Sun™ Shared Visualization 1.1 Software Release Notes

Includes information on Sun Shared Visualization 1.1 Update 1

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Sun Shared Visualization 1.1 Software Release Notes

These release notes provide last-minute information regarding the Sun™ Shared Visualization 1.1 software. This document also applies to the Sun Shared Visualization 1.1 Update 1 release.

Topics include:

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These notes are complementary to the Sun Shared Visualization 1.1 software documentation.

Note – Some file and directory names specify specific versions of Sun Shared Visualization and other software products. Newer releases of software might include slightly different names than are published in these documents.

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New and Improved Features in Sun Shared Visualization 1.1

These are some of the features added since Sun Shared Visualization 1.0.1 software.

General Sun Shared Visualization 1.1 Functionality

■ **Software versions upgraded**

Sun Shared Visualization 1.1 components have been upgraded to new versions:

Component	Version in Sun Shared Visualization 1.1
VirtualGL	2.1
TurboVNC	0.4 (based on TightVNC 1.3.9)

■ **New operating system versions supported**

Sun Shared Visualization 1.1 software supports Red Hat Linux 5 in addition to Red Hat Linux 3 and 4.

Sun Shared Visualization 1.1 software supports Windows Vista clients, as well as Windows XP clients.

Sun Shared Visualization 1.1 Update 1 software supports Mac OS X clients on Apple Macintosh x86 systems.

■ `vis_report` **reporting script**

The Sun Shared Visualization 1.1 software includes a reporting script, `/opt/SUNWvrpt/bin/vis_report`. This script is helpful in debugging product installation, configuration, and usage problems. This feature was introduced in Sun Shared Visualization 1.0.1. Details on this feature are included in Appendix A of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

VirtualGL 2.1 Functionality

Sun Shared Visualization 1.1 contains VirtualGL 2.1, which includes these features:

- `vglserver_config` **greatly simplifies server configuration**

  Procedures and instructions for configuring a graphics server for use with Shared Visualization 1.1 clients have been greatly simplified from the version 1.0 procedures, because the `vglserver_config` script automates almost all VirtualGL configuration steps. Use of the `vglserver_config` script is explained in Chapter 4 of the *Sun Shared Visualization 1.1 Software Server Administration Guide*.

- `vglconnect` **simplifies client use**

  Procedures for Sun Shared Visualization 1.0 made explicit use of `xhost`, `ssh`, and `vglclient`, along with setting of `DISPLAY` or `VGL_CLIENT` environment variables. Sun Shared Visualization 1.1 documentation has replaced those procedures (in most cases) with simple invocations of the `vglconnect` script with various options. This situation is explained in Chapter 3 of the *Sun Shared Visualization 1.1 Software Client Administration Guide* and summarized in that document's Table A-1.

  In addition, dynamically allocated ports are used, so multiple instances of `vglclient` can coexist on the same server, if necessary (for example, in multiuser client environments).

- **Symbolic links**

  To normalize file paths on the Solaris™ OS and Linux OS, the symbolic links described in TABLE 1 are installed automatically:

TABLE 1   Symbolic LInks Installed for VirtualGL and TurboVNC

Operating System	Package or RPM	Installed Symbolic Link
Solaris	SUNWvgl	`/opt/VirtualGL -> /opt/SUNWvgl`
Solaris	SUNWtvnc	`/opt/TurboVNC -> /opt/SUNWtvnc`
Linux	VirtualGL	`/opt/VirtualGL/bin/vglclient -> /usr/bin/vglclient`
		`/opt/VirtualGL/bin/vglconfig -> /usr/bin/vglconfig`
		`/opt/VirtualGL/bin/vglgenkey -> /usr/bin/vglgenkey`
		`/opt/VirtualGL/bin/vglconnect -> /usr/bin/vglconnect`
		`/opt/VirtualGL/bin/vglserver_config` `-> /usr/bin/vglserver_config`
		`/opt/VirtualGL/bin/vglrun -> /usr/bin/vglrun`
		`/opt/VirtualGL/bin/vgllogin -> /usr/bin/vgllogin`
		`/opt/VirtualGL/doc -> /usr/share/doc/VirtualGL-2.1`

Symbolic links enable both Solaris and Linux to find VirtualGL commands in `/opt/VirtualGL/bin` and TurboVNC commands in `/opt/TurboVNC/bin`.

- **Windows installation includes PuTTY**

  The Windows VirtualGL package now includes an optimized version of the PuTTY 0.60 SSH® client terminal emulator, which is used by the Windows version of `vglconnect`. This version of PuTTY provides significantly better performance when tunneling the VGL image stream than the stock version of PuTTY 0.60.

