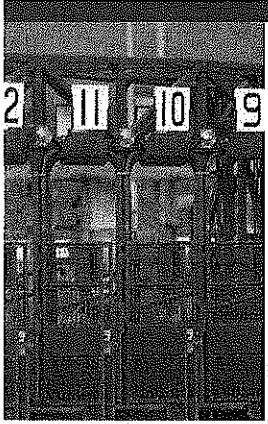


Integrated. Workflow. Results.

"WebCRD is the best system available. It is doing everything we want it to do, and more."



PRINT CENTER CHALLENGES

Enterprises must increase centralized printing to reduce costs and improve accounting.

As more jobs enter the print center, more logistical challenges arise.

Customers demand 100% document fidelity, reliable ticketing, and status updates.

Delivered jobs don't always meet expectations because of inaccurate job tickets, missing fonts, and document reflow.

Print Centers need to increase efficiency and automate repetitive tasks.

Operators spend too much time interpreting and re-entering ticketing information, responding to customer phone calls and emails, and not enough time on higher value tasks.

Imagine:

- No more lost, incorrect, or illegible job tickets
- No emailed jobs bouncing because of large attachments
- Getting work done instead of answering status phone calls
- A fully automated print center

"Control over ordering has increased, fulfillment has been accelerated, and inventory control has been simplified."

WebCRD... a proven enterprise portal to the print center

WebCRD from RSA is a powerful, Web-based tool that automates job submission to the print center, resulting in precise, thorough, and flawless print instructions—each and every time. Users are guided through the submission process with highly intuitive, pre-populated instruction fields. Jobs are then automatically submitted directly to the print center along with a complete job ticket. Operators can print, finish, and deliver jobs without having to track down any information.

More than a storefront

- Unlike a storefront, which simply accepts orders, WebCRD ensures the order is correct before it ever reaches the print center.
- Pictograms help users view finishing options.
- Approval authority allows organizations to control printing cost and content.
- Production views separate jobs by production stage, with pictograms for at-a-glance order information.
- Online catalogs can contain non-print items such as pens and mugs.
- WebCRD remembers a user's history and offers reprints and job template presets for common ticketing choices.

WebCRD delivers on the promise of a fully automated print center

With WebCRD, print centers define precisely what capabilities are presented to end users. Intelligent Printing Options™ ensure only legitimate ticketing options are offered with support for rules-based ticketing (i.e. staple 2-40 pages only). Once a job is submitted via WebCRD, it can automatically route to the correct production printer that supports the ticketing options requested via AutoFlow™.

Demand 100% Adobe PDF... the thoroughbred print driver



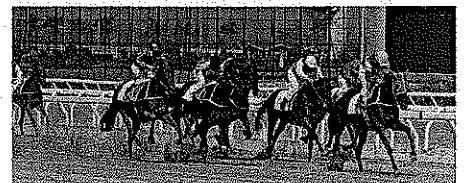
Unlike knockoff PDF drivers from other Web-to-Print storefronts, WebCRD's SurePDF™ uses Adobe® PDF JobReady™ to ensure 100% document fidelity. The print center defines settings such as font embedding and color management so end users cannot make mistakes. SurePDF ships with unlimited client licenses, so everyone enjoys perfect job fidelity.

Web to production print

WebCRD from RSA meets the needs of the most demanding print centers, driving production printers via JDF or the printer's own job ticketing language. Whether the need is integration with a corporate document repository, accounting to six decimal places of precision, or real-time authentication with LDAP and Active Directory, WebCRD fits right in with enterprises, large and small. And because multiple sites and multiple languages are supported, WebCRD is the ideal solution to grow with your operation.

Break away from the pack

Visit www.rocsoft.com for a Flash Demo of WebCRD or contact your production printer vendor for a live demonstration.



"Opening a business is more than hanging up a shingle. And opening a Portal to our Print Center was more than putting up a storefront. RSA's workflow experts worked closely with our IT department to ensure a smooth rollout."



Comprehensive ticketing... fastest submit in the industry!

WebCRD
Portal - Production - Administrator - Group - Help - Logout

Place an Order (Unsubmitted)
Change any of the options, then click SUBMIT, or Save Order to save changes.

Order Information
Order # 320 Order name WebCRD Success Story

Printing Options
Item: SuccessStory.pdf Pages 2 Web Print

Proof Request: Online Online proof will not affect Finishing Options

Save In: Brochures

Presets: A B C /

Color: Paper stock: Heavy 65 White Orientation: Portrait

Output: Color Plex: Two Sided

Recipients
Add Another Recipient Add Remove Print Cancel

Total Recipients: 100 Due Date: 09/21/2007 Time: Noon

Operators see a complete view of all jobs, at-a-glance

WebCRD
Production Portal - Dashboard - Production - Administrator - From Order - Help - Logout

Orders in Pre-Production

Order number	Last Name	Start date	End date	Days	Prod	CPDF	CPDF	CPDF	CPDF
<input type="checkbox"/> Unsubmitted	<input type="checkbox"/> Pending Approval	<input type="checkbox"/> Received	<input type="checkbox"/> Show On hold						
<input type="checkbox"/> Make ready	<input type="checkbox"/> Production	<input type="checkbox"/> All							
<input type="checkbox"/> Order (SORT)	<input type="checkbox"/> Cust (SORT)	<input type="checkbox"/> Due Date (T)	<input type="checkbox"/> Cou						
101	Dave Variable	Overdue: 4 hours	RUSH	D 1					
296	Marsha Beatty	Today: 8 hours		D 1					
301	Rebecca Morris	Today: 13 hours		D 1					
302	Dave Variable	Today: 19 hours		D 1					
251	Dave Variable	Next day: 26 hours	RUSH	D 1					
227	Hon Brooks	Next day: 36 hours	RUSH	D 1					
360	Anthony Leccese	Next day: 43 hours		D 1	R 1				
361	Anthony Leccese	Next day: 43 hours	RUSH	D 1	R 1				
362	Anthony Leccese	Next day: 43 hours		D 1	R 1	11			
368	Rebecca Morris	Next day: 62 hours		D 1	R 1	11			

(1 - 10 of 24) (11-20)

Track use of supplies with Production Dashboard

WebCRD
Production Portal - Dashboard - Production - Administrator - From Order - Help - Logout

Dashboard

Select filter criteria and columns to group by, and click Enter.

Received Make ready Assigned Printed

Started Printing Online Finishing Ready to Ship

All

Printer Type: Color Paper Stock: All Print queue: All Insp: 5"

Type	Stock	Due Date	Any	Jobs	Copies	Sheets
Total				9	341	374
Received				2	11	44
Color	Heavy 65 White	09/20/2007		1	10	40
Color	Heavy 65 White	09/28/2007		1	20	20
Make ready				1	110	110
Color	Business Card Stock	09/19/2007		4	170	170
Color	Standard 20	09/19/2007		1	10	10
Color	Standard 20	09/20/2007		1	30	30
Color	Heavy 65 White	09/22/2007		1	30	30
Color	Heavy 65 White	09/25/2007		1	30	30
Color	Heavy 65 White	09/27/2007		1	30	30
Printing				1	30	30
Color	Heavy 65 White	09/24/2007		1	30	30

"WebCRD has made the difference in our business. I don't know where we'd be without it!"

End users Win with WebCRD!

Adobe Client-Side PDF

Thanks to SurePDF™, based on Adobe® PDF JobReady™, documents no longer reflow or print incorrectly due to missing fonts or different versions of applications—from Windows or Mac.

Easy web upload

Users submit jobs from Macs, PCs, Linux, or UNIX systems. No more confusing FTP programs or bounced emails because attachments are too large. The job ticket is electronically coupled with the document itself, so there is no chance of misplacing information.

Single screen ticketing

Only valid ticketing options are presented, making job ordering a fast and easy process with no screen refreshes. WebCRD delivers the fastest submit in the industry!

Pictograms

A friendly, at-a-glance method for selecting finishing options takes the guesswork out of ordering. Text labels can even be changed depending on an organization's preference (i.e. "duplex" vs. "double sided").

Catalog ordering

Authorized users have access to customized catalogs of finished goods as well as print-on-demand documents.

Electronic job status

Users have access to Web and email status updates so they can see exactly where their jobs are without contacting the print center. Print center productivity increases exponentially.

MultiLingual support

Multiple languages are supported simultaneously by a single server and all text can be localized to suit any corporate environment. For example, different individuals from the same company can use WebCRD in English or French, based on their login and preferences.

Variable data templates

Users can easily "create" personalized sell sheets, postcards, business cards, and more using corporate approved templates. Variable data and personalized content can be leveraged to create 1-1 marketing applications.

"WebCRD's single-screen, WYSIWYG job ticket is slick—very well done and easy to use."

— Cary Sherburne, WhatTheyThink.com

Print centers love WebCRD!

Proven workflow

Getting the order into production is only half the job. Driving through production efficiently is critical to your success. The proven WebCRD software, the reliable sun platform, and RSA's support team ensure that the print center functions at its full potential.

Electronic ticketing with JDF support

RSA has been driving production printers automatically for over 20 years and we are experts at simplifying and streamlining even the most unique and complex environments.

Intelligent printing options

WebCRD ensures jobs arrive with valid ticketing specifications. The print center specifies which options are permitted, such as stapling for documents with two to fifty pages and 3-hole punching into binders for jobs with 100-250 pages.

Print management

Most web-to-print solutions present long job lists. Operators must click each order on the list to see its contents. With RSA, production pictograms display job information at-a-glance. Print production queues ensure effective management of the entire production facility so jobs are delivered on time.

Finish strong with AutoFlow™

A powerful rules engine evaluates user-specified ticketing options to automatically flow jobs directly to the printer. Operators do not have to re-enter ticket information, such as quantity, plex, paper, and finishing—saving time and eliminating potential mistakes. Operators are processing over 800 jobs a day. Only AutoFlow makes this possible!

Just-in-time fulfillment is a reality

Content owners are notified as inventory of both pre-printed and non-print items drop below defined thresholds. AutoStock™ automatically recommends reorders of desired items, ensuring a safe supply at all times.

Advanced job cost estimating

Business rules can be defined to enable volume discount schedules and multiple rate sheets can be used to set lower prices for preferred customers.

Enterprises Win with WebCRD!

Enterprise-class portal to the print center

WebCRD is built for the enterprise—secure, scalable, reliable, and ready to integrate smoothly with existing business systems and processes. As more jobs flow to the print center, the resulting increase in volume means greater efficiencies and lower costs.



Real-Time enterprise authentication

With support for LDAP and Active Directory logins, users only need one set of IDs and passwords. Enterprise standards are supported and another set of logins is not maintained, relieving the burden from IT departments.

HTTPS/SSL layer transmission

Encrypted document transfer and ticketing sessions are required for secure Internet transactions.

Approval Authority

Jobs are approved, rejected, or modified by designated approvers based on cost and content.

Variable data and template-based ordering

Compliance with branding and legal standards such as HIPAA and Sarbanes-Oxley is ensured when generating personalized sell sheets, postcards and business cards. Organizations create templates leveraging pre-approved content, logos, images, and fonts. Users personalize forms interactively via the WebCRD address book or using .CSV files for 1-1 marketing.

Reports

.CSV or XML files are extracted on demand or via external system calls for complete analysis, chargeback, and integration with enterprise business systems.

Credit cards

Secure ordering and payment before a single page is printed.

Customizable Login and Portal Pages

Create different login screens and welcome pages for different sites or groups of users. Portal pages can include links to frequent WebCRD functions such as business cards, or include external content such as stock reports, weather, and corporate information.

"With WebCRD, our print center is more effective and more accessible. Job submission is easier, turnaround is faster, and we can do the work more cost-effectively than sending it outside."

Integrated. Workflow. Results.

WebCRD™

SUBMIT

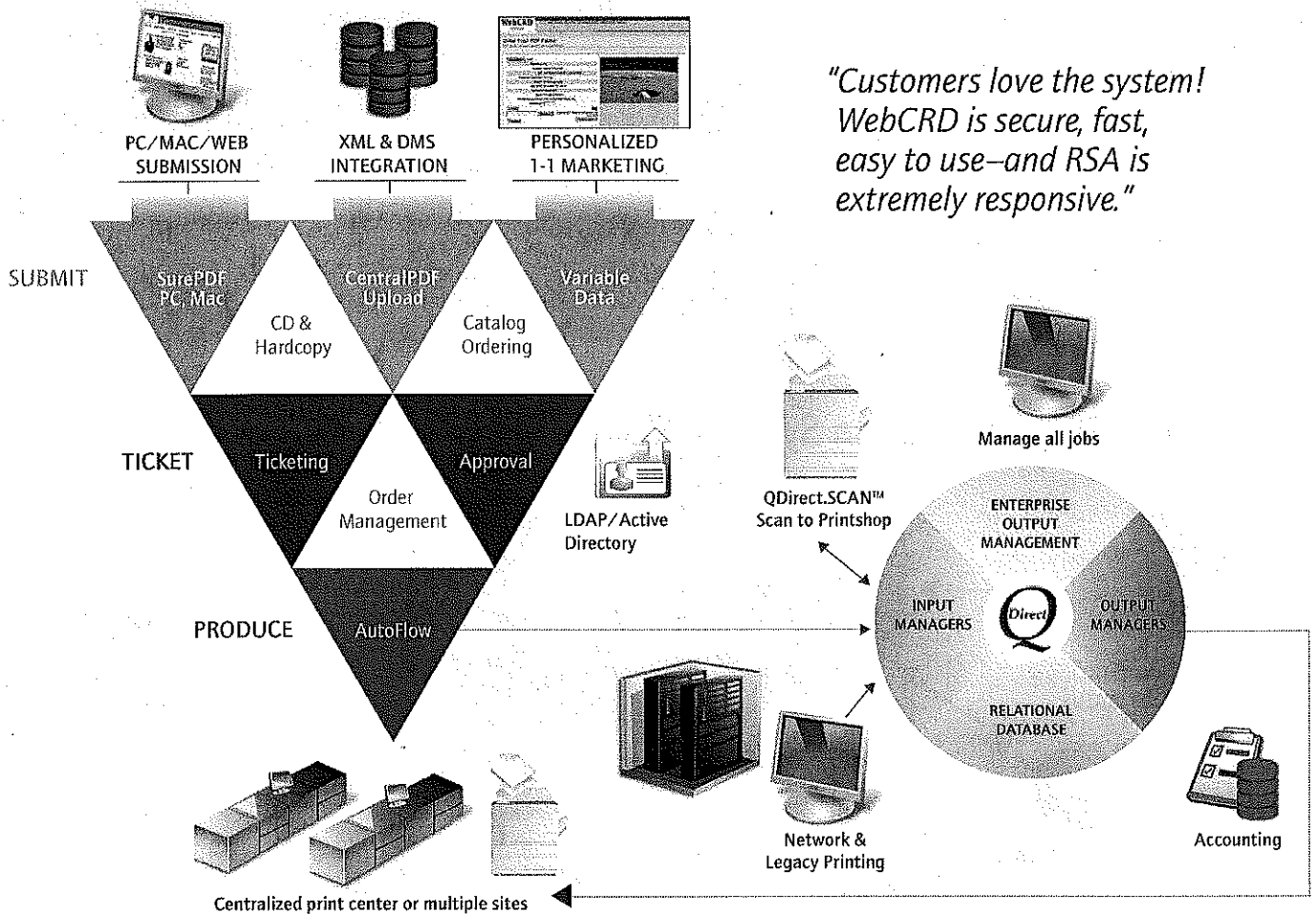
WebCRD modules and options

WebCRD is available in several configurations, from the affordable WebCRD Base to the powerful Enterprise System. Additional options, such as the SurePDF Print Driver, can be added as needed. Modular upgrades allow enterprises to improve operations immediately while ensuring the print center will never outgrow WebCRD.

Hardware platform specifications

Sun Server with RAID Level 1 Redundant Storage, pre-configured and installed at customer site, with scalability via multiple dual core X64 processors, more memory, and storage. Add RAID 5 or Business Continuity Disaster Recovery capabilities if your needs require. RSA's turnkey delivery minimizes IT involvement.

WebCRD WORKFLOW FOR SUBMISSION, TICKETING, AND PRODUCTION



*"Customers love the system!
WebCRD is secure, fast,
easy to use—and RSA is
extremely responsive."*

...ADD QDIRECT FOR ENTERPRISE OUTPUT MANAGEMENT



Rochester Software Associates, Inc.
Integrated. Workflow. Results.

69 Cascade Drive
Rochester, New York 14614
www.rocsoft.com

Phone 585.262.2690
Fax 585.262.4808
Email RSAinfo@rocsoft.com



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WebCRD™ modules

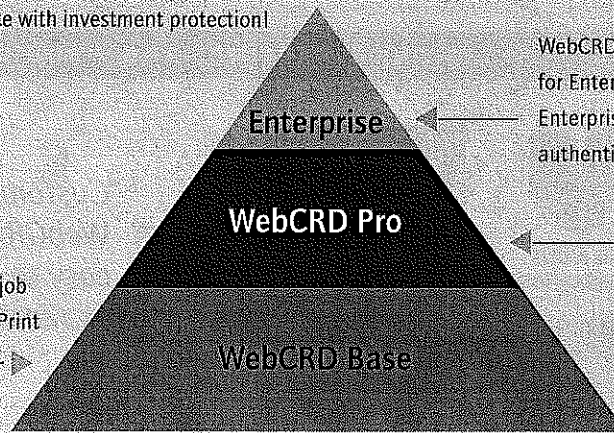
SUBMIT

With robust bundled solutions and modular options, WebCRD delivers everything customers need to submit jobs via the Web—in the manner that works best for your workflow. Choose WebCRD Enterprise System for a comprehensive bundled offering, or start out with WebCRD Base and add modules as needed. WebCRD is a solution that can grow with you!

RSA Makes it Easier™ ... to Afford the Best!

- Purchase the Best for Less, with new package pricing
- Cost-effective for any budget and fully upgradeable
 - Expand at your own pace with investment protection!

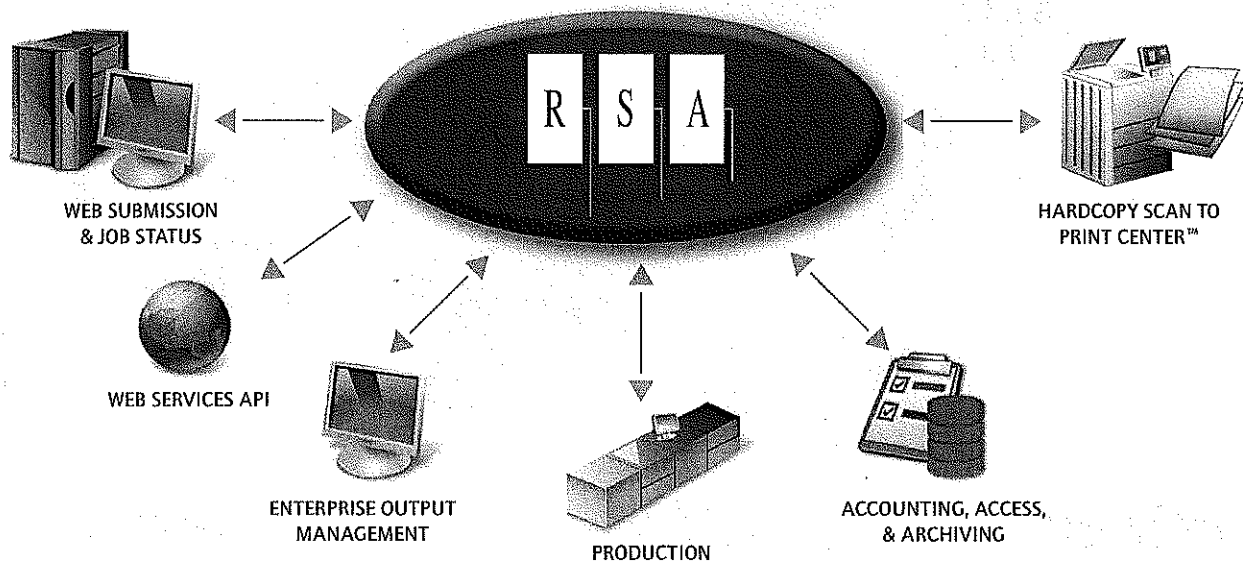
WebCRD Base offers full web-based job submission functionality with a File-Print Production workflow.



WebCRD Enterprise System adds QDirect for Enterprise Output Management and Enterprise Web Login (LDAP) for real-time authentication.

WebCRD Pro adds Auto Ticketing & AutoFlow™ for automated job ticketing to production printers and the Production Dashboard.

