

DPServer

General Information Guide

720P62712

***The cornerstone to your
output management solutions***

THE DOCUMENT COMPANY

XEROX

DPSERVER

***DP*Server**

***DocuPrint*Server**

General Information Guide

720P62712

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Xerox Corporation
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El Segundo, California 90245

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Preface

Welcome, and thank you for considering DocuPrintServer (DPSever) as your solution to achieve automated network production printing and improved print window management.

The goal of this document is to explain how DPSever and DPSever options add value and capability to your Xerox printer investment. We hope this information will assist you in evaluating DPSever for integration into your network environment.

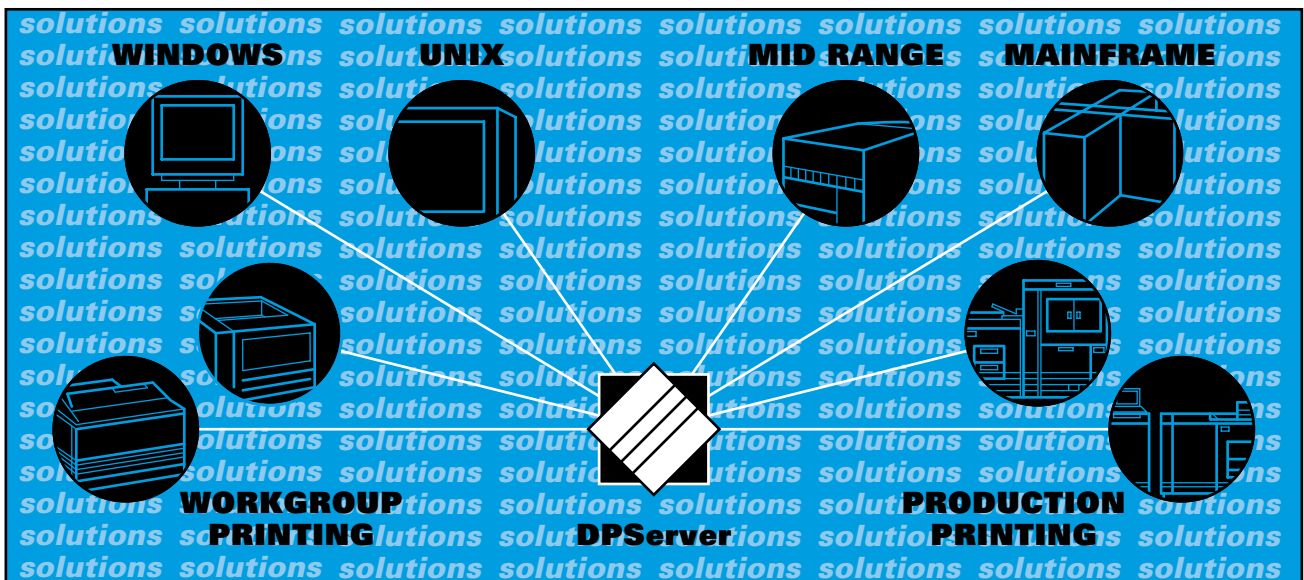
Briefly, what is DPSever?

DocuPrintServer (DPSever), formerly named the Xerox Print Services Manager (XPSM), is a shared, modular, software solution that improves enterprise printing productivity and efficiency in a variety of ways, yet does not require changes to current applications.

Based on a client/server architecture, DPSever simplifies network production printing, prints more jobs in less time, and reduces overall operating costs through intelligent, automated processes. Further, DPSever supports a variety of clients and can deliver output to production, workgroup, and desktop printers and devices in highly diverse network environments.

DPSever's core capabilities include print job management, printer control, network printing, workload balancing, job splitting, and parallel job processing. Options are available that extend DPSever capabilities to include resource management, automated printer instruction packet insertion, data stream transforms, accounting, and enhanced network job support.

FIGURE 1. DPSever opens the door to remote production and workgroup printing for network-connected hosts throughout your enterprise.



Who should read this guide?

This general information guide addresses the questions and concerns of potential customers who are considering DPServer for their production printing environment. To best meet the needs of potential readers, this guide is tailored to the following audience members.

Data center managers who want greater flexibility in network production printing, new document delivery alternatives, and reduced operating costs.

Operations managers who are interested in increasing print windows, improving job management flexibility, and reducing staffing requirements through automated printer workload balancing, remote printer control, and job queue management.

Systems programmers who are responsible for installing and maintaining software products and need to know how DPServer fits into a network environment.

Purchasing professionals who need to assess benefits, features, functions, and system requirements to ensure compliance with site prerequisites.

Network administrators who need to ensure product compatibility with communications and connectivity solutions already in place.

Application programmers who want to create applications that access resource control and distribution functions using an application programming interface (API).

Users of applications who require point-of-need document delivery capabilities, no matter where they are in a network enterprise.

How should this guide be used?

This guide provides answers to questions most often asked by the intended audience members. These questions are listed at the beginning of each chapter and in the Table of Contents.

While you are encouraged to read the guide thoroughly, readers wanting answers only to specific questions should review the questions first, then skip ahead to the discussions of greatest interest.

This guide also contains a question-and-answer section (Appendix A). The questions in this section were compiled during conversations with customers evaluating DPServer.

For additional information . . .

Readers wanting additional information on DP Server and DP Server options are encouraged to reference the following publications.

**DP Server for the IBM RS/6000
Implementation Planning Guide** (721P85000)

**DP Server for the IBM RS/6000
Communications Configuration Guide** (721P85010)

**DP Server for the IBM RS/6000
Installation and Management Guide** (721P85020)

**DP Server for the IBM RS/6000
Accounting Option** (721P85040)

**DP Server for the IBM RS/6000
Resource Management Option** (721P85050)

**DP Server for the IBM RS/6000
XPRM Installation and Reference** (721P85060)

**DP Server for the IBM RS/6000
XPTM Installation and Reference** (721P85070)

**DP Server for the IBM RS/6000
XPRM for the IBM MVS NFS Installation and Management Guide**
(721P85080)

**DP Server for the IBM RS/6000
Application Program Interface (API) Programmer's Guide** (721P85040)

**DP Server for the IBM RS/6000
Data Stream Transform Application Program Interface (API)**
(721P85100)

**Xerox Print Readiness Execution Program (X-PREP) for DP Server
Installation and User Guide** (720P32282)

**Xerox Windows to Xerox Meta (XWXM) for DP Server
Installation and User Guide** (720P32271)

The following publications are provided free of charge.

DP Server Solutions Guide (720P32660)
This document describes how DP Server can be implemented to achieve a variety of benefits.

Xerox Customer Documentation Catalog
This publication contains the titles of Xerox product documentation.

You may directly visit the DP Server home page on the world wide web at <http://www.xerox.com/print/products/dpserver>.

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Xerox Client/Server Solutions

This chapter provides answers to the questions listed below.

What are client/server solutions?

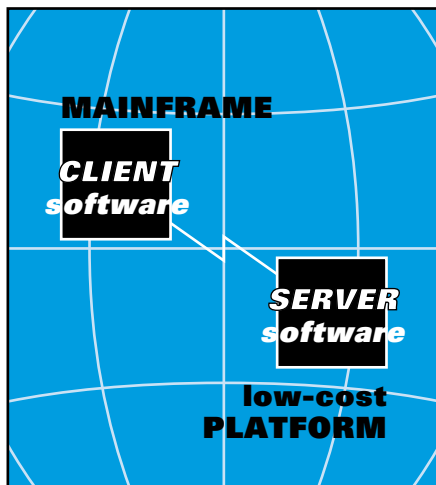
What client/server solutions does Xerox offer?

Is this Xerox's direction in enterprise printing software solutions?

What future DPServer benefits may I expect?

What are client/server solutions?

FIGURE 2. Client/Server solutions promote a shared, open environment while reducing costs and increasing flexibility.



In the climate of "downsizing" and "rightsizing," the direction in enterprise computing is to reduce the demand on mainframes by offloading applications to platforms that have a lower cost to operate and maintain. Corporations benefit through significantly reduced costs as the number of required mainframes decreases and expensive CPU and disk storage charges are minimized. Users benefit by having greater access to applications and services.

Client/Server software solutions promote these benefits by distributing software functions between computers. **Client software** resides on one computer, and makes requests to server software running on another computer. **Server software** processes client software requests and executes the desired functions. This enables mainframes, for example, to transfer processing to low-cost platforms, yet still receive key services.

As related to document delivery and printing, this strategy affords several key benefits. Mainframes running client software can offload print job processing to a low-cost server, share printers and electronic printer resources with other mainframes, and print and deliver documents at the user's point of need. This leads to a significant reduction in document distribution costs, offers print operations control at the server, and decreases overall document delivery time.

However, this migration also introduces several challenges. Mainframe printing has traditionally been highly structured with a limited number of computer platforms, data stream types, and connectivity possibilities. Conversely, network printing can combine a variety of computer platforms, data stream types, and connectivities. The result? A highly-complex document delivery and printing environment that demands solutions to meet a variety of needs.

Xerox is committed to providing solutions that meet these challenges. The direction at Xerox is to enable enterprise-wide document delivery and printing by offering client/server solutions that support a variety of platforms, applications, data streams, and network connectivities.

What client/server solutions does Xerox offer?

Xerox currently offers the client/server solutions described briefly below. Readers wanting additional detail on each product are invited to read the expanded discussions contained in the next chapters.

DocuPrintServer (DPSTServer) is the cornerstone of Xerox client/server software solutions. DPSTServer is a productivity suite of multiple software components. Each component is designed to add a specific value to your print operation. Globally, the goals of DPSTServer are to enable automated network production printing in highly-diverse enterprises, and to significantly improve print window management capabilities through automation (e.g., workload balancing) and intelligent data handling (e.g., job splitting).

The **Resource Management Option** offers a highly-flexible method to store, manage, and use resources in your enterprise. A key component of this option is the **Xerox Print Resources Manager for the IBM RS/6000 (XPRM)**, a resource database manager that can be shared by multiple client platforms and multiple DPSTServers.

The **Accounting Option** provides comprehensive statistics of client, server, and select printer activities. The information assembled by this option enables accurate billing, printing performance tuning, capacity planning, and resource tracking.

The **Xerox Print Transform Manager (XPTM)** promotes enterprise coherence by converting source data streams into device-compatible formats. The current release of XPTM enables customers to print Xerox centralized data streams to PostScript and PCL5 printers.

The **Xerox Print Readiness Execution Program (X-PREP)** automatically inserts printer instruction packets (DJDE or VIPP) into output data streams to control job formatting and to maximize printer up-time.

Other Xerox software solutions are available to extend DPSTServer's capabilities and benefits, but are not designed as true client/server products. These options seamlessly integrate into your DPSTServer-controlled environment and allow you to add capability incrementally, based on business needs. A complete description of all DPSTServer solutions and options may be found starting on page 19.

Is this Xerox's direction in enterprise printing software solutions?

Yes. Xerox client/server solutions provide customers with increased flexibility and capability in operating a production printing environment. Further, these benefits are fully scalable and are provided for both local and network environments.

What future DPServer benefits may I expect?

