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IPP Test Plan Outline

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194 1 General

195 1.1 Common restrictions for test purposes (*non-secure, UTF8, en-us*)

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

- 198 • Security. No authentication, authorization or privacy will be used. There will be a series of test
199 specifically targeting interoperability of security implementations. The core protocol testing
200 will eliminate these variables.
- 201 • Character set. We will use the UTF-8 character encoding of ISO646. This will simplify the
202 comparison of results.
- 203 • Language. We will use en-us. This will simplify the comparison of results.
- 204 • IPP Scheme. The URLs for printers will be http://* as specified in the June 30 IPP
205 specification.
- 206 • Http Chunking. No IPP component being tested will chunk its requests or responses.
- 207 • Set 1 operations. Any implementations that support the set 1 extensions will use the PWG OP
208 codes. The PWG OP codes are from 0x0C to 0X12 inclusive.

209

210 **1.2 Test print files**

211 Where possible a small standard file will be used.

212 **1.3 Result processing and documentation**

213 **1.3.1 Anonymity**

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

218 ~~4.1.21.3.2~~ **Test data collection method**

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

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

225 ~~4.1.31.3.3~~ **Results determination**

226 Humans can determine the results for many of the tests. An IPP Client submitting a job that is
227 printed by an IPP printer would seem to indicate interoperability. We will submit print requests
228 with various attributes. Subsequently we will list the attributes of the job and insure the expected
229 attributes are present.

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

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

233

234 ~~4.1.41.3.4~~ **Output**

235 **1.3.4.1 Detailed results**

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

240 ~~4.1.1.21.3.4.2~~ **Summary of results**

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

244 **1.1.1.31.3.4.3 Issues**

245 Issues will be recorded and tracked by the TES whip or designate.

246 **2 Procedure**

247 After setting up and establishing basic IP connectivity every IPP component will be assigned a
248 designator. The IP address and Ethernet address will be recorded in the table in section 4.1. During
249 each step of the test, each IPP component involved will be recorded.

250 The tests are performed against IPP components. ~~The~~In the tables in section 4 columns marked
251 “supported” indicates the IPP component supports that operation, attribute or attribute value. The
252 columns marked “interoperate” is-are used to indicate the peer IPP component correctly understands
253 the operation, attribute or attribute value.

254 **2.1 Send request from Client to Printer**

255 For each IPP Printer send a get-printer-attributes request to the Printer to get default response (i.e.
256 no requested attributes or groups). Any IPP Client or Test Tool may be used. The objective of this
257 initial test is basic IPP connectivity. It is preferable to use an independently implemented
258 Client/Test Tool. Use the results of the IPP operation below.

259 **1.1.1.2.1.1 Get-printer-attributes**

260 Use the test tool and/or a network analyzer and insure the appropriate operational attributes are
261 returned. Record results in section 4.2.1

262 **2.1.2 Mandatory operations coverage**

263 Check off the operations supported in the table in section 4.2.2.

264 **2.1.3 Optional operations coverage**

265 Check off the ~~operations-attribute~~ supported in the table in section 4.2.3

266 **2.2 Find out the capabilities of the printer**

267 Use the results from 2.1

268 **2.2.1 Mandatory printer attributes coverage**

269 Check off the ~~operations-attribute~~ supported in the table in section 4.3.1.

270 **2.2.2 Optional printer attribute coverage**

271 Check off the ~~operations-attributes~~ supported in the table in section 4.3.2

272

273

274 **NOTE: The remainder of the testing should be performed using a**
275 **pair of independent implementations of the IPP protocol.**

276 **2.3 Print Job interoperability matrix**

277 Each IPP Client/Test Tool will submit a simple print job to all of the IPP Printers. The attributes in
278 the request will be the entire mandatory attributes and one optional attribute. The mandatory
279 attributes are attributes-charset, attributes-natural-language and printer-uri. The optional attribute
280 will be job-name. For each IPP Client/Test Tool, the results will be recorded in the table in section
281 4.4.
282

283 **2.4 Print job validation**

284 This will test the mandatory validate-job operation. Implementations that do not implement
285 validate job can substitute the results from section 2.5 in the table in section 4.5. A note should be
286 made in the table indicating this substitution has been made.