- **VirtualGL configuration dialog**

  The VirtualGL Configuration Dialog has been enhanced, and now also applies to Sun Ray™ clients. For details, see Appendix A in the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

- **GLX Spheres test program**

  The VirtualGL Solaris and Linux packages now include a benchmark called GLX Spheres. This program is meant to provide an alternative to GLX Gears. GLX Spheres also includes modes you can use to test VirtualGL's support of advanced OpenGL® features, such as stereo, overlays, and color index rendering. For more details, see Appendix A of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

- **Grayscale JPEG encoding**

  VirtualGL adds a grayscale subsampling option, providing additional bandwidth savings over chrominance subsampling, since grayscale throws away all chrominance information. This option is potentially useful when working with applications that already render grayscale images (such as medical imaging). This option is documented in Table A-3 in Appendix A of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

- **Lossless RGB**

  VirtualGL can now encode images as uncompressed RGB and send these uncompressed images through the VGL Image Transport. This feature has two benefits:

  - Lossless RGB eliminates the need to use the X11 Image Transport (formerly Raw Mode) over a network.
  - Lossless RGB provides a mode that supports sending lossless stereo image pairs to a stereo-enabled client.

  A gigabit or faster network is recommended when using RGB encoding.

  For more about this feature, see the section on VGL_COMPRESS in Table A-4 and the section on the VirtualGL GUI in Appendix A of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

- **Anaglyphic stereo**

  When VirtualGL detects that an application has rendered something in stereo, its default behavior is to try using quad-buffered stereo.

But if the client or the image transport do not support quad-buffered stereo, then VirtualGL will fall back to using anaglyphic (red/cyan) stereo. This situation provides a quick way to visualize stereo data on clients that do not support quad-buffered stereo rendering. VirtualGL 2.1 can also be configured to send only the left eye or right eye image from a stereo application. This situation is documented in Table A-4 in Appendix A of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

TurboVNC 0.4 Functionality

Sun Shared Visualization 1.1 contains TurboVNC 0.4, which includes these features:

- **Improved performance**

  TurboVNC (when used with the TurboVNC viewer) on Solaris has greatly improved performance over a high-speed network. Also, the high-latency network option to `vncviewer` is no longer needed. You should update both the TurboVNC server and the TurboVNC client viewer to this release.

  This release removed unnecessary pixel format translation when sending JPEG from a big endian server to a little endian client (or the other way around). This feature improves performance when connecting x86 clients to SPARC® servers (or SPARC clients to x86 servers).

  This release includes an optimized version of PuTTY 0.60 in the Windows build (and viewer package). Use this version when tunneling TurboVNC connections over `ssh`, as it will perform as much as four times as fast as the stock version of PuTTY 0.60.

- **Lossless refresh**

  This release added a lossless refresh feature, which instructs the server to send a mathematically lossless (Zlib-encoded RGB) copy of the current screen. This feature is described in Appendix B of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

- **Optional lossless image encoding**

  This release adds an option for lossless (uncompressed RGB) image encoding. This option is useful for reducing CPU usage on the server and client (at the expense of increased network usage) when connecting over a gigabit (or faster) network.

- **Three quality options**

  TurboVNC quality options (which trade off performance gains at the expense of image fidelity) now include three alternatives. These alternatives are documented in Table B-3 in Appendix B of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

- **Java™ based WebVNC viewer defaults to opening a new window**

  The default of opening a new window allows your TurboVNC session to be sized independently of your web browser window. This change also allows the Tab key to function properly, being passed to the TurboVNC session from your keyboard.

- **TightVNC Updated to 1.3.9**

  TurboVNC is based on TightVNC. The TurboVNC in this release includes relevant patches from TightVNC 1.3.9.

- **Grayscale encoding**

  This release added an additional subsampling option to enable grayscale JPEG encoding. This option provides additional bandwidth savings over chrominance subsampling, since grayscale throws away all chrominance pixels. This option is potentially useful when working with applications that already render grayscale images (such as medical imaging).

- **Default geometry**

  This release changed default geometry to 1240x900, an appropriate size for most 1280x1024 displays.

Sun Grid Engine Extensions Functionality

Sun Shared Visualization 1.1 extensions to Sun Grid Engine now include these features:

- `config_gfx` **script eases configuration**

  A new `config_gfx` script automates Sun Grid Engine graphics configuration for each execution host. Use of the script is explained in Chapter 4 of the *Sun Shared Visualization 1.1 Software Server Administration Guide*.

