White Paper

Micro Focus iPrint
Open Enterprise Server

Micro Focus iPrint Appliance 1.1 and Open Enterprise Server iPrint 11.2 Performance

This report presents a comparison between Micro Focus® iPrint® Appliance and Micro Focus Open Enterprise Server iPrint for desktop printing. Open Enterprise Server is a long-running standard for enterprises deploying file and print services. Micro Focus iPrint Appliance is an enhanced version of Open Enterprise Server iPrint, which provides mobile printing capabilities. The appliance is similar to Open Enterprise Server iPrint since both use the same printing subsystems. Furthermore, Open Enterprise Server can run on physical servers, whereas the Appliance runs as a virtualized server. Testers used the built-in Micro Focus iPrint server and its audit log to track job submissions, job wait time, CPU and memory usage to compare desktop printing performance. This document contains information about the test environment, the tests and the results.

MICRO FOCUS

1. Introduction—Micro Focus iPrint Appliance or Open Enterprise Server?

We performed several tests focused on comparing the system performance between Micro Focus iPrint Appliance 1.1 and Open Enterprise Server iPrint 11.2 under particular loads.

In each test, both environments receive a set of jobs for a fixed period of time. We considered several parameters in these tests:

- Print job size
- Print file format
- Hourly print jobs up to a period of 10 hours
- Mobile print jobs' effect on desktop print performance

Testers used the built-in Micro Focus iPrint auditing function to calculate job wait time, and used the task manager top to monitor the CPU and memory consumption of print subsystems.

The results in this report do not indicate the maximum performance capabilities of desktop printing for all environments.

2. Overview

Open Enterprise Server iPrint

Micro Focus iPrint eliminates complex printing environments. It leverages the industry-standard Internet Printing Protocol (IPP), and provides instant global access to all your enterprise's printing resources via a web browser. It is easy to find a printer on a graphical office map, download drivers and add the printer to your Mac, Windows or Linux workstation. Users can send documents to the printer from any application and can add printers without needing administrator privileges. Plus, Micro Focus iPrint does not require any new hardware.

Users can also print documents to remote printers using an existing Internet connection. Micro Focus iPrint includes auditing capabilities and is compatible with various third-party accounting programs to monitor and establish printing environments; you can use this information to charge each department for its printing costs or institute green initiatives. Micro Focus iPrint simplifies the printing process, enabling users to be more self-reliant, which also reduces helpdesk requests. The Micro Focus iPrint Appliance can also save time for your IT staff by being a small, virtual appliance staff members can upload to a system in minutes.

Micro Focus iPrint Appliance

In addition to the details mentioned above in Open Enterprise Server iPrint, the Micro Focus iPrint Appliance delivers mobile printing.

MOBILE PRINTING

Printing normally requires drivers to convert documents into printer-ready languages. Some vendors use cloud services to convert documents from mobile devices. However, the Micro Focus iPrint Appliance does not require any cloud service or any specific hardware. By keeping information out of the cloud, the Micro Focus iPrint Appliance ensures a secure environment. The unique Micro Focus iPrint infrastructure also allows users to leverage their current infrastructure and avoid vendor lock in. The Micro Focus iPrint Appliance contains its own rendering and conversion capabilities, which enables it to receive print jobs from a variety of mobile sources. Testers conducted the tests to achieve the following objectives:

- To track an average waiting time for higher job loads
- To compare printing performance of both servers when printing from a desktop environment
- To see if the performance of Open Enterprise Server and Micro Focus iPrint Appliance is similar
- To ensure minimal performance degradation while both desktop and mobile jobs are processing

3. Configurable Test Variables

Testers used the following parameters and conditions for the tests:

Job Size: Testers considered file sizes ranging from a few KBs to MBs for printing from mobile devices. They tested on both external and internal renderers and incorporated various file sizes into the test matrix to understand typical wait times for users submitting these jobs.

