

# Monitor Upgrade Solution v2.1-10.x Linux User's Guide

This edition applies to Monitor Upgrade Solutions 2.1 for Linux and to all subsequent releases and modifications until otherwise indicated in new editions.

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## 1 Introduction to MUS

### 1.1 What is Monitor Upgrade Solution

The Monitor Upgrade Solution (MUS) is a solution by Toshiba Global Commerce Solutions, Inc. to perform silent and remote updating of the Touch and Video Firmware of Toshiba Monitor type 6149-5XX. Monitor Upgrade Solution is composed of two parts.

- First is the Operational Package (OP), this is needed to be pre-installed to the system for the MUS solution to operate. This is the base mechanism for upgrading. It contains the monitor upgrade service and other support executable.
- Secondly, there will be an upgrade-specific upgrade package (UP) for the actual upgrade to be done. And this package is made when a critical firmware change is released by a vendor. So for example there may be a release of new firmware for 6149-5XX Video micro-controller - in this case a 6149-5XX Video firmware UP will be created by TGCS and tested. This will then be released to customers. Similarly another critical touch firmware change may be released by the touch vendor for 6149-5XX. Another UP will be created by TGCS, tested and released. Each upgrade is domain specific.

## 2 MUS Contents

### 2.1 Operational Package (OP)

This is the basic mechanism needed to perform firmware and other upgrades on a POS System with newer 6149-5XX model. It consists of Monitor Upgrade Service scripts which run at boot time in order to perform monitor upgrade tasks.

#### 2.1.1 File format

The OP will be in an RPM in this format `<name>-<version>-<release>.<arch>.rpm`

Example: `toshiba-mus_op-suse-2.1-1.noarch.rpm`

#### 2.1.2 Components of OP

The components included in the Operational Package are:

- ❖ Monitor Upgrade Service support scripts
- ❖ 4820 Monitor Video firmware update utility - **4820MonUtil**
- ❖ Touch firmware update utilities - **elo\_config** and **elo\_download**
- ❖ 6149 Monitor Video firmware update utility - **aipfwupdate**
- ❖ Ocular/Atmel Touch firmware update utilities - **mxt-app**

### 2.2 Upgrade Packages (UP)

The Upgrade Packages contain the actual Upgrade Tasks to be performed by the Monitor Upgrade Service.

Typically they provide the updated touch or video firmware files along with a manifest and any support files required. Each represents a compact atomic upgrade task.

UP Tasks are run by the Monitor Upgrade Service at system boot time.

### 2.2.1 File format

The UPs are also RPMs with format *name-version-release.arch.rpm*

Example: toshiba-mus2.1\_up\_6149\_touch-AwwMCwgODg0NAwMJBawJBw\_0006-1.0-3.noarch.rpm

### 2.2.2 RPM Dependency

It requires mus\_op version 2.1-10.1 or above.

Example: toshiba-mus\_op-suse-2.1-10.1.noarch.rpm

## 3 Pre Requisites

### 3.1 Supported Linux OS

- ❖ SLES 12 SP2 64-Bit
- ❖ SLED 12 SP2 64-Bit
- ❖ SLEPOS 12 POS Client 64-bit

### 3.2 Supported Displays

- ❖ Toshiba TCx Display 6149 (Model 5Cx, 5Nx, 5Sx)

### 3.3 C/C++ Compiler and Tools (Will need this to compile the downloaded Python 2.6.8)

**NOTE:** When performing a fresh install of SLE 12 SP2, please include "C/C++ Compiler and Tools" from "Software" headline within "Installation Settings" page. If your system comes pre-installed with SLE 12 SP2, please check that "C/C++ Compiler and Tools" is installed from "Software Management" in YaST2.

Required only C/C++ 64Bit module - patterns-sles-Basis-Devel or patterns-sled-Basis-Devel

### 3.4 Python 2.6.8 Environment

MUS OP service requires Python 2.6.8 environment to run. However, SLE 12 SP2 only provides Python 2.7.9 (default) and 3.4 environments. Therefore it is required to download Python 2.6.8 from the Python web site as shown below and then install into SLE 12 SP2. To check which Python version environment is running in the system, type 'python -V'.