The current version of DPServer brings added data transform capabilities, resource support, and productivity enhancements (e.g., job splitting). In future releases, you can look forward to the following:

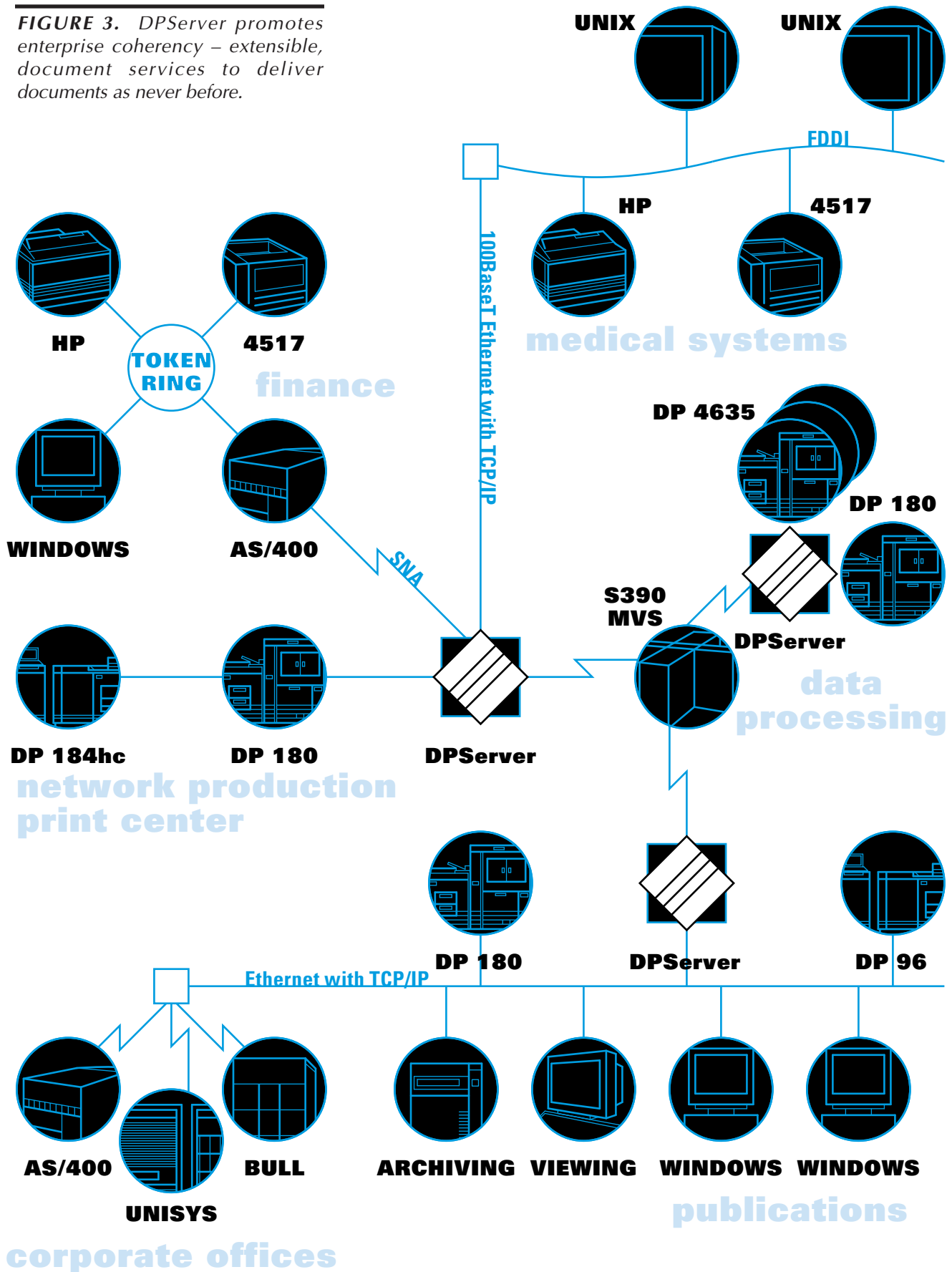
New platforms that will run DPServer so that customers can better utilize existing hardware investments.

New data stream transforms that allow more documents to be used by more types of network devices, regardless of data stream requirements.

Expanded client support to allow more users to access network devices and enterprise printing resources.

Additional management functions that address emerging customer challenges and concerns.

FIGURE 3. DPServer promotes enterprise coherency – extensible, document services to deliver documents as never before.



Product Overview

This chapter provides answers to the questions listed below.

What is DPServer?

What does DPServer do for me?

What are the benefits of DPServer?

How does DPServer impact my existing applications?

What printers and devices are supported by DPServer?

What is DPServer?

DPServer is an open, modular software solution that provides data-center-level control of output and printing devices for network and remote printing environments. Installed on a network server, DPServer supports a variety of clients and data streams to enable true multi-platform production printing and document delivery across an enterprise – all without operator intervention or change to your current applications or operating systems.

As a network print manager, DPServer controls and monitors Xerox production printers attached to the server, as well as Xerox and non-Xerox printers directly attached to the network. Printer and job control is performed either at the server or at a remote X-Windows terminal, giving you predictability and full control of a dynamic production print environment.

As a network print server, DPServer processes jobs from multiple clients simultaneously, then schedules and releases jobs according to "local" site requirements and priorities. Additionally, jobs can be distributed to the appropriate printer, or made available to an archiving solution, viewing product, or other network device. This increases user access to enterprise resources and eliminates technology limitations that hinder business objectives.

Options are also available to extend DPServer's features and benefits when your needs expand. These options enable customers to manage resources, track print job accounting statistics, and accept and deliver more types of data streams.

As stated earlier, DPServer is composed of client-, server-, and printer-resident software. Each module performs a specific set of functions that enable orchestrated network production printing and document delivery.

Client Software

DPSever client software is designed for specific environments and operating systems, including IBM MVS mainframes. The client software is required to take full advantage of all DPSever benefits.

MVS client software is responsible for acquiring print jobs from JES, sending print jobs to DPSever, ensuring communications integrity, and receiving accounting data and job/printer status from DPSever. Optional client software is also available for automated resource management between the host and server.

Windows 3.1 and 95 client software enables Windows users to submit jobs to DPSever. This allows you to print workgroup pages on Xerox production printers at a greatly reduced cost and at significantly faster speeds.

Non-MVS sites can submit jobs using the following options: lpr, lp (HP platforms only), FTP, and BDT. (Please refer to page 18 for complete details.) These options open DPSever benefits and capabilities to virtually any enterprise client. To learn about support for a specific platform other than discussed here, consult the DPSever home page on the world wide web or contact your Xerox representative.

Server Software

DPSever server software, DPSever for the IBM RS/6000, is the heart of the solution. DPSever software carries on intelligent conversations with DPSever client software and server-attached Xerox printers. All DPSever functions can be controlled using a standard UNIX graphical interface, OSF/Motif[®]. Functions include:

- automated network printing
- job control and queue management
- printer management
- archive management
- resource management (optional)
- accounting (optional)
- automated DJDE and VIPP packet insertion (optional)
- data stream transforms (optional)

These tasks are briefly discussed beginning on page 7 and in detail beginning on page 22.

Sites who require DPSever capabilities but prefer to control and monitor DPSever from a location other than the server can utilize a remote console. A **remote console** allows you to display the graphical user interface of one or more DPSevers on a single terminal (see page 41 for requirements). This provides a flexible solution for consolidating printing operations and management according to your needs.

DPServer Printer Software

While DPServer does not provide "printer software" as such, DPServer works in conjunction with Xerox production printers *directly attached to the server*. The operating system of these printers allows information to be returned to the server such as printer status, accounting information, and more. Xerox and non-Xerox printers *directly attached to a network* can be controlled by DPServer, but do not support 2-way communication.

What does DPServer do for me?

DPServer is designed to simplify production printing in a network enterprise and improve print window management. DPServer promotes an open, shared print environment and reduces "bottom-line" costs by consolidating job and printer management functions on a low-cost server.

Among the many benefits of DPServer, the key benefit for many customers is productivity enhancement. Through automated management functions and intelligent decision making, DPServer keeps printers up and running while reducing the need for operator intervention. This creates a wider print window and eliminates the need to re-run jobs due to operator error.

The following pages continue to discuss the major features of DPServer. Readers who want expanded detail on DPServer features and operation are invited to read the next chapter, Components and Operation.

Automated Network Printing

DPServer combines the quality and versatility of Xerox production printers with the openness and access of a network environment. You can now print your production jobs at the site that best supports your business objectives and processes. DPServer can intelligently manage, schedule, and print jobs to both Xerox production printers and select non-Xerox printers within your network.

To improve overall network and print operation performance, DPServer supports multiple clients simultaneously over SNA and TCP/IP connections, allowing jobs to be sent and processed in parallel. DPServer also performs transparent data stream transforms to enable you to use the most appropriate printer for the job without regard to data stream compatibility. These processes can be performed automatically and without user or operator intervention.

Job Control and Queue Management

DPServer increases your print windows by providing flexible and automated job control and queue management at the server. All jobs sent to DPServer can be managed locally, then directed to server-attached and network-attached printers. You now have the power to manage print operations based on current priorities and accommodate changes in scheduling when needed.

DPServer operators have access to a comprehensive display of jobs queued at the server and can perform many operations. A sample of these operations are listed below:

- hold, release, cancel, and delete jobs
- redirect jobs to other printers
- reprint job (without resending from the host)
- change job attributes (e.g., number of copies)
- reprioritize queues based on job attributes (e.g., stock, color)
- create queues for each physical printer or group of printers
- customize the queue to show only fields of interest

To ensure that Xerox printers produce at their maximum level, DPServer employs workload balancing. **Workload balancing** is a DPServer feature that minimizes printer idle time by automatically scheduling jobs to printers based on printer availability. For example, if one printer is busy or taken offline, DPServer sends the job to another printer that is suited to the job. This enables you to print jobs on-time, keep your printers up and running, increase printer utilization, and increase overall site throughput. For additional information on workload balancing, please refer to the discussion of logical printers on page 23.

DPServer also offers "job splitting." **Job splitting** is a productivity enhancement that enables jobs to be divided into smaller segments and printed across multiple printers. Print window management is greatly improved as lengthy applications can now be printed in significantly shorter time frames. To protect your investment in application software, job splitting is performed on the output data stream – no application changes are required.

Printer Management

DPServer provides control of all Xerox printers attached to a DPServer. This **master printer console** feature simplifies day-to-day operation and management of printers by placing control at a centralized location – at the print server.

Managing multiple Xerox production printers has never been easier. Operators can execute commands, obtain printer status, and much more from one location. Operators can view information using the server's graphical user interface or in a separate window containing the printer's command-line user interface. To simplify the task of monitoring printing operations, the DPServer user interface presents information in various colors to convey high-priority events, processing stages, availability, and so on. This productivity enhancement ensures that operators can inspect printing operations simply by glancing at a display.

To further extend these benefits, a **remote console** is available that allows control of one or more DPServers from any network workstation or PC that supports X-Windows and OSF/Motif. The remote console allows you to establish network printing control at the location that best meets your needs. Specifically, a remote console gives you the ability to display the graphical user interface of one or more DPServers. All controls and displays that can be accessed from DPServer can also be accessed from the remote console. (When using a remote console, you may wish to establish procedures for server and remote console operation to help ensure that conflicting commands are not entered.)

Archive Management

DPServer makes all jobs available for archiving by third-party solutions. Archiving can occur before printing, after printing, or instead of printing if desired. DPServer writes the job data and job ticket information to a server-resident directory where it may be accessed by your archiving solution. For convenience, the archive data is stored in a directory using the same spool name as the original job.

While not part of the archive management solution described above, DPServer also enables jobs to be retained locally at the server for a user-defined period of time. This feature allows you to reprint jobs without having to re-send data from the host or retrieve job files from an archiving product.

Resource Management

The Resource Management Option offers improved management, version control, automation, and accessibility of resources required for production print jobs. Resources are electronic versions of forms, logos, and fonts that can be merged with personalized data to create sophisticated, powerful documents.

DPServer simplifies production resource management through intelligent, flexible design, and productive features. When you add the Resource Management Option, you can:

Store, manage, and distribute Xerox, PostScript, and PCL5 resources across multiple printers. Whether you use traditional Xerox DocuPrint printers, networked DocuPrint NPS printers, third-party PCL and PostScript printers, or any combination, you can store and maintain all production resources in a single database, and download them either manually or automatically to your printers.

Share printer resources among multiple client platforms. Jobs submitted from MVS hosts, midrange systems, workstations, and PCs can all share resources from the same DPServer-resident resource database. This minimizes concerns associated with multiple versions of printer resources. DPServer can also be configured as a "resource client," meaning that jobs submitted to one DPServer can request resource services from another DPServer on which a resource database is installed. This approach allows you to have multiple DPServers at your points of need, yet maintain one (or more, if desired) resource database.

