



# Printing and Using Peripherals With Sun Ray™ Appliances

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A Technical White Paper

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# Printing and Using Peripherals With Sun Ray™ Appliances

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## Executive Summary

With the release of Sun Ray™ server software 1.2, support for local printing and selected USB, parallel, and serial devices is enabled. This white paper contains information on printing from Sun Ray appliances as well as information about selected USB, parallel, and serial devices.

A limited number of low-end printers are supported through Solaris™ operating environment drivers. The low-end, local printing solution for Sun Ray appliances remains a low-cost PostScript™ laser printer because the majority of Solaris applications generate PostScript output for printing.

Support for legacy serial and parallel devices is achieved with third-party adapters. The Sun Ray server software 1.2 recognizes a parallel printer with an adapter as a USB printer. In the case of the serial device, such as a personal digital assistant (PDA), the adapter maps serial protocol to USB protocol. The Sun Ray server interprets USB protocol as serial protocol and directs it to the appropriate device node.

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**Note** – The printing naming conventions in the Sun Ray server software 1.2 differ from those in the Solaris 8 operating environment.

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# Device Nodes and USB Peripherals

A device directory is created on the server for each appliance on the interconnect. This directory is created in `/tmp/SUNWut/units` and is named `IEEE802.MACID` where `MACID` is the MAC address.

This directory contains `dev` and `devices` directories, analogous to the `/dev` and `/devices` directories in the Solaris operating environment. The `devices` directory contains a representation of the physical topology of the devices connected to the appliance. Directories correspond to buses and hubs, and files correspond to ports. Hub directories are named according to the port on the upstream hub into which they are attached.

Device nodes are created for each serial or printer port on an attached USB device. The device nodes are created in the `hub` directory corresponding to the hub to which they are attached, and they are named:

```
manufacturer_name, model_name@upstream_hub_port
```

If the USB device has multiple identical ports (for example, two serial ports), the name is followed by `:n` where `n` is a numerical index.

A typical device node path is as follows:

```
/tmp/SUNWut/units/IEEE802.MACID/devices/usb@1/hub@1/  
Digi_International,AccelePort_R_USB_2@3:1
```

# Definitions

TABLE 1 Definitions of Naming Conventions

| Term   | Definition  |
|--|---|
| <i>tid</i>                                       | Terminal ID   |
| <i>sid</i>                                       | Session ID  |
| <i>bus</i>                                       | Universal serial bus (USB)  |
| <i>physical topology</i>                         | <i>physical topology</i> is <i>hub@port/hub@port</i> and so on. <i>port</i> refers to the port on the parent hub into which the device or child hub is plugged.   |
| <i>printer name 1,</i><br><i>terminal name 1</i> | The printer and term name in the <code>devices</code> directory is <i>manufacturer, model@port</i> , with a colon separating numerical index in cases when the string just described is not unique in the directory. For example:<br>Inside_Out_Networks,Edgeport-4@4:1<br>Inside_Out_Networks,Edgeport-4@4:2<br>Inside_Out_Networks,Edgeport-4@4:3 |
| <i>printer name 2,</i><br><i>terminal name 2</i> | The printer and terminal name in the <code>/dev</code> directory is the manufacturer and serial number concatenated with an alphabetic index in cases when the serial number is not unique. For example:<br>Inside_Out_Networks04-01-004575a<br>Inside_Out_Networks04-01-004575b<br>Inside_Out_Networks04-01-004575c                                |

## Device Linknames

Device links are created under the `dev` directory. A link for each serial node is created in `dev/term`, and a link for each parallel node is created in `dev/printers`.

Typical device links are:

```
/tmp/SUNWut/units/IEEE802.080020cf428a/dev/term/Digi_International.2-67a  
/tmp/SUNWut/units/IEEE802.080020cf428a/dev/printers/1608b-64
```

*manufacturer\_name-serial\_number index*

where *index* is an increasing alphabetical character, starting at “a.”

If the manufacturer name is not available, use the USB vendor and product ID numbers.

## Session Link

The `/tmp/SUNWut` directory also contains a `sessions` directory. For each session that is associated with an appliance, there is a link to the `unit` directory associated with the appliance. The link names are `x_session_id`. For convenience, the `UTDEVROOT` environment variable points to this directory, allowing you to locate the `devices` and `dev` directories for the appliance on which your session is active.

### ▼ To Find the Device Name Links for Devices Attached to an Appliance

- Type the following:

---

**Note** – You must be on an appliance with a valid session and logged into the server.

---

```
# cd $UTDEVROOT/dev
```

## Device Node Ownership

All device nodes are owned by the user whose session is active on the appliance. Only that user has permission to use the attached device. If there is no user with an active session, `superuser` owns the device nodes.

## Hot Desking and Device Node Ownership

Changing the active session on an appliance changes the ownership of the device nodes to the user associated with the new session. A session change occurs whenever a user inserts a smart card into or removes one from an appliance. In a failover environment, a session can also be changed using the `utselect` or `utswitch` commands. A session change causes all devices currently open by a non-root user to be closed after 15 seconds. Any input or output to or from any affected device results in an input or output error. Any devices currently open by `superuser` are not affected by the session change.



