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IPP Bake Off 3 Testing Outline

Table of Contents

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1　General

1.1　Common restrictions for test purposes

To facilitate testing and analysis of results we should conduct our tests under certain restrictions. If time permits, specific restrictions may be lifted for specific tests.

- Security. Authentication, authorization and privacy will not be used except where explicitly stated. There will be a series of test specifically targeting interoperability of security implementations. The core protocol testing will eliminate these variables.

- Character set. We will use the UTF-8 character encoding of ISO646. This will simplify the comparison of results. The exception will be tests specifically targeted at characters sets.

- Language. We will use en-us. This will simplify the comparison of results. Once again the exception will be tests that are intended to test this aspect of the protocol.

- IPP Scheme. The URLs for printers will be ipp://* as specified in the IPP 1.1 specification.

- Http Chunking. No IPP component being tested will chunk its requests or responses. Testing of chunking IPP requests and responses will specifically be performed.

- HTTP Version 1.1 will be used. Compatibility tests with 1.1 and 1.0 components will be performed.

- Firewalls and proxies. . These will be used throughout the tests. The firewalls and proxies may be bypassed if they interfere with a test not targeted at firewalls and proxies.

1.2　Test print files

Where possible a small standard file will be used. A large test file will be used for IPP contention testing and real life printing scenario testing

1.3　Result processing and documentation

1.3.1　Anonymity

The participants of the tests will be aware of the identity of the participants. Any posting or discussion of results will not identify the participants demonstrating the issue at hand. The discussions will focus on issues regarding the IPP specification. The objective is to clarify the specification's language to resolve the issue.

1.3.2　Test data collection method

Developers of IPP test tools should operate at the IPP application layer. This will simplify the comparison of results. The format of the traces will be test tool specific.   It is recommended that there be an indication of success or failure. The tool should also report expected and received results.

Network analyzers are suggested to keep a detailed trace of various tests. All participants are encouraged to bring their favorite.

86 1.3.3 Results determination

87 Humans can determine the results for many of the tests. An IPP Client submitting a job that is
88 printed by an IPP printer would seem to indicate interoperability. .

89 Some clients or tools will allow us to examine the attribute groups, tags, attributes and values.
90 The examination of these may be automated to some extent.

91 If all else fails the network analyzers will allow us to examine the bits on the wire.

92

93 1.3.4 Output

94 1.3.4.1 Detailed results

95 The detailed results of the bake-off will be emailed directly to the participants of the test. Some
96 of the detailed results will be made available during the bake-off. All participants are
97 encouraged to make their traces available to interested participants. Implementers of IPP
98 components involved in a test are entitled to the results of the test.

99 1.3.4.2 Summary of results

100 A summary of the test results will be circulated among the participants prior to posting on the
101 IPP distribution list. The results will be sanitized of any vendor specific information. The
102 object of the summary results is to give a high level overview of the bake-off results.

103 1.3.4.3 Issues

104 Issues will be recorded and tracked by the TES whip or designate. The issue will be sent to the
105 IPP Working Group for disposition.

106 2 Procedure

107 After setting up and establishing basic IP connectivity, every IPP component will be assigned a
108 designator. The relevant information for each IPP component will be recorded in the table similar to
109 the one in section 3.1.

110 Throughout the tests the term "interoperate" means that two independent IPP implementations
111 correctly understands the feature.

112 *2.1 IPP connectivity and basic printing*

113 Each IPP Client will send a simple print job to every IPP Printer. The results will be recorded in a
114 table similar to the one in section 3.2.This step should be performed during the initial set up day.
115 Any holes in the table can be filled in the following days.

116

117 *2.2 IPP model coverage testing*

118 Each IPP Printer will have an automated test suite run against it. The test suite will test only the
119 support of the operations and attributes. This test is not intended to evaluate the robustness of an
120 implementation. The operations and attributes that interoperate will be recorded anonymously on a

121   form and collected. Another test tool and printer(s) will be selected to verify interoperability
122   coverage of the IPP Model.
123   The model coverage is broken up into the following sections:
124   Mandatory operations
125   Optional operations
126   Mandatory printer attributes
127   Optional printer attribute
128   Mandatory Job attributes
129   Optional Job attribute

130
131

2.3 Common Error Conditions

133 The objective of this step is to compare the state of printers under common error conditions. The get-
134 printer-attributes operation will be used to obtain the printer-state and printer-state-reasons attributes.
135 Printers that support event notifications should also record the notifications and their content generated by
136 the following events.