Download resources to the server from the host. DPServer allows you to mount a resource tape on an MVS host, write those resources to PDS, then download the resources to the server-resident database. You may also download resources directly from a PDS or disk file.

Distribute resources from the server to both server-attached and network-attached printers. Printer resources can be downloaded to multiple printers using a single command.

View a catalog of resources that are resident on each printer, or the resources themselves. DPServer maintains a catalog of all resources that have been downloaded to the printers. This catalog can be inspected at the server. Additionally, the Xerox Resource Transform utility allows you to view LPS resources (except forms) at a Windows 95/NT workstation, whether stored in a remote DPServer resource database or on the local file system. This utility also transforms Xerox resources into PostScript and PCL5 formats.

Avoid printing interruptions due to missing resources. DPServer determines resource availability at the printer before printing begins by comparing resources required by the job with resources stored at the printer. If a resource is not available at the printer, DPServer acquires and downloads the resources from the server-resident resource database. The resource checking capability extends to resources that are embedded in other resources (**recursive resource checking**), for example, a logo referenced within a form. Operators can also display required resources for queued jobs and their availability at the printer.

Accounting and Performance Management

The Accounting Option increases site productivity and efficiency by recording statistics on a variety of client, server, and printer events. The Accounting Option offers both a "birds-eye" and microscopic view of a network production print operation.

The information collected by the Accounting Option can be used for many different processes:

- identify peak printing times
- obtain accurate print volumes for capacity planning
- identify high-volume users and lengthy applications
- measure job transmission time to tune network performance
- determine resource usage per application or customer
- measure operator and operator shift performance
- ensure that all printed pages and copies are billed
- isolate charges for special features, such as color printing

The Accounting Option also offers report generation capabilities. These reports can be used with your accounting, performance analysis, or asset management tools. Reports may be generated in variable-structured SMF records, or in "raw" format for use by SQL databases, spreadsheets, statistical analysis packages, or other software.

Automated DJDE and VIPP Packet Insertion

The Xerox Print Readiness Execution Program (X-PREP) option controls document formatting and printer operation by inserting printer instruction packets into output data streams – automatically and without change to your applications. X-PREP can be used to condition data streams destined for either Xerox LCDS/metacode or PostScript printers. Xerox Dynamic Job Descriptor Entry (DJDE) packets are created for Xerox LCDS/metacode printers, and Xerox Variable Data Intelligent PostScript PrintWare (VIPP) packets are created for Xerox PostScript printers.

Using X-PREP, you can control document formatting and printing by adding customized banner pages, and by defining page orientation, duplex and multiple-up printing, and more. You can also automate start commands to ensure that your printers do not stop unless absolutely necessary.

X-PREP is designed for simplicity and ease of use. It does not require Xerox printer programming experience.

Data Stream Transforms

In support of Xerox's goal of "any document to any printer," DPServer offers tools that extend your ability to print documents at their point of need, regardless of source data stream or device PDL.

The Xerox Print Transform Manager (XPTM) is a DPServer option that transforms Xerox data streams for printing on PostScript and PCL devices. XPTM also has the ability to transform most Xerox printer resources dynamically. Fonts and logos, however, must be pre-converted using a tool such as the Xerox Resource Transform (discussed on page 29). The Xerox Resource Transform runs on a Windows 95 or Windows NT platforms and also offers the ability to view and print LPS resources (excluding forms) stored locally or in a remote XPRM resource database.

What are the benefits of DPServer?

Improve Print Window Management

Reduce printer idle time using DPServer's workload balancing feature. Jobs are automatically released to the first available printer so your printers stay busy.

Split lengthy jobs across multiple printers. Jobs can be printed in one-half, one-third, and even one-fourth the time.

Avoid printing interruptions due to missing resources. The DPServer Resource Management Option verifies resource availability for jobs *before* they begin printing.

Enhance Job Control

Modify jobs queued at the server before they print. Hold, release, delete, change job priority, and change number of copies, all from the server.

Re-direct jobs to other printers. DPServer allows you to override automated job scheduling so you can reassign jobs to printers based on your immediate needs.

Reprint jobs without resending data from the host. DPServer retains jobs locally at the server, allowing you to print an entire job or a range of pages quickly and easily.

Streamline Business Processes

Structure your business processes according to your needs, not technology limitations. DPServer allows you to deliver documents to the best location for your business. Take advantage of reduced shipping and mailing charges, faster time to delivery, and much more.

Simplify Migration to a Client/Server Environment

Pace your migration to the client/server world. DPServer gives you all the benefits of client/server computing without impact to your current applications.

Open Access to Network Users

Open production printing to workgroup users. Windows client software gives PC users access to Xerox production printers, in addition to PCL5 and PostScript workgroup printers.

Choose the network connectivity that works best for you and your users. DPServer supports SNA and TCP/IP protocols over Ethernet and Token Ring connections.

Print jobs from several platforms to any DPServer-controlled printer in your enterprise – simplified production printing at the location you need.

Improve Enterprise Efficiency

Control your print schedule from the server instead of the host. Network printing sites now have greater predictability and can better control printing operations according to "local" production windows and priorities.

Use a single, common interface for all your printers. DPServer eliminates the need for unique printer interface boxes and offers control at a centralized location.

Choose between fully-automated or hands-on management of your printing operations, whichever is best for you. Automated print job, printer, and resource management at the server greatly decreases the demands on your staff while reducing host operating costs.

Manage enterprise printer operations on a single terminal. Using the remote console, you can control and monitor any or all network DPServers from one location.

Fine-tune network printing operations. Data collected by the Accounting Option can be used for performance tuning, capacity planning, and more using custom or third-party performance analysis tools.

View print operations at-a-glance using DPServer's graphical user interface. It's intuitive, easy to use, and operators can begin accessing DPServer's benefits with little or no training.

Reduce Cost

Eliminate redundant software. A single server can support multiple hosts and manage multiple printers.

Eliminate costly "front-end" devices for each printer. DPServer manages communications and performs data transformation for all DPServer-controlled printers.

Reduce expensive CPU charges for host-based print-formatting software.

Expand Accounting

Charge your customers for exactly what you deliver. The Accounting Option collects detailed printer events including number of copies printed, even if copies were defined in a DJDE.

Use the accounting package best for you. The Accounting Option generates reports in a variable-structured SMF format and automatically sends the records to the appropriate MVS library.

Gain better control over your applications and printing operation. The Accounting Option can tell you how many physical pages printed, how many logical pages were processed, if highlight color was used, when an application completed printing, plus much more.

Improve Resource Management

Use one or several resource databases to support all your production jobs. The Resource Management Option can be used as a single, centralized repository to support all production applications for your enterprise, or can be implemented on multiple DPServers.

Redirect resource requests to other DPServer resource databases. Jobs processed by DPServer can optionally request resources from databases on other remote DPServers.

Download resources to the server from a host-mounted tape. Optional software allows you to download resources from the same tapes you use to back up production printer resources.

Download needed resources from the server automatically. DPServer has built-in intelligence to automatically locate and download resources to any DPServer-controlled printers.

View, print, and update resources using the Xerox Resource Transform. Create PostScript and PCL5 versions of your production resources, and view and print resources from a Windows 95/NT platform.

How does DPServer impact my existing applications?

DPServer supports your current production applications without modification. Further, DPServer offers new opportunities for your current applications by providing access to new network destinations and new document services such as viewing and archiving.

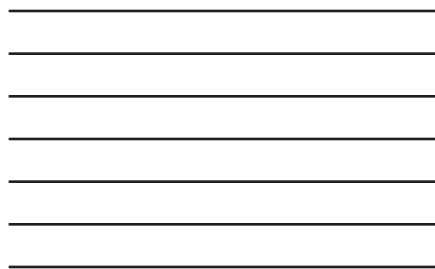
Applications that print using RJE products may require some modification. Please contact Xerox for additional details.

What printers and devices are supported by DPServer?

DPServer manages document delivery and printing to a variety of Xerox and third-party products and devices. As the list of supported products and devices continues to grow, you are invited to consult the DPServer home page on the world wide web at <http://www.xerox.com/print/products/dpserver>.

DPServer: Components and Operation

This chapter provides answers to the questions listed below.



How does DPServer fit into my site?

How does DPServer work?

What do my printer operators need to know?

How do I configure my DPServer-controlled resource environment?

How do I manage and control resource distribution?

How do I control security?

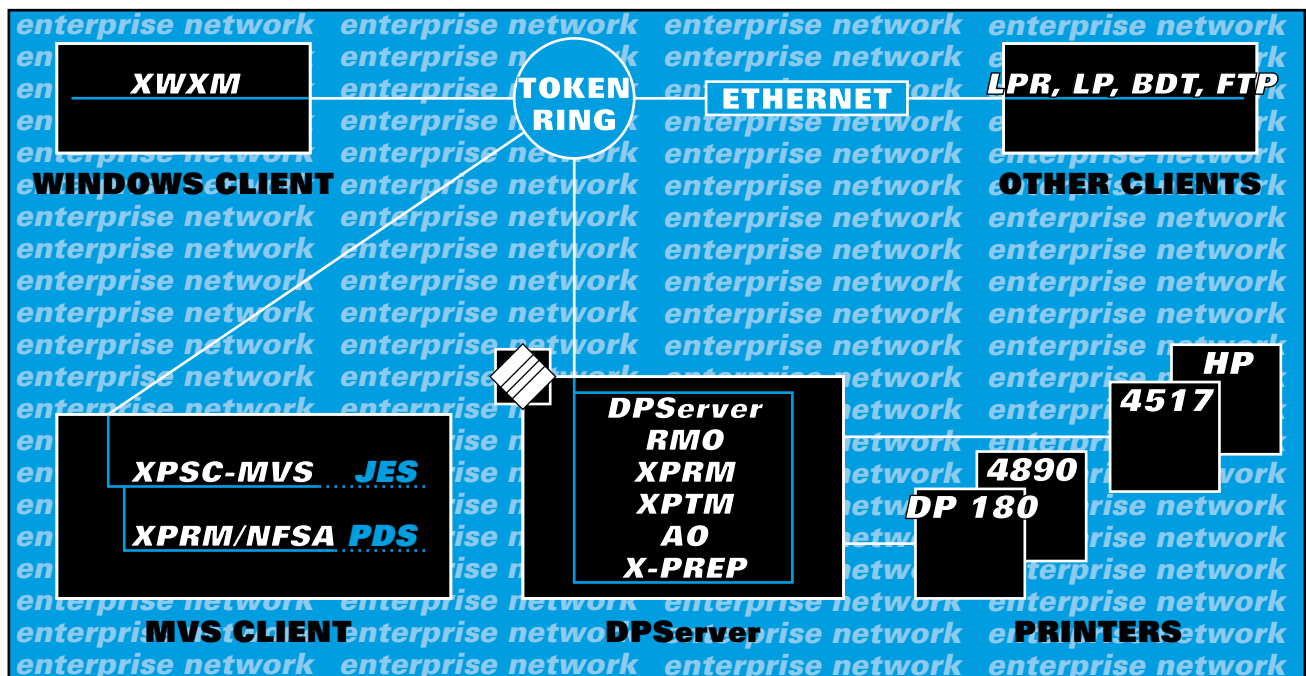
Does DPServer support archiving and viewing solutions?

How does DPServer fit into my site?

DPServer is composed of several modules, some specific to platforms, other specific to optional server functionality. How DPServer integrates into your site depends on the platforms you utilize and the functionality you require.

This section on site integration identifies the benefits that DPServer provides for popular client environments. The table on the next page is provided to breakdown the capabilities, data streams, and client environments available to each job submission option.

FIGURE 4. XPSM's distributed architecture easily fits in your network environment.



