



PIXIL™ Thin Client

Linux based Operating Environment for Thin Client Terminals

version 1.18

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PIXIL Thin Client Support

You may contact Century Software for support of your PIXIL Thin Client product. Live telephone support is available Monday through Friday, 8am – 5pm mountain time.

Telephone Support: 801-268-3088, and select option 5

Email: support@centurysoftware.com
www.centurysoftware.com

PIXIL Thin Client Hardware Support

The following machines from Dell are currently certified for running PIXIL Thin Client:

OptiPlex GX270, SX270

OptiPlex GX280, SX280

OptiPlex GX1, GX60

OptiPlex 170L

HARDWARE NOTES

GX280 & SX280

For the GX280 and SX280, there is currently a hardware limitation of the USB bus that will not allow a USB boot from certain types of flash drives if they are inserted in one of the ports of the main unit. Drives supplied by Dell are fully functional. However, if you are using your own hardware, please use the USB ports located on the keyboard or an external USB hub as a temporary workaround.

SOUND

Sound support is limited to the GX270, SX270, GX280, SX280 and 170L. Additional drivers for other sound cards can be made available for specific hardware installations.

Client Setup

BIOS OPTIONS

There are a number of BIOS options that must be set to gain full advantage of the hardware in the Dell OptiPlex units. Setting these options on the different units vary from unit to unit, but all are accomplished from the BIOS setup screen, reached by pressing F2 during the hardware check phase machine startup.

Normally in units shipped from Dell for the purposes of PIXIL Thin Client these options will have been pre-configured from the factory.

VIDEO MEMORY

In the BIOS, video memory must be set to the highest value. On older versions of the BIOS this was set to 1MB which only allows very low display resolutions. For most versions of the BIOS, you can set this to 8MB. If there is a higher setting, you may use it as well.

USB BOOT

For booting from USB keys, two options must be set. One, USB booting must be enabled in the hardware section of the BIOS. This is normally on by default. Two, you must ensure that USB devices are placed above any other viable boot options (such as a hard drive) in the boot order screen.

Some BIOS revisions have boot order settings that allow only hard drives to be selected. For these types, another setting is provided that allows you to choose which hard drive is “drive C”, the one that will be used for booting.

PXE BOOTING

For PXE booting, ensure that PXE boot is enabled for your built in Ethernet card in the hardware section of your BIOS setup. After this, ensure that PXE booting is at the top of the list of boot options in the boot order screen.

COMMAND LINE OPTIONS

When booting a PIXIL Thin Client, there are a number of configuration items that may be set by passing them on the command line before the boot process. There are two ways in which this is done depending on how the client is booting (either PXE, hard drive, USB drive, etc.)

PASSING OPTIONS, PXE BOOTING

When PXE booting, command line options are provided in the boot descriptor file for each client. In a simple configuration, this file is called default and is located (from the top of your TFTP server directory) in `pxelinux.cfg/default`. It is possible (and often desirable) to have differing boot descriptor files for use with different groups of clients. However, passing options is the same for all of these.

The contents of a typical boot descriptor file:

```
label PIXIL-PXE
    kernel bzImage
    append ramdisk_size=65536 root=/dev/ram0 initrd=/pixil-initrd.gz
    init=/linuxrc rw
default PIXIL-PXE
```

To set command line options, we add them to the end of the “append” line. For instance, if you wanted to set the option for a wheel mouse, you’d add “wheel-mouse” to the end of the append line, separated with a space from the previous option.

PASSING OPTIONS, HARD DRIVE, USB KEY, CD BOOTING

For this style of booting, options for the command line are given directly on the client. Soon after turning on the client, a prompt will appear: LILO Boot: It is at this prompt where options may be entered. All options using this method must start with the word “pixil”. For instance, to change the type of graphics card, you’d end up with a line like this:

```
LILO Boot: pixil i810-graphics
```

at which point you’d hit the enter key. It is only necessary to enter the word “pixil” once, and it must come first, before any options..

Unlike command line options for use in PXE booting, options to machines booting from local storage will keep any changed settings permanently. For instance, if you set the mouse type to a wheel mouse, this setting will remain the default for all future boots of the machine, without having to type “pixil wheel-mouse” at the boot prompt every time.

OPTION REFERENCE

GRAPHICS DRIVERS

i810-graphics

vesa-graphics

fbdev-graphics

Description:

These select the type of graphics driver for use. For all supported Dell OptiPlex machines, the i810 graphics driver will work. VESA and fbdev are generic graphics drivers that can be used with other hardware for which PIXIL Thin Client does not yet have a specific driver fo.

The i810 driver uses full hardware acceleration for drawing, in contrast with the VESA and fbdev drivers, which provide no hardware-specific drawing routines.

Please see the troubleshooting section of this document for information on when using the fbdev and VESA modes may be appropriate if the client is not displaying correctly.

