Toshiba Display Inventory Driver User's Guide

Contents

Contents 2
About this guide 4
Who should read this guide? 4
Summary of changes 5
November 2021 5
August 2023 5
Chapter 1. Introduction 6
Supported Hardware 6
Software Requirements 6
Chapter 2. Display Inventory Driver Package Installation and Removal Instructions 7
Installation Procedure 7
Installation of SFCB 7
Installation of RPM Package 7
Removal of RPM Package 7
Installation of DEB Package 8
Removal of DEB Package 8
Problem Troubleshoot 8
Chapter 3. Configuring the Driver 9
Logging 9
Firmware Tools 9
Configuring the SBLIM-SFCB server to Load DID provider 10
Security Policies in SLE 15 Distribution 11
Chapter 4. Data Provided by Display Inventory Driver 12
Chapter 5. Accessing the Display Information 13
Enumerating Instances 13
Trademark 16

About this guide

The guide describes how to install and configure and use the Toshiba Display Inventory Driver 1.7 for Linux.

Who should read this guide?

This guide is intended for personnel who will be using the TCx® Displays information provided by Display Inventory Driver (DID) on a system management environment.

Summary of changes

November 2021

This release is including software deployment support on the following POS Systems:

- TCx® 810 6201-2xx/Exx
- TCx® 810E 4828-T2x/E2X

August 2023

- Added support for: Toshiba TCx® 900 4901-91x/E1x/C1x.

Chapter 1. Introduction

The Display Inventory Driver is designed to extract information from the supported external displays attached to the POS system using USB bus and populate it using the CIM standard.

Supported Hardware

Toshiba Display Inventory Driver can be deployed in any POS system, but the driver will be capable of only provide information of the following display models.

1. TCx® Display 6149-5SR/5SD/5NR
2. TCx® Display 6149-5CR/5CD
3. TCx® Display 6149-Bxx/Wxx

***Note**: All monitors should be connected to USB 12v and to any of the supported video ports (VGA, DP, USB-C) before use this application.*

Software Requirements

The Display Inventory Driver has the following software requirements and dependencies to be properly deployed in the system, this will grant the stable functioning of the driver in the system.

Operating System	• Linux x64-bit (Kernel 4.4+)[1] Packages tested on GNU/Linux distributions[2]: Ubuntu (20.04, 22.04), SLE 15 (SP3, SP4)
Libraries/Packages Dependency	• libusb 1.0 • libudev • SFCB (SMALL Footprint CIM Broker)[3]

[1] Best effort will be provided for no default version.

[2] Best effort will be provided for no tested GNU/Linux distributions.

[3] If the CIM broker is not installed on the system, Display Inventory driver package installation will fail with an alert message to installing it. It is strongly recommended to previously install the CIM Broker alongside a client to consume and test the information.

Chapter 2. Display Inventory Driver Package Installation and Removal Instructions.

This chapter describes the process to deploy the Toshiba Display Inventory Driver in the system.

Installation Procedure

In this section you will encounter the steps to install the `***.deb***` or `***.rpm***` package depending on the Linux distribution you may be using.

Installation of SFCB

It is important that SFCB (Small Footprint CIM Broker) broker be already installed on the selected system before installing Toshiba Display Inventory Driver, but if SFCB is not yet installed, please follow the next steps to install it on your system:

- On Ubuntu

```
$ sudo apt install sfcb
```

- On SLE 15

```
$ sudo zypper install sblim-sfcb
```

Installation of RPM Package

On rpm-based packages systems such as SLE 15, please follow the next instructions to install the driver:

1. Open a terminal
2. Change directory where the package "t*oshiba-dspdrv-linux-1.7.X-1.0.X.X.86_64.rpm*"[4] is located at.
3. Type:

```
$ sudo rpm -ivh toshiba-dspdrv-linux-1.7.X-1.0.X.X.86_64.rpm
```

4. When you hit enter, the terminal will prompt for `*sudo*` password.
5. Enter the password and you will see the installation process.

Removal of RPM Package

If you no longer want to use the driver or it is a newer version that fixes older problems you must need to remove the package that is currently on the system, to do so, please follow the next steps.

1. Open a terminal
2. Type the next command in the terminal:

[4] **The first capital x (X) indicates the build number of the package, and the second X will indicate the packages is intended to be installed only on a SUSE distribution.**

```
$ sudo rpm -e toshiba-dspdrv-linux
```

3. Hit enter and the terminal will prompt for sudo password
4. Enter the password and the driver package should be removed from the system.

Installation of DEB Package

For .deb package-based systems like Ubuntu please follow the next steps:

1. Open a terminal
2. Change Directory to where the toshiba-dspdrv-linux_1.7.x-1.0_amd64.deb[5] package is located at.
3. In the terminal type:

```
$ sudo dpkg -i toshiba-dspdrv-linux_1.7.x-1.0_amd64.deb
```

4. This will prom for the `*sudo*` password, please enter it and the package will be installed on your system

Removal of DEB Package

Please follow the next steps to remove the package from your system, in case of an update for a newer version or removing it from your system.