DPSERVER	Job Submission Option		
	JES	lpr, BDT, FTP, lp**	Windows Client
DPServer Support			
Available DPServer Capability			
print job submission	√	√	√
error recovery between the client and server	√		
printer management	√	√	√
job control and queue management	√	√	√
resource management	√	√	√
accounting	√	√	√
job reprint	√	√	√
auto DJDE / VIPP packet insertion	√	√	√
data stream transforms	√	√	√
Data Streams			
SYSOUT	√		
LCDS (DJDE)	√	√	√
Metacode	√	√	√
PCL5*	√	√	√
PostScript*	√	√	√
AFPDS (with XPAF)	√		
ASCII	√	√	√
Communications/Protocols			
SNA LU 6.2 via Token Ring or Ethernet	√		
TCP/IP via Token Ring or Ethernet	√	√	√
Client Environments[†]			
IBM MVS	√		
OS/390	√		
DOS/VSE		√	
OS/400		√	
UNIX		√	
WINDOWS 3.1, 95			√
HP-UX**		√	
DEC		√	
BULL		√	
SUN		√	
UNISYS		√	
TAPE		√	

TABLE 1. DPServer Support by Job Submission Option.

* PCL5 and PostScript print files (without transform) are "passed through" DPServer. DPServer will direct the print file to the appropriate destination, but will not process the file or enable extended job management.

** lp is supported for HP-UX operating systems only. All other operating systems will have richer access to DPServer functions through lpr, ftp, or BDT job submission options.

† This is only a **partial** listing of supported client environments. If your environment is not listed, please contact your Xerox representative to find out how DPServer may be integrated into your environment.

DPServer Client Software

MVS Client Software and Options

Xerox Print Services Client for MVS Hosts (XPSC-MVS) is the client software for an MVS host and is a functional subsystem (FSS). XPSC-MVS is primarily responsible for acquiring jobs from JES, sending jobs to the remote DPServer, and accepting SMF records from DPServer.

Xerox Print Resources Manager for the IBM MVS Native File System Access (XPRM/NFSA) is part of the Resource Management Option. XPRM/NFSA is installed on an MVS host to enable resources stored in PDS libraries to be downloaded to XPRM at the server.

Also part of XPRM/NFSA is **Xerox Tape Resource Manager (XTRM)** which reads backup resource tapes created on Xerox centralized printers and writes the resources as members on an MVS PDS.

XPAF Client software is offered for customers who use the Xerox Printer Access Facility (XPAF) to print AFP, IBM line mode, and Xerox-formatted data streams to Xerox laser printers. XPAF Client software extends XPAF benefits by providing customers with access to benefits and features offered by DPServer.

Windows Software and Options

Xerox Windows to Xerox Meta (XWXM) provides Windows users with access to Xerox production printers. XWXM is a print driver that interprets print command sequences issued by a Windows application and produces a Xerox-formatted data stream. XWXM can be installed on Windows 3.1 or Windows 95 workstations.

Xerox Resource Transform (XRT) is an optional application that pre-converts Xerox fonts and logos for printing on PostScript and PCL5 printers. Additionally, this module enables LPS resources (excluding forms) to be viewed whether stored locally on disk, on a network storage device, or within an XPRM database on a remote DPServer. This module supports the Xerox Print Transform Manager described on the following page, and can be installed on Windows NT or Windows 95 workstations.

DPServer Server Software

DPServer Server Software and Options

DocuPrintServer for the IBM RS/6000 (DPServer for the IBM RS/6000) is the core module that provides print services to DPServer clients. DPServer for the IBM RS/6000 offers a variety of print services, described later in this section.

Resource Management Option offers resource management capabilities and is composed of both client-resident and server-resident modules. (This option is referenced as RMO in Figure 4 and Figure 6.)

Xerox Print Resources Manager for the IBM RS/6000 (XPRM) is part of the Resource Management Option and resides on DPServer. XPRM has three key functions: to act as a centralized repository for electronic printer resources, to provide database management and maintenance tools, and to respond to resource requests made by RS/6000 applications.

Xerox Print Transform Manager (XPTM) transforms data streams into multiple device formats to extend the reach of your documents.

Accounting Option is an optional server software module that provides extensive accounting and data collection capabilities. (This option is referenced as AO in Figure 4.)

Xerox Print Readiness Execution Program (X-PREP) is a server-resident utility that automatically and dynamically creates and inserts Xerox printer commands (DJDEs) into client data streams.

How does DPServer work?

DPServer modules work together to provide an intelligent network production printing environment. In addition to automated operation, a full suite of job, printer, queue, and resource management functions are available to the operator through an OSF/Motif-compliant graphical user interface at the server. Following are discussions of each component of DPServer and DPServer options.

Xerox Print Services Client for MVS Hosts (XPSC-MVS)

XPSC-MVS is an MVS host-resident software component of DPServer. It provides a two-way communication link between the MVS host and the server-resident DPServer software. XPSC-MVS is a functional subsystem (FSS) and is written in compliance with the standard functional subsystem interface (FSI). Integrating XPSC-MVS requires no modifications to MVS or JES.

XPSC-MVS performs five primary tasks. Each is described below.

Acquire jobs from JES spool. Jobs destined for Xerox printers are acquired by XPSC-MVS for transmission to DPServer.

Build job ticket. XPSC-MVS scans the job to determine basic information that DPServer will require, such as job type, priority, and other information contained in an output statement. XPSC-MVS builds a job ticket containing this information.

Transmit jobs to DPServer. Following job acquisition from JES and construction of the job ticket, the data is sent to DPServer via SNA LU 6.2 communications interface. This type of communications interface supports multiple parallel sessions between DPServer client and server software, giving you the ability to transmit several jobs simultaneously while processing requests from DPServer. This is an especially attractive feature for sites with heavy print volumes.

Ensure data communication integrity. XPSC-MVS has automated error recovery capability if communication fails during job transmission. XPSC-MVS utilizes "confirm processing" to synchronize JES checkpointing.

Accept SMF accounting data from DPServer. Optional accounting software creates variable-structured System Management Facilities (SMF) page-printer accounting records. These records are created at the server, sent to XPSC-MVS at the host, then stored in a host-resident SMF database for use by host accounting and performance analysis packages. Again, this information can be received by XPSC-MVS even if jobs are being actively transmitted to DPServer.

XPAF Client

Customers who use AFP data streams but want the quality and features of Xerox printing systems often choose the Xerox Printer Access Facility (XPAF) as their solution. XPAF offers a variety of benefits for customers who print AFP, IBM line mode, and Xerox-formatted data streams.

XPAF Client software is installed on an MVS host to extend XPAF benefits. In addition to Xerox printer access, XPAF customers can send jobs to any DPServer-controlled printer in their enterprise, and have access to all job, queue, accounting, and resource management benefits offered by DPServer.

Xerox Windows to Xerox Meta (XWXM)

XWXM is a Windows-based print driver that translates Windows print command sequences into a Xerox production printer format. This utility enables Windows users to print proposals, manuals, direct mailings, and other production-class jobs to the printer that makes the most sense from both a cost and performance perspective.

XWXM is installed on Windows 3.1 and Windows 95 platforms using standard PC installation procedures and is accessed directly from within Windows applications. Users simply select the name of the Xerox production printer from the Print dialog box just as they would any other printer. Transforms are transparent to your users.

DocuPrintServer for the IBM RS/6000 (DPServer for the IBM RS/6000)

DPServer for the IBM RS/6000 provides intelligent printer management functions at the server to automate printing to DPServer-controlled Xerox and third-party printing systems. The following functions are provided:

- automated network printing
- job control and queue management
- printer management
- archive management
- resource management (optional)
- data stream transforms (optional)
- accounting (optional)
- automated DJDE and VIPP packet insertion (optional)

Automated Network Printing

DPServer for the IBM RS/6000 performs a variety of tasks that enable automated document delivery. Each task is described below.

Acquire job ticket and data (XPSC, XPAF, and XWXM clients). A job ticket is automatically created by these clients and sent with the job data to DPServer where it is spooled to disk. Job ticket information is used to make decisions about printer assignment, resource acquisition, and so on.

Create job ticket (BDT, lpr, and lp clients). Users who submit jobs via Bulk Data Transfers (BDTs), such as FTP, NFS, or tape copies, must create a separate control file that is submitted with the data file. The control and data files are copied to a BDT directory on the RS/6000 that is scanned periodically by DPServer. Once DPServer retrieves the control and data files from this directory, it creates a job ticket and places the data in the appropriate job queue.

Analyze job ticket and schedule job. The content of the job ticket is analyzed and used to schedule the job to a physical or logical printer queue. DPServer employs the concept of logical printers to balance workload between multiple Xerox printers.

Logical printers are simply a collection of one or more printers that have common printing characteristics (such as color, resident resources, speed, or paper handling capabilities) and can print the same types of jobs. This allows you to specify the logical printer when submitting a print request without regard to a physical printer. Logical printers may consist of Xerox, third-party, or a combination of both.

FIGURE 5. Balance the workload among printers and simplify job submission using logical printers.



By employing logical printers, DPServer can automatically deliver jobs to the first available printer within a logical group. If one printer is busy, taken offline, or is unavailable for other reasons, jobs are routed to other physical printers within the logical group.

Deliver job to the printer. The job is released from the queue and downloaded to the appropriate printer.

Job Control and Queue Management

As previously discussed, jobs received from clients are spooled to disk, then automatically scheduled to the logical printer defined in the job ticket. If no logical printer has been defined, the job is assigned to a default logical printer pre-defined by you. In addition to automated operation, a variety of features are provided that allow you to control jobs and set up queues according to your site requirements.

Job Control. Once in the queue, all jobs waiting to be printed are displayed. This display may be customized to show only the information of interest. In addition to automated operation, tools are provided that allow you to manually control and manipulate jobs. Specifically, jobs can be held, released for printing, canceled, deleted from the queue, or reprinted. The number of copies defined for a queued job may also be changed at the server.

A newly added job control feature is "job splitting." Based on user-defined "break points," SYSOUT jobs can be segmented and distributed across multiple printers controlled by DPServer. Each segment is subject to all DPServer functions, including resource management, transforms, workload balancing, accounting, and so on. For additional information on job splitting, consult the DPServer Installation and Management Guide or the DPServer Solutions Guide.

Queue Management. Individual job queues can also be manipulated. Controls are provided to enable queue input, reject queue input, enable queue output, and hold queue output. Printing priority within a queue is given to the most urgent jobs as defined by the host. Jobs of equal priority are printed according to the first-in-first-out (FIFO) rule. The priority value is contained in the job ticket and can be changed at the server by the DPServer operator.

The key benefit of job control and queue management at the server is flexibility. Your remote sites now have the control they need to schedule printing based on their priorities.

Printer Management

A true productivity enhancement, DPServer allows you to control and configure multiple Xerox printers from a single DPServer. This provides a global view of all attached printers and their configuration characteristics. Using the graphical user interface, you can view status, current job in progress, number of queued jobs waiting to be printed, and more for all server-connected printers. Printer commands can also be entered from DPServer and include start, stop, cancel, abort, endjob, and drain.

If you prefer, the printer's command-line user interface may be opened within a window at DPServer. Any command or query that is supported at the printer may now be entered from DPServer, providing the ultimate in remote printer control and productivity.

Archive Management

DPServer includes an archive management interface, enabling any job processed by DPServer to be used by a third-party archiving product. Archiving requirements are defined for each logical printer. You may choose to archive jobs before printing, after printing, as an alternative to printing, or not at all. Archived jobs are written to a directory on the IBM RS/6000 where they may be accessed by your archiving solution. Xerox specialists will work with you or your archiving vendor to assist you with implementation details if requested.

Resource Management

The Resource Management Option is available for customers who want to take advantage of server-based storage and management of resources. Please refer to the discussions on resource management below, and beginning on page 36 for complete information.

Data Stream Transforms

The Xerox Print Transform Manager is offered for customers who want to support new applications and business processes without changing or adding to their current printer investment. Please refer to the discussion on page 29.

