



# **SUSE\* Linux\* Enterprise Server for Intel® Server Board S2600WF, S2600BP and S2600ST Product Families**

## ***Installation Guide***

Detailed instructions to successfully install SUSE\* Linux\* Enterprise Server v12 SP1 / SP2 on the Intel® Server Board S2600WF, S2600BP and S2600ST product families.

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## ***Document Revision History***

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# 1. Introduction

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## 1.1 How to use this guide

This document details step-by-step instructions to successfully install SUSE\* Linux\* Enterprise Server v12 SP1 / SP2 when local video graphics features are required (use of the optimized ASPEED\* graphics controller and X.Org).

If local video graphics features are not required (for example, in headless or remote management environments), follow the installation procedure only (section 2.1). The driver update is not required in these environments.

**Table 1. System Update Package (SUP) firmware prerequisites**

Item	Version
BIOS	R0001 or later
Intel® ME	04.00.03.202 or later
FRUSDR	1.00 or later
BMC	1.00 or later
Operating System	SUSE* Linux* Enterprise Server v12 SP1 / SP2

## 1.2 Assumptions

The following assumptions are made in the procedure.

- The server condition is in a healthy state.
- SUSE\* Linux\* Enterprise Server v12 SP1 / SP2 is being installed locally.
- The Linux/FreeBSD/Solaris driver package v1.03 is downloaded from [http://upload.aspeedtech.com/BIOS/v103\\_linux\\_freebsd\\_solaris.zip](http://upload.aspeedtech.com/BIOS/v103_linux_freebsd_solaris.zip) and extracted to the following locations.
  - The `Linux DRM` folder (AST DRM driver) is on a removable media (i.e. USB drive)
  - The `Linux` folder (AST X.Org driver) is on a removable media

## 2. Step-by-Step Procedure

### 2.1 Installing SUSE\* Linux\* Enterprise Server v12 SP1 / SP2 (SLES v12 SP1 / SP2)

#### 2.1.1 EFI boot mode

Use the following procedure to install SLES v12 SP1 / SP2 in EFI boot mode.

1. Boot from the SLES v12 SP1 / SP2 installation source / media.
2. Press **<E>** to edit the **Installation** boot menu as shown in Figure 1.



**Figure 1. Press <E> to edit the Installation boot menu**

3. Append the parameter `nomodeset` or `modprobe.blacklist=ast` at the end of the `linuxefi` line as shown in Figure 2. I am using `modprobe.blacklist=ast` for this demonstration

```
setparams 'Installation'

set gfxpayload=keep
echo 'Loading kernel ...'
linuxefi /boot/x86_64/loader/linux splash=silent modprobe.blacklist=ast_
echo 'Loading initial ramdisk ...'
echo 'Loading initial ramdisk ...'
initrdefi /boot/x86_64/loader/initrd
```

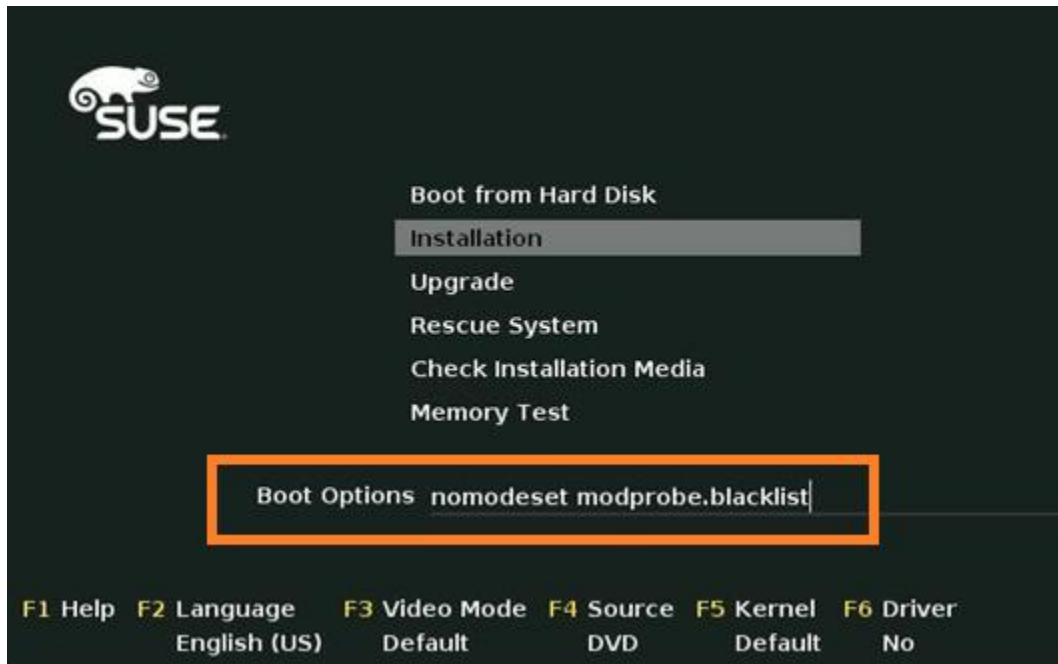
**Figure 2. Append `modprobe.blacklist=ast`**

4. Press **<Ctrl+X>** to start the installer.
5. Complete the installation as usual. When the installation completes, reboot the server.

#### 2.1.2 Legacy boot mode

Use the following procedure to install SLES v12 SP1 / SP2 in Legacy boot mode.

1. Boot from the SLES v12 SP1 / SP2 installation source / media.
2. Append the parameter `modprobe.blacklist=ast` in the **Boot Options** line at the bottom of the screen as shown in Figure 3.



