reporting a bug, please provide the following information where applicable:

- Description of the problem, including the situation, where the problem occurs, and its impact on your operation.
- Machine type, operating system version, browser type and version, locale and product version, including any patches you have applied, and other software that might be affecting the problem.
- Detailed steps on the method you have used, to reproduce the problem.
- Any error logs or core dumps.

Further Information

You may also be interested in these related release notes:

- Sun Ray Server Software 4.1 Release Notes - http://docs.sun.com/app/docs/doc/820-3774
- Sun Ray Windows Connector 2.1 Release Notes - http://docs.sun.com/app/docs/doc/820-3777
- Sun Secure Global Desktop 4.41 Release Notes - http://docs.sun.com/app/docs/doc/820-4905
- Sun xVM VirtualBox 2.0.8 for VDI - http://download.virtualbox.org/virtualbox/vboxvdi3download.html

This page last changed on Jun 08, 2009 by phanieellentest.

VDI Patches

The information below provides an overview of the patching available for all VDI versions. Use the links from the patch ID numbers to access the official patch documentation on SunSolve.

VDI Patch Strategy

- Patches for the VDI Core will be released as patches for the VDI 3 product.
- Patches for included Sun Ray technology will be released as the part of the Sun Ray product.
  In general it is recommended to run on the latest patch level, even though it might not be important to VDI 3. The most recent patch was announced here.
- Changes to VirtualBox will NOT be delivered as patches.
  If bug fixes are required, a new minor version of VirtualBox qualified for VDI 3 will be released. As a result, VirtualBox must be reinstalled on the virtualization host.
- Changes to the storage platform are not driven or controlled by the VDI team.
  Therefore the VDI team needs to qualify a new firmware for the Unified Storage systems as well as updates to OpenSolaris. The VDI team will announce which future versions are supported or by when. So, be a bit careful in this area.

VDI 3 Patch 1

The first patch for VDI 3 was released on May 30. The patch is available for both x86 and SPARC platforms:

- x86 - 141482-01
- SPARC - 141481-01

The patch includes the following features:

- S10 U7 support - Allows you to build a demo/POC on a single box including VirtualBox and storage.
- VMware vSphere 4 support - VDI 3 runs against VMware vCenter 4
- Support of the latest Unified Storage firmware
- Performance improvements in the Admin GUI

The patch corrects the following bugs listed in the Release Notes:

1. Limitations with VDI hosts running on SPARC. (Bug ID 6812848)
2. Sun Open Storage fails after a software update. (Bug ID 6826006)
3. OpenSolaris Update causes SSH to the storage box to fail. (Bug ID 6812829)
4. Migrating large numbers of pools from VDI 2.0 to 3.0 fails. (Bug ID 6819562)
5. Importing VDI 2.0 data into VDI 3.0 fails if pool's recycle policy is 'Destroy'. (Bug ID 6818383)

VDI 2 Patch 1 (Revision 5)

The fifth revision of VDI 2 Patch 1 was released on April 29. The patch is available for the following packages:

- Linux packages - 127561-05
- Solaris 10 packages on x86 - 127560-05
- Solaris 10 packages on SPARC - 127559-05
- Windows packages - 138482-05

This page last changed on Jun 18, 2009 by stephanielewellen.

Contents

Supported Configurations

The following information outlines the supported and unsupported configurations for a Sun VDI 3 deployment in a production environment. For more information about supported software versions, please refer to the Release Notes.

Supported Configurations for Sun Virtualbox Virtualization Platforms

Configuration Type	Minimum No. of Machines
Standard VirtualBox Configuration	5
All on One Host	1
VirtualBox on Primary Host	4

Supported Configurations for VMware Infrastructure Virtualization Platforms

Configuration Type	Minimum No. of Machines
Standard VMware Configuration	6
Primary Host Virtualized	5

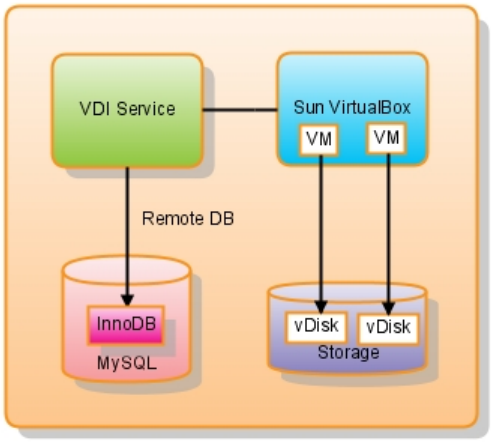
Sun VDI Support Information

- Some VDI configurations are Explicitly Unsupported Configurations.
- In order to download the VDI 3 Patches, you must have (at minimum) a Sun Basic Service support plan. For more information about Sun Service support plans, see the Sun Services site.
- VMware software is not included as part of the Sun VDI Software 3 package, therefore a Sun Support contract will not cover VMware-related issues. For VMware coverage, you will need an additional support plan. For more information about Sun Service plans for VMware, see the Sun Services for VMware site.

All on One Host

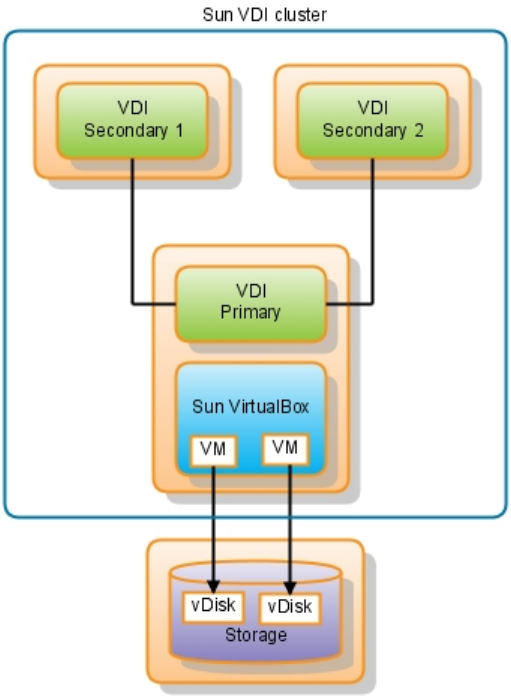
In the All on One Host configuration, everything (VDI connection broker, VirtualBox virtualization platform, and storage) run on one physical host. Please note that the requirement for this deployment option is to run Solaris 10 Update 7 on this host. Concerning the database, you would have a locally installed MySQL Server (with an InnoDB engine) and connect to it selecting the remote database option during VDI 3 configuration. This kind of deployment offers zero redundancy, meaning it is one big Single Point of Failure.

The VDI support contracts only cover a VDI configuration with an embedded MySQL database. The All on One Host configuration uses a locally installed MySQL database with a InnoDB engine, which must be configured as a remote database. Therefore, if you want support service for the database component of the All on One Host configuration, you must purchase an additional MySQL service contract. For more information, see the MySQL Support page.



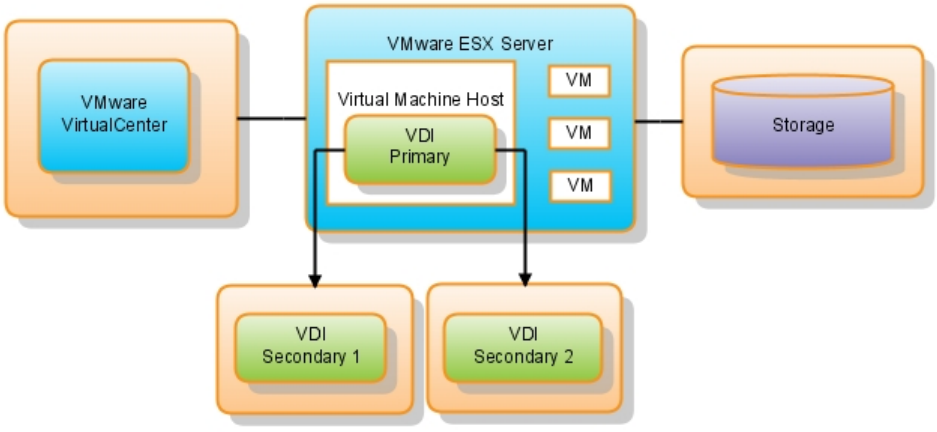
VirtualBox on Primary Host

In the VirtualBox on Primary Host configuration, the Sun VDI 3 Primary node and one of your VirtualBox hosts share one physical machine. Make sure the shared host has enough capacity to deal with these two roles at the same time. For more information about sizing VirtualBox configurations, see the Deployment Guide.



Primary Host Virtualized

In the Primary Host Virtualized configuration, the Sun VDI 3 Primary node runs in a virtual machine hosted by a VMware Infrastructure virtualization platform. Running the MySQL Cluster completely in a virtualized environment is not supported. Given the fact that the MySQL Cluster management node (or Primary node) requires only little resources, the MySQL team has agreed that it is an acceptable and supported scenario to run it in a virtual machine. The two VDI 3 Secondary hosts running the MySQL Cluster data nodes nevertheless need to run on bare metal.



Explicitly Unsupported Configurations

- Virtualized VDI Core
  In a Virtualized VDI Core configuration, the Sun VDI 3 Primary and two Secondary nodes could be hosted in virtual machines--this may work for some deployments, but it is explicitly unsupported! Sun VDI 3 core with embedded database provides High-Availability out of the box, which requires network and I/O response times that cannot be guaranteed in virtualized environments. Customers who rely on a fully virtualized environment will need to use a configuration utilizing an external database. However, there is one exception for the Primary VDI Core node. This node can be virtualized with the embedded database, as long as it is not used for delivering sessions to users. For more information about virtualizing the MySQL database, see the MySQL FAQs.

- Mixed Endian Cluster Nodes
  In a Mixed Endian Cluster Nodes configuration, the Sun VDI 3 Primary and two Secondary nodes could be hosted on machines with dissimilar CPU types (a mix or x86 and SPARC). For a Sun VDI 3 Core with embedded database, the management node (Primary VDI node) and first two data nodes (Secondary VDI nodes) used in the cluster must have the same architecture (all x86 or all SPARC). That is, all machines hosting nodes must be either big-endian or little-endian, and you cannot use a mixture of both. Any additional nodes added (since they are just MySQL client nodes and not part of the data cluster) can be either architecture. For more information about mixed Endian MySQL nodes, see the MySQL Limitations.

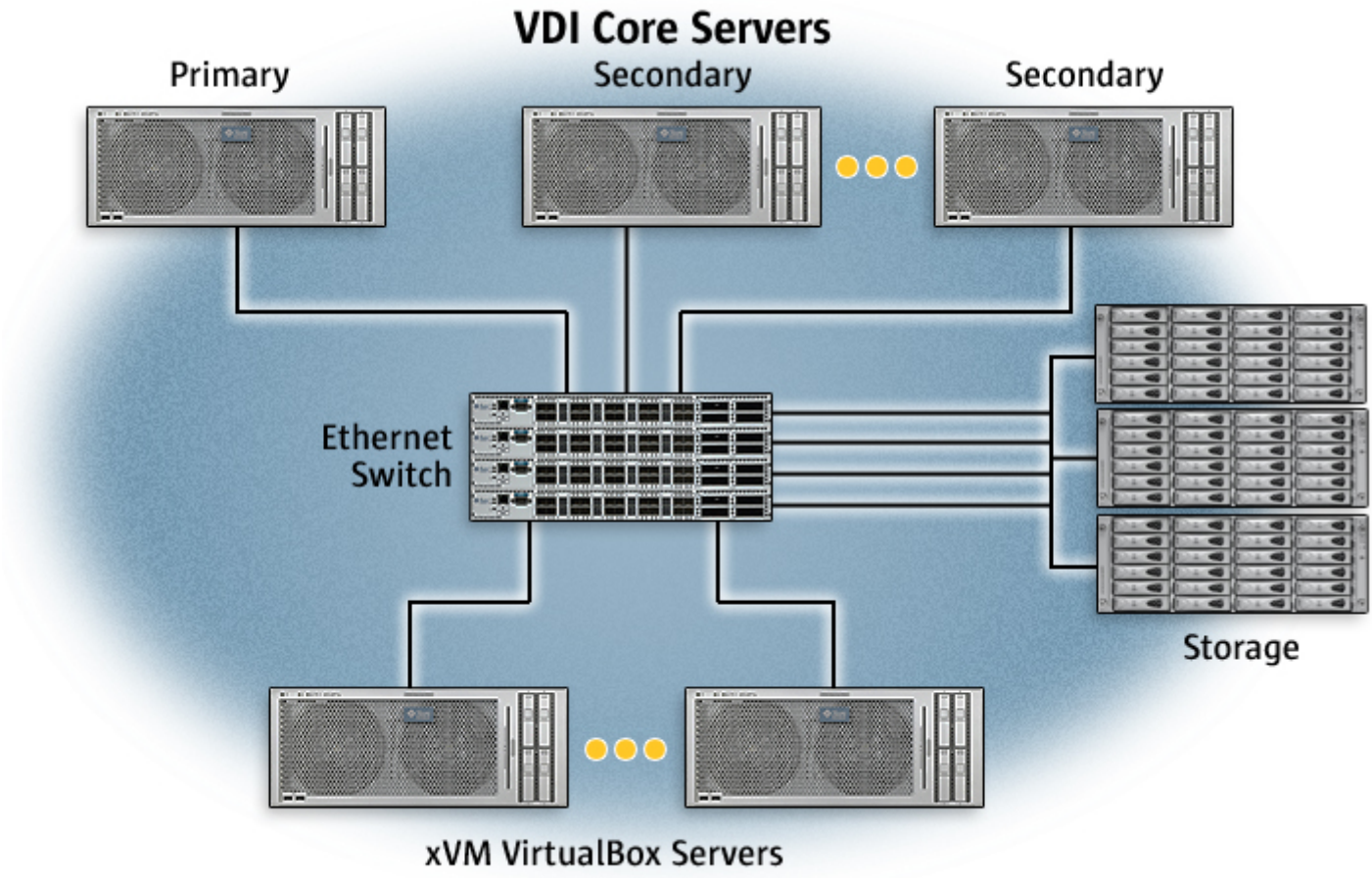
- VDI Demo
  The VDI Demo configuration cannot be supported as a production environment VDI deployment, because the embedded database configuration does not comply with MySQL standards. We do, however, encourage customers to try VDI Demo configuration to evaluate the new features before committing to a larger deployment. See the Getting Started - VDI Demo page for step-by-step information about installing and configuring a Demo setup. If you run into any problems, you can always consult the VDI Forum or check the Troubleshooting and FAQs.

This page last changed on Apr 28, 2009 by stephanielewellen.

Deployment Guide

This chapter provides guidelines for the design of the hardware architecture for VDI 3 deployments with VirtualBox. The information provided here is derived from a sizing test with 1000 desktops which were running a script to simulate an office workload (for closer details see the 'Appendix' chapter). The workload is different for every single installation and relatively small changes in the usage patterns can have noticeable effects on the hardware requirements. Therefore it is a good practice to size every deployment individually. This guide provides cornerstones for such efforts.

The hardware environment for a VDI 3 deployment typically looks like this:



Every (production) deployment consists of one primary VDI core server and at least two secondary VDI core servers to provide redundancy. The VDI core servers host a clustered MySQL database for the VDI data (optional remote databases are supported), route information between clients and desktops, and provide the broker functionality which delivers the desktops to the clients. The VirtualBox servers run the virtual machines which provide the desktops. The storage(s) provide the virtual disks which are interpreted as physical disks by the operating systems running within the virtual machines. The iSCSI protocol is used to transfer the disk data between the VirtualBox servers and the storages. That iSCSI data creates a major part of the total network traffic of a VDI system (for a closer discussion see the 'Storage' chapter).

Other consumers of network bandwidth worth mentioning are the clients of VDI 3 (Sun Rays, RDP clients and the Sun Secure Global Desktop). The clients connect to the VirtualBox servers via the VDI core servers. In case of a Sun Ray client, which uses the ALP protocol to transfer the desktop graphics, the VDI core servers convert the RDP protocol received by the VirtualBox servers to the ALP protocol. So there is one data stream for each client connection between the client, the VDI core server and the VirtualBox server. RDP clients, like the windows connector (uttsc), connect to the VDI core server

which in turn uses the 'RDP redirect' feature to instruct the clients to connect to the VirtualBox servers directly as there is no need to translate the RDP protocol. In this case there is a data stream between the soft client and the VirtualBox server.

The texts behind the bold terms are rules of thumb for calculating the according resource requirements.

VDI Core Servers

The primary VDI core server requires a dual-core CPU and 2 GB of memory. As long as the VDI services are not configured on that server (which is not recommended) these hardware requirements do not change with the number of running desktops.

The secondary VDI core server requirements for the number of cores and memory size varies with the number of running desktops supported, as well as the required network bandwidth. The bandwidth also varies with the content displayed. The numbers given below are typical for office work. Displaying videos or web pages with flash content can multiply the required bandwidth.

Number of cores = number of running desktops / 20

Example: Two secondary VDI core servers with 8 CPUs and 4 cores per CPU can serve 2 * 8 * 4 * 20 = 1280 running desktops

Memory size [MB] = number of desktops * 110 MB + 2048 MB

Example: Two secondary VDI core servers with 64 GB of memory can serve (2 * 64 * 1024 MB - 2 * 2048 MB) / 110 MB = 1154 running desktops

Network bandwidth [Mb/s] = number of running desktops * 0.15 [Mb/s]

Example: One secondary VDI core server with one 1 Gb Ethernet interface can serve 1024 / 0.15 Mb/s = 6827 running desktops

Please refer also to the Complete Sun Ray Server Sizing Guide

VirtualBox Servers

VDI 3 supports any server running Solaris 10u6 to host VirtualBox.

Number of cores = number of running desktops / 4

Example: A server with 8 CPUs and 4 cores per CPU can support up to 8 * 4 * 4 = 128 running desktops

Memory size [MB] = number of running desktops * memory size of a desktop * 1.2 + 1024 MB

Example: A server with 64 GB of memory can support 64 * 1024 MB - 1024 MB / (512 MB * 1.2) = 105 running desktops of 512 MB in size

A rule of thumb for VirtualBox servers is: "A server with 32 cores and 64 GB of memory supports 100 desktops." While the CPU power of the server chosen for the examples above allows to support 128 desktops it is not advisable to increase the memory size to do so. At least 20% of the available CPU power should be available as security margin.

Network bandwidth [Mb/s] = storage network bandwidth / number of VirtualBox servers

For a closer discussion of the network bandwidth see the chapter 'Storage'.

100+ VMs: If you want to run more than 100 VMs on a single VirtualBox server you need to increase the SYSV semaphores on the VirtualBox server. You need to set the number of available semaphores to the number of VMs you intend to run including a security margin for other processes. To set the SYSV semaphores for 1000 VMs type as root:

```
prctl -r -n project.max-sem-ids -v 1024
projmod -s -K "project.max-sem-ids=(priv,1024,deny)" user.root
```

The first line changes the available semaphores for the current process, the second line makes this a permanent system setting for the 'root' user. If the VBoxSVC process is run by another user add a user.myuser line to the /etc/project file and change the second line accordingly.

The maximum number of virtual machines on a single VirtualBox server is 1023.

Storage

VDI 3 supports any Sun Storage 7000 Unified Storage System and any server running the OpenSolaris 2008.11 operating system.

The recommended disk layout is RAID 10 (mirrored sets in a striped set; ZFS stripes the data automatically between multiple sets). It is called 'Mirrored' by the 7000 series. While this disk layout uses 50% of the available disk capacity for redundancy it is faster than RAID 5 for intense small random read/writes which is the typical access characteristic for iSCSI.

The storages provide the virtual disks which are accessed by VirtualBox via iSCSI. iSCSI is a CPU-intensive protocol therefore the number of cores of the storage are a decisive factor for its performance which makes the x7410 the best-suited solution for heavy-duty installations as it can be equipped with up to 16 cores. Other important factors are the memory size (cache), the number of disks and the available network bandwidth.

The network bandwidth is very volatile and determined by the relation of desktops starting up (peak network bandwidth) and desktops that have cached the application(s) in use (avarage network bandwidth). Starting a VM creates a network load of 150 MB which needs to be satisfied in ~30 seconds. If many desktops are started at the same point in time the requested network bandwidth may exceed 1 Gb/s (if the CPUs of the storage can handle the load created by the iSCSI traffic). This senario is typical for shift-work companies. In such a case it is recommended to set the "Pool / Cloning / Machine State" option to "Running" which keeps the desktops always running and therefore decouples the OS boot from the login of a user. Another option is to trunk several interfaces as a cheap way to provide more than 1 Gb/s bandwidth via one IP. It is also possible to use Jumbo Frames to speedup iSCSI connections. Jumbo Frames need to be configured for all participants of the network (storages, VirtualBox servers and switches) and it is important to note that Jumbo Frames are not standardized so there is a risk of incompatibilities.

Typically there is no shortage of disk space. VDI 3 in combination with VirtualBox uses the 'sparse' volume feature of ZFS which allows to allocate more space for volumes than physically available as long as the actual data written does not exceed the capacity of the storage. This feature in combination with the fact that cloned desktops reuse unchanged data of their templates results in a very effective usage of the available disk space. In this light the calculation for disk space below is a worst-case scenario assuming that all volumes are completely used by data which differs from the template.

Number of cores = number of virtual disks in use / 200

Example: A x7210 storage with 2 CPUs and 4 cores per CPU can serve up to 2 * 4 * 200 = 1600 virtual disks

Memory size. The more the better as the free memory can be used as disk cache which reduces the access time

Average Network bandwidth [Mb/s] = number of virtual disks in use * 0.032 Mb/s

Example: A x7210 storage with one Gigabit Ethernet interface can serve up to 1000 / 0.032 = 31250 virtual disks

Peak Network bandwidth [Mb/s] = number of virtual disks in use * 40 Mb/s

Example: A x7210 storage with one Gigabit Ethernet interface can serve up to 1000 / 40 = 25 virtual disks

Disk space [GB] = number of desktops * size of the virtual disk [GB]

Example: A x7210 storage with a capacity of 46 TB can support 46 * 1024 GB / 2 / 8 GB = 2944 8 GB disks in a RAID 10 configuration

Helpful Hints

- The graphic performance of desktops is better without background images.
- Avoid processes which generate constant or, even worse, burst disk I/O, as for example the indexing service of MS Windows or virus scanners with a scheduled scan every Friday at 9 pm.

Appendix

The script used during the sizing tests starts a sequence of applications generating a workload which is aligned with the 'heavy worker' workload as defined in VMware's 'VDI server sizing and scaling':

1. Start PowerPoint. Load a massive presentation and browse the slides. Close PowerPoint.
2. Start Internet Explorer. Browse three different Web pages. Close Internet Explorer.
3. Start Command Prompt. Do a directory listing.
4. Start PowerPoint. Load a massive presentation and browse the slides. Close PowerPoint.
5. Start Excel. Open an Excel sheet. Close Excel.
6. Start PowerPoint. Load a massive presentation and browse the slides. Close PowerPoint.
7. Start Word. Type a small document. Close Word.

This page last changed on Jun 17, 2009 by thomaspfohe.

Installing

1. Review the System Requirements

Check the VDI System Requirements to determine what equipment you will need.

2. Obtain the Sun VDI Software

To download a copy of the Sun VDI software, go to sun.com.

To download VDI 3 Patch 1:

- x86 platforms
- SPARC platforms

3. Set Up a Virtualization Platform

VDI 3 enables you to set up one or more virtualization platforms. You can set up xVM VirtualBox or VMware Infrastructure platforms (or both).

Sun xVM VirtualBox	VMware Infrastructure

1. Set Up a Storage Server
  • How to Set Up a Solaris Storage Server
  • How to Set Up an OpenSolaris Storage Server
  • How to Set Up a Sun Storage 7000 Unified Storage System
2. Set Up a Sun xVM VirtualBox Server
3. Define Virtual Machine Templates
	1. Set Up a VMware ESX Server
	2. Set Up a VMware vCenter Server
	3. Define Virtual Machine Templates
	4. Test the VMware Infrastructure Setup

4. Install and Configure the VDI Core

The VDI Core is the central management layer between the virtualization platform and the desktop access clients.

1. Install the VDI Core
2. Configure the VDI Core
   - How to Configure Sun VDI for an Evaluation Environment
   - How to Configure Sun VDI for a Production Environment
   - How to Configure a Remote MySQL Database
   - Reconfiguring the VDI MySQL Cluster
     - How to do a Rolling Restart of Your MySQL Cluster
     - How to Prevent Unrestricted SQL Node Joins
     - MySQL Cluster Reconfiguration Scenarios
   - Backing Up the VDI Configuration
   - VDI Default Configuration

Optional Tasks

- Patch VDI 3
- Check VDA Services
  - How to Check the Core Service
  - How to Check the Database Service
  - How to Check the Admin GUI Service
  - How to Check the RDP Broker Service
- Upgrade from VDI 2 to VDI 3

- Remove the VDI Core

This page last changed on Apr 03, 2009 by stephanielewellen.

Testing the VMware Infrastructure Setup

It is highly recommended to test the configuration made so far, before setting up the remaining Sun VDI components. A quick manual test consists of cloning a virtual machine using the desired template and customization specification followed by a remote access to the cloned virtual machine via RDP:

Steps

1. Open the Virtual Infrastructure Client.
2. Right-click on the desired template and select Deploy Virtual Machine from this Template.
   a. The wizard will ask you to specify a name for the new VM - select the desired host/cluster and datastore with sufficient free space.
   b. On the Guest Customization step, select the Customize Using an Existing Customization Specification option, then choose the customization specification you just created from the list.
   c. Review your selections, and click Finish to begin cloning.
3. After the cloning has finished, select the new virtual machine and power it on.
   After some time you should see its IP address and hostname appear in the Virtual Infrastructure Client. Make sure that it has a unique IP address and that the hostname corresponds to the virtual machine name.
4. On the VMware vCenter server, open a Remote Desktop Connection by clicking Start > All Programs > Accessories > Communications > Remote Desktop Connection.
   a. In the Remote Desktop Connection window, enter the IP address of the newly cloned virtual machine, and click Connect.
   b. If everything is configured correctly, a full-screen remote desktop session to your virtual machine should be displayed.

	⬅ Previous Page Defining Virtual Machine Templates in VMware vCenter		Up One Page Level ⬆ Installing		

This page last changed on Jun 08, 2009 by stephanielewellen.

Installing the VDI Core

The VDI Core can be installed on an x86 or SPARC platform running Solaris 10 Update 6 (64-bit). It is important to note that when you are choosing to use the embedded MySQL Cluster database all of your hosts need to be of the same architecture either x86 or SPARC. If you have an xVM VirtualBox virtualization platform, the VDI Core and xVM VirtualBox may share the same host.

Steps

1. Become root user:

```
$ su
```

2. Unzip the VDI archive on the VDI server:

```
# unzip vda_3.0_amd64.zip
```

   or

```
# unzip vda_3.0_sparc.zip
```

3. Go to the image directory:

```
# cd image
```

4. Execute the installation.
   The files will be installed to `/opt/SUNWvda/`.

```
# ./vda-install
```

   The installation script displays the text of the Sun Software License Agreement and prompts you to accept its terms and conditions. After the license confirmation, the installation process begins, and all VDI components are installed. These components include:

   - Sun Ray Server Software
   - Sun Ray Connector for Windows Operating Systems
   - Sun VDI Core
   - MySQL Database
   - Web Administration
   - Apache Tomcat
   - RDP Broker
   - Sun Ray Client

   On completion, the installation script will indicate the path of the installation log file. All installation log files are stored in the directory `/var/sadm/install/logs`.
5. Reboot the VDI server:

```
# reboot
```


			Up One Page Level Installing		Next Page Configuring the VDI Core

This page last changed on Jun 17, 2009 by stephanielewellen.

Configuring the VDI Core

Configuring the VDI Core for a Production Environment provides high availability and the required level of performance for medium to bigger deployments. For the Production Setup a minimum of three VDI hosts is required in order to guarantee high-availability: a Primary host, and two Secondary hosts.

- How to Configure Sun VDI for a Production Environment
- How to Configure a Remote MySQL Database

Additional VDI Configuration Options

If you have an expert understanding of MySQL and would like to reconfigure or back up the VDI MySQL Cluster, please refer to the following sections:

- Reconfiguring the VDI MySQL Cluster (Optional)
- Backing Up the VDI Configuration (Optional)

	⬅ Previous Page Installing the VDI Core		Up One Page Level ⬆ Installing		Next Page ➡ Checking VDA Services

This page last changed on Apr 03, 2009 by stephanielewellen.

How to Configure Sun VDI for an Evaluation Environment

It is only recommended to use the Evaluation Setup for demo and showcase setups.

Steps

1. Go to the installation directory:

```
cd /opt/SUNWvda/sbin
```

2. Execute the configuration script:

```
./vda-config
```

3. Choose the **`0 Evaluation Sun VDI Host`** configuration type.

At the end of the configuration script you will be given a path of the configuration log file. Or, on Solaris platforms, you can find it at `/var/adm/log/vda-config.`<date and time>`.log`

For the evaluation setup no password will be set for the MySQL database.
To set a password use the following script: `/opt/SUNWvda/mysql/bin/mysqladmin --defaults-file=/etc/opt/SUNWvda/my.cnf password` <new password>.

			Up One Page Level Configuring the VDI Core		Next Page How to Configure Sun VDI for a Production Environment

This page last changed on Jun 17, 2009 by stephanielewellen.

How to Configure Sun VDI for a Production Environment

To configure VDI 3 for a production environment, you need to set up a minimum of one physical Primary Host and two physical Secondary Hosts.

Before you Begin

If your VDI installation will consist of more than 20 secondary hosts, add more [MYSQLD] sections to the end of the file '/etc/opt/SUNWvda/config.clustered.ini'.

Steps

1. Configure the Primary Sun VDI Host.
   a. Go to the installation directory:

```
cd /opt/SUNWvda/sbin
```

   b. Execute the configuration script:

```
./vda-config
```

   Read VDI Default Configuration for more information about the configuration script.
   c. Choose the `1 Primary Sun VDI Host` configuration type.
   d. Specify an administrator password.
   This is the password that will be used to secure the MySQL database.
   e. Specify a cluster signature.
   This password will be used to encrypt messages that will be exchanged among the Sun Ray hosts forming a Fail-Over-Group (FOG). This password must be the same on all hosts that will be added to the multi-host group. It needs to be at least 8 characters long.
   f. Choose whether to use the MySQL Cluster database bundled with VDI 3.0 or connect to a remote MySQL database.
      - If you choose to use the MySQL Cluster, you must specify the DNS names of your first two secondary hosts, which will also run the MySQL Cluster data nodes.
      - If you choose to connect to a remote MySQL database, the remote database must be MySQL 5.0 or higher with InnoDB or MySQL Cluster 6.2.15 or higher.
      On completion, the configuration script will indicate the path to the configuration log file. This will be `/var/adm/log/vda-config.<date and time>.log`.

      The configured primary host cannot host Sun Ray sessions nor run the VDI Service. It just serves as a primary in the Sun Ray FOG and as the management node of the MySQL Cluster database if the VDI MySQL Cluster database option has been chosen during configuration. In order to turn it into a fully-fledged VDI host (which is not recommended) you would have to run vda-config a second time after the first two secondaries have been configured.

2. Configure the Secondary Sun VDI Hosts.

   Always wait until the configuration of one Secondary host has completed before configuring the next one.
   You may spoil the MySQL Cluster otherwise.

3. Go to the installation directory:

```
cd /opt/SUNWvda/sbin
```

4. Execute the configuration script:

```
./vda-config
```

   a. Select the `2 Secondary Sun VDI Host` configuration type and specify an administrator password.
   b. Specify a cluster signature.
      Must be the same as for the primary host.
   c. Specify the maximum number of users to be hosted.
   d. Specify the user ID range start.
      This information is useful to avoid user ID conflicts and to comply with company regulations regarding user IDs.
   e. Enter the DNS names of the primary host and the secondary host you are configuring.
   f. Choose whether to use the MySQL database of the Sun VDI cluster or connect to a remote MySQL database.
      This selection must be the same as for the primary host.
      - If you choose a remote MySQL database, you will need to provide some additional information about the database host and users.

			Up One Page Level ⬆ Configuring the VDI Core		Next Page ➡ How to Configure a Remote MySQL Database

This page last changed on Apr 03, 2009 by stephanielewellen.

How to Configure a Remote MySQL Database

As an alternative to the VDI MySQL Cluster database, it is possible to use a remote MySQL database. This needs to be a MySQL version 5.0 (or higher) or a MySQL Cluster version 6.2.15 (or higher). You can use either the 32-bit or the 64-bit version. It is important that a transactional storage engine is available, which will usually be InnoDB or NDB.

> VDI MySQL Cluster database vs. Remote MySQL Database
> Sun VDI allows you to either make use of the MySQL Cluster database that is bundle with the software or is able to integrate into an existing MySQL database. The first option requires almost no knowledge of SQL databases in general and MySQL in particular. It is well suited for small to medium deployments. For larger deployments, if a MySQL database exist already or if specific security related requirements exist choosing the remote MySQL database option more likely the right choice. Find details on the remote database configuration below.

