IBM JavaPOS For Linux v1.12.1 Installation Instructions (2.6.27 Kernel)

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	Approval Date	Change Description
V 1.12.0	05/08/09	Initial version
V1.12.1	09/02/09	Updated for 1.12.1 release

Table of Contents

1.0   Overview

1.1   Introduction

This document provides installation instructions for the IBM JavaPOS on Linux distributions. The IBM JavaPOS is tested and supported on supported on SUSE Linux Enterprise Family – SLED 11, SLES 11 and SLEPOS 11. Therefore, the instructions provided in this document are based upon the SUSE Linux file structure. The IBM JavaPOS installation can be easily adapted to other Linux distributions.
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If support for other Linux Distributions is desired, please contact IBM representative or visit IBM support site at:

http://www.ibm.com/solutions/retail/store/support/

and submit a **TechLine** question under "Ask a Retail Question".

1.2   Resources for SUSE Linux Enterprise (SLE) OS

The table below provides the resources for setting up SUSE Linux Enterprise family. Please note that you must install the IBM POS kernel mode drivers. They are required for IBM JavaPOS support.

Name	Description or Resource Link
Kernel version of SLED 11, SLES 11 and SLEPOS 11 tested and supported by IBM JavaPOS.	2.6.27.19-5-default
IBM POS Kernel Mode Drivers required for JavaPOS support.	http://forgeftp.novell.com/driver-process/staging/pub/update/ibm/sle11/slepos/i586/ You only need to install the following rpm that contains IBM POS kernel mode drivers required by JavaPOS. **ibm-poss-suse11-kmp-default-5.0.0_2.6.27.19_5-40.i586.rpm**
SLEPOS 11 Quick Installation Guide	**http://www-01.ibm.com/support/docview.wss?rs=220&uid=pos1R1004407**
IBM POS Linux Configuration Guide	http://www2.clearlake.ibm.com/store/support/html/pubs.html#SLED • Describes IBM POS Systems supported on SLE 11 • Provides installation and configuration information
SLEPOS 11 Tools and Utilities	**http://www-01.ibm.com/support/docview.wss?rs=220&uid=pos1R1004421**
IBM Systems Management for POS peripherals.	Refer to the document included in this package. **IBM UnifiedPOS Management Services v1.12.1.pdf**
IBM UnifiedPOS Programming Reference, Keyboards, and Code pages	http://www.ibm.com/solutions/retail/store/support/ click on Publications, click on IBM UPOS (JavaPOS/OPOS) Publication under IBM Store Systems Hardware Publications

2.0   Installation Package Contents

The following main installation package can be downloaded from http://www.ibm.com/solutions/retail/store/support/:

The following a list of rpms that are necessary to install IBM JavaPOS product

- **JavaPOS**
    - o   ibm-javapos-<version>-<build>.i386.rpm
    - o   ibmposs -gcc43<version>-<build>.i386.rpm
- **IBM JVM**
    - o   ibm-java2-i386-jre-5.0-10.0.i386.rpm
    - o   ibm-java2-i386-javacomm-5.0-10.0.i386.rpm
- **JavaxUsb**
    - o   javax-usb-1.0.2-1.i386.rpm
    - o   javax-usb-ri-1.0.2-1.i386.rpm
    - o   javax-usb-ri-linux-1.0.2-1.i386.rpm
- **Systems Management for POS Peripherals**
    - o   posIBM_sblim-cmpi-upos-server-sled-1.12-1.1.0.i586.rpm
    - o   posIBM_XML4C-5.7.1-1.i586.rpm
    - o   IBM UnifiedPOS Management Services v1121.pdf
- IBM JavaPOS for Linux v1.12.1 Installation Instructions.htm or pdf (this document)
- **IBM POS kernel mode driver source for other linux distributions**
    - o   pos_kernel_drivers_other_linux / ibmposs-kernel-5.1.0-25.i386.rpm

2.1   SLED/SLES Package dependencies

During the SLE Operating System Installation, you must select the following rpm which will install necessary libraries required to support IBM JVM 5.

From Development C/C++ compiler and tools , select and install "libstdc++.so.5" library from "libstdc++33" rpm

2.2   IBM JavaPOS Supported Environment on SLE 11

Component	Version
Kernel Version	2.6.27.19-5-default available on SLE 11
IBM JVM	1.5 - SR10
System Management of IBM POS Peripherals	SFCB (Small Foot Print CIM Broker) Version 1.3.3 available from Novell
POS Systems supported / Configuration	Refer to IBM POS Linux Configuration Guide at http://www2.clearlake.ibm.com/store/support/html/pubs.html#SLED

3.0   JavaPOS Installation

The instructions in this document assume the following:

- User has root privileges
- % represents console command prompt
- The comments are indicated by #.