WebCRD Enterprise System: Web + Scan to Print Center™



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Rochester, New York 14614
www.rocsoft.com

Phone 585.262.2690
Fax 585.262.4808
Email RSAinfo@rocsoft.com

WebCRD™ modules

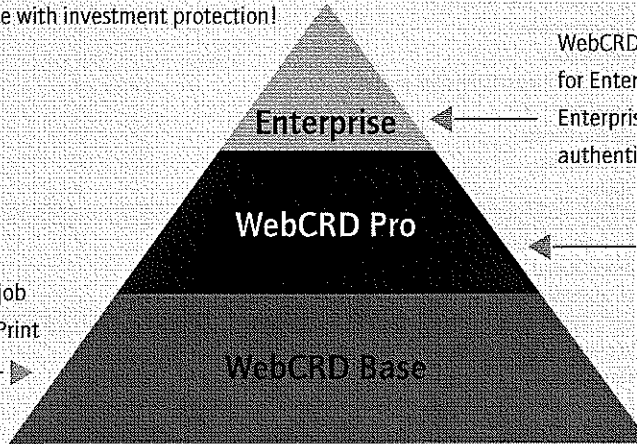
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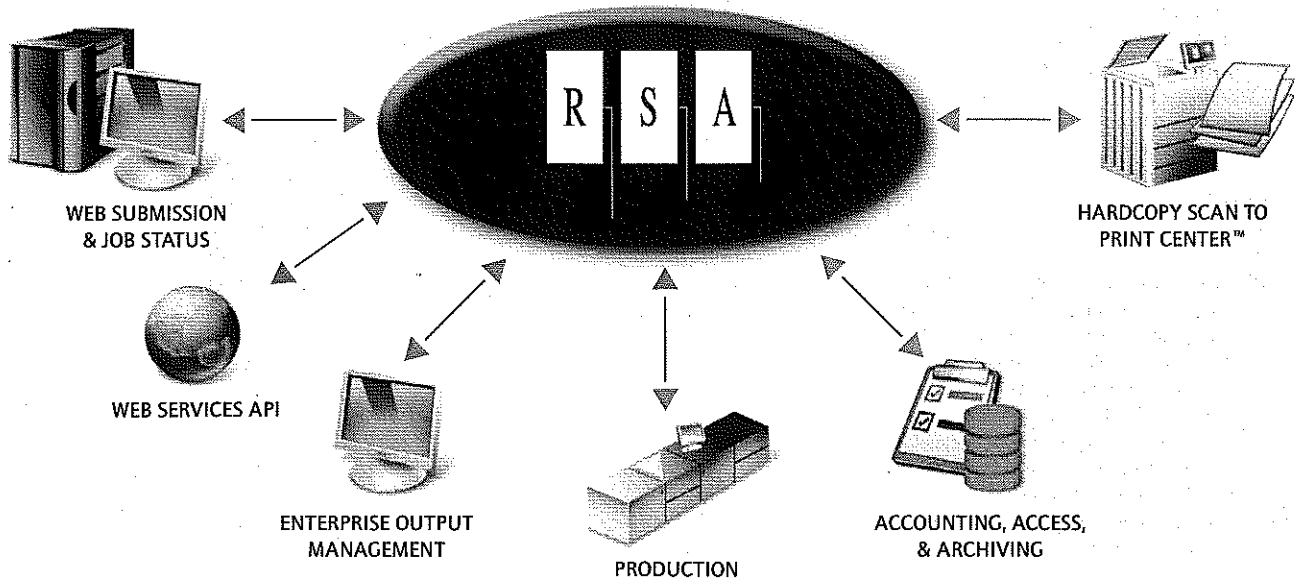
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WebCRD™ modules

SUBMIT

WebCRD modules and options

WebCRD is available in several configurations, from the affordable WebCRD Base to the powerful Enterprise System. Additional options, such as the SurePDF Print Driver, can be added as needed. Modular upgrades allow enterprises to improve operations immediately while ensuring the print center will never outgrow WebCRD.

Hardware platform specifications

Sun Server with RAID 1 Redundant Storage, pre-configured at RSA and installed at customer site. Scalability via additional dual core X64 processors, RAM, and storage. Add Business Continuity Disaster Recovery capabilities if needed.

WebCRD Highlights	WebCRD Base	WebCRD Pro	WebCRD Enterprise System
SUBMISSION FEATURES			
Web-based job submission and ticketing (fastest submit in the industry!)	✓	✓	✓
Fast, easy one-click reprints from personal or shared archives	✓	✓	✓
Intuitive pictograms to simplify complex ticketing choices	✓	✓	✓
Web and email job status notifications, reducing interruptions to the print center	✓	✓	✓
Support for both electronic and hardcopy order workflow	✓	✓	✓
Automated archiving for instant access to stored documents	✓	✓	✓
Integrated address book for expedited shipping and billing	✓	✓	✓
Form/Catalog Ordering of print and non-print items	✓	✓	✓
WORKGROUP FEATURES			
"Order on Behalf of" Proxy Ordering for CSRs and administrative assistants	✓	✓	✓
Approval Authority to approve/deny/modify orders based on cost or content	✓	✓	✓
Configurable Login and Portal pages to emulate customer's look and feel	✓	✓	✓
REPORTING FEATURES			
SSL support for secure ordering via customer-supplied digital certificate	✓	✓	✓
Complete chargeback information automatically compiled	✓	✓	✓
Trend analysis using production extract reports	✓	✓	✓
Reporting capabilities with Enterprise Integration via .CSV files	✓	✓	✓
Control information sharing via groups of authorized users	✓	✓	✓
PRODUCTION FEATURES			
File-Print Production Workflow for operator-based printing of jobs	✓	✓	✓
Auto-Ticketing Workflow automatically creates job ticket for destination printer	upgrade to Pro	✓	✓
Manage work at all production stages (Pre-, Makeready, Production, Post-)	upgrade to Pro	✓	✓
AutoFlow™ for Automated Distribution to Production Printers	upgrade to Pro	✓	✓
Two production printer definitions included (additional PDFs available)	upgrade to Pro	✓	✓
Production Dashboard for analysis of jobs and commodities	upgrade to Pro	✓	✓
ENTERPRISE FEATURES			
QDirect Enterprise Output Management for entire organization's printing	QDirect	QDirect	✓
Enterprise Web Login (LDAP, Active Directory)	LDAP	LDAP	✓
Java-based solution running on a turnkey high availability Sun/Solaris server	✓	✓	✓
Web services API capability for creating orders and querying for orders	✓	✓	✓
OPTIONAL MODULES			
		(add to any WebCRD configuration)	
Genuine Adobe PDF Print Driver with auto-upload workflow (unlimited client licenses)		SurePDF	
Server-based PDF conversion to support uploading of native files		CentralPDF	
Template Based Ordering for simple Adobe PDF Forms		TBO	
WebCRD Dynamics™, rules-based variable data integration, using forms designed with FusionPro™		Dynamics	
Job Cost Estimating for automatic estimates and pricing		JCE	
Advanced Job Cost Estimating including volume price plans, group pricing, discounts		AJCE	
DocuShare® Integration: order from DocuShare & authenticate WebCRD users via DocuShare		DocuShare	
SiteMinder® Single-Sign-On authentication		SiteMinder	
Multiple languages (and locales) supported by a single server		MultiLingual	
Customizable landing page content and look and feel, per application profile		Portal	
Analytics for complex usage reporting and analysis		Analytics	
Credit Card external payment system integration		Credit Cards	
Process Manager integration		Process Manager	
Multiple site support with site-to-site job routing		MultiSite	

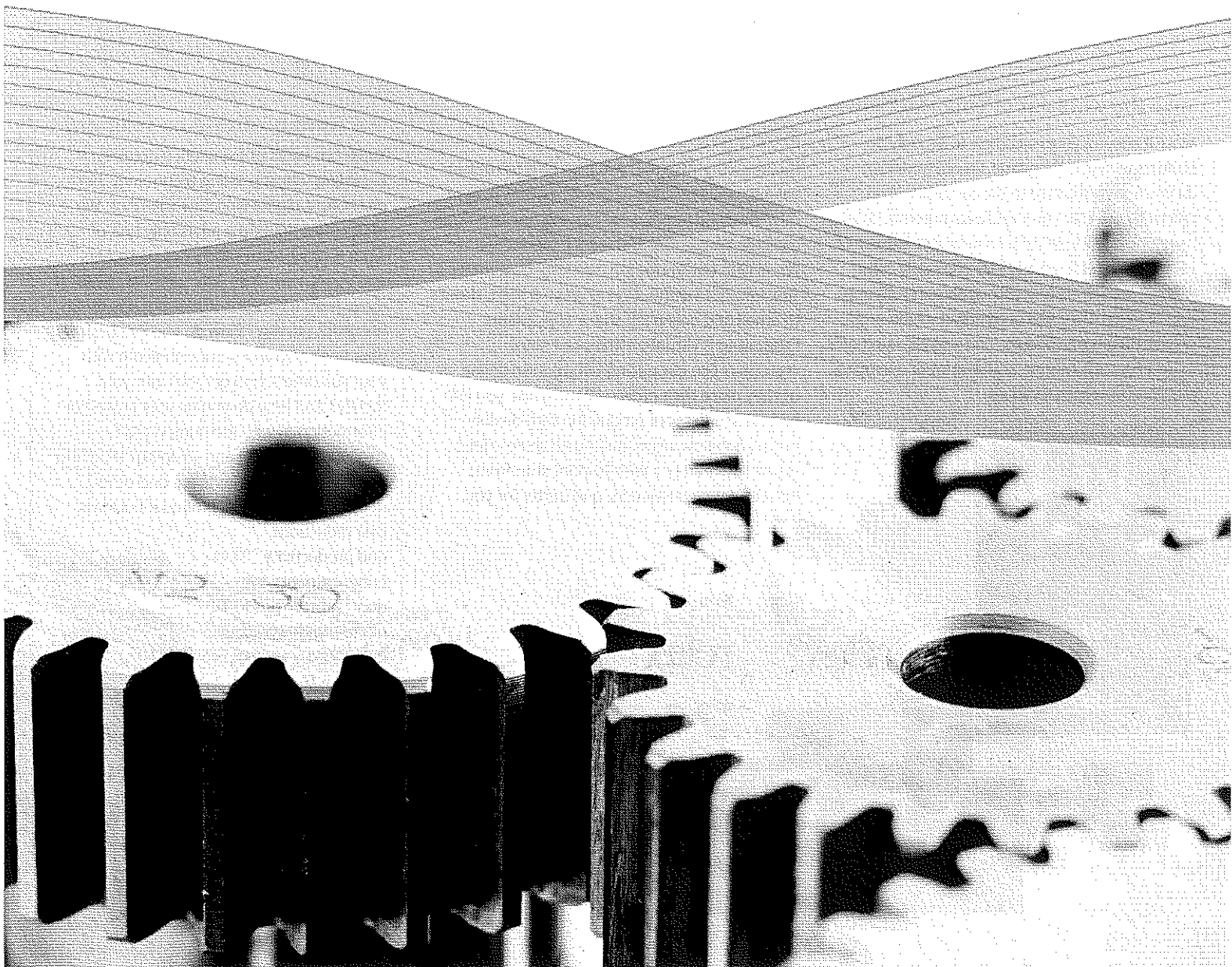


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Xerox Automated
Print Productivity Solutions
Set the wheels in motion
for a new level of productivity.

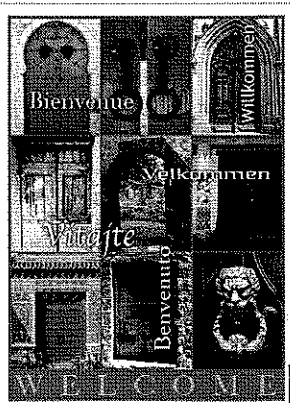


Automate your print production workflow— from step to step or end to end.

Connect with your customers, reduce costs, and enable new applications with Xerox Automated Print Productivity Solutions. If you're spending more time preparing and managing jobs than actually printing them, your digital presses may be sitting idle—and that can hurt your return on investment. Keep your production pipeline filled with revenue-building jobs. Liberate your highly trained people from routine tasks so they're available for more critical ones. Streamline your processes, from order entry through shipping and billing, so you can take on more work and satisfy more customers. In short, automate your workflow for greater productivity and profitability. Xerox can help.

Take the work out of your workflow.

Make it easy for your customers to securely do business with you—anytime. Create workflows once—from the simple to the complex—then efficiently use them over and over, automatically preparing and routing jobs to maximize the use of your existing resources. Quickly and easily utilize variable data to expand your application offerings. And so much more. Our automated solutions give you an integrated, modular, and scalable approach to workflow automation, enabling lower operating costs and increased revenues.



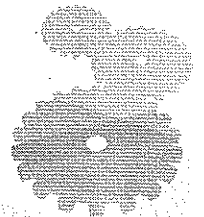
Accept jobs 24/7 and grow your business.

Leverage the Web and you'll be able to capture volume while building customer loyalty. Accept new jobs, and reorders for existing ones, through a secure Web portal and reduce production errors with automatic job ticketing. Customers stay informed without tying up your staff, thanks to email and online job status capabilities. Estimating is virtually eliminated, since customers can get pricing information online as they place their orders. All the while, you can better manage your production with flexible pricing, job flow, users, and much more—far exceeding merely a Web-to-print storefront. Better for your customers, and better for you.



Our focus on providing solutions

Xerox has years of experience not only providing robust printing technology, but also robust digital workflow solutions. We realize that printing a job is only half of what is required to satisfy our customers and yours. How does your prepress operator move from a handful of jobs per day to hundreds per day? How do you establish your print e-business, communicate with your customers, and get jobs into your facility? And how do you tie your customer information in with the printed job to streamline finishing and shipping? Workflow automation addresses these and other needs, bringing you unlimited e-business, cost reductions, and productivity enhancements. We don't provide products alone—with workflow automation, we deliver solutions to you and your customers.



Eliminate prepress bottlenecks and reduce costs.

Imagine if you had software that automatically processed your diverse customer jobs. A file could be received, inspected, preflighted, checked for errors, imposed, cropped, and more—without anyone having to touch the file. So a job that manually took more than 60 minutes to process could be ready in 10—which means you could get more jobs into and through your workflow while keeping your digital presses running. Thanks to conditional logic, this automated approach can be applied to simple or complex jobs. Build decision-making into your workflows—for critical steps such as imposition, color management, and more—and your workflow will do the work for you. Smart.

Expand your capacity with your existing technology.

The key is sophisticated load balancing and job scheduling enabled through workflow automation. You'll be able to increase throughput by processing and routing jobs across multiple printers—digital and offset. You'll improve productivity by splitting jobs based on color vs. monochrome pages, copy count, and page count. And you'll do it all automatically, which will reduce your production costs and improve your turnaround time. Put it together and you have a single point of control that gives you multiple benefits.

Attract more customers with new services, new applications.

Help your customers increase revenues and boost their response rates with personalized communications enabled through variable data printing. Add a level of security to their high-value documents—such as event tickets, ID badges, and transcripts—with special effects that you can affordably produce. You can even integrate the worlds of print and electronic media and make it easier for your customers to create and produce personalized communications through multiple media. Using one solution, you can create, deploy, and track highly effective variable data and cross-media campaigns, leveraging customer information to achieve dramatic returns on marketing investments.

Print more jobs, every day.

With an automated workflow, you can effectively prioritize and direct jobs throughout your print operation. Instead of different workflows for your digital monochrome, digital color, and offset presses, you can streamline using one workflow—and remove redundant labor and technology as a result. You'll benefit from automation on our digital presses as well, where innovations remove much of the guesswork and time from the process of achieving great results. Tasks that used to take the attention of a dedicated press operator can happen with the push of a button. The result is more uptime and more consistency than ever. And that will make you more profitable.

Succeed in The New Business of Printing[®]

The printing business is changing faster than ever, with explosive demand for color documents, shorter runs, and quicker turnarounds. Your customers need their jobs completed in hours, not days. In fact, in a Trends & Analytics report published by 2009, more than half of the jobs you receive will require delivery within 24 hours.

Customers are also looking for instant information—including quotes, pricing, notifications, and more. And they want more to be automated and more robust, such as scheduling cross-media personalized communications.

Color and monochrome inkjet printing device deliver the speed, quality, and productivity you need to print jobs quickly, enable variable data, and deliver customer-optimized quality. But when your prepress processes have bottlenecks, those printing devices may struggle, causing delays to your customers.

You need a way to efficiently deal with the unique work processes of five different technologies—including offset, digital, color, and end-of-line or home. A way to reduce costs, maximize uptime, and still keep your customers happy.

For 91% of the respondents in a recent NAPL survey, the plan is to make capital investments that will improve productivity and create a more efficient workflow. Who will you invest for your success? We can help you determine the right solution for your business and your future.

Fewer touches. Greater productivity.

When jobs can go quickly and automatically from submission into prepress, then through printing, finishing, and shipping, your productivity and profitability can soar. Automate to save time and enhance your return on investment for every job, from point of entry to final delivery. Whether you use one product from the Xerox FreeFlow Digital Workflow Collection or integrate several to meet your specific workflow needs, these solutions can help you connect with your customers, reduce costs, and enable new applications.

	Order Entry	Preparation	Submission	Processing	Customer Value
FreeFlow Web Services, powered by Press-sense™	[Bar spanning Order Entry, Preparation, Submission, and Processing]				A convenient order process, automatic estimating and billing, and ready access for reprints. Speeds workflow by communicating complex job instructions and automatically sending jobs for prepress processing while managing back-end production with flexible pricing, job flow, users, and much more.
FreeFlow Process Manager™		[Bar spanning Preparation and Submission]			Minimize time-consuming prepress tasks while eliminating bottlenecks, freeing up skilled labor for "critical" jobs. Maintains quality/consistency across digital and offset environments.
FreeFlow Express to Print		[Bar spanning Preparation, Submission, and Processing]			Simple document job preparation. Quickly and easily prepare jobs for print. Automate repetitive imposition and finishing setup. Priced and featured for light production/entry level.
FreeFlow Makeready®		[Bar spanning Preparation, Submission, and Processing]			Extensive page-level document editing. Improve time-consuming, labor-intensive, and error-prone prepress processes. Streamline hard copy and electronic file integration. Enable complex tab programming and variable data printing.
FreeFlow Output Manager™			[Bar spanning Submission and Processing]		Multiple (offset or digital) production printers function as a single integrated system with growth flexibility, enabling more efficient production schedules and better use of print resources.
FreeFlow Print Manager			[Bar spanning Submission and Processing]		Remote access and job submission. Monitor multiple printers from a single interface. Unify offset and digital workflows.
FreeFlow Print Server			[Bar spanning Submission and Processing]		A robust, fully featured print server. Drives Xerox production printers. Offers high-end features (sophisticated color management, simple to complex variable data jobs). Order/customer data stays with job through finishing, allowing for a fully streamlined workflow.
FreeFlow VI Suite		[Bar spanning Preparation, Submission, and Processing]			Optimal speed for personalized document production. Prints variable jobs in minutes rather than hours or days. Increases response rates with high-value, high-impact customized content. Extends reach with electronic personalized documents for additional forms of customer contact.
XMPie®	[Bar spanning Order Entry, Preparation, Submission, and Processing]				Design/produce high-value, high-impact VI jobs and campaigns. Easily develop/implement personalized communications and cross-media publishing. Integrate profitable Web-to-print and VI programs and track results automatically by utilizing a marketing dashboard.

For more information on Xerox Workflow Automation, call 1-800 ASK XEROX or visit us on the Web at: www.xerox.com/freeflow.



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FreeFlow®
Digital Workflow Collection

Makeready®



Xerox FreeFlow
Makeready
Advanced document
preparation to maximize
prepress efficiency.



Take the labor out of your labor-intensive jobs.

Document preparation just got easier. Xerox FreeFlow Makeready streamlines labor-intensive prepress operations so you can make quick work of even the most complex jobs. It gives you "what you see is what you get" (WYSIWYG) page programming, drag-and-drop document assembly, flexible late-stage editing, and even a simple way to start adding variable content to your documents.

See into the future.

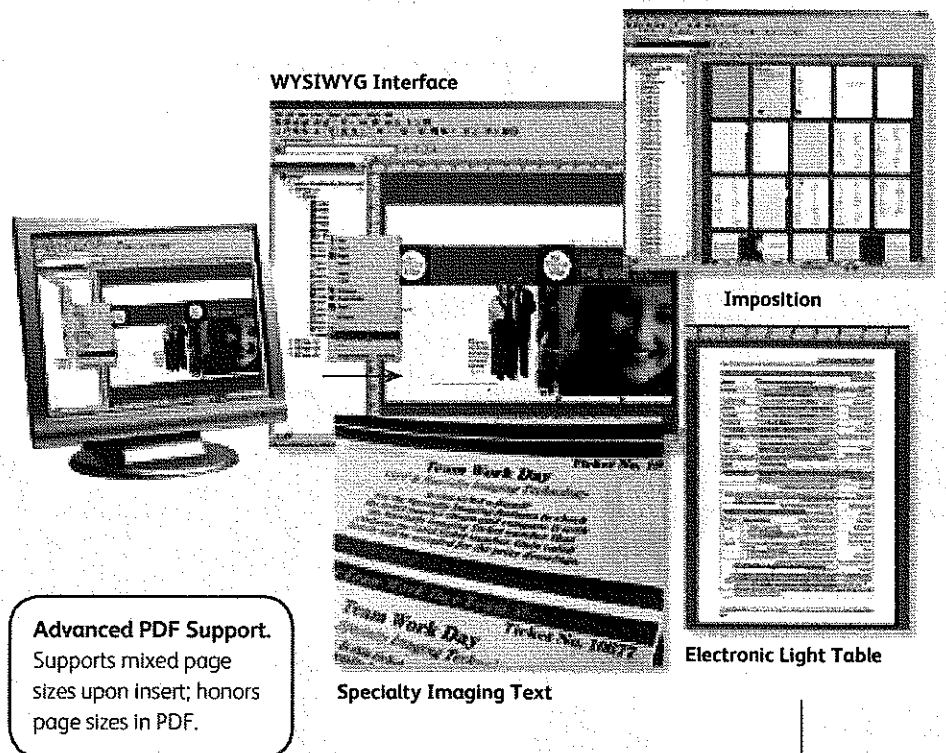
View the effects of your job setup before you print a single page with the WYSIWYG interface. FreeFlow Makeready increases accuracy and simplifies proofing—saving you time and streamlining your prepress activities.

Enhance productivity.

With FreeFlow Makeready and its extensive document-editing tools—including automatic tabs and tab annotation—Makeready's PDF workflow enables your operation to get jobs in and out the door faster than you ever thought possible.

Make every job a winner.

FreeFlow Makeready provides your operators with the tools they need to tackle every job, including the most complex ones. Even last-minute requests for late-stage edits can be handled quickly and easily, making your operation more responsive to your customers.



Input flexibility
FreeFlow Makeready accepts a wide range of industry-standard file types, including Adobe® PostScript®, PDF, EPS, TIFF, JPEG, and more, plus hardcopy via the FreeFlow Scanner 665®.

Document preview
Choose from several logical views of documents for printing pages or book layouts to simplify the proofing and approval process.

Composition flexibility
Take advantage of custom imposition templates and selective page programming to improve accuracy and reduce rework.

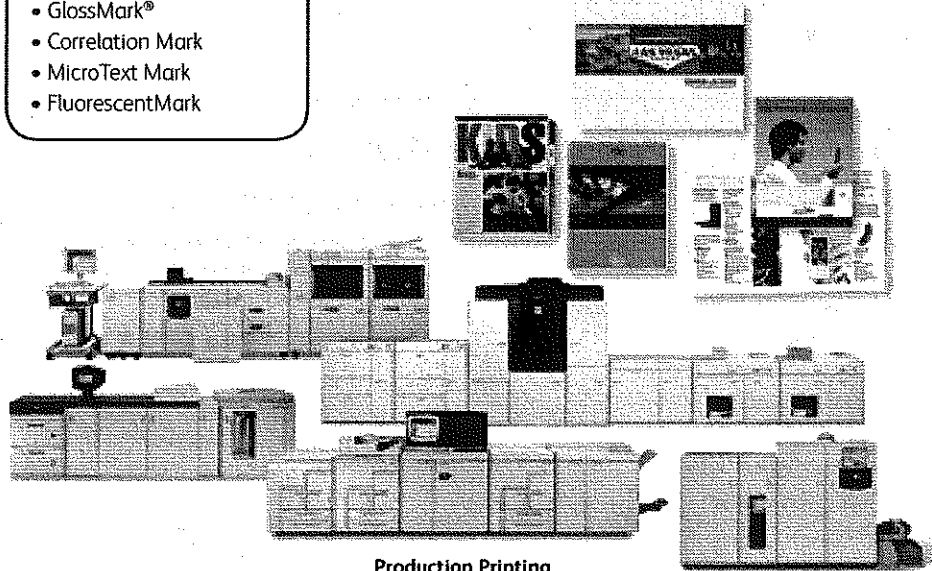
Electronic Light Table
Offer precise control over front-to-back alignment using WYSIWYG registration for a range of book publishing applications like booklets, catalogs, and manuals.