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**Caution** – Any input or output in progress on a device node opened by a non-root user when a session is changed is cancelled after 15 seconds. For example, PDA synchronizing should be completed before changing sessions.

---

---

**Note** – If the original session is restored within 15 seconds, the ownership is not relinquished and input and output continue uninterrupted.

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## Printing to an Attached Printer

Locally attached parallel printers are supported through adapters. Starting a print queue on a printer attached to a Sun Ray appliance is identical to starting a print queue in the Solaris operating environment. To set up a printer, you need to know the name of the printer, the path to the printer, and whether or not the printer is a PostScript printer.

Solaris Ready™ printers are verified using either parallel or network interfaces. Even though serial printers can be connected using USB adaptors, some Solaris functionality or features may be unverified or unavailable with these printers.

---

**Note** – When starting a print queue, use the `units` path under `/tmp/SUNWut`. You should not use the `sessions` path or the `UTDEVROOT` variable when starting a print queue because these change with each session. You can use the link in the `dev` directory.

---

---

**Note** – The `lp` subsystem opens the device node as superuser for each print request, so print jobs are not affected by hot desking unless you are using Ghostscript.

---

Sun Ray server software 1.2 supports USB printing. USB printers are attached directly to a port on the Sun Ray appliance. Parallel printers require a USB-to-parallel adapter to attach to the printer. USB and parallel printers function in the same way, using the same type of device nodes created in the same directory.

You can add printers using the Administration Tool supported by the Solaris operating environment.

---

**Note** – Only superuser can add a printer.

---

Vendors integrate and bundle specialty printing with third-party applications. The information provided in this white paper concerning USB and parallel printing applies to specialty printing, provided those services are supported by the third-party applications.

## Printer Setup

### ▼ To Set Up a Printer

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**Note** – Only superuser can set up a printer.

---

1. **To determine the MAC address of the appliance, press the three audio option keys to the left of the moon key in the upper right corner of the keyboard.**

The alphanumeric displayed above the connection icon represents the unique part of your MAC address or your truncated MAC address.

2. **To locate the Sun Ray appliance, type:**

```
# cd /tmp/SUNWut/units/*truncated_MAC_address
# pwd
/tmp/SUNWut/units/IEEE802.MACID/
```

The path to the extended MAC address for your particular Sun Ray appliance is displayed.

3. **Locate the port for the printer by typing:**

```
# cd dev/printers
# pwd
/tmp/SUNWut/units/IEEE802.MACID/dev/printers
#ls
printername
```

4. **In the directory, locate the printer.**
5. **Start the Administration Tool by typing:**

```
# admintool &
```

6. **Go to Browse -> Printers -> Edit -> Add -> LocalPrinter.**

**7. Type in:**

**a. Printer name:** *printername*

**b. Description (optional)**

**c. Printer Port**

Choose "Other" to enter the printer port pathname, using the resulting directory from Step 4.

```
/tmp/SUNWut/units/IEEE802.MACID/dev/printers/printername
```

---

**Note** – Do not use the port name under the device directory.

---

**d. Click OK.**

**e. If you are using a PostScript printer, under Printer Type choose PostScript unless your printer is listed.**

Select the printer type according to your printer model. If no option matches, select "other"; then type your printer type or "unknown."

**f. If you are using a PostScript printer, under File Contents choose PostScript and ASCII.**

**g. Options: Default Printer (optional)**

**h. Click OK.**

---

**Note** – Do not click OK more than one time. If you do, a failure message is displayed.

---

**8. To verify that the printer has been set up correctly, type:**

```
# lpstat -d printername
```

## USB Printers

For a current list of USB printers for use with Sun Ray appliances, see the following web site:

<http://www.sun.com/sunray>

# Printers Other Than PostScript Printers

PostScript printers are the native Solaris operating environment printing solution. Printers that do not use PostScript, such as engineering plotters, are best supported by third-party software. Low-cost inkjet printers require third-party software, such as Easy Software's ESP PrintPro, available from <http://www.easysw.com>; Ghostscript, available from <http://www.ghostscript.com>; or Vividata PShop, available from <http://www.vividata.com>. Check with the vendors for pricing and precise printer models supported.

## Ghostscript

- “<Selemtext<Selempagenum
- “<Selemtext<Selempagenum
- “<Selemtext<Selempagenum

## What Ghostscript Does

Ghostscript allows the user to print a PostScript or a Adobe® Portable Document Format (PDF) document to a printer that does not use PostScript by converting PostScript and PDF input into a format which printers can understand.

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**Note** – Ghostscript does not support all printers that do not use PostScript.