The JavaPOS driver installation includes several components as described below, and they must be installed separately. You must be root to install the files and perform many of the steps described in this document.

3.1   JavaPOS Components

The JavaPOS rpms are required to support IBM JavaPOS and RS485 devices.

To Install:
```
% rpm -ivh ibmposs-gcc43<version>-<build>.i386.rpm
% rpm  -ivh ibm-javapos-<version>-<build level>.i386.rpm
```

To uninstall:
```
% rpm -e ibmposs-gcc43
% rpm -e ibm-javapos
```

3.2   javax.usb Components

The javax.usb rpms are required to support IBM USB peripheral devices.

To Install:
```
% rpm -ivh javax-usb-<version>.i386.rpm
% rpm -ivh javax-usb-ri-<version>.i386.rpm
% rpm -ivh javax-usb-ri-linux<version>.i386.rpm
```

To uninstall:
```
% rpm -e javax-usb
% rpm -e javax-usb-ri
% rpm -e javax-usb-ri-linux
```

3.3 IBM JVM

The JVM component includes two rpms – one for JVM and the other for Java COMM support. Install both JVM rpms:

To Install:

      % rpm -ivh ibm-java2-i386-jre-5.0-10.0.i386.rpm

      % rpm –ivh ibm-java2-i386-javacomm-5.0-10.0.i386.rpm

To uninstall:

      % rpm -e ibm-java2-i386-jre-5.0-10.0

      % rpm -e ibm-java2-i386-javacomm-5.0-10

Setup path and symbolic links:

If Operating System provides a default JVM or you have previously installed another JVM, then symbolic links and the paths must be set manually to point to IBM JVM.

- Remove old java symbolic links and re-link them to IBM JVM.
    - rm /usr/bin/java
    - ln - s /opt/ibm/java2-i386-50/jre/bin /usr/bin/java

- Setup path., as necessary. This can be added to your .profile
    - export PATH=/opt/ ibm/java2-i386-50/jre/bin:$PATH$

- Check IBM JVM version. The output should be something like below. If not, check symbolic links or paths.

```
java -version

java version "1.5.0"
Java(TM) 2 Runtime Environment, Standard Edition (build pxi32dev-20090707 (SR10))
```

3.4 Systems Management support for IBM POS Peripherals

The IBM JavaPOS supports Systems Management capability for IBM POS peripherals. Please refer to the following documents included in this package.

- o   IBM UnifiedPOS Management Services v1121.pdf
- o   RMA Information can be found at:
    http://www-01.ibm.com/support/docview.wss?rs=219&uid=pos1R4000158

3.5   Install IBM Point of Sale (POS) Kernel Mode Drivers

The IBM JavaPOS requires several kernel mode drivers. The drivers must be installed on target systems. For SLE OS, the Novell builds IBM POS kernel mode drivers and distributes them in the form of binaries as well as source rpms. For non-SLE distributions, the IBM POS kernel mode drivers must be complied and installed on target OS. The driver source rpm is included in this package.

3.4.1   IBM POS kernel mode drivers for SLE 11 Linux

For SLE 11, the IBM POS kernel mode drivers can be obtained and installed directly from Novell's website.

- Click on

    http://forgeftp.novell.com/driver-process/staging/pub/update/ibm/sle11/slepos/i586/

- Download the rpm:

    ibm-poss-suse11-kmp-default-5.0.0_2.6.27.19_5-40.i586.rpm

- Install the rpm

    rpm - ivh ibm-poss-suse11-kmp-default-5.0.0_2.6.27.19_5-40.i586.rpm

- IBM POS kernel mode drivers location.

    /lib/modules/2.6.27.19-5-default/updates/IBM/pos/aipbcd.ko

    /lib/modules/2.6.27.19-5-default/updates/IBM/pos/aipdcs.ko

    /lib/modules/2.6.27.19-5-default/updates/IBM/pos/aipikbps.ko

    /lib/modules/2.6.27.19-5-default/updates/IBM/pos/aipmtn.ko

    /lib/modules/2.6.27.19-5-default/updates/IBM/pos/aipsocdkl.ko

    /lib/modules/2.6.27.19-5-default/updates/IBM/pos/aipsokbps.ko

3.4.2   IBM POS kernel mode drivers for other Linux distributions

For other Linux distributions, the IBM POS kernel mode drivers must be compiled on the specific kernel version. The process of compiling and installing IBM POS drivers is very simple.

The source code for IBM POS kernel mode driver is included in

    ibmposs-kernel-5.1.0-25.i386.rpm

This rpm is located under "pos_kernel_drivers_other-linux' directory within the JavaPOS driver package.