1. Open a terminal
2. In the terminal type:

```
$ sudo dpkg -r toshiba-dspdrv-linux
```

```
$ sudo dpkg -P toshiba-dspdrv-linux
```

3. This will prom for the sudo password, please enter it and the package will be removed from your system

Problem Troubleshoot

Package leftovers, Packages marked with "rc" status by dpkg -l

If you need to reinstall a new version you first need to remove the previous version, to avoid any problem with the newer installation please run the following command:

```
$ dpkg --list |grep "^rc" | cut -d " " -f 3 | xargs sudo dpkg –purge
```

This will remove the files that the previous uninstallation process left and leave a clean installation environment.

[5] The x indicates the build number

Chapter 3. Configuring the Driver

The Toshiba Display Inventory Driver includes configuration files for its operation, please refer to this section to know about this configuration.

Logging

The driver logs abnormal conditions to **/var/log/dspdrv/dspdrv.log**. For normal production usage there is no need to change this behaviour.

If any problems surface however additional information may be logged for purposes of support.

To enable detailed logging, edit the **/etc/dspdrv/log.conf** file:

- Change the Level property to 4 to enable very detailed trace logging.
- Restart the SFCB Broker to activate the logger configuration changes.

Log Levels:

0 - Off
1 - Error
2 - Information (production default)
3 - Debug
4 – Trace

You may also change the **MaxLength** property if you want to log for any length as the logfile length might be not enough.

MaxLength=10000000 (production default)

Notes:

- Digits should not be separated.
- When reaches to MaxLength no more logging is recorded.

Firmware Tools

There is a configuration file **/etc/dspdrv/dspdrv.conf.**

This currently contains the names of firmware update utilities named:

- **elo_download,**
- **elo_config,**
- **4820MonUtil,**
- **aipflash,**
- **aipfwupdate,**
- **mxt-app**.

The purpose of this list is to inhibit the Monitor Inventory driver from accessing the monitor while any one of these programs is running a video or touch firmware update. The values should not need changing.

Configuring the SBLIM-SFCB server to Load DID provider

In order to be able to obtain information from the Display that is attached to the POS via USB bus, the "*sfcb*" broker service must be able to load the driver provider which by default is installed under the **/usr/lib/** directory, to let this happened the **sfcb.cfg inside the /etc/sfcb** directory must me modified to let the "sfcb" service know where to load the Display Driver Provider.

Below you can find an example of the file's content just for demonstration purposes:

```
##############################################################################
#
# No Authentication config file - Use for wbemcat & other simple clients
#
##############################################################################

# $Id: sfcb.cfg.pre.in,v 1.13 2008/09/12 23:51:32 mchasal Exp $
# Sample Configuration for Small Footprint CIM Broker
httpPort:      5988
enableHttp:    true
enableUds:     true
httpProcs:     8
httpsPort:     5989
###enableHttps:   true
###httpsProcs:    8
provProcs:     32
doBasicAuth:   false
doUdsAuth:     false
###basicAuthLib:   sfcBasicPAMAuthentication
useChunking:   true
keepaliveTimeout: 1
keepaliveMaxRequest: 10
###sslKeyFilePath: /etc/sfcb/file.pem
###sslCertificateFilePath: /etc/sfcb/server.pem
###sslClientTrustStore: /etc/sfcb/client.pem
###sslClientCertificate: ignore
###certificateAuthLib:   sfcCertificateAuthentication
registrationDir: /var/lib/sfcb/registration
providerDirs: /usr/lib64/sfcb /usr/lib/cmpi /usr/lib64 /usr/lib
enableInterOp:  true
```

Please add the **/usr/lib** directory to the **providerDirs** inside the sfcb.cfg file, save it and restart the sfcb broker service.

Security Policies in SLE 15 Distribution

In Linux distribution like SLE 15 the security polices are set to control the resources access by any service that is running on the system.