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## Where to Get Ghostscript

The Software Companion CD in the Bonus Software package in the Solaris 8 operating environment release contains three packages that contain Aladdin's Ghostscript, version 5.10, to be installed on your Sun Ray appliance:

**TABLE 2** Ghostscript Packages

| Package  | Description                    |
|----------|--------------------------------|
| SFWgs    | GNU Ghostscript                |
| SFWgsfot | GNU Ghostscript Other Fonts    |
| SFWgsfst | GNU Ghostscript Standard Fonts |

These packages install Ghostscript binaries and libraries into the `/opt/sfw` directory.

If you have the Solaris 2.6 operating environment or the Solaris 7 operating environment or if your printer requires a different version of Ghostscript, you can get it from various web sites on the Internet, including:

<http://www.ghostscript.com>

These sites offer source code, which must be compiled for your system. You must then install Ghostscript on your system.

## How To Use Ghostscript

Ghostscript comes with man pages located at `/opt/sfw/man`.

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# Serial Device Support

Serial devices can be attached to Sun Ray appliances using a serial adapter. The following sections describe how to set up and synchronize a PDA on a Sun Ray appliance.

## PDA Synchronization

PDAs that use Palm OS can be synchronized to a Sun Ray appliance. Using hot desking, the user's ability to sync a PDA moves with the user when the user moves from appliance to appliance. For PDA syncing, the Solaris PDASync application is included in the Solaris 7 11/99 and Solaris 8 operating environments.

In the Solaris 8 operating environment, PDASync is compatible with Java™ 1.2 software. In the Solaris 7 operating environment, PDASync is compatible with Java 1.1 software. To run PDASync under Java 1.2 software in the Solaris 7 operating environment, the PDASync patch is required. This patch is available at the following website:

<http://www.sun.com/software/solaris/pdasync/index.html>

In addition to PDASync, PilotManager, which is shareware, is another syncing option; however, it is not a supported option. PilotManager is available from the following web site:

<http://www.moshpit.org/pilotmgr>

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**Note** – Solaris PDASync and PilotManager operations are incompatible.

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## PDASync Application on Sun Ray™ Appliances

PDASync requires Java Communications API 2.0.2 or later version to run on the Sun Ray appliance. Java Communications API 2.0.2 is provided in the Sun Ray Server Software 1.2 CD's Supplemental directory.

Certain components of the Java Communications API 2.0.2 package must be installed in specific directories for PDASync to run:

### ▼ To Set Up the PDASync Application on a Sun Ray Appliance

1. **Log in as superuser.**
2. **Insert the Sun Ray Server Software 1.2 CD-ROM.**
3. **Copy the `comm.tar.Z` file from the Supplemental directory on the CD into a directory you created on your system by typing:**

```
# cp /cdrom/cdrom0/Supplemental/comm.tar.Z /tmp
```

4. **Change to the directory you created on your system by typing:**

```
# cd /tmp
```

5. **Uncompress the `comm.tar.Z` file located in the Supplemental top-level directory on the Sun Ray Server Software 1.2 CD.**

```
# uncompress comm.tar.Z  
# tar -xvf comm.tar
```

6. **To change directories to the `commapi` directory, type:**

```
# cd commapi
```

7. **Copy the `comm.jar` file by typing:**

```
# cp comm.jar /usr/dt/appconfig/sdtpdasync/classes
```

8. Copy `libSolarisSerialParallel.so` by typing:

```
# cp libSolarisSerialParallel.so /usr/dt/appconfig/sdtpdasync/lib
```

9. Run the PDASync application by going to Application Manager -> Desktop\_Apps->PDASync or typing:

```
# /usr/dt/bin/sdtpdasync
```

## PilotManager Application on Sun Ray Appliances

PilotManager cannot access the Sun Ray appliance serial adapter because the serial adapter's path name is too long. A simple, shorter linkname is required.

### ▼ To Synchronize a PDA Using PilotManager

1. Plug in a verified USB-to-serial adapter.

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**Note** – If there is more than one serial port on the serial adapter, you must decide which port to use for your PDA connection.

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2. Determine the path name to the serial port on the serial adapter.

For example, the following path name refers to the Digi International 4 Port Serial Adapter's port a.

```
/tmp/SUNWut/units/IEEE802.MACID/dev/term/Digi_International.4-66a
```

3. Make a link from this path name to a unique identifier either in a temporary directory or in your home directory; for example, `/tmp/george-digi` or `/home/user_name/george-digi`, by typing:

```
# ln -s /tmp/SUNWut/units/IEEE802.MACID/dev/term/Digi_International.4-66a \  
/home/user_name/unique_identifier
```

Use this link as your serial device in PilotManager.

4. Sync your PDA.

In PilotManager, configure the PDA port according to the link you created above; then sync your PDA.

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**Note** – If the user hot desks, this link must be changed to link the new Sun Ray appliance's serial adapter.

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## Peripherals

With Sun Ray enterprise server software 1.0 and 1.1, the use of a mouse, keyboard, and trackball were supported. This support continues with the release of Sun Ray server software 1.2

## Adapters

A list of verified adapters, serial and parallel, is available by following the links on the Sun Ray appliance third-party peripherals web site:

<http://www.sun.com/sunray>

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## Further Information

Further information may be found on the website:

<http://www.sun.com/sunray>





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