Toshiba Global Commerce Solutions
Point-of-Sale Subsystem

TOSHIBA
Leading Innovation

Toshiba JavaPOS Installation Instructions for Linux_x64

Version 1.14.7

Summary of Changes

Changes resulting in document revisions will be summarized in this table in reverse chronological sequence. Revision bars (|) will highlight the text changed in new document versions.

Version	Release Date mm/dd/yyyy	Change Description
V1.0	05/11/2018	Initial release
V1.1	08/02/2018	Added installation instructions for Ubuntu
V1.2	08/06/2018	Minor updates
V1.3	10/22/2018	Updates to Appendix 6 and file version for 1.14.4
V1.4	10/31/2018	Removed unnecessary firmware update configuration.
V1.5	01/01/2018	Addition of firmware update configuration for user's reference.
V1.6	12/20/2018	Power Management instructions were included.
V1.7	02/22/2019	Update instructions for Ubuntu
V1.8	03/28/2019	Add dkms instructions to compile Kernel mode Driver
V1.9	05/17/2019	Typos and minor updates / Remove dkms instructions
V1.10	06/18/2019	Add support for System Management in Ubuntu
V1.12	07/02/2019	Fix typos and clarify SFCB configuration
V1.13	07/26/2019	Remove rpm to deb instructions
V1.14	08/06/2019	Add POS Kernel mode driver instructions for Ubuntu
V1.15	12/09/2019	Add JVM x86 instructions for Ubuntu
V1.16	04/15/2020	Add instructions for dkms in Ubuntu
V1.17	08/24/2020	Updates for 1.14.7 release.

Table of Contents

1.0 Overview 4

2.0 JavaPOS Installation 6

2.1 USB device support 6

2.2 RS232 device support 6

2.3 Installing rpm on Ubuntu or similar Linux distribution 6

2.4 RS485, Embedded and PS2 keyboard device support 7

2.5 Reboot 10

3.0 Device Configuration and Device Demo 11

4.0 Configuration for non-root users 13

4.1 USB device access 13

4.2 Serial port access 13

5.0 Debugging 14

5.1 Using TraceConfigTool GUI 14

5.2 Manual Method 14

6.0 Appendix – Installation Instructions for Ubuntu 15

6.1 Installing tools to facilitate the installation and compilation of drivers. 15

6.2 Installation of deb file 15

6.3 Uninstallation of deb files 15

6.4 Compiling Toshiba POS Kernel Mode Drivers 15

6.5 Uninstall kernel mode drivers 17

6.6 System Management 17

6.7 Using x86 JVM in Ubuntu 19

1.0 Overview

This document provides Installation Instructions for Toshiba JavaPOS 1.14.7 on 64-bit Linux distributions. The 64-bit JavaPOS release is distributed on demand by approval. For more details, please refer to Toshiba UPOS User's Guide located under /opt/tgcs/javapos/config directory.

Restrictions and Limitations:
The JavaPOS drivers do not distribute any JVM. The end user can use 64-bit OpenJDK 8 available on Linux distribution. .

Dependencies

Component	Description
JVM (64-bit)	Install 64-bit OpenJDK 8 available on Linux distribution. The JavaPOS drivers are tested with 64-bit OpenJDK 8.
RxTx (64-bit)	This component is required to support RS232 devices on JavaPOS drivers. Refer to RxTx Libraries section 2.2.
Configuration	Refer to Configuration for non-root user section 4.0

Release Contents:

The Toshiba JavaPOS release package includes the files described in the table below.