Steps

1. Configure the Primary Sun VDI Host.
   a. See Configure the Primary Sun VDI Host Steps 1-3 above.
   b. Choose `2 Remote Database`.
      i. Specify the DNS name of your MySQL server.
      ii. Specify the port on which your MySQL server is listening.
      iii. Specify a privileged database administrator. This user needs to have the privileges to create databases and add users. If you do not have such a user yet follow the instructions below How to Create a Privileged Database User in order to add one.
      iv. Specify the password for the database administrator that you have specified.
      v. Specify whether you want to connect to your MySQL server via SSL or not.
      vi. Specify the name of the VDI database that will be created or just accept the default 'vda'.
      vii. Specify the name of a user that will be associated with and used to access the VDI database. Alternatively you can simply accept the default 'vdadb'.
      viii. Specify a password for the VDI database user.
2. Configure the Secondary Sun VDI Hosts.
   a. Follow Configure the Secondary Sun VDI Hosts Steps 1-5 above.
   b. Choose `2 Remote Database`.
      i. Specify the DNS name of your MySQL server.
      ii. Specify the port on which your MySQL server is listening.
      iii. Specify whether you want to connect to your MySQL server via SSL or not.
      iv. Specify the name of your VDI database which has been specified when configuring your Primary Sun VDI host.
      v. Specify the name of the user that has access to the VDI database. This is the user you have specified when configuring your Primary Sun VDI host (the default is 'vdadb').
      vi. Specify the password for your VDI database user.

- How to Create a Privileged Database User
  You may want to set up a privileged database user who has, among other things, the privileges to create databases and other users.
  Use the 'mysql' command line tool to enter the mysql interactive mode as root. Then execute the following statements (replace '<user>' and '<password>' accordingly):

```
GRANT ALL PRIVILEGES ON *.* TO '<user>'@'localhost' IDENTIFIED BY '<password>' WITH GRANT OPTION;
GRANT ALL PRIVILEGES ON *.* TO '<user>'@'%' IDENTIFIED BY '<password>' WITH GRANT OPTION;
```

  For more information, follow the instructions outlined by MySQL in Adding New User Accounts to MySQL.

	⬅ Previous Page How to Configure Sun VDI for a Production Environment		Up One Page Level ⬆ Configuring the VDI Core		Next Page ➡ Reconfiguring the VDI MySQL Cluster

This page last changed on Apr 03, 2009 by stephanielewellen.

Reconfiguring the VDI MySQL Cluster

The following tips and procedures require a profound knowledge of the VDI configuration in general and the MySQL Cluster database configuration in particular.
Be sure have have this level of knowledge before continuing. Familiarize yourself with MySQL Cluster. Detailed information can be found in the official MySQL documentation MySQL Cluster Overview. Failures made when executing the following procedures may seriously spoil your VDI installation or make it completely unusable.

When the MySQL Cluster database option has been chosen during the VDI configuration a MySQL Cluster database will be installed under the hood. It has been mentioned already that for this option at least three physical hosts are required each of which will assume a different role from the perspective of the MySQL Cluster database. A detailed overview about MySQL Cluster node types and core concepts can be found here: MySQL Cluster Core Concepts. In particular there will exist:

1. A Primary hosts which runs the MySQL Cluster Management node
2. The 1st Secondary which runs the first MySQL Cluster data node as well as a SQL node
3. The 2nd Secondary which runs the second MySQL Cluster data node as well as a SQL node
4. Further Secondaries which will run a SQL node each

This is a rather static MySQL Cluster configuration consisting always only of one Management node, two Data nodes and up to 99 SQL nodes. Besides that several compromises have been made favoring ease of installation and configuration over absolute security. Find detailed information about security related aspects in conjunction with MySQL Cluster here: MySQL Cluster Security Issues. Several reasons may exist forcing you to adapt the MySQL Cluster database setup for instance:

- Security, you want to make the MySQL Cluster installation more secure
- Scalability/Fail-safety, you want to increase the level of fail-safety of the MySQL Cluster database by adding more Data nodes
- Error recovery, one of your hosts suffers from an outage and a new or another hosts need to take over his role e.g. one of your Data node hosts is broken which is a dangerous situation as in that moment you lack fail-safety (one Data node alone doesn't provide fail-safety). In a situation like this you are maybe forced to promote one of your other secondary hosts to be a Data node.

What follows are some procedures that can be followed in order to do some reconfigurations to the MySQL Cluster configuration none of which is support out-of-the-box by the 'vda-config' script. Most of these reconfiguration procedures imply a complete outage of the system. Be aware also that you have to comply with the MySQL Cluster rules regarding reconfiguration as published here Performing Rolling Restart of MySQL Cluster.

- How to do a Rolling Restart of Your MySQL Cluster
- MySQL Cluster Reconfiguration Scenarios
- How to Prevent Unrestricted SQL Node Joins

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This page last changed on Apr 03, 2009 by stephanielewellen.

How to do a Rolling Restart of Your MySQL Cluster

Be sure to comply with the MySQL Cluster rules regarding reconfiguration as published here: Performing Rolling Restart of MySQL Cluster.

Steps

1. Stop the **`vdadb:core`** service on the Primary host.
   Execute `svcadm disable vda:/application/database/vdadb:core`. Verify that it has been stopped by executing `svcs svc:/application/database/vdadb:core` (this can take a couple of minutes). You should see an output similar to this one:

```
STATE          STIME    FMRI
disabled       Dez_09   svc:/application/database/vdadb:core
```

2. Start the **`vdadb:core`** service again on the Primary host.
   Execute `svcadm enable svc:/application/database/vdadb:core`. This makes the new MySQL Cluster configuration effective. Verify that the service has been started by executing `svcs svc:/application/database/vdadb:core` (again, this may take a couple of minutes). You should see an output similar to this one:

```
STATE        STIME    FMRI
online       Dez_09   svc:/application/database/vdadb:core
```

3. Stop your first data node.
   Execute `svcadm disable svc:/application/database/vdadb:core` on your first Secondary host. Verify that is has been stopped by executing `svcs svc:/application/database/vdadb:core` (this can take a couple of minutes).

```
STATE          STIME    FMRI
disabled       Dez_09   svc:/application/database/vdadb:core
```

4. Once the data node has been stopped, start it again.
   Execute `svcadm enable svc:/application/database/vdadb:core` and wait until it has been started (again, this might take a couple of minutes). Verify that the service has been started by executing `svcs svc:/application/database/vdadb:core`. You should see output similar to this one:

```
STATE        STIME    FMRI
online       Dez_09   svc:/application/database/vdadb:core
```

5. Repeat the last two steps on your second Secondary host.
6. Stop the SQL node on every secondary host.
   Execute `svcadm disable svc:/application/database/vdadb:sql`. Verify that is has been stopped by executing `svcs svc:/application/database/vdadb:sql` (this can take a couple of minutes).

```
STATE          STIME    FMRI
```

```
disabled       Dez_09   svc:/application/database/vdadb:sql
```

7. Start the SQL node on every secondary host.
   Execute `svcadm enable svc:/application/database/vdadb:sql`. Verify that is has been started by executing `svcs svc:/application/database/vdadb:sql` (this can take a couple of minutes).

```
STATE          STIME    FMRI
online         Dez_09   svc:/application/database/vdadb:sql
```


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How to Prevent Unrestricted SQL Node Joins

The default MySQL Cluster configuration allows up to 20 SQL nodes joining the MySQl Cluster. In security sensitive environment however one might want to prevent unrestricted SQL node joins. This is just one step toward a more secure MySQl Cluster configuration other steps can be taken by following the suggestions from the official MySQL site MySQL Cluster Security Issues. Restricting SQL nodes from joining the MySQL Cluster will be accomplished by changing the file `/etc/opt/SUNWvda/config.ini` on the Primary VDI host. At the end of this file there are a couple of [MYSQLD] sections. For every SQL node that wants to join the MySQL Cluster there has to exist a free [MYSQLD] slot. For VDI every Secondary host (and the Primary if configured to serve sessions as well) runs its own SQL node hence one [MYSQLD] slot has to exist for every Secondary and the Primary in case. Restricted access of SQL nodes will be accomplished by exactly specifying the hosts that are allowed to join. Augment the [MYSQLD] slots in your `/etc/opt/SUNWvda/config.ini` file like this:

```
...
[MYSQLD]
HostName=<ip_or_dns_of_the_host_running_an_sql_node>
...
```

Please follow the existing convention in this file regarding the use of IPs vs. host names. Mixing of IPs and host names in `/etc/opt/SUNWvda/config.ini` is not allowed. Remove all unnecessary [MYSQLD] slots. Example: Imagine you have 3 secondary hosts with the the following host names: my-1st-secondary, my-2nd-secondary, my-3rd-secondary.
Initially your `/etc/opt/SUNWvda/config.ini` will look like this:

```
...
[MYSQLD]
[MYSQLD]
[MYSQLD]
[MYSQLD]
[MYSQLD]
[MYSQLD]
[MYSQLD]
...
[MYSQLD]
```

Change it to look like this:

```
...
[MYSQLD]
HostName=my-1st-secondary
[MYSQLD]
HostName=my-2nd-secondary
[MYSQLD]
HostName=my-3rd-secondary
```

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	MySQL Cluster Reconfiguration Scenarios		Reconfiguring the VDI MySQL Cluster		

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MySQL Cluster Reconfiguration Scenarios

The following table show the different host types from the perspective of the MySQL Cluster database and the possible transformation from one type to another. The following terms will be used:

- Non-VDI host - a host which is not yet a VDI host e.g. a completely new host
- Primary-Management host - the host which is running the MySQL Cluster Management node
- Secondary-Data host - a secondary host which is running one of the MySQL Cluster data nodes as well as a SQL node
- Secondary-SQL host - a secondary host which is running a SQL node only

From/To	Non-VDI host	Primary-Management host	Secondary-Data host	Secondary-SQL host
Non-VDI host	-	From Non-VDI to Primary-Management host	From Non-VDI to Secondary-Data host	From Non-VDI to Secondary-SQL host
Primary-Management host	From Primary-Management to Non-VDI host	-	From Primary-Management to Secondary-Data host	From Primary-Management to Secondary-SQL host
Secondary-Data host	From Secondary-Data to Non-VDI host	From Secondary-Data to Primary-Management host	-	From Secondary-Data to Secondary-SQL host
Secondary-SQL host	From Secondary-SQL to Non-VDI host	From Secondary-SQL to Primary-Management host	From Secondary-SQL to Secondary-Data host	-

From Non-VDI to Primary-Management host

This reconfiguration implies a complete outage of the system.

1. Prepare your new Primary-Management host by Installing the VDI Core and configuring it as Primary VDI host according to Configuring the VDI Core.
2. Prepare your two Secondary-Data hosts.
   a. Stop the `vdadb:core` service by executing
   `svcadm disable svc:/application/database/vdadb:core`
   b. Stop the `vdadb:sql` service by executing
   `svcadm disable svc:/application/database/vdadb:sql`
   c. If your original Primary-Management host is still running, un-configure it now by executing `/opt/SUNWvda/sbin/vda-config -u`.
   d. On both Secondary-Data hosts edit `/etc/opt/SUNWvda/my.cnf` exchange the ip address of the original Primary-Management host with that of your new one.
   e. Edit `/etc/opt/SUNWvda/vdadbconnection.properties` and exchange the ip address of the original Primary-Management host with that of your new one.
   f. On both Secondary-Data hosts change the `svc:/application/database/vdadb:core` SMF configuration by executing `svccfg -s svc:/application/database/vdadb:core setprop config/ndbd_connectstring = astring:`
   g. Refresh the `svc:/application/database/vdadb:core` SMF service description: `svcadm refresh svc:/application/database/vdadb:core`
   h. Check that your `svc:/application/database/vdadb:sql` SMF service is in 'disabled' state. Start it again by executing `svcadm enable svc:/application/database/vdadb:core` (this can take a couple of minutes).

i. Start the `svc:/application/database/vdadb:sql` SMF service again by executing `svcadm enable svc:/application/database/vdadb:sql`.

From Non-VDI to Secondary-Data host

⚠ This reconfiguration implies a complete outage of the system.

1. Stop the Data node as well as the SQL node on your two Secondary-Data hosts (or the remaining one in case one data node is broken etc.). On all Secondary-SQL hosts stop the SQL node.
   a. On your Secondary-Data hosts execute `svcadm disable svc:/application/database/vdadb:core`. Wait until the service has been stopped (this can take a couple of minutes). Verify that it has been stopped by executing `svcs svc:/application/database/vdadb:core` (this can take a couple of minutes). When the service has been stopped correctly you will see something similar to this:

```
STATE          STIME    FMRI
disabled       Dez_09   svc:/application/database/vdadb:core
```

   b. On your Secondary-Data as well as on all Secondary-SQL hosts stop the SQL node by executing `svcadm disable svc:/application/database/vdadb:sql`. Wait until the service has been stopped (this can take a couple of minutes). Verify that it has been stopped by executing `svcs svc:/application/database/vdadb:sql`. When the service has been stopped correctly you will see something similar to this:

```
STATE          STIME    FMRI
disabled       Dez_09   svc:/application/database/vdadb:sql
```

2. On your Primary host stop the `svc:/application/database/vdadb:core` service by executing `svcadm disable svc:/application/database/vdadb:core`. Wait until the service has been stopped. Verify that the service has been stopped by executing `svcs svc:/application/database/vdadb:core`. When the service has been stopped correctly you will see something similar to this:

```
STATE          STIME    FMRI
disabled       Dez_09   svc:/application/database/vdadb:core
```

3. On your Primary host:
   a. Change the file `/etc/opt/SUNWvda/config.ini` and exchange the ip/hostname of the data node that you want to retire with that of the new one.
   Be sure not to mix hostnames and ip addresses in this file! Follow the existing convention in this file.
   b. Start the `svc:/application/database/vdadb:core` service again by executing `svcadm enable svc:/application/database/vdadb:core`. Wait a couple of minutes and check that the service has been started correctly again by executing `svcs svc:/application/database/vdadb:core`. When the service has been started correctly you will see something similar to this:

```
STATE          STIME    FMRI
online         Dez_09   svc:/application/database/vdadb:core
```

4. On your remaining "old" Secondary-Data host:
   a. Start the data node again by executing `svcadm enable svc:/application/database/vdadb:core`. Wait until the service has been started (this can take a couple of minutes). Verify that it has been started by executing `svcs svc:/application/database/vdadb:core` (this can take a couple of minutes). When the service has been started correctly you will see something similar to this:

```
STATE      STIME    FMRI
online     Dez_09   svc:/application/database/vdadb:core
```

b. Start the SQL node again by executing `svcadm enable svc:/application/database/vdadb:sql`. Wait until the service has been started (this can take a couple of minutes). Verify that it has been started by executing `svcs svc:/application/database/vdadb:sql` (this can take a couple of minutes). When the service has been started correctly you will see something similar to this:

```
STATE      STIME    FMRI
online     Dez_09   svc:/application/database/vdadb:sql
```

5. Configure your new Secondary-Data host by simply executing `/opt/SUNWvda/sbin/vda-config`
6. On your Secondary-SQL hosts start the SQL node again by executing `svcadm enable svc:/application/database/vdadb:sql`. Wait until the service has been started (this can take a couple of minutes). Verify that it has been started by executing `svcs svc:/application/database/vdadb:sql` (this can take a couple of minutes). When the service has been started correctly you will see something similar to this:

```
STATE      STIME    FMRI
online     Dez_09   svc:/application/database/vdadb:sql
```

From Non-VDI to Secondary-SQL host

As long as there are still free [MYSQLD] slots on the Primary available you can add a new SQL node by simply following the steps outlined here: Installing the VDI Core and Configuring the VDI Core.

From Primary-Management to Non-VDI host

1. Un-configure your Primary-Management host.
2. Configure a new Primary-Management host using the instructions above.

From Primary-Management to Secondary-Data host

1. Convert the Primary-Management host to a Non-VDI host using the instructions above.
2. Now configure the host to run as a Secondary-Data host following these instructions.

From Primary-Management to Secondary-SQL host

1. Convert the management node to a nothing node using the instructions above.
2. Now configure the host to run an SQL node using these instructions.

From Secondary-Data to Non-VDI host

1. Un-configure the Secondary-Data host by executing `/opt/SUNWvda/sbin/vda-config -u`.
2. Setup a new Secondary-Data host using the instructions above.

From Secondary-Data to Primary-Management host

1. Un-configure the Secondary-Data by executing `/opt/SUNWvda/sbin/vda-config -u`.
2. Setup a new Secondary-Data host follow the instructions above.

3. Un-configure your existing Primary-Management host following these instructions
4. Reconfigure your former Secondary-Data host as a Primary-Management hosts following these instructions.

From Secondary-Data to Secondary-SQL host

1. Unconfigure the data node by executing `/opt/SUNWvda/sbin/vda-config -u`.
2. Set up a new data node using these instructions.
3. Convert the new data node into an SQL node using the instructions above.

From Secondary-SQL to Non-VDI host

1. Unconfigure the SQL node by executing `/opt/SUNWvda/sbin/vda-config -u`.

From Secondary-SQL to Primary-Management host

1. Unconfigure the SQL node by executing `/opt/SUNWvda/sbin/vda-config -u`.
2. Replace your existing management node by the unconfigured SQL node using these instructions.

From Secondary-SQL to Secondary-Data host

1. Unconfigure your data node by executing `/opt/SUNWvda/sbin/vda-config -u`.
2. To setup a new data node, use the instructions above.

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This page last changed on Apr 03, 2009 by stephanielewellen.

Backing Up the VDI Configuration

The use of MySQL Cluster for the VDI configuration implies a high level of fail-safety already which reduces the need for backups as a means for disaster recovery. Find further details about this topic in the official MySQL documentation. Nevertheless there may exist reasons for creating backups of the VDI configuration. Creating a backup of the VDI MySQL Cluster database is relatively easy accomplished. Detailed steps on how to do this can be found in the official MySQL documentation under the section Online Backup of MySQL Cluster. When following the steps outlined there the backup files of your VDI configuration database will reside in '/var/opt/SUNWvda/mysql-cluster/BACKUP' on each of your first two secondary hosts which are running the MySQL Cluster data nodes. You can save these directories aside and restore the VDI database from this backup later in time.

Please keep in mind that flexible desktop assignments existing at the time when the backup will be created might not be valid anymore when the VDI configuration has to be restored from this backup. This may lead to some unexpected side effects. For this reason you should consider replication as an alternative to regularly taken backups. Master-Slave replication is supported with the MySQL Cluster version coming along with VDI. Find details on the topic here: MySQL Cluster Replication

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Checking VDA Services

It is important to know how to check the status of the different services provided by Sun VDI. Most services run under the control of the Solaris Service Management Facility (SMF).

- How to Check the Core Service
- How to Check the Database Service
- How to Check the Admin GUI Service
- How to Check the RDP Broker Service

	⬅ Previous Page Configuring the VDI Core		Up One Page Level ⬆ Installing		Next Page ➡ Removing the VDI Core

This page last changed on Apr 03, 2009 by stephanielewellen.

How to Check the Core Service

Starting with Sun VDI 3, the main VDI Core service now runs as a module within the Common Agent Container (cacao). This Java-based agent is an integrated part of Solaris 10 and is already used in a wide range of Sun products. If you encounter any issues, you should first check the status of the agent as well as the status of the VDI Core service module.

To check the status of the Common Agent Container execute as root:

```
# cacaoadm status
```

or alternatively use the Solaris Service Management Facility:

```
# svcs svc:/application/management/common-agent-container-1:default
```

To check the status of the VDI Core service module (deployed within the agent):

```
# cacaoadm status com.sun.vda.service_module
```

Log messages will appear in the Common Agent Container log file at:

```
# /var/cacao/instances/default/logs/cacao.0
```

Log messages at error or warning level will also be forwarded to the syslog daemon.

			Up One Page Level Checking VDA Services		Next Page How to Check the Database Service

This page last changed on May 07, 2009 by tino-rachui.

How to Check the Database Service

Sun VDI Core uses a MySQL database which is configured within the Sun VDI services or remotely. To ensure that the database service is up and running:

```
# /opt/SUNWvda/sbin/vda-db-status status
```

If not configured remotely, the database service runs under the Solaris Service Management Facility. Depending on the selected configuration, the status of the database service can also be checked as explained below.

In an Evaluation Environment

```
# svcs svc:/application/database/vdadb:sql
```

In a Production Environment

On a Primary host or on the specified Secondary hosts A and B (i.e. first and second data nodes), the status of the database service engine can be checked using:

```
# svcs svc:/application/database/vdadb:core
```

Also, on any Secondary host:

```
# svcs svc:/application/database/vdadb:sql
```

The corresponding log files can be located at:

```
# /var/svc/log/application-database-vdadb:core.log
# /var/svc/log/application-database-vdadb:sql.log
```


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This page last changed on Apr 03, 2009 by stephanielewellen.

How to Check the Admin GUI Service

To check the status of the Admin GUI:

```
# /opt/SUNWvda/sbin/vda-webadmin status
```

The corresponding log file can be located at:

```
# /var/opt/SUNWvda/log/webadmin0.log
```


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This page last changed on Apr 03, 2009 by stephanielewellen.

How to Check the RDP Broker Service

The RDP broker service supplied by Sun VDI 3.0 also runs under the Solaris Service Management Facility. To ensure that the RDP broker service is running:

```
# svcs svc:/application/rdpbroker:default
```

The log file for the RDP broker service can be located at:

```
# /var/svc/log/application-rdpbroker:default.log
```


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This page last changed on Mar 23, 2009 by stephanielewellen.

Using the CLI

The following sections provide detailed information about the usage, subcommands, and examples of VDI CLI commands. You can also see examples of the man page associated with each command.

Command	Description
vda-install	Installation / Uninstallation of Sun VDI
vda-config	Configuration / Unconfiguration of Sun VDI
vda-migrate	Migration of settings and data from a previous version of Sun VDI
vda-webadmin	Management of the Web server hosting the Sun VDI Web Administration
vda	Administration of Sun VDI
vda-db-status	Status of the Sun VDI database service
vda-service	Management of the Sun VDI service

This page last changed on Mar 31, 2009 by stephanielewellen.

The Man Page for the vda Command

```
Sun VDI 3.0                                vda(1M)


NAME
    vda - administer Sun Virtual Desktop Infrastructure

SYNOPSIS
    /opt/SUNWvda/sbin/vda [-? | --help]

    /opt/SUNWvda/sbin/vda [-V | --version]

    /opt/SUNWvda/sbin/vda <subcommand> [-? | --help]

    /opt/SUNWvda/sbin/vda <subcommand> [options] [operands]

DESCRIPTION
    The vda command may be used to administer Sun Virtual Desk-
    top Infrastructure. Support is included for common adminis-
    tration tasks such as the creation and management of desktop
    providers and pools of desktops, the assignment of desktops
    to users and groups, and monitoring the state of the virtu-
    alization platform.

    In all cases, vda executes an action on a Sun Virtual Desk-
    top Infrastructure system object. Examples of such objects
    are user, group, pool, desktop etc. The action to be exe-
    cuted is identified by a subcommand where the subcommand
    name is composed of the relevant object type and the name of
    the action to be performed, separated by a hyphen (-).

    /opt/SUNWvda/sbin/vda [-? | --help]

        This command lists all the subcommands.

    /opt/SUNWvda/sbin/vda [-V | --version]

        This command displays the version information.

    /opt/SUNWvda/sbin/vda <object>

        This command lists the subcommands that apply to the
        specified object type.

    /opt/SUNWvda/sbin/vda <subcommand> [-? | --help]

        This command displays the detailed usage of the subcom-
```

mand.

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/opt/SUNWvda/sbin/vda <subcommand> [options] [operands]

This command executes the action specified by the sub-command, options and operands. Options and operands depend on each subcommand, the detailed description of options and operands for a subcommand can be obtained by /opt/SUNWvda/sbin/vda <subcommand> [-? | --help].

Objects

user Users and groups from the user directory

group Local groups of users that are not pre-defined in the user directory

directory Active Directory or LDAP server where user information is stored

token Smart cards identifiers for users in a Sun Ray environment

pool Collection of desktops

desktop Desktops managed by Sun VDI

provider Desktop providers that encapsulate the details of the underlying virtualization technology

job Action executed in the background

settings Global settings that apply to the Sun VDI sys-tem

Generic Actions

list Lists all the objects

show Shows the detailed properties/status of an object

setprops Sets the properties of an object

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getprops Gets the properties of an object

add Adds an object

create Creates an object

remove Removes an object

delete Deletes an object

Example of Subcommands

user-show Shows the desktops available for a user

group-create Creates a new local group with the specified properties

token-setprops Edits the properties of the token

pool-list Lists all pools

desktop-delete Deletes the desktops

provider-vc-create Creates a new VMware VirtualCenter desktop provider

provider-disable-host Disables the hosts for the xVM VirtualBox desktop provider. Disabled hosts are not used for automated cloning.

Refer to http://wikis.sun.com/display/VDI3/Home for a complete list of available subcommands and their usage.

OPTIONS

The following options are supported:

-x, --parseable

the -x option displays information in a parseable format, as

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a list of lines of colon ':' separated fields. The -x option is available for the list, show, search, desktops subcommands.

EXIT STATUS

Exit Code Status

0 Successful completion

1 An error occurred

2 Invalid command line options or arguments were specified

EXAMPLES

Example 1 Creating a Desktop Provider

The following example creates a VMware VirtualCenter desktop provider:

```
example% /opt/SUNWvda/sbin/vda provider-vc-create -p
name="VC provider",host=my.vc.com,username=Administrator
```

The following example creates a xVM VirtualBox desktop provider with two hosts and one storage:

```
example% /opt/SUNWvda/sbin/vda provider-vb-create -p
name="VB provider

example% /opt/SUNWvda/sbin/vda provider-add-host -p
host=my.first.vb.com,port=443,username=root "VB provider"

example% /opt/SUNWvda/sbin/vda provider-add-host -p
```

host=my.second.vb.com,port=443,username=root "VB provider"

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example% /opt/SUNWvda/sbin/vda provider-add-storage -p host=my.zfs.com,username=root,zfspool=vda_zfspool "VB provider"

Example 2 Creating a Pool

The following example creates a pool for storing xVM VirtualBox templates:

example% /opt/SUNWvda/sbin/vda pool-create -p name="Templates",provider="VB provider",assignment-type=personal

example% /opt/SUNWvda/sbin/vda pool-vb-import -p vdi-image=template.vdi,xml-configuration=golden-master.xml Templates

The following example creates a pool for cloning 30 desktops from VMware VirtualCenter. First list the templates from the VirtualCenter, and select one of them:

example% /opt/SUNWvda/sbin/vda provider-list-templates "VC provider"

NAME	ID	PATH
XP-Template	vm-134	[Datacenters, ADatacenter, vm]
XPClone	vm-629	[Datacenters, ADatacenter, vm]

example% /opt/SUNWvda/sbin/vda pool-create -p name="VC pool",provider="VC provider",template=vm-134,preferred-size=30,free-size=5,max-size=35,power-state=on,assignment-type=flexible,recycle-policy=reuse,idle-timeout=2

example% /opt/SUNWvda/sbin/vda pool-start "VC pool"

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Example 3 Configuring the User Directory

The following example configures a LDAP directory using simple authentication, the default 389 port, a fallback LDAP server, and no restriction on the base DN:

```
example% /opt/SUNWvda/sbin/vda directory-add -p auth-
type=simple,hosts=my.ldap.com;secondary.ldap.com,username='"cn=Administrator,ou=people,dc=my,dc=company,dc=com"'
```

The following example configures an Active Directory using Kerberos authentication:

```
example% /opt/SUNWvda/sbin/vda directory-add -p auth-
type=kerberos,addomain=my.company.com,username=Administrator
```

Example 4 Assigning Pools and Desktops to Users

The following example assigns the user "John Smith" to the pool "VC pool". Once complete, John Smith will be dynamically assigned a desktop from the VC pool each time he logs in.

```
example% /opt/SUNWvda/sbin/vda user-assign -p "VC pool"
"cn=John Smith,ou=people"
```

The following example lists the desktops in the pool "Static pool" and permanently assigns one of them to the user "Mary O'Leary". Each time Mary O'Leary logs in, she will get the same desktop.

```
example% /opt/SUNWvda/sbin/vda pool-desktops "Static pool"

  NAME              ID      MACHINE STATE      STATUS      DN
  WindowsXP0001     80      Running            Used        cn=John Smith,ou=people
  WindowsXP0002     81      Powered Off        Available   -
```

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example% /opt/SUNWvda/sbin/vda user-assign -d WindowsXP0002 moleary

Example 5 Listing the Desktops and Pools Assigned to a User

The following example lists all the desktop and pools assigned to "Mary O'Leary" in the order they apply to her.

example% /opt/SUNWvda/sbin/vda user-show moleary

SEE ALSO
vda-db-status (1M), vda-service (1M)

NOTES
Find more information at http://wikis.sun.com/display/VDI3/Home.

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This page last changed on Mar 31, 2009 by stephanielewellen.

The vda Command

The vda command, /opt/SUNWvda/sbin/vda, is used for administration tasks at the CLI level. Nearly all administration tasks that are performed via the Web Administration GUI can also be performed using the vda command. The vda command also provides advanced usage of VDI administration that is not available from the Admin GUI.
The vda command information has been broken up into the following sections.

Content	Description
Command Usage	General information about the vda command
Subcommand Usage	Detailed information about using the vda subcommands
Examples	Examples of vda command usage
Man Page	The man page for the vda command

Information about creating bulks of tokens with and creating automated administration scripts is available in Administering VDI 3.0.