- `RUN.glxspheres` **job script is included**

  A job script is provided to invoke VirtualGL 2.1's new GLX Spheres test program. This program and the `RUN.glxspheres` script are used in examples that referred to `RUN.glxgears` in past Sun Shared Visualization documentation.

- **TurboVNC now exits normally**

  In Sun Shared Visualization 1.0 and 1.0.1, `RUN.vncserver` created a window with the title "EXIT this window to kill TurboVNC server." Exiting this window would cause the TurboVNC session to exit. This technique is no longer necessary in Sun Shared Visualization 1.1. See "Terminating the TurboVNC Session" in Chapter 3 of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

- **Advance Reservation email reminders are included**

  The Advance Reservation facility now supports email to be optionally sent at a variety of times, such as when the reservation is confirmed, begins, completes, is canceled, or at a specified number of minutes before the reservation starts. This functionality is available from either the command line or GUI clients. See Chapter 5 of the *Sun Shared Visualization 1.1 Software Client Administration Guide*.

- **Subcluster allocation is supported**

  Sun Shared Visualization 1.1 now supports the subcluster definition and allocation in Sun Scalable Visualization 1.1 software.

Software Notes

Resolved Issues

With the release of the Sun Shared Visualization 1.1 software, the following noteworthy change requests were resolved since Sun Shared Visualization 1.0.1.

TABLE 2   Change Requests Addressed in the Sun Shared Visualization 1.1 Software

CR ID	Synopsis
6482041	VGL's GUI does not control parameters for a Sun Ray
6490513	A mix of Sun Rays on a private network and on the LAN can cause problems with Sun Ray plug-in
6538273	`ping` is not a 100% reliable way to find out if the graphics server can reach the SunRay directly
6541742	AutoForm dynamic section window is missing graphics
6545194	Frame spoiling in Direct/Raw Mode causes Pro/Engineer to display incorrect image after rotate/zoom
6548716	`runar Reserve -listReservations` limits its search for reservations to just one execution host
6557907	Solaris 8: Alarm clock error with `ogl_install_check`
6558475	Window manager fails to start in TurboVNC if TurboVNC started from a local X session
6559594	`runar` script does not realize that some Java 1.6 releases are new enough
6560752	With a Solaris 8 server displaying to a Sun Ray, the image doesn't display until main thread pauses

CR ID	Synopsis
6578131	AR server does not enforce administrator security or authentication
6579609	`$AR_DIR/run` directory is not created by installation on a Linux host
6581853	AR clients do not honor `ServerPort` from `ar/config/defaults.prop` file
6588685	Windows that obscure the 3D window are sometimes missing bits of rendering
6597144	The Sun Ray plug-in should change its compression method to match the GUI settings when changed
6602822	Moving a window while it changes can produce dirt on screen
6614458	Autoform fails to start with VirtualGL 2.1
6636338	Error in Server Guide instructions for Adding Graphics to Sun N1™ Grid Engine ("start" versus "starter")

Patches and Recommendations

Selected Patches

You can check the SunSolve^{SM} web site and download the latest revision of appropriate operating system and OpenGL patches at:
http://sunsolve.sun.com

The patch revisions listed in TABLE 3 and TABLE 4 are included in the Sun Shared Visualization 1.1 Update 1 product in this directory:

```
SharedVisualization_1.1/Solaris/sparc/Patches/
```

Note – The installation script installs patches for you, if needed. However, the earlier Sun Shared Visualization 1.1 release will install older versions of some patches. You should install patches at least as recent as the versions listed in this section. Those versions are installed by the Sun Shared Visualization 1.1 Update 1 release.

TABLE 3 provides a list of suggested patches for your operating system.

TABLE 3 Selected Patches for Solaris OS Releases

Operating System	Patch ID	Description
Solaris 10	120928-24 and later	For Sun XVR-2500 graphics accelerators
Solaris 9	120927-12 and later	For Sun XVR-2500 graphics accelerators

TABLE 4 provides a list of suggested patches for your version of OpenGL.