Specialty Imaging Text

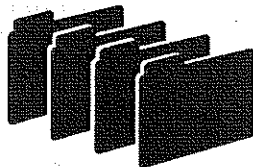
Unique special effects deliver more value and add security to your documents.

Choose from:

- GlossMark®
- Correlation Mark
- MicroText Mark
- FluorescentMark



Production Printing



Document Repository

Expand your applications, build complex jobs more easily, decrease prepress time, and reduce errors with FreeFlow Makeready.

See the effects of your job setup before you print a single page—FreeFlow Makeready increases accuracy, simplifies proofing, saves time, and streamlines your prepress activities.

Create tabs so easily, they almost program themselves with automatic tab annotation. Accuracy and consistency go up as the time and effort that goes into tab programming goes down.

Add basic variable content and add value to your documents with the easy-to-use merge and labeling utility. Merge images and delimited lists with static documents to add personalization that boosts profits.

Empower real productivity with extensive document editing, true PDF workflow, and production make-ready tools.

FreeFlow Makeready is part of the Xerox Digital Workflow Collection that includes FreeFlow Scanner 665, Output Manager™, VI Suite, Web Services, Process Manager™, Print Server, and partner products to deliver scalable, integrated production workflow solutions.

Subset finishing—automatically

Reduce the time required to program complex finishing options with Automated Subset Finishing.

Outstanding tab capabilities

Enable multi-line annotations, bleed tabs, precut tabs, and PDF bookmark support.

Fewer touches. Greater productivity.

When jobs can go quickly and automatically from submission to printing to finishing to shipping, your productivity and profitability can soar. It comes down to more jobs in, more jobs out, for a greater return on your investment. The Xerox FreeFlow Digital Workflow Collection can help you automate to save time and reduce costs for every job, from point of entry to final delivery.

Orders come in through your current system or the 24/7 Web portal enabled through FreeFlow Web Services, powered by Press-sense™.

Immediately, they're processed through FreeFlow Process Manager™, which automatically handles preflight, imposition, scripting, and more.

FreeFlow Print Manager takes care of job ticketing and tracking—it can even integrate with your offset prepress systems.

Jobs can also be prepared with our document preparation software, which allows you to view and prepare jobs for printing—FreeFlow Express to Print uses templates for ease and simplicity while FreeFlow Makeready® puts advanced capabilities at your fingertips.

Now, FreeFlow Output Manager™ takes over, acting as a centralized collection point to route and schedule jobs across multiple printers.

Finally, the FreeFlow Print Server RIPs the jobs, providing timesaving efficiency, excellent image quality, and benchmark security.

Looking to gain a competitive edge? Use the FreeFlow Variable Information Suite to add personalization and cost-effective security features to your documents.

The bottom line? Whether you use one of these products or integrate several to meet your specific workflow needs, you can connect with your customers, reduce costs, and enable new applications.

Xerox® FreeFlow® Makeready® Specifications

Software

FreeFlow® Makeready® includes:

- FreeFlow® Makeready®
- Scan and Print
- File Manager
- Printer Administration Tool
- Print Manager Advanced Print Path
- Printer Registration
- Registered Printer List Locator
- Printer and Job Status

Options:

- Set Labeling/Data Merge
- Copyright Clearance Solution (U.S. only)

Minimum System Requirements

FreeFlow® Makeready® requires a server platform that meets the following minimum specifications for optimal performance:

- Processor: Dual Intel® Xeon® 2.8 GHz equivalent or better
- System Memory: 2 GB or better
- Hard Drive: 10 GB of available SCSI/SAS hard disk space to install FreeFlow® Makeready® software; additional space required for customer data
- Video Capability: PCI-based or AGP Video Controller with 128 MB RAM
- Ethernet Capability: 10/100/1000 MB/sec
- Display: Analog CRT or LCD Monitor
- Input Devices: Keyboard and Mouse
- Peripheral Devices: DVD/CD-ROM Drive
- Backup Storage Device recommended

Also required for FreeFlow® Scanner:

- SCSI Controller Card: Adaptec Ultra160 (39160) or Adaptec Ultra 320 (39320A-R)—must be retail version
- PCI Interface: One (1) Standard PCI slot (32/64-bit interface) for SCSI Controller Card above

Supported Scanners:

- Xerox® FreeFlow® Scanner 665®
- Xerox® Production Scanner

For more information on Xerox® FreeFlow® Makeready®, call 1-800 ASK XEROX or visit us on the Web at: www.xerox.com/freeflow.



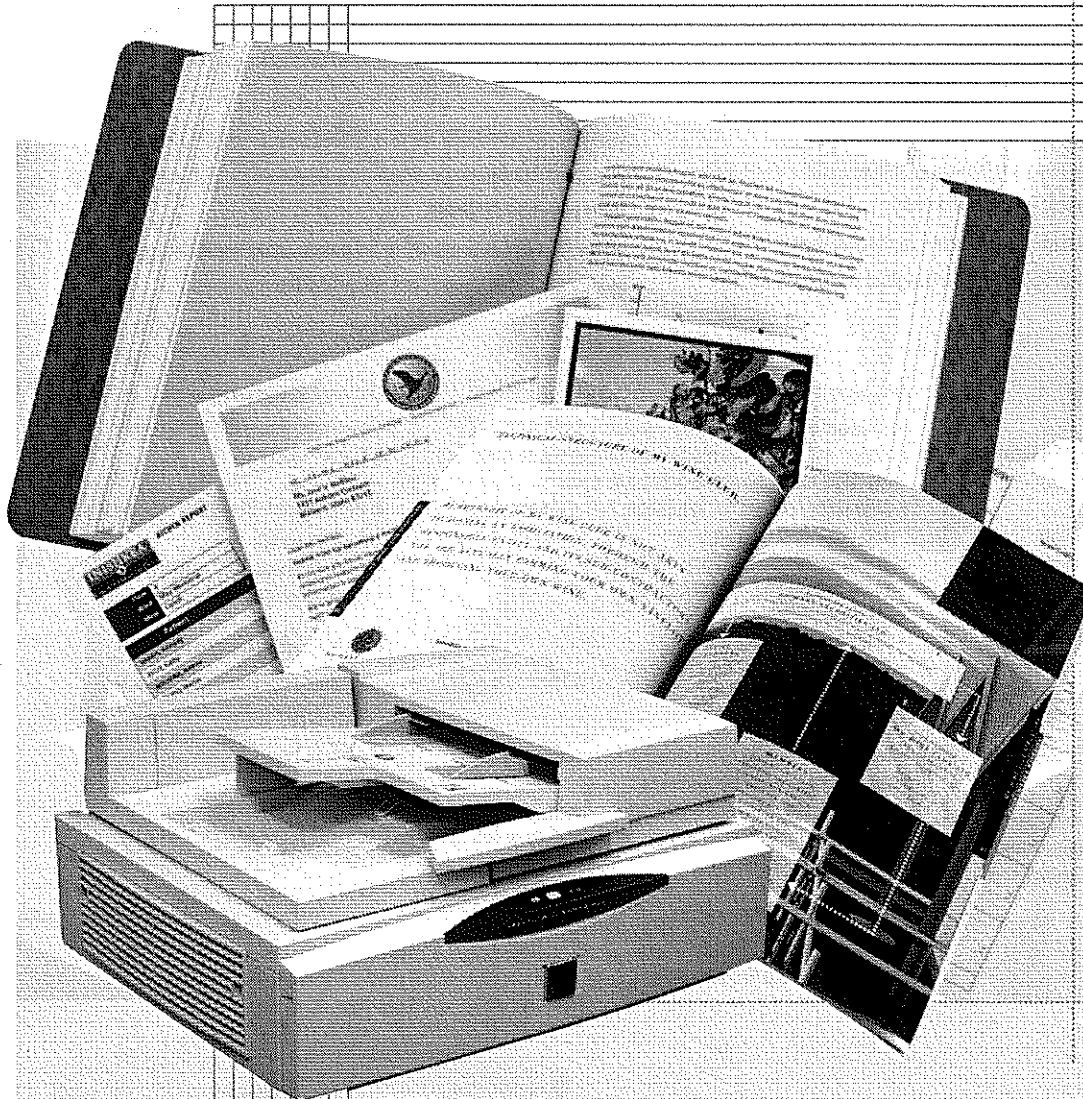
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XEROX®

Technology | Document Management | Consulting Services

Xerox FreeFlow™ Scanner 665

Specifications



Introducing the Xerox FreeFlow™ Scanner 665, an affordable production scanner for color and monochrome documents. This scanner sets a new benchmark for image quality and productivity. New advances in image processing provide much improved image quality for even the most complex documents. And new features maximize productivity while minimizing operator intervention. The FreeFlow™ Scanner 665—production-level power and quality for any environment.

FreeFlow™ Scanner 665

Part of the Xerox FreeFlow™ Digital Workflow Collection



For more information on the Xerox FreeFlow™ Scanner 665, call 1-800 ASK XEROX or visit us on the Web at: www.xerox.com

Xerox FreeFlow™ Scanner 665 Specifications

A new standard for scanning image quality and productivity

Image quality

- The FreeFlow™ Scanner 665 delivers 600 x 600 optical resolution and 1200 x 1200 output resolution to production printers such as the Xerox Nuvera™ Printer Family, and 600 dpi color output to production color printers.
- Faster processing and more sophisticated image quality algorithms improve even the smallest image anomalies.
- Various original document modes within the FreeFlow™ Scanner 665 and DocuSP provide near original document quality.

Productivity

- Automatic image enhancement scans complex documents and renders them based on image characteristics without operator intervention.
- Scanner automatically detects documents placed in the feeder.
- Improved automatic punched hole fill provides high-quality output from punched originals.
- Interactive Preview allows operators to make multiple image quality adjustments without reloading the document.

Automatic Document Feeder

- Capacity:
 - Up to 100 20 lb. 5.5" x 6.5" (140 mm x 165 mm) sheets to 11.69" x 17" (297 mm x 432 mm)
- Paper Weights:
 - 13 lb. - 32 lb. (49 gsm - 120 gsm) simplex
 - 16 lb. - 32 lb. (60 gsm - 120 gsm) duplex

Document Glass

- Up to 12" x 18" (305 mm x 457 mm)

Output

- Binary for monochrome scans
- 24 bit device independent for color

Resolution

- Optical resolution: 600 x 600 dpi (36 bits/pixel internal)
- Output resolution: up to 1200 dpi monochrome, 600 dpi color

Reduction/Enlargement

- Monochrome—10% to 400%
- Color—11% to 150%

Image Processing Features

- Onboard image processing—industry best
- New color Automatic mode—Automatic mode now available for both monochrome and color
- New color controls for saturation, hue rotation, and color cast adjustments
- Background detection and suppression
- More refined sharpening control
- Halftone descreening
- Electronic page deskew
- Electronic punched hole removal

Scan Rate

- Monochrome—up to 65 simplex images/minute; up to 20 duplex images/minute
- Color—up to 60 simplex 400 dpi images/minute and 40 600 dpi images/minute; up to 20 duplex 400 dpi images/minute and 20 600 dpi images/minute

Image File Formats

- Monochrome—TIFF 6.0
- Color—TIFF 6.0 Technical note 2

Compression

- Monochrome—CCITT Group IV
- Color—JPEG

Electrical Requirements

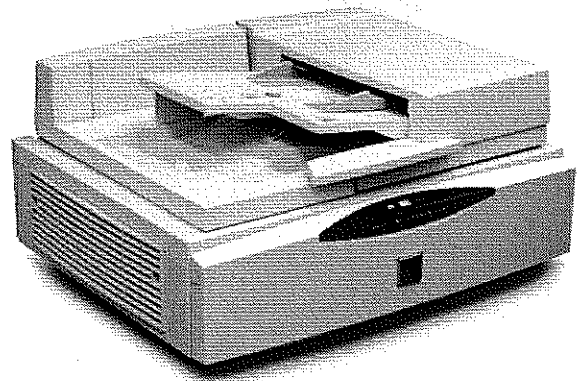
- 85 - 264 VAC.
- Input frequency: 47 - 63 Hz
- Rated power consumption: 139W

Physical Dimensions

- Scanner with Document Handler:
 - 13.9" high x 31.3" wide x 26.4" deep (353 mm x 795 mm x 671 mm)
 - 106 lbs (44 kg)

Options

- Footswitch



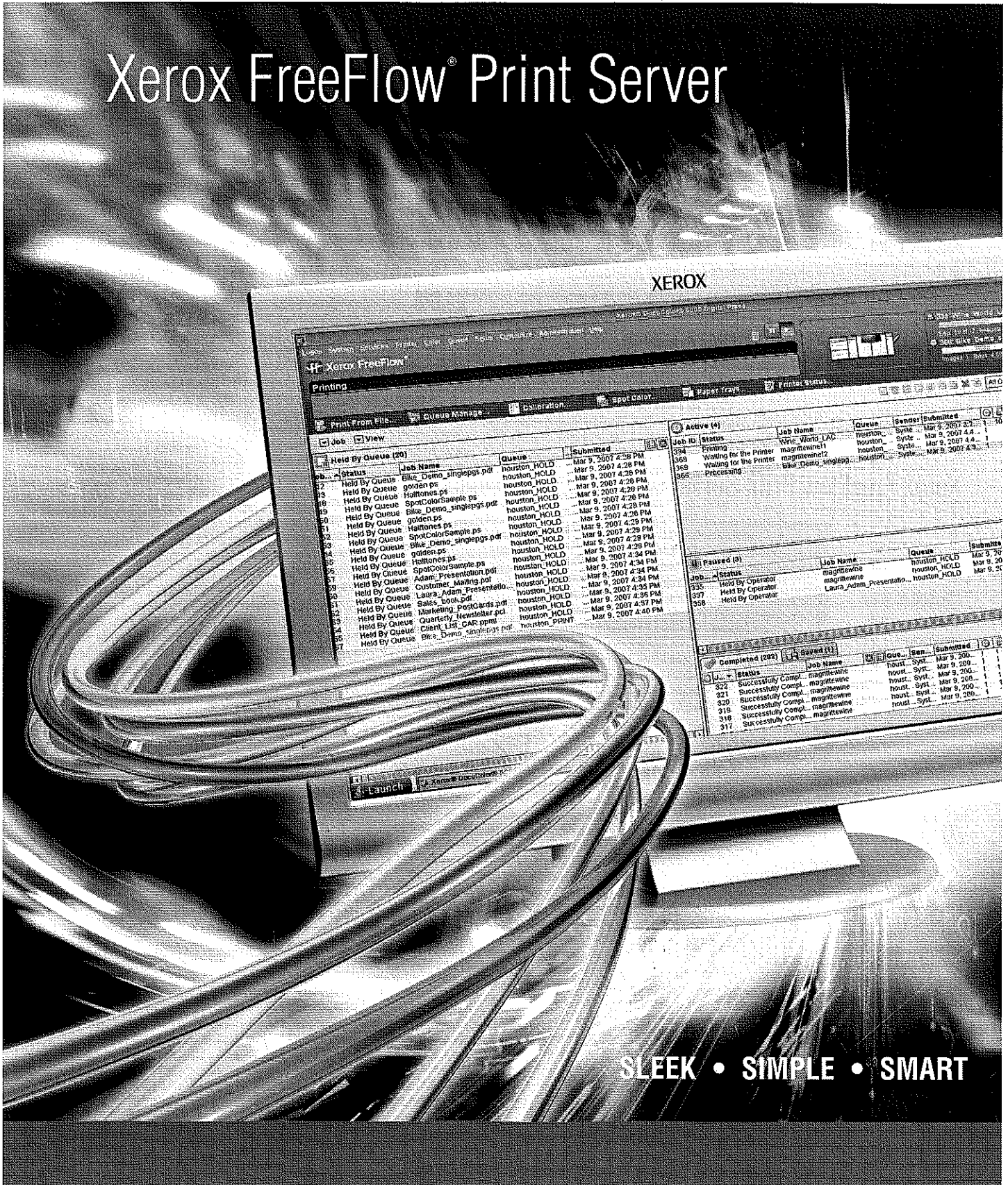
XEROX®

Technology | Document Management | Consulting Services

FreeFlow®

Print Server

Xerox FreeFlow® Print Server



SLEEK • SIMPLE • SMART

It's your business. Step it up.

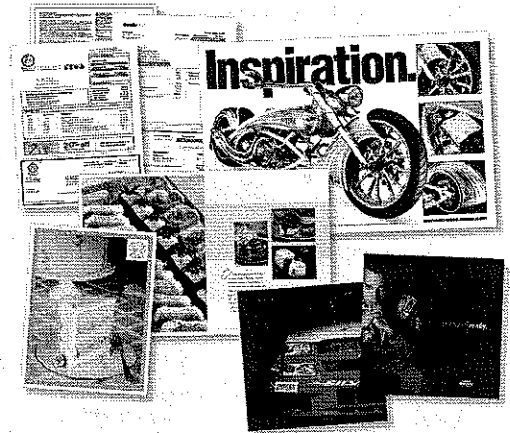
With the Xerox FreeFlow® Print Server.

Discover the sleek, simple, and smart way to step up your workflow productivity with greater control over data streams, job queues, output quality, and more.

The Xerox FreeFlow Print Server combines the extensive heritage and outstanding capabilities of Xerox production solutions into one **sleek** and compact print server. Its drag-and-drop user interface makes it **simple** for training and for working. And it's **smart** in the way it streamlines and organizes your workflow to optimize every production printer in your shop. With ConfidentColor Technology for enhanced color management, it's our most advanced print server technology to date.

Built and refined based on experience and feedback from users of more than 35,000 Xerox DocuSP® Servers, the Xerox FreeFlow Print Server retains all the advantages of the DocuSP product line while adding exciting enhancements. Plus, it delivers the benefits of a single workflow with common features on a common platform, providing a familiar process across your production fleet.

The Xerox FreeFlow Print Server will help you automate, reduce costs, and enable new applications, whether you're starting out with simple digital printing or delivering complex variable data jobs.



Xerox FreeFlow Print Server Graphical User Interface (GUI)

Shortcut buttons allow you quick access to frequently used features

Drag-and-drop job management allows you to easily move and prioritize jobs

The screenshot displays the Xerox FreeFlow Print Server GUI. At the top, there are navigation buttons for 'Print', 'Queue Manager', 'Coloration', 'Spot Color', and 'Print & Copy'. Below this is a 'Printing' section with a progress bar. The main area is divided into three sections: 'Active (11)', 'Paused (3)', and 'Completed (27)'. Each section contains a table of job details.

Job ID	Status	Job Name	Queue	Sender	Submitted	Pages	Estimated
36	Printing	Bike_Demo_singlepps.pdf	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM	12	8
37	Waiting for the Printer	golden.ps	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM	1	
38	Printing	100pp.pdf	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM	100	
39	Waiting for the Printer	2-CastleLong_Is.ps	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM	5	
40	Waiting for the Printer	5-Environment_Is.ps	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM	29	
41	Waiting for the Printer	5-Travel_Is.ps	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM	18	
42	Processing	5-Taurus_Is.ps	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM	9	
43	Waiting for Processor	bunsaund.pdf	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM		
44	Waiting for Processor	bucsoth.pdf	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM		
45	Waiting for Processor	chiversd.pdf	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM		
46	Waiting for Processor	frat.pdf	graupeL_HOLD	System Administrator	Mar 16, 2007 2:55 PM		

Job ID	Status	Job Name	Queue	Sender	Submitted
3	Failed	Bike_Demo_singlepps.pdf	graupeL_PRINT	System Administrator	Mar 16, 2007 11:10 AM
30	Held By Operator	SpotColorSample.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM
31	Held By Operator	APIAGJ_xpd.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM

Job ID	Status	Job Name	Queue	Sender	Submitted	Completed
35	Completed With Warnings	SpotColorSample.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM	32 / 32 Mar 16, 2007 1:47 PM
34	Successfully Completed	Hallones.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM	7 / 7 Mar 16, 2007 1:47 PM
33	Successfully Completed	golden.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM	1 / 1 Mar 16, 2007 1:47 PM
29	Successfully Completed	Hallones.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM	7 / 7 Mar 16, 2007 1:47 PM
27	Successfully Completed	Bike_Demo_singlepps.pdf	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM	12 / 12 Mar 16, 2007 1:47 PM
28	Successfully Completed	golden.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM	1 / 1 Mar 16, 2007 1:47 PM
26	Successfully Completed	APIAGJ_xpd.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:45 PM	1 / 1 Mar 16, 2007 1:47 PM
25	Completed With Warnings	SpotColorSample.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:44 PM	32 / 32 Mar 16, 2007 1:47 PM
22	Successfully Completed	Bike_Demo_singlepps.pdf	graupeL_PRINT	System Administrator	Mar 16, 2007 1:44 PM	13 / 12 Mar 16, 2007 1:46 PM
24	Successfully Completed	Hallones.ps	graupeL_PRINT	System Administrator	Mar 16, 2007 1:44 PM	7 / 7 Mar 16, 2007 1:45 PM

Customizable GUI can be set up to match your workflow and queues

Simplicity—to help you get the work done.

An intuitive and fast operator experience translates into a streamlined workflow. The **user-friendly GUI** minimizes job submission to click, drag, and drop, making it simple to manage multiple print jobs from multiple queues.

With the power of over 250 **print queues**, which can be integrated with hot folder submission, you can program queue settings and utilize them over and over. Set queues according to job or customer—it's up to you. The FreeFlow Print Server supports open industry standards such as **job definition format (JDF)**. Process JDF job tickets through hot folders and receive feedback on job status and process times so you can efficiently manage your print schedule.