287 **2.4.1 Simple Job**

288 Send a validate-job to the printer. Record the job attributes that are being sent. Try various
289 supported attributes. Record combinations in the table in section 4.5 for comparison with the
290 results in section 2.5.1.

291 **2.4.2 Unsupported attribute job/best effort**

292 Send a validate-job to the printer. The attribute-fidelity attribute should be set to false and/or not
293 included. Record the job attributes that are being sent. Try various unsupported and supported
294 attribute combinations. Record combinations in the table in section 4.5 for comparison with the
295 results in section 2.5.2.

296 **2.4.3 Unsupported attribute job/fidelity**

297 Send a validate-job to the printer. The attribute-fidelity attribute should be set to true. Record the
298 job attributes that are being sent. Try various unsupported and supported attribute combinations.
299 Record combinations in the table in section 4.5 for comparison with the results in section 2.5.3.

300 **2.5 Print jobs submission**

301 This step tests the print-job operation. The results of this test can be checked by the examining the
302 response and performing a subsequent operation as in sections 2.6 and ~~0-2.7~~. List any results that
303 do not match the results from section 2.4 in the table in section 4.6

304 **2.5.1 Simple Job**

305 Submit some jobs using the print-job operation. Use the attribute combinations used in section
306 2.4.1. If the results do not agree, make a note in section 4.6.

307 **2.5.2 Unsupported attribute job/best effort**

308 Submit some jobs using the print-job operation. Use the attribute combinations used in section
309 2.4.2. If the results do not agree, make a note in section 4.6.

310 2.5.3 Unsupported attribute job/fidelity

311 Submit some jobs using the print-job operation. Use the attribute combinations used in section
312 2.4.3. If the results do not agree, make a note in section 4.6.

313 2.6 *List all the jobs*

314 This will test the get-jobs operation. If job information is not retained once a job is completed the
315 printer should be paused. This may be done with the optional set 1 operation “pause-printer” or
316 by preventing the printer by some other means from processing the job. This test can be done in
317 combination with the section 2.5 to examine the results. For each job tThe results from this test
318 should match the results from section 2.7.

319 For this section, submit a job(s) with known attributes.

320 2.6.1 ~~default~~Default

321 The list of jobs should only have the 'job-uri' and 'job-id' attributes. Record results in section 4.7.

322 2.6.2 Requested-attributes: groups

323 The groups to be tested are ‘all’, ‘job-description’ and ‘job-template’. Record results in section
324 4.7.

325 2.6.3 Requested-attributes: attributes

326 Pick an attribute that is in every job. Pick an attribute that is not in every job. Record results in
327 section 4.7.

328 2.6.4 Which-jobs

329 List ‘completed’ and ‘not-completed’ jobs. Record results in section 4.7.

330 2.6.5 Limit

331 Send a request with the ‘limit’ set to less than the number of jobs on the printer. Try again with
332 ‘limit’ greater than the number of jobs on the printer. Record results in section 4.7.

333 2.6.6 My-jobs

334 Submit a job from two different users. Each user should then submit a ‘get-jobs’ request. Record
335 results in section 4.7.

336 2.7 *List specific job*

337 This will test the Get-Job-Attributes operation. If job information is not retained once a job is
338 completed the printer should be paused. This may be done with the optional set 1 operation “pause-
339 printer” or by preventing the printer by some other means from processing the job. This test can be
340 done in combination with the section 2.5 to examine the results. This test should also be done in
341 combination with section 2.6

342 For this section, submit a job(s) with known attributes.

343 2.7.1 Default

344 Send get-jobs-attributes and compare with section [2.6.12-6.2](#). Note that the default behavior of
345 get-jobs-attributes is different from that of get-jobs. Record results in section 4.7.

