

PIXIL Thin Client Image README

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Built with SUSE LINUX

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1. BIOS Warning for SX270 and Others

We've recently become aware of compatibility problems with the most recent version of Dell's BIOS, version A03, on the SX270. This version removes certain default video modes that PIXIL TC demo needs to properly operate. The symptoms are failing to boot, or appearing to go into a loop, displaying "Can't open display :0" on the console.

Currently, the PIXIL TC demo requires BIOS A01 or A02 to be installed on the SX270 to properly operate. On the same FTP site where you obtained the PIXIL Thin Client demo images, you can download the A02 BIO update program supplied by DELL, as well as a PDF detailing how to install it.

The two files are: SX270A02.EXE and A02Install.pdf

In addition, you can download this yourself from:

<http://support.dell.com/filelib/format.aspx?releaseid=r64297>

As well as receive some additional information on what is contain

You can check your BIOS revision by hitting F2 as the machine boots. In the upper right hand corner, this BIOS revision will appear. It consists of the letter "A" followed by a number, like "A01" or "A03".

Update: As of June, updated BIOS revisions are available and shipping. The A04 version for the SX270 has been tested and works. For other systems, the A06 BIOS appears to be correct. These have been tested with PIXIL Thin Client and can be used.

2. Filename Conventions

The filenames of the various PIXIL images are indicative of what is inside them. For instance:

pixil-tc-32-usb-opti-win-moz-1.16.2420.img

This refers to:

- a. PIXIL Thin Client (pixil-tc)
- b. 64 megabytes (the minimum size of the media for this image)

- c. usb (USB Flash Drive, the type of media this image is designed for)
- d. opti (The DELL Optiplex SX270, with gigabit ethernet, or GX60 with 10/100)
- e. win (Windows look and feel, with Start menu, and similar window decorations)
- f. moz (Contains Mozilla, for a web browser)
- g. 1.16.2420 (PIXIL Thin Client Version)

Basically the filenames are of the form:

<PRODUCT> <SIZE> <BOOT MEDIA> <TARGET MACHINE> <VISUAL OPTIONS>
<OPTIONAL COMPONENTS> <VERSION> <.EXTENSION>

a. <PRODUCT>

For product, only pixil-tc is used.

b. <SIZE>

Currently, only 32MB images (-32) are being created.

c. <BOOT MEDIA>

- usb- for USB flash drives
- pxe- for PXE boot-enabled images

d. <TARGET MACHINE>

-opti- for the DELL Optiplex SX270 machines with gigabit ethernet,
Optiplex GX60 with 10/100 ethernet, and Dell D600 laptops with
Broadcom's integrated ethernet.

e. <VISUAL OPTIONS>

- win- for Windows-style window decorations and Start menu
- pix- for PIXIL-style window decorations and no Start menu

f. <OPTIONAL COMPONENTS>

- moz- for images with the Mozilla web browser
- nb- for images with no web browser

g. <EXTENSION>

.img for a single image designed for use with a flash memory card or USB drive.

.tar.gz for a tar-packaged series of files for PXE booting.

3. Use of the -usb- Images

For -usb- images, Century has provided the Century Software USB Flash Image Writer, which allows you to write the .img files directly to an attached USB flash drive plugged into a Windows 2000 or Windows XP system. This utility will not function on Windows 95, 98 or NT.

Using this utility is very straightforward:

- a. As a system administrator, run the FlashWrite.exe from the .zip package you downloaded.
- b. In the resulting window, use the "Select..." button to select the .img file you wish to download to your flash device.
- c. In the drop-down box, select the drive letter of the USB flash device as it appears on your Windows system. FlashWrite.exe will warn you if the drive does not appear to be a USB flash device, but nevertheless, please be careful when selecting this, as you can damage your hard drive, resulting

in permanent data loss.

d. Click the "Write" button to begin writing the USB flash device with the specified image.

Writing an image in this way takes some time, approximately 8 minutes for a 64 MB file.