Preflight capabilities enable quick checking for common errors before "committing to print." You'll also benefit from two levels of **preview** capabilities that allow you to preview static and Variable Information (VI) jobs before scheduling. Generate a low-resolution proof to verify job layout, formats, and intended color rendition. Or with Advanced Preview, generate a high-resolution preview that can be reviewed at the pixel level, giving you absolute color control over your job.

ConfidentColor Technology—prepress through production.

The FreeFlow Print Server is part of the only **PANTONE®-licensed** solution that includes the server and the digital color press. It features ConfidentColor Technology, a comprehensive suite of color-management tools that provides consistent and predictable results with enhanced color matching, including accurate tints and highlights. Additionally, it supports Duotone, Tri-tone, and Quad-tone, as well as "Custom Spot Colors" and "Device N" supported by the Quark®/Adobe® suite.



The dynamic **DeviceLink ICC profile** feature provides the real-time build of custom RGB and CMYK DeviceLink ICC profiles, allowing you to emulate any printing device you choose. In addition, you can preserve the black (K) pathway when moving between printers and color management for superior overall image quality.

Automatic Image Enhancement (AIE) gives you "one click" photo enhancements for exposure, sharpening, saturation, and red-eye reduction. This provides for quick and simple modifications to photo applications while maintaining the integrity of the rest of the document.

Benchmark security.

Get **multiple security levels**, all based on super stable and secure UNIX®. Encrypted job-submission modes provide for public and private key encryption. For security profiles, the FreeFlow Print Server offers custom setups, a secure password, and a print mode that limits duplicate page printing. Rest assured, you are working with a very secure system.

Overall performance for every workflow.

Efficiently compose **Variable Information (VI)** jobs with sophisticated formats and graphic elements. With its broad range of VI capabilities, FreeFlow Print Server is the logical printing solution for both transactional printers using mainframe data streams such as AFP/IPDS, LCDS, or a VIPP® workflow, and commercial printers using graphic-intensive VI workflows. It securely handles all of the most widely used data streams, so you have the flexibility to print to a variety of print engines based on the application, not the data stream. The ability to accomplish PDF generation with no additional workflow steps makes the FreeFlow Print Server a perfect choice for print and electronic workflows.

VI imposition supports common file formats, including VIPP, PPML, PDF, PostScript®, and PCL5c. All data is kept intact using a native format without file conversion.

Parallel processing, available for many printers, enables concurrent operation, speeding up the production of hundreds of small jobs or complex VI jobs with thousands of customer database entries. The FreeFlow Print Server will optimize page parallel or job parallel RIPping, delivering peak performance for every print job.

Meeting your daily needs while expanding your opportunities.

It's the sleek, simple, and smart way to connect with what your customers want. The Xerox FreeFlow Print Server helps you automate more job steps, optimize your workflows, and enable new applications. Each and every job will benefit from unprecedented productivity, outstanding color, powerful variable data capabilities, and benchmark security. And it works with more than 40 Xerox production printers including monochrome, highlight color, full color, cut sheet, and continuous feed, as well as the ever-widening family of innovative Xerox FreeFlow workflow solutions. Seamlessly integrate the components of your existing workflows, offset as well as digital, for powerful job control, time-saving efficiencies, and unified operations with the Xerox FreeFlow Print Server.



The power of Xerox FreeFlow:

Workflow solutions to help you build your business.



Xerox
FreeFlow

Digital Workflow Collection

Xerox FreeFlow solutions enable you to connect with your customers, reduce costs, and enable new applications never before possible. Thousands of companies worldwide depend on FreeFlow to streamline and automate workflow processes—saving time, labor, and waste while shifting quality, productivity, and efficiency into overdrive. Built on industry standards, Xerox FreeFlow integrates and extends your existing workflow to deliver measurable business benefits.

FreeFlow Web Services, powered by Press-sense™, provides a Web portal that is available 24/7, enabling customers to securely submit new jobs and reorder existing ones over the Internet (or an intranet) from virtually anywhere.

FreeFlow Makeready and FreeFlow Scanner 665 serve as a document composition solution providing prepress tools such as scanning, imposition, tab programming, late-stage editing, color management, and integration with Adobe Photoshop® CS, allowing you to maximize overall print quality and efficiencies in prepress.

FreeFlow Process Manager automates typical prepress steps so you can prepare, proof, and print jobs with less operator intervention. The result is a touchless workflow, processing more jobs with less time and money—and keeping your printers printing.

FreeFlow Output Manager enables automated management of valuable printer resources by acting as a centralized collection point for print jobs that will be distributed across the enterprise. Multiple printers can work as efficiently as one with sophisticated load balancing and job scheduling.

FreeFlow Print Manager allows for easy job submission to all of your output devices and provides full Xerox job ticketing as well as JDF job ticket support. Printer activity is continually monitored, simplifying job tracking and shop status. Print Manager also supports job flow from popular offset shop management systems, allowing you to maintain a single workflow that can drive both digital and offset print systems.

FreeFlow Variable Information Suite is a collection of tools that produces optimal variable print jobs. The VI Suite contains all of the software components you need to create high-value, personalized documents including the print-optimizing VI Interpreter, which delivers unmatched throughput and print efficiency.

Open standards, big-picture solutions.

Xerox FreeFlow products and print engines are built on open standards such as JDF, PPML, ICC, PDF, and many others, enabling seamless integration with your existing production workflow including more than 100 business partners specializing in all areas of print and document management.

Find out more.

It's your business. Want to step it up? Call 1-800-ASK-XEROX, ext 774, or visit us online at www.xerox.com/FreeFlow.

FreeFlow®
Digital Workflow Collection

Output Manager™



Xerox FreeFlow Output Manager

Multiple printers working
as one—automatically.



Harness the power of many printers.

Work as one, automatically. FreeFlow Output Manager provides a single point of control for managing mixed jobs and multiple print production systems. It effectively and automatically prioritizes, schedules, and splits print jobs throughout your operation. As a result, you can reduce turnaround time and increase capacity. And that can help you lower your costs and grow your revenue.

A single point of control.

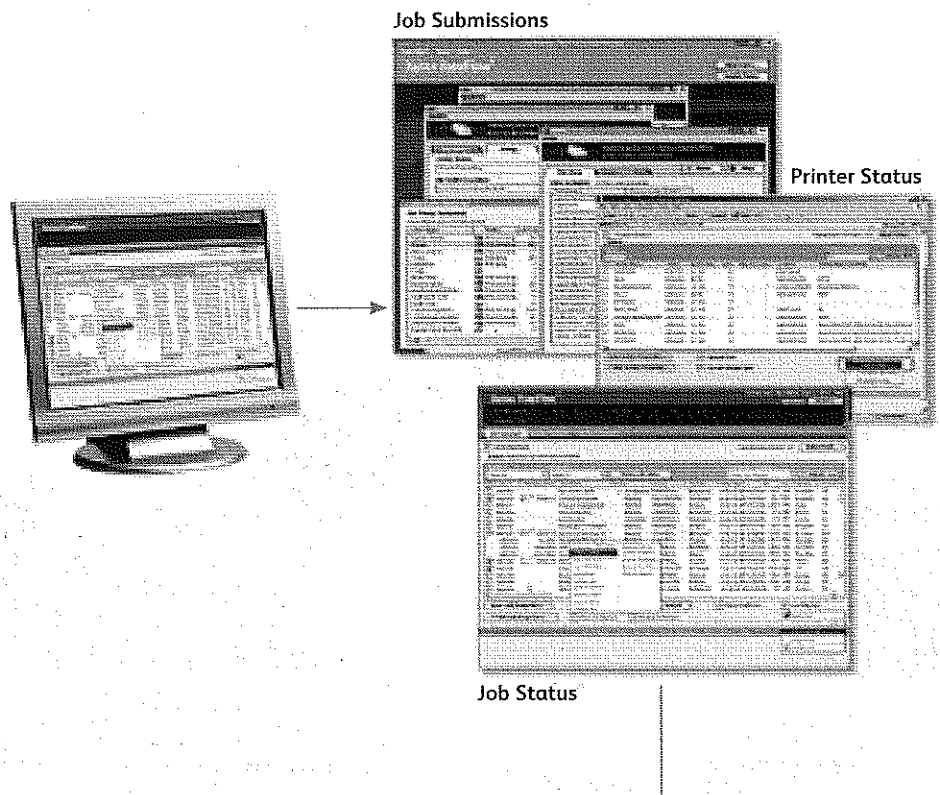
This powerful software is not only effective, but also simple to use. You can customize the interface based on location, work shift, job type, and other criteria. Assign queues and printers to groups to further enhance its effectiveness in your operation. As the single point through which all jobs are scheduled and routed, FreeFlow Output Manager serves as a window on your production world.

Input and output flexibility.

With FreeFlow Output Manager acting as your centralized collection point, you can accept jobs in diverse data streams from anywhere on your network. You can even offload jobs from a multifunction device—such as those with high volumes or special finishing options—and route them to your production workflow.

Maximized productivity.

FreeFlow Output Manager eliminates labor-intensive decision-making steps by automatically routing jobs to the appropriate printer, including the full line of Xerox monochrome, highlight-color, and full-color digital printers. Mixed monochrome and color jobs can be produced more cost effectively, and thresholds can be set for the number of color pages required for a job to be split. With its sophisticated load balancing and job scheduling capabilities, FreeFlow Output Manager lets you grow your capacity with the technology you already have.



Input flexibility

Accept jobs from:

- Job submission clients
- Internet
- Network PCs
- Mainframes
- Hot folders
- Multifunction devices

Load balancing

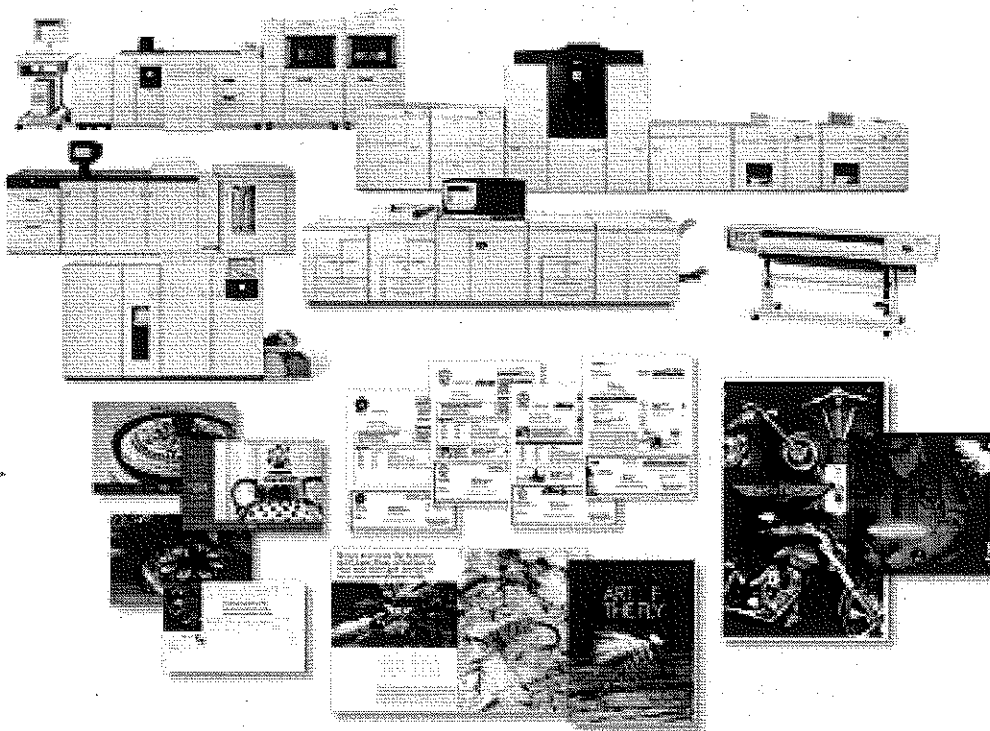
Increase throughput by processing jobs across multiple printers automatically.

Job splitting

Improve productivity by splitting jobs based on color vs. monochrome pages, copy count, or page count.

Scripting

Enable tighter integration and customization of workflows through scripting of job processing functions.



Print Production Versatility

From monochrome forms to highlight-color newsletters to full-color catalogs and brochures, FreeFlow Output Manager helps you produce the applications you need while maximizing the productivity of your digital printers. It works with all Xerox digital printers as well as other manufacturers' printers with IPP and LPR support.

Job attribute matching
Eliminate decision making by automatically routing jobs to the appropriate printer.

Accounting module
Manage printer accounting information from a central point and ensure balanced usage across a fleet of printers.

Support for multifunctional devices
Scan jobs on multifunctional devices and send to production to promote efficiency or address special finishing needs.

FreeFlow Output Manager drives improved flexibility, faster turnaround, and higher productivity.

Meet tight turnaround requirements by effectively prioritizing, scheduling, and splitting jobs throughout your print operation.

Boost production capacity by leveraging your digital printing resources and cost-effectively printing mixed monochrome and color jobs.

Lower your production costs by maximizing the use of digital printing assets, reducing labor needs, and automating job acceptance and distribution.

Support a wide range of formats, including the industry-standard Job Definition Format (JDF) and Job Messaging Format (JMF).

Receive jobs from anywhere and send jobs anywhere using a single, easy-to-use print-shop management solution.

Output Manager combines with other FreeFlow products like MakereadySM, Print Manager, Print Server, Process ManagerSM, VI Suite, and Web Services to deliver scalable and integrated production workflow solutions.

Fewer touches. Greater productivity.

When jobs can go quickly and automatically from submission to printing to finishing to shipping, your productivity and profitability can soar. It comes down to more jobs in, more jobs out, for a greater return on your investment. The Xerox FreeFlow Digital Workflow Collection can help you automate to save time and reduce costs for every job, from point of entry to final delivery.

Orders come in through your current system or the 24/7 Web portal enabled through FreeFlow Web Services, powered by Press-sense™.

Immediately, they're processed through FreeFlow Process Manager™, which automatically handles preflight, imposition, scripting, and more.

FreeFlow Print Manager takes care of job ticketing and tracking—it can even integrate with your offset prepress systems.

Jobs can also be prepared with our document preparation software, which allows you to view and prepare jobs for printing—FreeFlow Express to Print uses templates for ease and simplicity while FreeFlow Makeready® puts advanced capabilities at your fingertips.

Now, FreeFlow Output Manager™ takes over, acting as a centralized collection point to route and schedule jobs across multiple printers.

Finally, the FreeFlow Print Server RIPs the jobs, providing timesaving efficiency, excellent image quality, and benchmark security.

Looking to gain a competitive edge? Use the FreeFlow Variable Information Suite to add personalization and cost-effective security features to your documents.

The bottom line? Whether you use one of these products or integrate several to meet your specific workflow needs, you can connect with your customers, reduce costs, and enable new applications.

Xerox® FreeFlow® Output Manager™ Specifications

Minimum System Requirements

FreeFlow® Output Manager™ requires a server platform that meets the following minimum specifications for optimal performance:

- Processor: Dual Intel® Xeon® 2.8 GHz equivalent or better
- System Memory: 2 GB or better
- Hard Drive: 10 GB of available SCSI/SAS hard disk space to install Output Manager™ software; additional space required for customer data
- Video Capability: PCI-based or AGP Video Controller with 128 MB RAM
- Ethernet Capability: 10/100/1000 MB/sec.
- Display: Analog CRT or LCD Monitor
- Input Devices: Keyboard and Mouse
- Peripheral Devices: DVD/CD-ROM Drive
- Backup Storage Device recommended

Minimum Software Requirements

- Windows® Server 2003 Operating System
- One of the following Internet browsers:
 - Internet Explorer® 6.0 or higher
 - Netscape® 7.0 or higher
 - Firefox® 1.0.6 or higher

For more information on Xerox® FreeFlow® Output Manager™, call 1-800 ASK XEROX or visit us on the Web at: www.xerox.com/freeflow.



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Security Overview

YOUR PASSPORT
to Superior Information Security

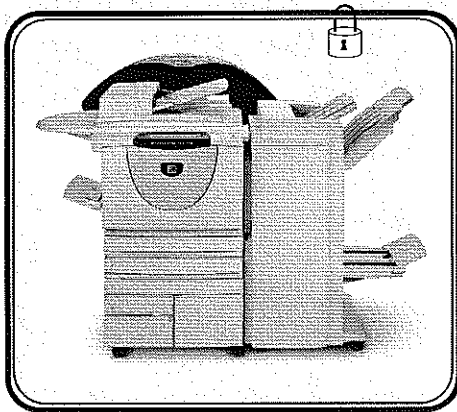
XEROX®

The risk is real.

Information is your company's greatest asset.

Xerox can help you keep it safe.

Xerox digital security solutions lock down mission-critical digital information to make sure it doesn't fall into the wrong hands. We provide the most comprehensive, systems-based security solutions that allow you to restrict access, track usage, and protect confidential data that flow through CopyCentre®, WorkCentre®, and WorkCentre Pro® multifunction devices – in a single workgroup or for an entire company.



Xerox WorkCentre® Pro 275
Advanced Multifunction System

Architecture

The Xerox SMart controller prevents unauthorized access by maintaining strict data separation among print/copy/scan/fax functions. It also implements effective authentication and authorization mechanisms for all configuration and setup functions.

Your data is always controlled.

Standards

Xerox products comply with stringent industry standards, including Common Criteria certification and various government-mandated, industry-specific regulations. **Your security will be implemented via proven methodologies.**

Extended Capabilities

Xerox security features are enhanced by integration with solutions from Xerox Business Partners. **You can extend your protective shield even further.**

Xerox offers 30 multifunction systems that have received the Common Criteria certification.

This Xerox Passport is issued in recognition of your critical need to keep documents secure and confidential.

At a time when so many offices are networked and so much information is digital, the threat is very real. If important information that belongs to your organization is stolen, destroyed, falsified, or placed in the wrong hands, the results can be devastating.

*Compare this to other manufacturer's certification methods. Often a product is published as Common Criteria certified but it only pertains to a single feature. The feature is deemed Common Criteria certified but the entire system is not. Xerox's security approach is a commitment that all **features and functions**, not just one or two, of the system are safe and secure.*



SECURITY CHALLENGES

Xerox is committed to helping you meet your security challenges.

Our systems, software, and services conform to recognized industry standards and the latest governmental security regulations.

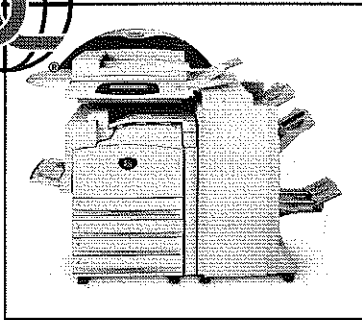
For example, Xerox products are designed to support the standards set forth in:

- The Health Insurance Portability and Accountability Act (HIPAA) (Health)
- Sarbanes-Oxley
- Gramm-Leach-Bliley Act (Finance)
- FDA 21 CFR Part 11 (Pharmaceutical)

To comply with U.S. Government Security Policy (National Security Telecommunications and Information Systems Security Policy #11), companies doing business with governmental agencies, financial institutions, etc., must have proof that the equipment they use has been certified to meet stringent federal document security standards.

COMMON CRITERIA

The Common Criteria is an internationally recognized set of standards that define security requirements and establish procedures for evaluating the security of IT systems and software. The Xerox WorkCentre 232 / 238 / 245 / 255 / 265 / 275 and Xerox WorkCentre Pro 2128 / 2636 / 3545 / 232 /



WorkCentre® Pro 3545
with Booklet Maker

238 / 245 / 255 / 265 / 275 / 90 and CopyCentre 2128 / 2636 / 3545 and 90 have all received the National Information Assurance Partnership's (NIAP) Common Criteria certification.* This certification makes it easier for Xerox customers to meet the high-

level security requirements and increasing regulations in the government, military, health care, legal, and financial sectors.

Note: Systems that do not contain Hard Disk Drives are at a significantly lower risk to security breaches. Xerox deemed it unnecessary to apply for Common Criteria certification for systems that do not have Hard Disk Drives.

**Earlier versions may be updated by visiting www.xerox.com/security and downloading the latest software updates.*

SECURITY
PRIVATE

XEROX CONTROL WHO NEEDS TO KNOW?

Xerox devices that have received NIAP Common Criteria certification include features such as:

Device Access Password Protection

- Administrative device setup screens and remote network settings cannot be viewed or altered without a Personal Identification Number (PIN).

Built-in Firewall

- Blocks unwanted connections to secure network devices.
- Controls communications with specific network clients based on IP address and/or port number filtering rules.

User Authentication

Restricts access to scan, email, and network fax features by validating user names and passwords prior to the use of these functions.

- Network Authentication, when used with Scan to Email, will automatically populate the "From" address with the logged-in user's name. This field cannot be edited once a user is validated.
- Xerox Standard Accounting on WC / WCP* – the ability to manage access to, and utilization of, Copy / Print / Fax / Scan by user group.

XEROX CONFIDENCE

DAY IN, DAY OUT

Image Overwrite Security

- Electronically erases data processed to the hard disk in copy, print, fax, and scan modes.
- Eliminates data stored as part of routine job processing.
- Happens automatically after every job or on demand at your convenience.
- Implements a 3-Pass algorithm specified in the U.S. Department of Defense Directive 5200.28-M.

Secure Embedded Fax

- Controller architecture isolates the fax telephone line and the network to foil any attack.
- Faxes can be automatically routed to a password-protected fax mailbox or stored at the device until an authorized user releases them for printing.
- Other robust security features (auto/manual answer mode, dial directory setup, and fax reports) can be customized to meet your individual needs.

**Note: For CopyCentre, enable the internal Auditron feature to manage access and utilization for Copy.*

XEROX PROTECTION COUNT ON IT

Xerox was the first manufacturer to offer a Common Criteria-certified product that assures complete separation of the telephone line and the network fax connection.

Secure Print

- Holds jobs at the device until their owner releases them with a PIN.
- Prevents unauthorized viewing.
- Makes sure documents don't walk away.

Device / Network Management

- Certificate-based security using HTTPS (SSL). SSL provides a secure link to the Web UI (CentreWare Internet Services).
- SNMP V3 provides encrypted network management communications with the device. Supported by CentreWare Web.

Print Channel Encryption

- Provides a secure channel for print job submission using IPsec.

XEROX SECURITY ALWAYS ON DUTY

Audit Log

- This feature tracks who did what (printing, scanning, network faxing) and when (date- and time-stamped).

Internal Auditor

- Limits use of walk-up copy features to authorized users.
- Limits the number of copies available for each user.
- Tracks usage at the account or department level.
- Downloads data to a PC to generate audit reports.

