SUSE* Linux* Enterprise Server for Intel® Server Boards S2600WFQ, S2600BPQ and S2600STQ

Intel® Quick Assist Technology Installation Guide

Detailed instructions to successfully install the Intel® Quick Assist Technology driver v1.0.x for SUSE* Linux* Enterprise Server (SLES*) v12 SP2 on the Intel® Server Boards S2600WFQ, S2600BPQ and S2600STQ product families (Intel® C62X chipset).

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Document Revision History

Date	Revision	Changes
August 2017	1.00	First Public Release

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1. Introduction

1.1 How to use this guide

This document details step-by-step instructions to successfully install the Intel® Quick Assist Technology (QAT) updated driver v1.0.x for SUSE* Linux* Enterprise Server (SLES*) v12 SP2.

Table 1. System Update Package (SUP) firmware prerequisites

Item	Version
BIOS	R0004 or later
Intel® ME	04.00.03.219 or later
FRUSDR	1.04 or later for S2600BP and S2600WF / 1.02 or later for S2600ST
BMC	1.04 or later
Operating System	SLES* 12 SP2 kernel 4.4.21-69-default

1.2 Assumptions

The following are made for the procedure to succeed.

- The server condition is in a healthy state.
- SLES* 12 SP2 is being installed locally.
- The following software is available:
  - SLES* SP2 SDK disc 1
  - The Intel® QuickAssist Technology driver v1.0.x (e.g., `QAT1.7.Upstream.L.1.0.3_42.tar.gz` which is used in this guide) has been downloaded from HERE and the tarball file stored at the root of a removable media (e.g., USB drive).

2. Step-by-Step Procedure

2.1 Installing SLES* 12 SP2

Note the **<ast>** driver is also being blacklisted. For details on updating that driver please refer to the Technical Advisory TA-1125, located **HERE**.

2.1.1 EFI boot mode

Use the following procedure to install SLES* 12 SP2 in EFI boot mode.

1. Boot from the SLES* 12 SP2 installation source / media.
2. Press **<E>** to edit the **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,qat_c62x` at the end of the `linuxefi` line as shown in Figure 2.

```
setparams 'Installation'

  set gfxpayload=keep
  echo 'Loading kernel ...'
  linuxefi /boot/x86_64/loader/linux splash=silent modprobe.blacklist=ast,qat_c62x_
  echo 'Loading initial ramdisk ...'
  initrdefi /boot/x86_64/loader/initrd
```

Figure 2. Append `modprobe.blacklist=ast,qat_c62x`

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* 12 SP2 in Legacy boot mode.

1. Boot from the SLES* 12 SP2 installation source / media.
2. Append `modprobe.blacklist=ast,qat_c62x` to the end of the options line.