Accounting

The Accounting Option is available for customers who want improved accounting capabilities and access to data that can be analyzed for performance tuning and capacity planning. Please refer to the discussion of the Accounting Option on page 30.

Automated DJDE and VIPP Packet Insertion

An optional utility is provided that automatically inserts Xerox production printer controls (DJDEs and VIPP packets) into a print data stream based on parameters you define. Please refer to the discussion of Xerox Print Readiness Execution Program (X-PREP) on page 31.

Resource Management Option

The Resource Management Option offers centralized resource management from a remote server, and dynamic resource acquisition and retrieval for jobs submitted from multiple platforms, including remote DPServer platforms. This option extends DPServer software functions to include recursive resource checking and resource verification which ensures that all resources required for a job are available at the printer before printing occurs. This option is composed of the following two modules.

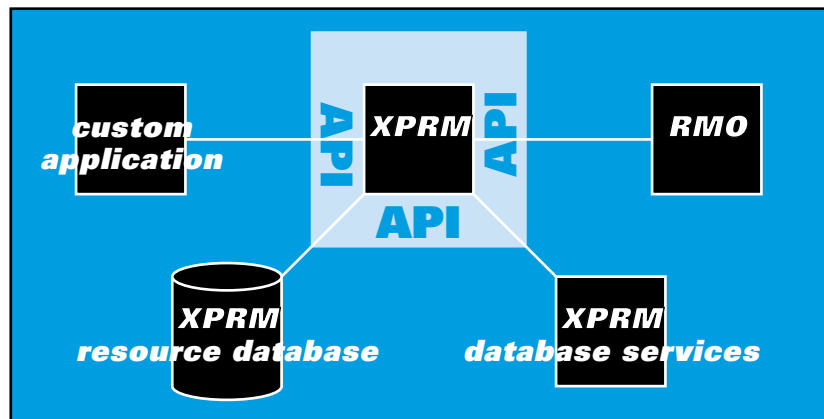
Xerox Print Resources Manager for the IBM MVS Native File System Access (XPRM/NFSA)

XPRM/NFSA resides on an MVS host and is included with the Resource Management Option. Running under VTAM, XPRM/NFSA acquires resources stored in host-resident PDS libraries, and can carry on multiple, simultaneous conversations with XPRM at the server using Advanced Program-to-Program Communications (APPC). XPRM/NFSA also includes the Xerox Tape Resource Manager (XTRM), allowing customers to upload resources from resource backup tapes created on Xerox centralized printers. These resources are stored in MVS PDS and can be downloaded to the XPRM database at the server.

Xerox Print Resources Manager for the IBM RS/6000 (XPRM)

XPRM is part of the Resource Management Option and is composed of a centralized resource database, database services, and an open application programming interface (API). Each of these components is described below. XPRM can be configured in different ways to best facilitate resource usage and access for your enterprise. To learn how you can configure XPRM for your enterprise, please refer to the discussion beginning on page 41.

FIGURE 6. XPRM can be accessed by RS/6000 applications using XPRM's API.



Centralized Resource Database

XPRM stores Xerox, PostScript, and PCL5 printer resources in a centralized database at the server. This allows you to control and maintain enterprise resources from one location and avoid duplication of resources across multiple hosts.

The XPRM database is designed to be shared by many applications running on different platforms. Because multiple applications share the database, it is important that tight control of the database be maintained. Resources contained in the XPRM database should be production resources only, that is, proven resources for production jobs. Test resources should be stored outside the XPRM database and managed separately to avoid jeopardizing production resources.

The following resources may be stored in the XPRM database.

Forms (.FRM, PostScript level II, and PCL5 files) can be created using a variety of Xerox or third-party products. Examples of forms used in popular applications are billing statements, insurance policies, and income tax forms.

Fonts (.FNT, PostScript (Adobe) Type I, and PCL5 files) can be purchased from Xerox or third-party vendors, or can be created by you with products such as Elixifont from Elixir Technologies or the Xerox Resource Transform.

Logos (.LGO files) are a special type of graphic file used by Xerox printers. Logo files generally contain small graphics and are stored in a separate logo library on the printer.

Images (.IMG files, and PostScript level II and PCL5 graphics) can be created or scanned using a variety of products. Photographs and line art are examples of image and graphic files.

Xerox PDL objects (Print Description Language objects) are special, Xerox-specific objects that are created to control printer functions. Each supported Xerox PDL object is described as follows.

Copy Modification Entries (CME) allow you to change the appearance or content of a document from copy to copy. For example, text may be added or removed for specific copies within a job.

Ink Descriptor Entry (IDR) files define toner requirements for a job.

Job Descriptor Library (JDL) files are used by Xerox printers and contain commands that describe how applications are to be printed.

LIB files are special files used by Xerox 4135, 4635, and 4635MX printers to describe font mapping for jobs that require short-edge feed.

Page Descriptor Entries (PDE) are files that contain commands that describe formatting information for every page within a job.

Stock (STK) files describe the printer stockset and the type of paper that is required by a job.

TST files contain RTEXT commands. RTEXT is simply text that is to be printed on the first page that precedes a report.

Each resource type is stored in a relational database on DPServer. Resources can be accessed and manipulated using the database services described on the next page.

Database Services

XPRM provides services that allow you to control resources stored in the XPRM database, and are accessed using the graphical user interface. The following database functions are supported.

List provides both summary and detailed reports of attributes for selected resources. Resource attributes are specific to each type of resource, but generally include information such as name, type, resolution, color, version, logical group, dimensions, and so on.

Update allows you to modify the "group" attribute for a printer resource. Logical groups are discussed later in this chapter.

Delete enables resources to be removed from the database.

Import allows you to add resources to the database. Resources may be imported from local RS/6000 directories or physical media, MVS PDS libraries, or other XPRM databases located on the network. Resources created using PC-based development tools, such as the Xerox Resource Transform, Elixir, or Lytrod Software, can be imported into the XPRM database, but must first be moved to an MVS PDS, UNIX directory, or physical media compatible with the IBM RS/6000.

Export allows you to copy a resource from the database to a directory on DPServer.

Download allows you to download any resource in the database to a logical printer. Downloading a resource to a logical printer ensures that all physical printers within the logical printer group will receive the resource. (not available for PostScript resources)

Sample allows you to print one copy or multiple copies of a compiled form resource at the printer. In addition to number of copies, you may select paper source when sampling forms. (not available for PostScript resources)

Backup allows you to copy the contents of the database to tape or to a file.

Restore allows you to copy a database, previously saved using the backup command, back to the server.

Application Programming Interface (API)

The API provides RS/6000 applications with direct access to XPRM database functions and the resource database. The DPServer user interface is an example of an application that uses the API to access XPRM functions and resources.

The API is a published specification that allows programmers and developers to incorporate specific requests for XPRM services into their applications. Users of the API should have a working knowledge of the C programming language. The API specification is available upon request.

Xerox Print Transform Manager (XPTM)

The Xerox Print Transform Manager (XPTM) transforms data streams and resources into device-specific formats. Documents can now be printed to the most appropriate device, regardless of PDL requirements. Specifically, XPTM performs the following functions:

Data stream transforms. XPTM transforms metacode, LCDS EBCDIC, and LCDS ASCII into PostScript and PCL5 data streams. (Please contact your Xerox representative or visit the DPSTServer home page at <http://www.xerox.com/print/products/dpserver> for the latest list of supported transforms.)

Resource acquisition and conversion. XPTM acquires resources referenced in the job stream from the XPRM database. Xerox-formatted images and forms can be accessed, converted, then embedded in a PostScript or PCL5 data stream. Images and forms can also be converted "on the fly" if the resources themselves are present in the data stream. However, fonts and logos must be preconverted using the Xerox Resource Transform and stored in the XPRM database.

Automatic resource deletion for added security. For security purposes, XPTM ensures that all downloaded resources are deleted from the printer after the job is completed.

Accounting. XPTM tracks the number of pages transformed and reports the results back to DPSTServer.

Xerox Resource Transform (XRT)

The Xerox Resource Transform (XRT) runs on Windows 95 and Windows NT platforms and supports XPTM by offering "offline" resource conversion and viewing capabilities.

As mentioned earlier, select resources (fonts and logos) must be pre-converted in the appropriate format before printing begins. However, we recommend that you also pre-convert forms and images that require conversion on a regular basis. Having these resources available in the required format will speed DPSTServer processing and ensure that jobs are delivered as quickly as possible.

Any Xerox resource can be converted into PostScript or PCL5 using XRT. Specifically, XRT performs the following conversions:

- Xerox .FNT to PostScript (Adobe) Type I font
- Xerox .FNT to PCL5 bitmap font
- Xerox .FRM to PostScript form
- Xerox .FRM to PCL5 form
- Xerox .IMG to Encapsulated PostScript File (EPS)
- Xerox .IMG to PCL5 bitmap image, Windows bitmap (.bmp)

Using XRT, users can access the resources described above from a local disk, network storage device, or from a remote XPRM database. XRT also allows LPS resources to be viewed on-screen (with the exception of forms).

Accounting Option

The Accounting Option provides a comprehensive solution for collecting statistical data about host, server, and printer performance during job printing and processing. This data can be used for billing and charge-backs, asset management, printing performance analysis, operator/shift performance measurement, resource utilization and tracking, and more. Below is a description of major processes and tasks.

Record statistics. Printer statistics are continuously recorded and maintained at the Xerox printer. Printer statistics relate to the printing of a job, resources used, printer configuration, and so on. Server and host statistics are recorded and maintained in a database on the server. Data is collected on over 150 variables that relate to the job identity and make up, transmission time, processing time, and so on.

Send printer statistics to server. Information contained in the printer-resident database can be uploaded either automatically or manually. For automatic uploading, the DP Server operator can define a capacity threshold for the printer-resident database. Once the threshold is reached, the data will be automatically uploaded to the server. The DP Server operator can also upload the database contents manually.

Store accounting data on server. The printer and server accounting information is stored in a database on DP Server. As a default, this database stores the most recent 1000 records received from the printer. This value may be changed by you depending on your needs, however, it is not recommended that records be allowed to accumulate indefinitely at the server. In addition to SMF formatting, these records may be stored to a file, formatted using a report utility, or exported to an application such as a performance analysis tool or a spreadsheet.

Send printer statistics to MVS client. The server compiles and formats one variable-structured SMF record for each report in a job, and sends the record to XPSC-MVS or XPAF Client on the host that originally sent the job. The record is then moved to the appropriate location on the host. This record can be used by any SMF-compatible accounting or performance analysis package.

Analyze performance. The accounting data can also be formatted for use with performance management and analysis software. Host-resident SMF records may be used for capacity planning, performance tuning, and more. Accounting data can also be formatted for use with spreadsheets and SQL database products for customized analysis and plotting.

Write reports. With DP Server operator intervention, the accounting database contents can be written in one of three report formats: a listing of all jobs printed, a listing of each outage by printer, and a listing of MVS hosts from which print jobs have been received. These reports are offered as a starting point, as most customers have special reporting needs and can customize these reports accordingly.

Note: The Accounting Option supports all Xerox laser printers supported by DP Server. However, the degree of support for these printers varies according to the printer Operating System Software installed. Please contact your Xerox representative for further details.

Xerox Print Readiness Execution Program (X-PREP)

Xerox Print Readiness Execution Program (X-PREP) enables clients to dynamically and transparently format documents for printing on Xerox metacode, PostScript, and PCL5 production printers. Specifically, X-PREP inserts packets containing Xerox Dynamic Job Descriptor Entries (DJDEs) or Xerox Variable Data Intelligent PostScript PrintWare (VIPP) statements into the job data stream at spool time.

X-PREP's **Configurator File** is the key to formatting jobs and controlling printer features. The Configurator File is used to define and apply job formatting requirements to jobs passed from DPServer. This file contains multiple FCOVER sections, each section being a unique set of document formatting descriptions. For example, one FCOVER section may invoke portrait duplex printing, another may invoke 2-up landscape printing, and so on. Default FCOVER sections are supplied with X-PREP, but are easily modified to your site requirements.