Display Inventory Driver provider which is loaded by the `***SFCB***` broker service needs to access the USB bus, and if the configuration inside the **/etc/selinux/config** file is set to the **enforcing** option, the display driver won't be able work due to this policy, if you face any issue regarding this, please change the **enforcing** attribute to **permissive,** as shown in the example below:

```
# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#     enforcing - SELinux security policy is enforced.
#     permissive - SELinux prints warnings instead of enforcing.
#     disabled - No SELinux policy is loaded.
SELINUX=permissive
# SELINUXTYPE= can take one of these three values:
#     targeted - Targeted processes are protected,
#     minimum - Modification of targeted policy. Only selected processes are protected.
#     mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

Chapter 4. Data Provided by Display Inventory Driver

Property	Description
BUS	Shows the bus of how the display is connected to the POSS default must be USB
Device Category	Shows the device category
Firmware Revision	Shows firmware version
Manufacturer Date	When the display was built
Manufacturer Name	Who built the display
Mechanical Revision	Mechanical revision
Physical Device Name	Device Model Name
Model name	Device model
Serial Number	Device serial number
Horizontal Screen Size	Display horizontal screen size (mm)
Vertical Screen Size	Display vertical screen size (mm)
Horizontal Resolution	Horizontal resolution px
Vertical Resolution	vertical resolution px
Refresh Rate	Display Frequency
Supported Resolution and Refresh Rate	It describes the supported resolution and refresh rates supported by the monitor
Preferred Resolution and Refresh Rate	It is the preferred resolution and refresh rate in which the monitor will perform at its best
Display Technology	Indicates the technology the display is built with: 0 – Unknown 1 – Other 2 - Passive LCD Matrix 3 – Active LCD Matrix 4 – Cholesteric LCD 5 – Field Emission 6 – Electro Luminescent 7 – GAS Plasma 8 - LED
Scan Mode	The mode of scan for the Display 0 – Unknown 1 – Other 2 – Single 3 – Dual
Supports Color	This is a Boolean value to identify if the display supports color or not.
Supported Video Sources	The Different Supported Video Sources the Display can support

Current Video Source	The current video source in which the Display is connected to the POS system
Light Source Type	This will indicate the light source type of the display 0 – Unknown 1 – Other 2 – LED 3 – Cold Cathode
Light Source Illumination Type	The type of illumination the monitor has built in.
Light Source Count	The number of light sources the display has
Recommended Brightness Level	The recommended brightness level to set the monitor to properly work
Current Brightness level	The current Brightness level the display has
Backlight state	Whether if the backlight is on or off, 1 for On and 0 for Off
Hours Powered Count	The time in hours that the display has been powered on
Current Backlight POH	The time in hours that the backlight has been powered on
Power Management Modes	The Power management modes the display supports

Chapter 5. Accessing the Display Information

In this section we discuss how to retrieve the information and how to interact with what the Display Inventory Driver provides.

Enumerating Instances

To enumerate instances directly from what the CIM broker can detect you can use a client, in this example **WBEMCLI** client is used to retrieve de data, to obtain it you need to install it first as it doesn't come in the broker packages, to do so please run the next command in a terminal.

- For RPM Packages based systems

```
$ sudo zypper install sblim-wbemcli
```

- For DEB Packages based systems

```
$ sudo apt install sblim-wbemcli
```

Once this utility is installed in the system and having configured the CIM broker as discussed in section 3, run the next command:

```
$ wbemcli ei http://localhost:5988/root/cimv2:RSS_Display
```

This command will enumerate all the instances that belongs to the `***RSS_Display***` class, depending on the attached displays the enumeration list will be bigger or smaller, also during this process, the information of each display should be retrieved and shown in the terminal.

This information is displayed having the information separated by comas, for more ease of use below you can find an example abstracted list of the information displayed by this command:

- localhost:5988/root/cimv2:RSS_Display.
- DeviceID="6149-B1T-41SDV38"
- SystemCreationClassName="ComputerSystem"
- SystemName="Toshiba POS Monitor Inventory Drivers"
- CreationClassName="RSS_Display"
- Description="Toshiba Display: 6149-B1T-41SDV38"
- Caption="Toshiba Display: 6149-B1T-41SDV38"
- CreationClassName="RSS_Display"
- SystemName="Toshiba POS Monitor Inventory Drivers"
- SystemCreationClassName="ComputerSystem"
- PowerManagementModes="On","Sleep","Off"
- CurrentBacklightPowerOnHours=116
- HoursPoweredCount=2637
- BacklightState=1
- CurrentBrightnessLevel=32
- RecommendedBrightnessLevel=220
- LightSourceCount=2
- LightSourceIlluminationType=2
- LightSourceType=2
- CurrentVideoSource="DisplayPort"
- SupportedVideoSources="VGA","DisplayPort","DisplayPort (USB-C)"
- SupportsColor=TRUE
- ScanMode=2
- DisplayTechnology=3
- PreferredResolutionAndRefreshRate="1024 x 768 @ 60Hz"
- SupportedResolutionsAndRefreshRates="720 x 400 @ 70Hz IBM VGA","640 x 480 @ 60Hz IBM VGA","640 x 480 @ 72Hz VESA","640 x 480 @ 75Hz VESA","800 x 600 @ 56Hz VESA","800 x 600 @ 60Hz VESA",…
- RefreshRate=60
- VerticalResolution=768
- HorizontalResolution=1024
- VerticalScreenSize=230
- HorizontalScreenSize=300
- SerialNumber="41SDV38"
- ModelName="B1T"
- PhysicalDeviceName="6149"
- MechanicalRevision="Uknown"
- ManufacturerName="TGC"
- ManufactureDate="2019 Week 24"

- FirmwareRevision="0305"
- DeviceCategory="Display” …

Trademark

The following are trademarks or registered trademarks of Toshiba, Inc. in the United States, or other countries, or both:

Toshiba
The Toshiba logo

The following are trademarks of Toshiba Global Commerce Solutions in the United States, or other countries, or both:

AnyPlace
SureMark
SurePoint
SurePOS
TCx® Wave
TCx® Printer

Other company, product, or service names may be trademarks or service marks of others.