JavaPOS Drivers	toshiba-javapos-<version>.x86_64.rpm toshibaposs-gcc48-<version>.x86_64.rpm
JavaxUSB Drivers	javax-usb-1.0.2-1.x86_64.rpm javax-usb-ri-1.0.1-2.x86_64.rpm javax-usb-ri-linux-1.0.3-2.x86_64.rpm These rpms provide support for USB devices.
RS232 Device support	rxtx-2.2-pre2.03.x86_64.rpm Install this rpm if support for RS232 devices are required.
Kernel Mode Drivers	toshibaposs-kernel-<version>.x86_64.rpm located under /poss_kernel_drivers_other_linux folder This rpm contains source code for Toshiba kernel mode drivers. The drivers must be built and installed on selected Linux distribution. For details, refer to “POS Kernel Mode Drivers” section

2.0 JavaPOS Installation

The instructions in this section assume the following:

- The user has root privileges

2.1 USB device support

Install the following rpms for **USB** device support.

- toshiba-javapos-<version>.x86_64.rpm (core rpm required for all device support)
- toshibaposs-gcc48-<version>.x86_64.rpm (core rpm required for all device support)
- javax-usb-1.0.2-1.x86_64.rpm
- javax-usb-ri-1.0.2-1.x86_64.rpm
- javax-usb-ri-linux-1.0.3-2.x86_64.rpm

2.2 RS232 device support

In addition to rpms installed in section 2.1, install the following rpm for RS232 device support. For additional details, refer to readme.txt located at /opt/tgcs/javapos/rxtx, specifically the Programming Notes section.

- rxtx-2.2-pre2.03.x86_64.rpm

2.3 Installing rpm on Ubuntu or similar Linux distribution

If Linux distribution supports deb package format, then all rpms described in sections 2.1 and 2.2 must be converted to deb. For convenience, few steps are described below, and refer to the man pages for more details.

All commands must be run with root privilege

sudo -i

Download pre-requisite tools:

apt install openjdk-8-jre

Install deb package

To install deb files created above. To install individual deb file, specify the full deb file name.

- apt install./*.deb

Uninstall deb package

To uninstall deb package run the follow.

- apt purge <package name>

i.e.

- apt purge toshiba-javapos

2.4 RS485, Embedded and PS2 keyboard device support

In addition to rpms installed in section 2.1, you must also build kernel drivers and install them. The instructions are provided in the following section.

POS kernel mode drivers

You may skip this section, if you don't need support for RS485 devices, PS/2 attached POS Keyboard

The JavaPOS drivers require kernel mode drivers to support system attached Keyboard, RS485 Devices and Cash Drawer attached to the system. The kernel mode driver source rpm in included in the release package. The kernel drivers must be built and installed on the system.

SUSE SLE 12 (64-bit):

For SLE12, SUSE builds the kernel mode drivers and publish them on their support site for download at the link below.
link => https://drivers.suse.com/Toshiba/tgcs/pos/sle12sp2/x86_64/1.0/

rpm name: toshiba-poss-suse12-kmp-default-11.3.0_k4.4.21_69-17.1.x86_64.rpm

Ubuntu (64-bit):

For Ubuntu, after installing the toshibaposs-kernel-<version>.amd64.deb file, perform the following steps:

1. Change to the /usr/src/kernel-modules/toshiba/dkms directory
2. Run the command ./install_toshiba_driver.sh

Other Linux Distributions:

The kernel mode driver must be built as described in the instructions below. To build kernel mode drivers, you must install required development tools, gcc compiler, and kernel source.

Extract source rpm:

To do this, cd into "poss_kernel_drivers_other_linux" folder and install the following rpm.

toshibaposs-kernel-<version>.x86_64.rpm

If needed, convert rpm to deb package format and install deb file as described in section 2.3

The rpm will extract kernel mode driver source into 2 directories.

