XFree86 3.1.1 P9000 Server Release Notes

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Contents

1 Change Log

1995.01.15:

- Fixed problem with line capping in accelerated line drawing. (Chris Mason)
- Fixed p9000QuadAlu$GXset$ to be 0 rather than 1. (Erik Nygren)

1995.01.14:

- `Clocks` line is no longer used in `XF86Config` file. Operation should now be consistent with the operation of the other servers which use programmable clocks. (Erik Nygren)
- Users with 1MB cards can now explicitly specify `videoRam` in the `XF86Config` file when autoprobing fails. The new `vram_128` option may also be used to force the detection of 128Kx8 SIMM's. (Erik Nygren)
- Added p9000line.c and p9000seg.c for accelerated line drawing code using the p9000 quad/clipping engine. Blazingly fast for 1 clipping rectangle, could be made faster for multiple clipping regions by using software clipping. There is still a bug which causes xtest to report `Cap style incorrect for thin line and CapNotLast` for the `XDrawLines` tests but not for the `XDrawLine` or `XDrawSegments` tests $fixedin 1995.01.15 patch.$ (Chris Mason)
- Changed p9000blt.c, and p9000win.c to wait for the quad/blit engine to be free. Before a quad/blit, check SR_ISSUE_QBN, then blit, then when all blits are done, do a p9000QBNotBusy. (Chris Mason)
- Changed p9000init.c to clear the screen using the quad meta coord drawing mode. Appears the rect mode does not update the CINDEX register correctly. Changed the color to 1 (black) from 0. (Chris)
- Added p9000QuadAlu. When drawing a quad, the p9000 equivalent to X's source is the foreground mask. When bliting/pixel8ing/pixel1ing, it is the p9000 source mask and the p9000alu lookup table should be used. (Chris Mason)
- Added some more registers to p9000reg.h. (Chris Mason)

1994.09.20:

- Fixed problem which prevented 16 bpp modes from working (Erik Nygren)

1994.09.16:

- Added screen blanking support for 16 bpp and 32 bpp modes. Screen blanking now powers down the RAMDAC rather than just changing the planemask. (Chris Mason, Erik Nygren)
- Fixed more problems caused by switch to `XF86Config` (Erik Nygren)
- Possible fix to maxclock for Orchid P9000 (Harry Langenbacher, Erik Nygren)

1994.09.15:

- Now almost always works with `XF86Config` changes (Erik Nygren)
- Cursor code looks at VTSema before writing to RAMDAC. This had been causing the x11perf server crash (Erik Nygren)

1994.09.08:

- Fixed problem with xdm and restarting the server (Erik Nygren)
- Fixed and enabled ImageRead in CopyArea (Chris Mason)

- Made informational comments conform to standard :-) (Erik Nygren)

1994.09.05:

- Fixed BIOS probe for Viper PCI (Bob Hollinger)
- Fixes to Orchid P9000 support (Harry Langenbacher)
- Changing of datatypes in clock code (Harry Langenbacher)
- Fixed clock and misc reg restoration so now works fine with svgalib (Chris Mason, Harry, Erik)

1994.08.29:

- Increased number of memory regions in xf86_OSlib.h from 2 to 3 as needed by the Viper PCI (Erik Nygren)
- Changed method of short pauses in p9000vga.c to outb(0x80,0) (Erik)
- Rewrote routines to determine sysconfig from horizontal resolution. Also added check for valid hres to probe. (Erik Nygren)
- Added MoveWindow acceleration for all depths. Opaque move even looks nice at 32bpp now! (Chris Mason)
- Minor fixes to acceleration. Acceleration is now enabled by default (Chris Mason)
- Added `"noaccel"` option (Erik Nygren)
- Added some fixes for Viper PCI (Matt Thomas)

1994.07.21:

- Preliminary Viper PCI support - totally untested so disabled (Erik Nygren)
- Preliminary Orchid P9000 support - incomplete and totally untested so disabled (Erik Nygren)
- Preliminary accelerated support - incomplete and not fully tested so disabled (Erik Nygren and Chris Mason)

1994.07.08:

- 16 and 32 bpp TrueColor support (Erik Nygren)
- Color restoration hopefully fixed (Erik Nygren)
- Changes to how `"Modes"` line in Xconfig is processed
- Removed banking support :-(

I've started adding in support for other cards and for acceleration. Due to its untested nature, it is disabled. A define at the top of `p9000.h` controls all of these features. The Viper PCI code is untested and probably won't work the first time! The Orchid P9000 code is incomplete and is waiting for a few mods by Harry to change the way it deals with the clock. The acceleration code has been started on but probably won't work. It's provided more to give our developers a common base to start from. Notice the new global variable `p9000BytesPerPixel`, BTW. Before working on any acceleration, please contact *nygren@mit.edu* so we don't duplicate efforts. The code in `p9000blt.c` should work, but the stuff in `p9000im.c` probably won't.