This page last changed on Jun 15, 2009 by katell.

vda Command Usage

Command

```
/opt/SUNWvda/sbin/vda
```

Usage

```
Sun Virtual Desktop Infrastructure Administration

Usage: vda <subcommand>

   -?, --help:              Print this help list
   -V, --version:           Display the version

User Subcommands:
   user-search:             Search for users/groups in the user directory that
                          match the specified search criteria
   user-show:               Show the desktops available for the user
   user-desktops:           Show the desktops assigned to the user
   user-assign:             Assign users to pools or desktops
   user-unassign:           Unassign users from pools or desktops. If no pool or
                          desktop is specified, all assignments are removed
                          from the users
   user-defaultdesktop:     Make the desktop the default desktop for the user
   user-personaldesktop:    Make the desktop a personal desktop for the user

Custom Groups Subcommands:
   group-list:              List all custom groups
   group-create:            Create a new local group with the specified
                          properties
   group-delete:            Delete the custom group
   group-getprops:          List the properties of the custom group
   group-setprops:          Edit the properties of the custom group
   group-show:              Show the pools assigned to the custom group
   group-assign:            Assign custom groups to pools
   group-unassign:          Unassign custom groups from pools. If no pool is
                          specified, all assignments are removed from the
                          custom groups

Token Subcommands:
   token-search:            Search for tokens that match the search criteria
   token-create:            Create a new token (smart card id)
   token-remove:            Remove the specified tokens from the system
   token-getprops:          List the properties of the token
   token-setprops:          Edit the properties of the token
   token-unsetprops:        Remove the properties of the token
   token-show:              Show the desktops available for the token
   token-desktops:          Show the desktops assigned to the token
   token-assign:            Assign tokens to pools or desktops
   token-unassign:          Unassign tokens from pools or desktops. If no pool
                          or desktop is specified, all assignments are removed
                          from the tokens

Pool Subcommands:
   pool-list:               List all pools
```

```
  pool-create:             Create a new pool with the specified properties
  pool-delete:             Delete the pools and their desktops
  pool-getprops:           List the properties of the pool
  pool-setprops:           Edit the properties of the pool
  pool-resetprops:         Reset the properties of the pool to their default
                           value
  pool-unsetprops:         Unset the properties of the pool
  pool-show:               Show  detailed information about the pool
  pool-desktops:           List all desktops from the pool
  pool-vb-import:          Import xVM VirtualBox desktops into the pool
  pool-vc-import:          Import VMware VirtualCenter desktops into the pool
  pool-start:              Start automatic cloning of desktops for the pools
  pool-stop:               Stop automatic cloning of desktops for the pools
  pool-enable:             Enable users to connect to flexible desktops from
                           the pools
  pool-disable:            Disable users from connecting to flexible desktops
                           from the pools
  pool-create-sysprep:     Create a Sysprep file for the pool. Valid only for
                           xVM VirtualBox pools

Desktop Subcommands:
  desktop-delete:          Delete the desktops
  desktop-show:            Show detailed properties for the desktops
  desktop-template:        Convert the desktops to templates. Valid for xVM
                           VirtualBox desktops only
  desktop-start:           Start the desktops
  desktop-stop:            Stop the desktops

Desktop Provider Subcommands:
  provider-list:           List all desktop providers
  provider-vb-create:      Create a new xVM VirtualBox desktop provider
  provider-vc-create:      Create a new VMware VirtualCenter desktop provider
  provider-delete:         Delete the desktop providers
  provider-vb-getprops:    List the properties of the xVM VirtualBox desktop
                           provider
  provider-vb-setprops:    Edit the properties of the xVM VirtualBox desktop
                           provider
  provider-vc-getprops:    List the properties of the VMware VirtualCenter
                           desktop provider
  provider-vc-setprops:    Edit the properties of the VMware VirtualCenter
                           desktop provider
  provider-show:           Show detailed information about the desktop provider
  provider-list-hosts:     List all hosts for the xVM VirtualBox desktop
                           provider
  provider-add-host:       Add a host to the xVM VirtualBox desktop provider
  provider-remove-host:    Remove the hosts from the xVM VirtualBox desktop
                           provider
  provider-enable-host:    Enable the hosts for the xVM VirtualBox desktop
                           provider. Enabled hosts are used for automated
                           cloning
  provider-disable-host:   Disable the hosts for the xVM VirtualBox desktop
                           provider. Disabled hosts are not used for automated
                           cloning
  provider-list-storage:   List all storages for the desktop provider
  provider-add-storage:    Add a storage to the xVM VirtualBox desktop provider
  provider-remove-storage: Remove the storage from the xVM VirtualBox desktop
                           provider
  provider-list-templates: List the templates for the desktop provider
  provider-list-unmanaged: List the desktops from the VMware VirtualCenter that
                           are not managed by any desktop provider

User Directory Subcommands:
  directory-add:           Add the user directory configuration to the system
  directory-remove:        Remove the user directory configuration from the
                           system
  directory-getprops:      List the properties of the user directory
```

```
    directory-setprops:      Edit the properties of the user directory
    directory-show:          Show the configuration details for the user
                             directory

  Global Settings Subcommands:
    settings-getprops:       List global settings
    settings-setprops:       Edit global settings
    settings-resetprops:     Reset global settings to their default value

  Job Subcommands:
    job-list:                List the existing jobs
    job-show:                Show the job details
    job-wait:                Wait until the job ends

  Each subcommand has its specific options and arguments. Specify --help after the
  subcommand name to display its usage.
```

This page last changed on Mar 31, 2009 by stephanielewellen.

vda Command Usage Examples

Topic Jump List

Creating a Desktop Provider

The following example creates a VMware VirtualCenter desktop provider:

```
example% /opt/SUNWvda/sbin/vda provider-vc-create -p name="VC provider",host=my.vc.com,username=Administrator
```

The following example creates a xVM VirtualBox desktop provider with two hosts and one storage:

```
example% /opt/SUNWvda/sbin/vda provider-vb-create -p name="VB provider
example% /opt/SUNWvda/sbin/vda provider-add-host -p host=my.first.vb.com,port=443,username=root "VB provider"
example% /opt/SUNWvda/sbin/vda provider-add-host -p host=my.second.vb.com,port=443,username=root "VB provider"
example% /opt/SUNWvda/sbin/vda provider-add-storage -p host=my.zfs.com,username=root,zfspool=vda_zfspool "VB provider"
```

Creating a Pool

The following example creates a pool for storing xVM VirtualBox templates:

```
example% /opt/SUNWvda/sbin/vda pool-create -p name="Templates",provider="VB provider",assignment-type=personal
example% /opt/SUNWvda/sbin/vda pool-vb-import -p vdi-image=template.vdi,xml-configuration=golden-master.xml Templates
```

The following example creates a pool for cloning 30 desktops from VMware VirtualCenter. First list the templates from the VirtualCenter, and select one of them:

```
example% /opt/SUNWvda/sbin/vda provider-list-templates "VC provider"
NAME ID PATH
XP-Template vm-134 [Datacenters, ADatacenter, vm]
XPClone vm-629 [Datacenters, ADatacenter, vm]
example% /opt/SUNWvda/sbin/vda pool-create -p name="VC pool",provider="VC provider",template=vm-134,preferred-size=30,\
free-size=5,max-size=35,power-state=on,assignment-type=flexible,recycle-policy=reuse,idle-timeout=2
example% /opt/SUNWvda/sbin/vda pool-start "VC pool"
```

Configuring the User Directory

The following example configures a LDAP directory using simple authentication, the default 389 port, a fallback LDAP server, and no restriction on the base DN:

```
example% /opt/SUNWvda/sbin/vda directory-add -p auth-type=simple,hosts=my.ldap.com;secondary.ldap.com,\
username='"cn=Administrator,ou=people,dc=my,dc=company,dc=com"'
```

The following example configures an Active Directory using Kerberos authentication:

```
example% /opt/SUNWvda/sbin/vda directory-add -p auth-type=kerberos,addomain=my.company.com,username=Administrator
```

Assigning Pools and Desktops to Users

The following example assigns the user "John Smith" to the pool "VC pool". Once complete, John Smith will be dynamically assigned a desktop from the VC pool each time he logs in.

```
example% /opt/SUNWvda/sbin/vda user-assign -p "VC pool" "cn=John Smith,ou=people"
```

The following example lists the desktops in the pool "Static pool" and permanently assigns one of them to the user "Mary O'Leary". Each time Mary O'Leary logs in, she will get the same desktop.

```
example% /opt/SUNWvda/sbin/vda pool-desktops "Static pool"
NAME ID MACHINE STATE STATUS DN
WindowsXP0001 80 Running Used cn=John Smith,ou=people
WindowsXP0002 81 Powered Off Available -
example% /opt/SUNWvda/sbin/vda user-assign -d WindowsXP0002 moleary
```

Listing the Desktops and Pools Assigned to a User

The following example lists all the desktop and pools assigned to "Mary O'Leary" in the order they apply to her.

```
example% /opt/SUNWvda/sbin/vda user-show moleary
```

The vda-config Command

This page last changed on Mar 20, 2009 by katell.

Command

```
/opt/SUNWvda/sbin/vda-config
```

Usage

```
Usage: vda-config OPTIONS

Configures the Sun Virtual Desktop Infrastructure product.

If no OPTIONS are specified, the command will perform
a full interactive configuration of this product.

The accepted values for OPTIONS are:

-h
      Display this help list.

-u
      Unconfigures all components of this product.

-w
      Configures only the web administration user interface
      of the Sun Virtual Desktop Infrastructure.
```

Man Page

```
Sun Virtual Desktop Infrastructure Commands        vda-config(1)



NAME
    vda-config - Sun Virtual Desktop  Infrastructure  configura-
    tion tool

SYNOPSIS
    /opt/SUNWvda/sbin/vda-config [-u] [-w] [-h]

DESCRIPTION
    The vda-config command line tool will be used  to  configure
    or  unconfigure  the Sun Virtual Desktop Infrastructure.  If
    no OPTIONS are specified, the command will configure the Sun
    Virtual Desktop Infrastructure.

OPTIONS
    -u    Unconfigure Sun Virtual Desktop Infrastructure.

    -w    Configures only the web administration user  interface
          of the Sun Virtual Desktop Infrastructure.

    -h    Prints a usage message for this command.
```

EXIT STATUS

The following exit values are returned:

0 Success

1 Failure

ATTRIBUTES

See attributes(5) for descriptions of the following attributes:

Attribute Type	Attribute Value
Availability	SUNWvda-service
Interface Stability	Uncommitted

SEE ALSO

Sun VDI 3.0 Last change: 03/11/09 1

The vda-db-status Command

This page last changed on Mar 20, 2009 by katell.

Command

```
/opt/SUNWvda/sbin/vda-db-status
```

Usage

```
Usage: vda-db-status OPTIONS

Shows a detailed status of the Sun Virtual Desktop Infrastructure Database service.

The accepted values for OPTIONS are:

-h
      Display this help list.

-s
      Displays a short version of the status.

-x
      Displays the status without headers.

-i
      Displays information about the current configuration.
```

Man Page

```
Sun Virtual Desktop Infrastructure Administration
                                        vda-db-status(1M)



NAME
    vda-db-status - Sun Virtual Desktop  Infrastructure  Service
    database status tool

SYNOPSIS
    /opt/SUNWvda/sbin/vda-db-status [-i] [-x] [-s] [-h]

DESCRIPTION
    The Sun  Virtual  Desktop  Infrastructure  Service  database
    status  tool displays information about the current database
    configuration and the status  of  the  Sun  Virtual  Desktop
    Infrastructure Service database.

OPTIONS
    -i   Displays information about the current database confi-
         guration.

    -x    Display the status without a header.

    -s    Display a short version of the database status.
```

```
    -h    Print a usage message

EXIT STATUS
    The following exit values are returned.

    0     Success

    non zero
          Failure

ATTRIBUTES
    See attributes(5) for descriptions of the  following  attri-
    butes:

    ____________________________________________________________
    |       Attribute Type         |       Attribute Value      |
    | Availability                 | SUNWvda-db-status          |
    | Interface Stability          | Uncommitted                |
    |______________________________|____________________________|


SEE ALSO
    vda-config(1M), vda-service(1M)


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```

The vda-install Command

This page last changed on Mar 20, 2009 by katell.

Command

```
/opt/SUNWvda/sbin/vda-install
```

Usage

```
Usage: vda-install OPTIONS

Installs the Sun VDI product.

If no OPTIONS are specified, the command will perform
a full installation of this product.

The accepted values for OPTIONS are:

-h
      Display this help list.

-u
      Uninstalls all components of this product.
```

Man Page

```
Sun Virtual Desktop Infrastructure Commands        vda-install(1)



NAME
    vda-install - Sun Virtual Desktop  Infrastructure  installa-
    tion tool

SYNOPSIS
    /opt/SUNWvda/sbin/vda-install [-u] [-h]

DESCRIPTION
    The vda-install command line tool will be used to install or
    uninstall Sun Virtual Desktop Infrastructure.  If no OPTIONS
    are specified, the command will perform a full  installation
    of the Sun Virtual Desktop Infrastructure.

OPTIONS
    -u   Uninstalls Sun Virtual Desktop Infrastructure.

    -h   Prints a usage message for this command.

EXIT STATUS
    The following exit values are returned:

    0    Success

    1    Failure
```

ATTRIBUTES

See attributes(5) for descriptions of the following attributes:

Attribute Type	Attribute Value
Availability	vda-install
Interface Stability	Uncommitted

SEE ALSO

vda-config(1M)

Sun VDI 3.0 Last change: 03/11/09 1

The vda-migrate Command

This page last changed on Mar 20, 2009 by katell.

Command

```
/opt/SUNWvda/sbin/vda-migrate
```

Usage

```
Usage: vda-migrate OPTIONS

Migrates settings and data from a previous version of Sun Virtual Desktop Infrastructure

The accepted values for OPTIONS are:

-e [/path/to/directory]
      Exports data from an older version of Sun Virtual Desktop Infrastructure 3.0.
      Execute only while the old version is still installed and configured.
      This is the default option.

-i /path/to/directory
      Imports data to Sun Virtual Desktop Infrastructure 3.0 from an older version.
      Execute only after the new version is installed and configured.

-h
      Display this help list.
```

Man Page

```
Sun Virtual Desktop Infrastructure Administration
                                        vda-migrate(1M)



NAME
    vda-migrate - Sun Virtual  Desktop  Infrastructure  Settings
    and data migration utility

SYNOPSIS
    /opt/SUNWvda/sbin/vda-migrate

    /opt/SUNWvda/sbin/vda-migrate -e [</path/to/directory>]

    /opt/SUNWvda/sbin/vda-migrate -i </path/to/directory>

    /opt/SUNWvda/sbin/vda-migrate -h

DESCRIPTION
    The Sun Virtual  Desktop  Infrastructure  migration  utility
    provides a way to export and import data and settings from a
    previous version to a current version of Sun Virtual Desktop
    Infrastructure.
```

OPTIONS

-e [</path/to/directory>]

Exports data from an older version of Sun Virtual Desktop Infrastructure. This option should only be executed while the old version is still installed and configured. The exported data is stored in the given directory; if no directory is supplied, /var/opt/SUNWvda/backup is used. This is the default option.

-i </path/to/directory>

Imports data to Sun Virtual Desktop Infrastructure from an older version. This option should onle be executed after the new version is installed and configured. The imported data is read from a the supplied directory.

-h Print a usage message

ATTRIBUTES

See attributes(5) for descriptions of the following attributes:

Attribute Type	Attribute Value
Availability	SUNWvda-db-status
Interface Stability	Uncommitted

SEE ALSO

vda-config(1M), vda-service(1M)

The vda-service Command

This page last changed on Mar 20, 2009 by katell.

Command

```
/opt/SUNWvda/sbin/vda-service
```

Usage

```
Usage: vda-service SUBCOMMAND
 or: vda-service OPTIONS

Manages the Sun Virtual Desktop Infrastructure service.

The accepted values for SUBCOMMAND are:

start   Starts the service
stop    Stops the service
restart Stop followed by start
status  Display status of service

The accepted values for OPTIONS are:

-h      Display this help list.
```

Man Page

```
Sun Virtual Desktop Infrastructure Administration
                                        vda-service(1M)



NAME
    vda-service - Sun  Virtual  Desktop  Infrastructure  Service
    administration tool

SYNOPSIS
    /opt/SUNWvda/sbin/vda-service start

    /opt/SUNWvda/sbin/vda-service stop

    /opt/SUNWvda/sbin/vda-service restart

    /opt/SUNWvda/sbin/vda-service status

    /opt/SUNWvda/sbin/vda-service -h

DESCRIPTION
    The Sun Virtual Desktop Infrastructure Service is  responsi-
    ble  for  brokering  desktop  sessions  on  behalf of client
    applications. vda-service may be used to  control  the  ser-
    vice.

SUBCOMMANDS
```

The following subcommands are supported.

start Start the service

stop Stop the service

restart
Restart the service

status
Query and print the service status

OPTIONS
-h Print a usage message

EXIT STATUS
The following exit values are returned.

0 Success

non zero
Failure

ATTRIBUTES
See attributes(5) for descriptions of the following attributes:

Attribute Type	Attribute Value
Availability	SUNWvda-service
Interface Stability	Uncommitted

SEE ALSO
vda-config(1M), vda-webadmin(1M)

This page last changed on Jun 15, 2009 by katell.

Detailed Usage of the Subcommands

user

user-search

```
Search for users/groups in the user directory that match the specified search
criteria

Usage:
 vda user-search [-x | --parseable] [<searchfilter>]

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

Operand:
 <searchfilter>          The search filter criteria

'*' denotes mandatory parameters.
```

user-show

```
Show the desktops available for the user

Usage:
 vda user-show [-x | --parseable] <userId>

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

Operand:
*<userId>                The DN or userid of the user

'*' denotes mandatory parameters.
```

user-desktops

```
Show the desktops assigned to the user

Usage:
 vda user-desktops [-x | --parseable] <userId>
```

```
 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

Operand:
*<userId>                The DN or userid of the user

'*' denotes mandatory parameters.
```

user-assign

```
Assign users to pools or desktops

Usage:
 vda user-assign [-p <pool1>,<pool2> | --pool=<pool1>,<pool2>] [-d
              <desktop1>,<desktop2> | --desktop=<desktop1>,<desktop2>]
              <userId1> <userId2>

 -?, --help              Print this help list

Options:
 -p <pool1>,<pool2>, --pool=<pool1>,<pool2>
                      The name of the pools
 -d <desktop1>,<desktop2>, --desktop=<desktop1>,<desktop2>
                      The id of the desktops

Operand:
*<userId1> <userId2>     The DN or userid of the users to assign

'*' denotes mandatory parameters.
```

user-unassign

```
Unassign users from pools or desktops. If no pool or desktop is specified, all
assignments are removed from the users

Usage:
 vda user-unassign [-p <pool1>,<pool2> | --pool=<pool1>,<pool2>] [-d
               <desktop1>,<desktop2> | --desktop=<desktop1>,<desktop2>]
               <userId1> <userId2>

 -?, --help              Print this help list

Options:
 -p <pool1>,<pool2>, --pool=<pool1>,<pool2>
                      The name of the pools the users should be unassigned
                      from
 -d <desktop1>,<desktop2>, --desktop=<desktop1>,<desktop2>
                      The id of the desktops the user should be unassigned
                      from

Operand:
*<userId1> <userId2>     The DN or userid of the users to unassign
```

```
'*' denotes mandatory parameters.
```

user-defaultdesktop

```
Make the desktop the default desktop for the user

Usage:
 vda user-defaultdesktop <desktopId>

 -?, --help              Print this help list

Operand:
*<desktopId>             The id of the desktop which should be made default.
                         This should be a desktop assigned to a user

'*' denotes mandatory parameters.
```

user-personaldesktop

```
Make the desktop a personal desktop for the user

Usage:
 vda user-personaldesktop <desktopId>

 -?, --help              Print this help list

Operand:
*<desktopId>             The id of the desktop which should be made personal.
                         This should be a desktop assigned to a user with a
                         flexible assignment

'*' denotes mandatory parameters.
```

group

group-list

```
List all custom groups

Usage:
 vda group-list [-x | --parseable]

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

'*' denotes mandatory parameters.
```

group-create

```
Create a new local group with the specified properties

Usage:
 vda group-create [-p <prop1>=<value1>,<prop2>=<value2> |
                --property=<prop1>=<value1>,<prop2>=<value2>]

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --property=<prop1>=<value1>,<prop2>=<value2>
                        The list of properties that define the group

Properties:
*name=<name>            The name of the custom group
 comment=<comment>      The comment for the custom group
 search-filter=<search-filter>
                        The LDAP search filter which defines the users in this
                        group

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

'*' denotes mandatory parameters.
```

group-delete

```
Delete the custom group

Usage:
 vda group-delete <group-name1> <group-name2>

 -?, --help              Print this help list

Operand:
*<group-name1> <group-name2>
                        The name of the custom group to delete

'*' denotes mandatory parameters.
```

group-getprops

```
List the properties of the custom group

Usage:
 vda group-getprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>]
```

```
                  <group-name>

 -?, --help              Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                        The list of properties to get

Properties:
 comment                  The comment for the custom group
 search-filter            The LDAP search filter which defines the users in this
                        group

Operand:
*<group-name>            The name of the custom group

'*' denotes mandatory parameters.
```

group-setprops

```
Edit the properties of the custom group

Usage:
 vda group-setprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>]
                  <group-name>

 -?, --help              Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                        The list of properties to set

Properties:
 name=<name>              The new name for the custom group
 comment=<comment>        The comment for the custom group
 search-filter=<search-filter>
                        The LDAP search filter which defines the users in this
                        group

Operand:
*<group-name>            The name of the custom group

'*' denotes mandatory parameters.
```

group-show

```
Show the pools assigned to the custom group

Usage:
 vda group-show [-x | --parseable] <group-name>

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.
```

```
Operand:
*<group-name>           The name of the custom group

'*' denotes mandatory parameters.
```

group-assign

```
Assign custom groups to pools

Usage:
 vda group-assign [-p <pool1>,<pool2> | --pool=<pool1>,<pool2>] <group-name1>
                  <group-name2>

 -?, --help              Print this help list

Options:
*-p <pool1>,<pool2>, --pool=<pool1>,<pool2>
                        The name of the pools

Operand:
*<group-name1> <group-name2>
                        The name of the custom group to assign

'*' denotes mandatory parameters.
```

group-unassign

```
Unassign custom groups from pools. If no pool is specified, all assignments are
removed from the custom groups

Usage:
 vda group-unassign [-p <pool1>,<pool2> | --pool=<pool1>,<pool2>] <group-name1>
                    <group-name2>

 -?, --help              Print this help list

Options:
 -p <pool1>,<pool2>, --pool=<pool1>,<pool2>
                        The name of the pools the custom groups should be
                        unassigned from

Operand:
*<group-name1> <group-name2>
                        The name of the custom group to unassign

'*' denotes mandatory parameters.
```

token

token-search

```
Search for tokens that match the search criteria

Usage:
 vda token-search [-x | --parseable] [<search-criteria>]

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

Operand:
 <search-criteria>       The search criteria to be matched to the token id or
                         the user associated to the token

'*' denotes mandatory parameters.
```

token-create

```
Create a new token (smart card id)

Usage:
 vda token-create [-p <prop1>=<value1>,<prop2>=<value2> |
                 --prop=<prop1>=<value1>,<prop2>=<value2>] [-f <token-file> |
                 --file=<token-file>] [-w | --write]

 -?, --help              Print this help list

Options:
 -p <prop1>=<value1>,<prop2>=<value2>, --prop=<prop1>=<value1>,<prop2>=<value2>
                         The list of properties that define the token
 -f <token-file>, --file=<token-file>
                         A CSV file containing the properties of the tokens to
                         be created. Format of the file is: <token-id> <comment>
                         <userid>
 -w, --write             Overwrite existing tokens, option to be used with the
                         token-file option

Properties:
*token-id=<token-id>     The token id
 user=<user>             The DN or userid of the user associated to the token
 comment=<comment>       The comment for the token

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

'*' denotes mandatory parameters.
```

token-remove

```
Remove the specified tokens from the system

Usage:
 vda token-remove <tokenId1> <tokenId2>

 -?, --help              Print this help list

Operand:
*<tokenId1> <tokenId2>   The id of the tokens to remove

'*' denotes mandatory parameters.
```

token-getprops

```
List the properties of the token

Usage:
 vda token-getprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>]
                    <tokenId>

 -?, --help              Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                        The list of properties to get

Properties:
 user                   The user associated to the token
 comment                The comment for the token

Operand:
*<tokenId>              The id of the token

'*' denotes mandatory parameters.
```

token-setprops

```
Edit the properties of the token

Usage:
 vda token-setprops [-p <prop1>=<value1>,<prop2>=<value2> |
                    --properties=<prop1>=<value1>,<prop2>=<value2>] <tokenId>

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                        The list of properties to set

Properties:
 user=<user>            The DN or userid of the user associated to the token
```

```
 comment=<comment>       The comment for the token
 token-id=<token-id>     A new token id for the token

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

Operand:
*<tokenId>              The id of the token

'*' denotes mandatory parameters.
```

token-unsetprops

```
Remove the properties of the token

Usage:
 vda token-unsetprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>]
                      <tokenId>

 -?, --help             Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                       The list of properties to unset

Properties:
 user                  The user associated to the token
 comment               The comment for the token

Operand:
*<tokenId>             The id of the token

'*' denotes mandatory parameters.
```

token-show

```
Show the desktops available for the token

Usage:
 vda token-show [-x | --parseable] <tokenId>

 -?, --help             Print this help list

Options:
 -x, --parseable        Display output suitable for programmatic parsing.

Operand:
*<tokenId>              The id of the token

'*' denotes mandatory parameters.
```

token-desktops

```
Show the desktops assigned to the token

Usage:
 vda token-desktops [-x | --parseable] <tokenId1> <tokenId2>

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

Operand:
*<tokenId1> <tokenId2>   The id of the token

'*' denotes mandatory parameters.
```

token-assign

```
Assign tokens to pools or desktops

Usage:
 vda token-assign [-p <pool1>,<pool2> | --pool=<pool1>,<pool2>] [-d
                <desktop1>,<desktop2> | --desktop=<desktop1>,<desktop2>]
                <tokenId1> <tokenId2>

 -?, --help              Print this help list

Options:
 -p <pool1>,<pool2>, --pool=<pool1>,<pool2>
                      The name of the pools
 -d <desktop1>,<desktop2>, --desktop=<desktop1>,<desktop2>
                      The id of the desktops

Operand:
*<tokenId1> <tokenId2>   The id of the tokens to assign

'*' denotes mandatory parameters.
```

token-unassign

```
Unassign tokens from pools or desktops. If no pool or desktop is specified, all
assignments are removed from the tokens

Usage:
 vda token-unassign [-p <pool1>,<pool2> | --pool=<pool1>,<pool2>] [-d
                <desktop1>,<desktop2> | --desktop=<desktop1>,<desktop2>]
                <tokenId1> <tokenId2>
```

```
 -?, --help              Print this help list

Options:
 -p <pool1>,<pool2>, --pool=<pool1>,<pool2>
                         The name of the pools the tokens should be unassigned
                         from
 -d <desktop1>,<desktop2>, --desktop=<desktop1>,<desktop2>
                         The id of the desktops the token should be unassigned
                         from

Operand:
*<tokenId1> <tokenId2>   The id of the tokens to unassign

'*' denotes mandatory parameters.
```

pool

pool-list

```
List all pools

Usage:
 vda pool-list [-x | --parseable]

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

'*' denotes mandatory parameters.
```

pool-create

```
Create a new pool with the specified properties

Usage:
 vda pool-create [-p <prop1>=<value1>,<prop2>=<value2> |
                 --properties=<prop1>=<value1>,<prop2>=<value2>]

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                         The list of properties that define the pool

Properties:
*name=<name>             The name to identify the pool
*provider=<provider>     The name of the desktop provider for this pool
 comment=<comment>       The comment for the pool
 template=<template>     The id of the template to use to automatically populate
                         this pool
 name-pattern=<name-pattern>
                         The naming pattern to use for new cloned desktops. The
                         pattern is composed of a prefix and a '0' for each
```

```
                    digit of the sequential number
 system-preparation=<system-preparation>
                    The system prepartion to use for cloned desktops. For
                    VMware VirtualCenter pools, specify a custom spec name.
                    For xVM VirtualBox pools, specify a filepath to a
                    Sysprep file.
 preferred-size=<preferred-size>
                    The desired number of desktops in the pool
 free-size=<free-size>   The minimum number of available desktops in the pool
 max-size=<max-size>     The maximum number of desktops the pool can contain
 power-state=<power-state>
                    The power state of a desktop after cloning or
                    recycling. Default is 'off'. Possible values are 'on',
                    'off', 'suspended'
 assignment-type=<assignment-type>
                    The assignment policy for this pool. Default is
                    'flexible'. Possible values are 'personal' and
                    'flexible'
 idle-timeout=<idle-timeout>
                    The time a machine remains suspended before being made
                    available (in minutes). Default is 120 minutes
 synchronous-cloning=<synchronous-cloning>
                    The maximum number of parallel desktop cloning jobs.
                    Default is 5
 recycle-policy=<recycle-policy>
                    The action to take when recycling desktops. Default is
                    'snapshot'. Possible values are 'snapshot', 'reuse',
                    'delete'
 network-interface=<network-interface>
                    The type of network interface for xVM VirtualBox pool,
                    NAT or Host Interface. Possible values are 'nat' or
                    'host'. Valid only for xVM VirtualBox pools
 desktop-protocol=<desktop-protocol>
                    The type of desktop protocol for xVM VirtualBox pools,
                    only valid if the network interface is Host Interface.
                    Possible values are 'virtualbox' or 'windows' rdp
                    connector. Valid only for xVM VirtualBox pools

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

'*' denotes mandatory parameters.
```

pool-delete

```
Delete the pools and their desktops

Usage:
 vda pool-delete [-f | --force] [-d | --delete-desktops] <pool1> <pool2>

 -?, --help              Print this help list

Options:
 -f, --force             Delete the pool even if one of the desktops/templates
                    are in use
 -d, --delete-desktops   Delete the desktops also from backend

Operand:
*<pool1> <pool2>         The name of the pools to be deleted
```

```
'*' denotes mandatory parameters.
```

pool-getprops

```
List the properties of the pool

Usage:
 vda pool-getprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>] <name>

 -?, --help              Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                     The list of properties to get

Properties:
 comment                 The comment about the pool
 assignment-status       Whether desktop assignments from the pool are enabled
                     or disabled. Possible values are 'enabled' and
                     'disabled'
 assignment-type         The assignment policy for this pool. Possible values
                     are 'personal' and 'flexible'
 cloning-status          Whether desktop cloning is for this pool is enabled or
                     disabled. Possible values are 'enabled' and 'disabled'
 template                The name of the template used to automatically populate
                     this pool
 system-preparation-status
                     Whether system preparation is applied to cloned
                     desktops for this pool
 system-preparation      The system prepartion used for cloned desktops. For
                     VMware VirtualCenter pools, a custom spec name. For xVM
                     VirtualBox pools, a Sysprep file
 power-state             The power state of a desktop after cloning or
                     recycling. Possible values are 'on', 'off', 'suspended'
 name-pattern            The naming pattern to use for new cloned desktops. The
                     pattern is composed of a prefix and a '0' for each
                     digit of the sequential number
 preferred-size          The desired number of desktops in the pool
 free-size               The minimum number of available desktops in the pool
 max-size                The maximum number of desktops the pool can contain
 recycle-policy          The action to take when recycling desktops. Possible
                     values are 'snapshot', 'reuse', 'delete'
 idle-timeout            The time a machine remains suspended before being made
                     available (in minutes)
 synchronous-cloning     The maximum number of parallel desktop cloning jobs
 preferred-storage       The list of storages used when the pool creates new
                     desktops. Valid only for VMware VirtualCenter pools
 network-interface       The type of network interface for xVM VirtualBox pool,
                     NAT or Host Interface. Possible values are 'nat' or
                     'host'. Valid only for xVM VirtualBox pools
 desktop-protocol        The type of desktop protocol for xVM VirtualBox pools,
                     only valid if the network interface is Host Interface.
                     Possible values are 'virtualbox' or 'windows' rdp
                     connector. Valid only for xVM VirtualBox pools

Operand:
*<name>                  The name of the pool

'*' denotes mandatory parameters.
```

pool-setprops

```
Edit the properties of the pool

Usage:
 vda pool-setprops [-p <prop1>=<value1>,<prop2>=<value2> |
                --properties=<prop1>=<value1>,<prop2>=<value2>] <name>

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                     The list of properties to set

Properties:
 name=<name>             The name to identify the pool
 comment=<comment>       The comment about the pool
 assignment-type=<assignment-type>
                     The assignment policy for this pool. Possible values
                     are 'personal' and 'flexible'
 template=<template>     The id of the template used to automatically populate
                     this pool
 system-preparation-status=<system-preparation-status>
                     Whether system preparation is applied to cloned
                     desktops for this pool. Possibles values are 'enabled'
                     or 'disabled'
 system-preparation=<system-preparation>
                     The system prepartion used for cloned desktops. For
                     VMware VirtualCenter pools, a custom spec name. For xVM
                     VirtualBox pools, a Sysprep file.
 power-state=<power-state>
                     The power state of a desktop after cloning or
                     recycling. Possible values are 'on', 'off', 'suspended'
 name-pattern=<name-pattern>
                     The naming pattern to use for new cloned desktops. The
                     pattern is composed of a prefix and a '0' for each
                     digit of the sequential number
 preferred-size=<preferred-size>
                     The desired number of desktops in the pool
 free-size=<free-size>   The minimum number of available desktops in the pool
 max-size=<max-size>     The maximum number of desktops the pool can contain
 recycle-policy=<recycle-policy>
                     The action to take when recycling desktops. Possible
                     values are 'snapshot', 'reuse', 'delete'
 idle-timeout=<idle-timeout>
                     The time a machine remains suspended before being made
                     available (in minutes).
 synchronous-cloning=<synchronous-cloning>
                     The maximum number of parallel desktop cloning jobs
 preferred-storage=<preferred-storage1>;<preferred-storage2>
                     The list of storages used when the pool creates new
                     desktops. Semi-colon ';' separated list of storage IDs,
                     the IDs can be found using the provider-list-storage
                     command. Valid only for VMware VirtualCenter pools
 network-interface=<network-interface>
                     The type of network interface for xVM VirtualBox pool,
                     NAT or Host Interface. Possible values are 'nat' or
                     'host'. Valid only for xVM VirtualBox pools
 desktop-protocol=<desktop-protocol>
```

```
                    The type desktop protocol for xVM VirtualBox pools,
                    only valid if the network interface is Host Interface.
                    Possible values are 'virtualbox' or 'windows' rdp
                    connector. Valid only for xVM VirtualBox pools

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

Operand:
*<name>             The name of the pool

'*' denotes mandatory parameters.
```

pool-resetprops

```
Reset the properties of the pool to their default value

Usage:
 vda pool-resetprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>] <name>

 -?, --help          Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                    The list of properties to reset

Properties:
 assignment-type       The assignment policy for this pool
 power-state           The power state of a desktop after cloning or recycling
 name-pattern          The naming pattern to use for new cloned desktops
 recycle-policy        The action to take when recycling desktops
 idle-timeout          The time a machine remains suspended before being made
                    available
 synchronous-cloning   The maximum number of parallel desktop cloning jobs
 network-interface     The type of network interface for xVM VirtualBox pool,
                    NAT or Host Interface. Valid only for xVM VirtualBox
                    pools
 desktop-protocol      The type desktop protocol for xVM VirtualBox pools,
                    only valid if the network interface is Host Interface.
                    Valid only for xVM VirtualBox pools

Operand:
*<name>             The name of the pool

'*' denotes mandatory parameters.
```

pool-unsetprops

```
Unset the properties of the pool

Usage:
 vda pool-unsetprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>] <name>

 -?, --help          Print this help list
```

```
Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                    The list of properties to unset

Properties:
 template              The id of the template used to automatically populate
                    this pool

Operand:
*<name>                The name of the pool

'*' denotes mandatory parameters.
```

pool-show

```
Show  detailed information about the pool

Usage:
 vda pool-show [-x | --parseable] <pool>

 -?, --help             Print this help list

Options:
 -x, --parseable        Display output suitable for programmatic parsing.

Operand:
*<pool>                The name of the pool

'*' denotes mandatory parameters.
```

pool-desktops

```
List all desktops from the pool

Usage:
 vda pool-desktops [-x | --parseable] <pool>

 -?, --help             Print this help list

Options:
 -x, --parseable        Display output suitable for programmatic parsing.

Operand:
*<pool>                The name of the pool

'*' denotes mandatory parameters.
```

pool-vb-import

```
Import xVM VirtualBox desktops into the pool

Usage:
 vda pool-vb-import [-p <prop1>=<value1>,<prop2>=<value2> |
                 --properties=<prop1>=<value1>,<prop2>=<value2>] <pool>

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                        The list of properties that define the desktop

Properties:
*vdi-image=<vdi-image>   The name of the disk image file for this desktop. The
                        file must be in '/var/tmp'.
*xml-configuration=<xml-configuration>
                        The name of the XML configuration file for this
                        desktop. The file must be in '/var/tmp'.