/usr/src/<kernel-version>kernel-modules/toshiba/dcs

/usr/src/<kernel-version>kernel-modules/toshiba/kbd

Note: On Ubuntu, path will be /usr/src/kernel-modules/toshiba/*

Build and Install Kernel Mode Drivers:

Build and install drivers in the dcs directory:

```
cd /usr/src/<kernel-version>/kernel-modules/toshiba/dcs
make          (to compile drivers)
make install (to install drivers)
```

depmod –ae (this must be done to satisfy module dependency in modules.def file)

Build and install drivers in the kbd directory:

cd /usr/src/<kernel-version>/kernel-modules/toshiba/kbd
make (to compile drivers)
make install (to install drivers)
depmod –ae (this must be done to satisfy module dependency in modules.def file)

The Toshiba kernel mode drivers will be installed at the following location.
/lib/modules/<kernel-version>/kernel/drivers/char/dcs

/lib/modules/<kernel-version>/kernel/drivers/input/keyboard

Driver Details:

Name	Description
aipdcs3.ko	Core driver for RS485 devices, like Cash Drawer, NVRAM, Printer, Display
aipbcd.ko	Cash Drawer driver for SP300
aipmtn.ko	Motion Sensor driver for AnyPlace Kiosk
aipikbps.ko	PS/2 keyboard driver for POS Keyboard
aipsocdkl.ko	SurePOS 100/SureOne: Cash Drawer and Keylock driver
aipsops.ko	SurePOS 100/SureOne: Keyboard driver

2.5 Reboot

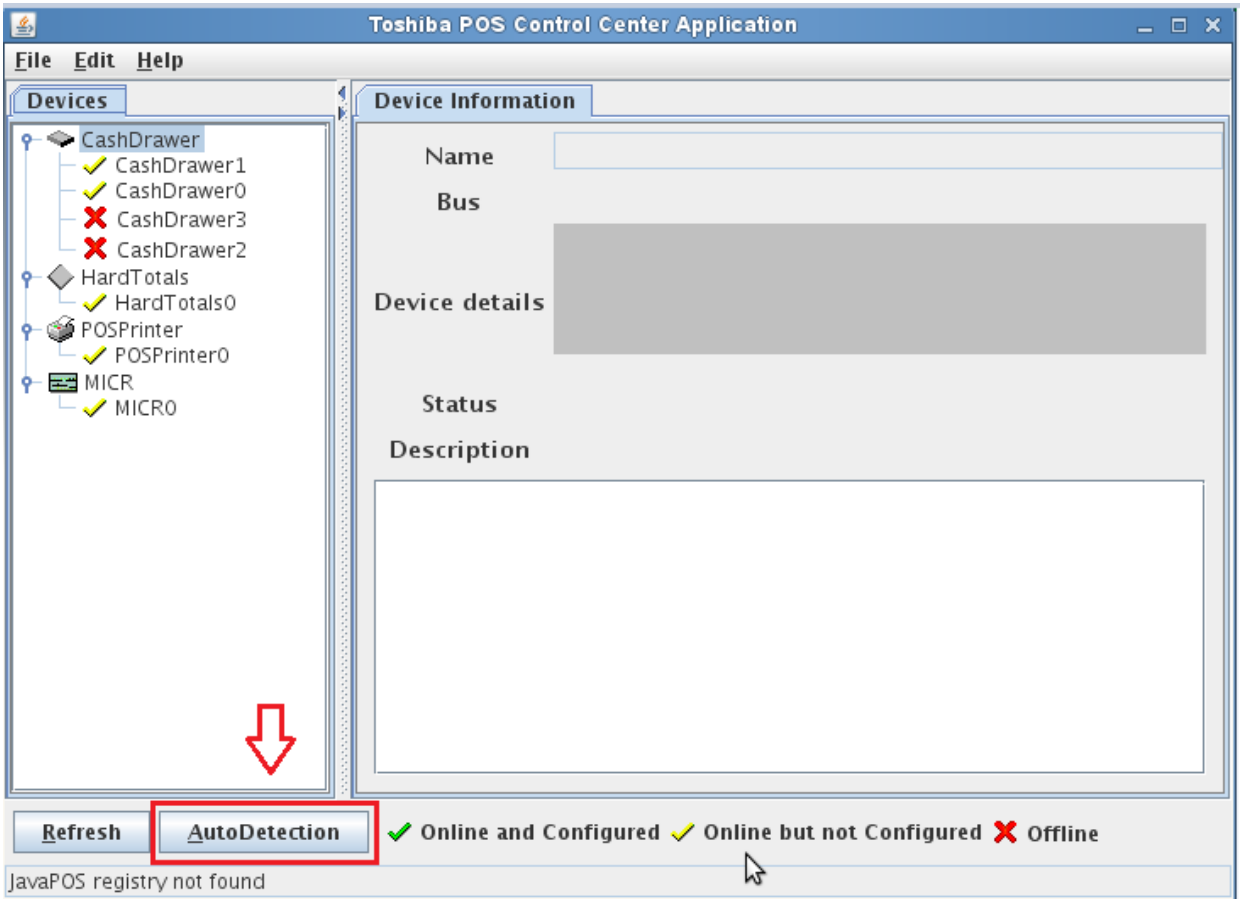
Reboot the system. Once the system is rebooted, you should be able to configure the devices through JavaPOS POS Control Center described in the next section.