4. Use of the -pxe- Images

The -pxe- images are for use with an established PXE server setup. This document assumes that you have this working with the appropriate DHCP options installed, a TFTP server (with tsize extensions) running, and have knowledge on how to configure these for use.

a. On your PXE-enabled DHCP configuration, ensure that your next-server is set to point to your TFTP server. For the filename argument, set this to "/pxelinux.0".

b. On the TFTP server, change to the root directory of your TFTP server hierarchy, and untar the PIXIL tar file contained in your zip package. This will place a series of files on your server that looks something like this:

```
.:  
total 31220  
-rw-r--r-- 1 root root 958435 Dec 29 15:31 bzImage  
-rw-r--r-- 1 root root 19840396 Dec 29 16:57 pixil-initrd.gz  
-rw-r--r-- 1 root root 11720 Dec 19 15:07 pxelinux.0
```

```
drwxrwxrwx    2 root    root          4096 Dec 30 09:37 pxelinux.cfg
```

./pxelinux.cfg:

```
total 4
```

```
-rw-r--r--    1 root    root          143 Dec 30 09:35 default
```

c. Ensure that the chroot setting for your TFTP server is set to this top level directory. That is, when retrieving files, pxelinux.0 should be at the root level.

d. For client configuration, please see the following sections in this file.

```
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5. Client Configuration DELL Optiplex SX270, GX270, & D600  
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```

a. General Configuration

Ensure that your client has a working network connection, and that your network has a working DHCP server connected to it. By default, PIXIL Thin Client expects to retrieve an IP address via DHCP during startup. If one is not present, significant startup delays will result.

After booting, you can change the networking settings to a fixed IP address if you wish.

For the SX270 and GX270, please make sure you have a BIOS version dated June 2004 or later. This should be version A04 for these units.

b. USB Booting

i. In the BIOS settings, we need to change some of the settings, or at least verify that they are present before we can continue. You can reach the BIOS by pressing the F2 key during boot.

ii. In "Integrated Devices", ensure that "USB Emulation" and "USB Controller" are set to "On", and "Onboard Video Buffer" is set to "8 MB" (or higher.)

iii. In "Boot Sequence" make sure that the "Hard Disk Drive C:" is selected for booting (use the SPACE key) and is at the top of the list (use the + and - keys.)

iv. In "Hard-Disk Drive Sequence" make sure that "USB Device" is at the top, even if it claims it is not installed.

v. Once your changes (if any) have been made, hit ESC to exit and save your settings. When the machine begins to reboot, turn it off, and insert your USB drive into one of the USB connectors.

vi. Turn the machine on. After a couple of seconds, you should see the "LILLO:" prompt, and after a couple of more seconds, PIXIL Thin Client should start booting, as indicated by the series of dots being displayed.

c. PXE Booting

i. In the BIOS settings, we need to change some of the settings. You can reach the BIOS by pressing the F2 key during boot.

ii. In "Integrated Devices", ensure that "USB Emulation" and "USB Controller" are set to "On", and "Onboard Video Buffer" is set to "8 MB" (or higher.)

iii. In "Boot Sequence" make sure that the "Integrated NIC" is selected for booting (use the SPACE key) and that it is at the top of the list (use the + and - keys to move it.)

iv. In "Integrated Devices", set the "Network Interface Controller" to "On w/ PXE". Being set to "On" is an incorrect setting, you must use "On w/ PXE"

v. Once your changes (if any) have been made, hit ESC to exit and save your settings.

vi. As the machine reboots, you should see it contact the DHCP and then the TFTP server, and retrieve the boot files (bzImage and pixil-initrd.gz).

6. Client Configuration DELL Optiplex GX60

a. BIOS Version

For PIXIL Thin Client to work in any configuration, PXE or USB, the BIOS must be updated to at least version A02. My test system shipped with BIOS rev A00, which doesn't support the proper VESA graphics mode or USB Flash booting.

You can download the new BIOS from DELL's support site, <http://support.dell.com>.

b. Hardware Configuration

Your GX60 system may ship with two network cards installed, a 3Com PCI card, and the built-in Intel 10/100. With this demonstration image, PIXIL will only run with the built-in network card. However, PXE booting requires that the 3Com card be removed, or PXE will not run using the built-in network adapter.

c. General Configuration

Ensure that your client has a working network connection, and that your network has a working DHCP server connected to it. By default, PIXIL Thin Client expects to retrieve an IP address via DHCP during startup. If one is not present, significant startup delays will result.

After booting, you can change the networking settings to a fixed IP address if you wish.

d. USB Booting