For Diamond Viper PCI owners, you'll need to get the `PCIDUMP.EXE` program from the Unixware P9000 server for now. Run it under DOS and use the values to fill in `MemBase` and `IOBase` in the `Device` section of `XF86Config`. These values will change whenever you move cards around or add cards.

I've started adding in support for other cards and for acceleration. Due to its untested nature, much of it is disabled. A define at the top of `p9000.h` controls all of these features.

2 Supported Cards

2.1 Diamond Viper VLB

All Viper VLB's should work with this server, hopefully... :-) Due to Diamond's putting the same BIOS in some Viper VLB's as are used in Viper PCI's, the probe may detect you have a Viper PCI when you really have a Viper VLB. If this happens, put `chipset "vipervlb"` into your `XF86Config` file.

2.2 Diamond Viper PCI

This should now work, thanks to help from Bob Hollinger and Matt Thomas. You may to specify the chipset `"viperpci"` in your `XF86Config` file. You'll also need to specify an `IOBase` and a `MemBase`. You can obtain these values with `PCIDUMP.EXE`. This program may be obtained by sending email to *xserver@summit.novell.com* with the two lines:

```
send
*p9k
```

You should run this program and change these values after you add more PCI cards or move existing cards to different slots. According to David DeWolfe (*SXDJD@orca.alaska.edu*), you need to run `PCIDUMP.EXE` after a clean boot to DOS (with no `AUTOEXEC.BAT` or `CONFIG.SYS`). This may be accomplished by holding down the `SHIFT` key while `DOS` is booting.

Eventually we would like to autodetect the `IOBase` and `memBase`, but this doesn't yet work.

3 Orchid P9000 and random clones

The Orchid P9000 and other cards based on the Weitek board design (such as the STAR 2000) should now work. Talk to *harry@brain.jpl.nasa.gov* if you have problems with this. Specify the chipset `"orchidp9000"` in the `Device` section of `XF86Config`

4 Viper Pro and other P9100 and P9130 cards (UNSUPPORTED!!!)

These are NOT supported yet. We don't have the hardware to write and or test drivers for them on. The docs I have says the P9100 has a different interface than the P9000. As a result, they may need an entirely new server. If you need support for one of these cards, you should look into XInside's AcceleratedX. It's a commercial product that costs about $99. Send email to *info@xinside.com* for more information. Their P9000 server is also much faster than ours at present (but then this server is free :-)

5 Acceleration

Some of the acceleration code is working, but there are probably still bugs. Only a very small number of accelerated features have been implemented. Before working on any acceleration, please contact *nygren@mit.edu* so we don't duplicate efforts. Acceleration may be turned off with the `"noaccel"` option. The following things are now accelerated:

- Hardware cursor (8/16/32bpp)
- MoveWindow (8/16/32bpp)
- CopyArea (8bpp)

6 High Color and TrueColor

Support for 16 and 24 bit truecolor is now supported. Note that 24 bit color is really 32 bits per pixel. Use the `-bpp` option when starting the server. Examples:

```
startx -- -bpp 32
startx -- -bpp 16
startx -- -bpp 16 -weight 555
startx -- -bpp 16 -weight 565
```

Note that many programs do not yet work properly with these modes. Don't tell me. Tell the authors unless they've already fixed it. It's their fault... :-)

Example problems:

xv 3.00

Works fine in 32 bpp and in 16 bpp with 24 bit images. Has problems with colors in 8 bit images in 8 bpp mode.

Mosaic 2.1

Has problems with colormap in both 16 bpp and 32 bpp. Newer versions of Mosaic such as 2.4 do work.

mpeg_play

Doesn't work at all in 16 bpp mode. Works fine 24 bpp mode when compiled with -DRS6000 and when run with "`-dither color`"

xpaint 2.1

Works great in both modes but has a bug in the color requester for the selection tool. I think later versions may have fixed this.

7 Random Notes

Text restoration should now be fixed. Color restoration should also be fixed. You can now even run the server at the same time as svgalib programs!!!

Diamond has actually been fairly open and helpful. No NDA's were signed by anyone who wrote code and Diamond claims that none of the information they provided is proprietary.

One unresolved issue is the maximum clock speed. It is currently set to 135 MHz with a warning printed over 110 MHz. Diamond claims that this is the max in their docs, but examination has shown some Viper's to contain 110 MHz bt485's. Without 135 MHz, it is not possible for people to with large monitors to run at 1280x1024. Diamond claims that all Vipers have 135MHz bt485's or compatibles. If you have something slower, call their tech support and they will send you a RMA to get the board replaced.