The FCOVER section to be applied is controlled by information contained in the job ticket. You configure X-PREP to use the value associated with either the SYSOUT class, form id, or logical printer name as an indicator of the appropriate FCOVER section to apply. Each FCOVER section must be named with the expected value of a SYSOUT CLASS, form id, or logical printer. For example the FCOVER A section in the Configurator File will be included in the data stream for jobs with a SYSOUT Class value of A. The FCOVER PASTDUE section in the Configurator File will be included in the data stream for jobs with form id values of PASTDUE, and so on.

These are only simple examples of how formatting can be controlled external to your applications, and in a fully-automated fashion. Please note that no Xerox printer programming experience is required to use X-PREP. Xerox printer features are specified using simple keywords.

For additional details, consult the X-PREP for DPServer User Reference Guide.

What do my printer operators need to know?

Following installation and configuration, DPServer is designed to run automatically, without user intervention. For those instances when you want to override default settings, reprint jobs, change number of copies, and perform other tasks to take full advantage of DPServer and its options, DPServer provides tools both at the host and at the server.

Operation of Client-resident DPServer Components

XPSC-MVS runs transparently following installation. Operators are provided with commands that are entered from the JES console to control transmission-related functions such as displaying log and job status, and terminating/activating tasks. You can also route jobs to logical printers, specify an alternate resource library, and perform other functions to give added control of your printing environment.

XPRM/NFSA runs transparently following installation. There is very little operator interaction with XPRM/NFSA. Tasks are limited to installation, starting XPRM/NFSA, displaying the status of each conversation, and shutting down XPRM/NFSA. XTRM is also simple to use and allows operators to load resources to PDS from tape using standard ISPF panels.

XWXM is the Windows client for DPServer and can be accessed only by end-users. No operator intervention is required.

Xerox Resource Transform is a Windows-compatible program that provides operators with multiple controls for converting Xerox fonts into PCL5 fonts and proofing the results. Operators need not be experienced with font conversion tools, but should be familiar with Xerox printers and fonts.

Operation of Server-resident DPServer Components

Most aspects of DPServer software can be configured to run automatically and transparently to your users. All features of DPServer for the IBM RS/6000 and the Resource Management Option are accessed through an OSF/Motif-compliant graphical user interface running on DPServer. Accounting Option features are accessed through a UNIX window within the graphical user interface.

The server user interface is designed to simplify the job of monitoring and controlling network printing. Many displays accessed through the user interface offer a high degree of customization. Data can be hidden, sorted, shown in summary or expanded form, and organized in other ways to ensure that the operator has only the information that is needed, and in the way it is needed. Activity and status information in many instances are color-coded to provide the DPServer operator with maximum feedback in a highly-efficient manner.

The DPServer user interface is composed of the following main modules.

The Administration component of DPServer offers management and control for high-level tasks such as system processing, system configuration, and system security, and includes a UNIX shell window. Using the shell window, you have access to all UNIX capabilities without having to exit the graphical user interface.

The Communications Management component allows you to manage and configure SNA, SDC, lpr, and BDT communications.

The Information Management component gives the DPServer operator great flexibility in organizing, customizing, and viewing the Job History Log. The Job History Log contains critical information about how jobs were printed, such as the host that sent the job, the physical or logical printer on which the job printed, if the job printed successfully, and other details. Depending on your needs, this log can be customized to display either summary or expanded information for each completed job, and can be sorted to display all completed jobs, all completed jobs for a particular data stream type (e.g., ASCII), jobs printed by logical or physical printer, or jobs that completed with a certain status.

The Job Management component provides controls to manage jobs within DPServer queues and configure logical printers. Job management controls include hold, delete, cancel, reprint, change job priority, and change number of copies. Queue management controls include accept, reject, disable, and hold queue.

The Printer Management component offers the ability to control and configure multiple Xerox printers from DPServer. Printers can be started, terminated, drained, aborted, and more. This component includes controls to configure and set up physical printers and manage and control physical printers from the server.

The Resource Management component provides access to a catalog of resources that reside on all server-attached printers. If the Resource Management Option is installed, access is also provided to a display of required resources for all jobs currently in a queue, and to the XPRM database and services.

The Transform Management component allows customers to print Xerox centralized data streams to network-attached PostScript and PCL printers. This option includes controls to set up "on the fly" data stream conversion, automated embedding of PostScript and PCL5 fonts, forms, and images within the data stream, auto deletion of resources after job completion, plus more.

The Accounting Option is accessed from a UNIX window within the DPServer graphical user interface. The Accounting Option provides information on over 150 printer- and job-related statistics. Operators using this option can configure polling times, write accounting data to SMF records, and generate reports.

How do I configure my DPServer-controlled resource environment?

Some customers gain the most value by using a single, shared resource database to serve all production applications in their enterprise. This promotes accurate version control and simplifies resource maintenance and distribution procedures. However, other customers prefer to use multiple resource databases to serve select production applications. DPServer offers the flexibility to configure your resource environment using either approach.

To configure your resource environment, you should first consider the number of DPServers in your enterprise, the resources and naming conventions in use, and your desire to maintain one or several resource databases. You can have one or several XPRM resource databases, regardless of the number of DPServers in your enterprise. XPRM can be configured as a standalone resource database, a resource server, or as a resource client. Each is described below.

Standalone Configuration

The standalone configuration is for customers who have only one DPServer, or who have multiple DPServers but want to maintain separate resource databases. In the standalone configuration, XPRM responds only to requests from DPServer software running on the same IBM RS/6000. Resources are not accessible by other remote DPServers, or to the Xerox Resource Transform utility.

Client/Server Configuration

In the client/server configuration, XPRM can be installed either as a client or a server, but not both. This configuration is best suited to customers who wish to use a single resource database for all applications, or to customers who require multiple resource databases, but do not wish to install XPRM on every DPServer in the enterprise.

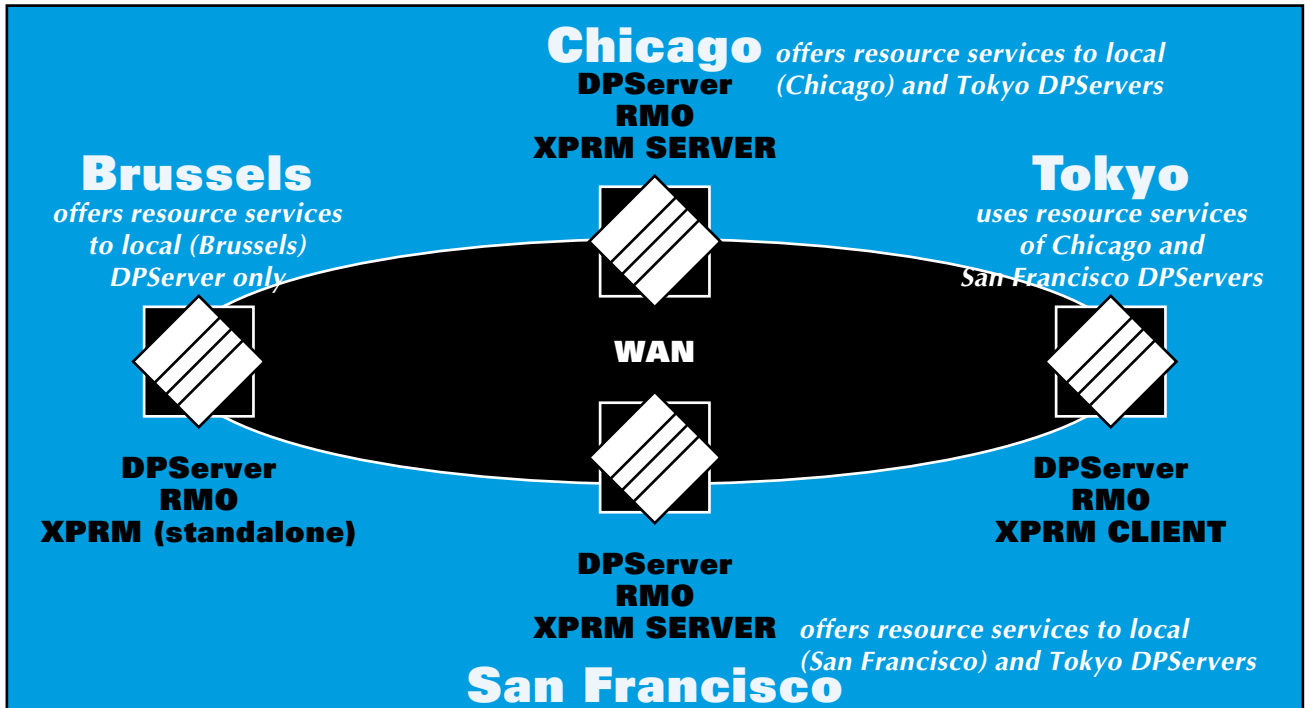
As a server, XPRM resources and management services are open to any XPRM client that has been defined and assigned permissions at the server. A client can be the "local" DPServer software, a remote DPServer with XPRM installed as a client, or the Xerox Resource Transform utility.

As a client, XPRM simply redirects resource requests to an XPRM server. Resource verification, resource distribution, and all other resource management functions are still available to XPRM clients, but XPRM clients do not have an "on-board" resource database. This enables customers to control the number of resource databases in existence, yet gain all the advantages of multiple, interconnected DPServers. While XPRM clients can make requests from any XPRM server (providing permissions have been defined), requests can be made to only one server at a time.

Please note that XPRM/NFSA can be used to load resources from an MVS mainframe to XPRM, whether in a client, server, or standalone configuration.

FIGURE 7.
Sample XPRM implementation.

To illustrate the relationship between XPRM standalone, XPRM server, and XPRM client, please examine the figure and scenarios below.



The DPServer located in Brussels has XPRM configured in the standalone mode. In this configuration, XPRM responds only to resource requests initiated from DPServer software running on the same RS/6000. Even though the servers in Chicago, Tokyo, and San Francisco are interconnected via WAN, they are unable to access the XPRM resource database on the Brussels DPServer.

The DPServer located in Chicago has XPRM configured as a server. All functions offered by the XPRM server in Chicago are available to any authorized XPRM client. In the above figure, services are open to DPServer on the same platform (Chicago) and to the XPRM client in Tokyo. Please note that neither the DPServers in Brussels nor San Francisco can access resource services of the Chicago XPRM server. Only the "local" DPServer software and XPRM clients can access XPRM server functions.

The DPServer located in San Francisco also has XPRM configured as a server, opening resource services to the local (San Francisco) DPServer and to the XPRM client in Tokyo.

The XPRM client in Tokyo can access the XPRM servers in Chicago and San Francisco, but not simultaneously.

If you are a customer who has only one DPServer, then you should choose to install XPRM in the standalone configuration. However, if you have multiple DPServers, you will likely wish to minimize the number of resource databases to avoid unnecessary duplication and to simplify resource tracking and version control. Hence, you should choose to install XPRM in the client configuration for additional DPServers.

How do I manage and control resource distribution?

The Resource Management Option promotes version control through a centralized resource database, and simplifies the task of distributing resources to enterprise printers attached to DPSEver. Managing resources can be performed automatically, manually, or by using a combination of both techniques. Each strategy offers different advantages. The strategy you choose should be based on your site performance goals and operational objectives.

Whichever method you choose to implement, we encourage all customers to adhere to strict practices regarding resource management. Together with the Resource Management Option, establishing and following procedures related to updating and distributing resources to logical and physical printers will help you maintain a secure, controlled resource environment.

Automated Resource Acquisition and Distribution

If you choose, resources can be downloaded and distributed to your printers automatically on a job-by-job basis. Using this strategy, no user intervention is required. Key steps are discussed below. Please note that the following steps are true for both XPRM client and server implementations.

Determine resource requirements. When a job is received at DPSEver, the job content is scanned to identify all defined resources. This includes identifying resources that are listed within other resources, such as an image file referenced within a form. This function can be disabled if you choose.