137

Out of paper/Paper low
- Submit a job of a known size to a printer with the input tray(s) empty.
- Examine and record the "printer-state" and "printer-state-reasons".
- Put some paper into the input tray. There should not be enough to complete the job.
- While the printer is printing, examine and record the "printer-state" and "printer-state-reasons".
- When the printer runs out of paper, examine and record the two attributes again.

Out of marker supply/Marker supply low
- Put a marker supply cartridge (spool, reservoir etc.) that is almost empty into the printer.
- Submit a small job to the printer.
- Examine and record the "printer-state" and "printer-state-reasons".
- Cause the printer to run out of marker supply.
- Examine the two attributes again.

Output bin full/Output bin almost full
- Almost fill an output bin.
- Submit a job of sufficient in size to fill the printer's output bin.
- While the printer is printing, examine and record the "printer-state" and "printer-state-reasons".
- When the printer' output bin is full of paper, examine the two attributes again.

Cover open/Door open
- Open the appropriate covers and doors.
- Examine and record the "printer-state" and "printer-state-reasons".

Tray missing
- Remove an input tray.
- Examine and record the "printer-state" and "printer-state-reasons".

Pausing a printer
- If possible, pause the printer.
- Examine and record the "printer-state" and "printer-state-reasons".

Paper jam
- If possible, cause the printer to jam.
- Examine and record the "printer-state" and "printer-state-reasons".

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2.4   Version Interoperability

Use Clients and Printers of differing versions.   Submit a simple print job, get a list of jobs and get the
attributes of the job and the printer. Record results in table similar to the one in section 3.4

2.5   Notification Registration and Delivery Methods

Notification registration will be tested at the Printer and Job level. The registration will contain the
mandatory attributes. The registration will be carried in the "Create-Printer-Subscription" operation
and in the subscription attribute template group in the job creation operations. If time permits, the
optional attributes and the "Create-Job-Subscription" operation will be tested.
Upon registration, the "Get-Subscriptions" operation will be used to verify success. The "Get-
Subscriptions-Attributes" may also be tested at this time. The notification method used will be
based on printer and client capabilities.
The events to be tested are "printer-state-changed", "printer-stopped", "job-state-change", "job-
created" and "job-completed". Other events will be tested based on printer capabilities and time.
Results will be captured in a table similar to the one in section 3.7.

2.6   Firewall and Proxy Interactions

**This section requires input from the specific vendors that plan to attend. The capabilities of the
various products should be demonstrated. Security testing will be an integral part of this testing.**

Need to fill out this section.
    Test inbound and outbound printing.
    Test inbound and outbound notification.
    Is there any firewall specific test that should be run?
        Filtering at different layers
        Content filtering
        Policy based filtering
        Virtual private Networks
    Test security and printing through a proxy.

2.7   Authentication and Security

Authentication and security will be tested for interoperability. The IPP printers and client
participating will record the results in tables similar to the table in section 3.8   Authentication and
security schemes include Basic, Digest, SSL3, TLS and Kerboros

210 # 3   Sample Tables and Checklists

211 ## 3.1   IPP Components matrix

212

ID	URL	Ethernet Address	Chunking (Send,Receive)	Security Schemes	Authentication Schemes	Notification Schemes
Clients						
C1						
C2						
C3						
Printers						
P1						
P2						
P3						
Test Suites						
TS1						
TS2						
TS3						

213 ## 3.2   Simple Print Table

214

	Client ID							
Printer ID								

215
216

217 ### *3.3   IPP Operation/Attribute Coverage Tables*

218 ### 3.3.1 Mandatory Operations

Mandatory Operations	
Operation	**Interoperate**
print-job	
validate-job	
get-printer-attributes	
get-jobs	
cancel-job	
get-job-attributes	

219 ### 3.3.2 Optional Operations

Optional Operations	
Operation	**Interoperate**
print-uri	
create-job	
pause-printer	
resume-printer	
purge-printer	
send-document	
send-uri	
hold-job	
release-job	
restart-job	

220 ### 3.3.3 Operational attributes

Operational attributes		
Operational Attribute	**Group**	**Interoperate**
version-number	preamble	
operation-id	preamble	
request-id	preamble	
attributes-charset	operational-attribute	
attributes-natural-language	operational-attribute	
printer-uri	operational-attribute	
requesting-user-name	operational-attribute	
status code	preamble	
Status-message (Optional)	operational-attribute	

