



Red Hat* Enterprise Linux* for Intel® Server Board S2600WF, S2600BP and S2600ST Product Families

Installation Guide

Detailed instructions to successfully install Red Hat* Enterprise Linux* (RHEL*) v7.3 on the Intel® Server Board S2600WF, S2600BP and S2600ST product families.

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1. Introduction

1.1 How to use this guide

This document details step-by-step instructions to successfully install Red Hat* Enterprise Linux* (RHEL*) v7.3 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 | RHEL* v7.3 kernel 3.10.0-51.4 |

1.2 Assumptions

The following are made for the procedure to succeed.

- The server condition is in a healthy state.
- RHEL* v7.3 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 and the extracted folders stored at the root of a removable media (i.e. USB drive).
 - The `Linux DRM` folder (AST DRM driver) is used in this guide.
 - The `Linux` folder (AST X.Org driver) is also used in this guide.

2. Step-by-Step Procedure

2.1 Installing RHEL* v7.3

2.1.1 EFI boot mode

Use the following procedure to install RHEL* v7.3 in EFI boot mode.

1. Boot from the RHEL* v7.3 installation source / media.
2. Press **<E>** to edit the **Install Red Hat Enterprise Linux 7.3** installation option as shown in Figure 1.

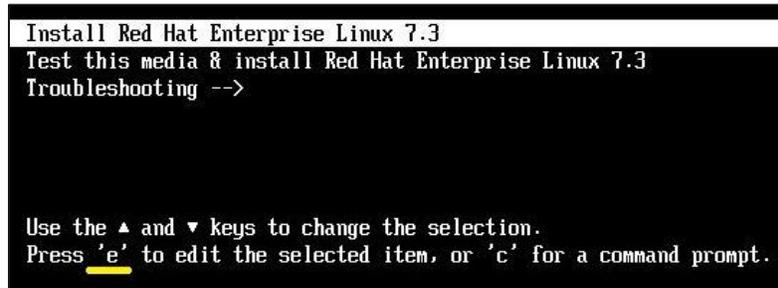


Figure 1. Press **<E>** to edit the selected GRUB menu option

3. Append the parameter `modprobe.blacklist=ast` before the `quiet` parameter at the end of the `linuxefi` line as shown in Figure 2.

Before

```
setparams 'Install Red Hat Enterprise Linux 7.3'

linuxefi /images/pxeboot/vmlinuz inst.stage2=hd:LABEL=RHEL-7.3\x20Server.x86_64 quiet
initrdefi /images/pxeboot/initrd.img
```

After

```
setparams 'Install Red Hat Enterprise Linux 7.3'

linuxefi /images/pxeboot/vmlinuz inst.stage2=hd:LABEL=RHEL-7.3\x20Server.x86_64 \
modprobe.blacklist=ast quiet
initrdefi /images/pxeboot/initrd.img
```

Figure 2. Append `modprobe.blacklist=ast`

Note the `\` (backslash) symbol at the end of the `linuxefi` line is a continuation marker so that Linux interprets the next line of text as part of the first line. While writing `modprobe.blacklist=ast` before the `quiet` parameter, it will automatically add a `\` when the line is full of characters, you do not need to type it.

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 RHEL* v7.3 in Legacy boot mode.

1. Boot from the RHEL* v7.3 installation source / media.
2. Use the arrow keys to select **Install Red Hat Enterprise Linux 7.3** and press **<Tab>** to edit options.
3. Append `modprobe.blacklist=ast` to the end of the options line.
4. Press **<Enter>** to start the installer.
5. 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>.

```

Red Hat Enterprise Linux Server (3.10.0-514.el7.x86_64) 7.3 (Maipo)
Red Hat Enterprise Linux Server (0-rescue-1cf8d5f9301540648980430ffbd2db3f) 7.3 (Maipo)

Use the ↑ and ↓ keys to change the selection.
Press 'e' to edit the selected item, or 'c' for a command prompt.

```

Figure 3. Press <E> to edit selected GRUB menu option

2. Append a '2' (to boot the system in runlevel 2 with only command line environment) at the end of the line beginning with `linuxefi` in EFI boot mode or `linux16` in legacy boot mode. Then press <Ctrl+X> to boot the operating system.

```

setparams 'Red Hat Enterprise Linux Server (3.10.0-514.el7.x86_64) 7.3 (Maipo)'

    load_video
    set gfxpayload=keep
    insmod gzio
    insmod part_gpt
    insmod xfs
    set root='hd0,gpt2'
    if [ x${feature_platform_search_hint} = xy ]; then
        search --no-floppy --fs-uuid --set=root --hint-bios=hd0,gpt2 --hint-efi=hd0,gpt2 --hint-
baremetal=ahci0,gpt2 6fd0136f-08a4-4b76-8940-d502a8dd71b4
    else
        search --no-floppy --fs-uuid --set=root 6fd0136f-08a4-4b76-8940-d502a8dd71b4
    fi
    linuxefi /vmlinuz-3.10.0-514.el7.x86_64 root=/dev/mapper/rhel-root ro rd.lvm.lv=rhel/root \
rd.lvm.lv=rhel/swap rhgb quiet LANG=en_US.UTF-8 2_
    initrd /initramfs-3.10.0-514.el7.x86_64.img

```

Figure 4. Edit kernel module parameters

3. Login as root. Mount the removable media and copy the directories **Linux DRM** and **Linux** to `/root/`.
4. Unmount the removable media. 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.

```

[root@localhost Linux DRM]# ./auto-update.sh
The architecture is x86_64
Check Previous Installation Package ....
Remove Previous Installation Package ....
Install Package on Redhat Distribution ....
Preparing... ##### [100%]
Updating / installing...
 1:ast-drm-3.10.0-514.el7.x86_64-1.3##### [100%]
Rebuilt Image ....
Install Package Ready and Please Reboot System!!

```

Figure 5. Update AST DRM driver

5. (Optional. If graphics mode is not required, skip this step. If graphical environment is desired but not installed, install it before continuing with this step.) Change to the **Linux** directory in the copied driver

directory. Unpack the tarball with the command `tar xzf lxdrv.tar.gz`. If the graphical environment has already been installed, but not launched, take the following steps:

- a. Issue the command `startx` to start the graphical interface desktop.
- b. Click the down arrow next to the power icon in the upper corner of the screen and click the right arrow next to **root**.
- c. Click **Log Out** and confirm in the pop-up dialog.
- d. Execute the command `./auto-update.sh` to perform a kernel module update for the AST X.Org driver.

```
[root@localhost Linux]# ./auto-update.sh
The architecture is x86_64
X Window is Xorg 7.8
ASPEED Graphics Family Linux XORG 7.8 driver update begin ...
ASPEED Graphics Family Linux XORG 7.8 driver update finished
```

Figure 6. Update AST X.Org driver

6. 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 |
|------------------|---|
| AST | ASpeed Technology |
| BIOS | Basic Input/Output System |
| BMC | Baseboard Management Controller |
| DRM | Direct Rendering Manager |
| EFI | Extensible Firmware Interface |
| FRUSDR | Field Replaceable Unit/Sensor Data Record |
| GRUB | Grand Unified Bootloader |
| Intel® ME | Intel® Management Engine |
| RHEL* | Red Hat* Enterprise Linux* |