346 2.8 *get-printer-attributes*

347 Test the attribute groups in the get-printer-attributes

348 ~~1.4.1~~2.8.1 Default

349 Make sure output is the same as the results for the printer in section 2.1 as listed in the tables in
350 section [4.2](#)

351 2.8.2 All

352 Make sure output is the same as 2.8.1

353 2.8.3 Printer-description

354 Make sure all the printer-description attributes listed in section 4.3 for the target printer are
355 reported. The list of attributes for the target printer may be obtained from performing section 2.2
356 on the Printer. The Printer implementers will have these results. The attribute groupings are listed
357 in section 5.3.

358 2.8.4 Job-template

359 Make sure all the job-template attributes listed in section 4.3 for the target printer are reported.
360 The list of attributes for the target printer may be obtained from performing section 2.2 on the
361 Printer. The Printer implementers will have these results. The attribute groupings are listed in
362 section 5.3.

363 2.9 *Cancel a job*

364 The printers tested must have the ability to prevent jobs from being scheduled. This may be
365 accomplished by the Set 1 IPP operations, opening a cover or by other printer specific means.
366 Record the results and behavior in section 4.8

367 2.9.1 Cancel a pending job (owner)

368 2.9.2 Cancel a pending job (not owner)

369 2.9.3 Cancel a completed job

370 2.9.4 Cancel a processing job

371 ~~2.92.10~~ **Printer State and Status**

372 The objective of this step is to compare the state of printers under various conditions. The get-
373 printer-attributes operation will be used to obtain the printer-state and printer-state-reasons
374 attributes. The printer-state-reasons attribute is optional. Therefore, it may be unsupported in
375 some implementations.

376 Record the results in section 4.9

377 2.9.12.10.1 State of the printer

378

379 Poll the printer before, during and after a job has been processed. The printer-state should be
 380 'idle', 'processing' and 'idle' respectively. The printer-state of 'paused' will be tested in section
 381 2.10.5.

382 4.1.2 Status

383 'paused'

384 4.1.32.10.2 Out of paper

385 Submit a job of a known size to a printer with the input tray(s) empty. The printer-state should be
 386 stopped and the printer-state-reasons should be 'media-empty'.

387 Put some paper into the input tray. There should not be enough to complete the job. While the
 388 printer is printing, examine the printer-state and printer-state-reasons. The printer-state should be
 389 processing and the printer-state-reasons may contain media-low.

390 When the printer runs out of paper, examine the two attributes again. The printer-state should be
 391 stopped. The printer-state-reasons may contain media-needed

392 'media-empty' 'media-low' 'media-needed'

393 4.1.4 Paper jam

394 'media-jam'

395 4.1.52.10.3 Cover open

396 Open the appropriate covers and doors. The printer-state should move to 'stopped'. The printer-
 397 state-reasons may contain 'cover-open' 'open' and/or 'door-open'

398 4.1.62.10.4 Tray missing

399 Remove an input tray and record the printer-state and printer-state-reasons. The printer-state-
 400 reasons may contain 'input-tray-missing'.

401 2.10.5 Pausing a printer

402 If possible, pause the printer. The printer-state should be stopped. The printer-state-reasons may
 403 contain paused.

404 2.10.6 Paper jam

405 If possible, cause the printer to jam. The printer-state should be stopped. The printer-state-
 406 reasons may contain media-jam.

407 4.1.7 Xxx

408

409 **~~2.10~~Cancel a job**410 **~~2.11~~ *client error handling* Operation status code sampling**

411 Below are some statuses codes that will be tested. The list is not all-inclusive. It is intended to
412 touch on some of the important conditions.

413 For each of these scenarios record the status-code in section 4.10. The status-code-message should
414 also be recorded.