Examine resource catalog. As explained earlier in this document, the **resource catalog** contains an inventory of all resources that reside on both logical and physical printers attached to the server. This list is consulted to quickly determine if a printer has the required resources.

Request missing resources from XPRM. Any resources that are referenced in the job but not available at the printer are requested from XPRM (either locally or from XPRM server on another platform).

Acquire resources and provide to DPSEver for the IBM RS/6000. XPRM searches the XPRM database for the requested resources. If found, the resources are passed to DPSEver for the IBM RS/6000. If not found, XPRM sends notification that the resources could not be located.

Download resources and update resource catalog. DPSEver for the IBM RS/6000 downloads the resources and updates the printer's resource catalog accordingly.

Release job for printing. DPSEver for the IBM RS/6000 releases the job to the printer for printing.

The advantages associated with automated resource distribution are reduced staff workload and greater assurance that jobs will be printed without interruption whenever possible. If all the resources for your applications are contained in the XPRM database or other valid location, no operator intervention is required. However, the cost associated with automated resource downloading may be reduced printer throughput, as server processing time is required to scan data streams and retrieve resources.

Manual Resource Acquisition and Distribution

Resource management functions can also be performed manually through DPServer's graphical user interface. Downloading and distributing resources is quite simple and straightforward. The process is described below.

Identify resources to download. Select the resources you wish to download.

Identify logical printer(s). Downloading resources to logical printers is an efficient way to distribute resources to physical printers. Instead of performing multiple operations for each individual printer, you only perform one operation for each logical printer group. This ensures that the selected resources will be available to all physical printers within the same logical group.

Confirm selection. By clicking a button, the request to download resources is executed and all selected resources are distributed to your printers.

The advantages associated with manual resource distribution are improved printing efficiency and printer throughput. Printing is more efficient and throughput may be higher because processing time to scan the print data stream is eliminated.

Logical Resource Groups

An additional feature associated with all XPRM resources is the **logical group attribute**. This attribute is available for all XPRM resources and allows you to create groups to organize and locate resources. For example, you can create a logical group called TRAVEL, which may be composed of an itinerary form (ITN.FRM), the corporate logo of a travel agency (FLY.LGO), and a company graphic (GLOBE.IMG). When downloading resources, only the logical group need be specified. Again, XPRM is designed to save time and increase staff and site productivity through intelligent solutions.

FIGURE 8. Use the logical group attribute to organize multiple printer resources by a single name.



Combined Manual and Automated Resource Acquisition and Distribution

Most sites will likely gain the most benefit from using a combination of both automated and manual techniques.

For example, when installing and customizing the Resource Management Option and configuring the XPRM database, it may be more efficient to distribute resources manually according to the requirements of your applications and the capabilities of your logical printers. This will avoid throughput delays to acquire and download resources for every job. You should consider first using the resource database services to distribute resources to printers, then take advantage of the automated capabilities for those instances where resources may be new or newly updated.

How do I control security?

DPServer for the IBM RS/6000 offers four levels of security, as described below. Each security level allows access to a specific set of functions most likely required by a specific type of user. You may change the functions associated with each security level to better customize access based on your needs and site requirements.

Minimum privileges allow users to monitor DPServer operations and access most informational displays. System status, job management, and printer management are examples of screens that may be displayed. This level of security does not permit any command execution.

Operator privileges allow users to access all non-configurable displays. Non-configurable displays provide system status and information, and allow control of printing-related functions such as holding, releasing, or reprinting jobs, downloading resources to logical printers, and so on.

Administrator privileges provide access to configurable displays. Tasks that can be performed include configuring communications, adding and deleting logical printers, viewing or changing accounting triggers, adding queues, and so on.

Security manager privileges allow users to add, change, or delete DPServer users, and change the security level associated with specific functions.

Does DPServer support archiving and viewing solutions?

Yes. DPServer offers choice and flexibility in supporting your archiving and viewing strategy by making print files available to your solutions at the server. This allows you to select the most appropriate archiving and viewing product and platform for your site.

Archiving Options

DPServer offers both temporary and long-term storage options for your print files. Each is described below.

Temporary Print File Retention at the Server

DPServer offers temporary job storage by automatically retaining all print files at the server. The retention time is defined by you. This feature can be used to reprint documents quickly and easily without re-running the application on the mainframe.

Long-term Archiving

Many third-party solutions are available to provide long-term storage of documents and print files. DPServer supports these archiving products by writing print files in their original format to an RS/6000 directory. The files may then be accessed, indexed, and stored to the appropriate device by the archiving product.

If your print files contain only references to resources, not the resources themselves, you need to consult your archiving vendor to determine the best method to download resources to the archiving database.

Viewing Options

As many production documents are dynamically created as a result of database transactions being merged with electronic forms and fonts, a "source document" as such does not exist. It only exists for that brief moment when it is being transferred to paper. Viewing solutions extend the life of dynamic documents by allowing customers to view print data as electronic documents.

DPServer supports viewing products in the same way archiving products are supported. DPServer writes the print file to a directory on the server. The print file may then be accessed by your viewing product. Xerox is available to work with you and your viewing vendor to implement viewing of jobs processed by DPServer.

Installation and Maintenance

This chapter provides answers to the questions listed below.

What are the system requirements for installation?

What are the printer and device requirements?

How is DPServer installed?

What support is available?

What are the system requirements for installation?

The system requirements for DPServer vary based on supported clients, application complexity, and network performance demands.

DPServer Client and Server Requirements

To obtain the most current information possible, please contact your Xerox representative for DPServer client and server requirements.

Remote Console Requirements

The only requirements for a remote console are that it support X-Windows and OSF/Motif. Required memory will vary according to the platform you select and the number of user interfaces you wish to display at any given time. Please contact your Xerox representative for assistance when configuring a remote console.

Command-line Window Requirements

To display the printer's command-line interface at the server, the printer console must be connected to the RS/6000 via an RS232 cable. If you plan to connect to either a 4135, 4635, or 4635MX printer, special considerations may apply. Please contact your Xerox representative for further details.

What are the printer and device requirements?

The list of supported devices is continually being expanded. Again, to provide the most current information possible, all supported device requirements may be found on the DPServer home page at <http://www.xerox.com/print/products/dpserver>.

How is DPServer installed?

Installing XPSC-MVS on an MVS Mainframe

XPSC-MVS is easily installed using SMP/E and is available on 6250 bpi tapes or 3480 cartridges. Installing XPSC-MVS does not modify MVS or JES. The XPSC-MVS user manual provides a step-by-step guide to installing and implementing the product, and contains the JCL files for all required operations. Below is an outline of major installation steps.

Step 1. SMP/E installation of XPSC-MVS.

Download XPSC-MVS libraries and install using SMP/E.

Step 2. Customize system and install user mods.

Prepare the operating system, install JES offset table usermod, select initialization parameters, create connection profiles, define XPSC-MVS capabilities, and prepare the network.

Step 3. Define XPSC-MVS and printers to JES.

Define XPSC-MVS and each "printer connection" between XPSC-MVS and DPServer for the IBM RS/6000 as a functional subsystem to JES.

Step 4. Setup initialization parameters.

Define or override initialization parameters for XPSC-MVS.

Step 5. Setup up connection profiles.

Define "conversation paths" between XPSC-MVS and the appropriate DPServer. Multiple paths can be defined to enable concurrent job transmissions.

Step 6. Install user exits (optional).

Install eight exits that are provided with XPSC-MVS.

Step 7. Perform IVP.

Verify successful installation by executing jobs supplied with the installation media.

Installing XPRM/NFSA on an MVS Mainframe

XPRM/NFSA is installed using SMP/E and is available on 6250 bpi tapes or 3480 cartridges. Below is a summary of main installation tasks.

Step 1. Offload installation library to host.

Step 2. Setup and execute Stage 1 jobs.

Step 3. Generate Stage 2 jobs.

Step 4. Customize XPRM/NFSA.

Step 5. Perform IVP.

Installing DPServer and DPServer Options on an IBM RS/6000

Installing DPServer for the IBM RS/6000 and DPServer-resident options is easily performed. Installation procedures are detailed in each product's installation and user guide.

Step 1. Install the IBM RS/6000.

Install and configure the RS/6000. Tasks include customizing the operating environment (verifying and allocating memory), adding a Token Ring or SDLC data link control, and defining a Token Ring address (only if Token Ring is installed).

Step 2. Install DPServer for the IBM RS/6000.

Install DPServer for the IBM RS/6000 by responding to prompts and making selections from a menu of items.

Step 3. Configure communications.

Define the communication links between DPServer clients and the server. At this point, you may also define security requirements for DPServer client access.

Step 4. Configure system-wide parameters.

Define system-wide parameters to tailor DPServer operation to your particular needs. Processing time limits, resource checking limits, and communications limits are some examples.

Step 5. Configure Xerox printers.

Configure Xerox printers simply by attaching them to the RS/6000 and selecting from a variety of printer configuration options displayed on the DPServer graphical user interface.

Step 6. Configure logical printers.

Set up logical printers. Logical printers are "groups" of printers (defined by you) that can print similar jobs, store common resources, accept common data streams, and so on. To create logical printers, simply create a group name, then add the physical printers to the group.

Step 7. Perform system checkout.

Verify successful installation by executing jobs supplied on the installation media.

Step 8. Install DPServer options.

Install any of the following DPServer options via on-screen prompts:

- Resource Management Option
- Xerox Print Transform Manager
- Accounting Option
- Xerox Print Readiness Execution Program

What support is available?

Xerox provides a suite of services and support solutions to meet a variety of needs.

Integration and implementation services are available. If you choose, Xerox will install and implement DPServer for your site. You can count on Xerox to provide fast and complete service to give your applications the fastest and fullest access to Xerox open document services and Xerox printer functions.

Consulting and planning services are available for both pre- and post-product integration. You can rely on the unparalleled expertise of Xerox consultants to assist you in planning for product integration, or in customizing and tailoring DPServer when your needs change.

Customer training is available to provide your staff with a thorough knowledge of product operation and customization techniques.

The Customer Support Center hot line is available to answer questions related to DPServer and your Xerox printing systems. From installation to application development, Xerox technical support analysts are expert in supporting Xerox products in a multi-platform, network environment.

Appendix A: Questions and Answers

The questions contained in this section were compiled when working with customers who implemented DPSServer. Although not comprehensive, we hope this list of questions is of value to you and answers some preliminary questions about DPSServer.

Supported Client Environments

Beyond MVS, are any other client environments fully supported?

A "fully-supported" client has access to all DPSServer capabilities including bi-directional communication with the server, print job management, receipt of accounting data, and other advanced features. While job submission capabilities are supported for many environments, only MVS environments are considered to be fully supported at this time. A sample of the currently supported client environments may be found in Table 1 on page 18.

When will other client environments be fully supported?

Xerox is working to add full support for other environments. Contact your Xerox representative for the latest information.

Remotely Controlling Servers

Can I control DPSServer from a remote location?

Yes. A remote console offers the ability to replicate the graphical user interface of DPSServer on any network device that supports X-Windows and OSF/Motif, such as an X-Windows terminal, a UNIX workstation, or a PC. Using a remote console, an operator has access to all DPSServer features and functions, and can display the user interface of multiple DPSServers simultaneously.

How many remote consoles may I have?

There is no limit to the number of remote consoles supported by DPSServer.

Are there any special requirements for a remote console?

The only requirements are that the console support X-Windows and OSF/Motif.

Routing Jobs

Can jobs be routed from multiple MVS partitions to DPServer?

Yes. There are two basic approaches for routing jobs from multiple partitions to DPServer. One solution is to utilize a shared-DASD/shared-spool for all your partitions. In essence, all partitions would send print jobs to a single spool where they would be acquired by XPSC-MVS, then sent to the server. Another solution would be to install a channel-to-Token-Ring interface for each partition. This would allow each partition to interface directly with DPServer, and other DPServer clients as well.

Can print jobs be re-routed between DPServers?