Job Format: Testers used different job formats to study the time-taken-to-render performance with internal and external renderers.

Driver Type: Each of the environments was configured with the same set of drivers to eliminate discrepancy in the job processing time and size.

Printers: Both environments were configured with 1,000 printers for processing the jobs.

Job Submission Rates

By nature, desktop jobs are rendered on the client itself. This differs from mobile printing in that jobs submitted remotely are rendered on a server or remote renderer, depending on the file type. Hence, desktop jobs can achieve a higher "normal" load and an even higher "peak" load than mobile jobs. These tests were run for a period of 10 hours, which is assumed to be typical office working hours.

- **Normal Load:** Testers created and submitted jobs of different volumes for a period of one hour: 1,000 jobs per hour and 5,000 jobs per hour. We emulated this job traffic from the current page per minute (PPM) handling capability of enterprise class printers, defining these loads as normal loads.
- **Peak Load:** By definition, peak-load traffic occurs over a very short period of time during which job submission rates skyrocket, thereby stressing the printing subsystem and possibly affecting users' wait time. The purpose of this test was to capture the wait time, CPU and memory usage by both environments. Testers tested peak loads of 15,000–25,000 jobs per hour.

4. Test Methodology

Compared to a physical environment, a virtualized environment can be challenging to test because of the latency of both the network and I/O. To remove this variable, testers deployed Open Enterprise Server iPrint as a virtualized environment. Both virtualized environments were deployed on similar hardware, details of which will be covered in the next section.

Testers' primary objective was to capture and compare the desktop performance results of both Open Enterprise Server iPrint and the Micro Focus iPrint Appliance with a controlled job set and job load. Aspects outside the test's scope included I/O and network latency between desktop clients and servers. These potential bottlenecks can have similar impacts on both environments, and therefore were not accounted for in the tests.

NOTE: The number of jobs used for measuring performance is more than the real-world data used by actual companies. This was done to understand Micro Focus iPrint job capacity limitations.

To obtain accurate results and ensure reliability, testers used the following methods:

- The test bed and setup used a 1 GBps LAN network
- Testers used VMware ESX5 5.5 for deploying all appliances in the test
- Testers used a Windows 7 Enterprise 64-bit environment for configuring desktop clients to submit jobs
- Testers submitted jobs using multiple instances of the desktop Micro Focus iPrint client to emulate normal-load and peak-load job traffic
- Testers recorded the time until print gateways submitted the jobs to the printers. (Because print time depends on the printer's make and model, testers did not account for this time.)
- Testers captured CPU usage and memory usage of print subsystems during all load tests
- For a test scenario involving mobile jobs, only mobile clients were used and job submission via email was not considered

Testers used audit logs for each participating printer to capture these parameters:

- **Job Submission Time:** Time when the server receives the print job
- **Job Completion Time:** Time when the server submits the job to the printer
- **Wait Time for Jobs:** Time between job submission time and job completion time
- **Total Submission Time:** Duration of time for which the jobs were submitted
- **Peak-Load Count:** Jobs were submitted continuously until testers reached a count limit

Testers also used mixed file sets in both the normal and peak job loads.

- 3 PDFs (3 MB, 4 MB, 5 MB)
- 1 DOC (1 MB)
- 1 XLS (100 KB)
- 1 ODT (100 KB)
- 1 PPT (2 MB)
- 3 images (JPG, TIF, PNG—s3MB, 5MB, 5MB)

NOTE: Testers did not perform management functions with Management Console or iManager when tests were running.