415 **2.11.1 successful-ok (0x0000)**

416 This code should be returned in any of the successful operations performed so far.

417 **2.11.2 successful-ok-ignored-or-substituted-attributes (0x0001)**

418 This code should have been returned in the test in section 2.4.2 and section 2.5.2.

419 **2.11.3 client-error-bad-request (0x0400)**

420 Submit a request that is syntactically incorrect.

421 **2.11.4 client-error-not-found (0x0406)**

422 Submit a get-jobs-attribute request for a job that does not exist.

423 **2.11.5 client-error-request-value-too-long (0x0409)**

424 Submit a request with an attribute value whose length exceeds the specified maximum.

425 **2.11.6 client-error-document-format-not-supported (0x040A)**

426 Submit a request specifying a document format not listed in the printer attribute document-format-
427 supported.

428 **~~2.11.5~~ 2.11.7 **client-error-attributes-or-values-not-supported (0x040B)****

429 Submit a get-printer-attribute request with a requested attribute that is not supported by the printer.
430 The attribute may be an attribute not defined in the IPP model specification. The test should be
431 repeated for an invalid attribute value for a supported attribute.

432 **~~2.11.6~~ 2.11.8 **client-error-charset-not-supported (0x040D)****

433 Submit a request where the value of the operational attribute attributes-charset is set to an
434 unsupported value. The value may be something other than the valid values from the IPP
435 specification.

436 **~~2.11.7~~ 2.11.9 **server-error-operation-not-supported (0x0501)****

437 Submit a request with a value in the operation field for a nonexistent operation.

438 **~~2.11.8~~ 2.11.10 **server-error-version-not-supported (0x0503)****

439 Submit a request with an invalid value for the IPP version.

440 ~~2.11.9server-error-not-accepting-jobs-(0x0506)~~

441 ~~2.11.9print-job~~

442 **2.12 Printer Contention**

443 ~~Make sure that client abort job data transfer as soon as the server responds with a status code~~
 444 ~~indicating that it will not accept the job (due to fidelity or other issues).Have multiple clients submit~~
 445 ~~print jobs to a single printer. Record the status codes, status code message from the responses.~~
 446 ~~Describe the behavior of the client/printer interactions. Record in section 4.11~~
 447 ~~Compare the results with other printer contention tests.~~

448 **2.13 Large Jobs**

449 ~~Have a clients submit a large print jobs to several printers. Watch the data flow using a network~~
 450 ~~analyzer. Record the status codes, status code message from the responses. Describe the behavior~~
 451 ~~of the client/printer interactions. Record in section 4.12~~
 452 ~~Compare the results with other printer contention tests.~~

453

455 **3Issues**

456 ~~Will a client(s) be available to exercise the complete IPP protocol?~~

457 ~~Will a client(s) be able to generate invalid IPP requests?~~

458 ~~Should we exercise specific combinations of operation attributes?~~

459 ~~What combinations of which operation are of interest?~~

460 ~~How much error case testing should be included?~~

461 ~~What error codes are most critical?~~

462 ~~Will we test processing of invalid IPP requests?~~

463 ~~Should we test attributes that control the information returned in the “Get” operations?~~

464 ~~If we test the new IPP operations what enum values should be used?~~

465 ~~ZZZ check through the tables ZZZ~~

466 ~~ZZZ follow up on attribute fidelity ZZZ~~

467 ~~ZZZ provide cross references to status codes in validate and print ZZZ~~

468 ~~ZZZ give space for status code and returned unsupported attributes in validate and print ZZZ~~

469 ~~ZZZ there is no on-line/off-line ZZZ~~

470 ~~ZZZ requested attribute groups are not well explained in MOD ZZZ~~

471

472 **3 Optional Testing**

473
474 If time permits some additional tests may be performed.

475 **3.1 Security**

476 Security that is supported by the HTTP layer will be tested for interoperability. The IPP printers
477 participating will all turn on the security mentioned below. The results will be summarized and
478 recorded in section .

479 **3.1.1 Basic**

480 Turn on basic authentication at the printer. Have the client submit an request. Record the
481 participating components, the operation and the results.