Defaults To:

i810-graphics

MONITOR SETTINGS

lcd-monitor

lowsync-monitor

medsync-monitor

highsync-monitor

Description:

These settings allow the selection of various types of monitors and refresh rates. This is useful for use with monitors that have limited refresh rates, or you wish to raise the default refresh rate.

lcd-monitor has no refresh rate associated with it. PIXIL Thin Client attempts to determine which refresh rate is most appropriate for the connected monitor. This automatic detection works only with DVI-connected LCD panels.

lowsync-monitor has a refresh rate of 50-60Hz

medsync-monitor has a refresh rate of 50-85Hz

highsync-monitor has a refresh rate of 50-130Hz

Defaults to:

lowsync-monitor

DISPLAY RESOLUTION

640x480

800x600

1024x768

1280x1024

Description:

These settings change the physical display resolution of the PIXIL Thin Client. This does not have an effect on the size of the remote displays connected to using either the Citrix or RDP clients.

Defaults To:

1024x768

DISPLAY COLOR DEPTH

8bpp-display

16bpp-display

24bpp-display

Description:

These settings control the color depth of the physical display of PIXIL Thin Client. This effectively limits the number of colors that may be displayed on the screen at one time. If the number of colors exceeds the number allowed for the display, a color is chosen automatically that is closest to the actual color requested.

8bpp-display can display 256 colors

16bpp-display can display 65536 colors

24bpp-display can display 16777216 colors

All of the currently supported Dell OptiPlex can easily display 24bpp. This option is most useful for testing with other hardware.

Defaults To:

24bpp-display

KEYBOARD LANGUAGE

en-keyboard

de-keyboard

it-keyboard

it142-keyboard

fr-keyboard

Description:

These settings allow keyboard for specific languages to be supported, including English (en), German (de), Italian (it), Italian-142 (it142), and French (fr).

Setting this is the same as changing the setting in the Login Manager on the Terminal tab.

Defaults To:

en-keyboard

CONFIGURATION RETRIEVAL

????-config

Description:

This option allows the retrieval via TFTP of a specified configuration file. For instance, if you passed “/rdpdemo-config” on the command line, PIXIL Thin Client will attempt to retrieve the file called /rdpdemo from the TFTP server and use it for configuration of the Login Manager. Please see the section “Configuration File Structure” on Page 13.

These configuration files are currently limited to configuring connections to remote servers and their parameters (i.e., Connect on Launch.)

PIXIL Thin Client uses the TFTP server specified in the “next-server” portion of the DHCP response when booting. If this option is specified, PIXIL Thin Client will attempt to retrieve a DHCP address even if it is configured for use with a static IP address. After retrieving the configuration file, normal network startup is resumed.

Like the other options, this one is permanent for machines booting locally (not from PXE.) However, on subsequent boots, the configuration is not retrieved using TFTP, the local copy stored on the client is used (unless, of course, the ????-config option is given again.)

The remote filename of the configuration cannot contain any dashes (“-“)

Defaults To:

No default

TIMESERVER (NTP)

????-timeserver

Description:

Allows the specification of an NNTP timeserver. For instance:

```
LILLO Boot: pixil time.censoft.com-timeserver
```

will cause PIXIL Thin Client to use the timeserver at time.censoft.com to set it's local clock. This is the same as the Timeserver setting on the Terminal tab of the Login Manager.

Defaults To:

time.censoft.com-timeserver

SOUND

sound-rdp

nosound-rdp

Description:

Turns sound on and off for all RDP connections. It is useful to turn sound off if you do not have speakers, or are on a platform with no sound support as it reduces the load on the network and server.

Defaults To:

sound-rdp

MOUSE TYPES

wheel-mouse

nowheel-mouse

Description:

Selects the type of mouse used on the system. While PIXIL Thin Client automatically detects whether a USB or PS/2 style mouse is in use, it cannot accurately determine whether or not the mouse has a scroll wheel or not.

Defaults To:

wheel-mouse

RDP WINDOWS

windowed-rdp

fullscreen-rdp

Description:

Selects whether or not RDP connections default to full screen or windowed. Windowed mode is useful for starting up multiple connections to RDP servers, but somewhat limits the keys that may be used.

Defaults To:

fullscreen-rdp

RDP COLOR DEPTH

8bpp-rdp

16bpp-rdp

24bpp-rdp

serverbpp-rdp

Description:

Selects the default color depth of the RDP client. This setting is independent of the actual display color depth. If you select, say, 24bpp-rdp and your display is actually running 8bpp, PIXIL Thin Client will automatically downgrade the colors to match the display.

serverbpp-rdp allows the server to choose what color depth the client will use.

Running with the fewest number of colors for this setting reduces network and server load. Also keep in mind that some RDP servers will not allow connections if the color depth is not set correctly. See the Troubleshooting section of this document for more details.