5. Test Lab Design

Test Bed

Servers	Open Enterprise Server 11 SP2 patched through May 2014; Micro Focus iPrint Appliance 1.1
Clients	Windows 7 Enterprise 64-bit systems configured with Micro Focus iPrint Client 5.94
Tools	Micro Focus iPrint audit logs, top command for print manager and driver store CPU and memory usage
Number of Scenarios Tested	5

Table 5.1: Server Specifications, Micro Focus iPrint Appliance 1.1 Build 407

Test Server	Micro Focus iPrint Appliance
Server Role	Micro Focus iPrint Server
Virtual Environment	Open Virtualization Format (OVF) deployed on VMware ESXi 5.5
CPUs/Cores	2
Memory	4 GB
Operating System	Micro Focus iPrint Appliance 1.1

Table 5.2: Server Specifications, Micro Focus iPrint Appliance External Renderer

Test Server	Renderer
Server Role	External Render
Virtual Environment	Open Virtualization Format file deployed on VMware ESXi 5.5
CPUs/Cores	1
Memory	4 GB
Operating System	Windows 7 64-bit with Rendering client 1.1

Table 5.3: Server Specifications, Open Enterprise Server with Micro Focus iPrint Configured

Test Server	Open Enterprise Server
Server Role	Micro Focus iPrint configured on Open Enterprise Server
Virtual Environment	Open Virtualization Format file deployed on VMware ESXi 5.5
CPUs/Cores	2
Memory	4 GB
Operating System	SUSE Linux Enterprise Server 11 SP3 with the Open Enterprise Server add on patched through May 2014

Table 5.4: Server Hardware Details

CPU	Intel Xeon 2.7 GHz processor6 processor cores per socket
Make and Model	Dell PowerEdge R510
Memory	16 GB
Hard Disk	925 GB
LAN Speed	1 GBps

6. Tested Scenarios

Unless otherwise specified, the print and wait times listed in the following tables are in minutes, rounded to the nearest whole minute.

Print Appliance 1.1

DESKTOP JOB LOADS, SUBMITTED OVER A PERIOD OF 60 MINUTES

Testers performed this test with the following variables:

- Set of 10 different jobs
- Jobs consisted of tests ranging from 1,000 to 25,000 jobs per hour

Table 6.1

Micro Focus iPrint Appliance 1.1—Desktop Jobs					
Number of Jobs per 60 Minutes	Wait Time for Last Job	Memory Usage by Print Manager in MB	Memory Usage by Driver Store in MB	CPU Usage by Print Manager	CPU Usage by Driver Store
1,000	0	216	108	2–4%	2%
2,000	0	325	172	2–6%	2%
3,000	0	325	172	2–10%	2%
5,000	0	325	236	2–14%	2%
7,000	0	325	236	2–16%	2%
10,000	0	325	236	2–22%	4%
15,000	0	325	236	2–34%	2%
20,000	0	349	236	2–40%	4%
25,000	0	413	236	2–47%	4%

COMBINED DATA FOR DESKTOP AND MOBILE JOBS, SUBMITTED OVER A PERIOD OF 60 MINUTES

Testers performed this test with the following variables:

- Set of 10 different jobs
- Jobs consisted of tests ranging from 1,000 to 25,000 jobs per hour, and 100 mobile jobs per hourr

Comparing the following results with the data from desktop-only jobs shows a peak in CPU and memory cycles.

Table 6.2

Micro Focus iPrint Appliance 1.1—Desktop and Mobile Jobs Versus Desktop Jobs						
	Number of Jobs in 10 Hours	Wait Time for Last Job	Memory Usage by Print Manager in MB	Memory Usage by Driver Store in MB	CPU Usage by Print Manager	CPU Usage by Driver Store
Desktop and Mobile	15,000	0	413	236	2–38%	2%
Desktop	15,000	0	325	236	2–34%	2%

Open Enterprise Server 11 SP2 Data

DESKTOP JOB LOADS, SUBMITTED OVER A PERIOD OF 60 MINUTES

Testers performed this test with the following variables:

- Set of 10 different jobs
- Jobs consisted of tests ranging from 1,000 to 25,000 jobs per hour