Foreign Device Interface

- Enables external access and accounting via magnetic card readers, coin devices and third-party accounting solutions.

Removable Disk Drive

(CopyCentre 90 and WorkCentre Pro 90 only)

- Lets you remove and store hard drives for physical protection.
- Virtually eliminates risk of unauthorized access to classified data.

EXTENDED CAPABILITIES

Xerox Business Partner Solutions

Meeting the latest security demands may require a joint effort between Xerox and our Business Partners. Combining Xerox office technology with innovative software created by Xerox Business Partners makes possible higher levels of security and overall productivity for our customers.

Discovery, tracking, reporting, and assessment

solutions: Control Systems Xtrak, Equitrac Office with MyPrint Secure Document Release, Pharos Blueprint and Uniprint.

Secure fax solutions: Omtool Genifax, Captaris RightFax, SecureDocs.

Secure e-mail solutions: Omtool Genidocs™, Captaris RightFax, SecureDocs.

Secure printing solutions: Equitrac Office with MyPrint Secure Document Release, Pharos Uniprint, Control Systems Xtrak and Document Retrieval.

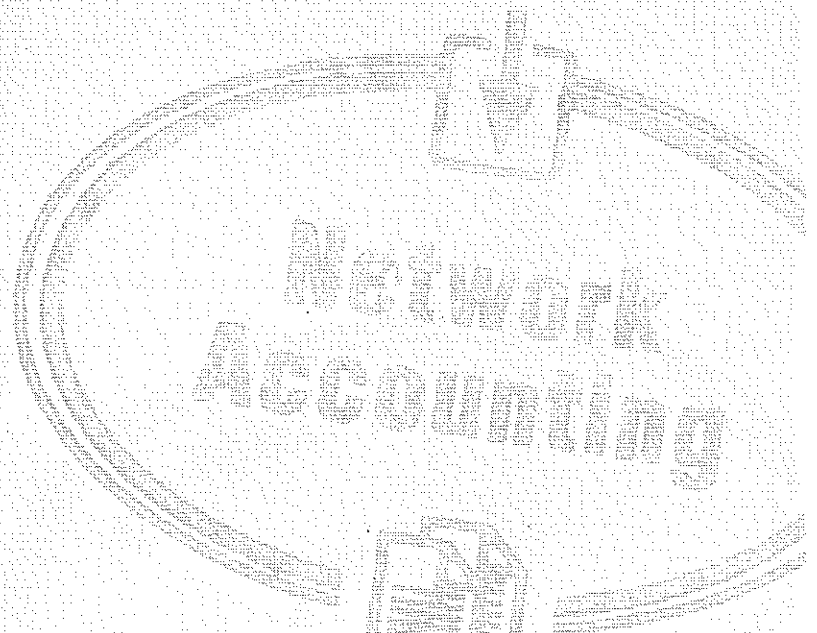
EXTENDED CAPABILITIES

Secure capture, integrate, and distribute information:

Omtool AccuRoute, Omtool Genidocs and Genifax, Cobra Image Router.

Network Accounting

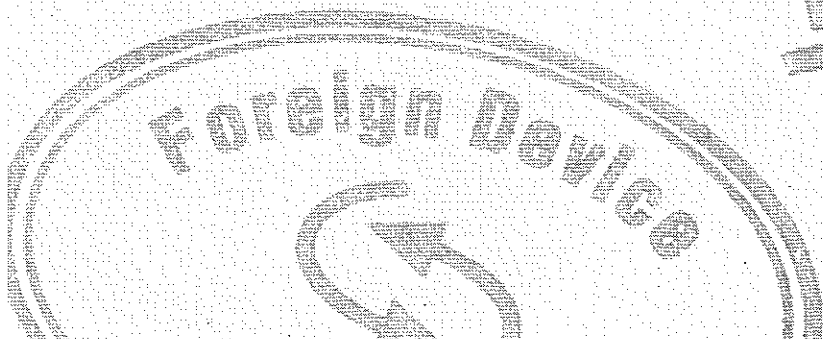
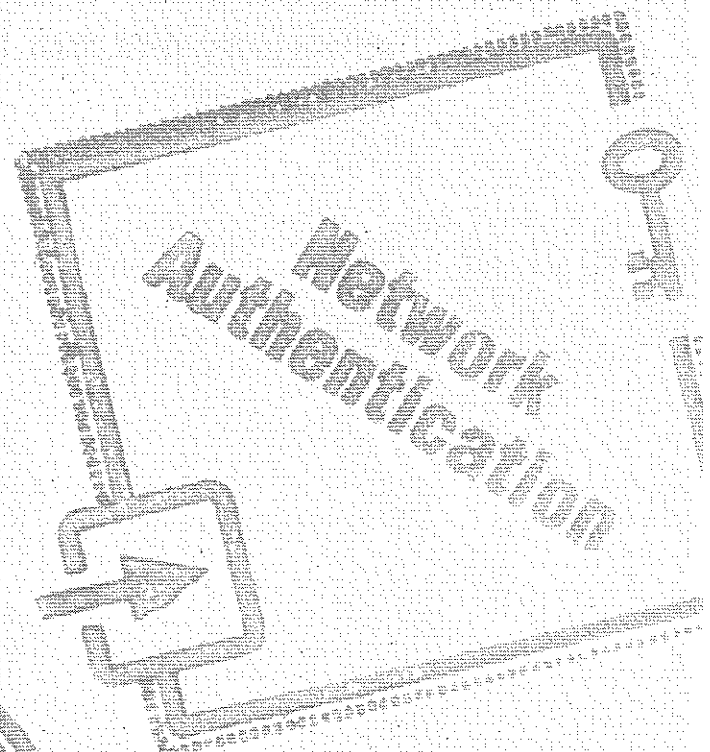
- Integration with Xerox Business Partner accounting solutions, such as those provided by Equitrac and Control Systems, is required to extend your control and enhance security.
- Controls access and tracks usage on a centralized basis.
- Provides up-to-the-minute data on how WorkCentre Pro is being used by account and/or user number, the type of service (copy, print, scan, fax), and even the time and date of completion.



EXTENDED CAPABILITIES

Genidocs, a Xerox Business Partner Solution

- Enables secure and encrypted document delivery.
- Authenticates sender and recipient.
- Integrates with WorkCentre Pro's scanning and e-mail capabilities.



YOU SHOULD KNOW . . .

- To avoid the issue of bringing diagnostic equipment into secure facilities, Xerox provides diagnostic maintenance software for customer PCs that must remain on-site. The software can be installed on the customer's PC in the secure facility.
- The portable workstation (PC) used to service your machine cannot access your user data.
- Xerox technicians with government security clearances are on call in select areas.
- Xerox posts its responses to current CERT (Computer Emergency Readiness Team*) security alerts at www.xerox.com/security so that your security/IT team knows its document security is always up to date.

** The Computer Emergency Readiness Team provides the Internet community with a single organization that coordinates responses to security incidents.*



SECURITY FEATURES AND OPTIONS

STANDARD FEATURES	CopyCentre 2128/2636/3545 CopyCentre 232/238/245/255/265/275 CopyCentre 90
Device Access Password Protection	★
Xerox Standard Accounting	NA
Internal Auditor (Copy Accounting)	★
Service Diagnostic Port Restrictions	★
Remote Systems Administrator Device Access Password Protection	NA
Configurable Network Services	NA
Secure Print	NA
Secure Print Protocol IPsec	NA
SecureScan Protocol HTTPS (SSL)	NA
User Authentication / Network Authentication (Scan / Email / Fax)	NA
Audit Logs	NA
OPTIONAL FEATURES	
Secure Embedded Fax Modem	★ ⁽²⁾
Foreign Device Interface	★
Cleared Service Technicians/PWS Software for Customer-Owned PC	★
Image Overwrite Security (On-Demand and Immediate)	★
Network Accounting Enablement	NA
COMMON CRITERIA CERTIFIED	NA⁽⁴⁾

(1) Not available on WorkCentre Pro 2128 / 2636 / 3545 and WorkCentre Pro 90.

(2) Not available on CopyCentre 90 or WorkCentre Pro 90.

(3) Requires integration with a Xerox Business Partner Solution.

(4) CopyCentre 232/238/245/255/265/275 do not have hard drives and therefore cannot be Common Criteria certified.

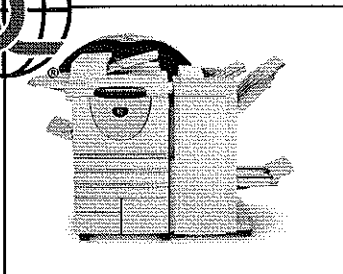
NA: Not applicable.

SECURITY FEATURES AND OPTIONS

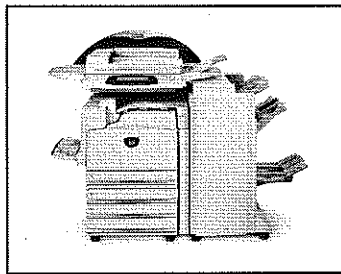
WorkCentre 232/238/245/255/265/275	WorkCentre Pro 2128/2636/3545 WorkCentre Pro 232/238/245/255/265/275 WorkCentre Pro 90
★	★
★	★ ⁽¹⁾
★	★
★	★
★	★
★	★
★	★
★	★
★	★ ⁽¹⁾
★	★ ⁽¹⁾
★	★
★	★ ⁽¹⁾
★	★ ⁽¹⁾
★	★
★	★
★	★
★	★
★	★ ^(2,3)
★	★

Xerox analysts can help assess your document security requirements and work with you to make sure they are met. For more information call **1-800-ASK-XEROX** or visit us at www.xerox.com/security

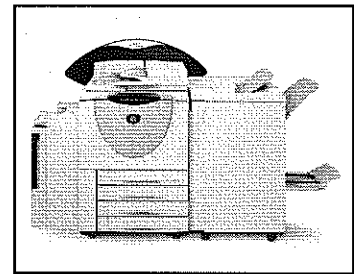
Common Criteria certification is the international standard for IT security testing accepted by many federal agencies.



WorkCentre® Pro 275
Advanced Multifunction System



WorkCentre® Pro 3545
Advanced Multifunction System



WorkCentre® Pro 90
Advanced Multifunction System

XEROX | BUSINESS
PARTNER

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6/06 610P718940A SECBR-02UC



Xerox DocuColor 242/252/260 Networking Security White Paper

Version 1.1

Date of Issue: 3/29/07

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Version Control

Version	Date	Editor	Description of Change
0.9	11/13/2006	P. Mabanglo	First draft
1.0	2/13/2007	P. Mabanglo	Updates to with DocuColor 242/252
1.1	3/28/2006	P. Mabanglo	Access exceptions change
1.1	3/29/2007	P. Mabanglo	Final

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1 Document Overview

The purpose of this document is to assist System Administrators and IT professional with evaluating the security features enabled with the Xerox DocuColor 242/252/260 for secure network environments. This document will highlight features mostly commonly requested for high-security environments and detail limitation on the implementations of these features.

Xerox and EFI places a high priority on producing products with strong security features; both have worked together to determine the best requirements for the digital printing community. EFI has also created a cross-functional team whose primary focus is to deal with present and future security issues. EFI hopes that the end users will be able to independently evaluate the information provided in this overview to develop their own chosen system of security. Only by choosing measures designed to enhance security such as secure password procedures and strong physical security procedures, can the end user realize a system with security features.

2 Background

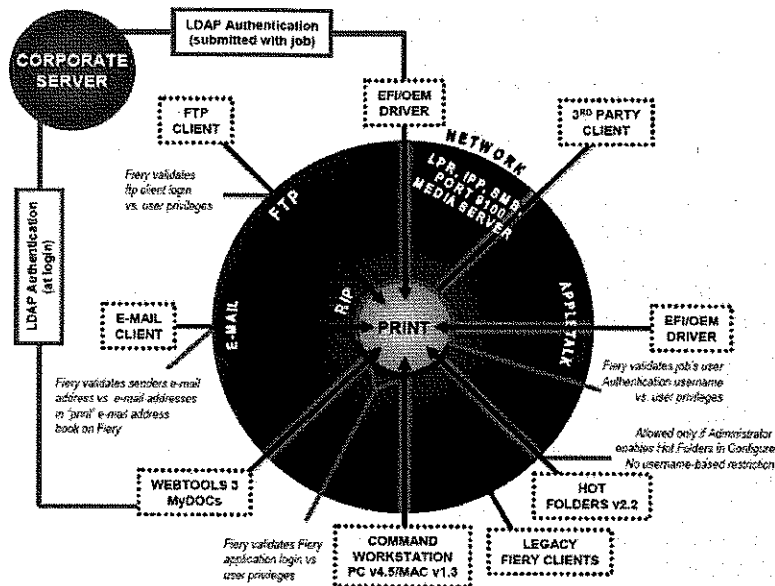
2.1 The Need for Security

For Corporate and Government IT organizations, on-going document security is one of the greatest challenges they face, taxing IT and document production personnel alike. These organizations are confronted with a more complicated range of security risks than ever before, as well as growing government regulatory compliance and confidentiality demands. Although most of these organizations have employed some degree of security over their electronic document processes; very little attention has been paid to the document printing process and its vulnerability.

EFI Fiery servers and bustled controllers for the Xerox DocuColor 242/252/260 are developed to assist these organizations with tools in helping to protect electronic access to documents and data through a complement of sophisticated security functions and options including SNMP v3, LDAP, SSL and Certificate-driven authentication, and Encryption of Critical Information.

Some security features and issues require further examination and explanation, based upon the needs of individual secured network environments. They are specific to organizations whose security needs require special or higher levels of security protocols. The items discussed in this document include:

- NAIP Certification (Common Criteria Certification) for Secure Erase
- IP v6
- IPsec
- 802.1x
- Port Blocking and IP Filtering
- Volatile Memory Usage
- Windows Service Pack Information



Fieri Job Printing Authentication Workflow

- Some clients have restrictions logging in (outside the circle); others have no restrictions
- Some jobs require authorization in the job (inside the job)

3 EFI Fieri Security

3.1 Secure Erase Option

To ensure optimal security, Government agencies and security-minded corporations sometimes require the complete removal of data from computer equipment. Often, simple file erasing and/or re-formatting does not entirely remove stored data, and is therefore insufficient for high security environment as data can be retrieved intact with data recovery tools.

The Secure Erase Option is designed to remove latent traces of job data from the Fieri hard disk drive. At the instance of deletion, the space occupied by each job data file is overwritten multiple times, minimizing the possibility of restoring the data to an intelligible form. The method used with the Secure Erase algorithm is based upon the United States Department of Defense specification US DoD5220.22M. This option provides ISO-15048 Common Criteria security assurance to connected Fieri servers and bustled controllers to Xerox DocuColor 240/250 and DocuColor 242/252/260 systems. Fieri System 6/6e and 7/7e are certified with the National Information Assurance Partnership (NIAP)—Common Criteria Certification. Fieri System 8/8e is currently in certification.

The user enables or disables the feature with the ON/OFF option in Fieri WebTools Configure, a web-based interface.

Two modes of operation are available with the Secure Erase Option within Linux-based bustled controllers: "Run Time" and "Idle Time." Selecting "Run Time" will enable the secure erasure of a job immediately upon deletion. With "Idle Time" selected, jobs will be securely erased during idle periods of the engine. While "Idle Time" provides optimal production performance in secure data environments, "Run Time" offers a higher level of security.

The following limitations and restrictions apply:

- Secure Erase does not apply to job files not located in systems other than the Fiery such as:
 - Copies of the job that are load balanced to another Fiery
 - Copies of the job archived to media or network drives
 - Copies of the job located on client workstations.
 - Pages of a job that are merged or copied entirely into another job
- Does not delete any entries from the job log
- If the system is manually powered off before a job deletion has finished, there is no guarantee that the job will be fully deleted.
- Secure Erase does not erase jobs submitted through the following methods-
 - Submitted through FTP server.
 - Submitted through a Novell pserver.
- When printing via SMB, the print job goes through the spooler on the Fiery which saves the job to disk. The Fiery System software has no control over this, hence the system cannot securely erase the job.
- Does not delete any job data that may have been written to disk due to disk swapping and disk caching.

3.2 802.1x Authentication

Continuing its commitment to highly flexible integration and connectivity with virtually all network requirements, EFI is introducing 802.1x Authentication as a standard feature with the release of Fiery System 8/8e Release 2.

802.1x is an IEEE standard for port-based Network Access Control. It allows only authenticated devices access to the LAN port. 802.1x is based on the Extensible Authentication Protocol (EAP). It provides security at the data-link layer. When 802.1x is enabled, the Fiery uses one of the two EAP methods to seek authentication from an 802.1x authentication server (such as a RADIUS server). The two EAP methods utilized are MD5-Challenge and PEAP-MSCHAPv2. The Fiery seeks this authentication at start up time. Once authenticated, the Fiery is allowed access to the network. If authorization is not granted, the Fiery is not allowed access to the network.

Configuration set-up on the Fiery for 802.1x Authentication is performed via a web-based tool called WebTools.

The following limitations and restrictions apply:

Currently supported EAP types are limited to EAP-MD5 and PEAP-MSCHAPv2. No TCP/UDP ports are used in 802.1x operation.

3.3 IPsec

IPsec or IP Security Protocol provides security to IP protocols through encryption and authentication mechanisms. As a standard feature, IPsec in the Fiery allows the Fiery to accept incoming data that supports IPsec using a specific authentication method.

When IPsec is enabled, the Fiery will accept connections from other nodes that are not using IPsec..

The pre-shared authentication keys are used strictly for establishing trust – not for application data packet protection.

The interface for setting up IPsec in the Fiery is in the "Configure" section of WebTools.

3.4 IP Filtering

IP Filtering provides access control to devices as a standard feature in a network environment. There are several network environments where IT Administrators may need to restrict the access to the Fiery for various reasons: 1) To control print costs, 2) To segregate budget centers expenses, and 3) To limit the printing activity to authorized users.

The IP Filtering feature is most applicable to static IP environment where the System Administrator can specify whether to accept or deny connections from a specific IP address or a range of IP addresses, blocking client computers from using a Fiery.

3.5 Port Blocking

With today's proliferation of computer "hacking", viruses and illegal data harvesting, Government and Corporate IT organizations sometimes require the ability to limit network access to unauthorized users.

By default all ports required by Fiery services are enabled. Systems administrators can deselect any number of ports from setup. Any ports deselected are disabled by the Fiery, which also disables the dependent Fiery service

The following table lists all the open ports on the Fiery.

TCP	UDP	PORT NAME	DEPENDENT SERVICE(S)
21		FTP	FTP
80		HTTP	WebTools, IPP
	123	SNTP	SNTP
135	135	MS RPC	Microsoft RPC Service (External Fiery Server Only)
	137-9	NETBIOS	Windows Printing
	161-2	SNMP	WebTools, Velocity, some legacy utilities, other SNMP-based tools
	427	SLP	
443		HTTPS	HTTPS
445	445	SMB/IP	SMB over TCP/IP
	500	ISAKMP	
515		LPD	LPR printing, WebTools, some legacy utilities
631		IPP	IPP
	4500	IPsec NAT	
	5353	Multicast DNS	
3050 8010 8021-8022 18021 18022 18081 21030 22000	9906	EFI Ports	CWS4, EFI SDK-based tools, EFI Driver bi-di functions
9100-9103		Printing Port	Port 9100 (with bidi support)

3.6 IPv6 Support

IPv6 is short for Internet Protocol Version 6. IPv6 is the next generation protocol designed by the Internet Engineering Task Force (IETF) to replace the current version of Internet Protocol, IP Version 4 (IPv4). IPv6 fixes a number of problems in IPv4, such as the limited number of available IPv4 addresses. It also adds many improvements to IPv4 in areas such as routing and network auto configuration. IPv6 is expected to gradually replace IPv4, with the two coexisting for a number of years during a transition period.

The Fiery will receive the IP prefix announced by the router and then it will negotiate with its neighbors to get its own specific IP address.

The standard Fiery supports the phase-in transition for Ipv6. In the Fiery's IPv6 Phase 1 the following features are supported:

- LPR
- Enable/disable via WebTools v3.0 Configuration (default is enabled)
- Approved for IPv6 Ready Phase 1 Logo

The following are the limitations for the Fiery's IPv6 Phase 1 support:

- No DDNS support.
- No DHCP6 support.

- For remote clients over IPv6, no bi-directional support of any kind, including no bi-directional support in drivers and job monitor.
- For remote clients over IPv6, no support of Fiery utilities, including Command WorkStation.

3.7 Volatile Memory Usage

Data is written and stored to areas other than the hard drive disk of the Fiery server and busted controller. The following table volatile memory usage and purpose can help determine the level of security vulnerability:

MEMORY/STORAGE	SIZE	PURPOSE & EXPLANATION
DDR SDRAM	1 GB	The executable software is loaded from disk and run in this memory. It is also used for temporary storage of data files and images. This information is not backed up and is lost when the power to the copier is removed. Upon power-on the Network Controller SDRAM is put through a memory test which performs an overwrite function.
Cache (L2)	1 GB	It is used for temporary storage for program code and data. There is no access to individual locations to read or write, other than the internal software itself.
Boot ROM	512 KB	This read-only Flash memory contains the code necessary to boot the system. A power-on self-test is performed and the bootstrap OS is loaded. The area never contains any user image or document data.
NVRAM	256 B	Non-Volatile RAM stores boot-up and configuration information. There is no access to individual locations to read or write, other than the internal software itself.
Video Board	512 KB	EFI video board provides temporary storage for print data. There is no access to individual locations to read or write, other than the internal software itself.
Network Controller Hard Disk	40 -160 GB	This device contains numerous types of data: <ol style="list-style-type: none"> 1. All executable code (operating system, PDL interpreters, network protocols, document scheduler, etc.). 2. Spooled documents in PDL format from the network, plus scans. 3. Server IDs, server password, user IDs, user passwords, and file locations (for sharing folders). 4. All MIB Objects. 5. All resident fonts. 6. The hard disk within busted controllers employs a UNIX-like format.

3.8 Windows Service Pack Updates Policy

Effective October 10, 2006, Microsoft has officially discontinued support for Windows XP Service Pack 1 and XPe Service Pack 1. However, EFI will continue to test and release patches for XPe-based Fierys for both SP1 and SP2 systems.

All XPe-SP1 based Fierys that have all the latest security patches installed (through Fiery System Update) are equivalent to an SP2 system.

For any customer concerns regarding XPe-SP1 systems and latest SP2 patches, please contact your authorized Xerox technical support.