8 Operating System Notes

Any operating system that can memory map linear regions in really high memory should work. This should include Linux, FreeBSD, SVR4, and more.

8.1 NetBSD

If you have NetBSD, you will need to install the aperture driver. Extract the file `apNetBSD.shar` (in `xc/programs/Xserver/hw/xfree86/etc/apNetBSD.shar`) and read the `README` contained therein.

9 XF86Config

The `modes` line in the `XF86Config` file is now handled differently. The virtual line is now ignored entirely. Each mode on the mode line is looked at and the first usable mode is selected (ie the first one which works with available memory, etc). Any other modes which are valid and have the same dimensions are also used. And other modes are ignored.

The current supported keywords in the `Device` section of the `XF86Config` file are:

VideoRAM

1024 or 2048 (use 2048 for "3MB" Orchid P9000's)

ChipSet

`"vipervlb"` or `"viperpci"` or `"orchidp9000"`

MemBase

Viper VLB:

0xA0000000 or 0x20000000 or 0x80000000 (0x80000000 is default if none spec'd)

Orchid P9000:

0xC0000000 or 0xD0000000 or 0xE0000000 (this MUST be set to correspond to the jumpers)

Viper PCI:

any value corresponding to the output of `PCIDUMP.EXE`

IOBase

Viper PCI:

any value corresponding to the output of `PCIDUMP.EXE`

Others:

unused

Clocks

any values between 25 and 135 corresponding to the clocks for the mode entries being used. This line may now be omitted and clocks will be matched automatically.

Option

"sw_cursor"

use software cursor

"vram_128"

use if you have 1024K VRAM in 128Kx8 SIMMS

"sync_on_green"

generate sync pulses on the green signal. Most (all?) P9000 based boards don't support this.

"noaccel"

do not do hardware acceleration if it's causing problems for you

Modes

almost any valid mode (there are constraints on the horiz res so not all values are possible)

The current supported keywords in the Display section of the `XF86Config` file are:

Depth

8:

use 8 bits per pixel for 256 colors (default)

15 or 16:

use 16 bits per pixel for up to 65K colors

24 or 32:

use 32 bits per pixel (sparse 24 bpp) for up to 16 million colors

Weight

555 or 565 if Depth is 15 or 16. Otherwise this is ignored. These are the Red, Green, and Blue bits per pixel (default=565)

Here's a portion of a sample `XF86Config` file for the Viper VLB:

```
Section "Device"
    Identifier "ViperVLB"
    VendorName "Diamond"
    BoardName "Viper VLB"
    Videoram 2048                    # This is mandatory
    Membase 0x80000000               # This is mandatory on non-ViperVLB's
    IOBase  0xe000                   # Use this ONLY on ViperPCI's
EndSection

Section "Screen"
    Driver "accel"
    Device "ViperVLB"
    Monitor "NEC4FGe"
    Subsection "Display"
        Depth 8   # This line is optional
        Modes "1024x768" "800x600"
    EndSubsection
EndSection
```

10 Known Bugs

There are currently problems with the server when used in conjunction with xdm, olvwm, and VT switching under Linux.

If the cursor changes while you're in a VT, the cursor won't look right when you return from the VT until it is moved between windows (and changes color and shape).

Autoprobing doesn't always properly detect cards with 1024K of VRAM. If you have a problem with this, try putting `VideoRAM 1024` into the `Device` section of your `XF86Config` file. If this still doesn't help, try adding `Option "vram_128"`.

11 Credits

Major contributors to P9000 code:

- Erik Nygren (*nygren@mit.edu*)
- Harry Langenbacher (*harry@brain.jpl.nasa.gov*)
- Chris Mason (*mason@mail.csh.rit.edu*)

Thanks to Matt Thomas (*thomas@lkg.dec.com*) and Bob Hollinger (*bob@interaccess.com*) for helping to get the Viper PCI server working.

Special thanks to David Moews (*dmoews@xraysgi.ims.uconn.edu*) whose banking patch could unfortunately not be included.

Special thanks to Henrik Harmsen (*d9hh@dtek.chalmers.se*) whose 16bpp and 32bpp accelerated blit code won't be included until the next XFree86 release.

Thanks to Andy, David, Dave, Michael, Bob, all the XFree86 core team people, and everyone else!

During the course of the next few months, people will be working on acceleration, etc. Please send any patches to me (*nygren@mit.edu*).

```
$XConsortium: P9000.sgml,v 1.4 95/01/27 16:14:28 kaleb Exp $
$XFree86: xc/programs/Xserver/hw/xfree86/doc/sgml/P9000.sgml,v 3.8 1995/01/28 16:02:06 dawes Exp $
```