Currently, no. DPServer does not have the capability to automatically re-route print jobs to other DPServers.

Can print jobs on one DPServer be directed to a device on another server?

Jobs queued on DPServer can be manually rerouted to other DPServers.

Printing Performance

Will I experience bottle necks when printing over Token Ring versus printing over a traditional channel connection?

No, at least not due to connectivity limitations. Token Ring networks pass data at a rate of approximately 16 Mb per second, as compared to channel throughput of 0.5 Mb per second. Token Ring networks allow you to process more print data to more printers while maintaining high printer throughput levels.

Can DPServer keep my printers running at rated speed?

Yes. However, running at rated speed is based on a number of conditions, including network band width, job complexity, and availability of required resources at the printer.

What are some things I can do to promote printer throughput?

When possible, store graphics directly on the printer or at the server. Sending graphic- and image-intensive jobs over a network can decrease network performance.

DPServer Requirements and Restrictions

Are there any other "requirements" which are not mandatory, but are highly recommended?

Yes. A tape backup system is strongly recommended. You may wish to consider either an 8mm unit which allows storage of up to 5 Gb of data per tape, or a 1.4" cartridge unit that holds up to 1 Gb per tape.

If your DPServer is to support Ethernet, your RS/6000 must have more than 4 slots, as DPServer for the IBM RS/6000 requires 4 card slots (video card, Token Ring card, multi-protocol adapter, and S/370 channel card). Alternatively, the Ethernet could be connected to the Token Ring via an external router, which does not require an extra card slot.

Are there any limitations to queue size or number of queues per DPServer?

No. DPServer imposes no limit on queue size or number of queues, and is only limited by the amount of installed memory/disk.

Printer-to-Server Connectivity

How are printers connected to DPServer?

DPServer supports channel connectivity for Xerox metacode printers, and network connectivity for both Xerox and third-party printers. Printers directly attached to the network must have the appropriate network interface card and do not support 2-way communication with DPServer.

Can both Xerox and non-Xerox printers be daisy-chained to an RS/6000 channel card?

No. DPServer supports only Xerox printers daisy-chained to an RS/6000 channel card.

How many Xerox printers can DPServer support?

Each channel card supports up to four printers. The total number of printers that can be supported by DPServer is dependent on the number of available card slots in the RS/6000.

What is the maximum distance allowed between a DPServer and a Xerox printer?

The maximum distance between a DPServer and the last Xerox printer in a chain is 200 feet.

XPRM and Printer Resources

Can resources be obtained from a remote server during job processing?

Yes. XPRM may be installed as a "client," offering resource services to locally-processed jobs, but the actual resources would be retrieved from a remote XPRM database.

What type of database manager does XPRM employ?

The underlying database engine used in XPRM is Empress, an industry-standard SQL database. Empress is pre-packaged with XPRM, is not visible to the user, and can only be accessed by XPRM.

Can XPRM utilize "jukebox" databases, or must all resources be resident on the RS/6000 hard disk?

XPRM will support any type of storage device that is supported by the AIX operating system, including tape jukebox systems, disk arrays, and optical jukebox systems.

Data Stream Support

What data streams may be printed using DPSTserver?

Please refer to the table located on page 18 for complete data stream support information.

Miscellaneous

Can DPSTserver print queues store information in a compressed format?

No. Print queue data is stored uncompressed.

Can DPSTserver and Entire run concurrently on a 4890?

Both DPSTserver and Entire can be concurrently connected to a 4890 (running V5.0 printer software). However, only one of the two devices may be active at one time.

Glossary

Accounting Option	The server-resident component that compiles statistics related to host, server, and printer performance.
Advanced Function Presentation (AFP)	An IBM architecture that enables documents to be presented in a variety of ways, including printed documents.
centralized printer	see production printer
checkpoint restart	A capability whereby checks are taken at predefined intervals (for example, every 100 pages, or every 2 minutes) during transmission of a data stream to a server. In the event of a system crash or a transmission failure, data transmission is resumed from the point at which the last check was taken.
client	A software component residing on one computer that makes requests to server software running on another computer. Also used in this guide to refer to systems that make requests of DPServer.
client/server architecture	An architecture that distributes software functions and services between two computers.
client/server solutions	Open document services offered by Xerox that enable intelligent document delivery, printing, and management between a client and a remote server.
configurator file	An X-PREP file that invokes specific printer and document formatting functions based on data in the job stream.
conversation	An exchange of information between DPServer client software and DPServer software. Uploading SMF records from DPServer to XPSC-MVS is an example of a conversation.
data stream	The content of a job transmission (or stream of data) between the computer and printer. Data streams can be in various formats, including line mode, DJDE, XES, PostScript, and PCL.
decentralized printer	see distributed printer
distributed printer	A low-volume printer that is generally remotely-attached to the host.
document formatting	Defining the visual structure and components of a document.
DocuPrintServer (DPServer)	The collection of client-resident and server-resident software components that enable users to print and manage documents at a remote site. Also used throughout this document to refer to an RS/6000 running DPServer for the IBM RS/6000.
DocuPrintServer for the IBM RS/6000 (DPServer for the IBM RS/6000)	The server-resident component of DPServer that communicates with DPServer clients to accept jobs for printing and provides extensive job and printer control capabilities at the server.

DPServer	see DocuPrintServer and DocuPrintServer for the IBM RS/6000
DPServer for the IBM RS/6000	see DocuPrintServer for the IBM RS/6000
Dynamic Job Descriptor Entry (DJDE)	A Xerox control statement within a document that dynamically overrides or changes existing control statements or parameters which specify how a document should be printed on a Xerox printer. These specifications include forms and image merging, font selection, bin switching, report offsetting, and file downloading.
font	A type of resource. A set of printing characters that have common characteristics such as style, width, height, and weight.
form	A type of resource. An electronically composed arrangement of predefined lines, boxes, text, logos, and embedded text that may be printed as is or merged with data during the printing process.
functional sub-system (FSS)	An address space that communicates with JES to drive devices unsupported by JES.
graphic	see image
host environment	Used by Xerox to mean a mainframe computer environment.
IBM RISC System 6000 workstation	The platform on which DPServer software operates.
image	A type of resource. A file format for printing graphic images on Xerox production printers.
library	Defined areas internal and external to a software product that are used to store resources, files, and programs.
line mode documents	Documents that do not contain any formatting instructions with the exception of carriage control characters.
logical group attribute	A resource attribute that is used to group multiple printer resources by a single, common group identifier.
logical printer	Named group of physical printers capable of processing the same types of jobs. DPServer uses logical printers to manage physical printers.
logo	Logotype used to print large (up to two-inch square) regions with a fixed pattern. Logos are often small illustrations or designs typically used to identify a company.
LU 6.2 communications protocol	A protocol used between DPServer client and server software to enable two-way, parallel communications over an SNA connection.
master printer console	A DPServer feature that enables control of multiple Xerox printers from a single console.
master resource	A production resource stored in the server-resident XPRM database.

metacode	Control codes used by Xerox production printers to control the internal functions of their imaging systems and provide all-points-addressability. Functions such as font selection, print orientation selection, and character positioning are controlled by metacodes. Metacodes may be created and inserted into the print data stream, either by the printer when formatting data for printing or by application programs when formatting the print data stream.
network	An implementation of computing, communications, and application devices and software to enable remote, interconnected communications.
non-master resource	A resource that can be accessed by XPRM, but is stored outside the XPRM database.
OSF/Motif[®]	An industry-standard graphical user interface for UNIX platforms.
PCL	Printer Control Language. A widely used printer control language.
PDL	Print Description Language. Language used to describe printing jobs to a Xerox laser printer. PDL describes the input (type, format, characteristics), performs the processing functions, and describes the output (type, format, font selection, and accounting options).
PDS	Partitioned Data Set. Data set in direct storage that is divided into partitions, called members. Each member can contain data, a program, or part of a program.
physical printer	An individual printer, as opposed to a logical printer.
PostScript	A widely-used printer control language.
print server	A network server that provides printing services to other members of a network environment, and allows job control at the server. DPServer running on an RS/6000 is an example of an intelligent print server.
printer resource	A library member, a sequential data set, or a printer-resident file that is needed to print a data stream on a printer. Forms, fonts, images, and logos are examples of resources.
production printer	A high-volume printer.
recursive resource checking	A Resource Management Option feature that identifies resources that are referenced within other resources, e.g., a logo within a .FRM file.
remote console	An X-windows terminal that can display the graphical user interface of one or more DPServers. A remote console can be network- or direct-connected to DPServer.
remote print server	A print server that is physically connected to a host computer via telecommunications lines.
resource	see printer resource
resource catalog	A server-resident file containing an inventory of all resources that are available on physical and logical printers attached to DPServer.

resource database	A centralized database containing electronic printer resources. XPRM contains a centralized resource database that is controlled and managed from the server.
resource management	The ability to control the distribution and manipulation of printer resources among libraries and printers.
Resource Management Option	An option that enables server based control and storage of electronic printer resources, automated resource checking and verification capabilities, and automated acquisition of resources stored on the server, MVS host, or RS/6000 workstation. This option includes XPRM/NFSA and XPRM.
RS/6000	see IBM RISC System 6000 workstation
server	A network device that provides services to other members of a network. File servers, mail servers, and print servers are examples of servers.
SYSOUT jobs	Print jobs that do not require conditioning before printing. Commonly referred to as "SYSOUT data stream" although not truly a data stream.
VIPP	Xerox Variable Data Intelligent PostScript PrintWare (formerly Xerox Generic Format). An intelligent multi-function data stream that enables VIPP-native and line-data applications to be printed on PostScript printers.
workload balancing	A DPServer feature that automatically schedules queued jobs to server-attached printers based on printer availability.
Xerox Print Readiness Execution Program (X-PREP)	A server-resident DPServer option that automatically creates and inserts DJDE commands into data streams to control document formatting and printer actions.
Xerox Print Resources Manager for the IBM MVS Native File System Access (XPRM/NFSA)	The MVS host-resident component of DPServer that acquires printer resources from host-resident PDS libraries.
Xerox Print Resources Manager for the IBM RS/6000 (XPRM)	The server-resident component of DPServer that contains a centralized resource database and services for accessing database functions.
Xerox Print Services Client for MVS Hosts (XPSC-MVS)	The MVS host-resident component of DPServer that acquires print jobs from JES, accepts resources from XPRM/NFSA (if installed), and accepts SMF records from the print server.
Xerox Print Services Manager (XPSM)	An earlier version of DocuPrintServer.
Xerox Print Transform Manager (XPTM)	A server-resident DPServer option that transforms data streams into device-compatible formats.
Xerox printer operating system	The operating system software of a Xerox printer that controls all on-board processes, and provides to DPServer the necessary functions to enable two-way communications, automated printing, resource downloading, and accounting.

Xerox Resource Transform (XRT)	A software application that runs on Windows 95 and Windows NT workstations that converts Xerox-formatted fonts and logos into a PCL5 format.
Xerox Tape Resource Manager (XTRM)	An optional component of XPRM/NFSA that reads printer resource backup tapes mounted on an MVS host, and writes resources as members on an MVS PDS.
Xerox Windows to Xerox Meta (XWXM)	A Windows print driver that converts Windows print command sequences into a metacode data stream, enabling PC users to submit jobs to Xerox metacode production printers via DPSTServer.
XPAF Client	The MVS host-resident component of DPSTServer for customers who have installed the Xerox Printer Access Facility.
X-PREP	see Xerox Print Readiness Execution Program
XPRM	see Xerox Print Resources Manager for the IBM RS/6000
XPRM/NFSA	see Xerox Print Resources Manager for the IBM MVS Native File System Access
XPSC-MVS	see Xerox Print Services Client for MVS Hosts
XPSM	see Xerox Print Services Manager
XPTM	see Xerox Print Transform Manager
XRT	see Xerox Resource Transform
XTRM	see Xerox Tape Resource Manager
XWXM	see Xerox Windows to Xerox Meta

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