Please download Python 2.6.8 from the link - <https://www.python.org/download/releases/2.6.8/>

Before installing MUS OP, please follow these steps below to install Python 2.6.8 first.

- a. Unzip **Python-2.6.8.tgz** or **Python-2.6.8.tar.bz2**.
- b. Open a bash or terminal from unzipped **Python-2.6.8.tgz** or **Python-2.6.8.tar.bz2** directory/folder.
- c. To check current Python version, type '**python -V**' and system will return Python 2.7.9 (default SLE12 SP2's Python version).
- d. Next, type '**./configure**' (Ignore all warning messages shown during this process).
- e. Then type '**make**' (Ignore all warning messages shown during this process).
- f. Finally, type '**make install**' to install Python 2.6.8 into SLE 12 SP2 (Ignore all warning messages shown during this process).
- g. When the installation has completed, type '**python -V**' to verify that current Python version is 2.6.8. Once the above (Python 2.6.8) is confirmed, proceed to MUS OP installation.

### 3.5 Zypper command line tool

Zypper is a default package included with SLES, SLED. If this package is not installed then the user needs to install this package.

**For SLEPOS Users:**

This is not a default package. Therefore, the user needs to include the Zypper package when they create their SLEPOS image.

### 3.6 Libusb-1\_0-0-32bit-USB Library Module

It is required to install Libusb-1\_0-0-32bit USB library module to avoid receive error message “error while loading shared libraries: libusb-1.0.so.0: cannot open shared object file: No such file or directory”.

## 4 MUS 2.1 Installation

MUS 2.1 and lower versions (< 2.1) are incompatible and cannot co-exist on the same system. If lower version of MUS OP is installed in the system, the user **MUST** uninstall this first before installing the new MUS 2.1 OP rpm file. This will ensure that there will be no file or driver conflicts between the two OPs.

### 4.1 MUS 2.1 OP Installation

Execute the following command:

```
# rpm -ivh toshiba-mus_op-suse-2.1-10.1.noarch.rpm
```

**NOTE:**

MUS currently will not support “rpm upgrade options” meaning, user cannot install a new MUS OP with the command “rpm -Uvh toshiba-mus\_op-suse-2.1-10.1.noarch.rpm”

This installs just the basic upgrade mechanisms. No Upgrade Tasks are installed yet.

### 4.2 MUS 2.1 UP Installations

Each Upgrade Task is contained in its own RPM package.

These RPMs will install UP task files under a folder called */opt/toshiba/mus/UpdateTasks/*. Each task (video, touch, touch configuration) will be installed into its appropriate part of the sub-tree.

A user may install the UP RPM manually or let the MUS install the UP RPM by “dropping” it into a UP stage folder called */opt/toshiba/mus/RpmUpdates*. The MUS will install any UP rpm(s) found in the stage folder.

#### 4.2.1 Manual Install

```
#rpm -ivh toshiba-mus2.1_up_6149_touch-AwwMCwgODg0NAwMJBawJBw_0006-1.0-3.noarch.rpm
```

#### 4.2.2 Install at boot time (via RpmUpdates directory).

The `/opt/toshiba/mus/RpmUpdates` is the directory where the UP RPMs must be placed when there are new UP available. These RPMs will get installed by the Monitor Upgrade Service on the next system reboot. After uninstallation, the RPM package will be removed from this directory.