482 **3.1.2 Digest**

483 Turn on digest authentication at the printer. Have the client submit an request. Record the
484 participating components, the operation and the results.
485

486 **3.2 Get-printer-attribute/Document-format Test**

487 Any printer that supports the behavior of returning different printer attributes based on the document-
488 format attribute will be tested. The test will be similar to section 2.2 except the procedure will be
489 repeated for each document-format-supported. Record the results in section 4.14
490

491 **4 Procedure Checklists**

492 **4.1 IPP Components matrix**

493

<u>Section 2 (Procedure)Section 2</u>			
ID	IP Address	Ethernet Address	<u>URL</u>
Clients			
CA			
CB			
CC			
CD			
CE			
CF			
CG			
Printers			

PA			
PB			
PC			
PD			
PE			
PF			
PG			
PH			
PI			
PJ			
PK			
PL			
PM			
PN			
PM			
Test Suites			
TS A			
TS B			
TS C			

494

495

496 **4.2 Checklists for section 2.1**

497 4.2.1 Checklist for section 2.1.1

498

Operational attributes				
Printer ID				
Client(s) ID				
Test Tool(s) ID				
Attr ID	Operational Attribute	Group	Supported	Interoperate
OA05	version-number	preamble		
OA06	<u>operation-id</u>	<u>preamble</u>		
OA07	request-id	preamble		

Operational attributes				
Printer ID				
Client(s) ID				
Test Tool(s) ID				
Attr ID	Operational Attribute	Group	Supported	Interoperate
OA08	attributes-charset	operational-attribute		
OA09	attributes-natural-language	operational-attribute		
OA10	printer-uri	operational-attribute		
OA14	requesting-user-name	operational-attribute		
OA17	status code	preamble		
OA18	Status-message	operational-attribute		

499

500 4.2.2 Checklist for section 2.1.2

Mandatory Operations		
Printer ID		
Client(s) ID		
Test Tool(s) ID		
Attr ID	Operation	Supported
OC01	print-job	
OC04	validate-job	
OC05	get-printer-attributes	
OC06	get-jobs	
OC07	get-job-attributes	
OC08	cancel-job	

501 4.2.3 Checklist for section 2.1.3

Optional Operations		
Printer ID		
Client(s) ID		
Test Tool(s) ID		
Attr ID	Operation	Supported
OC09	print-uri	
OC10	create-job	

Optional Operations		
OC11	send-document	
OC12	send-uri	
OC13	hold-job	
OC14	release-job	
OC15	pause-printer	
OC16	resume-printer	
OC17	purge-printer	
OC18	reprint-job	

502

503

504

505 **4.3 Checklist for section 2.2**

506 4.3.1 Checklist for section 2.2.1

Mandatory Printer Attributes		
ID	Attribute	Supported
PD01	printer-uri-supported	
PD01	uri-security-supported	
PD03	printer-name	
PD04	printer-state	
PD05	operations-supported	
PD06	charset-configured	
PD07	charset-supported	
PD08	natural-language-configured	
PD09	generated-natural-language-supported	
PD10	printer-is-accepting-jobs	
PD11	pdl-override-supported	
PD21	document-format-default	
PD22	document-format-supported	
PD12	printer-up-time	

507 4.3.2 Checklist for section 2.2.2

Optional Printer Attributes		
Attr ID	Attribute	Supported
PD13	printer-location	
PD14	printer-info	
PD15	printer-more-info	
PD16	printer-driver-installer	
PD17	printer-make-and-model	
PD18	printer-more-info-manufacturer	
PD19	printer-state-reasons	