3.9 Virus Software Protection

Administrators can install anti-virus software on Windows-based Fierys with FACL kits. A local GUI is required for proper configuration of anti-virus software. Anti-virus software is most useful in a local GUI configuration, where users have the potential to infect the Fiery with a virus through standard Windows actions.

For Fierys without a FACL kit, it is still possible to launch anti-virus software on a remote PC and scan a shared hard drive of a Fiery, EFI supports this configuration/workflow. However, EFI suggests the Fiery administrator work directly with the anti-virus software manufacturer for support of this operation.

EFI supports the use of antivirus solutions as used in accordance with this specification. EFI does not support or give any warranty regarding the efficacy of any anti-virus software.

3.10 Access Control Exceptions

When using the Secure Print feature from the PostScript or PCL drivers, documents can be released for printing at the Web LCD with the Secure Print password.

If user authentication is enabled and the correct credentials are not set the documents will be visible but they will not print.

4 Product Specific options

4.1 Fiery Network Controller Hardware Matrix

Fiery Controller	Standalone / Embedded	Operating System	Code Base	DVD-ROM	Removable Media Drive (optional)	GUI Kit
EX260 for DocuColor 260	Standalone	Windows XPe	System 8	✓	✓	✓
EX260 for DocuColor 242 & 252	Standalone	Windows XPe	System 8	✓	✓	✓
Network Controller for DocuColor 240/250	Embedded	Linux	System 6.0e	X	X	X
Network Controller for DocuColor 242/252	Embedded	Linux	System 8.0e	X	X	X
Network Controller for DocuColor 260	Embedded	Linux	System 8.0e	X	X	X
Splash RPX-ii	Splash	OS 10.4 and up	RPX-ii	X	NA	NA
Splash RPX-i	Splash	OS 10.4 and up	RPX-i	X	NA	NA
EXP250	Standalone	Windows XPe	System 6.1	✓	✓	✓

Xerox Print Driver Platform

Xerox Global Print Driver

Xerox Mobile Express Driver

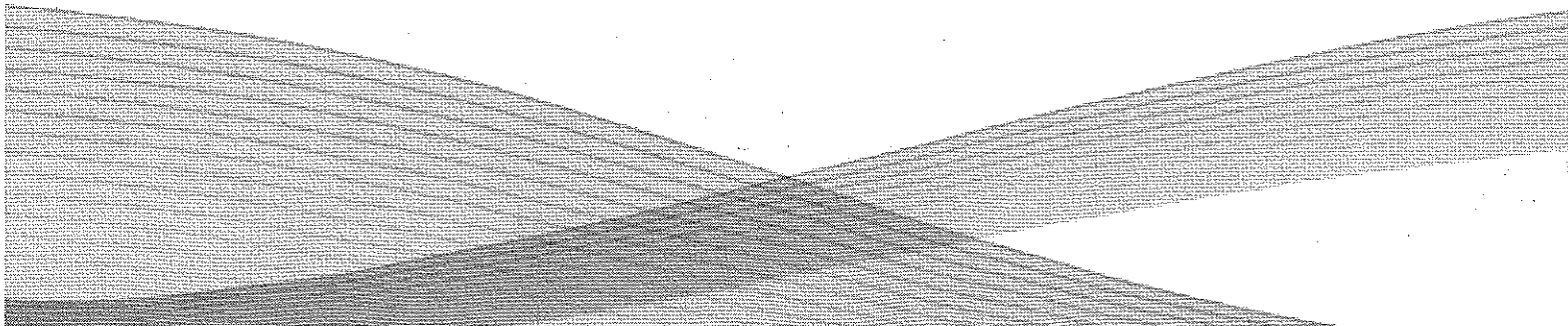
Contents

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4	Xerox Print Driver strategy
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Authors:

Kathren Korsky, Xerox
Richie Michelin, Xerox
Greg L. Schmidt, Xerox
Doug Tallinger, Xerox



Xerox Print Driver Platform

Executive Summary

Xerox Corporation has developed a breakthrough print driver platform that can significantly reduce costs and increase the efficiencies of enterprise printer management and support. It will change the way that IT administrators view and manage print drivers in the enterprise.

The key component of this new strategy, our core driver platform, increases user productivity by streamlining the user interface and ensuring a consistent experience across the majority of the Xerox product lines. We feel it will greatly simplify print services delivery and reduce end-user training and support requirements, lowering the cost of IT print services.

In addition to traditional Xerox drivers built on this core driver platform, we are also introducing two innovative new print drivers:

- **Xerox Global Print Driver (X-GPD)** is a universal print driver that offers unprecedented ease of use for network administrators managing a diverse array of print devices across the enterprise. It greatly reduces the time and effort required to deploy and upgrade print drivers on a network.
- **Xerox Mobile Express Driver (X-MED)** allows mobile professionals to quickly and easily find and use printers in any new location, without time-consuming driver installation and costly support calls.

Unlike proprietary “universal” print drivers, X-GPD and X-MED support both Xerox and non-Xerox printers, an important advantage for IT managers administering the typically diverse mixture of print devices on today’s enterprise networks. These drivers also support 100 percent of the feature sets of most Xerox printers.

In addition, these drivers provide users with a consistent single interface for all printers, with real-time, dynamic reports of printer status. As a result, users can easily identify the best printer for their needs, quickly choose the correct options and see updated consumables status without the assistance of IT.

Xerox Print Driver Platform

Background Information

Traditional Print Drivers: The "One Driver: One Printer" Model

In the typical, "traditional" scenario, print drivers are device-specific. While they can manage a single device or family of related models, traditional drivers generally can't be used to manage other printers, particularly from other manufacturers.

Most enterprise networks have diverse output requirements and employ a wide array of devices with varying capabilities. Some are connected directly to the network; others connect via USB to individual users' computers. The task of qualifying, installing, and managing those drivers can be a large drain on an organization's IT resources.

In addition, this standard "one driver: one printer" model can proliferate drivers on a single print server, increasing the chances of conflicts between drivers. The plethora of drivers can also slow down migrations to new technology, or delay recovery in the event of a disaster. It significantly increases network operations staffing requirements.

Making changes to a printer or its configuration, in addition, can require repeated touches of user computers, which slows down device refreshes and increases IT's support costs. Printer users can be confused by differences between different print driver interfaces, which not only reduces employee productivity but also increases the need for additional training and/or help desk support.

Traditional drivers can also be a problem for today's mobile professionals. An employee visiting a new location must identify and install drivers in order to print documents, or beg "print favors" from on-site personnel. The user's printer list soon grows to unmanageable levels, whether or not the listed printers are actually available.

Printing with Universal Print Drivers

A single "universal" driver platform for all networked devices can resolve many of the issues that arise from the "one driver: one printer" model. A universal print driver (UPD) provides users and network administrators with a single driver interface that communicates with multiple printers.

By deploying a UPD on the network, IT managers can reduce printer support requirements, install or upgrade printers in a fraction of the time, and reduce the labor and overhead needed to support network printing. This cuts overall printing costs for the organization, and increases user satisfaction with IT's print services.

Unfortunately, older UPDs are proprietary, providing little or no support for other manufacturers' devices. The UPD may not be able to print to any device it doesn't explicitly support (even from the same manufacturer), and may not always allow access to all the device's features and capabilities. For example, the UPD may not offer access to advanced color management options or print quality settings for a selected printer, even in the manufacturer's own product line.

Proprietary UPDs are only of limited usefulness in supporting the diverse array of output devices found on today's networks. It's not always clear if these drivers will scale to accommodate future printers and multifunction devices when a company's product direction changes.

Moreover, current UPDs still fail to address mobile user issues. Since they usually can't provide dynamic, location-specific updates of printer status and availability, users can mistakenly send documents to printers in other sites. This is frustrating and inconvenient for the user and, when confidential documents mistakenly print in a remote location, introduces a potential security risk.

Xerox Print Driver Platform

Xerox Print Driver Strategy

Xerox Windows Driver Platform

The Xerox Windows Driver Platform solves many of the problems of older, proprietary UPDs, providing an underlying driver base that unifies a common user experience and feature implementation. Introduced with new Xerox devices in 2007, it forms the basis for a new generation of universal and mobile print drivers. It also improves the user experience through enhanced ease of use and the ability to present a common user interface for all supported devices.

Built on industry-standard UNIDRV and PScript core driver components from Microsoft, the Xerox Windows Driver Platform supports Xerox Office and Production products including our Phaser, WorkCentre, and DocuSP/FreeFlow devices. It provides a common driver implementation for Microsoft Windows operating systems, including 32- and 64-bit versions of Windows XP, Windows Server 2003, Windows Vista and Windows Server 2008.

Architecture

The Xerox Windows Driver Platform enables a wide range of workflows from a common driver core. This simplifies driver certification in enterprise environments, and also significantly reduces or eliminates effort required to transition between driver types.

The Xerox Global Print Driver (X-GPD) is one of the first truly universal print drivers. Along with the Xerox Mobile Express Driver (X-MED), it shares the same architectural components as traditional Xerox drivers. As a result, all Xerox drivers in this platform can present a consistent user experience regardless of printer chosen. Users will see the same features and behaviors, the same interface components, and the same driver/application interactions.

These driver solutions will allow users to print to almost any Xerox or non-Xerox device even when not explicitly supported.

X-GPD lets IT managers virtually eliminate the one printer: one driver model, dramatically streamlining print driver management across the enterprise. Since the three driver types share the same core and feature implementations, creating a common print driver base, IT need only focus on the unique changes in workflow characteristics, driver improvements or version changes when transitioning between driver types. This eliminates the need to fully test and certify multiple drivers for multiple devices, significantly reducing IT support costs.

Integration with Microsoft Core Drivers

We chose to strategically align with Microsoft's print driver development architectures, basing our platform on Microsoft's core drivers, UNIDRV and PScript, ensuring that our drivers maintain optimal compatibility with the Windows operating system.

Consistent Interface Lowers User Learning Curve

Each driver offers distinct workflows tailored to meet the needs of specific types of users. Since the drivers share a consistent user experience, users can move between drivers and printers without confusion, greatly reducing the need to call IT for printer support. An employee can install X-MED, for example, and find each feature in the same position in the user interface for every printer they use.

Xerox Print Driver Platform

Xerox Global Print Driver (X-GPD)

The Xerox Global Print Driver (X-GPD) reduces the burden of network printer support for IT administrators by providing broad device support in a convenient, single driver package. It works with virtually all Xerox-branded printers and multifunction printers (MFPs), and also supports non-Xerox devices that implement print features using compliant PostScript® and PCL.

Key Features

- **Unified, universal driver.** Single driver can be used across the network with Xerox and non-Xerox devices using PostScript® and PCL PDLs.
- **Simplified device management.** Printers can be upgraded or replaced without requalification or reinstallation of print drivers.
- **Custom printer settings.** IT managers can deploy global, pre-configured printer settings to all X-GPD-supported devices. In addition, users can configure their own application-specific printer settings that will be applied to every new printer they choose.
- **Single, consistent interface** greatly improves user experience.

Unified, Universal Driver

The X-GPD supports virtually all Xerox-branded printers and multifunction printers (MFPs). Our tests have shown that it also works with non-Xerox devices if they support a Microsoft Windows implementation of PostScript (Level 2 or Level 3) or PCL 5/6.

For fully supported devices, X-GPD will display the full feature set of the selected device, including such options as advanced color management and print quality settings. However, we can't guarantee that non-standard features of every non-Xerox device will be compatible with X-GPD.

Simplified Device Management

X-GPD's ability to unify and streamline print driver management can dramatically reduce ongoing network printing costs.

A single instance of X-GPD can support multiple devices across the enterprise. This allows IT administrators to streamline driver testing, optimizing the certification process.

It can greatly simplify driver deployment and maintenance. When a network administrator upgrades a device with two-sided printing capabilities, for example, X-GPD will dynamically update the user's printer options to reflect the new features.

A printer can be easily replaced when using X-GPD; the network administrator simply plugs in the new device and assigns it the same IP address as the old printer (or redirects the port). No additional installation or qualification is necessary. X-GPD will automatically determine which product should be associated with a print queue during printer installation, and select the appropriate user interface to use for the new device.

This capability eliminates the need to distribute new printer queue mappings to users when changing or replacing printers. Instead, the change can be quickly and transparently delivered to the user environment without requiring additional user intervention.

Xerox Print Driver Platform

Xerox Global Print Driver (cont.)

Custom Printer Settings

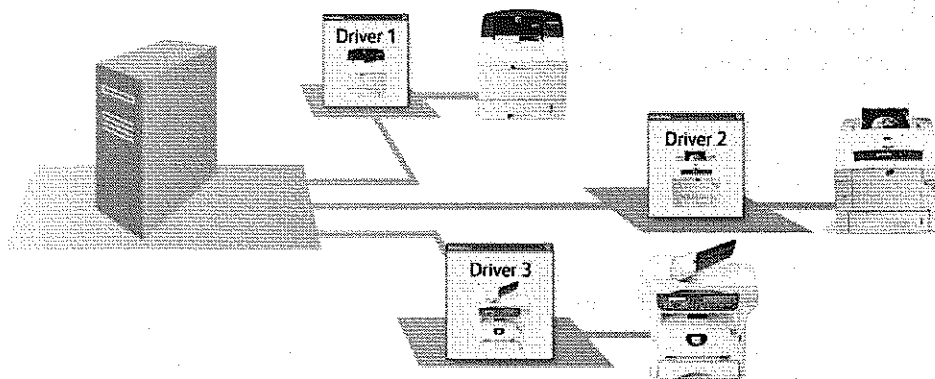
The architecture of X-GPD makes it easy to establish global printer settings for certain print driver features and apply them across the network. IT managers can use this capability, for example, to enforce sustainability or "green" by defaulting all print queues to use two-sided, or duplex, printing, or save money by electing a default setting of black and white instead of color.

Single, Consistent Interface for Users

Since X-GPD creates a consistent, easy-to-use printer interface, it can reduce user training and support. When X-GPD is first installed and enabled with bidirectional communication, it will identify the print device associated with the print queue. It then selects and displays the correct user interface and feature set for the user's chosen printer.

If bi-directional communication is not enabled, or the device is not fully supported by X-GPD, the user can choose between manually configuring the print driver for a richer feature experience or using a standard basic interface.

Printing with Traditional Print Drivers: The "One Printer: One Driver" Model



The traditional one printer: one driver model significantly increases IT's driver management and support burden, and is frequently a source for driver conflicts on network print servers. Most "universal" print drivers are proprietary and support relatively few devices on the typical network, doing little to resolve this issue.

Printing with the Xerox Global Print Driver



The breakthrough Xerox Global Print Driver significantly consolidates print driver management for both Xerox and non-Xerox printers, dramatically reducing IT management and support requirements.

Xerox Print Driver Platform

Xerox Mobile Express Driver (X-MED)

The Xerox Mobile Express Driver provides users with a simple, intuitive, and consistent interface that makes it easy to find, configure and print to the best available printer in a location.

The driver is location-aware, i.e., when a user logs into a new location, X-MED initiates search-and-discovery of printers on the user's local network subnet. It will display printers found in the new location and will allow the user to construct a customized list of printers for each new location so that the user only sees the printers that are relevant for their current setting.

Key Features

- **Configures itself at print time.** When the user selects a printer, the driver automatically populates its interface with the correct options and status information for that device.
- **Helps users find the right printer without IT.** Lets users find and sort printers based on IP address, printer name, location, real-time status and other information.
- **Automatically detects location,** discovers printers and dynamically updates the user's printer list to reflect Xerox and non-Xerox printers in that location.
- **Customized for each user.** Users can add favorite printers to the "My Printers" list and save application-specific print settings.

Configures Itself at Print Time

X-MED differs from the traditional drivers and X-GPD, since it configures the print driver experience at print time rather than at install time.

When installed, X-MED isn't associated with any particular device. Instead, when printing from an application, X-MED initially discovers the devices available on the network or allows the user to choose from a device in the My Printers list.

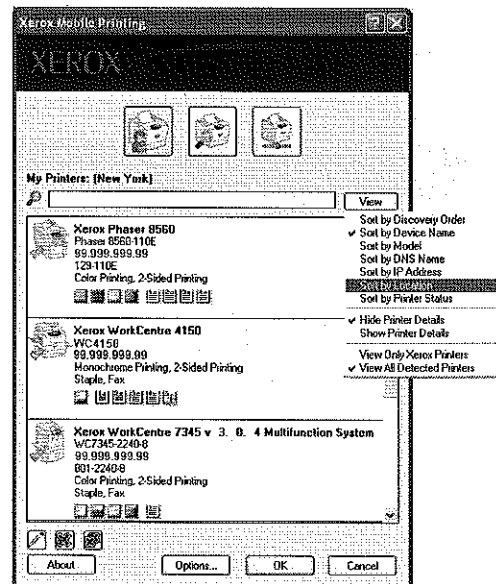
The user can view detailed information about the device and choose the device that contains the appropriate capabilities required for the print job. After selection, the driver automatically configures its driver display to represent the chosen device.

Helps Users Find the Right Printer without IT

X-MED uses SNMP requests to query for devices on the network, within the user's local subnet. On connection to the network, X-MED identifies the location, queries for available printers, and populates the driver's "Discovered Printers" pane with the printers it finds on the subnet.

Users can sort the list by device name, model, DNS name and IP address, and by status (see right). Previously used printers become available in the user's "My Printers" list, with the most recently used printer appearing at the top of the list.

X-MED ensures that users always know which printers are ready to accept print jobs before attempting to print to a device, reducing the frustration and delay of printing to a device that requires attention. This improves employee productivity and satisfaction with IT print services.



Xerox Print Driver Platform

Xerox Mobile Express Driver (X-MED) (cont.)

Automatically Detects Location

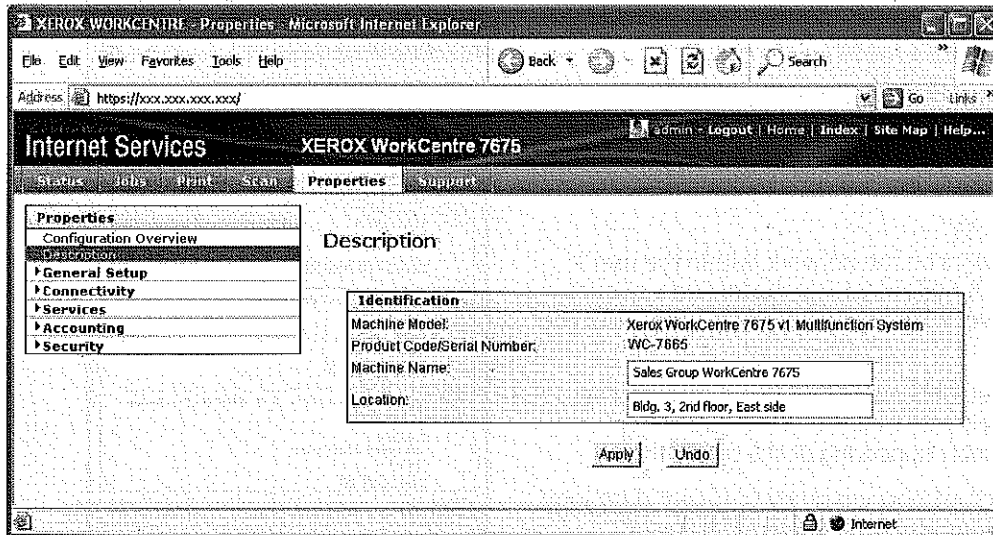
X-MED incorporates an intelligent discovery that identifies when the user has connected to a new network location. It lets users manage the lists of available printers in different office locations, a feature that's particularly valuable to mobile professionals working in multiple office locations.

When the user moves to a different office location, building, or branch, X-MED recognizes the change in network profiles and offers to create a new location for that device. Users will only see devices in their My Printers list that are physically in that location. When the user returns to a previous location, X-MED will identify a change in location and will include only the printers in that location.

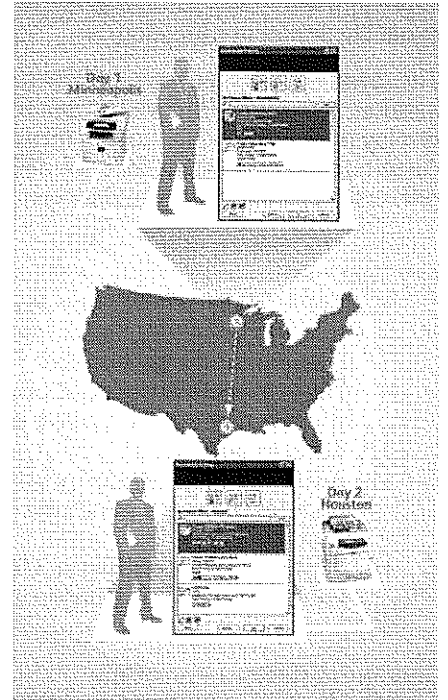
This eliminates the need for users to juggle a long list of print queues and try to remember which print queue to use when traveling to each of these various locations.

Additionally, X-MED shows users information about the location of each of the devices it discovers. This can help users find the right printer when they're unfamiliar with a new office. To maximize the usefulness of this feature, network administrators should be sure to configure the device with this information.

By using a standardized "template" for entering the location of the device, it will allow users more opportunities to be self-sufficient and productive. Many devices, including recent Xerox devices, let an administrator access device settings through a web browser. (As in the example below, a browser screen in the Xerox WorkCentre 7675 MFP user interface). By using a consistent format for specifying building, floor, and room locator details, users can find devices in their office environments quickly and easily.



Location-Centric Printing



Day 1: Visiting Minneapolis

X-MED identifies the new location on connection, and automatically discovers and displays available local printers. At print time, it configures the interface to match the chosen printer.

Day 2: Home in Houston

Back in the home office, X-MED detects its regular location and updates its display for local Houston office printers.

Xerox Print Driver Platform

Xerox Mobile Express Driver (X-MED) (cont.)

Customized for Each User

Once a device has been selected by the user, that device is saved in the user's configured list of My Printers for easy identification, and can be used in future print jobs. Users can even rename the printers in their My Printers list by adding a personal, "custom printer name" to the description of the device. When user's needs or preferences change, they can also remove unused printers from their My Printers list.

Users can also save selected print options for specific applications. These settings will be used by any printer the user chooses, whenever the user prints from that application. For example, a user could choose to print all PowerPoint presentations as handouts, in color, and save those settings. X-MED will subsequently default to printing all that user's Microsoft PowerPoint presentations as color handouts, regardless of printer or location.