**Figure 3. Append `modprobe.blacklist=ast`**

3. Press **<Enter>** to start the installer.
4. Complete the installation as usual. When the installation completes, reboot the server.

## 2.2 Updating drivers

Depending on the boot mode, follow these steps to update the AST and X.Org drivers.

1. Edit the GRUB menu option by pressing **<E>**.



**Figure 4. Press **<E>** to edit selected GRUB menu option**

2. Append a '3' (to boot the system in runlevel 3 with only command line environment) at the end of the line beginning with `linuxefi` in EFI boot mode or `linux` in Legacy boot mode. Confirm the `modprobe.blacklist=ast` is present (if you used `nomodeset`, then confirm its presence too). Then press **<Ctrl+X>** to boot the operating system.



```

GNU GRUB  version 2.02~beta2

load_video
set gfxpayload=keep
insmod gzio
insmod part_gpt
insmod btrfs
set root='hd1,gpt3'
if [ x$feature_platform_search_hint = xy ]; then
  search --no-floppy --fs-uuid --set=root --hint-bios=hd1,gpt3 --hint-efi=h\
d1,gpt3 --hint-baremetal=ahci1,gpt3 95dce115-82a0-4ff7-852e-ce37ef46da41
else
  search --no-floppy --fs-uuid --set=root 95dce115-82a0-4ff7-852e-ce37ef46d\
a41
fi
echo      'Loading Linux 3.12.49-11-default ...'
linuxefi /boot/vmlinuz-3.12.49-11-default root=UUID=95dce115-82a0-4ff7-852e\
-ce37ef46da41 ro ${extra_cmdline} nomodeset modprobe.blacklist=ast resume=/dev/rhe\
l/swap splash=silent quiet showopts crashkernel=122M,high crashkernel=72M,low 3_
echo      'Loading initial ramdisk ...'
initrdefi /boot/initrd-3.12.49-11-default

```



Minimum Emacs-like screen editing is supported. TAB lists completions.  
Press Ctrl-x or F10 to boot, Ctrl-c or F2 for a command-line or ESC to  
discard edits and return to the GRUB menu.

**Figure 5. Edit kernel module parameters**

3. Login as root. Mount the removable media and copy the directories **Linux DRM** and **Linux** to `/root/`. Unmount the removable media.
4. **(Skip this step if you are running SLES\* v12 SP1)**. Change directories to “Linux\DRM” and extract the tarball located there with the command `tar xzf lxdrm.tar.gz`. After extraction is complete, execute the command `./auto-update.sh` to perform a kernel module update for the AST DRM driver.
5. (Optional) To update the XORG driver, depending on your Service Pack, issue the appropriate command:

#### SLES\* v12 SP1

```

cd Linux
tar xzf lxdrv.tar.gz
cd x86_64/xorg76_1
./update.sh

```

#### SLES\* v12 SP2

```

cd Linux
tar xzf lxdrv.tar.gz
cd x86_64/xorg78_15
./update.sh

```

```

Welcome to SUSE Linux Enterprise Server 12 SP1 (x86_64) - Kernel 3.12.49-11-default (tty1).

linux-2med login: root
Password:
Last login: Thu Jul 6 07:48:21 on tty1
linux-2med:~ # ls
.bash_history .dbus .gnupg .local .rnd Linux autoinst.xml bin inst-sys
linux-2med:~ # cd Linux
linux-2med:~/Linux # tar xzf lxdru.tar.gz
linux-2med:~/Linux # cd x86_64/xorg76_1
linux-2med:~/Linux/x86_64/xorg76_1 # ./update.sh
ASPEED Graphics Family Linux XORG 7.6 driver update begin ....
ASPEED Graphics Family Linux XORG 7.6 driver update finished

```

**Figure 6. Update AST X.Org driver**

- Issue the following two commands to change configuration file and update the GRUB. (It is possible to use a text editor instead of the `sed` command to remove the `nomodeset` or the `modprobe.blacklist=ast` from the `/etc/default/grub` file).

```

sed -i -e 's/nomodeset modprobe.blacklist=ast//' /etc/default/grub
grub2-mkconfig > /boot/grub2/grub.cfg

```

```

ASPEED Graphics Family Linux XORG 7.6 driver update begin ....
ASPEED Graphics Family Linux XORG 7.6 driver update finished
linux-2med:~/Linux/x86_64/xorg76_1 # sed -i -e 's/modprobe.blacklist=ast//' /etc/default/grub
linux-2med:~/Linux/x86_64/xorg76_1 # grub2-mkconfig > /boot/grub2/grub.cfg
Generating grub configuration file ...
Found theme: /boot/grub2/themes/SLE/theme.txt
Found linux image: /boot/vmlinuz-3.12.49-11-default
Found initrd image: /boot/initrd-3.12.49-11-default
done
linux-2med:~/Linux/x86_64/xorg76_1 #

```

**Figure 7. Change GRUB configuration file**

- Reboot the server. The boot up continues to the graphical interface automatically. Further GRUB file editing is not required.

The kernel module updates for AST DRM and AST X.Org (optional) are complete.

## Appendix A. Glossary

Term	Definition
<b>AST</b>	ASpeed Technology
<b>BIOS</b>	Basic Input/Output System
<b>BMC</b>	Baseboard Management Controller
<b>DRM</b>	Direct Rendering Manager
<b>EFI</b>	Extensible Firmware Interface
<b>FRUSDR</b>	Field Replaceable Unit/Sensor Data Record
<b>GRUB</b>	Grand Unified Bootloader
<b>Intel® ME</b>	Intel® Management Engine
<b>SLES*</b>	SUSE* Linux* Enterprise Server
<b>SP#</b>	Service Pack number