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

Operand:
*<pool>                 The name of the pool where desktops are imported

'*' denotes mandatory parameters.
```

pool-vc-import

```
Import VMware VirtualCenter desktops into the pool

Usage:
 vda pool-vc-import [-d <desktop1>,<desktop2> | --desktop=<desktop1>,<desktop2>]
                 <pool>

 -?, --help              Print this help list

Options:
*-d <desktop1>,<desktop2>, --desktop=<desktop1>,<desktop2>
                        The UUID if the desktops to import

Operand:
*<pool>                 The name of the pool where desktops are imported

'*' denotes mandatory parameters.
```

pool-start

```
Start automatic cloning of desktops for the pools
```

```
Usage:
 vda pool-start <name1> <name2>

 -?, --help              Print this help list

Operand:
*<name1> <name2>         The name of the pools

'*' denotes mandatory parameters.
```

pool-stop

```
Stop automatic cloning of desktops for the pools

Usage:
 vda pool-stop <name1> <name2>

 -?, --help              Print this help list

Operand:
*<name1> <name2>         The name of the pools

'*' denotes mandatory parameters.
```

pool-enable

```
Enable users to connect to flexible desktops from the pools

Usage:
 vda pool-enable <name1> <name2>

 -?, --help              Print this help list

Operand:
*<name1> <name2>         The name of the pools

'*' denotes mandatory parameters.
```

pool-disable

```
Disable users from connecting to flexible desktops from the pools

Usage:
 vda pool-disable <name1> <name2>

 -?, --help              Print this help list

Operand:
*<name1> <name2>         The name of the pools
```

```
'*' denotes mandatory parameters.
```

pool-create-sysprep

```
Create a Sysprep file for the pool. Valid only for xVM VirtualBox pools

Usage:
 vda pool-create-sysprep [-p <prop1>=<value1>,<prop2>=<value2> |
                     --properties=<prop1>=<value1>,<prop2>=<value2>] <name>

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                     The list of properties to use to create the Sysprep
                     file

Properties:
 admin-password=<admin-password>
                     The Windows Administrator password
*key=<key>               The Windows license key
 workgroup=<workgroup>   The Windows workgroup name
 domain=<domain>         The Windows domain name
 domain-admin=<domain-admin>
                     The Windows domain Administrator name
 domain-password=<domain-password>
                     The Windows domain Administrator password

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

Operand:
*<name>                  The name of the pool

'*' denotes mandatory parameters.
```

desktop

desktop-delete

```
Delete the desktops

Usage:
 vda desktop-delete [-f | --force] [-r | --remove-vc] <desktop1> <desktop2>

 -?, --help              Print this help list

Options:
 -f, --force             Delete the pool even if one of the desktops/templates
                     are in use.
 -r, --remove-vc         Delete the desktops also from VMware VirtualCenter
```

```
Operand:
*<desktop1> <desktop2>   The id of the desktops to delete

'*' denotes mandatory parameters.
```

desktop-show

```
Show detailed properties for the desktops

Usage:
 vda desktop-show <desktop1> <desktop2>

 -?, --help              Print this help list

Operand:
*<desktop1> <desktop2>   The id of the desktops

'*' denotes mandatory parameters.
```

desktop-template

```
Convert the desktops to templates. Valid for xVM VirtualBox desktops only

Usage:
 vda desktop-template [-u | --undo] <desktop1> <desktop2>

 -?, --help              Print this help list

Options:
 -u, --undo              Convert the templates back to desktops

Operand:
*<desktop1> <desktop2>   The id of the desktops to convert

'*' denotes mandatory parameters.
```

desktop-start

```
Start the desktops

Usage:
 vda desktop-start <desktop1> <desktop2>

 -?, --help              Print this help list

Operand:
*<desktop1> <desktop2>   The id of the desktops to start

'*' denotes mandatory parameters.
```

desktop-stop

```
Stop the desktops

Usage:
 vda desktop-stop <desktop1> <desktop2>

 -?, --help              Print this help list

Operand:
*<desktop1> <desktop2>   The id of the desktops to stop

'*' denotes mandatory parameters.
```

provider

provider-list

```
List all desktop providers

Usage:
 vda provider-list [-x | --parseable]

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

'*' denotes mandatory parameters.
```

provider-vb-create

```
Create a new xVM VirtualBox desktop provider

Usage:
 vda provider-vb-create [-p <prop1>=<value1>,<prop2>=<value2> |
                        --properties=<prop1>=<value1>,<prop2>=<value2>]

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                         The list of properties that define the desktop provider

Properties:
*name=<name>             The name for the desktop provider
 comment=<comment>       The comment for the desktop provider
```

```
If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

'*' denotes mandatory parameters.
```

provider-vc-create

```
Create a new VMware VirtualCenter desktop provider

Usage:
 vda provider-vc-create [-p <prop1>=<value1>,<prop2>=<value2> |
                        --properties=<prop1>=<value1>,<prop2>=<value2>]

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                        The list of properties that define the desktop provider

Properties:
*name=<name>              The name for the desktop provider
*host=<host>              The hostname of the VMware VirtualCenter host
 port=<port>              The port to connect to the VMware VirtualCenter host.
                        The default is 443
*username=<username>      The username to authenticate to the VMware
                        VirtualCenter host
 password=<password>      the password to authenticate to the VMware
                        VirtualCenter host
 comment=<comment>        The comment for the desktop provider

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

'*' denotes mandatory parameters.
```

provider-delete

```
Delete the desktop providers

Usage:
 vda provider-delete <provider1> <provider2>

 -?, --help              Print this help list

Operand:
*<provider1> <provider2> The name of the desktop providers to delete

'*' denotes mandatory parameters.
```

provider-vb-getprops

```
List the properties of the xVM VirtualBox desktop provider

Usage:
 vda provider-vb-getprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>]
                          <provider>

 -?, --help              Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                        The list of properties to get

Properties:
 comment                 The comment for the desktop provider

Operand:
*<provider>              The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-vb-setprops

```
Edit the properties of the xVM VirtualBox desktop provider

Usage:
 vda provider-vb-setprops [-p <prop1>=<value1>,<prop2>=<value2> |
                          --properties=<prop1>=<value1>,<prop2>=<value2>]
                          <provider>

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                        The list of properties to edit

Properties:
 name=<name>             The new name for the desktop provider
 comment=<comment>       The comment for the desktop provider

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

Operand:
*<provider>              The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-vc-getprops

```
List the properties of the VMware VirtualCenter desktop provider

Usage:
 vda provider-vc-getprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>]
                          <provider>

 -?, --help              Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                        The list of properties to read from the desktop
                        provider

Properties:
 host                    The hostname of the VMware VirtualCenter host
 port                    The port to connect to the VMware VirtualCenter host.
 username                The username to authenticate to the VMware
                         VirtualCenter host
 certificate             The certificate for the VMware VirtualCenter server
 comment                 The comment for the desktop provider

Operand:
*<provider>              The name of the provider

'*' denotes mandatory parameters.
```

provider-vc-setprops

```
Edit the properties of the VMware VirtualCenter desktop provider

Usage:
 vda provider-vc-setprops [-p <prop1>=<value1>,<prop2>=<value2> |
                          --properties=<prop1>=<value1>,<prop2>=<value2>]
                          <provider>

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                        The list of properties to edit for the desktop provider

Properties:
 name=<name>              The name for the desktop provider
 host=<host>              The hostname of the VMware VirtualCenter host
 port=<port>              The port to connect to the VMware VirtualCenter host.
                         The default is 443
 username=<username>      The username to authenticate to the VMware
                         VirtualCenter host
 password=<password>      The password to authenticate to the VMware
                         VirtualCenter host
 password-prompt          Prompt for the password to authenticate to the VMware
                         VirtualCenter host
 certificate=<certificate>
                         Indicate to update the certificate for the VMware
                         VirtualCenter host. Possible value is 'update'
 comment=<comment>        The comment for the desktop provider
```

```
If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

Operand:
*<provider>             The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-show

```
Show detailed information about the desktop provider

Usage:
 vda provider-show <provider>

 -?, --help             Print this help list

Operand:
*<provider>             The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-list-hosts

```
List all hosts for the xVM VirtualBox desktop provider

Usage:
 vda provider-list-hosts [-x | --parseable] <provider>

 -?, --help             Print this help list

Options:
 -x, --parseable        Display output suitable for programmatic parsing.

Operand:
*<provider>             The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-add-host

```
Add a host to the xVM VirtualBox desktop provider

Usage:
 vda provider-add-host [-p <prop1>=<value1>,<prop2>=<value2> |
                    --properties=<prop1>=<value1>,<prop2>=<value2>]
                    <provider>
```

```
 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                        The list of properties that define the host

Properties:
*host=<host>             The hostname
 port=<port>             The port for the SSL connection to the host. Default is
                        443
 sshport=<sshport>       The port for the SSH connection to the host. Default is
                        22
*username=<username>     The username to authenticate to the host
 password=<password>     The password to authenticate to the host

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

Operand:
*<provider>              The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-remove-host

```
Remove the hosts from the xVM VirtualBox desktop provider

Usage:
 vda provider-remove-host [-h <host1>,<host2> | --host=<host1>,<host2>]
                          <provider>

 -?, --help              Print this help list

Options:
*-h <host1>,<host2>, --host=<host1>,<host2>
                        The list of hosts to remove from the desktop provider

Operand:
*<provider>              The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-enable-host

```
Enable the hosts for the xVM VirtualBox desktop provider. Enabled hosts are used
for automated cloning

Usage:
 vda provider-enable-host [-h <host1>,<host2> | --host=<host1>,<host2>]
                          <provider>

 -?, --help              Print this help list
```

```
Options:
*-h <host1>,<host2>, --host=<host1>,<host2>
                        The list of hosts to enable

Operand:
*<provider>             The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-disable-host

```
Disable the hosts for the xVM VirtualBox desktop provider. Disabled hosts are
not used for automated cloning

Usage:
 vda provider-disable-host [-h <host1>,<host2> | --host=<host1>,<host2>]
                           <provider>

 -?, --help             Print this help list

Options:
*-h <host1>,<host2>, --host=<host1>,<host2>
                        The list of hosts to disable

Operand:
*<provider>             The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-list-storage

```
List all storages for the desktop provider

Usage:
 vda provider-list-storage [-x | --parseable] <provider>

 -?, --help             Print this help list

Options:
 -x, --parseable        Display output suitable for programmatic parsing.

Operand:
*<provider>             The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-add-storage

```
Add a storage to the xVM VirtualBox desktop provider
```

```
Usage:
 vda provider-add-storage [-p <prop1>=<value1>,<prop2>=<value2> |
                          --properties=<prop1>=<value1>,<prop2>=<value2>]
                          <provider>

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --properties=<prop1>=<value1>,<prop2>=<value2>
                        The list of properties that define the storage

Properties:
*host=<host>             The hostname of the storage server
 port=<port>             The port to connect to the storage. Default is 22.
*username=<username>     The username to authenticate to the storage
 password=<password>     The password to authenticate to the storage
*zfspool=<zfspool>       The name of the ZFS pool to use on the storage

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

Operand:
*<provider>              The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-remove-storage

```
Remove the storage from the xVM VirtualBox desktop provider

Usage:
 vda provider-remove-storage [-h <host> | --host=<host>] [-z <zfspool> |
                             --zfspool=<zfspool>] <provider>

 -?, --help              Print this help list

Options:
*-h <host>, --host=<host>
                        The hostname of the storage server
*-z <zfspool>, --zfspool=<zfspool>
                        The name of the ZFS pool of the storage

Operand:
*<provider>              The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-list-templates

```
List the templates for the desktop provider

Usage:
 vda provider-list-templates [-x | --parseable] <provider>
```

```
 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

Operand:
*<provider>              The name of the desktop provider

'*' denotes mandatory parameters.
```

provider-list-unmanaged

```
List the desktops from the VMware VirtualCenter that are not managed by any
desktop provider

Usage:
 vda provider-list-unmanaged [-x | --parseable] <provider>

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

Operand:
*<provider>              The name of the desktop provider

'*' denotes mandatory parameters.
```

directory

directory-add

```
Add the user directory configuration to the system

Usage:
 vda directory-add [-p <prop1>=<value1>,<prop2>=<value2> |
                --property=<prop1>=<value1>,<prop2>=<value2>]

 -?, --help              Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --property=<prop1>=<value1>,<prop2>=<value2>
                         The list of properties that define the user directory

Properties:
*auth-type=<auth-type>   The type of authentication to be used. Possible values
                         are 'anonymous', 'simple', 'secure', 'kerberos', and
                         'publickey'
 hosts=<hosts1>;<hosts2> The host name or IP address and port number of the LDAP
                         server, separated by a colon ':'. The port number may
                         be omitted, if so, 389 is the default for anonymous and
                         simple authentication, 636 is the default for secure
                         authentication. May be a semi-colon ';' separated list
```

```
                    of hosts. Property required with anonymous, simple and
                    secure authentication
 basedn=<basedn>    The base DN to restrict the part of the directory used
                    to search for users. Valid only with anonymous, simple
                    and secure authentication
 addomain=<addomain>  The Active Directory domain name. Valid only for
                    kerberos and publickey authentication
 username=<username>  The username to authenticate to the user directory
                    with. Required with simple, secure and kerberos
                    authentication
 password=<password>  The password to authenticate to the user directory
                    with. Required with simple, secure and kerberos
                    authentication

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

'*' denotes mandatory parameters.
```

directory-remove

```
Remove the user directory configuration from the system

Usage:
 vda directory-remove [-f | --force]

 -?, --help         Print this help list

Options:
 -f, --force        Force removal of the user directory configuration when
                    the user directory is in use, because some users are
                    assigned to desktops or associated to tokens

'*' denotes mandatory parameters.
```

directory-getprops

```
List the properties of the user directory

Usage:
 vda directory-getprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>]

 -?, --help         Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                    The list of properties to get

Properties:
 auth-type          The type of authentication to be used. Possible values
                    are 'anonymous', 'simple', 'secure', 'kerberos', and
                    'publickey'
 hosts              The host name or IP address and port number of the LDAP
                    server, separated by a colon ':'. May be a semi-colon
```

```
                    ';' separated list of hosts
 basedn             The base DN to restrict the part of the directory used
                    to search for users. Valid only with anonymous, simple
                    and secure authentication
 addomain           The Active Directory domain name. Valid only for
                    kerberos and publickey authentication
 username           The username to authenticate to the user directory
                    with. Required with simple, secure and kerberos
                    authentication

'*' denotes mandatory parameters.
```

directory-setprops

```
Edit the properties of the user directory

Usage:
 vda directory-setprops [-p <prop1>,<prop2> | --properties=<prop1>,<prop2>]

 -?, --help         Print this help list

Options:
*-p <prop1>,<prop2>, --properties=<prop1>,<prop2>
                    The list of properties to set

Properties:
*auth-type=<auth-type>  The type of authentication to be used. Possible values
                    are 'anonymous', 'simple', 'secure', 'kerberos', and
                    'publickey'
 hosts=<hosts1>;<hosts2> The host name or IP address and port number of the LDAP
                    server, separated by a colon ':'. The port number may
                    be omitted, if so, 389 is the default for anonymous and
                    simple authentication, 636 is the default for secure
                    authentication. May be a semi-colon ';' separated list
                    of hosts. Property required with anonymous, simple and
                    secure authentication
 basedn=<basedn>    The base DN to restrict the part of the directory used
                    to search for users. Valid only with anonymous, simple
                    and secure authentication
 addomain=<addomain>  The Active Directory domain name. Valid only for
                    kerberos and publickey authentication
 username=<username>  The username to authenticate to the user directory
                    with. Required with simple, secure and kerberos
                    authentication
 password=<password>  The password to authenticate to the user directory
                    with. Required with simple, secure and kerberos
                    authentication

'*' denotes mandatory parameters.
```

directory-show

```
Show the configuration details for the user directory

Usage:
```

```
vda directory-show

-?, --help              Print this help list
```

settings

settings-getprops

```
List global settings

Usage:
 vda settings-getprops [-p <prop1>,<prop2> | --property=<prop1>,<prop2>]

 -?, --help              Print this help list

Options:
*-p <prop1>,<prop2>, --property=<prop1>,<prop2>
                        The list of global settings to read

Properties:
 clientauthentication    Determines whether clients are authenticated
 vbox.connect.timeout    Connection timeout to the xVM VirtualBox web service,
                        in milliseconds
 vbox.request.timeout    Request timeout to the xVM VirtualBox web service, in
                        milliseconds
 ldap.user.object.filter LDAP filter used to identify objects of type user
 ldap.user.search.filter LDAP filter used to search for users according a search
                        criteria. Searches for users can be done using the
                        user-search command or in the web administration
                        console. $SEARCH_STRING is the placeholder for the
                        search criteria
 ldap.user.member.attributes
                        List of comma separated LDAP attributes on a user
                        object storing the groups the user is a member of
 ldap.userid.attributes  List of comma separated LDAP attributes storing the
                        userid value for user objects. This is used to find a
                        user given its userid
 ldap.group.object.filter
                        LDAP filter used to identify objects of type group
 ldap.group.search.filter
                        LDAP filter used to search for groups according a
                        search criteria. Searches for groups can be done using
                        the user-search command or in the web administration
                        console. $SEARCH_STRING is the placeholder for the
                        search criteria
 ldap.group.member.attributes
                        List of comma separated LDAP attributes on a group
                        object storing the users member of the group
 ldap.group.short.attributes
                        List of comma separated LDAP attributes on a group
                        object storing the information for short membership
 ldap.container.object.filter
                        LDAP filter used to identify objects of type container.
                        Containers can be selected as root for custom group
                        filters in the web administration console
 ldap.container.search.filter
                        LDAP filter used by the web administration console to
                        search for containers according a search criteria, when
```

```
                    selecting a root for a custom group filter.
                    $SEARCH_STRING is the placeholder for the search
                    criteria
 ldap.default.attributes List of LDAP separated attributes loaded in the cache
                    when looking up an object

'*' denotes mandatory parameters.
```

settings-setprops

```
Edit global settings

Usage:
 vda settings-setprops [-p <prop1>=<value1>,<prop2>=<value2> |
                       --property=<prop1>=<value1>,<prop2>=<value2>]

 -?, --help            Print this help list

Options:
*-p <prop1>=<value1>,<prop2>=<value2>, --property=<prop1>=<value1>,<prop2>=<value2>
                    The list of global settings to edit

Properties:
 clientauthentication=<clientauthentication>
                    Determines whether clients are authenticated. Possible
                    values are 'enabled' and 'disabled'
 vbox.connect.timeout=<vbox.connect.timeout>
                    Connection timeout to the xVM VirtualBox web service,
                    in milliseconds
 vbox.request.timeout=<vbox.request.timeout>
                    Request timeout to the xVM VirtualBox web service, in
                    milliseconds
 ldap.user.object.filter=<ldap.user.object.filter>
                    LDAP filter used to identify objects of type user
 ldap.user.search.filter=<ldap.user.search.filter>
                    LDAP filter used to search for users according a search
                    criteria. Searches for users can be done using the
                    user-search command or in the web administration
                    console. $SEARCH_STRING is the placeholder for the
                    search criteria
 ldap.user.member.attributes=<ldap.user.member.attributes>
                    List of comma separated LDAP attributes on a user
                    object storing the groups the user is a member of
 ldap.userid.attributes=<ldap.userid.attributes>
                    List of comma separated LDAP attributes storing the
                    userid value for user objects. This is used to find a
                    user given its userid
 ldap.group.object.filter=<ldap.group.object.filter>
                    LDAP filter used to identify objects of type group
 ldap.group.search.filter=<ldap.group.search.filter>
                    LDAP filter used to search for groups according a
                    search criteria. Searches for groups can be done using
                    the user-search command or in the web administration
                    console. $SEARCH_STRING is the placeholder for the
                    search criteria
 ldap.group.member.attributes=<ldap.group.member.attributes>
                    List of comma separated LDAP attributes on a group
                    object storing the users member of the group
 ldap.group.short.attributes=<ldap.group.short.attributes>
                    List of comma separated LDAP attributes on a group
```

```
                    object storing the information for short membership
 ldap.container.object.filter=<ldap.container.object.filter>
                    LDAP filter used to identify objects of type container.
                    Containers can be selected as root for custom group
                    filters in the web administration console
 ldap.container.search.filter=<ldap.container.search.filter>
                    LDAP filter used by the web administration console to
                    search for containers according a search criteria, when
                    selecting a root for a custom group filter.
                    $SEARCH_STRING is the placeholder for the search
                    criteria
 ldap.default.attributes=<ldap.default.attributes>
                    List of LDAP separated attributes loaded in the cache
                    when looking up an object

If a property value contains a comma (','), use the double-quoting syntax for
the value, such as <prop>='"<value>"' (single-quote ' followed by double-quote "
to open, double-quote " followed by single quote ' to close).

'*' denotes mandatory parameters.
```

settings-resetprops

```
Reset global settings to their default value

Usage:
 vda settings-resetprops [-p <prop1>,<prop2> | --property=<prop1>,<prop2>]

 -?, --help             Print this help list

Options:
*-p <prop1>,<prop2>, --property=<prop1>,<prop2>
                    The list of global settings to reset

Properties:
 clientauthentication    Determines whether clients are authenticated
 vbox.connect.timeout    Connection timeout to the xVM VirtualBox web service,
                    in milliseconds
 vbox.request.timeout    Request timeout to the xVM VirtualBox web service, in
                    milliseconds
 ldap.user.object.filter LDAP filter used to identify objects of type user
 ldap.user.search.filter LDAP filter used to search for users according a search
                    criteria. Searches for users can be done using the
                    user-search command or in the web administration
                    console. $SEARCH_STRING is the placeholder for the
                    search criteria
 ldap.user.member.attributes
                    List of comma separated LDAP attributes on a user
                    object storing the groups the user is a member of
 ldap.userid.attributes  List of comma separated LDAP attributes storing the
                    userid value for user objects. This is used to find a
                    user given its userid
 ldap.group.object.filter
                    LDAP filter used to identify objects of type group
 ldap.group.search.filter
                    LDAP filter used to search for groups according a
                    search criteria. Searches for groups can be done using
                    the user-search command or in the web administration
                    console. $SEARCH_STRING isthe placeholder for the
                    search criteria
```

```
ldap.group.member.attributes
                    List of comma separated LDAP attributes on a group
                    object storing the users member of the group
ldap.group.short.attributes
                    List of comma separated LDAP attributes on a group
                    object storing the information for short membership
ldap.container.object.filter
                    LDAP filter used to identify objects of type container.
                    Containers can be selected as root for custom group
                    filters in the web administration console
ldap.container.search.filter
                    LDAP filter used by the web administration console to
                    search for containers according a search criteria, when
                    selecting a root for a custom group filter.
                    $SEARCH_STRING is the placeholder for the search
                    criteria
ldap.default.attributes List of LDAP separated attributes loaded in the cache
                    when looking up an object

'*' denotes mandatory parameters.
```

job

job-list

```
List the existing jobs

Usage:
 vda job-list [-x | --parseable]

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

'*' denotes mandatory parameters.
```

job-show

```
Show the job details

Usage:
 vda job-show [-x | --parseable] <job>

 -?, --help              Print this help list

Options:
 -x, --parseable         Display output suitable for programmatic parsing.

Operand:
*<job>                   The id of the jobs

'*' denotes mandatory parameters.
```

job-wait

```
Wait until the job ends

Usage:
 vda job-wait [-t <timeout> | --timeout=<timeout>] <job>

 -?, --help              Print this help list

Options:
 -t <timeout>, --timeout=<timeout>
                         Timeout in seconds to wait

Operand:
*<job>                   The id of the job

'*' denotes mandatory parameters.
```

The vda-webadmin Command

This page last changed on Mar 20, 2009 by katell.

Command

```
/opt/SUNWvda/sbin/vda-webadmin
```

Usage

```
Usage: vda-webadmin SUBCOMMAND
 or: vda-webadmin OPTIONS

Manages the Web server hosting the Sun Virtual Desktop Infrastructure Web Administration.

The accepted values for SUBCOMMAND are:

start   Starts the server
stop    Stops the server
restart Stop followed by start
status  Display status of server
enable  Enable the server to start at system boot
disable Disable the server from starting at system boot

The accepted values for OPTIONS are:

-h      Display this help list.
```

Man Page

```
Sun Virtual Desktop Infrastructure Administration
                                    vda-webadmin(1M)



NAME
    vda-webadmin - Sun Virtual Desktop Infrastructure Web
    Administration tool

SYNOPSIS
    /opt/SUNWvda/sbin/vda-webadmin start

    /opt/SUNWvda/sbin/vda-webadmin stop

    /opt/SUNWvda/sbin/vda-webadmin restart

    /opt/SUNWvda/sbin/vda-webadmin status

    /opt/SUNWvda/sbin/vda-webadmin enable

    /opt/SUNWvda/sbin/vda-webadmin disable

    /opt/SUNWvda/sbin/vda-webadmin -h

DESCRIPTION
```

The Sun Virtual Desktop Infrastructure Web Administration tool allows administrators control and configure the brokering of desktop sessions. vda-webadmin may be used to control the web administration service used by the tool.

SUBCOMMANDS

The following subcommands are supported.

start Start the service

stop Stop the service

restart
Restart the service

status
Query and print the service status

enable
Enable the service to start at system boot

enable
Disable the service from starting at system boot

OPTIONS

-h Print a usage message

EXIT STATUS

The following exit values are returned.

0 Success

non zero
Failure

ATTRIBUTES

See attributes(5) for descriptions of the following attributes:

Attribute Type	Attribute Value
Availability	SUNWvda-admin
Interface Stability	Uncommitted

SEE ALSO

vda-config(1M), vda-service(1M)

This page last changed on Jun 16, 2009 by thomaspfohe.

Setting Up a Storage Server

A Sun xVM VirtualBox virtualization platform requires a storage server to house the virtual machines.

The following servers can be used as storage by VDI 3.0:

- Any Sun Storage 7000 Unified Storage System (the 7210 or 7410 are best suited for production)
- Any server running the OpenSolaris 2008.11 operating system (best suited for demo purposes)

There are storage limitations with SPARC VDI hosts.
Please see the Release Notes for more information.

- How to Set Up a Sun Storage 7000 Unified Storage System
- How to Set Up an OpenSolaris Storage Server
- How to Set Up a Solaris Storage Server

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This page last changed on Jun 18, 2009 by thomaspfohe.

How to Set Up a Solaris Storage Server

Each virtual disk is represented by a ZFS volume. The ZFS volumes are stored in a ZFS pool and accessed by xVM VirtualBox via iSCSI. The management of the ZFS volumes is done by Sun VDI 3.0 and requires ssh root access to the ZFS storage server and a ZFS pool on that ZFS storage server.

A Solaris storage server requires the following preparation:

Steps

1. Install the operating system.
   Install Solaris 10 update 7. The Solaris installer offers you the option to use UFS or ZFS for the root file system. It is recommended that the storage server contains multiple disks and the other disks are exclusively used for the VDI ZFS pools. In that case either of the two choices is fine. If there is only one disk available choose ZFS.
2. Enable root access.
   To enable root access:
   a. Edit the file `/etc/ssh/sshd_config` and change the line `PermitRootLogin no` to `PermitRootLogin yes`
   b. Restart the SSHD service to implement the changes you made to the sshd_config file:

```
# svcadm restart ssh
```

3. Create a ZFS pool.
   Creating a pool is an optional action. The Solaris installer has already created a pool named 'rpool' if 'ZFS' has been selected during installation. This pool contains the root file systems and can also be used by Sun VDI 3.0. Creating a dedicated pool is recommended to separate the Sun VDI 3.0 data from the OpenSolaris/Solaris file systems.
   To create a ZFS pool, use the following command:

```
# zpool create <pool name> <disk1> <disk2> <disk3> ...
```

4. Enable iSCSI access.
   Execute the following CLI command as root on the Solaris storage server:

```
# svcadm enable svc:/system/iscsitgt:default
```


	Previous Page How to Set Up an OpenSolaris Storage Server		Up One Page Level Setting Up a Storage Server		

This page last changed on Jun 18, 2009 by thomaspfohe.

How to Set Up an OpenSolaris Storage Server

Each virtual disk is represented by a ZFS volume. The ZFS volumes are stored in a ZFS pool and accessed by xVM VirtualBox via iSCSI. The management of the ZFS volumes is done by Sun VDI 3.0 and requires ssh root access to the ZFS storage server and a ZFS pool on that ZFS storage server.

The ZFS storage host must be an x86 platform running OpenSolaris 2008.11 (64-bit). The ZFS server requires the following preparation.

Steps

1. Install the operating system.
   Install OpenSolaris 2008.11. We highly recommend to install the release version (101b). The OpenSolaris installer offers you the option to create a user. It is important to create such a user during the installation process otherwise several steps of the configuration will fail.
2. Enable root access.
   To enable root access:
   a. Log into the ZFS storage host. If you are working remotely, use the newly-created user account:

```
$ ssh <username>@<ZFS_Storage_Host>
```

   b. Become superuser:

```
$ su
```

   c. Transform the root role to the root user:

```
# rolemod -K type=normal root
```

   d. Edit the file `/etc/ssh/sshd_config` and change the line `PermitRootLogin no` to `PermitRootLogin yes`
   e. Restart the SSHD service to implement the changes you made to the sshd_config file:

```
# svcadm restart ssh
```

3. Create a ZFS pool.
   Creating a pool is an optional action. The OpenSolaris/Solaris installer has already created a pool named 'rpool'. This pool contains the OpenSolaris/Solaris file systems and can also be used by Sun VDI 3.0. Creating a dedicated pool is recommended to separate the Sun VDI 3.0 data from the OpenSolaris/Solaris file systems.
   To create a ZFS pool, use the following command:

```
# zpool create <pool name> <disk1> <disk2> <disk3> ...
```

4. Install the iSCSI packages.

Install the iSCSI packages on the storage server. You can add the packages from the command line of the storage server (Internet connectivity is required):

```
pkg install SUNWiscsi
pkg install SUNWiscsitgt
```

5. Enable iSCSI access.
   Execute the following CLI command as root on the Solaris storage server:

```
# svcadm enable svc:/system/iscsitgt:default
```


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This page last changed on Apr 03, 2009 by stephanielewellen.

How to Set Up a Sun Storage 7000 Unified Storage System

Sun VDI 3 supports the Sun Storage 7110, 7210 and 7410 Unified Storage Systems. A Sun Unified Storage System requires the following preparation:

Steps

1. Set up the system.
   Follow the instructions provided by the "Quick Setup" manual of the Sun Unified Storage System.
2. Update the Sun Unified Storage System Software.
   Updating the Sun Unified Storage System Software is an optional action. We recommend to update the system to version ak-2008.11.20.1.0,1-1.5 or higher. This version contains important performance features.
3. Create a project.
   Creating a project is an optional action. There is always a project called 'default' which can be used by Sun VDI 3.

Do not update the software of a Sun Storage 7000 Unified Storage System after it has been added to VDI 3.
Please see the Release Notes for more information.

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Setting Up a Storage Server

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How to Set Up an OpenSolaris Storage Server

This page last changed on Jun 08, 2009 by stephanielewellen.

Setting Up a Sun xVM VirtualBox Server

The xVM VirtualBox server should be an x86 platform running Solaris 10 Update 6 (64-bit).

Before You Begin

Make sure that the Solaris swap space is adequate, otherwise your installation will fail.
Solaris hosts running xVM VirtualBox must have swap space equal to, or greater than the host's physical memory size. See the Release Notes for detailed information.

Steps

1. Obtain the root user:

```
$ su
```

2. Unzip the VirtualBox archive:

```
# unzip vbox_2.0.zip
```

3. Change to the expanded directory:

```
# cd vbox_2.0
```

4. Execute the installation:

```
# ./vb-install
```


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This page last changed on Jun 08, 2009 by stephanielewellen.

Defining Virtual Machine Templates in Sun xVM VirtualBox

Sun VDI presents users with easy access to their virtual desktops, instances of any desktop operating system, executed in a virtual machine. You can manually create virtual machines, or you can configure Sun VDI to create, or clone additional virtual machines automatically from a template.

Before You Begin

After executing the Sun xVM VirtualBox for VDI 3 installer, you can create your first virtual machine. To simplify the installation, it is recommended that you use the installation of Sun xVM VirtualBox for VDI 3 (described in the previous section) to create the first virtual machine template.
You can also install a Sun xVM VirtualBox for VDI locally (on your laptop), and create virtual machines there. Make sure to download xVM VirtualBox version 2.0.8.

Steps

1. Launch the Sun xVM VirtualBox GUI.