3.0 Device Configuration and Device Demo

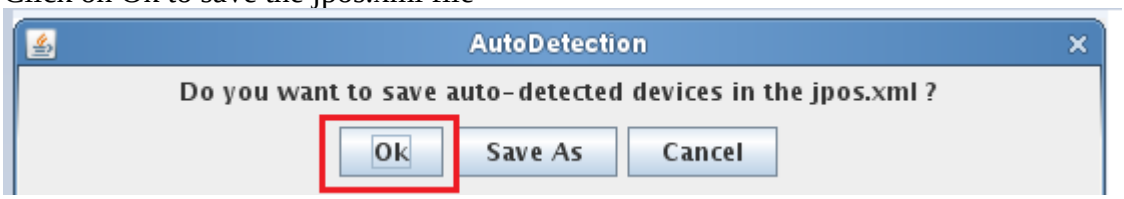
You can configure the devices and test them using POSControlCenter Utility. Below are step by step instructions.

1. Open a console
2. Enter **POSControlCenter**

   Click on AutoDetection – The POS Control Center will automatically detect USB/RS485 connected device automatically.



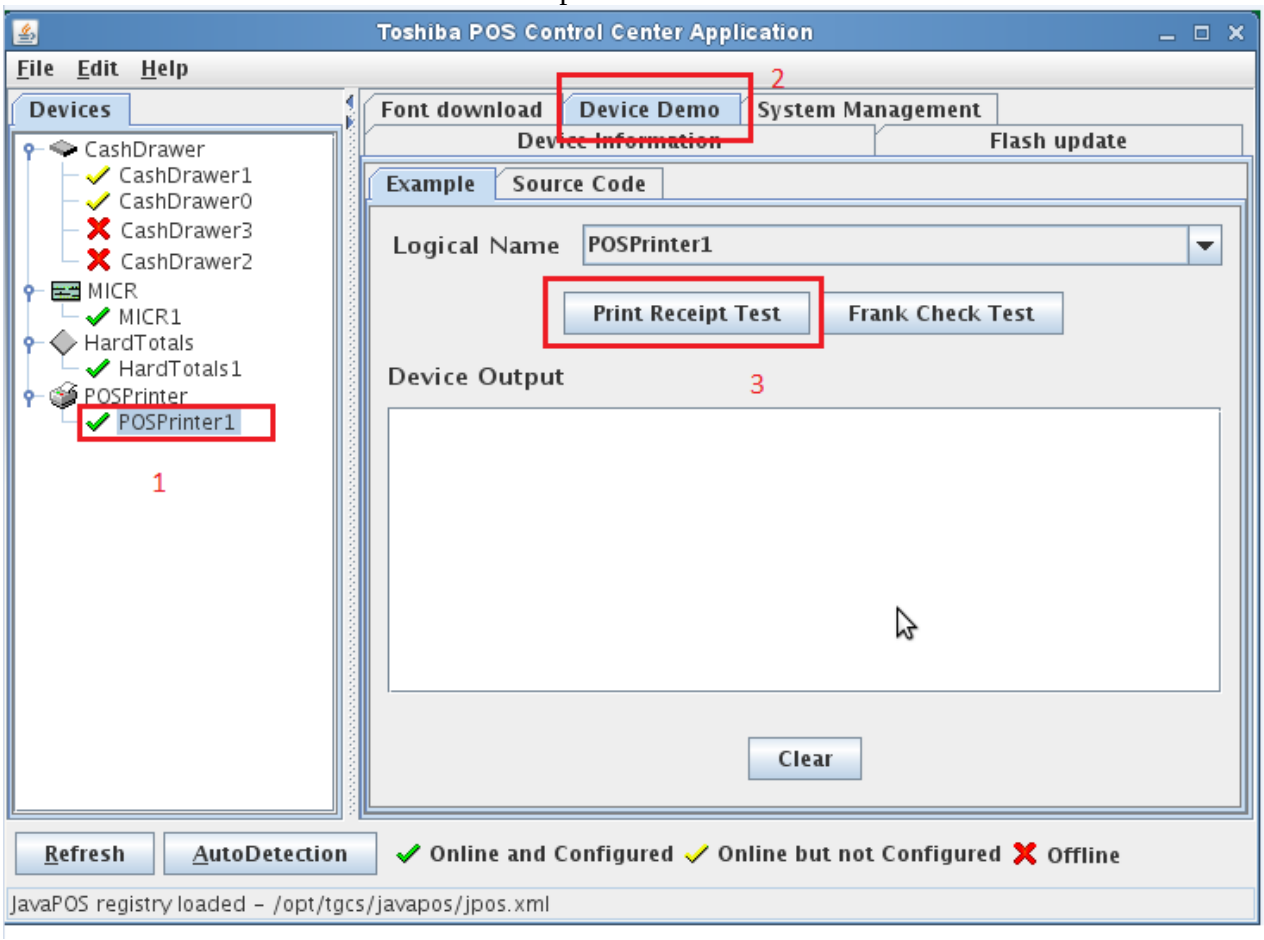
Click on Ok to save the jpos.xml file



Once devices are configured, they will be highlighted with green check mark indicating that the devices are online. At this point, you can also test the device to ensure that they are functioning correctly. The POS Control Center will perform simple device exercise.

Below is an example to exercise the attached USB POS Printer.

- Select the device on left pane
- Select Device Demo tab on right pane
- Click on Print Receipt Test



4.0 Configuration for non-root users

4.1 USB device access

The operating system does not, by default, provide users with access to USB devices. The JavaPOS RPM automatically enables USB device user access on your system for members belonging to users group.

Make sure the user is added to the group “users”

- # usermod -a -G users <username>

4.2 Serial port access

RxTx implementation uses lock files to deal with the concurrency of the serial port communication and requires write access to the following location:

- /var/lock

On CentOS 7, perform following steps with root privileges:

- # usermod -a -G lock <username>
- # chown root:lock /var/lock
- # chmod g+rw /var/lock

On SLE 12, perform following steps with root privileges:

- # usermod -a -G lock <username>
- log out
- log in

5.0 Debugging

Refer to Chapter 4 Problem Determination of Toshiba UnifiedPOS User's Guide for enabling tracing.

For a quick reference, you can use one of the 2 methods described below.

5.1 Using TraceConfigTool GUI

From a console, enter TraceConfigTool. A graphical Windows will be displayed.

5.2 Manual Method

If TrceConfigTool is not installed through toshibaposs-xxx.rpm, then you can use manual method. The JavaPOS tracing can also be enabled and disabled by modifying few properties in jutil.properties file. By default, JavaPOS tracing is disabled in this configuration file.

Edit /opt/tgcs/javapos/etc/jutil.properties, and make the changes, as shown below.