TABLE 4 Selected Patches for Respective Versions of OpenGL

Operating System	Patch ID
OpenGL 1.5 (recommended)	120812-24 and later
OpenGL 1.3 (64-bit)	113887-48 and later
OpenGL 1.3 (32-bit)	113886-48 and later

Download Media Library (mediaLib) for Optimal Solaris Performance

To optimize compression on Solaris SPARC and Solaris x86 platforms, the Sun Shared Visualization 1.1 software uses Sun's mediaLib™ library (`libmlib`). If your system does not have the `SUNWmlib` package installed, obtain that package and install it.

mediaLib is installed as part of Solaris 10 software, but this is not the latest version. mediaLib 2.5 improves performance significantly for x86 systems running the Solaris OS. Check the version on your system using this command:

```
% pkginfo -l SUNWmlib
```

If your system does not have the `SUNWmlib` package installed, or if your Solaris x86 system does not yet have mediaLib 2.5, download the latest version from: http://www.sun.com/processors/vis/mlibform.html

Patch Exceed 2008 to Improve Performance

If your Windows client is using Exceed 2008 to support VirtualGL, you can optimize performance (as much as a 20 percent gain) by enabling the MIT Shared Memory Extension (MIT-SHM extension). To enable the extension, obtain and install the `xlib` patch `xlib.dll` v13.0.1.235 (or higher) for Exceed 2008. This patch is available from the Hummingbird support site:

```
http://connectivity.hummingbird.com/support/nc/exceed_patches.html
```

You need a Hummingbird support account to download the patch.

Font Server Issues (CR 6530025 and 6691037)

Certain applications might need fonts that are not available on all X servers. The client system might not have the fonts, even if an application installs the extra fonts or the fonts are normally installed for the operating system that runs the application. This remote X font situation might occur even without involvement of Sun Shared Visualization software (for example, when redirecting using GLX).

One approach is to install on the client system any fonts needed by the application. (For a Sun Ray ultra thin client, the client system is the Sun Ray server host that runs the X server.) This approach is hard to execute consistently, because you might not know which fonts will cause a problem and the fonts might not be packaged for the client system.

Workaround: Perform the appropriate procedures to use the graphics server host's font server to provide fonts to the client's X server.

▼ To Assure the Font Server of a Graphics Server Allows TCP Access

1. **Perform this step on a Linux host (for a Solaris host, go to** **).**

   Modify the Linux graphics server's font server to disable `no-listen tcp`.

   a. **Locate the configuration file.**

      This file has a name such as `/usr/X11R6/lib/X11/fs/config`.

b. Edit the configuration file by commenting out this line:

```
no-listen = tcp
```

The line then reads:

```
# no-listen = tcp
```

2. **Start (or restart) the font server.**

   This step differs depending on the operating system.

   ■ For a Linux graphics server, as superuser enter:

   ```
   server% /etc/init.d/xfs restart
   ```

   If the font server had not been configured to start automatically, as root enter:

   ```
   server% chkconfig xfs on
   ```

   ■ For a Solaris 10 graphics server, as superuser enter:

   ```
   server% svcadm enable stfsloader xfs
   ```

   ■ For a Solaris graphics server running a version earlier than Solaris 10, as superuser enter:

   ```
   server% fsadmin -e
   ```

   This command assures that the font server is started by inetd.

▼ To Add a Font Server to the Client's Current X Session

● **Add the graphics server's font server in the path used by the client's X server.**

As superuser, type a command such as:

```
server% xset fp+ tcp/my-graphics-server:7100
```

Replace *my-graphics-server* with the name of your graphics server or of another host that has the needed fonts. (That host's font server must already allow TCP access.) The normal port number for a font server is `7100`.

This command appends the remote font server on *my-graphics-server* to the font path for the current X server session. The *my-graphics-server* location will follow the existing locations in the session's font path.

For more information, see the man page for `xset`(1).

▼ To Add a Font Server to the Client's X Session Startup Script

This procedure allows the client's X server to consult the font server on the graphics server every time the X server starts. You will not need to enter the `xset` command each time, as described in "To Add a Font Server to the Client's Current X Session" on page 12.

1. **Locate the script that starts X for the client.**

   For Solaris, this file is typically `/etc/dt/config/Xservers`.

   However, on a Solaris Sun Ray server, the file with that name is a link to a file in `/tmp` that you should not edit directly. Instead, edit the file named `/etc/dt/config/Xservers.SUNWut.prototype`. If that file does not already exist, copy the `/usr/dt/config/Xservers` file to that location as a starting point for your edits. Changes that you make to this file take effect the next time the server is booted.

2. **Add** `tcp/`*my-graphics-server*`:7100` **to the X server's font path.**

   ■ If there isn't already a `-fp` option in the script, as superuser add this line:

   ```
   -fp tcp/my-graphics-server:7100
   ```

- If the `-fp` option is already present in this script, as superuser add `tcp`/*my-graphics-server*`:7100` to the comma-separated arguments in that line of the script. For example, the font path options in the script might be this after you add the location:

`-fp` *my-directory*`/fonts,tcp/`*my-graphics-server*`:7100,tcp/`*another-graphics-server*`:7100`

In either case, replace *my-graphics-server* with the name of your graphics server or of another host that has the needed fonts. (That host's font server must already allow TCP access.) The normal port number for a font server is `7100`.