```
# /opt/VirtualBox/VirtualBox
```

   a. Click New to launch the New Virtual Machine wizard.
   b. The wizard will guide you through virtual machine creation.
      Be sure to choose the appropriate hard-disk and RAM space for the desired configuration (4 GB hard-disk and 384 MB RAM are recommended).
      For more information about virtual machine system requirements, refer to Chapter 3: Starting out with xVM VirtualBox in the Sun xVM VirtualBox User Manual.
2. Install the operating system.
   At this point you have an empty virtual machine, equivalent to a PC without an OS installed. The next step is to choose the boot medium for the OS and install it.
   a. Select the newly created virtual machine and click Settings.
   b. Open the Advanced tab in the Settings GUI.
   c. Ensure that CD/DVD-ROM is set as the first boot device.
   d. Select the CD/DVD-ROM option in the left panel of the Settings dialog.
   e. Check the Mount CD/DVD Drive checkbox.
      i. Select the Host CD/DVD Drive radio button to install the OS from the CD-ROM drive.
      ii. Select the ISO Image File radio button, with the appropriate path, to install the OS from a previously downloaded ISO file.
   f. Click OK to save the changes and close the Settings GUI.
      At this point the new virtual machine must be started to trigger the OS installation.
   g. Select the new virtual machine and click Start.
   h. Follow the installation prompts, or seek further installation details from the OS manufacturer.
3. Install the xVM VirtualBox Guest Additions.
   After the OS is installed, the xVM VirtualBox Guest Additions must be installed.
   a. With the virtual machine running and fully booted, click the Devices menu, then select Install Guest Additions.
      This will launch the xVM VirtualBox Guest Additions installer inside the virtual machine.
   b. Install the Guest Additions according to the instructions in the wizard and reboot when asked.
   c. Install all additional software for the desired virtual machine template.
4. Install System Preparation (recommended).
   If you later want to take advantage of desktop cloning, then it is often necessary to customize the identity and domain settings of Windows XP after a clone has been created from a template. This can be automated using Sysprep. However, the virtual machine that should be used as template must be prepared following the steps below:
   a. Download the appropriate Sysprep CAB from Microsoft and unpack the contents into the directory `C:\Sysprep`
      - Windows XP Service Pack 2 Deployment Tools.
      - Windows XP Service Pack 3 Deployment Tools.
   b. Execute Sysprep. This will shutdown the virtual machine.

```
# C:\Sysprep\sysprep.exe \-mini \-reseal \-quiet \-activated
```

If you plan on using Sysprep for cloned virtual machines, always test your configuration first. For example, if your virtual machines will be joining a Windows domain ensure that the template can be manually added to the domain. In doing so any DNS or other potential problems can be rectified early on. Detecting the root cause of failures during Sysprep can be tedious so ensure things work correctly with the template first!

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This page last changed on Apr 03, 2009 by stephanielewellen.

Setting Up a VMware ESX Server

VMware ESX server is a Linux-based appliance that provides a virtualization layer abstracting CPU resources, storage, and memory of a physical host into multiple virtual machines.

To install the software, just power on the host machine with the VMware ESX Server CD in the CD drive. If available, you can also use remote management applications such as the Integrated Lights Out Manager (ILOM) (available with the Sun Fire x4100 server) to drive the installation.

During installation, you can safely rely on the suggested default settings.

After installation, make sure that you can access the VMware ESX server through the VMware Virtual Infrastructure Client and that the license is set properly.

For full details see Installing ESX Server in the VMware ESX Server 3 and VirtualCenter Installation Guide.

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This page last changed on Apr 03, 2009 by stephanielewellen.

Setting Up a VMware vCenter Server

VMware vCenter provides central management of several ESX servers. It installs on a physical or virtual Windows machine. For quick evaluation you can simply install it on a virtual machine inside your ESX server. The guest OS can be Microsoft Windows XP or Microsoft Windows Server 2003 with 1 GB of RAM and an 8 GB hard-disk.

For full details, see Installing VMware Infrastructure Management in the VMware ESX Server 3 and VirtualCenter Installation Guide.

Steps

Once VMware vCenter is installed, complete the following configuration steps:

1. Add the VMware ESX server as a managed host.
   In VMware vCenter select the datacenter where the host will be added. In the menu bar go to Inventory > Datacenter > Add Host, and follow the instructions.
2. Install the Windows System Preparation Tools for Windows XP.
   They can be downloaded from Microsoft here:
   - Windows XP Service Pack 2 Deployment Tools.
   - Windows XP Service Pack 3 Deployment Tools.
     Extract the Sysprep tools from the CAB into the directory:
     `C:\Documents and Settings\All Users\VMWare\VMWare VirtualCenter\sysprep\xp`
     For further instructions see Appendix B Installing the Microsoft Sysprep Tools in the VMware Basic System Administration Guide.
     Sun VDI takes advantage of the web services API provided by the VMware Infrastructure SDK to communicate (via HTTPS) with VMware vCenter. Thus, make sure that:
   - VMware vCenter's Webaccess component is installed and configured.
   - Port 443 (HTTPS) is enabled in any firewall that may be active on the system.
     As a simple test, point your Web browser to `https://<localhost>/mob`. If everything works correctly, you will have access to the VMware Infrastructure SDK browser (after providing the VMware Admin user name and password).

> The previous version of Sun VDI required the installation of a Virtual Desktop Connector agent on the VMware vCenter host. Starting with Sun VDI 3, this step is no longer necessary.

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This page last changed on Apr 03, 2009 by stephanielewellen.

Defining Virtual Machine Templates in VMware vCenter

Sun VDI presents users with easy access to their virtual desktops, typically instances of Microsoft Windows XP executed in a virtual machine. You can manually create virtual machines, or you can configure Sun VDI to create, or clone additional virtual machines automatically from a template.

Steps

1. Create a virtual machine with Microsoft Windows XP.
   It is assumed that the process of creating virtual machines is already largely known. So, only a few important settings are highlighted. For full details see Creating Virtual Machines in VMware Basic System Administration.
   Follow these recommendations:
   - Use Microsoft Windows XP SP3 as the baseline. The license must be a volume license.
   - Define one disk. It should be as small as possible, for example, 4 GB is a good size. The size impacts system performance and overall storage consumption.
   - RAM also should be as small as possible (384 MB is recommended).
   - A single CPU should be enough.
   - One network interface is needed. It should be configured for DHCP. Ensure that the virtual machine gets a valid IP after powering on.
2. Install the VMware Tools.
   Once you have created a virtual machine with Microsoft Windows XP installed on it, install VMware Tools. VMware Tools is a suite of utilities that enhances the performance of the virtual machine's guest operating system and improves management of the virtual machine. Installing VMware Tools in the guest operating system is vital.
   The installation can be easily triggered from within the VMware Virtual Infrastructure Client (VIC): Right-click the virtual machine and choose Install VMware Tools. For additional details see Installing and Upgrading VMware Tools in VMware Basic System Administration.
3. Enable Remote Desktop Access.
   RDP is the main access method to the Microsoft Windows XP desktop. By default, this access method is disabled and rejected through the firewall. To enable remote desktop access, launch VMware's Virtual Infrastructure Client, with your virtual machine still powered on and logged in, then follow these steps:
   a. Open a console for the VM.
   b. In the console, click the virtual machine's Start button.
   c. Right-click on My Computer in the start menu, and select Properties.
   d. In the System Properties window, select the Remote tab.
   e. Under Remote Desktop, check the box marked Enable Remote Desktop on this computer so that this item is selected.
   f. Make sure that the desired users have been granted remote access rights.
   g. Click OK to save the settings and close the dialog.
      Before you try to connect to a virtual desktop remotely, ensure that no firewall blocks the remote access: Make sure that port 3389 is enabled in any firewall that may be active on the system.
4. Install the Sun VDI Tools.
   Sun VDI 3.0 has a tools component notifies the VDI service when a desktop is in use and handles RDP connections when the guest OS initiates Standby. The VDI Tools must be installed on the guest operating system for recycling to work correctly and so that the RDP connection is correctly closed when the virtual machine goes into Standby or Suspend mode.
   a. Locate the `vda-tools.msi` installer file in the directory where you unzipped the VDI archive.
      The `vda-tools.msi` is located in the `./image/vda_3.0/Windows/Packages/` subdirectory. Copy the installer to the desired VM.
   b. Within the VM's console double-click the installer and follow the prompts to complete installation.
      The default target location for the VDI Tools on Windows is `C:\Program Files\Sun\Virtual Desktop Access\Tools`.
   c. The VM services list should now contain a new service named Sun VDI Tools, running and set to start automatically.
5. Configure power management.
   An unused virtual desktop is treated like a laptop that is unplugged to save power; it is suspended automatically to release all its CPU and memory consumption. Suspending virtual machines also affects how they are recycled. A virtual machine will be recycled if it is has been suspended for longer than the recycling idle timeout period, even if the user has not logged out of the machine.

The Power Options for Microsoft Windows XP play an important role in the suspend behavior of the VM. The timeout before a virtual machine goes into standby should be set to an appropriate value.

a. Open the Virtual Infrastructure Client.
b. Select the desired virtual machine and open the console.
c. Log into the virtual machine.
d. Go to Start > Control Panel. Open Power Options.
e. Set the System Standby time to the desired value.
f. Verify that the guest OS actually enters standby as configured.
   Virtual machines should be configured to be suspended when the OS goes into standby. This is enabled in VMware vCenter.
g. Open the Virtual Infrastructure Client.
h. Right-click on the desired virtual machine and go to Edit Settings
i. Go to Options > Power Management, select Suspend the Virtual Machine.

6. Create a virtual machine template.
   You can clone additional virtual machines manually, or let Sun VDI clone them automatically from a template. Any existing virtual machine can be converted into a template:
   a. Open the Virtual Infrastructure Client.
   b. Right-click the desired virtual machine and power down the machine.
   c. From the commands area or the pop-up menu, click Convert to Template
      For additional details see Chapter 13: Working with Templates and Clones in VMware Basic System Administration.
      There is typically the need to customize the identity and network settings of the Windows XP after a clone has been create from a template. This can be achieved using a Customization Specification:
   d. Open the Virtual Infrastructure Client.
   e. Click Edit from the menu above the tool bar and select Customization Specifications...
   f. Click the New icon in the Customization Specification Manager to start the wizard.
   g. On the first wizard step, choose Windows as the target virtual machine OS, and give the specification a name and description.
   h. The following steps ask the standard Windows installation questions and should be completed to correspond with your requirements, with the exception of the following:
      - Computer Name: Make sure that the Use the Virtual Machine Name item is selected. If not, you may end up with duplicate hostnames.
      - Windows License: Enter your Windows XP serial number. The Include Server License Information item should be left unchecked.
      - Networking: Make sure the interface is configured for DHCP. If not, your cloned virtual machines will not have unique IP addresses and will not work with Sun VDI 3.0.
   i. After completing the wizard and saving your customization specification, close the Customization Specification Manager.
      For additional details see Chapter 14: Customizing Guest Operating System in VMware Basic System Administration.

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Upgrading

Configured settings from Sun VDI 2.0, including a VMware vCenter and its corresponding virtual machines and pools, can be stored and used once again after Sun VDI 3.0 has been installed and configured.

Sun VDI 3.0 provides a command line tool to preserve the data and settings from Sun VDI 2.0.

> **Sun VDI 2.0 = Sun VDC 1.0**
> Sun VDI 2.0 is also known as Sun VDC 1.0 - this can cause confusion. VDI refers to the complete layered software solution, while VDC refers to only the management software component.
> If you are currently running the Sun VDI 2.0 software, release in March 2008, you can upgrade to VDI 3.0 using the following procedure.

Steps

1. Extract data and settings from Sun VDI 2.0.
   If Sun VDI 2.0 is still installed and configured, and the Sun VDI 3.0 bits are already available, use `vda-migrate` to export the data:

   ```
   <MEDIA-DIR>/Supplemental/vda-migrate -e </path/to/directory>
   ```

   The data will be exported to the specified directory.

   ```
   Sun VDI 2.0 was found on the server.
     + Storing data...
       Data exported to directory '/var/opt/SUNWvda/backup'
   ```

   A log file is created with detailed information. When `vda-migrate` finishes it indicates the location of the log file. In Solaris platforms it can be located at '`/var/adm/log/vda-migrate.`<date and time>`.log`'.
   For more information about the `vda-migrate` command see its usage page.
2. Remove Sun VDI 2.0.
   Refer to the Sun Virtual Desktop Connector 1.0 Installation and Administration Guide.
3. Install Sun VDI 3.0.
   Refer to Step 4: Install and Configure the VDI Core in the Installing information.
4. Import the data and settings into Sun VDI 3.0.
   Later on, the exported data should be imported with the `vda-migrate` command, this time called in the Sun VDI 3.0 installation directory.

   > VDI must be configured before the data can be imported.
   >
   > In order to import data, Sun VDI 3.0 must have been previously installed and configured.
   > It's also recommended to import the data before any other action takes place on a Sun VDI host, (i.e. before adding a desktop provider, or performing another administrative task).

   ```
   /opt/SUNWvda/sbin/vda-migrate -i </path/to/directory>
   ```

   ```
   Import data from Sun Virtual Desktop Infrastructure 2.0 ([y]/n)?
   ```

```
Creating Desktop Providers
  + virtual.center...
    Enter port for VC host virtual.center [443]:

Creating Pools
  + pool.A...
    Restoring Pool Assignments
     + Importing desktop /datacenter/vm/vda-dyn-pool.A/vmA01...
     + Importing desktop /datacenter/vm/vda-dyn-pool.A/vmA02...
  + pool.B...
    Restoring Pool Assignments
     + Importing desktop /neid.Datacenter/vm/vmB11...

Restoring non-assigned Desktops
  + Creating Personal pool for 'virtual.center'...
     + Importing desktop /datacenter/vm/vmC31...
     + Importing desktop /datacenter/vm/vmD41...

The data from Sun Virtual Desktop Infrastructure 2.0 has been imported into Sun VDI 3.0.
```

A log file is created with detailed information and can be used to track eventual errors. The log file can be located at '`/var/adm/log/vda-migrate.<date and time>.log`'.
For more information about the `vda-migrate` command see its usage page.

5. Upgrade the VDI Tools.
   The VDI tools are installed on the desktop guest OS and are necessary for recycling to work properly and to handle RDP connections when the guest OS enters standby. VDI 3.0 introduces some improvements which are incompatible with previous versions of the tools. If you are importing desktops from a previous version of VDI, the tools need to be upgraded.
   a. Go Control Panel > Add or Remove Programs. Remove 'Sun Virtual Desktop Connector Tools'.
   b. Install the new version of the VDI tools. Instructions can be found here.

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Removing the VDI Core

Uninstall and un-configure the VDI Core:

```
# /opt/SUNWvda/sbin/vda-install -u
```


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Administering

1. Manage Virtual Desktops Using the VDI Web Administration or Using the CLI

The Sun VDI Web Administration (Admin GUI) provides an interface for managing virtual machine assignments in the VDI Core and monitoring the state of the hypervisor in the virtualization layer. The Sun VDI Core can also be controlled via a command line interface (CLI) - see Using the CLI for more information.

1. Access the Admin GUI
2. Create Desktop Providers
    - How to Create Desktop Providers for an xVM VirtualBox Platform
    - How to Create Desktop Providers for a VMware Infrastructure Platform
3. Create Desktop Pools
4. Import Virtual Machines
    - How to Import Virtual Machines for an xVM VirtualBox Platform
    - How to Import Virtual Machines for a VMware Infrastructure Platform
5. Enable Cloning in Pools
    - How to Enable Cloning for an xVM VirtualBox Platform
    - How to Enable Cloning for a VMware Infrastructure Platform
6. Set Up a User Directory
    - Active Directory Integration
        - How to Set up Kerberos Authentication
        - How to Set Up Public Key Authentication
    - LDAP Integration
        - How to Set Up Anonymous Authentication
        - How to Set Up Simple Authentication
        - How to Set Up Secure Authentication
    - Customizing the LDAP Filters and Attributes
    - User Directory Settings
7. Add Users to Pools
8. Associate Tokens to Users

- How to Create Automated Administration Scripts

2. Set Up Virtual Desktop Access Software

VDI 3.0 enables you to set up one or more client access method. Choose Sun Ray Software, Sun Secure Global Desktop Software, or Microsoft Remote Desktop Connection (or a combination).

Sun Ray Software	Sun Secure Global Desktop Software	Microsoft Remote Desktop Connection

• Adapting Sun Ray Software
  ◦ Sun Ray Administration GUI
  ◦ Sun Ray Computing Model
  ◦ Sun Ray Kiosk Session
• VDI Default Configuration
	• Setting Up Sun Secure Global Desktop Software	• Understanding the RDP Broker

3. Access a Desktop as an End-User

See what an end-user sees when they log into their desktop using each one of the supported client access devices.

Sun Ray Software	Sun Secure Global Desktop Software	Microsoft Remote Desktop Connection
• Accessing Desktops with a Sun Ray DTU	• Accessing Desktops with SGD Web Access	• Accessing Desktops with Microsoft RDC

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How to Access the Admin GUI

Use the VDI Web Administration to manage virtual desktops.

Steps

1. Go to `http://<server name>:1800` (or `http://localhost:1800` if remote administration has been disabled).
2. You must use root user credentials.

You will be re-directed to https and the browser will ask you to accept the security certificate. After confirmation, you should get the login screen.

			Up One Level Administering		Next Page How to Create Desktop Providers

This page last changed on Apr 07, 2009 by stephanielewellen.

How to Create Desktop Providers

Desktop providers encapsulate the details of the underlying virtualization platform. Since VDI 3 is compatible with both VMware Virtual Infrastructure and Sun xVM VirtualBox virtualization platforms, there are two types of desktop providers. At a minimum, you must configure one desktop provider before you can continue with the creation of pools. There is no limitation to the number of providers the system can manage. At any time you can configure additional providers.

- How to Create Desktop Providers for an xVM VirtualBox Platform
- How to Create Desktop Providers for a VMware Infrastructure Platform

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This page last changed on Apr 07, 2009 by stephanielewellen.

How to Create Desktop Providers for an xVM VirtualBox Platform

Follow the steps below to set up an xVM VirtualBox desktop provider.

Steps

1. Select the Desktop Providers category in the left sidebar.
2. Select New in the Sun xVM VirtualBox Desktop Providers overview.
   This will activate the New Desktop Provider for Sun xVM VirtualBox wizard that allows you to add multiple xVM VirtualBox hosts as well as multiple xVM VirtualBox storage servers.
3. Enter the host name (or IP address) and administrator credentials for the xVM VirtualBox host server.
4. Select the Select Existing Hosts option, in Step 2, when you are finished.
5. In Step 3, enter the host name (or IP address) and administrator credentials for the xVM VirtualBox storage server (a host running the recommended OpenSolaris version).
   Again, it is possible to configure multiple xVM VirtualBox storage servers.
6. Select the Select Existing Storage option, in Step 3, when you are finished.
7. Verify or change the desktop provider name and add comments, in Step 4.
8. Once you click Finish the new desktop provider will appear in the VDI Admin GUI. You can now view the provider details, including CPU and memory utilization, and it is possible to add or remove additional xVM VirtualBox hosts or storage servers as needed.

			Up One Page Level ⬆ How to Create Desktop Providers		Next Page ➡ How to Create Desktop Providers for a VMware Infrastructure Platform

This page last changed on Apr 07, 2009 by stephanielewellen.

How to Create Desktop Providers for a VMware Infrastructure Platform

Follow the steps below to set up a VMware Infrastrucure desktop provider.

Steps

1. Select the Desktop Providers category in the left sidebar.
2. Select New in the VMware VirtualCenter Desktop Providers overview.
   This will activate the New Desktop Provider for VMware VirtualCenter wizard.
3. Enter the name (or IP address) and administrator credentials for the VMware vCenter.
4. Verify or change the Desktop Provider name and add comments, in Step 4.
5. Once you click Finish the new desktop provider will appear in the Admin GUI. You can now view the VMware vCenter resource details, including datacenters, VMware clusters, and datastores.

In Sun VDI 2.0 it was possible to limit the used VMware vCenter resources to specific VMware datacenters. This kind of resource restriction will now happen as part of the pool configuration.

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This page last changed on Apr 29, 2009 by stephanielewellen.

How to Create Desktop Pools

Sun VDI 3 organizes desktops in pools. A pool is just a collection (or container) of desktops. Typically you will create different pools for different types of users. For example, the engineering team, in your company, might have different desktop requirements than the marketing department.

When changing pool settings from NAT networking to Host Networking + Windows RDP, existing desktops that are running must be stopped and restarted or else subsequent user requests for these desktops will fail.
This issue occurs because existing, running desktops will be using NAT and will not have a public IP address. After the pools settings have been changed, subsequent requests for that desktop will attempt to access the desktop via the private (and unaccessible) NAT IP.

Steps

1. Select the Pools category in the left sidebar.
2. Click New in the All Pools overview.
   This will activate a New Pool wizard.
3. In Step 2, select a desktop provider from the drop-down menu, and choose a pool type.
   - Dynamic pools are filled with cloned flexible desktops. If you choose the Dynamic Pool type, the desktops in the pool will be temporarily assigned to users; they will be recycled each time the user logs out. This pool type is considered dynamic because the user-desktop assignments are often changing.
   - Growing pools are filled with cloned personal desktops. If you choose the Growing Pool type, the desktops in the pool will be permanently assigned to users; the user can log in and out without losing their desktop settings. The desktops are not recycled.
   - Manual pools are initially empty. They are filled manually by importing personal desktops. The Manual Pool type should be used if cloned desktop assignment is not an option.
4. In Step 3, select None as template.
5. In Step 4, specify a name for the pool.
6. Once you click the Finish a new empty pool will appear in the Pools overview.

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This page last changed on Apr 29, 2009 by stephanielewellen.

Importing Virtual Machines

A pool will be empty (has no desktops) after initial creation. You can now manually add existing desktops (virtual machines) to your pool using the VDI Admin GUI. The procedure will differ depending on the virtualization platform.

- How to Import Virtual Machines for an xVM VirtualBox Platform
- How to Import Virtual Machines for a VMware Infrastructure Platform

	Previous Page How to Create Desktop Pools		Up One Page Level Administering		Next Page How to Enable Cloning in Pools

This page last changed on Apr 29, 2009 by stephanielewellen.

How to Import Virtual Machines for an xVM VirtualBox Platform

Sun VDI takes advantage of the ZFS file system which vastly improves the performance of desktop deployment. As a first step you must import the desktop to the storage:

If you plan to use desktop cloning (described in the next section), then the virtual machine should have been prepared with Sysprep before importing. Strictly spoken the Sysprep step can be omitted depending on how you finally deploy your guest Operating Systems running inside your virtual machines but you will almost certainly require Sysprep if you have a Microsoft Active Directory based network and want your Windows machines to join successfully.

Copy the XML config file and VDI disk image file of an existing xVM VirtualBox machine to the `/var/tmp` directory on the host where Sun VDI has been executed (VDI host).

Importing snapshots of virtual machines is not supported.

Steps

The following examples use the xVM VirtualBox default paths.

1. Shut down your virtual machine.
2. Copy the XML file:

```
# scp ~/.VirtualBox/Machines/<VM name>/<VM name>.xml root@<VDC host>:/var/tmp
```

3. Copy the VDI image:

```
# scp ~/.VirtualBox/VDI/<VM name>.vdi root@<VDC host>:/var/tmp
```

If you have insufficient space in `/var/tmp` you can copy both files to another location on the host and create a symbolic link.

```
# ln -s /<path to files>/<VM name>.xml /var/tmp/
```

```
# ln -s /<path to files>/<VM name>.vdi /var/tmp/
```

4. In the Admin GUI open the Pools tab, then select the previously created empty pool.
5. Select the Desktops tab, and click Import. An import dialog will be displayed.
6. Select the correct XML and VDI files, and click OK.
7. The virtual machine will be imported as a background job. Imports can take long periods of time (> 10minutes), so please be patient.

After the virtual machine has been imported successfully, it will show up in the Desktops tab of the Pools page (a page refresh might be necessary).

			Up One Page Level Importing Virtual Machines		Next Page How to Import Virtual Machines for a VMware Infrastructure Platform

This page last changed on Apr 29, 2009 by stephanielewellen.

How to Import Virtual Machines for a VMware Infrastructure Platform

VMware vCenter manages the virtual machines (VM) that have been executed on the configured VMware ESX server. You can use any existing VM and import it into the previously created pool. The VDI Core will just create a corresponding entry for the VM in its database - no physical copying is done here. The VM will not be altered in any way.

Steps

1. In the Admin GUI open the Pools tab, then select the previously created empty pool.
2. Select the Desktops tab, and click Import. An import dialog will be displayed.
3. The dialog will display the available VMs in the VirtualCenter hierarchy - you can select individual VMs, or folders. In the latter case, all the VMs under this folder will be selected for the import.
4. Click on OK to import the VMs into the VDI Core database.

VMs which are already imported into the VDI Core cannot be selected for import. Templates can also not be imported as they will be handled specially - see the next section dealing with desktop cloning.

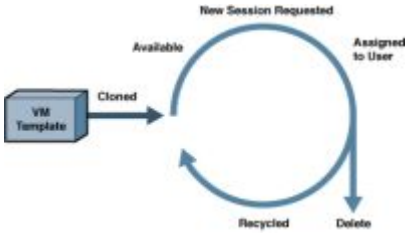
After the virtual machine(s) has been imported successfully, it will show up in the Desktops tab of the Pool page (a page refresh might be necessary).

	Previous Page How to Import Virtual Machines for an xVM VirtualBox Platform		Up One Page Level Importing Virtual Machines		

This page last changed on Apr 29, 2009 by stephanielewellen.

How to Enable Cloning in Pools

Filling a desktop pool manually is cumbersome and inefficient for large desktop numbers. Thus Sun VDI 3.0 can also clone desktops as needed from a template (or golden master).



For each pool, you can specify:
Preferred Size: The initial number of desktops that should be cloned
Free desktops: How many desktops must be available (unassigned) for other users - the system will clone new desktops, if necessary, to keep enough desktops available for new users.
Maximum Size: The maximum number of desktops
Power State: The desired state of the desktop after cloning has completed or after a desktop has been recycled given the recycle policy is not Delete Desktop.
Recycle Policy: What should happen if the desktop is no longer in use by the assigned user?
Reset to Snapshot: The desktop will be reverted to its initial state before becoming available to another user.
Reuse Desktop: The desktop will be handed over, as is, to the next user.
Delete Desktop: The desktop will be destroyed - it is used one-time only.

- How to Enable Cloning for an xVM VirtualBox Platform
- How to Enable Cloning for a VMware Infrastructure Platform

	Previous Page Importing Virtual Machines		Up One Page Level Administering		Next Page How to Set Up a User Directory

This page last changed on Apr 07, 2009 by stephanielewellen.

How to Enable Cloning for an xVM VirtualBox Platform

Cloning is the fastest and most efficient way to populate a pool. Use the steps below to enable cloning in a pool.

Steps

1. In the Admin GUI open the Pools tab, then select the previously created pool.
2. Select the Desktop tab.
3. Select the imported virtual machine that you want to use as the template. From the actions drop-down menu select Convert to Template.
4. Select the Desktop Cloning tab.
   This tab allows you to control most of the pool configuration options. For additional options see the User Assignment tab.
5. Select the template from the Template drop-down menu.
6. Check Apply System Preparation if Sysprep has been executed on your template.
   If System Preparation is checked you must also create a System Preparation File using the link below. In the System Preparation pop-up, specify whether cloned desktops should join a Windows Workgroup or Domain.
7. Specify Preferred Size, Free Desktops, and Maximum Size (start with lower numbers at the beginning - you can increase them at any time).
8. Check Enable Automatic Cloning.
9. Click Save.

Cloning can take up to a minute to start, after which you will see 'clone jobs' beginning to appear in the Jobs window. To access the Jobs window, click the Jobs Running link in the top-left of the Admin GUI. After a clone job has been finished successfully, the new desktop will show up in the Desktops tab of the Pool page (a page refresh might be necessary).

Where do my VirtualBox Desktops Live?

Powered Off Desktops
Powered off desktops reside in two places in the VDI environment, the database and the storage. The VDI database contains all desktop configuration information to register the desktop on a host and the storage host contains the desktops hard disk data.

Powered off desktop are typically* not associated or registered on any VirtualBox host. This allows VDI to select the best suited host on every start of a desktop. This helps ensure a spread of desktops across available VirtualBox hosts minimizing resource usage on each.

*In some rare circumstances a desktop maybe left registered and powered off on a VirtualBox host. Desktops in this state for more than a couple of minutes can safely be deleted from the VirtualBox host if necessary as the configuration is stored in the VDI database and all data on a storage host. When manually unregistering a desktop from VirtualBox ensure that you also unregister the desktops disk image.

Running Desktops
Running desktops are registered and started on a single VirtualBox host. The VirtualBox host that a desktop is running on can be determined using the 'Desktop Summary' page in the VDI UI. A running desktop is connected directly to the storage host.

			Up One Page Level ⬆ How to Enable Cloning in Pools		Next Page ➡ How to Enable Cloning for a VMware Infrastructure Platform

This page last changed on Apr 07, 2009 by stephanielewellen.

How to Enable Cloning for a VMware Infrastructure Platform

Cloning is the fastest and most efficient way to populate a pool. Use the steps below to enable cloning in a pool.

Steps

1. In the Admin GUI open the Pools tab, then select the previously created pool (or any other empty pool).
2. Select the Resources tab.
3. Select your preferred storage for newly cloned virtual machines. Per default, all available storage may be used (for each clone the VDI Core will select the storage with the most available disk space).
4. Select the Desktop Cloning tab.
5. Select the preferred template from the Template drop-down menu (the drop-down menu will list all templates that are available in the VMware vCenter).
6. Check Apply System Preparation, and specify which customization spec should be used if needed.
7. Specify Preferred Size, Free Desktops and Maximum Size (start with lower numbers at the beginning, you can always increase them at any time).
8. Check Enable Automatic Cloning.
9. Click Save.

Cloning can take up to a minute to start, after which you will see 'clone jobs' beginning to appear in the Jobs window. To access the Jobs window, click the Jobs Running link in the top-left of the Admin GUI. After a clone job has been finished successfully, the new desktop will show up in the Desktops tab of the Pool page (a page refresh might be necessary).

	Previous Page How to Enable Cloning for an xVM VirtualBox Platform		Up One Page Level How to Enable Cloning in Pools		

This page last changed on Jun 08, 2009 by katell.

How to Set Up a User Directory

Typically the user information is already stored in an Active Directory or LDAP server. Before you can assign users to desktops, you must configure the desired Active Directory/LDAP server and the VDI Core.

- Active Directory Integration

  To be used when integrating with Microsoft Active Directory.
- LDAP Integration

  To be used when integrating with other types of LDAP directories or to quickly set up a demo with Active Directory.

If you need to install your own directory, you may choose OpenDS. Some directions to set it up for VDI can be found here.

If you have an expert understanding of user directory integration and would like to optimize VDI for your user directory, please refer to the sections below:

- Customizing the LDAP Filters and Attributes
- User Directory Settings

	Previous Page How to Enable Cloning in Pools		Up One Page Level Administering		Next Page How to Add Users to Pools

This page last changed on Jun 08, 2009 by katell.

Active Directory Integration

Active Directory integration is the recommended choice for production platforms integrating with Microsoft Active Directory.

The users from the Active Directory can be used for desktop and pool assignments and will be able to access desktops from VDI. On top of this basic feature, Active Directory integration offers the following functionalities:

1. Active Directory integration allows to access all the users from a forest and use those users for desktop and pool assignments.
   This means that the users from the different sub-domains of the forest will be able to access desktops from VDI.
2. Active Directory integration allows computer entries to be removed from the Active Directory when cloned desktops are deleted by the VDI Core.
   When a Windows desktop (cloned by VDI) joins a domain (through Sysprep), this will typically create a new computer entry in the Active Directory. Configuring VDI with Kerberos Authentication will allow VDI to remove the computer entries from the Active Directory, when deleting unused desktops. This avoids having computer entries piling up in the Active Directory while the matching desktops have long been destroyed.

Active Directory integration requires additional configuration (Kerberos configuration and time synchronization) on the VDI host. If you just want to quickly set up a demo with an Active Directory, it should be more straight-forward to use LDAP Integration.

Kerberos Authentication

Kerberos Authentication is the typical choice when integrating with Microsoft Active Directory.

- How to Set up Kerberos Authentication

Public Key Authentication

Public Key authentication should be used to integrate with Microsoft Active Directory when the domain controller requires LDAP signing. (http://support.microsoft.com/kb/935834).

- How to Set up Public Key Authentication

			Up One Page Level ⬆ How to Set Up a User Directory		Next Page ➡ LDAP Integration

This page last changed on Jun 11, 2009 by katell.

How to Set up Kerberos Authentication

Follow the steps below to configure Kerberos Authentication for your Active Directory.

> To get the full functionality offered by Kerberos Authentication, it is necessary to provide the credentials of a user that has 'write' access to the Active Directory. This user will be used to read users and delete computer entries from the directory.

Steps

Kerberos Authentication requires some specific configuration on the Active Directory server and VDI host prior to setting up the user directory in the Admin UI:

1. Kerberos authentication must be enabled in Active Directory.
   It should already be enabled as the default.
2. Ensure that each Active Directory domain has a global catalog server.
   Configure a domain controller in each domain as a global catalog server.
3. Synchronize the time between the VDI server and Active Directory server.
   For example, use `ntpdate` <my.windows.host>
4. Edit the system default Kerberos configuration file (`/etc/krb5/krb5.conf` on Solaris OS platforms) on the VDI server.
   At a minimum, the Kerberos configuration file must contain the following sections:
   - `[libdefaults]` - this sets defaults for Kerberos authentication. You must set the default_realm and default_checksum.
   - `[realms]` - this sets the KDCs for each Kerberos realm. A realm can have more than one KDC. The entry for each KDC has the form hostname:port. The port can omitted if the default, port 88, is used.
   - `[domain_realm]` - this maps Active Directory domains to Kerberos realms.
     The following is an example Kerberos configuration file for a domain containing just one server:

```
[libdefaults]
default_realm = MY.COMPANY.COM
default_checksum = rsa-md5


[realms]
MY.COMPANY.COM = {
kdc = my.windows.host
}

[domain_realm]
.my.company.com = MY.COMPANY.COM
my.company.com = MY.COMPANY.COM
```

5. You can check that Kerberos works fine by using `nslookup` and `kinit`. For example:
   - `# nslookup -query=any _gc._tcp.my.company.com` must resolve the domain
   - `# kinit -V super-user@MY.COMPANY.COM` must succeed
6. Restart the Common Agent Container:

```
cacaoadm stop --force
cacaoadm start
```

7. In the Admin GUI, go to the Settings category and User Directory subcategory, and click Add User Directory to launch the User Directory wizard:

a. Select Active Directory Type, and click Next.
b. Select Kerberos Authentication.
c. Enter the domain for the Active Directory
   For example: `my.company.com`
d. Enter the user principal name of a user that has sufficient privileges to write into the Active Directory.
   For example: `super-user` or `super-user@my.company.com`
e. Enter the password for that user.
f. Click Next to review your choices before completing the configuration.

			Up One Page Level ⬆ Active Directory Integration		Next Page ➡ How to Set Up Public Key Authentication

This page last changed on Jun 08, 2009 by katell.

How to Set Up Public Key Authentication

Public Key Authentication requires some specific configuration on the Active Directory server and VDI host prior to setting up the user directory in the Admin GUI.

Steps

1. Follow the configuration steps 1 to 5 described for Kerberos Authentication
2. Creating a client certificate for each of the VDI host.
   The VDI keystore for the client certificate is located at `/etc/opt/SUNWvda/sslkeystore` and the password is `changeit`.
   a. Generating a key pair (private/public key) for the client certificate.
      - on the VDI host, log in as superuser (root) and use `keytool` to generate the key pair in the VDI keystore.