Install Kernel Source (pre-requisite):

To compile IBM drivers successfully, you must first install kernel source code. The kernel source should be available on install CD or from the location you obtained the kernel. If the kernel source does not exist, the IBM drivers will not compile successfully.

Extract IBM POS driver source:

% rpm -i ibmposs-kernel-<version>-<build>.i386.rpm

This will extract the driver source files into two separate directories

- /usr/src/<kernel-version>//kernel-modules/ibm/dcs/
- /usr/src/<kernel-version>//kernel-modules/ibm/kbd/

Build and Install IBM POS drivers:

Note: Before proceeding with building IBM drivers, ensure that you have installed linux kernel sources.

Build and install drivers in dcs directory:

- % cd /usr/src/<kernel-version>//kernel-modules/ibm/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 kbd directory:

- % cd /usr/src/<kernel-version>//kernel-modules/ibm/kbd
- % make   # to compile drivers
- % make install   # to install drivers.
- % depmod –ae   # This must be done to satisfy module dependency in modules.def file.

IBM driver install location:

The drivers will be installed in the following locations:

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

Driver details:

Driver Name	Description
aipdcs.ko	Core driver for RS485 devices, NVRAM, PCI Cash Drawer
aipbcd.ko	Cash Drawer driver for SP300
aipmtn.ko	Motion sensor driver for AnyPlace Kiosk
aipikbps.ko	PS/2 keyboard driver for IBM POS Keyboard
aipsocdkl.ko	SurePOS 100/SureOne: Cash Drawer and Keylock driver
aipsops.ko	SurePOS100/SureOne: keyboard driver

3.6 Serial Ports Configuration

The IBM SurePOS 300/500/700 systems require configuring additional COM ports. You can download and install the **setserial** configuration utility from the link below. This utility sets up additional COM ports correctly and remaps them starting with /dev/ttyS2 (COM2).

http://www-01.ibm.com/support/docvi ew.wss?rs=220&uid=pos1R1004421

By default, the operating system does not provide access to serial ports to users. If needed, you must provide access to the non-root users:

Manual Configuration - Add permissions to serial ports

> Run 'chmod 666 /dev/ttyS?'

Automatic Configuration using udev a rule

    a. Create a file named '`40-ibmjavapos.rules`' at '`/etc/udev/rules.d`'

    b. Add the following line to the file:

> `KERNEL=="ttyS*", MODE="0666", GROUP="users"`

    c. Restart your system

3.7 USB Device Access

To access IBM USB devices via javax.usb, you must create a rule at udev directory.

For example, to Provide access to all USB devices :

    1) Edit the "/etc/udev/rules.d/55-libsane.rules" rule file,

    2) Right after the "LABEL="libsane_rules_begin" line add:

ATTR{idVendor}=="*", ATTR{idProduct}=="*", MODE="0666", GROUP="users", ENV{libsane_matched}="yes"

3.8 PS2 Keyboard Configuration

No additional configuration is required to enable PS/2 scancodes.

Background Information:

The following information is provided for debug purpose in case of any issues with IBM PS/2 attached POS Keyboard.

/etc/ps2kbd.conf file:

The ps2kbd.conf file is installed by default in /etc directory. This file allows the JavaPOS driver to enumerate the IBM PS/2 keyboard as system attached keyboard.

Enabling raw scan codes:

To support IBM PS/2 keyboard scan codes, the raw scan codes must be enabled. By default, the raw scan codes are disabled by the OS. The JavaPOS rpm will automatically enable raw scan codes on your system.

How to know the status of atkbd.softraw?

Run the command: 'cat /sys/bus/serio/drivers/atkbd/serio0/softraw'. To get raw scan codes, the atkbd.softraw should be set to 0.

Automatic configuration updating grub:

Edit the '/boot/grub/menu.1st' and add the "atkbd.softraw=0" argument to the kernel line

For example:

```
title SUSE Linux2 enterprise Desktop 11 - 2.6.27.19-5-pae

    root (hd0,6)

    kernel /boot/vmlinuz-2.6.27.13-1-pae root=/dev/disk/by-id/ata-
WDC_WD800BB-23FRA0_WD-WCAJD1482394-part7 resume=/dev/disk/by-id/ata-
WDC_WD800BB-23FRA0_WD-WCAJD1482394-part6 splash=silent showopts vga=0x34b
atkbd.softraw=0

    initrd /boot/initrd-2.6.27.19-5-pae
```

3.9 USB System Attached POS Keyboard Configuration

For the IBM USB POS alphanumeric keyboard to function as system attached keyboard, the following configuration file must be present:

/opt/ibm/javapos/etc/usbkbd.conf

If the configuration file for the USB System Keyboard is not present, the IBM Alphanumeric USB Keyboard will be enumerated in Point of Sale mode i.e. the scan codes will not be available to the normal system keyboard mechanism.