Mac and Linux / UNIX Environments

The Xerox Mac and Linux / UNIX print drivers also enjoy the benefits of a platform approach to print driver development. As with the Windows driver platform, we work to ensure that Mac and Linux/UNIX users experience a similar user interface and consistent feature behaviors when using these drivers with a varied array of Xerox products.

Xerox Print Driver Platform Driver Type Comparison

Capability	Traditional Xerox Driver	X-GPD	X-MED
Driver is configured to use device feature set	At Installation	At Installation	At Print Command
Presents all device features using consistent user interface	●	●	●
Groups commonly used features on first tab for easy access and increased usability	●	●	●
Saved Settings feature allows each user to customize driver's default settings	●	●	●
Saves application-specific driver settings and applies to all printers selected, even non-Xerox printers	●	●	●
Rich status reporting provides quick view of current device status; users know if a device isn't ready before they print	●	●	●
Configures all installable options automatically	●	●	●
All changes to device configuration dynamically update in all user's drivers	●	●	●
Permits basic printing to any standards-compliant PostScript device*		●	●
Permits basic printing to any standards-compliant PCL5/PCL6 device*		●	
IT can certify and deploy one driver for many devices		●	
IT can replace or upgrade printers without reinstallation of driver (simply redirect port or use same IP address as old device)		●	●
User personalizes device list management per location			●
Shows device status and capabilities prior to selection			●
Enables quick and easy selection of the right device during print job setup			●

*Xerox cannot guarantee print quality or feature compatibility when printing to non-Xerox devices.

Xerox Print Driver Platform

Basic Printing Mode

When X-GPD and X-MED encounter a Xerox device that is not fully supported by the new driver platform, or devices from non-Xerox manufacturers, they will automatically fall back to a basic printing mode.

Basic printing mode ensures flexibility in supporting a diverse array of output devices across the network. X-GPD supports standard PostScript and PCL commands (X-MED is PostScript-only). The drivers can detect the printer's ability to support color vs. monochrome printing, and to provide two-sided printing functionality, and will present those as customized options in the driver interface.

Basic printing mode also supports most key features of these drivers, including the ability to save application-specific print driver settings.

The following table lists and describes some of the commonly used driver features in basic printing mode.

Feature	Description
Media size	Presents commonly available paper sizes.
Media type*	Includes various media types.
2-sided printing	Detects the ability of the device to support 2-sided printing and then displays the appropriate options.
Output color	Detects the ability of the device to print in color vs. monochrome, and displays the appropriate options. If the color capabilities of the device can't be determined by the driver, the PS driver will default to monochrome with the Output Color option, while the PCL drivers will default to monochrome printing and disable the Output Color feature.
Pages per sheet (N-Up)	Allows the user to place up to 16 images on one page. This environmentally friendly option helps reduce paper consumed in printing.
Booklet layout	Automatically re-orders and lays out pages in the print job to form a booklet.
Page layout options	Presents advanced functionality to customize the layout and appearance of the printed job.
Watermark	Allows user to incorporate a text or graphical watermark into the print job document.

**For best results, choose the media size and type offered by your device. Vendors' implementations of media options can differ substantially, and the behavior of these features is dependent on how the device supports paper sizes, paper path dimensions, media types and paper tray designations. Please consult your device's documentation for additional information.*

Xerox Print Driver Platform

Driver Security

Microsoft Windows operating systems check drivers for the presence of a digital signature before allowing installation and deployment to proceed. A digital signature is applied to the print driver package, certifying the security and robust behavior of the installed device.

A digital signature also indicates that the driver package is intact and in the original form intended by the manufacturer, with no evidence of tampering. If the signature is missing from a driver package, Windows will alert the user, giving them the chance to abort the installation.

X-GPD has been digitally signed with a Microsoft certificate in accordance with the Windows XP Logo (WHQL) program.

Microsoft's program rules require that signed drivers establish a distinct, fixed association with a single device. Since X-MED reconfigures itself to fit the selected device at print time, it doesn't establish the WHQL-required single relationship.

Instead, we have ensured the security of the X-MED driver package through the use of a VeriSign digital certificate. The presence of the VeriSign digital signature indicates that the X-MED package is intact and safe for installation.

Type of Driver	Type of Digital Signature	
	Microsoft XP Logo Program (WHQL)	VeriSign
Traditional Xerox driver	●	
Xerox Global Print Driver	●	
Xerox Mobile Express Driver		●

Xerox Print Driver Platform

Appendix A

FAQ: Xerox Driver Platform Strategy

Q. Does the release of the Xerox Global Print Driver and/or Xerox Mobile Express Driver mean that the traditional Xerox print drivers will be discontinued?

A. No. These drivers are additional solutions that customers may choose to use in place of traditional Xerox drivers. We feel that this allows customers to select the driver type that best meets their printing needs.

Q. Must I choose which type of driver to use during the install process?

A. No, you can easily move from Xerox traditional drivers to X-GPD or X-MED after installation. We make all three driver types readily available for download from Xerox.com as independent packages. Each driver type is clearly named to help you distinguish between them.

Q. Do X-MED or X-GPD support USB devices?

A. Yes. All three driver types, X-MED, X-GPD, and traditional Xerox drivers, support USB installations.

Caution: In some cases, when using Windows Vista, the drivers provided with the operating system will be selected as the preferred drivers for a USB printer installation. You can change this by removing those drivers from the Windows Vista driver store. (Requires administrative rights to the system).

Q. I frequently use the same print driver features when printing from certain applications. Is there a way that X-MED or X-GPD can help me simplify the process of setting up a print job when printing from these applications?

A. Yes. The Saved Applications Settings feature allows users to create customized feature profiles on a per-user, per-application basis. For example, when printing from Outlook, you might prefer to print in black and white mode, with two-sided print and one staple selected.

When you print from Outlook using X-GPD or X-MED, or even some traditional Xerox drivers, you can make these changes in the print driver and then save them for future use by choosing Save as Microsoft Office Outlook Defaults from the Saved Settings list. When you return to Microsoft Outlook and print again, the Microsoft Office Outlook default settings will automatically be applied to the print job.

Q. Were the drivers tested successfully in a Novell environment? Do they support Novell iPrint?

A. Yes. The Xerox Global Print Driver and Xerox traditional drivers were tested in Novell NDPS and iPrint configurations and worked well in the Novell environment. In order to ensure that proper device detection and automatic configuration of installable options works correctly, it is necessary to use version 4.20 or higher of the Novell iPrint client.

Q. Do the new drivers support Windows Server 2008?

A. Yes. Windows XP, Vista, Server 2003, and Server 2008 are all supported.

Xerox Print Driver Platform

Appendix B

FAQ: Xerox Global Print Driver (X-GPD)

Q. I am planning to upgrade my older Xerox products to newer Xerox products. Can X-GPD make this device replacement easier for me and my employees?

A. It certainly can! One of the fantastic benefits of deploying print queues using X-GPD is the ability to change print queue attributes, have the appropriate print driver changes take effect, and eliminate the need to redeploy new print queues to users when changes of this nature take place.

When the administrator alters the IP address or changes the print queue to use a different port, X-GPD detects this modification. It will attempt to identify the new device associated with that IP address or port and will update the print driver user interface to reflect that new device.

For Xerox products that are included in the Windows driver platform, the print driver will take on the feature set of this new device. If the administrator has configured the queue name to use a location-specifying naming scheme it won't be necessary to push new print queue mappings to the users or require the user's intervention to take advantage of the device update.

Q. How do I update a particular product's print driver? If X-GPD needs to be upgraded, does that affect all printer objects and require a complete rebuild?

A. If X-GPD has been used to deploy print queues for multiple products, all of those queues will be simultaneously upgraded with the underlying X-GPD. All of the queues are associated with the same driver, when that driver changes, all of the queues are affected. Further, if the environment contains a mix of traditional and X-GPD drivers from the Xerox Windows Driver Platform, an upgrade of one of these drivers would result in the upgrade of all other related traditional and X-GPD drivers on that system, assuming that those drivers share the same version number.

Under normal conditions, it should not be necessary to rebuild all of the associated printer objects when performing an upgrade.

Q. Can a network administrator create standard TCP/IP ports and apply X-GPD to local queues as they wish?

A. Yes. X-GPD can be used to create multiple print queues using standard TCP/IP ports. All of these queues would be enabled by a single install of X-GPD.

Q. What if you have a driver issue and need to un-install and re-install the driver? Will ALL driver objects need to be deleted? Or just the one affected product's driver?

A. In this situation, since all of the print queues are shared by one common print driver, presumably X-GPD, all of the print queues would be affected by the deletion of the driver.

5. Are there shared DLLs among the individual queues with the Xerox Global Print Driver? What happens if a DLL becomes corrupted? Can all printer queues be corrupted since the driver is a single, shared file?

A. Since all print queues associated with X-GPD use the same set of driver files, all queues will be affected if those files are corrupted.

Xerox Print Driver Platform

Appendix B

FAQ: Xerox Global Print Driver (X-GPD) (cont.)

Q. Can X-GPD be used to create multiple print queues across various Xerox products as well as other manufacturers' products?

A. Yes. X-GPD is intended to be used for the creation of multiple print queues. These queues can be configured for a variety of Xerox and non-Xerox models. Each queue would be associated with X-GPD yet retain attributes associated with the individual device and device configuration.

Q. How does an IT manager use X-GPD to support non-Xerox devices?

A. When installing a non-Xerox device using the Add Printer wizard, select or create the appropriate port for the device and proceed with the installation. X-GPD will recognize that this is a non-Xerox device and automatically default to the Basic Printing Mode. If X-GPD cannot establish bidirectional communication with the device, it will also default to Basic Printing Mode.

For more information on which devices are explicitly supported by X-GPD, and for additional details about configuration, please see appendix D.

Q. How is pre-configuration handled with this driver? Does it support multiple configurations? This is a known problem with some UPDs, as when you're not using SNMP and have multiple device configurations for the same model.

A. In this instance, X-GPD operates in the same way as a traditional Xerox driver. If SNMP is disabled and you have multiple devices with the same model name but varying installable options configurations, you'll encounter the same difficulties.

Similarly, the ability to pre-configure the X-GPD with certain feature defaults functions just like the traditional Xerox drivers. For more information on how to manage the drivers in this instance, please refer to the Xerox.com customer tip at:

<http://www.office.xerox.com/support/dctips/dc04cc0328.pdf>

Q. Is this a Windows platform-only driver?

A. Yes. At the present time, X-GPD currently is available for Windows XP, Vista, Server 2003, and Server 2008 only.

Q. Will X-GPD work with Follow-You-Print in the Xerox Secure Access ID System?

A. We have been working with Equitrac, and other Xerox partners to ensure that our X-GPD works well with their solutions. Since the same PDL is emitted when using X-GPD as the traditional Xerox driver, we anticipate that X-GPD will also integrate well with these solutions. This is especially true for Xerox products fully supported by X-GPD.

Q. Does X-GPD support accounting enablement? For example, if I've enabled network accounting with user IDs for my multifunction printer, how will X-GPD support a user who chooses it?

A. Yes. X-GPD can be configured for accounting when used with a fully supported Xerox product. This option is implemented commonly across X-GPD and traditional Xerox drivers.

Xerox Print Driver Platform

Appendix B

FAQ: Xerox Global Print Driver (X-GPD) (cont.)

Q. Are there instances where X-GPD is not the best choice?

A. X-GPD is of greatest benefit to IT for simplifying print driver certification, deployment and maintenance. It would be less useful when a user only needs to use one printer and doesn't need to create or modify additional print queues.

X-GPD will work with most non-Xerox devices that implement industry-standard PostScript and PCL commands. However, if a non-Xerox device implements features in a proprietary manner and fails to support industry-standard PS and PCL commands, you might experience some difficulty using the driver. In that case, we recommend that you use the manufacturer's print driver.

Q. Will the Xerox Global Print Driver support future Xerox products?

A. Yes. Future releases of X-GPD will include support for Xerox products that have launched since the last release of X-GPD.

Q. Will I be asked to update my Xerox Global Print Driver whenever I run the installer?

A. No. The intelligence built into Xerox's driver installer allows it to determine which version of a driver is installed. It will only ask you to upgrade the driver if it detects a difference in versions.

Q. Can the Xerox Global Print Driver be pushed out with a script? If so what DLL should we reference in the script? Is there one DLL for all products?

A. X-GPD is very similar to traditional Xerox drivers. The methods you use to push traditional drivers out to enterprise clients can be used with X-GPD as well. Since product support is already bundled with X-GPD, there is no need to reference specific DLLs for specific products. At install time, X-GPD will detect the product associated with the port and present the appropriate driver user interface.

Q. Is the Xerox Global Print Driver an appropriate driver solution for a Citrix or Windows Terminal Server environment?

A. Yes. By eliminating multiple driver versions, X-GPD may be especially helpful in a Citrix or Microsoft Terminal Server environment, since it helps ensure that matching drivers are present on both the server and the client, a common difficulty faced when deploying traditional print drivers in these environments. We have applied for Citrix Ready certification for X-GPD.

Server 2008 Terminal Services now includes Microsoft Easy Print, which reduces the hassle of ensuring that print driver versions match on both server and clients. To learn more, visit the Microsoft Windows Server 2008 website.

Q. I have changed the name of my print queues to refer to building locations. How can I tell which driver type I am using, X-GPD or the traditional driver?

A. In order to determine which type of driver is in use for a particular print queue, right-click on the queue, select Properties and the Advanced tab. The "Driver:" feature on this tab shows the print driver that is associated with the queue.

Xerox Print Driver Platform

Appendix C

FAQ: Mobile Express Driver (X-MED)

Q. Can I use X-MED and X-GPD together? Are there instances where you don't recommend using X-MED?

A. Yes to both questions. X-GPD and X-MED do have different workflows and are intended for different purposes. X-MED is best suited for users who require flexibility and convenience when printing, particularly when traveling. If the network environment requires strict control over printing configurations, or the user has no need to switch to different printers, there's less need for X-MED.

Q. How does X-MED employ specific protocols when sending print jobs?

A. X-MED uses a local port to enable print job transmission. The user doesn't need to manage the selection of settings such as port 9100 vs. RAW.

Q. Which ports need to be open on routers / switches to allow for discovery and bi-directional communications to work? Is there a specific port that SNMP communications use?

A. SNMP uses ports 161 and 162. In addition, the devices must support SNMP v1/v2 with the community name set to "public" in order to discover devices when using X-MED. To prevent devices from being discovered by X-MED, change the SNMP Community Name on those devices to use a name other than "Public" or enable the IP Filtering feature that is available on most Xerox devices.

Q. I clicked on the discovery icon in X-MED, but the printer I'm looking for didn't show up in the "Discovered Printers" list. Why?

A. X-MED's discovery module uses SNMP requests to query for devices on your network, within your local subnet. If your network is very large with many print devices, you may need to run the discovery module more than once to find the printer(s) you're looking for. This is due to inherent limitations in the SNMP protocol.

To force additional device discoveries, select the "Cancel" button from within X-MED and then re-open the driver by choosing Properties again from the application's Print dialog. (Another way to do this is to select any device from the "Discovered Printers" list, click the "OK" button, and then click the "Change Printer" button. You can then click the Discovery icon to launch the discovery module and find additional printers.)

If your printer is on a different network subnet than your PC, you'll need to find it using X-MED's Advanced Network Search feature. Click the "Advanced Search" button in the Discovered Printers window, and then specify the printer's IP address, or specify the device's gateway and subnet mask.

You can also search for your printer directly, by clicking on the "IP Address or DNS Name" button. Enter the printer's IP address or DNS name into the resulting window, click the Search button and the driver will attempt to establish communication with the device and return its status.

Xerox Print Driver Platform

Appendix C

FAQ: Xerox Mobile Express Driver (X-MED)

Q. X-MED displays a long list of discovered devices. Is there any way I can filter this list to make it easier to find the printer I am looking for?

A. X-MED lets you search for printers from both the My Printers list and Discovered Printers List views. For example, type "8860" into the search field that is next to the magnifying glass icon and the results will include all devices that contain "8860" in their device or model name field. The list is dynamically filtered to react to the characters typed in that field.

Q. Can I use accounting with X-MED?

A. No. X-MED is not meant to be permanently associated with a particular device. Therefore, features such as accounting, or manual configuration of installable options are not supported by X-MED. X-GPD or the traditional drivers for the device would be a more suitable choice in those situations.

Q. Are there instances where X-MED is not the best choice for a non-Xerox device?

A. Yes. X-MED will work with most non-Xerox devices that implement industry-standard PostScript commands. However, if a non-Xerox device implements features in a proprietary manner and fails to support industry-standard PS commands, you might experience some difficulty using the driver. In that case, we recommend that you install the manufacturer's print driver.

Q. Is this only a Windows platform driver?

A. Yes. X-MED will only be available for Windows XP, Vista, Server 2003, and Server 2008.

Q. Will there be a MAC or UNIX version of X-MED in the future?

The Xerox Mac and Linux / UNIX print drivers also enjoy the benefits of a platform approach to print driver development. As with the Windows driver platform, we work to ensure that Mac and Linux/UNIX users experience a similar user interface and consistent feature behaviors when using these drivers with a varied array of Xerox products.

Xerox Print Driver Platform

Appendix D: Choosing X-GPD Configurations

We recommend setting up the Xerox Global Print Driver on your network using the corresponding model from X-GPD's supported printer list and following the on-screen directions for printer installation.

In a few exceptions, however, such as when a Xerox device does not appear in the list of devices, we recommend using the following configuration choices:

Device	Recommended X-GPD Configuration
Phaser 790	Select Basic Printing Mode
Phaser 3124	PostScript/PCL not supported; use the device's supplied driver
Phaser 3130/Phaser 3150/ Phaser 3450	PostScript and PCL6 not supported; use X-GPD PCL5 in Basic Printing Mode
Phaser 3500	Select Basic Printing Mode
Phaser 4400	Select Basic Printing Mode
Phaser 6120/Phaser 6125	PostScript/PCL not supported; use the device's supplied driver
Phaser 6130	Select Basic Printing Mode
Phaser 6180/6180MFP	Select Basic Printing Mode
Phaser 6200	Select Basic Printing Mode
Phaser 7300	Select Basic Printing Mode
Phaser 8200	Select Basic Printing Mode
Phaser 6100/ Phaser 6110/ 6100MFP/Phaser 6115 MFP	PostScript/PCL not supported; use the device's supplied driver
Phaser EX7750	Select Basic Printing Mode
Document Centre 402/425/426 /430/432/440/460/470/480/490/ 535/545/555	Select Xerox WorkCentre Device
WorkCentre Pro C32/C40	Select Xerox WorkCentre Device
WorkCentre Pro 65/70/90	Select Xerox WorkCentre Device
WorkCentre M165/M175/ Pro 165/Pro 175	Select Xerox WorkCentre Device
WorkCentre 123/128/133	Select Basic Printing Mode
WorkCentre 7132	Select Basic Printing Mode
WorkCentre 7228/7235/7245	Select Basic Printing Mode
DocuColor® 12	Select Xerox FreeFlow Device
DocuColor® 2045	Select Xerox FreeFlow Device
DocuColor 2060	Select Xerox FreeFlow Device
DocuColor 5252	Select Xerox FreeFlow Device
DocuColor 6060	Select Xerox FreeFlow Device
DocuPrint 525	Select Xerox FreeFlow Device
DocuTech 65/75/90	Select Xerox FreeFlow Device
Non-Xerox devices	Select Basic Printing Mode (Please note: Device must support PS and/or PCL)

Xerox Print Driver Platform

Appendix D: Choosing X-GPD Configurations (cont.)

Currently, X-GPD explicitly supports the following Xerox devices:

Xerox WorkCentre Models

232, 238, 245, 255, 265, 275, 4150, 5030, 5050, 5222, 5225, 5230, 5632, 5638, 5645, 5655, 5665, 5675, 5687, 7232, 7242, 7328, 7335, 7345, 7346, 7655, 7665, 7675, Pro C2128, C2424, Pro C2636, Pro C3545, M35, M45, M55, Pro 35, Pro 45, Pro 55, Pro 232, Pro 238, Pro 245, Pro 255, Pro 265, Pro 275

Xerox DocuSP & FreeFlow® Models

24x / 25x / 260, 252 / 260, 495 / 650 CF, 4110 / 4590 / 4595 EPS, 4112 / 4127 EPS, 4112 / 4127 C/P, DocuColor 7000 / 8000 Digital Press, DocuPrint 100 / 115 / 135 / 155 / 180 EPS, DocuTech 128 / 155 / 180 Highlight Color, DocuTech 128 / 155 / 180 Highlight Color Publisher, DocuTech 6100 / 6115 / 6135 / 6155 / 6180, DocuPrint 350 / 425 / 500 / 525 / 700 / 850, 650 / 1300 CF, DocuPrint 1000 / 1050, iGen3, Nuvera 100 / 120 / 144 / 288 Digital Production System, Nuvera 288 Digital Perfecting System, XXP50 CS, XXP240 / 250, XXP4110 / 4590, XXP4595

Xerox Phaser Models

3635MFP, 4500, 4510, 5500, 5550, 6250, 6300, 6350, 6360, 7400, 7750, 7760, 8400, 8500, 8550, 8560, 8560MFP, 8860, 8860MFP

Xerox Print Driver Platform

Appendix E: Tested and Supported Environments

Xerox Global Print Driver

Microsoft Windows XP / Server 2003

- Windows XP (SP2 and forward) 32-bit, including Home and Professional Editions
- Windows Server 2003 32-bit Edition, including Terminal Server
- Windows XP Professional 64-Bit Edition
- Windows Server 2003 64-Bit Edition, including Terminal Server

Microsoft Windows Vista / Server 2008

- Windows Vista, including Home Basic, Home Premium, Business and Ultimate Editions
- Windows Vista Server 2008, including Standard, Enterprise and Data Center Editions

Microsoft Windows Cluster

- Windows Server 2003 and 2008

Microsoft Point & Print (including Active Directory)

- Windows Server 2003 and 2008

Microsoft IPP

- Microsoft RDP & HTTP

Novell

- Novell Netware 5.x: NDPS, NDS
- Novell Netware 6.x: NDPS, NDS, iPrint

Citrix

- Citrix XP Server
- Meta Frame FR3
- Presentation Server 4.x

Printer Description Languages

- PostScript (Level 2 & 3)
- PCL5c/5e and PCL6 (2.x, 3.x)

Xerox Mobile Express Driver

Microsoft Windows XP

- Windows XP (SP2 and forward) 32-bit, including Home and Professional Editions
- Windows XP Professional 64-Bit Edition

Microsoft Windows Vista

- Windows Vista, including Home Basic, Home Premium, Business and Ultimate Editions

Printer Description Languages

- PostScript (Level 2 & 3)

Xerox Print Driver Platform

To learn more, visit us at www.xerox.com/mobile (X-MED)
and www.xerox.com/global (X-GPD)

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THE DOCUMENT COMPANY

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*Imaging & Services
Technology Center*

Nuvera Remote Services

Security White Paper

Executive Summary

Nuvera Remote Services developed by the Xerox Corporation provides customers with a variety of remote services. The security aspects of Nuvera Remote Services are presented in this white paper. This paper provides an overview of Nuvera Remote Services, identifies the security design goals for this system, and describes at a high-level the technology architecture that was developed to achieve these goals. Relevant details are presented herein to explain how the security features are implemented. This paper concludes with a set of frequently asked questions (FAQs).