i. In the BIOS settings, we need to change some of the settings, or at least verify that they are present before we can continue. You can reach the BIOS by pressing the F2 key during boot.

ii. In "Integrated Devices", ensure that "USB Emulation" and "USB Controller" are set to "On", and "Onboard Video Buffer" is set to "8 MB" (or higher.)

iii. In "Boot Sequence" make sure that the "Hard Disk Drive C:" is selected for booting (use the SPACE key) and is at the top of the list (use the + and - keys.)

iv. In "Hard-Disk Drive Sequence" make sure that "USB Device" is at the top, even if it claims it is not installed.

v. Once your changes (if any) have been made, hit ESC to exit and save your settings. When the machine begins to reboot, turn it off, and insert your USB drive into one of the USB connectors.

vi. Turn the machine on. After a couple of seconds, you should see the "LILO:" prompt, and after a couple of more seconds, PIXIL Thin Client should start booting, as indicated by the series of dots being displayed.

e. PXE Booting

ii. In the BIOS settings, we need to change some of the settings. You can reach the BIOS by pressing the F2 key during boot.

iii. In "Integrated Devices", ensure that "USB Emulation" and "USB Controller" are set to "On", and "Onboard Video Buffer" is set to "8 MB" (or higher.)

iv. In "Boot Sequence" make sure that the "Integrated NIC" is selected for booting (use the SPACE key) and that it is at the top of the list (use the + and - keys to move it.)

v. In "Integrated Devices", set the "Network Interface Controller" to "On w/ PXE". Being set to "On" is an incorrect setting, you must use "On w/ PXE"

vi. Once your changes (if any) have been made, hit ESC to exit and save your settings.

vii. As the machine reboots, you should see it contact the DHCP and then the TFTP server, and retrieve the boot files (bzImage and pixil-initrd.gz).

7. Client Configuration DELL Optiplex SX280 and GX280

a. General Configuration

For these units, setup is similar to the SX and GX 270, though the visual display of the BIOS has changed. Please see the instructions in these sections for how to set up the unit for USB and PXE booting.

b. Special USB Booting Notes

When using the USB flash device for booting, it is important to **NOT** use the ports on the rear of the machine for the USB flash device. These ports default to USB 2.0, and will not function properly as boot ports.

By default, these units ship with a USB keyboard, which itself has USB ports available for use. These can be used with the USB flash key for a proper boot sequence, and are the recommended way of doing so.

c. DVI LCD Panels

For some LCD panels with DVI input, special handling of this device is needed. If PIXIL boots normally, but results in a blank LCD panel, a boot option must be added to set the appropriate mode.

i. For USB or hard drive booting, at the LILO Boot: prompt, enter

"pixil lcd-monitor" (without the quotes) and hit enter. This will put PIXIL TC into a compatibility mode with these devices. You will only have to do this once. After setting, this will become the default boot mode.

ii. For PXE booting, add lcd-monitor to the "append" line of the defaults file on the PXE boot server. This must remain for this to take affect after every boot (as compared to the USB version, which remembers the setting.)

8. Changelog

Version 1.11

First DELL version of PIXIL Thin Client, based on PIXIL 1.1. Included images for USB and PXE booting, as well as images with and without web browser support.

Version 1.12

1. Added support for automatically launching Citrix ICA clients when connected to a Citrix NFuse server with the browser.
2. Added support for the DELL Optiplex GX60 series of machines. To work, these must have the A02 or greater BIOS revision.

Version 1.13

1. XTERM removed from context menus

2. Default system console moved to /dev/tty2
3. The background image for the root window was changed. Namely, the Century logo was moved to the left so that certain video displays still show it.
4. Support for the Broadcom Gigabit ethernet adapter was added to the kernel.
5. The radio buttons were removed and replaced with a drop-down list of options. In addition, the hostname was moved to be the first field entered, instead of the last. Fields are now renamed and greyed out as appropriate for various connection types. For instance, for browser connections, username and password are disabled and hostname is renamed to "URL"
6. Added support for TN3270 & TN5250
A TN3270 emulator was added, and additional options added to the Login Manager. Support is basic, but includes LUNAME and TN3270-E and TN5250-E.

Version 1.14

1. Changed the HOSTNAME of the machine to PIXIL-TC.
2. Added a "Launch Configuration on Startup" button that allows a specific connection to auto-launch when the thin client is booted.
3. Added a simple method of updating files when a client boots when using a PXE server. See the AUTO-UPDATE.txt file for more information on this.

3. Updated all READMEs and the kernel image with warnings related to using the broken DELL A03 BIOS on the Optiplex SX270
