Information for SiS and XGI Users

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1. Introduction

This driver is written by Thomas Winischhofer and is a (nearly) complete re-write of a driver written for the SiS6326 and SiS530 by Alan Hourihane and others.

It currently supports the following chipsets:

- old series: SiS 5597/5598, 6236/AGP/DVD, 530/620
- 300 series: SiS 300/305, 540, 630/730
- 315 series: SiS 315/E/PRO, 55x, 650, 651, M650, 740, [M]661&[F/M/G]X, [M]741[GX]
- 330 series: SiS 330 ("Xabre"), [M]760[GX], [M]761[GX]
- 340 series: SiS 34x, XGI Volari Z7, V3XT, V5, V8

Among other features, the driver supports

- 8/16/24 bits color depth; old series also 15
- Hardware cursor; 315/330/340 series: Color HW cursor
- XAA; EXA; XVideo (Xv); RENDER and other extensions
- 6326: TV output
- 300/315/330/340 series: TV output via Chrontel TV encoders or SiS video bridges
- 300/315/330/340 series: LCD output via LVDS transmitters or SiS video bridges
- 300/315/330/340 series: Dual head mode; Xinerama; Merged framebuffer mode
- 300/315/330/340 series: Interface for SiSCtrl (see below)

This document provides a brief overview over the driver's features and configuration options. Please see http://www.winischhofer.at/linuxsisvga.shtml for detailed documentation and updates.

2. xorg.conf Options

The following options are of particular interest for the SiS driver. Each of them must be specified in the Device section of the xorg.conf file for this card.

In the list below, the options' arguments are described by type. For "boolean", the keywords "on", "true" and "yes", as well as "off", "false" and "no" respectively have the same meaning.

2.1 For all chipsets

Option "SWCursor" boolean]
>

Option "HWCursor" boolean]
These options select whether the software (SW) or hardware (HW) cursor should be used. The default is using the hardware cursor.

Option "NoAccel" boolean]
Disables 2D acceleration. By default, 2D acceleration is enabled.

Option "AccelMethod" string]
Determines which acceleration architecture should be used. Possible arguments are "XAA" or "EXA". As of this writing, EXA is still experimental and it is not recommended to be used on production machines. By default, XAA will be used.

Option "Rotate" string]
This option enables clockwise ("CW") or counter-clockwise ("CCW") rotation of the display. Enabling either CW or CCW rotation disables the RandR extension as well as all 2D acceleration and Xv support. Default: no rotation.

Option "Reflect" string]
This option enables reflecting the display horizontally ("X"), vertically ("Y") or in both directions ("XY"). Enabling reflection disables the RandR extension as well as all 2D acceleration and Xv support. Default: no rotation.

Option "ShadowFB" boolean]
This option enables the shadow framebuffer layer. By default, it is disabled.

Option "NoXVideo" boolean]
Disables the XVideo (Xv) support. Apart from the XGI Volari Z7, all chipsets support Xv. By default, XVideo support is enabled.

Option "CRT1Gamma" boolean]
Enables or disables gamma correction. Default: gamma correction is enabled.

2.2 Old series specific options

Option "FastVram" boolean]
Enables 1 cycle memory access for read and write operations. The default depends on the chipset used.

Option "Turboqueue" boolean]
SiS chipsets have the ability to extend the engine command queue in video RAM. This concept is called "TurboQueue" and gives some performance improvement. Due to hardware bugs, the TurboQueue is disabled on the 530/620, otherwise enabled by default.

Option "NoHostBus" boolean]
For 5597/5598 only. This option, if set, disables the CPU to VGA host bus. Disabling the host bus will result in a severe performance regression.

VideoRAM size]
The SiS 6326 can only directly address 4096K bytes of video RAM. However, there are some cards out there featuring 8192K (8MB) of video RAM. This RAM is not addressable by the engines. Therefore, by default, the driver will only use 4096K. This behavior can be overridden by specifying the amount of video RAM using the VideoRAM keyword. If more than 4096K is specified, the driver will disable 2D acceleration, Xv and the HW cursor. On all other chipsets, this keyword is ignored. The size argument is expected in KB, but without "KB".

Option "NoYV12" boolean]
Due to hardware bugs, XVideo may display a corrupt image when using YV12 encoded material. This option, if set, disables support for YV12 and hence forces the Xv-aware application to use either YUV2 or XShm for video output.

Option "TVStandard" string]
(6326 only) Selects the TV output standard. May be PAL or NTSC. By default, this is selected by a jumper on the card.

2.3 300/315/330/340 series specific options

Option "EnableSiSCtrl" boolean]
This option enables/disables the driver's interface for the SiSCtrl utility. Please see http://www.winischhofer.at/linuxsisvga.shtml for more information.

Option "Turboqueue" boolean]
(300 series only) SiS chipsets have the ability to extend the engine command queue in video RAM. This concept is called "TurboQueue" and gives some performance improvement. The TurboQueue is enabled by default.