```
/usr/java/jre/bin/keytool -genkey -keyalg rsa \
-keystore /etc/opt/SUNWvda/sslkeystore \
-storepass changeit -keypass changeit \
-alias <your_alias>
```

   b. Generating a Certificate Signing Request (CSR) for client certificate.
      - on the VDI host, use `keytool` to generate the certificate request.

```
/usr/java/jre/bin/keytool -certreq \
-keystore /etc/opt/SUNWvda/sslkeystore \
-storepass changeit -keypass  changeit \
-alias <your_alias> \
-file <certreq_file>
```

      The alias must be the same as the alias used when generating the key pair. Aliases are case-insensitive.
   c. Creating the certificate.
      - Copy the CSR file to the server hosting the Active Directory.
      - Using Internet Explorer, go to `"http://localhost/certsrv"`.
      - Log in.
      - On the Microsoft Certificate Services page, click Request a certificate.
      - On the Request a Certificate page, click advanced certificate request.
      - On the Advanced Certificate Request page, click Submit a certificate request by using a base-64-encoded CMC or PKCS #10 file, or submit a renewal request by using a base-64-encoded PKCS #7 file.
      - On the Submit a Certificate Request or Renewal Request page, paste the contents of the CSR into the Saved Request text box or browse to the CSR file.
      - Select an appropriate template from the Certificate Templates list. (Administrator is recommended).
      - Click Submit.
      - On the Certificate Issued page, ensure Base 64 encoded is selected and click Download certificate chain.
      - Save the certificate file.
   d. Importing the certificate on the VDI host.
      - Copy the certificate file to the VDI host.
      - Import the certificate into the VDI keystore

```
/usr/java/jre/bin/keytool -import  \
-keystore /etc/opt/SUNWvda/sslkeystore \
-storepass changeit -keypass changeit \
-trustcacerts -file <certificate_file> \
```

```
-alias <your_alias>
```

3. Restart the Common Agent Container:

```
cacaoadm stop --force
cacaoadm start
```

4. Configuring the user directory in VDI Admin GUI.
   In the Admin GUI, go to the Settings category and User Directory subcategory, and click Add User Directory to launch the User Directory wizard:
   a. Select Active Directory Type, and click Next.
   b. Select Public Key Authentication.
   c. Enter the domain for the Active Directory.
      For example: `my.company.com`
   d. The following step shows the SSL certificates of the Active Directory servers. Click Next to permanently accept the certificates.
   e. Click Next to review your choices before completing the configuration.

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This page last changed on Jun 08, 2009 by katell.

LDAP Integration

LDAP Integration allows to integrate with one Active Directory server or one LDAP server in a straight-forward way, without the need for extra configuration.

The users from the Active Directory or LDAP server can be used for desktop and pool assignments and will be able to access desktops from VDI.

LDAP Integration offers three security levels for authentication: anonymous, simple, and secure.

Anonymous Authentication

Anonymous Authentication is useful for demo when the directory supports it.

It is offered to enable you to set up a quick integration with an LDAP server for demo purposes. Anonymous Authentication may only be chosen if your LDAP server supports anonymous authentication.

It is not recommended to select Anonymous Authentication on production platforms.

Active Directory does not support Anonymous Authentication.

- How to Set Up Anonymous Authentication

Simple Authentication

Simple Authentication is the demo solution for Active Directory and the typical choice for other LDAP directories.

Simple Authentication is the recommended choice for production platforms integrating with LDAP directories other than Active Directory.

Simple Authentication also allows you to set up a quick integration with an Active Directory server for demo purposes. If integrating with Active Directory, it is not recommended to select Simple Authentication on production platforms as a better integration can be achieved using Kerberos Authentication.

- How to Set Up Simple Authentication

Secure Authentication

Use Secure Authentication to secure connections over SSL, when the directory supports it.

Choose Secure Authentication to integrate with an LDAP directory secured by SSL.

It is not possible to integrate with an Active Directory using Secure Authentication.

- How to Set Up Secure Authentication

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This page last changed on Apr 07, 2009 by stephanielewellen.

How to Set Up Anonymous Authentication

Use the steps below to set up anonymous authentication.

Steps

In the Admin GUI, go to the Settings category and User Directory subcategory, and click Add User Directory to launch the User Directory wizard:

1. Select LDAP Type, and click Next.
2. Select Anonymous Authentication.
3. Enter the hostname or IP address, and port number, of the LDAP server. 389 is the default port number used by most LDAP servers.
4. Enter the base DN of the LDAP server. Specifying a base DN is optional. It allows you to restrict the part of the LDAP directory used to search for users.
   For example: `cn=Users,dc=my,dc=company,dc=com`
5. Click Next to review your choices before completing the configuration.

			Up One Page Level LDAP Integration		Next Page How to Set Up Simple Authentication

This page last changed on Jun 08, 2009 by katell.

How to Set Up Simple Authentication

Use the steps below to set up simple authentication.

> It is necessary to provide the credentials of a user that has 'read' access to the user directory. This user will be used to read user information from the directory.

Steps

In the Admin GUI, go to the Settings category and User Directory subcategory, and click Add User Directory to launch the User Directory wizard:

1. Select LDAP Type, and click Next.
2. Select Simple Authentication.
3. Enter the hostname or IP address, and port number, of the LDAP server. 389 is the default port number used by most LDAP servers.
4. Enter the base DN of the LDAP server. Specifying a base DN is optional. It allows you to restrict the part of the LDAP directory used to search for users.
   For example: `cn=Users,dc=my,dc=company,dc=com`
5. Enter the user name. It must be the fully distinguished name (DN) of a user that has sufficient privileges to search the LDAP directory.
   For example: `cn=super-user,cn=Users,dc=my,dc=company,dc=com`.
   If integrating with an Active Directory, you may use the user principal name for the user. For example: `super-user` or `super-user@my.company.com`.
6. Enter the password for the user.
7. Click Next to review your choices before completing the configuration.

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This page last changed on Jun 08, 2009 by katell.

How to Set Up Secure Authentication

Use the steps below to set up secure authentication.

> It is necessary to provide the credentials of a user that has 'read' access to the user directory. This user will be used to read user information from the directory.

Steps

In the Admin GUI, go to the Settings category and User Directory subcategory, and click Add User Directory to launch the User Directory wizard:

1. Select LDAP Type, and click Next.
2. Select Secure Authentication.
3. Enter the hostname or IP address, and port number, of the LDAP server. 636 is the default port number used by most SSL secured LDAP servers.
4. Enter the base DN of the LDAP server. Specifying a base DN is optional. It allows you to restrict the part of the LDAP directory used to search for users.
   For example: `cn=Users,dc=my,dc=company,dc=com`
5. Enter the user name. It must be the fully distinguished name (DN) of a user that has sufficient privileges to search the LDAP directory.
   For example: `cn=super-user,cn=Users,dc=my,dc=company,dc=com`.
6. Enter the password for the user.
7. The following step shows the SSL certificate of the LDAP server. Click Next to permanently accept the certificate.
8. Review your choices before completing the configuration.

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This page last changed on Jun 24, 2009 by katell.

Customizing the LDAP Filters and Attributes

VDI uses various LDAP filters and attribute lists to look up and interpret the data stored in the user directory.

VDI comes with some LDAP filters that are suitable for demos with Active Directory or Sun Directory Server. But these filters might be incompatible with other types of directories such as OpenLDAP or eDirectory and would then need to be modified.

For production, it is always recommended to customize those filters to match most closely the schema definition of the directory.

How to Edit the Filters

This section explains how to edit those filters, and the values recommended per type of directory.

The LDAP filters are specified as global settings using the vda CLI command:
/opt/SUNWvda/sbin/vda settings-getprops
/opt/SUNWvda/sbin/vda settings-setprops

Example

Listing the LDAP filter used to identify objects of type user and the LDAP filter used to search for users according a search criteria:

```
example% /opt/SUNWvda/sbin/vda settings-getprops -p ldap.user.object.filter,ldap.user.search.filter
ldap.user.object.filter:
                (&(|(objectclass=user)(objectclass=person)(objectclass=inetOrgPerson)(objectclass=organizationalPerson))(!
(objectclass=computer)))
ldap.user.search.filter:
                (|(cn=$SEARCH_STRING)(uid=$SEARCH_STRING)(mail=$SEARCH_STRING))
```

Customizing the LDAP filter used to search for users according a search criteria, for Active Directory:

```
example% /opt/SUNWvda/sbin/vda settings-setprops -p ldap.user.search.filter='"(|(cn=\$SEARCH_STRING)(uid=\
$SEARCH_STRING)(mail=\$SEARCH_STRING))"'
Settings updated.

example% /opt/SUNWvda/sbin/vda settings-getprops -p ldap.user.search.filter
ldap.user.search.filter:
                (|(cn=$SEARCH_STRING)(uid=$SEARCH_STRING)(mail=$SEARCH_STRING))
```

Default LDAP Filters and Attributes

Global Setting Name	Description	Default Value
`ldap.user.object.filter`	LDAP filter used to identify objects of type user	`(&(|(objectclass=user)(objectclass=person)(objectclass=inetOrgPerson)(objectclass=organizationalPerson))(!(objectclass=computer)))`

ldap.user.search.filter	LDAP filter used to search for users according a search criteria. Searches for users can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(|(cn=$SEARCH_STRING) (uid=$SEARCH_STRING)(mail= $SEARCH_STRING))
ldap.userid.attributes	List of comma separated LDAP attributes storing the userid value for user objects. This is used to find a user given its userid	uid,sAMAccountName
ldap.user.member.attributes	List of comma separated LDAP attributes on a user object storing the groups the user is a member of	memberof,primaryGroupID
ldap.group.object.filter	LDAP filter used to identify objects of type group	(|(objectclass=group) (objectclass=groupofnames) (objectclass=groupofuniquenames))
ldap.group.search.filter	LDAP filter used to search for groups according a search criteria. Searches for groups can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(|(dc=$SEARCH_STRING) (o=$SEARCH_STRING)(ou= $SEARCH_STRING) (cn=$SEARCH_STRING)(uid= $SEARCH_STRING)(mail= $SEARCH_STRING))
ldap.group.member.attributes	List of comma separated LDAP attributes on a group object storing the users member of the group	member,uniquemember
ldap.group.short.attributes	List of comma separated LDAP attributes on a group object storing the information for primary group membership. Primary group membership is specific to Active Directory.	primaryGroupToken
ldap.container.object.filter	LDAP filter used to identify objects of type container. Containers can be selected as root for custom group filters in the web administration console	(|(objectclass=domain) (objectclass=organization) (objectclass=organizationalUnit) (objectclass=container))
ldap.container.search.filter	LDAP filter used by the web administration console to search for containers according a search criteria, when selecting a root for a custom group filter. $SEARCH_STRING is the place holder for the search criteria	(|(cn=$SEARCH_STRING) (dc=$SEARCH_STRING)(ou= $SEARCH_STRING))
ldap.default.attributes	List of comma separated LDAP attributes loaded in the cache when looking up an object. It should contain all the attributes used in the other filters and attribute lists.	dc,o,ou,cn,uid,mail,member,uniquembe sAMAccountName,primaryGroupToken,prima

Recommended Values with Active Directory

Global Setting Name	Description	Recommended Value with Active Directory
ldap.user.object.filter	LDAP filter used to identify objects of type user	(&(objectclass=user)(!(objectclass=computer)))
ldap.user.search.filter	LDAP filter used to search for users according a search criteria. Searches for users can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(|(cn=$SEARCH_STRING)(sAMAccountName=$SEARCH_STRING))
ldap.userid.attributes	List of comma separated LDAP attributes storing the userid value for user objects. This is used to find a user given its userid	sAMAccountName,userPrincipalName
ldap.user.member.attributes	List of comma separated LDAP attributes on a user object storing the groups the user is a member of	memberof,primaryGroupID
ldap.group.object.filter	LDAP filter used to identify objects of type group	(objectclass=group)
ldap.group.search.filter	LDAP filter used to search for groups according a search criteria. Searches for groups can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(cn=$SEARCH_STRING)
ldap.group.member.attributes	List of comma separated LDAP attributes on a group object storing the users member of the group	member
ldap.group.short.attributes	List of comma separated LDAP attributes on a group object storing the information for primary group membership. Primary group membership is specific to Active Directory.	primaryGroupToken
ldap.container.object.filter	LDAP filter used to identify objects of type container. Containers can be selected as root for custom group filters in the web administration console	(objectclass=container)
ldap.container.search.filter	LDAP filter used by the web administration console to search for containers according a search criteria, when selecting a root for a custom group filter. $SEARCH_STRING is the place holder for the search criteria	(cn=$SEARCH_STRING)
ldap.default.attributes	List of comma separated LDAP attributes loaded in the cache when	cn,member,memberof,sAMAccountName,prima

	looking up an object. It should contain all the attributes used in the other filters and attribute lists.	

Recommended Values with Sun Directory Server

Global Setting Name	Description	Recommended Value with Sun Directory Server
`ldap.user.object.filter`	LDAP filter used to identify objects of type user	`(objectclass=person)`
`ldap.user.search.filter`	LDAP filter used to search for users according a search criteria. Searches for users can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	`(|(cn=$SEARCH_STRING)(uid=$SEARCH_STRING))`
`ldap.userid.attributes`	List of comma separated LDAP attributes storing the userid value for user objects. This is used to find a user given its userid	`uid`
`ldap.user.member.attributes`	List of comma separated LDAP attributes on a user object storing the groups the user is a member of	`memberof`
`ldap.group.object.filter`	LDAP filter used to identify objects of type group	`(objectclass=groupofuniquenames)`
`ldap.group.search.filter`	LDAP filter used to search for groups according a search criteria. Searches for groups can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	`(cn=$SEARCH_STRING)`
`ldap.group.member.attributes`	List of comma separated LDAP attributes on a group object storing the users member of the group	`uniquemember`
`ldap.group.short.attributes`	List of comma separated LDAP attributes on a group object storing the information for primary group membership. Primary group membership is specific to Active Directory.	empty
`ldap.container.object.filter`	LDAP filter used to identify objects of type container. Containers can be selected as root for custom group filters in the web administration console	`(|(objectclass=domain)(objectclass=organizationalUnit))`
`ldap.container.search.filter`	LDAP filter used by the web administration console to search for containers according a search criteria, when selecting a root for a custom	`(|(dc=$SEARCH_STRING)(ou=$SEARCH_STRING))`

	group filter. $SEARCH_STRING is the place holder for the search criteria	
ldap.default.attributes	List of comma separated LDAP attributes loaded in the cache when looking up an object. It should contain all the attributes used in the other filters and attribute lists.	dc,ou,cn,uid,uniquemember,memberof

Recommended Values with OpenDS

Global Setting Name	Description	Recommended Value with OpenDS
ldap.user.object.filter	LDAP filter used to identify objects of type user	(objectclass=person)
ldap.user.search.filter	LDAP filter used to search for users according a search criteria. Searches for users can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(|(cn=$SEARCH_STRING)(uid=$SEARCH_STRING))
ldap.userid.attributes	List of comma separated LDAP attributes storing the userid value for user objects. This is used to find a user given its userid	uid
ldap.user.member.attributes	List of comma separated LDAP attributes on a user object storing the groups the user is a member of	memberof
ldap.group.object.filter	LDAP filter used to identify objects of type group	(objectclass=groupofuniquenames)
ldap.group.search.filter	LDAP filter used to search for groups according a search criteria. Searches for groups can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(cn=$SEARCH_STRING)
ldap.group.member.attributes	List of comma separated LDAP attributes on a group object storing the users member of the group	uniquemember
ldap.group.short.attributes	List of comma separated LDAP attributes on a group object storing the information for primary group membership. Primary group membership is specific to Active Directory.	empty
ldap.container.object.filter	LDAP filter used to identify objects of type container. Containers can be selected as root for custom group filters in the web administration console	(|(objectclass=domain)(objectclass=organizationalUnit))

ldap.container.search.filter	LDAP filter used by the web administration console to search for containers according a search criteria, when selecting a root for a custom group filter. $SEARCH_STRING is the place holder for the search criteria	(|(dc=$SEARCH_STRING)(ou=$SEARCH_STRING))
ldap.default.attributes	List of comma separated LDAP attributes loaded in the cache when looking up an object. It should contain all the attributes used in the other filters and attribute lists.	dc,ou,cn,uid,uniquemember,memberof

Recommended Values with Open LDAP

Global Setting Name	Description	Recommended Value with Open LDAP
ldap.user.object.filter	LDAP filter used to identify objects of type user	It is mandatory to remove (!(objectclass=computer)) from the default filter. Recommended is (objectclass=person)
ldap.user.search.filter	LDAP filter used to search for users according a search criteria. Searches for users can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(|(cn=$SEARCH_STRING)(uid=$SEARCH_STRING))
ldap.userid.attributes	List of comma separated LDAP attributes storing the userid value for user objects. This is used to find a user given its userid	uid
ldap.user.member.attributes	List of comma separated LDAP attributes on a user object storing the groups the user is a member of	memberof
ldap.group.object.filter	LDAP filter used to identify objects of type group	(objectclass=groupofnames)
ldap.group.search.filter	LDAP filter used to search for groups according a search criteria. Searches for groups can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(cn=$SEARCH_STRING)
ldap.group.member.attributes	List of comma separated LDAP attributes on a group object storing the users member of the group	member
ldap.group.short.attributes	List of comma separated LDAP attributes on a group object storing the information for primary group membership. Primary group membership is specific to Active Directory.	empty

ldap.container.object.filter	LDAP filter used to identify objects of type container. Containers can be selected as root for custom group filters in the web administration console	???
ldap.container.search.filter	LDAP filter used by the web administration console to search for containers according a search criteria, when selecting a root for a custom group filter. $SEARCH_STRING is the place holder for the search criteria	???
ldap.default.attributes	List of comma separated LDAP attributes loaded in the cache when looking up an object. It should contain all the attributes used in the other filters and attribute lists.	cn,uid,member,memberof

Recommended Values with Novell eDirectory

Global Setting Name	Description	Recommended Value with Novell eDirectory
ldap.user.object.filter	LDAP filter used to identify objects of type user	It is mandatory to remove (!(objectclass=computer)) from the default filter. Recommended is (objectclass=user)
ldap.user.search.filter	LDAP filter used to search for users according a search criteria. Searches for users can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	(|(cn=$SEARCH_STRING)(uid=$SEARCH_STRING)(givenName=$SEARCH_STRING))
ldap.userid.attributes	List of comma separated LDAP attributes storing the userid value for user objects. This is used to find a user given its userid	givenName,cn,uid
ldap.user.member.attributes	List of comma separated LDAP attributes on a user object storing the groups the user is a member of	groupMembership
ldap.group.object.filter	LDAP filter used to identify objects of type group	(|(objectclass=group)(objectclass=groupofnames)(objectclass=groupofuniquenames))
ldap.group.search.filter	LDAP filter used to search for groups according a search criteria. Searches for groups can be done using the user-search command or in the web administration console. $SEARCH_STRING is the place holder for the search criteria	???
ldap.group.member.attributes	List of comma separated LDAP attributes on a group object storing the users member of the group	member,uniquemember

`ldap.group.short.attributes`	List of comma separated LDAP attributes on a group object storing the information for primary group membership. Primary group membership is specific to Active Directory.	empty
`ldap.container.object.filter`	LDAP filter used to identify objects of type container. Containers can be selected as root for custom group filters in the web administration console	`(objectclass=organizationalUnit)`
`ldap.container.search.filter`	LDAP filter used by the web administration console to search for containers according a search criteria, when selecting a root for a custom group filter. $SEARCH_STRING is the place holder for the search criteria	???
`ldap.default.attributes`	List of comma separated LDAP attributes loaded in the cache when looking up an object. It should contain all the attributes used in the other filters and attribute lists.	`cn,uid,givenName,groupmembership,membe`

How the LDAP Filters are Used

Searching for Users and Groups

The administration tools (web-GUI or CLI) allow to search for users and groups in order to assign them to desktops or pools.

The search logic works as the following:

- the filter used to search for users is: `(&<ldap.user.object.filter><ldap.user.search.filter>))`
- the $SEARCH_STRING placeholder is replaced by `*criteria*` where criteria is the string typed in the web-GUI search field.
- same applies for groups, using the group filters.
- search is performed for users first, then for groups

Requesting a Desktop for a User

When requesting a desktop for a user, VDI first needs to find the user DN that matches the user id before resolving the pool/desktop assignments for the user DN. If client authentication is enabled, then the user id attribute is also used for authentication.

The attributes used to match the user id are defined in `ldap.userid.attributes`.

Resolving Group Membership

Group membership is resolved using the attributes defined in `ldap.user.member.attributes` and `ldap.group.member.attributes`.
Nested group depth is limited to 3.

VDI also resolves Primary Group membership which is Active Directory specific. The attributes used for resolving primary group membership are defined in `ldap.group.short.attributes` and `ldap.user.member.attributes`.

LDAP Cache

In order to improve the performance and reduce the load on the user directory, the user and group entries retrieved by VDI are cached. Entries in the LDAP cache time out after 10 minutes.

It is not possible at the moment to change the LDAP cache timeout neither to flush the cache.

	Previous Page LDAP Integration		Up One Page Level How to Set Up a User Directory		Next Page User Directory Settings

This page last changed on Apr 07, 2009 by stephanielewellen.

User Directory Settings

User directory settings are configured in the Admin Web UI in the Settings category and User Directory subcategory.

Defining the User Directory

The instructions to define the user directory are described in Active Directory Integration and LDAP Integration.

Only one user directory can be defined.

Changing the Security Level

It is possible to change the security level for the connections to the user directory:

1. go to the LDAP or Active Directory tab (depending on the user directory type)
2. click the Edit button for the Security Level, to launch the wizard
3. switch to another security level and modify the other settings if necessary, such as the port, the username and the password
4. click Next to review your choices before completing the configuration update.

It is only possible to switch to a security level within the same type of user directory, LDAP or Active Directory. If you want to switch between LDAP and Active Directory, you have to remove the user directory and add it again.

In the case of LDAP connection type, it is not possible change the security level if additional hosts have been defined (see Adding Fallback Hosts).

Changing the Credentials

When using Kerberos, Simple or Secure authentication, it is possible to update the credentials used for opening the connection to the user directory:

1. go to the LDAP or Active Directory tab (depending on the user directory type)
2. click the Edit button for the Security Level, to launch the wizard
3. edit the username and the password as necessary
4. click Next to review your choices before completing the configuration update.

Updating the Server SSL Certificates

When using Public Key or Secure authentication, if the SSL certificate for the server has been changed, you need VDI to use the new certificate:
#go to the LDAP or Active Directory tab (depending on the user directory type)
#click the Edit button for the Security Level, to launch the wizard
#do not change any of the existing settings if you only want to update the server certificates

1. the following step shows the SSL certificates of the servers. Click Next to permanently accept the certificates.
2. click Next to review your choices before completing the configuration update.

Adding Fallback Hosts

When using the LDAP type of connection, it is possible to have additional LDAP hosts that would be used as a fallback in the case the connection to the main host is failing.

The additional LDAP hosts must be the replica of the main host. The connection to the fallback hosts will be open using the same security level, same port, same base DN and same credentials as for the main host.

The list of LDAP hosts can be found in the LDAP tab. Hosts can be added, removed and their order can be changed.

Removing the User Directory

The button to remove the user directory can be found on the LDAP or Active Directory tab.

If some assignments have been registered using some data (users or groups) from the user directory, a warning will be poped up and a confirmation is asked. If you confirm, the user directory will be removed, but it will leave VDI in a broken state where the users will not be able to access to their desktop. If you add the settings to the same directory again, even using a different security level, the assignments will still be valid and the user will be able to access their desktop again.

	⬅ Previous Page Customizing the LDAP Filters and Attributes		Up One Page Level ⬆ How to Set Up a User Directory		

This page last changed on Apr 07, 2009 by stephanielewellen.

How to Add Users to Pools

It is now time to assign your users to desktops. You can either assign a user to a specific desktop, or you can assign a user (or user group) to a desktop pool. In the latter case, the Sun VDI Core will automatically assign any available desktop from the pool to the user, once the user requests a desktop.

Steps

1. Select the Users tab and Users and Groups entry in the left sidebar.
2. Search for a known user in the User Directory (you can specify user name or user ID).
3. Click on the user's name, and then select the Assignment tab in their profile.
4. In the Pool Assignments space, click the Add button.
5. Highlight the desired pool(s) and click OK to assign the user.

	Previous Page How to Set Up a User Directory		Up One Page Level Administering		Next Page How to Associate Tokens to Users

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How to Associate Tokens to Users

In a Sun Ray environment, users will take advantage of smart cards (tokens) to initiate a session on a Sun Ray thin client (DTU). With VDI 3, you can associate a token to a user (it is also possible to assign desktops directly to specific tokens). Once tokens have been created, they can be assigned to Pools and Desktops.

How to Associate Tokens Using the Admin GUI

1. Select the Users tab and Users and Groups entry in the left sidebar.
2. Search for a known user in the User Directory.
3. Click on the user's name, and then select the Token tab in their profile.
4. In the Tokens table, click the New button.
   It is possible to manage (create, search, delete) tokens by using the Tokens entry in the Users tab.
5. Enter the ID of the new token (e.g. Payflex.500d9b8900130200) and if desired an additional comment in the pop-up window, and click OK.

> Token IDs can be copied directly from the SRSS Admin GUI (see the Tokens tab and display Currently Used Tokens).

Users can also be associated to existing tokens. To do this, select Add in the user's Tokens table and search for the desired token.

How to Create Bulks of Tokens Using the **vda** CLI Command

It is possible to create a number of tokens at once using the token-create subcommand.

The `token-create` subcommand can take an input file containing the tokens to create and the user associated with the token if needed.

Usage

```
Options:
-f <token-file>, --file=<token-file>
A CSV file containing the properties of the tokens to
be created. Format of the file is: <token-id> <comment>
<userid>
-w, --write Overwrite existing tokens, option to be used with the
token-file option
```

The format of the token file is CSV with the following values:

- token-id: the id of the smart card, this value is mandatory.
- comment: a comment about the token that can be used as a user friendly description of the token. This value maybe empty.
- userid: the user id of a user from the user directory, to be associated with the token. This value maybe empty.

Example

The following example shows a valid csv file for token creation and uses the file to create the tokens and their association to users.

```
example% cat /tokens.csv
```

```
mo12.345,"token for Mary O'Leary",moleary
js46.23,"token for user John Smith",jsmith
x34.45,"token without any associated user",
example% /opt/SUNWvda/sbin/vda token-create -f /tokens.csv
example% /opt/SUNWvda/sbin/vda token-search
NAME USER DN
mo12.345 Mary O'Leary cn=Mary O'Leary,ou=people
js46.23 John Smith cn=John Smith,ou=people
x34.45 - -
```


	Previous Page How to Add Users to Pools		Up One Page Level Administering		Next Page How to Create Automated Administration Scripts

This page last changed on Apr 08, 2009 by stephanielewellen.

How to Create Automated Administration Scripts

The `/opt/SUNWvda/sbin/vda` CLI can be used in scripts for automated administration.

Reading the Return Code

The `/opt/SUNWvda/sbin/vda` returns the following exit codes:

- 0: Successful completion
- 1: An error occurred
- 2: Invalid command line options or arguments were specified

Parsing the Output of the CLI

A number of subcommands support a parseable option so that the output is formatted for easy parsing: as a list of lines of colon-separated (':') fields.

The syntax of the option is:

```
-x, --parseable        Display output suitable for programmatic parsing.
```

Jump List of Subcommands

user-search

Search for users/groups in the user directory that match the specified search criteria.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format

Name of the user/group	string
Kind of object	`User` / `Group`
DN of the user/group	string

user-show

Show the desktops available for the user.

Parseable Output in the case of a user: list of lines with the following values separated by a colon (':').

Value	Data Format
Pool Name	string
Desktop Name	string
Desktop Id	integer
Kind of Assignment	`User` / `Token <token>` / `Group <group_name>` / `Custom Group <group_name>`

Parseable Output in the case of a group: list of lines with the following values separated by a colon (':').

Value	Data Format
Pool Name	string

user-desktops

Show the desktops assigned to the user.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Desktop Name	string
Desktop Id	integer
Pool Name	string
Type of Assignment	`flexible` / `personal`
Is Default Desktop	`true` / `false`

group-list

Lists all custom groups.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format

Custom Group Name	string

group-show

Show the pools assigned to the custom group.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Pool Name	string

token-search

Search for tokens that match the search criteria.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Token	string
Name of the Associated User	string
DN of the Associated User	string

token-show

Show the desktops available for the token.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Pool Name	string
Desktop Name	string
Desktop Id	integer
Kind of Assignment	`User` / `Token` / `Group <group_name>` / `Custom Group <group_name>`

token-desktops

Show the desktops assigned to the token.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Desktop Name	string
Desktop Id	integer

Pool Name	string
Type of Assignment	`flexible` / `personal`
Is Default Desktop	`true` / `false`

pool-list

List all pools.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Pool Name	string
Type of Desktop Assignment	`Personal` / `Flexible`
Number of Desktops	integer
Desktop Provider Name	string

pool-show

Show detailed information about the pool.

Parseable Output: one line with the following values separated by a colon (':').

Value	Data Format
Assignment Status	`Enabled` / `Disabled`
Type of Desktop Assignment	`Personal` / `Flexible`
Desktop Provider Name	string
Cloning Status	`Enabled` / `Disabled`
Template	`None` / string
Number of Cloning Jobs	integer
Number of Available Desktops	integer
Number of Assigned Desktops	integer
Total Number of Desktops	integer

pool-desktops

List all desktops from the pool.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Desktop Name	string

Desktop Id	long
Machine State	`Running` / `Powered Off` / `Suspended` / `Unknown`
Desktop State	`Available` / `Used` / `Idle` / `Unresponsive` / `Reserved` / `Template`
Name of Assigned User	string
DN of Assigned User	string
Is It a Template (displayed only for Virtual Box pools)	`yes` / `no`

provider-list

List all desktop providers.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Desktop Provider Name	string
Total Number of Desktops	integer
Number of Used Desktops	integer
CPU Usage	`xx% (x.x GHz/MHz)`
Memory Usage	`xx% (x.x GB/MB)`
Storage Usage	`xx% (x.x GB/MB)`

provider-show

Show detailed information about the desktop provider.

Parseable Output: one line with the following values separated by a colon (':').

Value	Data Format
Server	string
Datacenters	comma separated strings
Pool Names	comma separated strings

followed by a list of lines with the following values separated by a colon (':').

Value	Data Format
Host Name	string
CPU Usage	`xx% (x.x GHz/MHz)`
Memory Usage	`xx% (x.x GB/MB)`

provider-list-hosts

List all hosts for the xVM VirtualBox desktop provider.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Host Name	string
Status	`Enabled` / `Disabled`
CPU Usage	`xx% (x.x GHz/MHz)`
Memory Usage	`xx% (x.x GB/MB)`
Number of Desktops	integer

provider-list-storage

List all storage servers for the desktop provider.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Storage Name	string
ZFS Pool	string
Capacity	`xxx.x GB`
Usage	`xx.x GB`
Number of Desktops	integer

provider-list-templates

List the templates for the desktop provider.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Template Name	string
Template Id	long

provider-list-unmanaged

List the desktops from the VMware VirtualCenter that are not managed by any desktop provider.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format

Desktop Name	string
Desktop Id	long

job-list

List the existing jobs.

Parseable Output: list of lines with the following values separated by a colon (':').

Value	Data Format
Job Title	`Cloning Desktop <desktop_name>` / `Recycling Desktop <desktop_name>` / `Starting Desktop <desktop_name>` / `Powering Off Desktop <desktop_name>` / `Shutting Down Desktop <desktop_name>` / `Restarting Desktop <desktop_name>` / `Deleting Pool <pool_name>` / etc.
Target of the Job	string
Status of the Job	`Queued` / `Running` / `Completed` / `Failed` / `Cancelling` / `Cancelled`
Id of the Job	integer

job-show

Show the job details.

Parseable Output: one line with the following values separated by a colon (':').

Value	Data Format
Job Title	`Cloning Desktop <desktop_name>` / `Recycling Desktop <desktop_name>` / `Starting Desktop <desktop_name>` / `Powering Off Desktop <desktop_name>` / `Shutting Down Desktop <desktop_name>` / `Restarting Desktop <desktop_name>` / `Deleting Pool <pool_name>` / etc.
Target of the Job	string
Status of the Job	`Queued` / `Running` / `Completed` / `Failed` / `Cancelling` / `Cancelled`
Start Time	hh:mm:ss
End Time	hh:mm:ss
Job Details	string

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	How to Associate Tokens to Users		Administering		

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VDI Default Configuration

This is an overview of the configuration actions which occur during VDI configuration (via script 'vda-config'). Actions are shown according to VDI component and the used command lines.

The configuration actions shown here don't necessarily happen in chronological order.

Sun Ray Server Software (SRSS)

Configures basic SRSS settings:

```
/opt/SUNWut/sbin/utconfig
```

- Administrator password
- Server for a FOG
- FOG's signature

Configures SRSS Web Administration:

```
/opt/SUNWut/lib/support_lib/srwa_config update
```

- Tomcat's home directory
- http ports (1660, 1661)
- Webservice's user name(utwww)
- Remote access (enabled)

Configures Kiosk user accounts:

```
/opt/SUNWkio/bin/kioskuseradm create -l utku -g utkiosk -i auto -u-c
```

Replicates from Primary to Secondary hosts:

```
/opt/SUNWut/lib/utrcmd -n/opt/SUNWut/sbin/utreplica -p -a
/opt/SUNWut/sbin/utreplica -s
```

Enables LAN access:

```
/opt/SUNWut/sbin/utadm -L on
```

Allows root user access:

```
/opt/SUNWut/sbin/utadminuser -a root
```

```
/opt/SUNWut/sbin/utadminuser -d admin
```

Additionally, the following line is commented out in the file `/etc/pam.conf` :

```
# utadmingui auth sufficient \/opt\/SUNWut\/lib\/pam_sunray_admingui.so.1
```

Sets Kiosk Session value to vda:

```
/opt/SUNWut/sbin/utkiosk -i session -f
```

Sets Kiosk Policy for both card users and non-card users:

```
/opt/SUNWut/sbin/utpolicy -a  [-g] -z both -k both -m
```

Sun Ray Windows Connector (SRWC)

Enables SRWC if the Kiosk and LAN settings succeed:

```
/opt/SUNWuttsc/sbin/uttscadm -c
```

VDI Core

Creates RDP Broker SMF service:

```
svc://application/rdpbroker
```

Configures VDA webservice:

- Ports are configured (1800 / 1801)
- `webuser` is set to `noaccess`
- Remote access is enabled

Stops CACAO:

```
cacaoadm stop -f
```

Sets java and file-encoding flags:

```
cacaoadm set-param java-flags=-Xms4M -Xmx256M -Dcom.sun.management.jmxremote -Dfile.encoding=utf-8
```

Starts CACAO:

```
cacaoadm start
```

Sets CACAO to start at boot:

```
cacaoadm enable -i default
```

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Adapting Sun Ray Software

Sun VDI 3 supports different desktop access mechanisms. End-users have the choice to use existing Windows PC client devices or they can step up to the energy efficient thin clients from Sun (also known as Sun Ray DTUs). Sun Ray Software (including Sun Ray Server Software and Sun Ray Connector for Windows Operating Systems) is automatically installed and configured as part of the Sun VDI core installation.

- Sun Ray Computing Model
- Sun Ray Administration GUI
- Sun Ray Kiosk Session

VDI 3 now authenticates users each time they sign in. If you would prefer to disable client authentication, refer to the following link:

- How to Disable Client Authentication

			Up One Page Level Administering		Next Page Setting Up Sun Secure Global Desktop Software

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Sun Ray Administration GUI

The Sun Ray administration GUI is configured and accessible on each Sun VDI host. This allows easy modification of Sun Ray configuration settings such as Kiosk session parameters (see following section).

Steps

1. Go to `http://<server name>:1660`.
2. You will be re-directed to https and the web browser will ask you to accept the security certificate. After confirmation, you should get the login screen.
3. You must login as super user ("root") with corresponding password.

Sun VDI 3 does not use the default "admin" user account that is normally configured as part of the Sun Ray Software installation.

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This page last changed on Apr 08, 2009 by stephanielewellen.

Sun Ray Computing Model

Sun Ray DTUs have no local disks or locally installed applications or operating systems and are therefore considered stateless. This makes them easy to exchange, inexpensive to maintain, and extremely secure. Sun Ray DTUs connect to the next available Sun VDI host using the Appliance Link Protocol (ALP). To ensure uninterrupted service, several Sun VDI hosts are automatically configured as a Sun Ray failover group, so that whenever a server goes down, the affected DTUs automatically re-connect to the next available Sun VDI server in the failover group.

The Sun Ray architecture uses tokens (authentication keys) to associate a desktop session with a user. Typically, the token is presented on a smart card that the user inserts into the DTU's card reader. If a session associated with that token is already running on any Sun VDI server, the DTU is automatically redirected to that server, and the user's most recent session is displayed. While the session continues to reside on the server, it appears to follow the user from one DTU to another. This functionality, called hotdesking or session mobility, enables users to access their desktops from different locations, using any DTU on their network.

More information around Sun Ray can be found in the Sun Ray Software documentation.

			Up One Page Level Adapting Sun Ray Software		Next Page Sun Ray Administration GUI

This page last changed on Apr 08, 2009 by stephanielewellen.

Sun Ray Kiosk Session

Sun Ray Software is typically used to serve standard UNIX desktop sessions. However, other session types can be easily supported taking advantage of the Sun Ray Kiosk mode. Sun VDI 3 comes with a predefined Kiosk session (called Sun Virtual Desktop Access - VDA) that uses the Sun Ray Windows Connector to establish a remote desktop protocol (RDP) connection to a virtual machine.

A Sun Ray Kiosk session is initiated when a user inserts a smart card into a Sun Ray DTU. The new session will first bring up a login dialog asking for user name and password (and optionally a Windows domain). This type of authentication can be disabled if required (see Disabling Client Authentication).

> Sun VDI 3 does not require the usage of smart cards. Per default the Kiosk session is enabled for smart card and non-smart card access.

After successful authentication, the system will contact the Sun VDI service to determine the desktops assigned to the logged in user. If multiple desktops are available, the user will get a desktop selection dialog. Once the user has selected a desktop, the Sun Ray Windows Connector will startup and connect to the virtual machine running the desktop (see DTU Access).

Supported Kiosk Session Parameters

The appearance and behavior of the Kiosk session can be configured via a number of session parameters. These parameters can be split up into two groups: Settings specific for the VDA session (affecting the desktop selector dialog), and settings specific for the Sun Ray Windows Connector (aka uttsc) (affecting the quality of the RDP connection). The general syntax is:

```
<specific settings for desktop selector> -- <uttsc specific settings>
```

Desktop Selector Settings

Per default the login/desktop selector dialog will take advantage of the Java Runtime Environment located under /usr/java. However, an alternative path can be specified using the "-j" option. We recommend to use Java 6 for the dialog to get better locale support and to take advantage of the latest improvements in the Java Swing area.

Other Kiosk parameters set default values for the input fields or hide/display certain UI elements in the dialog.

```
-n (--no-desktop-selector) - Disables the desktop selector completely.
-d (--default-domain)      - Allows to preset domain input field.
-l (--list-of-domains)     - Preset the domain selector pulldown, e.g. -l vdatest.germany,qa.ireland
-t (--timeout)             - Specifies the timeout applied after login (seconds)
-j (--java-home)           - Path to JRE (defaults to /usr/java) used by the selector dialog.
-o (--no-domain-field)     - Always hide domain input field.
-w (--show-password-field) - Always show password field
```

> Disabling the desktop selector
> If you disable the desktop login/selector dialog with the "-n" option, then users have no possibility to enter their password prior to accessing a desktop. Thus if you disable this dialog, you must also disable the client authentication at the same time - see Disabling Client Authentication.

Windows Connector (uttsc) Settings

See the uttsc man page for a complete listing of the supported parameters. The list below is just an extract of the settings to illustrate the configuration options.

```
-r sound:[low | high | off]    - Disable sound redirection from the server to the client or change the quality of
                        transmitted sound. The sound quality in terms of bits per second can be specified.
                        A "low" quality transmits 8khz and a "high" quality does 22.2 khz.  By default, High
                        quality sound is enabled.

-A color depth            - Sets the colour depth for the connection (8, 15, 16  or 24).
                        The  colour  depth  may be limited by the server configuration in which case
                        the server configuration is honored.

-E window-attribute       - Enable window attributes from the defined set. The available set of options which
                        can be enabled are:
                          wallpaper,  fullwindowdrag,  menuanimations,  theming,
                          cursorshadow,  cursorsettings.
                        Keeping these attributes disabled improves display performance  especially over lower
                        bandwidth  networks.  Multiple -E options can be specified for more than one attribute
                        if required.
```

Adapting Kiosk Session

Kiosk session settings can be easily adapted via the Sun Ray Admin GUI:

Steps

1. Login to the Sun Ray Admin GUI.
2. Switch to the Advanced tab.
3. Afterwards select the Kiosk Mode sub-tab.
4. Click on Edit to modify the configuration settings.
5. Enter the desired settings in the Arguments field.
   For example:

```
-d vdatest -j /usr/java6 -- -E wallpaper -E theming
```

6. Click on OK to save the new settings.

> If you want to adapt the default locale of login/desktop selection dialog, put in the desired locale in the Locale input field of the Kiosk settings.

Perform a Cold Restart

The new settings will become active for every newly created Kiosk session. If you want to enforce the settings for existing sessions also, then you can perform a cold Sun Ray services restart. This will terminate all existing sessions and will create new Kiosk sessions as necessary.

> Users will notice an outage and will also be forced to re-login into their desktop sessions again, if you perform a cold Sun Ray services restart.

Steps

1. Switch to the Servers tab.
2. Select all servers in your Sun VDI environment.
3. Click on Cold Restart to initiate the Sun Ray services restart.
4. This operation can take up to several minutes.

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This page last changed on Apr 08, 2009 by stephanielewellen.

Setting Up Sun Secure Global Desktop Software

Sun VDI can be also used with Sun Secure Global Desktop software (SGD) 4.41.

Steps

1. Install SGD 4.41.
   For detailed instructions, see the Sun Secure Global Desktop Software 4.41 Collection.

   > The mechanism for accessing desktops via Sun Secure Global Desktop has changed since Sun VDI 2. The 'My Desktop' Application Object and corresponding expect script is no longer required for Sun VDI 3.

2. Replace the SGD Terminal Service Client.
   The default SGD Terminal Service Client (ttatsc) does not support RDP redirection as required by the Sun VDI Core. Thus, you need to replace this binary with an updated version included in the Sun VDI Core installation.
   Replace the default SGD Terminal Services Client provided by SGD (found at `/opt/tarantella/bin/bin/ttatsc`) with the version provided by the Sun VDI RDP Broker (found at `/opt/SUNWrdpb/supplemental/ttatsc/<Installation_Platform>/ttatsc`).
3. Create a Windows Application Object.
   You need to create a Windows application object to offer users an easy way to access the desktops managed by Sun VDI. This can be done using the tarantella CLI or using the SGD Administration console.
   For example, to create a full screen kiosk Windows application using the SGD command line enter the following command:

```
# /opt/tarantella/bin/tarantella object new_windowsapp --name ".../_ens/o=applications/cn=Sun VDI Desktop" \
--width 1200 --height 1000 --maxinstances 1 --login windows.exp --displayusing kiosk --maximize true
```

Assign the new Application Object to the users that need to access a Sun VDI Desktop.
By default, all the users are assigned to the Applications group so an easy way to do so is to add the newly created application object to the Applications group:

```
# /opt/tarantella/bin/tarantella object add_member --name ".../_ens/o=applications/cn=Applications" \
--member ".../_ens/o=applications/cn=Sun VDI Desktop"
```

> Creating the Application Object and adding the object to the Applications group can also be done via the SGD Administration Console. Please see the SGD documentation for more details on adding Application Objects to SGD.

Security Considerations

Sun VDI 3 now authenticates users each time they sign into their desktop. If you would prefer to disable this feature, please see Disabling Client Authentication.

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	Adapting Sun Ray Software		Administering		Understanding the RDP Broker

This page last changed on Apr 08, 2009 by stephanielewellen.

Understanding RDP Broker

Sun VDI 3 includes a built-in RDP broker that allows easy desktop access leveraging the Remote Desktop Protocol (RDP). This way users can take advantage of existing RDP clients (for example, the remote desktop connection in Windows XP) for accessing desktops.

How Does it Work?

1. The RDP client first contacts the Sun VDI RDP broker (passing over any information like username, password, etc).
2. The RDP broker will then contact the VDI service on behalf of the client and will ask to startup the desired desktop.
3. The VDI service will first verify the username/password combination (if client authentication is enabled on the VDI service side - that is the default, see Disabling Client Authentication).
4. If authentication succeeds, the corresponding desktop will be started up and the VDI service returns the IP and optionally RDP port of the virtual machine (VM) running the desktop.
5. This information is used by the RDP broker to construct an RDP Server Redirection Packet containing either:

- the VM host/IP address as the server to redirect to (if using Windows RDP, as done for VMware Infrastructure 3)
- or a routing token containing encoded IP address and RDP port information (if using the VirtualBox RDP (aka VRDP))

The latter is necessary, because VRDP does not use the standard Windows RDP port. Thus the RDP broker needs to hand back both the IP and the RDP port information. For details of the routing token encoding, see the 'Routing Token Format' section of 'Session Directory and Load Balancing Using Terminal Server'.

Finally this RDP redirection packet is sent back to the RDP client and the client will redirect accordingly.

Supported RDP Clients

RDP clients that support all the above mentioned mechanism and that have been tested with Sun VDI are:

- the Microsoft terminal services client (aka remote desktop connection) as included in Windows XP and Windows Vista
- the Sun Ray Connector for Windows OS (aka uttsc)
- the SGD terminal services client (aka ttatsc, using the updated version delivered as part of Sun VDI)

Other clients may work, but have not been tested by QA.

Security Considerations

Sun VDI 3 now authenticates users each time they sign into their desktop. If you would prefer to disable this feature, please see Disabling Client Authentication.

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This page last changed on Apr 08, 2009 by stephanielewellen.

Accessing Desktops with a Sun Ray DTU

The following screenshots illustrate how to access a desktop from an end-user perspective using Sun Ray thin clients (DTUs).

Using the Desktop Login/Selector Dialog

Starting with Sun VDI 3 all users must authenticate themselves before getting access to any desktops. Also new is the possibility to select between multiple desktops. This behavior can be configured (see Using Sun Ray Software).

Steps

1. Log into Sun VDI.

Insert a smart card (token) that has been assigned to a pool, or a desktop directly (as described before) into a Sun Ray DTU that is connected to a Sun VDI host. It should display a login screen, after a short while. You must provide your user name and password (and optionally a Windows domain).

> Sun VDI 3 does not require the usage of smart cards. Per default desktop access is enabled for smart card and non-smart card usage.

2. Select a desktop or pool.

After successful authentication, the system will determine the desktops (and pools) assigned to you. If multiple desktops are available, you will get a desktop selection dialog. The selection screen will be skipped, if there is only one desktop available to you.

> You will be automatically logged out, if you do not select a desktop within three minutes (the default timeout).

3. Work with the desktop.

Once you have selected a desktop, the Sun Ray Connector for Windows OS will startup and will display your desktop. At any time you can disconnect from your desktop by moving your mouse up to the top of the screen. A remote desktop pulldown menu will appear. Hitting the "X" from the menu will disconnect you from the current desktop session and the desktop selection menu (or the login screen) will appear again.

> There is also a Disconnect button available in the Windows start menu, for desktops connected via Windows RDP. Desktops connected via VirtualBox RDP (VRDP) will not offer this button.

Using the Default Desktop

The desktop login/selector dialog can be completely disabled with the "-n" Kiosk session option (see Using Sun Ray Software). In this setup users are always connected to their default desktop without the need to pass any other Sun VDI dialogs. This behavior is similar to previous Sun VDI versions.

> If you disable the desktop login/selector dialog, users have no possibility to enter their password prior to accessing a desktop. Thus to make this setup work, you must also disable the Sun VDI client authentication - see Disabling Client Authentication.

Steps

1. Start the desktop.

Insert a smart card (token) that has been assigned to a pool, or a desktop directly (as described before) into a Sun Ray DTU that is connected to a Sun VDI host. Sun VDI will determine the assigned default desktop and will start it up if necessary. During that time a wait screen is displayed.

> Sun VDI 3 does not require the usage of smart cards. Per default desktop access is enabled for smart card and non-smart card usage.

2. Log into the desktop.

It is good practice, if desktops are configured to always present their own login screen before displaying the actual desktop content. This way authentication is still required, but it is now performed on the guest OS level.
In this example you will get the standard Windows login screen. Depending on your guest OS configuration you must enter user name/password (and potentially the Windows domain).

3. Work with the desktop.

Once you have successfully logged in you will get your desktop content displayed. The behavior is the same as for a standard Windows PC.

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This page last changed on Apr 08, 2009 by stephanielewellen.

Accessing Desktops with SGD Web Access

- Log into the SGD webtop (with URL `http://<ssgd_server>/`) as the user who has been assigned the pool/desktop.
- The Windows Application Object that you created (see The Virtual Desktop Access Layer section) should appear in the list of applications on the left-hand side. Clicking the Application Object should ask for user credentials and then launch a Windows session for the user on the assigned desktop.

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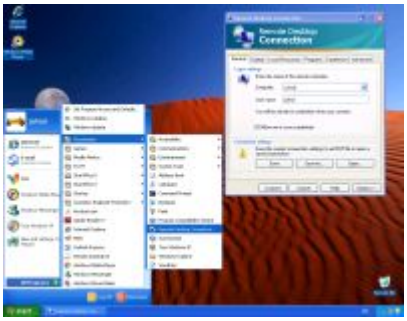
This page last changed on Apr 08, 2009 by stephanielewellen.

Accessing Desktops with Microsoft RDC

Sun VDI 3 includes a built-in RDP broker that allows easy desktop access leveraging the Remote Desktop Protocol (RDP). This way users can take advantage of existing Windows PCs for accessing desktops. There is typically no need to install any additional software on your PC. Both Windows XP and Windows Vista provide out of the box the necessary functionality. The following screenshots illustrate how to access a desktop from an end-user perspective using Windows XP.

Steps

1. Open a remote desktop connection.
   a. Click on Start > All Programs > Accessories > Remote Desktop Connection.
   b. In the dialog, specify as Computer the name, or IP address of the host running Sun VDI 3.
   c. Specify the user name, and optionally Windows domain. Click Connect.
   d. A popup dialog will come up asking for the user password. Enter the password and click OK.
   e. After a while, the desktop should be displayed, and be ready to use.



> The remote desktop connection on your computer might be configured for performance optimization. Thus certain elements like desktop background, theming, menu and window animations might not be displayed in your setup. You can easily adapt these settings (see Experience tab of the remote desktop connection) to meet your personal requirements.

2. Access a specific desktop or pool.
   If multiple desktops are assigned to a user, then Sun VDI will connect to the default desktop (which can be defined using the Sun VDI Admin GUI).
   Alternatively, it is possible to specify the desired desktop or pool when opening the remote desktop connection. Just enter the user name, followed by the pool name, and the optional desktop ID using the following syntax:

```
<username>::pool=<poolname>[,desktop=<desktopId>]
```

   It is usually sufficient to just specify the pool name. However, if you have multiple desktops assigned from the same pool, you must specify both the pool name and the desktop ID.

> Desktop identifiers can be listed via the Sun VDI administration CLI executing /opt/SUNWvda/sbin/vda user-desktops <username>


If you frequently switch between various desktops, then it is convenient to store the remote desktop connection settings for each desktop in an RDP file (see Connection Settings > Save As). You can then create shortcuts to these files allowing you to initiate a connection via a simple mouse double-click.

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This page last changed on Apr 08, 2009 by stephanielewellen.

Security Considerations

Starting with Sun VDI 3, all users must authenticate themselves before getting access to any desktop. Typically users will be asked for a user name/password combination (and optionally a Windows domain). The VDI service will then contact the user directory for the verification of the provided user credentials. If authentication succeeds the connection to the desired desktop will be established - otherwise it will be denied. The user name/password will also be forwarded to the guest OS running the desktop - this way users get automatically logged into their desktop without the need to potentially pass another login screen.

For Sun VDI 3 automatic login will work for Windows RDP only - forwarding of user credentials does not work yet for VRDP and non-Windows OS.

Authentication on the VDI service level can be disabled if desired. However, special care needs then to be taken on the users' desktops setup to not open unwanted security holes. For example, it is good practice, if desktops are configured to always present their own login screen before displaying the actual desktop content. This way authentication is still required, but it is now performed on the guest OS level only. This setup also allows to take advantage of more advanced authentication techniques that are not supported out of the box by the VDI service.

For security reasons it is recommended to leave authentication always enabled, unless the simple user name/password authentication does not satisfy your requirements.

Enabling/Disabling Authentication

You can use the VDA administration CLI to configure, if authentication should be performed by the VDI service.

To check the currently configured authentication policy:

```
# /opt/SUNWvda/sbin/vda settings-getprops -p clientauthentication
```

To enable authentication (the default):

```
# /opt/SUNWvda/sbin/vda settings-setprops -p clientauthentication=Enabled
```

To disable authentication:

```
# /opt/SUNWvda/sbin/vda settings-setprops -p clientauthentication=Disabled
```

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- Setting Up Sun Secure

			• Global Desktop Software • Accessing Desktops with Microsoft RDC		

This page last changed on Jun 24, 2009 by stephanielewellen.

Troubleshooting and FAQs

This page displays a categorical view of VDI Troubleshooting and FAQs. Some questions will be shown in more than one category. We are constantly updating this page based on VDI Forum questions!

Database

Desktops and Desktop Pools

Networking

RDP and SGD

Sun Ray Software and DTU

Supported Software and Configurations

- Which versions of JRE are supported?
- Is it possible to assign MS Terminal Server to users?
- Is the Demo configuration a supported configuration?
- Is VMware ESXi a supported virtualization platform?

Storage

- Does the VirtualBox swap space really have to be the same as the memory?
- I have free memory on my ZFS storage host, but my VirtualBox virtual machines will not start due to a lack of memory.
- When I start a desktop I get this error - No suitable hosts to start a desktop for Desktop Provider sunvdi-demo.

User Directory

- Users cannot log into their desktops using their User Principal Name (UPN), or email address.
- Kerberos authentication to Active Directory works for a while and then stops.
- Can I use PKI instead of Kerberos for authentication to an Active Directory?
- Users do not show up in the Admin GUI in the Users and Groups section.

Users

- End-users are not able to log into their Windows desktop.
- End-users cannot access their virtual machines.
- Users do not show up in the Admin GUI in the Users and Groups section.

VDI Admin GUI

- I cannot log into the Admin GUI.
- I get a blank screen after successfully logging into the Admin GUI.
- Jobs don't finish even after canceling them using the Admin GUI.
- There is an error when I add a VirtualBox host to a desktop provider.
- I can start a virtual machine from the VirtualBox GUI, but it will not start from the VDI Admin GUI.
- Users do not show up in the Admin GUI in the Users and Groups section.

VDI Demo

- Can I set up a Demo of VDI 3 on one machine?
- Can I convert a VDI Demo into a clustered VDI Production environment?
- Is the Demo configuration a supported configuration?
- VDI database doesn't start during an Evaluation configuration.
- Can I install a full Demo without user directory integration?

VDI Services

- The system is not reacting as expected.
- vda command reports that VDI is not running although cacaoadm and vda-db-status say it is.
- Jobs don't finish even after canceling them using the Admin GUI.

VirtualBox Virtualization Platform

- The VirtualBox software never finishes installing due to an error.
- The VirtualBox host is crashing unexpectedly.
- The VirtualBox Web Service cannot be contacted.
- Does the VirtualBox swap space really have to be the same as the memory?
- I have free memory on my ZFS storage host, but my VirtualBox virtual machines will not start due to a lack of memory.
- How do I configure the audio for VirtualBox hosted virtual machines?
- There is an error when I add a VirtualBox host to a desktop provider.
- I can start a virtual machine from the VirtualBox GUI, but it will not start from the VDI Admin GUI.
- When I start a desktop I get this error - No suitable hosts to start a desktop for Desktop Provider sunvdi-demo.

Virtual Machines

- End-users cannot access their virtual machines.
- Unused VMware virtual machines are not being recycled.
- The VMware virtual machine cloning process is not operating as expected.
- How do I configure the audio for VirtualBox hosted virtual machines?
- I am unable to get a MS RDC connection on my VMware virtual machine.
- How do I use VMware virtual machines with multiple network adapters?
- Why does my VMware virtual machine have an invalid IP address or cannot be pinged?

VMware Virtualization Platform

- I have created a new pool in my VMware desktop provider and virtual machines are not created automatically.
- Unused VMware virtual machines are not being recycled.
- The VMware virtual machine cloning process is not operating as expected.
- Is VMware ESXi a supported virtualization platform?
- In my VMware desktop pool, new virtual machines are created automatically, but they are not made available.
- The window displaying the VMware-hosted virtual desktop is freezing.
- I am unable to get a MS RDC connection on my VMware virtual machine.
- How do I use VMware virtual machines with multiple network adapters?
- Why does my VMware virtual machine have an invalid IP address or cannot be pinged?

Can I convert a VDI Demo into a clustered VDI Production environment?

This page last changed on Jun 17, 2009 by stephanielewellen.

Can I convert a VDI Demo into a clustered VDI Production environment?

Yes. While configuring the multi-host Production setup, run `vda-config` on all hosts (one Primary and two Secondaries).
On one of the Secondary hosts you may restore the data.
Back up the database:
On the Demo (or Evaluation) host, execute:

```
/opt/SUNWvda/mysql/bin/ndb_mgm
```

at the `ndb_mgm` prompt, execute:

```
START BACKUP
```

Check if a directory 'BACKUP' was created at the location `/var/opt/SUNWvda/mysql-cluster`.
Do a restore into the cluster:
Perform `vda-conig -u`, it should ask for restoring this backup. Run `vda-config` on all hosts (one Primary and two Secondaries). Save the backup as `/var/opt/SUNWvda/mysql-cluster/BACKUP` on the Secondary server. Execute the following command on the same host:

```
/opt/SUNWvda/mysql/bin/ndb_restore -b <backup #> -n <nodeid #> -r - - backup_path=<path>
```

For further reference, see the Backing Up the VDI Configuration page.

Can I install a full Demo without user directory integration?

This page last changed on Jun 24, 2009 by stephanielewellen.

Can I install a full Demo without user directory integration?

Sun VDI 3 allows to assign desktops to users and/or tokens (smart cards). The user information must always come from an LDAP (or Active Directory) server. There is currently no possibility to take advantage of local system accounts (Unix accounts). As a consequence a demo setup normally requires a user directory. This allows to test the full VDI 3 functionality for accessing desktops, for example using an RDP client or using Sun Ray DTUs.
The Sun Ray functionality also supports the usage of smart cards. You can assign desktops to specific smart cards (tokens) and you can configure the system to display a desktop by just inserting a smart card into a Sun Ray DTU (without asking for any user name). In such a setup a user directory is no longer mandatory. However, keep in mind that this limits you to test the Sun Ray functionality only. You will not be able to access desktops from an RDP client.
If you want to test the RDP broker functionality included in Sun VDI 3, then you must assign desktops to users and therefore must take advantage of LDAP (or Active Directory). This means that you have to configure an LDAP server, afterwards search for the user in the Sun VDI Admin tools and then assign either a pool or a desktop to this user. Desktops/pools are internally assigned to LDAP user DNs. If you are using an RDP client, you must specify a user name (and potentially a corresponding password). Sun VDI translates this user name into a user DN and will then bring up the corresponding desktop.
Full Background:

1. The RDP client contacts the VDI RDP broker and passes over any user name, credentials and domain information (if specified).
2. The RDP broker triggers an internal VDA client CLI called 'vda-client'. This CLI encapsulates the communication of any client with the VDA service. The vda client will request the start of a desktop for the provided user name (if authentication is enabled, the provided credential information will be verified first).
3. The VDA service will look up the LDAP DN for the provided user name.
4. It will then figure out the desktop assignments for this user DN.
5. Based on determined information one desktop will be picked up and started.
6. The IP and RDP port of the virtual machine is handed back to the vda-client CLI.
7. The RDP broker uses this information to redirect the RDP client to the IP/RDP port of the virtual machine.
8. The RDP client connects to the virtual machine.

Can I set up a Demo of VDI 3 on one machine?

This page last changed on Jun 12, 2009 by stephanielewellen.

Can I set up a Demo of VDI 3 on one machine?

Yes! We encourage new users to set up a VDI demo to get comfortable with the software before installing a production environment setup. See Getting Started - VDI Demo for VDI demo system requirements and step-by-step installation and configuration instructions.

Can I use OpenSolaris instead of Solaris 10 Update 7 for my single host Demo?

This page last changed on Jun 24, 2009 by stephanielewellen.

Can I use OpenSolaris instead of Solaris 10 Update 7 for my single host Demo?

OpenSolaris may be used as storage platform hosting the ZFS pool used by VDI 3. However, the core parts of VDI 3 CANNOT be installed on OpenSolaris.
The information on the Getting Started - VDI Demo page focuses on simplicity - everything (connection broker, storage, virtualization backend) is installed on a single machine. The VDI 3 install and configuration scripts (e.g. `vda-install`, `vda-config`, `vb-install`, `vb-config`), will work for the Solaris 10 platform only. The scripts require some libraries and tools under certain paths that do not exist (or exist under different paths) in OpenSolaris. This could be made to work on OpenSolaris, but it would require a lot of manual adaptations. That's why , for the moment, we require Solaris 10 for the VDI 3 installation and do not support OpenSolaris for installing the core VDI parts. Update 7 is required because several fixes in the ISCSI area went into this update.
The requirement of 64-bit is caused by the MySQL cluster database version shipped with VDI 3 (we only include the 64-bit version of the MySQL cluster in VDI 3).

Can I use PKI instead of Kerberos for authentication to an Active Directory?

This page last changed on Jun 24, 2009 by stephanielewellen.

Can I use PKI instead of Kerberos for authentication to an Active Directory?

You can certainly use PKI authentication and it should offer the same features (including removing computers from the Active Directory) as Kerberos authentication.

Can I use wild cards in token names to represent a group of DTUs in order to assign these DTUs to a pool?

This page last changed on Jun 24, 2009 by stephanielewellen.

Can I use wild cards in token names to represent a group of DTUs in order to assign these DTUs to a pool?

No, tokens in VDI don't allow wild cards. Instead, you can create tokens in bulk and have them associated to users by using the vda CLI as described on the How to Associate Tokens to Users page. Then you can make pool assignments based on existing groups of users in your user directory, or groups you would define especially for VDI using Custom Groups.

Does the MySQL database store all SRS-related configuration?

This page last changed on Jun 22, 2009 by stephanielewellen.

Does the MySQL database store all SRS-related configuration?

No, all SRS-related configuration is stored in the LDAP-based SRS datastore.

Does the VirtualBox swap space really have to be the same as the memory?

This page last changed on Jun 22, 2009 by stephanielewellen.

Does the VirtualBox swap space really have to be the same as the memory?

Yes, because of a long standing Solaris bug, all the memory that the VirtualBox virtual machines use is double accounted (but not actually used). This means that if you stay with 64GB of swap on your system, as soon as you start enough virtual machines to consume 64.1GB of memory, Solaris will think it has no memory left and stop forking processes, causing it to hang or crash.
See the Release Notes for more information.

Do I need to configure SRS separately in VDI 3?

This page last changed on Jun 22, 2009 by stephanielewellen.

Do I need to configure SRS separately in VDI 3?

A separate installation of SRS is not necessary in VDI 3. In fact, we require that SRSS and SRWC are NOT installed/ configured when starting the VDI 3 installation. The SRSS/SRWC parts are automatically setup as part of the VDI 3 install/ configuration script.

End-users are not able to log into their Windows desktop.

This page last changed on Jun 12, 2009 by stephanielewellen.

End-users are not able to log into their VMware provided Windows desktop.

Verify that the users are configured for remote access and are allowed to perform a remote access.

End-users cannot access their virtual machines.

This page last changed on Jun 12, 2009 by katell.

End-users cannot access their virtual machines.

1. On a terminal trigger the following command:

```
/opt/SUNWvda/lib/vda-client -p `cat /tmp/vdaservice.port` -m <test user>
```

2. If things work as expected, then the vda-client will trigger the startup of the corresponding Virtual Machine and should return an IP (e.g. 10.16.46.208) or DNS name (e.g. argus-load5-ham) for accessing the user's desktop. If the RDP port differs from the default, then it will be appended to the IP/DNS name (e.g. 10.16.46.208:49259 or argus-load5-ham:49259)
3. With that information it should now be possible to establish an RDP connection to the desktop.
4. If no IP or DNS name is returned by vda-client, VDI might have some trouble resolving the user ID in the user directory. To check that, change the log level of cacao to ALL as described in the cacao troubleshooting.
5. in the cacao log file `/var/cacao/instances/default/logs/cacao.0`, look for entries of the type