4. PIXIL TC is now based on SUSE LINUX distributions, instead of homegrown.
5. PIXIL TC now supports the D600 Dell laptops.

Version 1.15

1. Support for the 3Com 500/900 series cards (built in or PCI) was added to support Optiplex GX1 environments.
2. As mentioned, PIXIL TC now supports the Optiplex GX1.
3. Support for PS/2 mice was added. This is determined at boot time. If a USB mouse is inserted, it will use that; otherwise, a PS/2 mouse is assumed. Though not mentioned before, support for USB keyboards is present, and any combination of mouse/keyboard is supported, provided they are plugged in before boot time.
4. Support for the "small" 16 MB images was removed. This was beginning to be difficult to maintain, and nobody seemed to care about it anyway.
5. Most mass storage devices can now be plugged in to the USB ports and be automounted. This includes floppies, cameras, most flash devices, CDROMS, etc. Please see the PIXIL documentation for more information on where these appear in the filesystem.
6. Most USB and parallel printers can now be plugged in and configured through the Citrix interface. Please see the PIXIL documentation for more

information about where these appear in the filesystem.

7. The Citrix client has been updated to 7.1.
8. The RDP client has been updated to support RDP 5.1. This includes support for 24 bit color and lower, as well.
9. Default resolution for the client demo is now 1024x768. Most people were asking to have this changed.
10. Problems where the NumLock, arrow keys, and others were not functioning in certain RDP environments has been fixed.
11. CTRL-ALT-DELETE no longer reboots the device - it is sent to the remote system when using ICA or RDP clients and is otherwise ignored.
12. ScrollLock now functions properly in RDP and ICA clients.
13. Support for the Windows special keys (Left and Right Windows Key, plus the "Menu" key) has been added for the RDP and Citrix clients.
14. Support for PS/2 and USB scroll mice was added.
15. Can now change the default keyboard to one of five different types. This list can be easily expanded upon as well.
16. You can now change the display resolution directly from the client from the user interface.

Version 1.16

1. Support added for SX280 and GX280 for all boot modes.
2. Added option to allow a hard drive image to be made from a USB flash key.
3. Added ability to change configuration from the boot command line or from the kernel command line (for PXE boots.) Please see the documentation for a complete list of the options available.
4. Hardware-specific graphics drivers are now available, though the default compatibility mode is still set to VESA mode. See documentation on how to switch drivers.
5. Default video refresh rate is 60Hz to maintain compatibility with low-end monitors and LCD panels. There are actually three settings available, and these can be set at boot time from the command prompt.
6. Support for non-wheel (scroll) mice has been added.
7. Connections created by the Citrix connection manager now show up in the the Century Login Manager, preceded by a star. From there, they can be launched as normal.
8. Support for NTP time servers has been added to the Terminal tab.
9. The time zone of the device can be changed. This also permits the proper handling of Daylight Saving Time when used with an NTP server.
10. Support for different display color depths has been added and can be switched from the boot command line.

11. Different RDP client color depths can be selected.
12. For DHCP-assigned IP addresses, you can now see these in the "IP Address" field of the Network tab in the PIXIL Thin Client Login Manager.
13. The TELNET connection type was added. This will pop-up a window with a TELNET session running, connected to the specified server.
14. Sound for both Citrix and RDP servers has been added for the SX270, SX280, GX270 and GX280 Optiplex models.
15. The latest Citrix client has been added (version 8.0.) This version looks slightly different than the previous version.

Version 1.17

1. New background image fills the full screen in 1024x768 mode.
2. Updated Linux kernel to 2.6.10rc3 to fix certain USB boot issues.
3. USB 2.0 booting from most memory keys is supported on all platforms for which USB 2.0 is present.

Version 1.18

1. Added support for setting the hostname of the client from the command line by adding newname-hostname (replacing newname with your desired hostname, of course.)

2. A cleaner background image was added.
3. Support for the Dell D400 series of laptops.
4. It is no longer necessary to set the BIOS video memory to 8MB on i810 based Optiplex units. Most of these (including the D400 laptops) are now using dynamically allocated AGP memory for display.
5. 24-bit color is now the default for all platforms that support it.
6. For demonstration copies of the PIXIL Thin Client, a 30 minute timeout has been added to all sessions. That is, they will automatically disconnect after 30 minutes.

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