Nuvera Remote Services Overview

Increasingly, Xerox products implement services that communicate back to Xerox to provide services that are valuable to our customers. The Nuvera Remote Services system is based on a technology platform that provides a flexible end-to-end system for connecting products to our post-sale solutions offerings.

The diagram shown in Figure 1 emphasizes the three main architectural elements of the system, which are located at the vertices of the triangle. These three elements work together in a seamless manner to enable a rich variety of remote services and to provide for additional services to be added in the future.

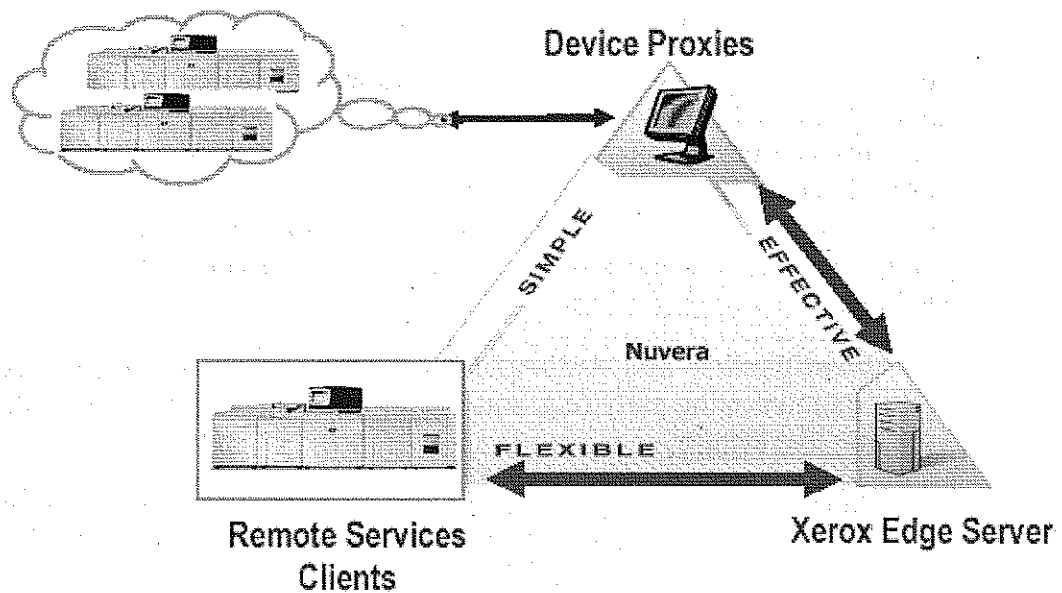


Figure 1: Major components of the Nuvera Remote Services architecture

At the lower left corner of the triangle are devices with the Nuvera Remote Services client software module embedded in them to provide the client-side infrastructure that enables secure transactions back to Xerox.

The connection to Xerox and our back-office processes is shown at the lower right corner of the triangle. Nuvera Remote Services clients connect to Xerox through a common connectivity server referred to as the *Xerox Edge Server*.

At the top of the triangle are device proxies. These proxies enable Nuvera products to communicate to the *Xerox Edge Server* through a single machine to serve as a Proxy. This provides the customer with the capability to consolidate data communication through a reduced number of Nuvera products. This document refers to both direct and proxy clients generically as *Remote Services Clients*.

Nuvera Remote Services Design Goals for Security

Xerox views network security as a key requirement of the overall Nuvera Remote Services architecture. The early inclusion of security requirements has produced a secure architecture. The security related goals were derived from the following sources:

1. Inputs and feedback from extensive Voice of the Customer studies conducted by the Xerox Innovation Group (XIG). These studies were focused on determining customer preferences and their remote services needs.
2. Security guidelines published by the Xerox Information Management (XIM) organization.
3. Various (internal Xerox) business group customer advocates.

The term "security" can refer to a wide variety of topics and issues. Security is important for maintaining the confidentiality of valuable customer data. It is also important to ensure the integrity of the data and of the systems that process that data. Finally, it is important to ensure the availability of network resources on which remote services are deployed, including the customers' network. The aspects of security that were addressed to secure Nuvera Remote Services include the following:

1. **Identification and Authentication.** The process of uniquely identifying a communicating party (e.g. end-use/client) and reliably verifying their right to use that identity.
2. **Authorization.** The process of granting the right to access information, resources, or operations based on authorization information (e.g. identity, role, access rights).
3. **Data Integrity.** The ability to verify that data has not been subjected to unauthorized modification. Data integrity is of special importance when data is transmitted across public networks.
4. **Non-repudiation.** A method to ensure that a party can not deny having sent data or having received data. In general, it is the method by which the denial of any previous commitments or actions (e.g., service requests and completions) can be prevented.
5. **Customer Confidentiality.** A client or server keeps data secret to prevent its disclosure to unauthorized parties. A commonly used method of keeping data secret is by making use of cryptographic (encryption and decryption) techniques.

For devices to participate in a secure end-to-end Remote Services system, a software module implementing the Remote Services Client is embedded into the device's front-end or into a hosted application. Within the end-to-end Remote Services system,

the system design goals (related to network security) respond to risks in two main categories.

Customer Network Environment

The first category is security concerns related to the connection of the client software to the end-user's network and to the transmission of data across the internet to Xerox. To mitigate the resulting risks, Nuvera Remote Services incorporate the following controls:

- Communications between Xerox and the customer environment can only be initiated by the customer.
- Communication from the customer environment must be authorized by the customer.
- Communications from the customer environment must not include information that indicates the identity of the customer or customer's employees.
- The Remote Services Client does not allow connectivity or access to machine data by another client within the end-user's environment.
- The integrity of any information (data or code) downloaded by the Remote Services Client is verified.

Transaction Security

The second category is the security concerns related to the exchange of information between the customer and Xerox in executing transactions. To mitigate these risks, the following controls have been established:

- The Xerox Edge Server and the Remote Services Clients mutually authenticate themselves.
- All transaction content between the Remote Services Client and the Xerox Edge Server must be auditable and observable by both the customer and Xerox.

Nuvera Remote Services Technology Architecture

Nuvera Remote Services effectively meet the goals articulated in the previous section. In this section Nuvera Remote Services design and architecture features, as well as applications that address these goals, are described.

Figure 2 depicts a high-level view of an end-to-end Nuvera Remote Services architecture. It highlights communication flow between the Remote Services Client (direct-device and/or proxy-host) and the Xerox Edge Server. As shown in the diagram, Remote Services Clients are embedded either in Xerox devices or in a hosted application (e.g. CentreWare™ Web). The clients are configured to connect and send messages to the Xerox Edge Server.

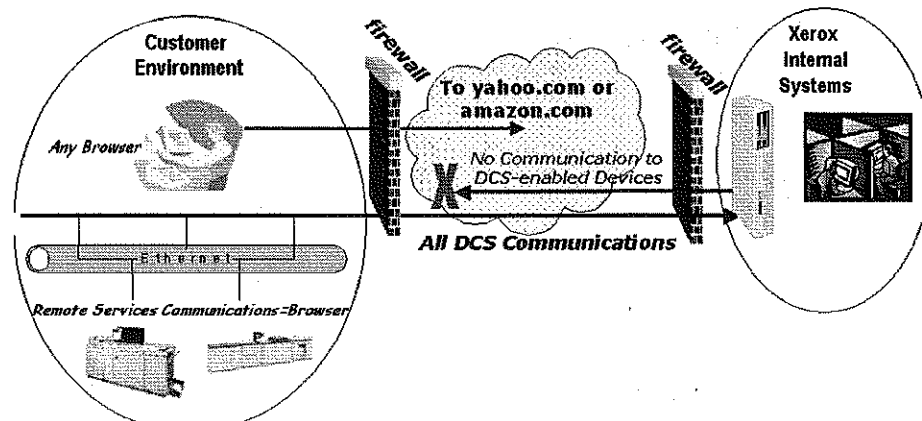


Figure 2: Nuvera Remote Services Communications

Nuvera Remote Services use industry standard web services protocols for all communications between Remote Services Clients and the Xerox Edge Server (Figure 3). Web services are accessed via the simple, ubiquitous Hypertext Transfer Protocol (HTTP) or secured-socket HTTP (HTTPS) that is common to web browsers and web servers. Use of web services as the underlying mechanism for all Nuvera Remote Services transactions ensures both interoperability and compatibility with firewalls.

Web Services
SOAP
XML
HTTPS
SSL
TCP

Figure 3: Web services protocol stack

By using the Internet's existing infrastructure, a Remote Services Client can be located on any platform and can be written in any programming language. The only requirement is that they can create and consume appropriate XML-based messages for communicating with the web services running on Xerox Edge Server.

- By using HTTP, web services can also take advantage of the Secure Socket Layer (SSL) protocol for security and HTTP's connection management capabilities.
- A *proxy* server is commonly used in network environments to provide a firewall system between the end-user network and the internet. Most firewalls/proxies are configured to block requests on all but a few network *ports*. Firewalls, however, usually allow traffic on port 80 for HTTP and 443 (secured HTTP or HTTPS) so browsers can access the Internet. By using HTTP or HTTPS over standard ports, Remote Services Clients are able to communicate through firewalls.
- As shown in Figure 2, Remote Services Clients initiate all interactions between themselves and the Xerox Edge Server. A Remote Services Client may initiate an interaction with the Xerox Edge Server upon the occurrence of an event (e.g. a customer presses a button on the machine UI, a timer generates an alarm, a Remote Services Client detects an anomaly in machine condition, etc). To achieve the effect of 2-way connectivity the Remote Services Clients periodically "check-in" with the Xerox Edge Server to receive any "instructions" for them.

The Remote Services Clients act like any web browser (over standard ports) requiring no "holes in the customer firewall" or changes to other equipment at the customer site.

- The Xerox Edge Server uses VeriSign (<http://www.verisign.com>) code signing certificates to sign all software downloaded by the Remote Services Client. The end-user benefits from this software integrity because:
 - Content Source: Certifies that the software really comes from the publisher who signed it.
 - Content Integrity: The software has not been altered or corrupted since it was signed.

Nuvera Remote Services Security Features

Authentication

- The Xerox Edge Server authenticates itself to Remote Services Clients using a server-side certificate.
- Remote Services Clients authenticate themselves to the Xerox Edge Server using a *username* and *password* pair. Clients present either a valid machine serial number or a unique identifier to the Xerox Edge Server as the login username. The Xerox Edge Server implements an algorithm that validates and transforms the machine serial number into the username.

Remote Services Client	Operating Environment	Login
Direct Device	Internet	Device Serial Number
Proxy Host	Internet	Associated computer MAC ID

Remote Services Clients use a Xerox Edge Server specified algorithm for generating passwords based on their username.

Authorization

- Prior to authorization, the identity of the party requesting the transaction must be authenticated. Only devices whose serial numbers are contained in the authenticated transaction are authorized for web services on the Xerox Edge Server.

Data Confidentiality

- Remote Services Clients use the Secured Socket Layer (SSL) protocol for interactions with the Xerox Edge Server. Remote Services Clients support both 40 and 128 bit SSL encryption.
- The Xerox Edge Server uses a server side certificate obtained from the VeriSign Certification Authority (CA).

Non-Repudiation

- The Remote Services Client logs the content of all incoming and outgoing transactions. This enables the customers to inspect the data being transmitted. The XML payload in each transaction is preserved “as-is” and is viewable in a suitable user interface (Figure 4). The Remote Services Client allows customers to configure the log depth to manage local storage space.

The screenshot displays the 'Xerox Device Centre Services Customer Service Platform' interface. It features a navigation menu with 'Administration' selected. The main content area is titled 'Transaction Logs' and contains a table with the following data:

Service Name	Log Date	Transaction Log
DeviceManager	Fri May 21 15:22:16 Eastern Device Type: 2002	<?xml version="1.0" encoding="UTF-8" standalone="no" ?><root xmlns="http://schemas.xerox.com/2002/05/DeviceManager" ><Header><Title>DeviceManager</Title></Header><Body><DeviceType>2002</DeviceType></Body></root>
DeviceManager	Fri May 21 14:22:16 Eastern Device Type: 2002	<?xml version="1.0" encoding="UTF-8" standalone="no" ?><root xmlns="http://schemas.xerox.com/2002/05/DeviceManager" ><Header><Title>DeviceManager</Title></Header><Body><DeviceType>2002</DeviceType></Body></root>

At the bottom of the interface, there is a copyright notice: 'Copyright © 2002 Xerox Corporation. All rights reserved.' and a small logo on the right.

Figure 4: Audit log UI

- A viewable transaction log gives end-users the ability to audit the information shared with Xerox.
- The Xerox Edge Server currently logs all incoming and outgoing transactions.

Frequently Asked Questions

Listed below is a set of FAQs helpful for an end-user of Nuvera Remote Services from Xerox.

1. *Will enabling a Nuvera Remote Services Client make my network more susceptible to viruses or hacker attacks?*

No. Customers make no changes to their own security infrastructure. Nuvera Remote Services only communicate to a specific secure server at Xerox and services are designed specifically to prevent unauthorized data transfers. The secure server at Xerox is regularly scanned for viruses using the latest tools.

2. *How do I know that Xerox is not accessing my company's private data off the machine disk?*

You may examine the data sent back to Xerox by using the device User Interface to view the transaction details. Nuvera Remote Services features only access machine related data, and not customer images or other customer data.

3. *How can I be sure that the device data is going to Xerox only?*

The secure transmittal process uses HTTPS and VeriSign signed certificates to ensure and verify that the device is sending to Xerox. Also, Xerox routinely authenticates your machine against its Remote Services database and uses a proprietary security algorithm to verify that it only accepts communications from Xerox devices. In addition, all transmission data is sent over a Secure Socket Layer (SSL) connection using 128-bit encryption.

4. *Will my machine interact with or receive information from "non-Xerox" systems?*

No. The device always initiates the remote services transfer activity and sets up a Xerox-only, non-intrusive communication path.

In summary, Xerox is responsive to the security concerns of our customers. Nuvera Remote Services will not make networks more susceptible to viruses. Remote Services transactions always originate from the device. Services can only communicate with a secure server at Xerox that conforms to the stringent requirements of the internal Xerox Corporation information management infrastructure. No customer images or sensitive information is transmitted. Customers do not need to make any changes to Internet firewalls, proxy servers, or other security infrastructure.



Fiery Security White Paper

Systems 8 and 8e (including Release 2)

Version 2.0

Date of Issue: 12/14/2007

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1 Document Overview

This document outlines architectural and functional aspects of Fiery Network Controllers with respect to device security. The purpose of this document is to provide a general overview of the Fiery Network Controller so that end users may research security features from which they can benefit and potential vulnerabilities they may encounter. This document outlines security aspects of the System 8 and 8e models of the Fiery Network Controller generally from the perspective of its hardware, network, access control, operating system, and data security.

1.1 Electronics For Imaging Security Philosophy

For end users, Fiery network controllers have brought tremendous value to otherwise standalone devices. EFI recommends installation of network devices such as a Fiery network controller is done in accordance with existing security paradigms. EFI's goal is to lead the printing industry in the level of security of our devices and their data. To this end, EFI has incorporated security features into its line of Fiery network controllers. To create a more secure network environment, end-users will need to combine the Fiery security features with other security safeguards.

EFI places a high priority on producing a product with strong security features. EFI has worked with all our OEM partners to determine the requirements of the digital printing community. EFI has also created a cross-functional team whose primary focus is to deal with present and future security issues. EFI hopes that the end users will be able to independently evaluate the information provided in this overview to develop their own chosen system of security. Only by choosing measures designed to enhance security such as secure password procedures and strong physical security procedures, can the end user realize a system with security features.

2 Hardware and Physical Security

2.1 Volatile Memory

The Fiery network controller uses volatile RAM as local memory for the CPU as well as working memory for the operating system, Fiery system software, and image data. Data that is written to RAM is held while the power is on; when the power is turned off all data is deleted.

2.2 Non-volatile Memory and Data Storage

The Fiery network controller contains several types of non-volatile data storage technologies to retain data on the Fiery controller when the power has been turned off. This data includes both system programming information and user data.

2.2.1 Flash Memory

Flash memory stores the self diagnosis and boot program (BIOS) and some system configuration data. This device is programmed at the factory and can be reprogrammed only by installing special patches created by EFI. If the data is corrupted or deleted the system will not start.

A portion of the flash memory is also used to record the use of dongles to activate software options on the Fiery.

No user data is stored on this device and the user does not have access to the data on it.

2.2.2 CMOS

The battery-backed CMOS memory is used to store machine settings on the controller. None of this information is considered confidential or private. Users may access these settings on a Windows XPe Server via the FACI kit (if installed).

2.2.3 NVRAM

There are a number of small NVRAM devices in the Fiery that contain operational firmware. These devices contain "non-customer specific" operational information and the user does not have access to the data contained on them.

2.2.4 Hard Disk Drive

The Hard Disk Drive (HDD) can contain the following data:

- System Software
- Font Data
- User Information (including password)
- Address Book
- Image Data
- Job Log

During normal Print and Scan operations, image data is written to a random area on the hard drive and job management information is created.

Image data and job management information can be deleted by an operator or at the end of a pre-set time period, so image data becomes inaccessible. However, the image data itself remains until the area where it is stored is reused.

To protect the image data from unauthorized access, EFI also provides a Secure Erase feature (see section 6.2.5). Once set, the selected operation will be carried out an appropriate time. Alternatively the operation can be carried out as set by a system administrator.

2.3 Physical Ports

The Fiery network controller can be connected through the following external ports:

Fiery Ports	Function	Access
Interface Ports	Copier/printer connection (DDI)	
Serial port	Software maintenance interface (embedded Linux system only)	
Ethernet RJ-45 connector	Ethernet connectivity	Network connections (see printing and network connections below)
Copier interface connector	Print/Scan	Dedicated for sending/receiving to/from the print engine
Parallel Port	Parallel connection	Bisynchronous communication limited to receiving print jobs via a parallel cable.
USB Port	USB device connection	Plug and play connector designed for use with optional removable media devices

2.4 Local interface

The user can access the Fiery functions via the FACI kit (if enabled on a Windows XPe server) or the Fiery LCD. The Windows Administrator password is used to control access to the Fiery if the FACI kit is enabled. The Fiery LCD only provides access to the Fiery functionality.

2.5 Removable HDD Kit Option

The Fiery supports a removable hard disk drive option kit for increased security. This kit provide the user with the ability to both lock the server drive(s) into the system for normal operation and the ability to remove the drives to a secure location after powering down the server.

2.5.1 For Servers

Fiery servers support a generic removable hard disk drive option kit. Whether this option kit is available for a specific Fiery product depends on the terms of EFI's development and distribution agreements with its OEM partner.

2.5.2 For Embedded

Embedded products can only offer removable HDD as an OEM coordinated option, because the mounting location and brackets for the MFP must be developed jointly with the OEM. The normal internal drive can be remotely mounted externally on the MFP in a removable drive enclosure as an option.

2.6 Dongles

2.6.1 HASP USB Dongles

HASP USB dongles are used for feature activation and for software protection mechanism for some optional client packages.

For HASP dongles, without the APIs and tool kits (which are separate packages available to vendors like EFI), the user cannot write information to the dongles.

<http://www.aladdin.com/hasp/PODM.asp>

This assures highly sensitive sites that unauthorized users cannot use the HASP USB dongles that came with the Fiery or any EFI client software packages to store/transfer sensitive information/data from the Fiery or from another client machine to another machine.

The HASP dongles that come from EFI are specifically programmed only for software protection or for feature activation.

2.6.2 ES-1000 Color Profiler Dongle

ES-1000 is not a USB dongle. Although it is a USB device, the EEPROMS have been specifically programmed using advanced APIs and toolkits which are available only from the manufacturer. They do not contain encryption.

They cannot be used to store/transfer information/data or any other purposes other than as a software protection mechanism for the EFI Color Profiler.

3 Network Security

3.1 Network Ports

The Fiery allows the user to selectively enable/disable the following IP ports:

TCP	UDP	Port Name	Dependent Service(s)
80		HTTP	WebTools, IPP
	123	NTP	Network Time Protocol
135		MS RPC	Microsoft RPC Service (Windows XPe only)
137-139		NETBIOS	Windows Printing
	161, 162	SNMP	WebTools, Velocity, some legacy utilities, other SNMP-based tools
445		SMB/IP	SMB over TCP/IP
515		LPD	LPR printing, some legacy utilities (such as WebTools, older versions of CWS)
631		IPP	IPP
8021-8022, 21030	9906	Harmony	CWS4, Velocity, EFI SDK-based tools, Fiery Printer Driver bi-di functions
9100-9103		Printing Port	Port 9100

Other TCP ports, except those specified by the OEM, are disabled. Any service dependent on a disabled port will not function as expected.

The Fiery administrator can also enable/disable the different network services provided by the Fiery.

The local administrator can define SNMP read/write community names and other security settings.

3.1.1 MAC Address Filtering

The administrator can configure the Fiery to allow or reject connections over ethernet based on the Media Access Control (MAC) address of the sender. The administrator can specify a list of MAC addresses on the Fiery and define whether the Fiery should reject all ethernet connections from these MAC addresses or accept only those ethernet connections from these MAC addresses.

The following limitations apply to this feature:

- It is possible for individuals to spoof a client MAC addresses and bypass this security
- If a router is allowed to connect to the Fiery, then any client that can connect to that router can bypass any MAC Address limitations as the Fiery decides whether to accept/reject communications forwarded through the router by the router's MAC Address.

3.1.2 IP Filtering

The administrator can restrict authorized connections with the Fiery from those hosts whose IP addresses fall within a particular IP range. Commands or jobs sent from non-authorized IP addresses are ignored by the Fiery.