Option "ForceCRT1" boolean]
Enables or disables CRT1 (= the external VGA monitor). By default, the driver will use CRT1 if a monitor is detected during server start. Some older monitors can't be detected, so they may require setting this option to true. To disable CRT1 output, set this option to false.

Option "ForceCRT1Type" string]
(For SiS 650, M650, 651, 661, 741, 760 with either SiS 301LV, 302LV or SiS 301C video bridge only) The argument may be "VGA", "LCD" or "OFF". Specifying LCD will force the driver to use the VGA controller's CRT1 channel for driving the LCD while CRT2 is free for TV usage. "OFF" is the same as setting the option ForceCRT1 to "false". Default is VGA.

Option "ForceCRT2Type" string]
Selects the CRT2 output device type. Valid parameters are "LCD", "TV", "SVIDEO", "COMPOSITE", "SVIDEO+COMPOSITE", "SCART", "VGA", "YPBPR480I", "YPBPR480P", "YPBPR720P", "YPBPR1080I" or "NONE". NONE disables CRT2. SVIDEO, COMPOSITE, SVIDEO+COMPOSITE, SCART and all the YPBPR alternatives are only for systems with a SiS video bridge and select the desired plug or TV standard type. For Chrontel systems, TV should be used instead. VGA means secondary VGA and is only available on some SiS video bridges (301, 301B, 301C).

Option "CRT2Gamma" boolean]
(For SiS video bridges only) This option enables or disables gamma correction for CRT2. Default: gamma correction for CRT2 is enabled.

Option "DRI" boolean]
Although this option is accepted for all chipsets, it currently only makes sense on the 300 series; DRI is only supported on these chipsets. This option enables/disables DRI.

Option "TVStandard" string]
Selects the TV output standard. May be PAL or NTSC, on some machines (depending on the hardware) also PALM and PALN. Default: BIOS setting.

Option "TVXPosOffset" integer]
>

Option "TVYPosOffset" integer]
These options allow relocating the image on your TV. Both options take an integer within the range of -16 to 16. Default: 0. Not supported for Chrontel 7019.

Option "CHTVOverscan" boolean]
(For Chrontel TV encoders only) Selects whether TV output should be overscan or underscan.

Option "CHTVSuperOverscan" boolean]
(For Chrontel 7005 TV encoders in PAL mode only) Selects whether TV output should be super-overscan (slightly larger than the viewable area) or not.

Option "SISTVXScale" integer]
>

Option "SISTVYScale" integer]
(For SiS video bridges only) These options allow zooming the image on your TV. SISTVXScale takes an integer within the range of -16 to 16. SISTVYScale accepts -4 to 3. Default: 0. Not all modes can be scaled.

2.4 300 series specific options

Option "MaxXFBMem" size]
This option might only be needed if you are running X on a Linux 2.4 series kernel. This option is not needed and should be omitted on Linux 2.6 and *BSD.

The Linux kernel features a framebuffer driver named "sisfb" which takes care of memory management for DRI/DRM (such as for 3D texture data). In order to keep the X driver and sisfb from overwriting each other's video memory, sisfb reserves a certain amount of video memory for the X driver. Reserved memory is for X 2D, pixmap cache and video data only. Sisfb will not present this memory to the DRI. The amount of reserved memory can either be selected using sisfb's mem parameter or auto-selected depending on the total amount of video RAM available.

Fact of the matter is, the X driver needs to know about the amount of RAM sisfb reserved. For this purpose, the Option "MaxXFBMem" exists.

If you start sisfb with a valid mode (ie you run a graphical console), the X driver can communicate with sisfb and doesn't require setting the MaxXFBMem option at all. The X driver will receive enough information from sisfb in this case.

If you, on the other hand, use sisfb for memory management only, ie you started sisfb with mode=none and still have a text mode console, there is no communication between sisfb and the X driver. In this - and ONLY this - case, you need to set MaxXFBMem to the same value as you gave sisfb with its mem parameter. If you didn't specify any mem parameter, sisfb will reserve (and you will have to specify by MaxXFBMem) 12288KB if more than 16MB of total video RAM is available, 8192KB if between 12 and 16MB of video RAM is available, 4096KB in all other cases. The size is expected in KB, without the "KB".

Final word of advice: If you intend to use DRI on an integrated chipset (such as the 540/630/730), it is recommended to set the total video memory in the BIOS setup utility to 64MB.

2.5 315/330/340 series specific options

Option "RenderAcceleration" boolean]
Enables or disables RENDER acceleration. This feature, for instance, accelerates output of anti-aliased text. By default, RENDER acceleration is enabled. RENDER acceleration is currently only supported for XAA, not EXA.

Option "XvOnCRT2" boolean]

(For 315, 650, 740, 330, 340 and XGI chips only) This option selects whether the XVideo (Xv) overlay should be displayed on CRT1 or CRT2. Setting this option means CRT2. The other CRT will only display the (by default: blue) color key or a black/red pattern.

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