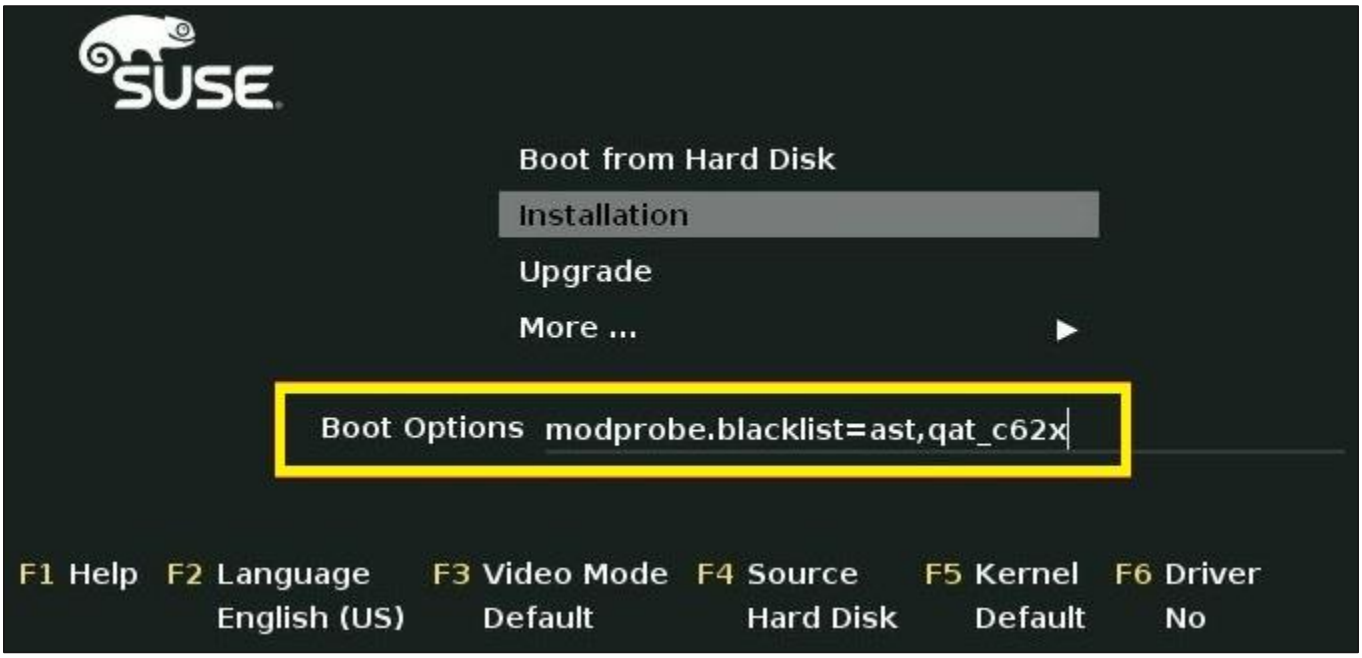

Figure 3. Installing SLES* 12 SP2 in Legacy Boot mode

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

2.2 Updating Drivers

Before continuing with this procedure and, if local video graphics features are required (use of the optimized ASPEED* graphics controller and X.Org), please make sure you have completed the steps described in the Red Hat* Enterprise Linux* Installation Guide to update the BMC video driver as described in TA-1125 HERE.

1. After completing the installation, reboot the server. Press **<E>** to edit the GRUB menu option.

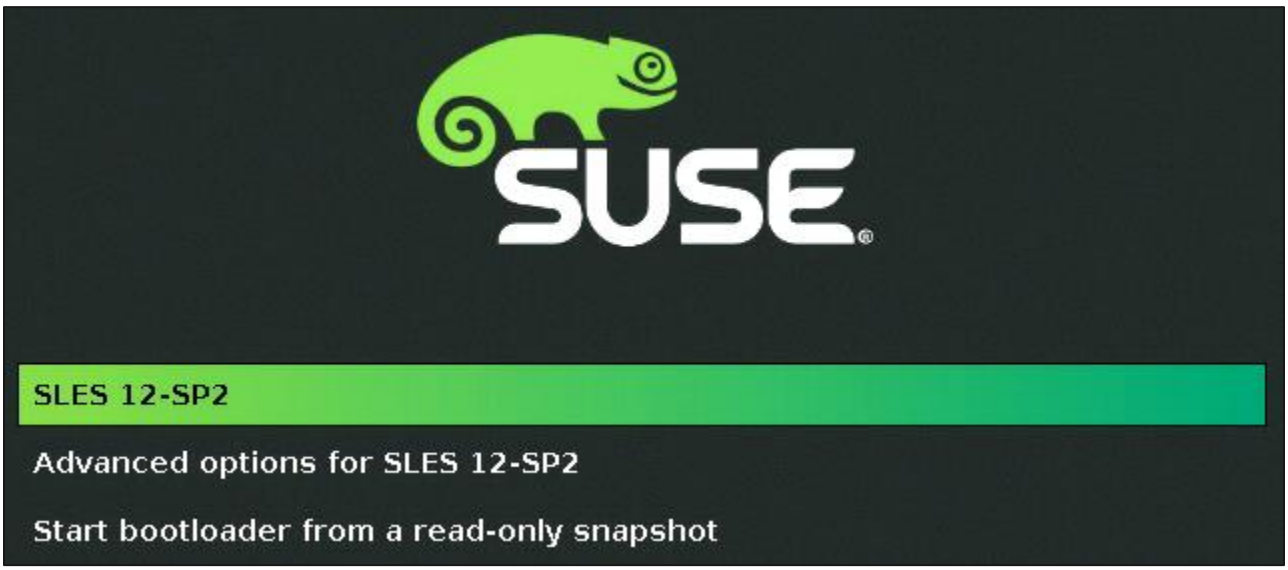

Figure 4. Press <E> to edit the GRUB menu option

2. Confirm the parameter `modprobe.blacklist=qat_c62x` is present (if the **<ast>** driver update has not yet been completed, append the parameter `modprobe.blacklist=ast,qat_c62x` instead) at the

`linuxefi` line in EFI boot mode or `linux16` in legacy boot mode. Also add the number **<3>** to the end of the line. Then press **<Ctrl+X>** to boot the operating system.

```
setparams 'SLES 12-SP2'

        load_video
        set gfxpayload=keep
        insmod gzio
        insmod part_gpt
        insmod btrfs
        set root='hd0,gpt3'
        if [ x$feature_platform_search_hint = xy ]; then
          search --no-floppy --fs-uuid --set=root --hint-bios=hd0,gpt3 --hint-efi=h\
d0,gpt3 --hint-baremetal=ahci0,gpt3  62124089-699e-4d8a-9057-1680ccaffd7d
        else
          search --no-floppy --fs-uuid --set=root 62124089-699e-4d8a-9057-1680ccaff\
d7d
        fi
        echo        'Loading Linux 4.4.21-69-default ...'
        linuxefi /boot/vmlinuz-4.4.21-69-default root=UUID=62124089-699e-4d8a-9057-\
1680ccaffd7d ro  ${extra_cmdline} modprobe.blacklist=ast,qat_c62x resume=/dev/sda2 \
splash=silent quiet showopts crashkernel=107M,high crashkernel=72M,low 3_
        echo        'Loading initial ramdisk ...'
        initrdefi /boot/initrd-4.4.21-69-default
```

Figure 5. Confirm the parameter `modprobe.blacklist=ast,qat_c62x` is present

3. Login as root.
4. If it has not yet been completed, please perform the steps required to update the **<ast>** video driver at this time.
5. Mount the removable media and copy the driver to `/root/QAT/`.
6. Unmount the removable media.