Optional Printer Attributes		
Attr ID	Attribute	Supported
PD20	printer-state-message	
PD23	queued-job-count	
PD24	printer-message-from-operator	
PD25	color-supported	
PD26	reference-uri-schemes-supported	
PD27	printer-current-time	
PD28	multiple-operation-time-out	
PD29	compression-supported	
PD30	job-k-octets-supported	
PD31	job-impressions-supported	
PD32	job-media-sheets-supported	
JT02	job-priority-default	
JT03	job-priority-supported	
JT05	job-hold-until-default	
JT06	job-hold-until-supported	
JT08	job-sheets-default	
JT09	job-sheets-supported	
JT11	multiple-document-handling-default	
JT12	multiple-document-handling-supported	
JT14	copies-default	
JT15	copies-supported	
JT17	finishings-default	
JT18	finishings-supported	
JT20	page-ranges-supported	
JT22	sides-default	
JT23	sides-supported	
JT25	number-up-default	
JT26	number-up-supported	
JT28	orientation-requested-default	
JT29	orientation-requested-supported	
JT31	media-default	
JT32	media-supported	
JT33	media-ready	
JT35	printer-resolution-default	
JT36	printer-resolution-supported	
JT38	print-quality-default	
JT39	print-quality-supported	

508

509

510

Test #	Description of difference

521

522 **4.7 Checklist for section 2.6 and 2.7**

523 List all the jobs and List specific job

Operation and description	results
List-jobs default	
List-jobs requested-attributes = all	
List-jobs requested-attributes = job-description	
List-jobs requested-attributes = job-template	
List-jobs attribute in every job	
List-jobs attribute not in every job	
List-jobs which-jobs = completed'	
List-jobs which-jobs = not-completed'	
List-jobs limit is less than the number of printer jobs	
List-jobs limit is greater than the number of printer jobs	
List-jobs my-jobs	

524

525

526 **4.8 Checklist for section 2.9**

527 Cancel a job

<u>Scenerio</u>	<u>status code</u>	<u>status-message</u>	<u>Describe behavior</u>
<u>Cancel a pending job</u>			

<u>Scenerio</u>	<u>status code</u>	<u>status-message</u>	<u>Describe behavior</u>
<u>(owner)</u>			
<u>Cancel a pending job (not owner)</u>			
<u>Cancel a completed job</u>			
<u>Cancel a processing job</u>			

528

529 **4.9 Checklist for section 2.10**

530

Printer State and Status

<u>Scenario</u>	<u>Printer-state</u>	<u>Printer-state-reasons</u>	<u>Describe behavior</u>
<u>State of the printer before job</u>			
<u>State of the printer during job</u>			
<u>State of the printer after job</u>			
<u>Out of paper</u>			
<u>Cover open</u>			
<u>Tray missing</u>			
<u>Pausing a printer</u>			
<u>Paper jam</u>			

531

532

533 **4.10 Checklist for section 2.11**534 Operation status code sampling

<u>status code</u>	<u>status-message</u>	<u>Operation</u>	<u>Description of conditions/behavior</u>
<u>successful-ok</u> <u>(0x0000)</u>			
<u>successful-ok-</u> <u>ignored-or-</u> <u>substituted-</u> <u>attributes</u> <u>(0x0001)</u>			
<u>client-error-bad-</u> <u>request</u> <u>(0x0400)</u>			
<u>client-error-not-</u> <u>found (0x0406)</u>			
<u>client-error-</u> <u>request-value-</u> <u>too-long</u> <u>(0x0409)</u>			
<u>client-error-</u> <u>document-</u> <u>format-not-</u> <u>supported</u> <u>(0x040A)</u>			
<u>client-error-</u> <u>attributes-or-</u> <u>values-not-</u> <u>supported</u> <u>(0x040B)</u>			
<u>client-error-</u> <u>charset-not-</u> <u>supported</u> <u>(0x040D)</u>			
<u>server-error-</u> <u>operation-not-</u> <u>supported</u> <u>(0x0501)</u>			
<u>server-error-</u> <u>version-not-</u> <u>supported</u> <u>(0x0503)</u>			

535 **4.11 Checklist for section 2.12**

536 Printer Contention

<u>status code</u>	<u>status-message</u>	<u>Description of behavior</u>

537

538 **4.12 Checklist for section 2.13**

539 Large Jobs

<u>status code</u>	<u>status-message</u>	<u>Description of behavior</u>

540 **4.13 Checklist for section 3.1**

541 Security

<u>Client ID</u>	<u>Printer ID</u>	<u>Security</u>	<u>Description of results</u>

<u>Client ID</u>	<u>Printer ID</u>	<u>Security</u>	<u>Description of results</u>

542 **4.14 Checklist for section 3.2**

543 Get-printer-attribute/Document-format Test

<u>1st document-format</u>	<u>2nd document-format</u>	<u>Description difference</u>

544

545

546 **5 Summary Checklists**

547 The purpose of the set of tables in this section is to assign a shorthand ID to all operations, attributes and
 548 syntaxes . These tables may also be used during and after the test to document the IPP Model coverage.

