Printing in AIX 4.1

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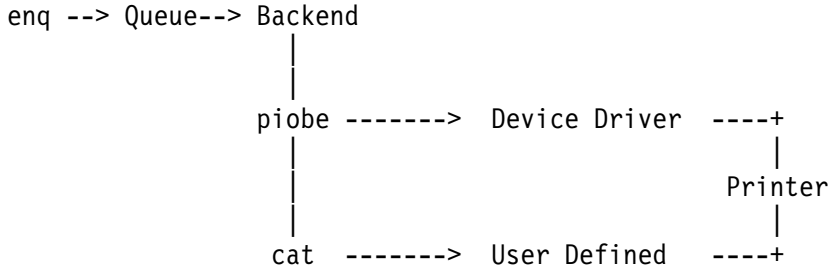
About This Document

This document provides an overview of printing in AIX 4.1, and contains the following sections:

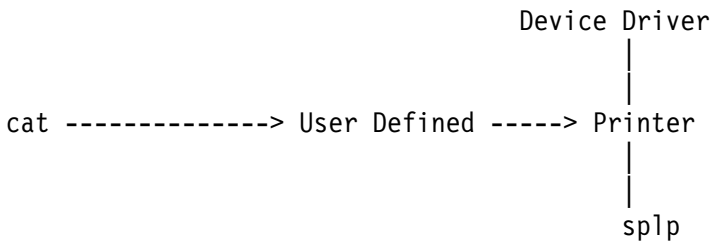
- How It Works
- Terminology
- Commands
- qdeamon
- Suggested Reading

How it Works

The printing command places the file, plus any print flags, onto the Queue. When the printer is ready, the qdaemon passes the file and flags to the printer backend which formats the output for the specific printer. The data is then passed to the Printer Device driver which communicates with the actual device and prints the file (see figure below).



It is also possible to bypass the Queue and backend by redirecting the file to the device (e.g., with the "cat" command).



Printer Terminology

- Printer/Plotter Device

  This is the special file in the /dev/ directory for the device. It can only be used by redirection (e.g. cat filename > /dev/lp0) and may be manipulated with "splp". Printer commands will not be able to access a "Printer Device" unless a "Print Queue" has been created or a change made to the printer backend in /etc/qconfig.

- Print Queue

  The Print Queue is really a combination of a specific Queue and Queue Device in the "/etc/qconfig". Also, depending on the backend that you select when adding the queue, the associated files will determine the function of that queue. Here is a list in smit of the possible choices for a Print Queue backend. (Note: You may or may not have all of these options, depending on what you've installed)

```
Add a Print Queue
Move cursor to desired item and press Enter. Use arrow
keys to scroll.
# ATTACHMENT TYPE      DESCRIPTION
  local                Printer Attached to Local Host
  remote               Printer Attached to Remote Host
  xstation             Printer Attached to Xstation
  ascii                Printer Attached to ASCII Terminal
  hpJetDirect          Network Printer (HP JetDirect)
  file                 File (in /dev directory)
  other                User Defined Backend

F1=Help                F2=Refresh             F3=Cancel
F8=Image               F10=Exit               Enter=Do
/=Find                 n=Find Next
```

  The Print Queue, when added through smit, will automatically create the Queue, Queue Device, and any control files needed.

  To create a Queue and Queue Device for a printer that will use the standard piobe backend, choose local.

  To add a second Queue Device to an existing Queue, to allow load sharing, select "Add an Additional Printer to an Existing Print Queue".

- Queue

The Queue is where the user directs a print job. It is a stanza in the "/etc/qconfig" file whose name is the name of the Queue and which points to the associated Queue Device.

```
lp0:
device = lp0
```

- Queue Device

  The Queue Device is the stanza in the "/etc/qconfig" file that normally follows the local Queue stanza. It specifies the actual "/dev/" file (Printer Device) to which printing should be done and the "backend" that should be used.

  ```
  lp0:
  file = /dev/lp0
  header = never
  trailer = never
  access = both
  backend = /usr/lpd/piobe
  ```

  There may be more than one Queue Device associated with a single Queue. The Print Queue can handle this as it associated itself with a "Queue:Queue Device" pair.

  Note: With a remote printer, there will be no file entry in the Queue Device stanza in the "/etc/qconfig" file, as the Queue directs the file to the server.

The Printing Commands

There are now four commands which use the piobe that can be used to print the files. The four commands are "enq", "lp", "lpr", and "qprt". These commands bypass some of the splp settings, since they use the settings that are contained in the local Print Queue. Local Print Queue settings can be configured using smit, under the Programming tools menu.

The commands lp, lpr, and qprt are actually just a front end to the enq command. Therefore the first thing that happens to a printed file is that it is passed to the enq program. The enq program simply places the information about the file, along with the flags, in the Queue for the qdaemon to use. The Queue is actually the "/var/spool/lpd/qdir" directory.

If the job is not a file (e.g., pipe output of a command to enq) then a real file is created in "/var/spool/qdaemon" which contains the data to be printed. The information in the "/var/spool/lpd/qdir" file then points to the file in "/var/spool/qdaemon".

The qdaemon Program

The qdaemon is a process that runs in the background. It is generally started with the "startsrc" command when the system is powered on. startsrc is a command to the "srcmstr" daemon which is started from "/etc/inittab".

The qdaemon keeps track of the print requests in the "/var/spool/lpd/qdir" directory and ensures that the jobs are sent to the proper printer at the proper time. It also keeps track of the status of the printers and stores printer usage data for system accounting purposes (e.g., lpstat, enq -a commands). This information is held in the "/var/spool/lpd/stat" directory.

If the qdaemon is killed it will be restarted by the "srcmstr".

Note: Never kill the srcmstr process because it controls other daemons that will be running on the system.

To stop the qdaemon issue "enq -G" or "stopsrc -cs qdaemon" (if there are no jobs queued).

To start the qdaemon again, use "startsrc -s qdaemon".

Suggested Reading

"AIX Version 4.1 System Management Guide" from IBM. Order number is SC23-2525-00

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