Enable JavaPOS Tracing:

1. Uncomment or delete comment char '#' for the line, as shown below
   com.ibm.jutil.tracing.TurnOnAllNamedTrace = ON
2. Replace 'AipTraced' with 'File, for the property as shown below
   com.ibm.jutil.TracerOutputTo = File
3. Change location of Output Trace File location, as shown below
   Com.ibm.jutil.tracing.TracerOutputFileName = /var/log

Output Trace file:
The output JavaPOS log file will be located in /var/log/tgcsjavapostraceX.txt where X can be 1-N.

Disable JavaPOS Tracing:

1. Replace 'ON' with 'OFF' for the line, as shown below.
   com.ibm.jutil.tracing.TurnOnAllNamedTrace = OFF

6.0 Appendix – Installation Instructions for Ubuntu

Described below are cookbook instructions to install Toshiba JavaPOS drivers on Ubuntu.

All commands must be run with root privileges

sudo -i

Pre-requisites

- linux kernel source
- development tool 'dpkg-dev'
- java packages openjdk 8

How to include Linux kernel source in Ubuntu

Software & Updates Setup

1. Network need to be connected
2. Download Server need to be setup under System Setting option 'Software & updates'
3. System Setting option 'Software & updates'->ubuntu software-> Option source code 'Enabled'

6.1 Installing tools to facilitate the installation and compilation of drivers.

apt install openjdk-8-jre

6.2 Installation of deb file

apt install ./toshibaposs-gcc48_<version>_amd64.deb
apt install ./toshiba-javapos_<version>_amd64.deb
apt install ./javax-usb_1.0.2-2_amd64.deb
apt install ./javax-usb-ri_1.0.2-2_amd64.deb
apt install ./javax-usb-ri-linux_1.0.3-3_amd64.deb
apt install ./rxtx-2.2-1_amd64.deb

6.3 Uninstallation of deb files

apt purge toshiba-javapos
apt purge javax-usb
apt purge javax-usb-ri
apt purge javax-usb-ri-linux
apt purge rxtx

6.4 Compiling Toshiba POS Kernel Mode Drivers

For more details, please refer to section 2.4.

Installing Linux Kernel sources and tools to compile

apt-get install linux-source -y

apt-get install gdebi-core
apt-get install make
apt-get install make-guile
apt install dkms

Install kernel mode driver rpm:

gdebi toshibaposs-kernel_<version>_amd64.deb

Build and install kernel mode driver after installing the rpm.

The rpm will extract kernel mode driver source into 3 directories.

- /usr/src/kernel-modules/toshiba/dcs
- /usr/src/kernel-modules/toshiba/kbd
- /usr/src/kernel-modules/toshiba/dkms

Run the following command in the directory of the driver source

- cd /usr/src/kernel-modules/toshiba/dcs
- make (to compile drivers)
- make install (to install drivers)
- depmod –ae (this must be done to satisfy module dependency in modules.def file)

- cd /usr/src/kernel-modules/toshiba/kbd
- make (to compile drivers)
- make install (to install drivers)
- depmod –ae (this must be done to satisfy module dependency in modules.def file)

- cd /usr/src/kernel-modules/toshiba/dkms
- ./install_toshiba_driver.sh

The Toshiba kernel mode drivers will be installed at the following location.

- /lib/modules/<kernel-version>/kernel/drivers/char/dcs
- /lib/modules/<kernel-version>/kernel/drivers/input/keyboard

Driver Details:

Name	Description
aipdcs3.ko	Core driver for RS485 devices, like Cash Drawer, NVRAM, Printer, Display
aipbcd.ko	Cash Drawer driver for SP300
aipmtn.ko	Motion Sensor driver for AnyPlace Kiosk
aipikbps.ko	PS/2 keyboard driver for POS Key-board

aipsocdkl.ko	SurePOS 100/SureOne: Cash Drawer and Keylock driver
aipsops.ko	SurePOS 100/SureOne: Keyboard driver

Add 'aipstart' service to auto start

Configuring auto-start services in Ubuntu is slightly different. Let's say script name is 'aipstart'

- Login to Ubuntu with root
  - Sudo -i
- 'aipstart' already in /etc/init.d/ folder
- Execute the below command
  - update-rc.d aipstart defaults

To view connected RS485/RS232 online even with default login – regular user <user>.
Add beller to users group

- sudo -i
- usermod -a -G users <user>

Reboot the system to ensure services are started.