Open Enterprise Server 11 SP2 Patched through May 2014					
Number of Jobs per 60 Minutes	Wait Time for Last Job	Memory Usage by Print Manager in MB	Memory Usage by Driver Store in MB	CPU Usage by Print Manager	CPU Usage by Driver Store
1,000	0	349	108	2–4%	2%
2,000	0	349	108	2–6%	2%
3,000	0	349	108	2–15%	2%
5,000	0	349	172	2–16%	2%
7,000	0	349	172	2–22%	2%
10,000	0	349	172	2–22%	4%
15,000	0	349	172	2–30%	2%
20,000	0	349	172	2–38%	2%
25,000	0	406	172	2–40%	2%

7. Comparison

Comparison of Micro Focus iPrint Appliance and Open Enterprise Server

Data Comparision Between Micro Focus iPrint Appliance and Open Enterprise Server										
Number of Jobs in 60 Minutes	Wait Time for Last Job		Memory Usage by Print Manager in MB		Memory Usage by Driver Store in MB		CPU Usage by Print Manager		CPU Usage by Driver Store	
	Appliance	OES	Appliance	OES	Appliance	OES	Appliance	OES	Appliance	OES
1,000	0	0	216	349	108	108	2–4%	2–4%	2%	2%
2,000	0	0	325	349	172	108	2–6%	2–6%	2%	2%
3,000	0	0	325	349	172	108	2–10%	2–15%	2%	2%
5,000	0	0	325	349	236	172	2–14%	2–16%	2%	2%
7,000	0	0	325	349	236	172	2–16%	2–22%	2%	2%
10,000	0	0	325	349	236	172	2–22%	2–22%	4%	4%
15,000	0	0	325	349	236	172	2–34%	2–30%	2%	2%
20,000	0	0	349	349	236	172	2–40%	2–38%	4%	2%
25,000	0	0	413	405	236	172	2–47%	2–40%	4%	2%

Based on these test results, we made the following conclusions:

- The CPU performance under normal loads is better with Micro Focus iPrint Appliance, while the Open Enterprise Server performs better under peak loads.
- The CPU usage by the driver store fluctuates two to four percent for Micro Focus iPrint appliance because the renderer installs individual drivers for different printer models to process mobile jobs. This is not the case with Open Enterprise Server, since it processes only desktop jobs.
- The memory usage by Print Manager is lower for Micro Focus iPrint Appliance—25 MB lower on average than for Open Enterprise Server.
- The memory usage by the driver store peaks above 100 MB under heavier job loads with Micro Focus iPrint Appliance for the same reason mentioned above in CPU usage. However, it fluctuates around 70 MB in Open Enterprise Server.
- The wait time for the last job was the same for all job loads.
- The printing performance of both servers when printing from a desktop environment is the same for all job loads.

- Mobile jobs performed alongside desktop jobs have minor peaks of memory and CPU usage, but the quality of service (QoS) is maintained. QoS refers to the wait time to print a job.

8. Conclusion

For a real-world deployment of Micro Focus iPrint Appliance, mobile printing jobs would be part of an everyday scenario, and having 100 jobs per hour along with 15,000 desktop jobs would not be unusual. Although memory and CPU usage might increase slightly at times, you will be able to maintain QoS for print jobs that originate from desktops. Based on the results described in this white paper, testers concluded that desktop printing with Micro Focus iPrint Appliance is just as good as desktop printing with Open Enterprise Server iPrint under similar load conditions, with the added benefit of allowing for mobile printing.

For more information on Micro Focus iPrint Appliance, see the *Micro Focus iPrint Appliance Administration Guide* at: **www.novell.com/documentation/iprint-appliance1/**

For more information on Open Enterprise Server, see the *Open Enterprise Server Guide* at: **www.novell.com/documentation/oes11/**

About Micro Focus

Since 1976, Micro Focus has helped more than 20,000 customers unlock the value of their business logic by creating enabling solutions that bridge the gap from well-established technologies to modern functionality. The two portfolios work to a single, clear vision—to deliver innovative products supported by exceptional customer service. **www.microfocus.com**

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