### Currently known MUS 2.1 UP Tasks:

- **6149-5XX USB touch monitor Touch Firmware Upgrade**  
File Name: toshiba-mus2.1\_up\_6149\_touch-**GUID**-1.0-**n**.noarch.rpm
- **6149-5CX USB touch monitor Video Firmware Upgrade**  
File Name: toshiba-mus2.1\_up\_6149-5CX\_video-**xxxx\_xxxx**-1.0-**n**.noarch.rpm
- **6149-5NX/5SX USB monitor Video Firmware Upgrade**  
File Name: toshiba-mus2.1\_up\_6149-5NXSX\_video-**xxxx\_xxxx**-1.0-**n**.noarch.rpm

#### NOTE:

1. **xxxx** is the version of the firmware.
2. **n** is the incremental version of the UP which normally contains bug fixes and always start from 1.
3. **GUID** is the Globally Unique Identifier with 22 characters to identify the content of the UP. Since MUS 2.1, the firmware version of the UP will no longer be included in the UP name as it may contain multiple firmware versions in a UP. User has to check on the release note for the firmware versions it contains.

## 5 MUS 2.1 Uninstallation

### 5.1 MUS 2.1 UP Un-installation

Tasks may be uninstalled by a user via RPM at any time. This is not done by the Monitor Upgrade Service.

(i.e. `# rpm -ev toshiba-mus2.1_up_6149_touch-AwwMCwgODg0NAwMJBawJBw_0006-1.0-3.noarch.rpm`)

### 5.2 MUS 2.1 OP Un-installation

Run the script “*mus\_op\_uninstall*” found at the directory `/opt/toshiba/mus`. This script takes care of dependencies created by the UP installations.

**Note:** Running an rpm command to uninstall the OP rpm will fail when one or more UP(s) are installed.

(i.e. `# rpm -ev toshiba-mus_op-suse-2.1-10.1.noarch.rpm` )

## 6 How MUS Works

The Monitor Upgrade Service is installed as a Linux Service. It will run at boot time. In the Normal case the Monitor Upgrade Service will run a Normal Update Cycle.

If there are recoverable failure scenarios encountered during the Normal Update Cycle the Monitor Upgrade Service will stop processing upgrades and reboot again in order to run a Recovery Cycle.

A recoverable failure is one where the manufacturer has provided failure recovery as part of their supplied utility. An example of a recoverable failure scenario is when power is removed from the Monitor during the actual byte transfer update part of a video firmware update task for 6149.

### Recoverable Scenarios:

1. Interruption when touch firmware flashing

#### Supported Interruption:

- Power Loss/ Unplug Power cable
- Unplugging of Power USB cable

#### Supported Displays:

- 6149-5XX

2. Interruption when video firmware flashing

#### Supported Interruption:

- Power Loss/ Unplug Power cable
- Unplugging of Power USB cable

#### Supported Displays:

- 6149-5XX

**Note:** Please refer to the **Section 11. Known Limitations** for what is not currently supported type of firmware flash interruption. Configuration updates do not have any built-in recovery mechanism.

### 6.1 Normal Update Cycle

1. MUS will install any UP Task RPM packages it finds in RpmUpdates - if it is not already installed – and will then move the RPM files for successfully installed packages to: **/opt/toshiba/mus/ProcessedRpm**s

**NOTE:** *MUS 2.1 OP will not support UP task RPM other than those mention in the available UP Tasks in Section 4.2*

2. After installing the UP Task RPM a new sub-tree folder corresponding to that update level is created.

Example: **/opt/toshiba/mus/UpdateTasks/Touch/toshiba-mus2.1\_up\_6149-5XX\_touch-fw\_xxxx/**

3. MUS will then check if there are any appropriate installed update tasks to be executed for any of the currently connected monitors.

This is done by comparing the current update level (both touch and video) of all attached monitors to the current greatest update level in all UP Task manifests.

4. MUS will then execute all the necessary update tasks in sequence (one or many).
5. Configuration Tasks will always be applied. This is much faster than querying USB controller devices and then deciding whether update is needed.
6. All tasks will be attempted and will only abort the processing if there is a task failure. If a task failed, then MUS will abort. If the task is recoverable, MUS will then reboot and perform a recovery cycle – see Section 6.2.
7. If there is no error then after any and all tasks are completed MUS will exit. There will be no reboot required.