6.5 Uninstall kernel mode drivers

- cd /usr/src/kernel-modules/toshiba/dkms
- ./uninstall_toshiba_driver.sh
- apt purge toshibaposs-kernel

6.6 System Management

Installation

Install

apt install ./posibm_xml4c_5.7.1-1_all.deb
apt-get install sblim-wbemcli
apt-get install sfcb
apt install ./toshiba-upos-sblim-cmpi-upos-server-sled_<version>_amd64.deb

Download and configure Xerces

- Download from http://archive.apache.org/dist/xerces/c/2/binaries/ the following file:

- xerces-c_2_8_0-x86_64-linux-gcc_3_4.tar.gz

- Uncompress and extract the contents of the file

- Copy the file “libxerces-c.so.28.0” and paste it in /usr/lib with the name: ibxerces-c.so.28
  - cp xerces-c_2_8_0-x86_64-linux-gcc_3_4/lib/libxerces-c.so.28.0 /usr/lib/libxerces-c.so.28

Configure SFCB

Edit /etc/sfcb/sfcb.cfg to allow http communication and authentication.
https lines must be commented (use: #) as follow:

```
httpPort:          5988
enableHttp:      true
httpProcs:        8
#httpsPort:       5989
#enableHttps:   true
#httpsProcs:     8
doBasicAuth:    false
```

Start SFCB server

/usr/sbin/sfcbd -d

You can validate the status of the SFCB server as follow

systemctl status sfcb

Validating System Management

To view the systems management properties for a device, the device must be opened and claimed. Example to open/claim/enable a device in JavaPOS:

Start POS Control Center utility:

- Open a terminal window.
- Open POSControlCenter
- To configure devices, click on AutoDetect and save jpos.xml to default location.
- Select a device that is online, and click on “System Management” tab
- Click on “Start Statistics Test”. This will display the system management properties of the device, and it will also keep the device in open/claim/enable state.
- Get System Management properties for a given device by issuing the wbemcli command, for example for POSPrinter device:
  - wbemcli ei http://localhost:5988/root/cimv2:UPOS_POSPrinter

6.7 Using x86 JVM in Ubuntu

This section provides installation instructions for Toshiba JavaPOS on 64-bit Linux distributions, using a 32-bit Java Virtual Machine.

Install and configure x86 JVM

```
#dpkg --add-architecture i386
#apt-get update
#apt-get install openjdk-8-jre:i386
#update-alternatives --config java
#java -version
```

Convert rpm to tgz and then to deb

```
#alien --keep-version --to-tgz --scripts toshiba-javapos-1.14.6-<level>.i386.rpm
#alien --keep-version --to-tgz --scripts toshiba-javapos_libs-32bits-1.14.6-<level>.i386.rpm
#alien --keep-version --to-tgz --scripts toshibaposs-gcc43-11.5.0-<level>.i386.rpm

#alien --keep-version --to-deb --scripts toshiba-javapos-1.14.6.tgz
#alien --keep-version --to-deb --scripts toshiba-javapos_libs-32bits-1.14.6.tgz
#alien --keep-version --to-deb --scripts toshibaposs-gcc43-11.5.0.tgz
```

Installation of deb files

```
#apt install ./toshiba-javapos_1.14.6-1_all.deb
#apt install ./toshiba-javapos_libs-32bits_1.14.6-1_all.deb
#apt install ./toshibaposs-gcc43_11.5.0-1._all.deb
```