7. Use **Zypper** to create a local repository from the SLES* 12 SP2 SDK DVD1 (download HERE) media, from which to install the dependencies.

```
linux-0jyn:~ #
linux-0jyn:~ # mount /dev/sr0 /mnt
mount: /dev/sr0 is write-protected, mounting read-only
linux-0jyn:~ # zypper ar /mnt SDK_REPO
Adding repository 'SDK_REPO' ..........................................................................................[done]
Repository 'SDK_REPO' successfully added
Enabled     : Yes
Autorefresh : No
GPG Check   : Yes
Priority    : 99
URI         : dir:///mnt

linux-0jyn:~ # zypper mr -erG 1
Autorefresh has been enabled for repository 'SDK_REPO'.
GPG check has been disabled for repository 'SDK_REPO'.
linux-0jyn:~ # zypper lr
# | Alias            | Name             | Enabled | GPG Check | Refresh
--+------------------+------------------+---------+-----------+--------
1 | SDK_REPO         | SDK_REPO         | Yes     | (  ) No   | Yes
2 | SLES12-SP2_12.2-0 | SLES12-SP2 12.2-0 | Yes     | (  ) No   | Yes
linux-0jyn:~ # zypper --non-interactive in pciutils boost-devel zlib-devel libudev-devel kernel-devel openssl-devel gcc
Loading repository data...
Reading installed packages...
'zlib-devel' is already installed.
No update candidate for 'zlib-devel-1.2.8-7.25.x86_64'. The highest available version is already installed.
'openssl-devel' not found in package names. Trying capabilities.
'libopenssl-devel' providing 'openssl-devel' is already installed.
'boost-devel' is already installed.
No update candidate for 'boost-devel-1.54.0-15.1.x86_64'. The highest available version is already installed.
'gcc' is already installed.
No update candidate for 'gcc-4.8-6.189.x86_64'. The highest available version is already installed.
'libudev-devel' is already installed.
No update candidate for 'libudev-devel-228-117.12.x86_64'. The highest available version is already installed.
'pciutils' is already installed.
No update candidate for 'pciutils-3.2.1-5.1.x86_64'. The highest available version is already installed.
'kernel-devel' is already installed.
No update candidate for 'kernel-devel-4.4.21-69.1.noarch'. The highest available version is already installed.
Resolving package dependencies...

Nothing to do.
linux-0jyn:~ # _
```

Figure 6. Add the local repository using the mounted media as file-based

Another method, insert the SLES* 12 SP2 SDK disc and add the local repository using the mounted media as cd-based

Issue the command:

```
zypper ar cd:///?devices=/dev/disk/by-id/YOUR_DVD_ID_HERE SDK_REPO
```

Example:

```
zypper ar cd:///?devices=/dev/disk/by-id/usb-GENERIC_Virtual_CDROM-0\:0 SDK_REPO
```

8. Verify the necessary dependencies are present with the command:

```
zypper in pciutils zlib-devel boost-devel libudev-devel kernel-devel \
libopenssl-devel gcc gcc-c++
```

{note: at the "Continue?" prompt, press <Enter>. Change discs when prompted between the SDK disc and the OS install disc, responding to the prompts as appropriate (e.g., press <Y>, then <Enter> after changing discs).}

9. After completing the installation of dependencies, remove the disc from the system.
10. Change directories to "QAT" and extract the tarball located there with the command:

```
tar zxf QAT1.7.Upstream.L.1.0.3_42.tar.gz
```

11. Issue the command:
    `./configure`
12. Issue the commands:
    `make && make install`

```
There is 2 QAT acceleration device(s) in the system:
 qat_dev0 - type: c6xx,  inst_id: 0,  bsf: 3d:00.0,  #accel: 5 #engines: 10 state: up
 qat_dev1 - type: c6xx,  inst_id: 1,  bsf: 3f:00.0,  #accel: 5 #engines: 10 state: up
make[1]: Nothing to be done for 'install-data-am'.
make[1]: Leaving directory '/root/QAT1.7.Upstream.L.1.0.3_42'
```

Figure 7. QAT Acceleration Devices are "up"

13. Edit the `/etc/default/grub` file to change configuration file and update the GRUB by removing the '`modprobe.blacklist=qat_c62x`' (or the `modprobe.blacklist=ast,qat_c62x`, if resolving the video driver at the same time as the Intel® QAT driver) parameter.
14. Finally, issue the following command:
    `grub2-mkconfig > /boot/grub2/grub.cfg`

The Intel® QAT driver update is now complete.

Additional Intel® QAT resources can be found HERE.

Appendix A. Glossary

Term	Definition
BMC	Baseboard Management Controller
EFI	Extensible Firmware Interface
FRUSDR	Field Replaceable Unit/Sensor Data Record
GRUB	Grand Unified Bootloader
Intel® ME	Intel® Management Engine
SLES*	SuSE* Linux* Enterprise Server
QAT	Intel® Quick Assist Technology