For more information, see the man page for `xserver`(1) and the FONT section of `X11`(1).

Other Known Issues and Workarounds

System Virtualization Technology and Graphics Applications

A graphics server using a system virtualization technology, such as Solaris Zones, can run 3D applications only in the zone containing one or more graphics accelerators.

64-bit Windows Systems Must Use 32-bit Exceed Software

A system running a 64-bit version of Microsoft Windows must use a 32-bit version of Exceed rather than a 64-bit version of Exceed.

Solaris Restrictions on Remote Logins as `root` Affect Use of `ssh` and `vglconnect`

In recent Solaris OS releases (such as Solaris 10), the Secure Shell daemon (`sshd`) has the default of not allowing remote logins as user `root`. This default is configured by the `PermitRootLogin` entry in the SSH® daemon's (`ssh`) configuration file, `/etc/ssh/sshd_config`. To avoid this problem, log in as a user other than `root` when running `ssh` or `vglconnect` (which uses `ssh`). Become `root` only when necessary by using the `su` command.

Sun Ray Plug-in Does Not Encrypt Images (CR 6480887)

The Sun Ray server software can be configured to encrypt the network traffic between the Sun Ray server and the Sun Ray appliances. However, the network traffic between the VirtualGL Sun Ray plug-in and the Sun Ray appliances is not encrypted. The 3D images sent by the plug-in could be seen by someone who has access to the network and detailed knowledge of the Sun Ray protocols.

If the Sun Ray traffic is encrypted, a warning is printed pointing out that the VGL traffic to the Sun Ray DTU is not encrypted.

There are two workarounds available:

- If the network between the graphics server and the Sun Ray server is inaccessible to intruders or otherwise protected, disable the Sun Ray plug-in by running the application with the `vglrun -c proxy` option. The images are sent to the Sun Ray server and encrypted before being sent to the Sun Ray appliance. There is a performance reduction with this workaround.
- Generic network protection, for example, VPN, can be used for network traffic going from the graphics server to the Sun Ray appliance.

Note – To prevent any users from inadvertently using the Sun Ray plug-in, remove the `SUNWvglsr` package from the graphics server.

Do Not Suspend VirtualGL Applications Displaying to a Sun Ray Thin Client (CR 6494251)

An application using the VirtualGL Sun Ray plug-in sends images directly to the Sun Ray desktop unit (DTU), rather than to the Sun Ray server. You should not suspend an application in this situation.

The Sun Ray plug-in has responsibility for drawing the application's areas of the screen. But if the application is suspended, the plug-in cannot draw, nor can it update the areas's clipping area on the screen. So other windows are unable to overlap the graphics window while the application is suspended.

Workaround: Do not suspend the application by using the STOP or TSTP signals. (TSTP is generated by a TTY's suspend sequence, normally Control-Z.) Also do not use a debugger to stop the application.

If you suspend the application accidentally, you might need to send it a CONT (continuation) signal, perhaps from another session.

If you need to suspend a VirtualGL application that will display to a Sun Ray, avoid using the Sun Ray plug-in by using `-c proxy`. With this option, the application graphics go through the Sun Ray server, which will decrease performance and increase network traffic. (The impact is explained in Appendix A of the *Sun Shared Visualization 1.1 Software Server Administration Guide*.)

Multihead Sun Ray Sessions With Xinerama Exhibit Problems Upon Keycard Reinsertion (CR 6658955)

You can connect multiple Sun Ray thin clients to the same multihead session (using `utmhconfig`). At the same time, you can enable Xinerama (using `utxconfig -x on`). An application running under VirtualGL on a Linux graphics server can display to such a multihead Sun Ray session using VirtualGL's Sun Ray plug-in.

However, in such conditions, when you remove and reinsert the Sun Ray's Java card (and enter your password to unlock your session), the application will occasionally not resume animating.

Workaround: To get the application to resume, move or resize the window.

Very rarely, an application will exit on its own when you reinsert the card, and sometimes leave a core dump. Therefore, save your work before removing your Java card to protect against this unlikely failure.

Documentation Notes

Clarified Terminology

In Sun Shared Visualization 1.1 software, some key terminology in the product and documentation has been improved from past releases. These differences are summarized in TABLE 5.

TABLE 5 Changed Terminology in Sun Shared Visualization Software 1.1

Shared Visualization 1.1 Term	Shared Visualization 1.0 Term
VGL Image Transport	Direct Mode
Sun Ray Image Transport	Sun Ray Mode
X11 Image Transport	Raw Mode