## 6.2 Recovery Update Cycle

1. The recoverable task will be re-attempted using the specific recovery processing by the vendor support utility.
2. If recovery routine is successful, MUS will reboot the system one more time to put it back to working state.
3. If the recovery fails MUS will try to attempt recovery one more time.
4. If (all) recovery attempts have failed MUS will exit the Recovery cycle and then reboot the system to Normal update cycle. RECOMMENDED PROCEDURE at this point is to unplug and remove the affected monitor. Field Support may be required.
5. If the recovery succeeds, MUS will exit and reboot the system to bring it to a consistent state and boot into Normal update cycle.

**NOTE:** The duration of a single recovery, 1 firmware update, is approximately 10 minutes. The time may vary from system to system depending on its speed. The approximated time is from attempting to reboot the system, do the recovery routine, reboot the system again and boot to normal user session.

## 7 Updating Touch Configurations

### 7.1 6149-5XX Touch Configuration Update

For 6149-5XX monitors, Touch Configurations are bundled together with the Firmware Update packages. This configuration is not intended to be modified by the user. If there are any touch configuration updates available, a new UP will be release and this will be the only way to update the existing configurations.

**NOTE:** This touch configuration will be loaded to all attached 6149-5XX Monitors every time the system reboots .This is to ensure that the monitors will always have the same configurations.

## 8 Updating Touch Firmware

1. Install UP rpm for new Touch Firmware or place this UP rpm at */opt/toshiba/mus/RpmUpdates* folder for auto install on boottime.  
**NOTE:** *MUS 2.1 OP will not support UP task RPM other than those mention in the available UP Tasks in Section 4.2*
2. Reboot the system
3. All attached designated monitors will now have the new Touch Firmware level.



## 9 Updating Video Firmware

1. Install UP rpm for new Video Firmware or place this UP rpm at */opt/toshiba/mus/RpmUpdates* folder for auto install on boot time.

**NOTE:** *MUS 2.1 OP will not support UP task RPM other than those mention in the available UP Tasks in Section 4.2*

2. Reboot the system
3. All attached designated monitors will now have the new Video Firmware level.

## 10 MUS Directory Structure

Described below are the well - known directories that the user can refer to about MUS.

### 10.1 MUS base directory

This will be the root directory for all of the upgrade solution functionality containing:

- ❖ OP support scripts (eg. ELO,SAMPO)
- ❖ UP RPM Directories
- ❖ Update Tasks Folder

#### MUS ROOT DIRECTORY

# /opt/toshiba/mus/

### 10.2 Logs Directory

This directory contains the log for all MUS operations including OP Installation, log history and the latest MUS log.