3.10 Touch device configuration

Please refer to the following document for configuration of IBM touch devices.

http://www2.clearlake.ibm.com/store/support/html/pubs.html#SLED

4.0   Appendix A: Additional Information

4.1   The USB Alphanumeric POS Keyboard does not receive scan codes

The problem may be caused by different reasons, the most common problem is the /dev/input/event<number> does not have the right permissions, do the following steps to validate this problem

1. List the USB devices and identified the event associated to your keyboard:

    a.   Run 'cat /proc/bus/input/devices' and search for an entry of your POSKeyboard, it should be like:

    ```
    I: Bus=0003 Vendor=04b3 Product=4604 Version=0100
    N: Name="(c) Copyright IBM Corp. 2008 IBM Retail USB Alphanumeric POS Keyboard
    "
    P: Phys=usb-0000:00:1d.0-1.4/input0
    S: Sysfs=/devices/pci0000:00/0000:00:1d.0/usb4/4-1/4-1.4/4-1.4:1.0/input/input4
    U: Uniq=
    H: Handlers=kbd event0
    B: EV=120013
    B: KEY=10000 7 ff9f207a c14057ff febeffdf ffefffff ffffffff fffffffe
    B: MSC=10
    B: LED=1f
    ```

    b.   The 'event0' is associated to the POS Keyboard

2. Review the event node has the right permissions, it should have 666:

    a.   Run 'ls -la /dev/input/event?'

3. Manual Fix: Add permissions to the event node

    a.   Run 'chmod 666 /dev/input/event0'

4. Automatic fix: Add a udev rule to set the permissions when the USB keyboard is hot-plugged

    d.   Create a file named '40-ibmjavapos.rules' at '/etc/udev/rules.d'

    e.   Add the following line to the file:

    ```
    KERNEL=="event*", NAME="input/%k", MODE="0666", GROUP="users"
    ```

    f.   Restart your system

4.2   Known GUI Issues

On certain systems, for example SurePOS 300 (4810-34x), you might see GUI applications may not displayed correctly. This is due to conflicts with IBM JMV 1.5-SR9 and Desktop effects which is enabled on SLE 11 by default.

To resolve this issue, disable Desktop Effects on SLE 11 as follows:

Go to Computers → More Applications → Desktop Effects (Under Tools), and uncheck "Enable Desktop Effects"

4.3   IBM Systems and COM Port Assignments Reference

Some POS Systems by default may not map correctly the serial COM ports; use the following reference to identify your COM ports :

System : Model	COM Port Label	COM Port assignment	JavaPOS device mapping (jpos.xml)
All POS Systems			
Common	A	/dev/ttyS0	COM1
	B	/dev/ttyS1	COM2
SurePOS 700			
4800-7x3	C	/dev/ttyS4	COM5
4800-7x2	D	/dev/ttyS5	COM6
4800-7x1	C	/dev/ttyS5	COM6
	D	/dev/ttyS4	COM5
4800-7x3 (with EIA232 IO Card)	E	/dev/ttyS6	COM7
4800-7x2 (with EIA232 IO Card)	F	/dev/ttyS7	COM8
4800-7x1 (with EIA232 IO Card)	H	/dev/ttyS3	COM4
SurePOS 500			
4846-545/565	C	/dev/ttyS5	COM6
	D	/dev/ttyS3	COM4
4851-514	C	/dev/ttyS4	COM5
	D	/dev/ttyS3	COM4
4840-5x3	C	<TBD>	<TBD>
	D	/dev/ttyS5	COM6
SurePOS 300			
4810-34x (with EIA232 IO Card)	C	/dev/ttyS7	COM8
	D	/dev/ttyS4	COM5
	E	/dev/ttyS5	COM6
	F	/dev/ttyS6	COM7
4810-33x	C	/dev/ttyS6	COM7
4810-32x	D	/dev/ttyS7	COM8
	E	/dev/ttyS4	COM5
	F	/dev/ttyS5	COM6
4810-34x (with USB IO Card)	C	/dev/ttyS7	COM8
AnyPlace Kiosk			
4838-5xx/7xx/9xx 4838-5xx/7xx/9xx 4838-13x	See Common	See Common	See Common

System : Model	COM Port Label	COM Port assignment	JavaPOS device mapping (jpos.xml)
SurePOS 100			
4613-108	C	/dev/ttyS2	COM3
4613-118	D	/dev/ttyS3	COM4
	Printer	/dev/ttyS4	COM5