221 ### 3.3.4 Mandatory Printer Attributes

Mandatory Printer Attributes	
Attribute	**Interoperate**
printer-uri-supported	
uri-security-supported	
printer-name	
printer-state	
operations-supported	
charset-configured	
charset-supported	

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Mandatory Printer Attributes	
Attribute	**Interoperate**
natural-language-configured	
generated-natural-language-supported	
printer-is-accepting-jobs	
pdl-override-supported	
document-format-default	
document-format-supported	
printer-up-time	

222   ### 3.3.5 Optional Printer Attributes

Optional Printer Attributes	
Attribute	**Interoperate**
printer-location	
printer-info	
printer-more-info	
printer-driver-installer	
printer-make-and-model	
printer-more-info-manufacturer	
printer-state-reasons	
printer-state-message	
queued-job-count	
printer-message-from-operator	
color-supported	
reference-uri-schemes-supported	
printer-current-time	
multiple-operation-time-out	
compression-supported	
job-k-octets-supported	
job-impressions-supported	
job-media-sheets-supported	
job-priority-default	
job-priority-supported	
job-hold-until-default	
job-hold-until-supported	
job-sheets-default	
job-sheets-supported	
multiple-document-handling-default	
multiple-document-handling-supported	
copies-default	
copies-supported	
finishings-default	
finishings-supported	
page-ranges-supported	
sides-default	
sides-supported	
number-up-default	
number-up-supported	
orientation-requested-default	
orientation-requested-supported	
media-default	
media-supported	
media-ready	

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Optional Printer Attributes	
Attribute	**Interoperate**
printer-resolution-default	
printer-resolution-supported	
print-quality-default	
print-quality-supported	

223

224   3.3.6   Mandatory job Attributes

Mandatory job Attributes	
Attribute	**Interoperate**
Job-uri	
Job-id	
Job-printer-uri	
Job-name	
Job-originating-user-name	
Job-state	
job-state-reasons	
Time-at-creation	
Time-at-processing	
Time-at-completed	
Attributes-charset	
Attributes-natural-language	

225

226   3.3.7   Optional Job Attributes

Optional Job Attributes	
Attribute	**Interoperate**
Job-more-info	
Job-state-message	
Job-detailed-status-message	
Job-document-access-error	
Number-of-documents	
Output-device-assigned	
Date-time-at-creation	
Date-time-at-processing	
Date-time-at-completed	
Number-of-intervening-jobs	
Job-message-from-operator	
Job-k-octets	
job-impressions	
job-media-sheets	
compression-supported	
Job-k-octets-processed	
job-impressions-completed	
job-media-sheets-completed	
job-priority	
job-hold-until	
job-sheets	
multiple-document-handling	
copies	
finishings	

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Optional Job Attributes	
Attribute	**Interoperate**
page-ranges	
sides	
number-up	
orientation-requested	
media	
printer-resolution	
print-quality	

227

228 *3.4   Version interoperability Table*

Operation	**1.1 Printer 1.0 Client**	**1.0 Printer 1.1 Client**
Print-Job		
Get-Printer-Attributes		
Get-Job-Attributes		
Get-Jobs		

229 *3.5   Notification Table*

Printer/ Client	Registration Operation	Notification Method	Events Registered	Registration Result	Events & Results

230

231 *3.6   Common Error Conditions Table*

Condition	Printer-state	Printer-state-reasons	Notification/relevant content
Paper low			
Paper out			
Marker supply low			
Marker supply out			
Output almost full			

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Condition	Printer-state	Printer-state-reasons	Notification/relevant content
Output full			
Cover open			
Tray missing			
Pause printer			
Paper jam			

232

3.7 Notification Table

233

	Printer ID & method			
Client ID & method	*Registration* *Delivery*			

234

3.8 Authentication & Security Table

235

Security, Authentication, (Firewall/Proxy)	**Client ID**			
Printer ID				

236

3.9 Firewall Table

237

	Inbound Print	Outbound Notify	Outbound Print	Inbound Notify
Printer ID, Client ID				

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238 ## 4 Issues

Issue #	Originator	Description

239 ## 5 Revision History

Version	Date	Name	Change
0.1	8/14/00	Zehler	Initial version for comment
0.2	8/22/00	Zehler	Added model coverage test, procedure and associated tables
0.2	8/28/00	Zehler	Added common error conditions
0.2	8/30/00	Zehler	

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