#### OP\_INSTALLATION:

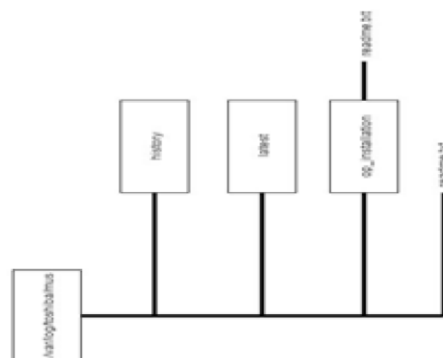
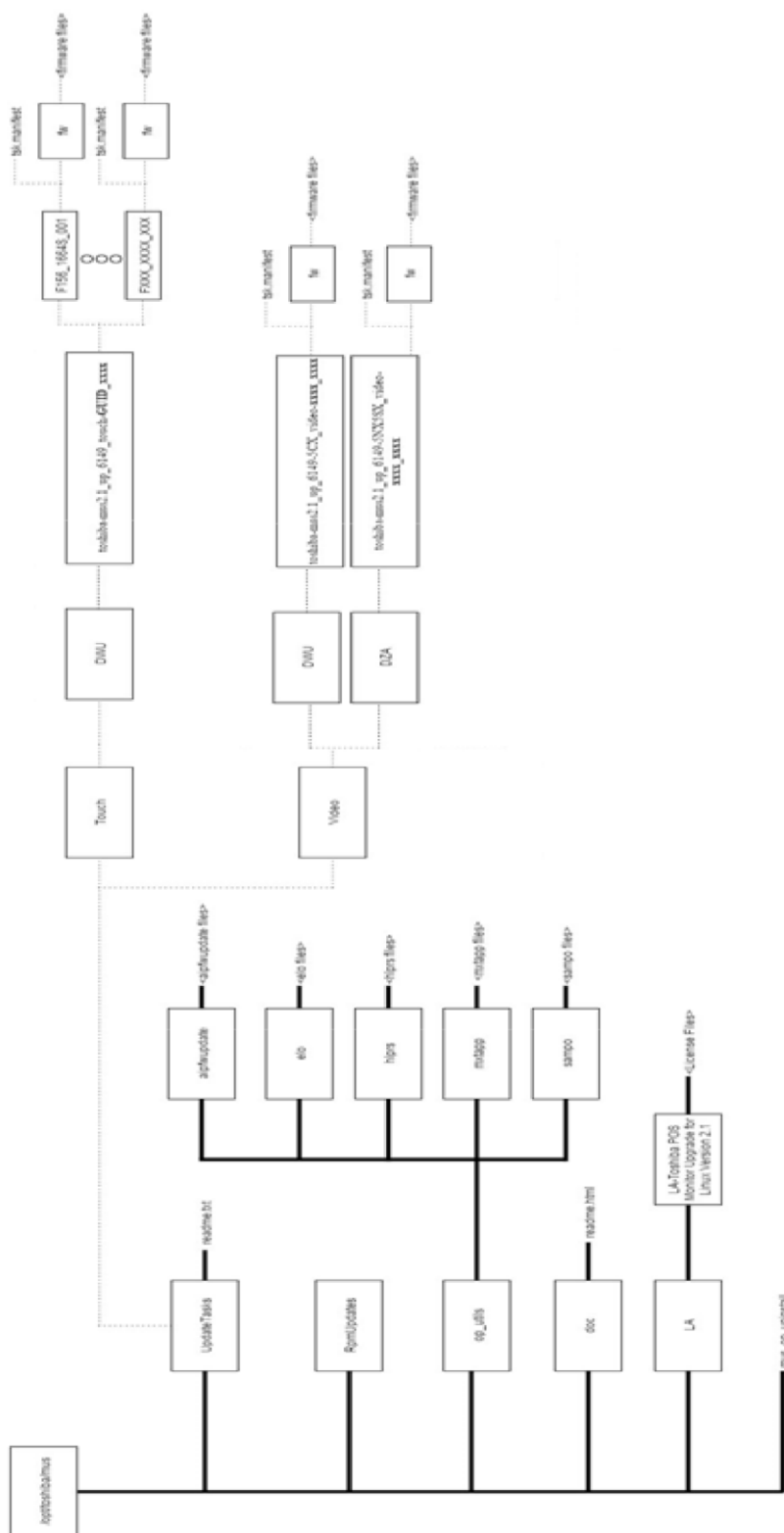
# /var/log/toshiba/mus/op\_installation/

#### LOG HISTORY:

# /var/log/toshiba/mus/history/

#### LATEST LOG:

# /var/log/toshiba/mus/latest/



## 11 Known Limitations

1. MUS 2.1 Linux does not support power loss/ unplug power cable and unplugging of power USB cable from the attached **61495XX** monitor while a **touch** firmware update is ongoing. Doing so will cause undesirable damage to the firmware and perhaps to the monitor itself.
2. In the event video firmware, touch firmware and touch configuration are installed to update **6149-5xx** monitor, please perform either of the following to ensure that the touch configuration is updated together with the video and touch firmware update. This is due to an interrupt triggered by SLE 12 SP2 kernel, and hence disconnecting the USB device.
  - a **Alternative 1:** Reboot the system after the machine has booted up for at least 5 minutes or more. (It is noted that the total time required for video firmware, touch firmware and touch configuration updates in one instance will require at least 5 minutes or more)
  - b **Alternative 2:** Install the Video UP only, reboot the system to allow Video UP to be updated. After which, install the Touch UP, reboot the system and allow the Touch UP to be updated.