```
FINEST: userId=<test user> -> DN=<dn>
```

6. if <dn> is null, that means that no user matching the user id `<test user>` was found in the user directory. It would then be necessary to customize the list of attributes `ldap.userid.attributes` to match the directory schema as explained in Customizing the LDAP Filters and Attributes.
7. if <dn> is not null, that means that the user matching the user id `<test user>` was correctly found in the user directory.

How do I configure DHCP in VDI 3?

This page last changed on Jun 22, 2009 by stephanielewellen.

How do I configure DHCP in VDI 3?

First, install and configure VDI using `vda-install` and `vda-config` as described on the Installingpages. This will also install SRS and configure the SRS fail-over group and Kiosk settings. You can then adapt things as needed using the typical SRSS commands. For example, use `utadm -a <interface name>` to configure a dedicated interconnect for the Sun Ray DTUs. This will also ask you for the desired DHCP settings.

How do I configure the audio for VirtualBox hosted virtual machines?

This page last changed on Jun 17, 2009 by stephanielewellen.

How do I configure the audio for VirtualBox hosted virtual machines?

If you change a virtual machine's configuration (i.e. audio) via the VDI GUI, the changes will not take effect until the virtual machine has been unregistered/re-registered on a VirtualBox host. Simply restarting the virtual machine from within will not result in this behavior. To force the unregister/register choose either 'Power Off' or 'Shutdown' from the VDI GUI and then a 'Start'.

How do I make a desktop available to a user at all times in VDI 3?

This page last changed on Jun 24, 2009 by stephanielewellen.

How do I make a desktop available to a user at all times in VDI 3?

Make sure the user's desktop has a personal assignment instead of a flexible assignment. For more about desktop assignment types, see: What is the difference between Personal and Flexible desktop assignments?

How do I specify USB redirection for Sun Ray?

This page last changed on Jun 17, 2009 by stephanielewellen.

How do I specify USB redirection for Sun Ray?

You can adapt the Kiosk session parameters using the Sun Ray Admin GUI as described on the Sun Ray Kiosk Session page. Add the desired drive mapping after any other uttsc specific settings: `<specific settings for desktop selector> - <any other uttsc specific settings> -r disk:<drive name>=<path>`

How do I use VMware virtual machines with multiple network adapters?

This page last changed on Jun 12, 2009 by stephanielewellen.

How do I use VMware virtual machines with multiple network adapters?

See Sun VDI: How to use virtual machines with multiple network adapters.

How is desktop assignment in VDI 3 different than in VDI 2?

This page last changed on Jun 24, 2009 by stephanielewellen.

How is desktop assignment in VDI 3 different than in VDI 2?

The previous release of VDI (Sun VDI 2/VDC 1) uses a slightly different terminology. A desktop with static assignment is owned by a user (similar to personal in Sun VDI 3). A dynamic or temporary desktop is only temporarily owned by the user (similar to flexible in Sun VDI 3).
In VDI 2, all desktops that are part of a pool must be dynamic, and static desktops are not part of a pool. In VDI 3 you can choose if the pool is filled with personal or flexible desktops.
For more about desktop assignment and pool types in VDI 3, see: What is the difference between Personal and Flexible desktop assignments?

I am unable to get a MS RDC connection on my VMware virtual machine.

This page last changed on Jun 12, 2009 by stephanielewellen.

I am unable to get a MS RDC connection on my VMware virtual machine.

1. Verify that it has been enabled in the Remote tab of the System Properties dialog.
   If this is enabled, the issue probably has to do with your network settings.
2. Verify that the virtual machine's subnet can be reached from the Windows machine from which you run the Remote Desktop Connection client.
   If you have set up a private network for your virtual machines, it might not be accessible from a machine not on that network.

I cannot log into the Admin GUI.

This page last changed on Jun 12, 2009 by stephanielewellen.

I cannot log into the Admin GUI.

This is most likely an issue with cacao or the vda service

1. If the VDI host runs into a virtual machine, check that the machine has enough RAM
2. Check the status of cacao and the vda service as described in The system is not reacting as expected.
3. Try restarting the service:

```
/opt/SUNWvda/sbin/vda-service restart
```

I can start a virtual machine from the VirtualBox GUI, but it will not start from the VDI Admin GUI.

This page last changed on Jun 24, 2009 by stephanielewellen.

I can start a virtual machine from the VirtualBox GUI, but it will not start from the VDI Admin GUI.

VirtualBox doesn't check for available memory before starting a virtual machine. When a virtual machine is started, ZFS releases cache to free up memory for it.

In contrast, VDI always checks for available memory before starting a virtual machine to ensure the host does not become over-committed. Unfortunately if ZFS cache has consumed most of the memory VDI will not attempt to start the virtual machine. The workaround for this is to limit the ZFS ARC cache, see the Release Notes for more information.

I get a blank screen after successfully logging into the Admin GUI.

This page last changed on Jun 12, 2009 by stephanielewellen.

I get a blank screen after successfully logging into the Admin GUI.

This is most likely an issue with the MySQL database

1. Try restarting the service

```
/opt/SUNWvda/sbin/vda-service restart
```

2. If problem persists, you need to troubleshoot the MySQL database:
   If you are using the VDI MySQL Cluster database, it is important to know that MySQL Cluster is quite demanding regarding physical resources, this specifically concerns CPU power, RAM and network bandwidth. The MySQL Cluster data nodes need to be connected via at least 100Mbps networks, preferable Gbps. The first thing to check is always if the network connectivity is provided and the load on the secondary hosts especially the first two secondary hosts which are hosting the MySQL data node process is ok.
   Execute:

```
/opt/opt/SUNWvda/sbin/vda-db-status
```

   to see if the MySQL Cluster management node and the two data nodes are running. Furthermore check on the concerned host the SQL node is running by executing:

```
svcs svc:/application/database/vdadb:sql
```

   If everything is fine you should see somthing similar to this:

```
STATE STIME FMRI
online Mrz_18 svc:/application/database/vdadb:core
```

   In case the SQL node is not running start it by either executing:

```
svcadm enable svc:/application/database/vdadb:core
```

   or

```
svcadm clear svc:/application/database/vdadb:core.
```

If none of this helps have a look at the MySQL log files for possible root causes for your database problems. You'll find the log files on the Primary hosts in `/var/opt/SUNWvda/mysql-cluster`. On the Secondary hosts you'll find the database log files in `/var/opt/SUNWvda/mysql-cluster` and `/var/opt/SUNWvda/mysql`.
Information about the MySQL Cluster log file format can be found in the official MySQL documentation MySQL Cluster Log Messages.

I have created a new pool in my VMware desktop provider and virtual machines are not created automatically.

This page last changed on Jun 12, 2009 by stephanielewellen.

I have created a new pool in my VMware desktop provider and virtual machines are not created automatically.

- You have not defined a template for the pool. Make sure that your pool configuration points to a virtual machine or template.
- There is not enough disk space available to create copies of the template.

I have free memory on my ZFS storage host, but my VirtualBox virtual machines will not start due to a lack of memory.

This page last changed on Jun 22, 2009 by stephanielewellen.

I have free memory on my ZFS storage host, but my VirtualBox virtual machines will not start due to a lack of memory.

The ZFS ARC cache is eating up the memory. See the Release Notes for information about limiting the ARC cache usage.

In my VMware desktop pool, new virtual machines are created automatically, but they are not made available.

This page last changed on Jun 12, 2009 by stephanielewellen.

In my VMware desktop pool, new virtual machines are created automatically, but they are not made available.

1. Verify that you still have enough disk space for your virtual machines.
   Depending on the recycle policy settings for your pool before a newly created virtual machine is made available for users, a snapshot is taken. This operation requires sufficient disk space.
2. Verify that the RDP port (typically 3389) of the Windows guest OS instance is open.
   Before a newly created virtual machine is made available, the Virtual Desktop Connector verifies whether RDP communication can be established to the virtual machine. The following issues might prevent a successful test:
   - The virtual machine is on a private network and cannot be accessed by the Virtual Desktop Connector. Verify your network configuration.
   - Remote access is disabled on the Windows guest OS.
   - Firewall settings of the Windows guest OS do not allow RDP connections.

Is it possible to assign MS Terminal Server to users?

This page last changed on Jun 04, 2009 by stephanielewellen.

Is it possible to assign MS Terminal Server to users?

MS Terminal Server support is not included in VDI 3, but it is being considered for future releases. In the meantime, you can work within the VDA session script. For example, you can forward unknown tokens to your TS environment.

Is the Demo configuration a supported configuration?

This page last changed on Jun 17, 2009 by stephanielewellen.

Is the Demo configuration a supported configuration?

The VDI Demo configuration cannot be supported as a production environment VDI deployment, because the embedded database configuration does not comply with MySQL standards. We do, however, encourage customers to try VDI Demo configuration to evaluate the new features before committing to a larger deployment. See the Getting Started - VDI Demo page for step-by-step information about installing and configuring a Demo setup. If you run into any problems, you can always consult the VDI Forum or check the Troubleshooting and FAQs.

For information about supported VDI configurations for a production environment, see the Supported Configurations page.

Is VMware ESXi a supported virtualization platform?

This page last changed on Jun 17, 2009 by stephanielewellen.

Is VMware ESXi a supported virtualization platform?

Yes, VMware ESXi is a supported virtualization platform, but if problems occur they need to be verified first on bare ESX.

Jobs don't finish even after canceling them using the Admin GUI.

This page last changed on Jun 12, 2009 by stephanielewellen.

Jobs don't finish even after canceling them using the Admin GUI.

You can force to abort all active jobs:

1. Verify that the vda service is running.
2. Enter the following command in the shell:

```
/opt/SUNWvda/mysql/bin/mysql --defaults-file=/etc/opt/SUNWvda/my.cnf -D vda -u root -p -e "UPDATE t_job SET status =
 'CANCELED', endtime = NOW() WHERE status IN ('RUNNING','QUEUED','CANCELLING') AND type <> 'DESTROY_POOL'"
```

3. If asked for a password, either enter the Admin password that you have chosen during the installation (for a multi-host setup) or just hit enter (for an evaluation setup).

Kerberos authentication to Active Directory works for a while and then stops.

This page last changed on Jun 18, 2009 by stephanielewellen.

Kerberos authentication to Active Directory works for a while and then stops.

A temporary solution for this issue is to run the following on each VDI server:

```
kinit -V administrator@MY.DOMAIN
```

Troubleshooting
This might be:

1. A time synchronization issue.
   Make sure the domain controllers and the VDI servers are connecting to the same NTP server.
2. A Kerberos configuration issue.
   Make sure the Kerberos configuration file (`/etc/krb5/krb5.conf`) contains the `libdefaults` section and sets the `default_realm` and `default_checksum` as in the following example:

```
[libdefaults]
default_realm = MY.COMPANY.COM
default_checksum = rsa-md5


[realms]
MY.COMPANY.COM = {
kdc = my.windows.host
}

[domain_realm]
.my.company.com = MY.COMPANY.COM
my.company.com = MY.COMPANY.COM
```

There is an error when I add a VirtualBox host to a desktop provider.

This page last changed on Jun 12, 2009 by stephanielewellen.

There is an error when I add a VirtualBox host to a desktop provider.

Several errors can occur when adding a VirtualBox host and will result in possible error alerts on either the 'Specify Host' or 'Verify Certificate' wizard steps.

Specify Host Step
After entering the host details and clicking, the next two actions happen:

- Resolve hostname (if used)
- Fetch the SSL and SSH certificates

An error on this page can be related to DNS problems resolving the hostname or issues contacting the host.

1. Verify that all information entered is correct including SSH and SSL ports. The SSL port refers to the port Apache 2 is listening on.
2. Verify that the VDI host can resolve the host by using 'nslookup <hostname>' from a shell on the VDI host.
3. If the name can be resolved, verify that the host is running, and SSH and Apache 2 have started successfully. This can be checked as follows:

```
# svcs svc:/network/http:apache2
```

```
# svcs svc:/network/ssh:default
```

Both commands should indicate that the service is 'Online'. If a service is marked as 'maintenance', try resetting it using:

```
# svcadm clear <service_frmi>
```

Verify Certificate Step
After reviewing the certificates and clicking Finish/Next, an error here indicates that the VirtualBox web service cannot be contacted or may not be running.

Verify that the service is online:

```
# svcs svc:/application/virtualbox/webservice:default
```

If the service is in maintenance mode, clear the service and check the status again:

```
# svcadm clear svc:/application/virtualbox/webservice:default
```

If the service is offline, enable it using:

```
# svcadm enable svc:/application/virtualbox/webservice:default
```

The Sun Ray DTU is cycling and cannot connect to a virtual machine.

This page last changed on Jun 12, 2009 by stephanielewellen.

The Sun Ray DTU is cycling and cannot connect to a virtual machine.

1. Verify that you have a virtual machine available to connect to.
2. Verify that remote access is correctly configured on your guest operating system.
3. Verify that the VDI Core host can communicate with either your vCenter or your VirtualBox host.
   The firewall on the vCenter server might be blocking the communication.
   The user name or password might be incorrect.
4. Verify that the VMware tools are installed on the Windows guest OS.

The system is not reacting as expected.

This page last changed on Jun 12, 2009 by stephanielewellen.

The system is not reacting as expected.

A restart of the vda service is recommended:
Restart the Common Agent Container:

```
cacaoadm stop --force
cacaoadm start
```

You may want to inspect the Common Agent Container (cacao) log file located at:

```
/var/cacao/instances/default/logs/cacao.0
```

In order to change the level of debugging information in the cacao log file for the vda service, before restarting cacao, execute:

```
cacaoadm set-filter -p com.sun.vda.service=ALL
```

To check the status of cacao execute:

```
cacaoadm status
```

To check the status of the vda service:

```
cacaoadm status com.sun.vda.service_module
```

The VirtualBox host is crashing unexpectedly.

This page last changed on Jun 12, 2009 by stephanielewellen.

The VirtualBox host is crashing unexpectedly.

The host may have run out of memory - the threshold for the crash is determined by the amount of swap space configured. Solaris hosts running VirtualBox must have swap space equal to, or greater than the host's physical memory size. For example, 16GB physical memory would require at least 16GB swap. This can be configured during a Solaris 10 install by choosing a 'custom install' and changing the default partitions.
For existing Solaris 10 installs you will need to create a swap image file on the local filesystem and mount it. The swap file image size should be: Physical Memory - Current Swap = Additional Swap Required. For example, 16GB physical memory - 1GB = 15GB of additional swap required. To add the swap to your system:

```
# mkfile 15g /path/to/swap.img
# swap -a /path/to/swap.img
```

To have the swap mounted after a reboot, add the following line to `/etc/vfstab`:

```
/path/to/swap.img - - swap - no -
```

The VirtualBox software never finishes installing due to an error.

This page last changed on Jun 24, 2009 by cbas.

The VirtualBox software never finishes installing due to an error.

If you are installing VirtualBox, you may get the following error in the console:

```
## Executing postinstall script.
Configuring VirtualBox kernel modules...
VirtualBox Host kernel module unloaded.
devfsadm: driver failed to attach: vboxdrv
Warning: Driver (vboxdrv) successfully added to system but failed to attach
can't load module: No such device or address
## Aborting due to attach failure.
## Configuration failed. Aborting installation.
pkgadd: ERROR: postinstall script did not complete successfully

Installation of <SUNWvbox> partially failed.
```

This error is typically seen when previous versions of VirtualBox are still installed. Try removing VirtualBox (`./vb-install -u`). Then verify that the following packages have been removed:

- `SUNWvbox`
- `SUNWvboxkern`

Reboot, then try the installation again.

The VirtualBox Web Service cannot be contacted.

The VirtualBox Web Service cannot be contacted.

The VDI 3 installer runs a check to be sure that the Apache 2 packages are installed on the Solaris platform. If the Apache 2 packages are not installed, and the check does not notify you, the VirtualBox web service cannot be contacted, and you will not be able to continue with installation. In this case, you should install the Apache 2 packages and try the VirtualBox installation again.

The VMware virtual machine cloning process is not operating as expected.

This page last changed on Jun 12, 2009 by stephanielewellen.

The VMware virtual machine cloning process is not operating as expected.

To determine whether a new virtual machine is ready for use, the VDI Core tries to open an RDP connection to it. In certain cases, especially if you use a customized VM template for Vista, RDP can become available before the build process has completed; however, a virtual machine made available before the build process has completed cannot be used.

The following procedure describes how to set up a customized virtual machine template VMware customization specs to correct this problem. It requires that RDP is disabled in the virtual machine template and that RDP is not blocked by a firewall when cloning is completed.

Preparations for manual Sysprep for Windows XP (Step 3) and Vista VMs (Step 4) are also included.

1. Disable RDP by making sure the Remote Desktop checkbox on the Remote section of the System Preference dialog on the Windows Control Panel is unchecked.

   > If you are using the Windows Firewall, make sure that the Remote Desktop item is checked under Firewall Exceptions.

2. Create a registry file called `enableRdp.reg` at `C:\` with the following content:

```
REGEDIT4
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\TerminalServer]
"fDenyTSConnections"=dword:00000000
```

   The `enableRdp.reg` file is used at the end of the Sysprep process to enable RDP in the Windows registry.
3. For Windows XP manual Sysprep, include the following under Additional Commands in the Setup Manager tool:

```
regedit /s C:\enableRdp.reg
```

   The Setup Manager tool is used to create answer files for Sysprep.
4. For Windows Vista manual Sysprep and customization specs, create a batch file called `SetupComplete.cmd` in the `%WINDIR%\Setup\Scripts` directory with the following content:

```
regedit /s C:\enableRdp.reg
```

   Windows Vista looks for `%WINDIR%\Setup\Scripts\SetupComplete.cmd` and executes it at the end of every setup process, including Sysprep. The default setting for `%WINDIR%` is `C:\Windows`.

The window displaying the VMware-hosted virtual desktop is freezing.

This page last changed on Jun 12, 2009 by stephanielewellen.

The window displaying the VMware-hosted virtual desktop is freezing.

If you suspend or power down your virtual machine without first closing the RDP connection, the guest OS dies, but the RDP connection remains active. The result is a non-responsive window displaying the last known state of your Windows session. The following steps show how to set the Run VMware Tools Scripts panel on both the Virtual Infrastructure Client and the guest OS to avoid this problem.

1. Configure the Run VMware Tools Scripts panel on the Virtual Infrastructure Client.
    a. Select Edit Settings of a particular VM to bring up the Virtual Machine Properties page.
    b. Click the Options tab.
    c. Select VMware Tools.
    This is where you can modify the behavior of the Power Controls (Start, Stop, Suspend, and Reset).
    d. Next to the Power Off switch (red rectangle), select Shut Down Guest.
    This allows the guest OS to shut down gracefully when the Power Control button is pressed.
    e. In the Run VMware Tools Scripts panel, check the Before Powering Off checkbox.
2. Repeat steps a. through e. above to configure the Run VMware Tools Scripts panel on the guest OS.
3. Modify the `poweroff-vm-default.bat` script on the guest OS.
    The install location on the guest OS, typically `C:\Program Files\VMware\VMware Tools`, contains the following default scripts:

```
poweroff-vm-default.bat
poweron-vm-default.bat
resume-vm-default.bat
suspend-vm-default.bat
```

4. Add `tsdiscon.exe` to the `poweroff-vm-default.bat` script.
    The `poweroff-vm-default.bat` script is the first to execute when the VM is powered off from the VMware Infrastructure Client. It now calls `tsdiscon.exe`, which closes all open RDP connections.

Unused VMware virtual machines are not being recycled.

This page last changed on Jun 12, 2009 by stephanielewellen.

Unused VMware virtual machines are not being recycled.

1. Verify that the Power Options on the Windows guest OS have been configured to go into standby when it is idle.
2. Verify that the VMware Tools and the Virtual Desktop Connector Tools are installed and running on the Windows guest OS.
   Check the Windows Event Log for any problems with the tools.
   If you imported desktops from a previous version of VDI, verify that the desktop is using the latest version of the VDI tools. Open the desktop console, go to Control Panel > Add or Remove Programs. Open the support information for Sun VDI Tools. The version number should be 3.0.0.
3. Verify that the virtual machine is configured to suspend when it is in standby.
   Check the virtual machine settings (Options/Power management), and make sure that the Suspend the Virtual Machine item is selected.
4. Verify that the Windows guest OS actually enters standby and the virtual machine suspends when the machine is not in use.

If you experience problems with the standby feature in Windows XP, see http://www.terranovum.com/projects/energystar/ez_gpo.html. EZ GPO includes a group policy for power options.

Users cannot log into their desktops using their User Principal Name (UPN), or email address.

This page last changed on Jun 17, 2009 by stephanielewellen.

Users cannot log into their desktops using their User Principal Name (UPN), or email address.

Users should be able log into Active Directory with the user name `user@example.com`, where `example.com` is different than the Active Directory domain. The default LDAP settings only allow the user to log in with their Windows username (the sAMAccountName). You need to change the LDAP user ID attributes to include the UPN. You can do this with the following command:

```
vda settings-setprops -p ldap.userid.attributes='"uid,sAMAccountName,userPrincipalName"'
```

You need to include both `sAMAccountName` and `userPrincipleName` in this order. This is because the user ID attributes are both used for looking up the DN and for authentication. So `userPrincipleName` is used to look up the DN, and `sAMAccountName` is used internally for authentication.
This also requires VDI 3 Patch 1 to be installed.

Users do not show up in the Admin GUI in the Users and Groups section.

This page last changed on Jun 12, 2009 by katell.

Users do not show up in the Admin GUI in the Users and Groups section.

It might be necessary to customize the LDAP filters `ldap.user.object.filter` and `ldap.user.search.filter` as described in Customizing the LDAP Filters and Attributes, especially if the user directory is OpenLDAP or Novell eDirectory.

vda command reports that VDI is not running although cacaoadm and vda-db-status say it is.

This page last changed on Jun 17, 2009 by stephanielewellen.

vda command reports that VDI is not running although cacaoadm and vda-db-status say it is.

If you run the `/opt/SUNWvda/sbin/vda` command, and:

1. You are getting the error message, "This command cannot be used because Sun Virtual Desktop Infrastructure is not running on this server",
2. `cacaoadm` and `vda-db-status` show that VDI is running fine,

look in your `/etc/hosts` file to see if you have an IPv6 localhost there. Comment that out and try to run the `vda` command again.

VDI database doesn't start during an Evaluation configuration.

This page last changed on Jun 12, 2009 by stephanielewellen.

VDI database doesn't start during an Evaluation configuration.

Installing VDI 3 Patch 1 will solve this problem.
If you do not intend to install VDI 3 Patch 1, change the value 'NoOfFragmentLogFiles' from 300 to 16 in `/etc/opt/SUNWvda/config.local.ini`. Then configure again.

What are the differences between SRS in VDI 2 and VDI 3?

This page last changed on Jun 22, 2009 by stephanielewellen.

What are the differences between SRS in VDI 2 and VDI 3?

The main change between SRS in VDI 2 and VDI 3 is the installation/configuration experience. In VDI 2 you had to manually install and configure the various pieces of software (SRSS, SRWC, and VDC) and the whole process was complex and error-prone (at least for customers new to SRS and VDI). Thus we tried to simplify things for VDI 3 and offer a single out-of-the-box experience for installation and configuration.
In VDI 3, there is no need anymore to install SRSS and SRWC manually before installing the VDI Core. Instead, everything is installed automatically using a single installation script (`vda-install`). We also offer a configuration script (`vda-config`) that configures the various pieces for common usage scenarios. It is still possible to adapt or fine tune things later using the usual SRSS commands.
There have been no changes to the SRS product itself. SRS still uses its own LDAP-based datastore for storing configuration settings specific to SRS. However, the VDI Core (formerly called VDC) now takes advantage of a full-blown MySQL database for storing settings specific to VDI (including desktop pool settings, desktop assignments, etc.). In VDI 2, these settings were stored in the SRS datastore, but this created several issues. In VDI 3, the read/write cycles/frequency are higher compared to VDI 2 and thus an LDAP based datastore was no longer the best suitable choice.

What is the difference between Personal and Flexible desktop assignments?

This page last changed on Jun 24, 2009 by stephanielewellen.

What is the difference between Personal and Flexible desktop assignments?

- Personal Assignment: Desktops which have been personally assigned to users are owned by these users (similar to the personal computers under their desks). Thus they will never be recycled and will never become available for other users. (However, an administrator can explicitly remove the assignment and re-assign a desktop to a different user.)
- Flexible Assignment: Desktops which have been flexibly assigned are temporarily owned by users. Once users log out of their desktops or their desktops are no longer in use, they will be recycled and become available for other users. As part of the recycle process the desktop assignment will be removed.

Personal assignments are created when you select a specific desktop in the VDI Admin GUI and assign it explicitly to a user.

If you assign a user (or a group of users) to a pool, the desktop assignments are created on demand the first time the user requests a desktop (or connects to a desktop). The type of assignment (personal or flexible) depends on the pool settings. You can configure this individually for each pool on the Pool - Settings subcategory (see the Desktop Assignment section).

In addition to the assignment type, you can also specify how each pool is filled with desktops. Here you have the choice to manually import desktops, or to clone desktops automatically from a specified template (see the Cloning subcategory).

When you create a new pool we provide default settings for the assignment and cloning configurations. For convenience, the pool wizard offer "Manual", "Dynamic", and "Growing" pool types which only differ in their default settings. You can change the pool settings at any point. The pool type is not stored anywhere - it just defines the initial pool settings and is offered as a shortcut. The main differences in the pool types are as follows:

- Dynamic pool: Desktops are cloned from a template. Flexible desktop assignment is the default.
- Growing pool: Desktops are cloned from a template. Personal desktop assignment is the default.
- Manual pool: Cloning disabled (you have to manually fill this pool via importing desktops). Personal desktop assignment is the default.

Recycling of desktops will only happen for flexibly assigned desktops. This is independent from the desktop provider.

For the moment recycling only works when Windows is used as the guest operating system for the desktop. Non-Windows guests (such as Ubuntu or OpenSolaris) are supported by VirtualBox but not recycled. The VirtualBox Guest Additions for these platforms do not provide the functionality needed for recycling (the information about logged in/out users). This will be addressed in the next release of VDI.

When I start a desktop I get this error - No suitable hosts to start a desktop for Desktop Provider sunvdi-demo.

This page last changed on Jun 24, 2009 by cbas.

When I start a desktop I get this error - No suitable hosts to start a desktop for Desktop Provider <ProviderName>.

The error 'No suitable hosts to start a desktop for Desktop Provider <ProviderName>.' indicates that there were no hosts with sufficient memory in your desktop provider.

1. Check the available memory on your hosts using the VDI UI under the DesktopProvider->Hosts tab.
2. If host memory usage is higher than expected it's possible that ZFS is consuming the memory for cache. See the Release Notes for information about limiting the ARC cache usage.

Which versions of JRE are supported?

This page last changed on Jun 18, 2009 by stephanielewellen.

Which versions of JRE are supported?

Java Runtime Environments 1.5 and 1.6 are supported with the most recent version of VDI.

Why does my VMware virtual machine have an invalid IP address or cannot be pinged?

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1. Verify that your networking interface is properly configured for your ESX server in the Virtual Infrastructure Client.
2. If the network interface is properly configured for your ESX server:
   Verify that the network adapter is enabled in the template and is connected to the correct network.
   Verify that there is a properly configured DHCP server with enough leases running on the subnet your virtual machine will run on.
   See the VMware documentation, available online at http://www.vmware.com/support/pubs/vi_pubs.html

JavaOne and VDI Success Story

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New URL!

Please go to* http://wikis.sun.com/display/DesktopVirtualization/Sun+VDI+for+JavaOne *instead.

Cannot resolve external resource into attachment.

Abstract

The JavaOne Conferenceis one of the most popular developer conferences around the globe. Over the last couple of years conference participants got access to email and browser through Sun's Ultra Thin Clients, Sun Ray and the Solaris desktop. This year participants are offered a choice of different desktops ranging from OpenSolaris 2009.06 over Windows 7 RC to Ubuntu 8.10. All desktops are accessed through Sun Ray's hosted by Sun's recently released desktop virtualization product Sun VDI 3(VDI - Virtual Desktop Infrastructure) and Sun's Unified Storage platform.

Introduction

The JavaOne conference expects each year about 7000 participants. Each participant has the opportunity to access the internet through the public conference WiFi or through terminals at various spots around the conference. These terminals are actually Sun's Ultra Thin Clients, called Sun Rays. Each participant simply needs to use his conference badge and inserts it into one of the terminals in order to obtain a session with internet access. This has been the common practice since years. This year the underlying technology is different as the participants get access to a variety of different desktops such as OpenSolaris 2009.06, Windows 7 RC and Ubuntu 8.10.

During the whole conference week participants will own this selection of desktops. Each desktop is completely isolated and acts as a Virtual PC. Every time the user inserts his card, he gets access to the same selection of desktops that has been assigned at first use. Based on the card information participants will get also access to personalized information, such as their conference schedule. So a level of customization is applied to each desktop. Participants are also able to switch between desktops.

In total the trade show group has to manage about 21000 desktops. This is a new dimension in virtual desktop management. It is a challenge in terms or management of the sheer amount of desktops as well as handling the storage capacity needed to host 21000 virtual desktop images with an average amount of 10GB per individual image. This sums up to a total of 210 TB.

Sun VDI 3 actually uses a number of intelligent techniques to simplify the management. First of all Sun VDI 3 doesn't actually run all the desktops in parallel. It only runs those desktops that are currently used by participants. As there are about 150 Sun Ray terminals around the conference, there are only about 150-200 desktops in use at a time. The way this is organized is quite simple. When a user inserts his conference badge and selects a certain desktop, the desktop is started or resumed from a previous usage. When a user finally removes his card, the desktop(s) being in use are suspended, meaning they are stopped and their current state is stored to disk. This behavior reduces the total requirement for CPU and memory quite dramatically.

A similar efficient approach is used on the storage side. Instead of creating 21000 full disk images in advance, Sun VDI 3 just populates 3 desktops images fully on the storage side. One image per desktop type: OpenSolaris, Windows or Ubuntu. The images are used as templates. Based on these templates there are a couple of thousand sparse desktop clones created for each template. These clones reference their template and grow only when participants start using their desktops. This cloning technique is based on capabilities of the Solaris filesystem ZFS and are exposed by the recently announced Unified Storage Systems. If you want to find out more about the architecture of Sun VDI 3, you should start reading here.

Architecture

For the conference we have been using a relatively small setup compared to the number of desktops to be hosted, that focuses on responsiveness of the desktops, sized for an upper limit of 400 to 500 hundred desktops running at the same time. As stated above, we expect a load of 150-200 hundred desktops due to the limitation of having just 150 Sun Ray terminals.

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The illustration above shows the general architecture. It misses just the terminals that are connected through a private interconnect with the 3 VDI core servers, responsible for the session handling. Here we are using 3 x4600, each with 4 CPUs and 16GB memory. This is well enough for the session handling and virtual desktop management.

The virtualization layer is equipped with 5 x4450 servers, each 4 CPUs, 6 cores per CPU and 64MB of memory. These servers will run VirtualBox hosting the virtual desktops. Each of these virtualization hosts will be able to handle about 100 desktops.

And finally we are using 3 7210 Unified Storage servers. From the capacity point of view, each server can handle more than thousand desktops. However, for the conference we need a maximum of throughput, as desktops will be started and suspended very frequently, which is not a common usage pattern for an enterprise customer. Therefore we have added more headroom on the storage side.

The solution has been built to provide a good level of availability. Both the session and the virtualization layer can tolerate host failures. A failure of a storage host will lead into a loss of the virtual desktop image. The user would get a new image on a different storage host. This is acceptable for a conference. But for an enterprise deployment you would need to cluster the storage backend. A solution with a clustered 7410 Unified Storage system is more appropriate in this case.

If you want to find out more about how to deploy and size Sun VDI 3, please have a look into our deployment guide.

Summary

The Sun VDI deployment for JavaOne demonstrates the capabilities of a highly integrated and flexible virtual desktop management system. It leverages at it's best the power of the underlying hardware and focuses on the administration and configuration of the backend. The clients are completely stateless and are not managed as such. All administration happens in the backend. Sun VDI 3 provides users with a choice of desktops on the one hand, while reducing the complexity on the backend quite dramatically with it's 3-tier self-contained approach (session, virtualization, storage).

Find out more:

- Sun VDI 3 Product Page: http://www.sun.com/solutions/vdi/index.jsp
- Sun VDI 3 Product Documenation: http://wikis.sun.com/display/VDI3/Home
- Sun VDI User Forum: http://forums.sun.com/forum.jspa?forumID=992
- VirtualBox: http://www.virtualbox.org/
- Unified Storage: http://www.sun.com/storage/disk_systems/unified_storage/
- OpenSolaris: http://opensolaris.org/

Get it

- Sun VDI 3: http://www.sun.com/software/vdi/get.jsp
- VirtualBox: http://www.virtualbox.org/wiki/Downloads
- Unified Storage Simulator: http://www.sun.com/storage/disk_systems/unified_storage/resources.jsp
- OpenSolaris: http://opensolaris.org/os/TryOpenSolaris/