Defaults To:

24bpp-rdp

INTERFACE SELECTION

useica

usepixil

Description:

Selects either the Citrix ICA Manager client (useica) or the PIXIL Thin Client Login Manger (usepixil) to be started upon client boot up. Regardless of what is selected using this option, you can start either manager from the background right-click context menu.

If using the Citrix ICA Manager as a default, the Connect on Launch setting of the Login Manager will not be used until it is started by hand.

Defaults To:

usepixil

CONFIGURATION LOCKDOWN

`config-lock`

`config-unlock`

Description:

Use these options to lock or unlock use of the Login Manager user interface. When locked, connections may be launched, but no other settings may be changed, only viewed. This is useful after configuration of the terminal to ensure no changes are made accidentally by end users.

Defaults To:

`config-unlock`

DEBUG PROMPT

`prompt`

`noprompt`

Description:

These options allow access to the command line without starting up the graphical user interface. This is mainly used for low-level debugging and isn't something that is commonly used.

Prompt mode doesn't start the GUI, noprompt does.

Defaults To:

`noprompt`

CREATING A BOOTABLE HARD DRIVE

`mkboot`

Description:

This option allows you to create a bootable hard drive from a USB flash key. This option is very dangerous as it will automatically overwrite the primary hard drive in the system, regardless of what is on it.

This option is typically used when deploying large numbers of hard drive-based PIXIL Thin Clients. An administrator will configure a unit using a USB Flash key, setting all appropriate options. Then, booting from the USB flash key and using this option, a hard drive version of the USB flash key will be created. This will include all options that were present on the flash key, including configuration and hardware information.

Defaults To:

No default

CONFIGURATION FILE FORMAT

This section describes the format of the configuration file that PIXIL Thin Client uses to configuration connections that appear in the Login Manager.

LOCATION

The configuration file is called `lmgr-config`, and is located in `/persist/config` in the PIXIL Thin Client filesystem. If you have a PIXIL TC SDK, it is possible to change this file directly and build new filesystem images for use with your hardware.

STRUCTURE

A typical entry in a configuration file looks like this:

```
[Sales Server]
Username=stevej
Password=thisisnotmypassword
Hostname=rdp.censoft.com
Launch=1
Type=Microsoft
```

For every connection that appears in the Login Manager, there will be a section similar to the above, starting with the name of the connection, enclosed in square brackets (“[Sales Server]”)

Following the entry’s name, username, password, and hostname are supplied. These should be self-explanatory. The Launch keyword indicates whether or not to launch this configuration automatically when the PIXIL Thin Client starts. A value of “1” will force a launch, a “0” means it will not be launched. If more than one entry has a “1” set for Launch, each one will be launched in turn. It is not possible to configure this situation from the Login Manager.

The last keyword, Type, indicates what type of connection will be made. Valid values for these entries are: Microsoft (for RDP connections), Citrix (for Citrix ICA connections), Browser (for web browser connections), TELNET (for generic TELNET and terminal emulation), TN3270 and TN5250 (for IBM connections.)

Linux PIXIL Configuration Server

This portion of the document describes the procedure for setting up a Linux PIXIL configuration server to work with a given network setup. This procedure assumes some familiarity with network configuration and use of a UNIX-style text editor.

Prerequisites

There are a few things that are needed that this setup procedure assumes:

1. A Dell OptiPlex GX60 desktop machine.

This will be used as the server for this setup. The original copy was made based on the hardware contained in this server, and must be used if it is to run properly. The 3Com network card must be removed – the built-in network adapter is being used. This is consistent with using the GX60 as a PIXIL Thin Client.

-- or --

A Dell 1750 or 1850 Rackmount Server

The default hardware can be used for this procedure. It assumes that you will be using network port 0.

2. Network settings.

You will need some general network settings to properly configure the server. You will need a static IP address, the network gateway address, DNS address, and a free range of IP addresses.

3. Network environment.

The PIXIL Configuration Server assumes that it is the only DHCP server on the network. There cannot be another DHCP server accessible to the local subnet. If there is another DHCP server locally, this must be disabled before using the PIXIL Configuration Server.

Setup

SERVER HARDWARE

ETHERNET CARD

As mentioned above, you must remove the 3Com ethernet card from the GX60 system. After removing this card, plug a network cable in to the built-in ethernet connection on the rear of the machine.

HARD DRIVE

The hard drive containing the PIXIL Configuration Server (PIXIL CS) must be placed in the GX60 and attached as the primary IDE drive. If there is another drive already in the chassis, this must be disconnected. Attach the PIXIL CS drive to the first IDE controller on the first channel. The drive is already setup to be the only drive connected to this controller, so ensure that there is nothing else connected. This is consistent with the initial setup of the hardware arriving from DELL.