549 **5.1 Operation Coverage**

550

ID	Operation	Mandatory	Tested
OC01	print-job	Yes	
OC04	validate-job	Yes	
OC05	get-printer-attributes	Yes	

ID	Operation	Mandatory	Tested
OC06	get-jobs	Yes	
OC07	get-job-attributes	Yes	
OC08	cancel-job	Yes	
OC09	print-uri	No	
OC10	create-job	No	
OC11	send-document	No	
OC12	send-uri	No	
OC13	hold-job	No	
OC14	release-job	No	
OC15	pause-printer	No	
OC16	resume-printer	No	
OC17	purge-printer	No	
OC18	reprintrestart-job	No	

551

552 **4.25.2 Operational Attributes Coverage**

553

Operational Attribute Coverage					
ID	Operational Attribute	Group	Comment	Mandatory	Tested
OA01		job-attribute	Tested by get-jobs	Yes	
OA02		printer-attribute	Tested by get-printer-attributes	Yes	
OA03		unsupported-attributes	Tested by print-job with unsupported attributes	Yes	
OA04		operational-attribute	See OA08 to OAZZ		
OA05	version-number	preamble	Test with any operation	Yes	
OA06	operation-id	preamble	See section <u>5-15.1</u>	Yes	
OA07	request-id	preamble	Test with any operation	Yes	
OA08	attributes-charset	operational-attribute	Must support utf-8	Yes	
OA09	attributes-natural-language	operational-attribute	Test imposes en-us requirement	Yes	
OA10	printer-uri	operational-attribute	This or OA11 must be 3 rd attribute	Conditional	

Operational Attribute Coverage					
ID	Operational Attribute	Group	Comment	Mandatory	Tested
OA11	job-uri	operational-attribute	This or OA10 must be 3 rd attribute	Conditional	
OA12	job-id	operational-attribute	This must be 4th attribute	Conditional	
OA13	job-name	operational-attribute	Only for print & validate operations	Optional	
OA14	requesting-user-name	operational-attribute		Optional	
OA15	document-uri	operational-attribute	Only for print-uri	Conditional	
OA16	last-document	operational-attribute	Only for send-uri and send-document	Conditional	
OA17	status code	preamble	Test with any response	Yes	
OA18	status-message	operational-attribute	Test with any response	Optional	
OA19	compression	operational-attribute	Only for print & validate operations	Optional	
OA20	document-natural-language	operational-attribute	Only for print & validate operations	Optional	
OA21	ipp-attribute-fidelity	operational-attribute	Only for print & validate operations	Optional	
OA22	job-impressions	operational-attribute	Only for print & validate operations	Optional	
OA23	job-k-octets	operational-attribute	Only for print & validate operations	Optional	
OA24	job-media-sheets	operational-attribute	Only for print & validate operations	Optional	
OA25	limit	operational-attribute	Only for get-jobs operations	Optional	

Operational Attribute Coverage					
ID	Operational Attribute	Group	Comment	Mandatory	Tested
OA26	message	operational-attribute	Only for cancel operations	Optional	
OA27	my-jobs	operational-attribute	Only for get-jobs operations	Optional	
OA28	requested-attributes	operational-attribute	Only for get-* operations	Optional	
OA29	Document-format	operational-attribute	Only for print operations	Optional	
OA30	which-jobs	operational-attribute	Only for get-jobs operations	Optional	

554 **5.3 Attribute Coverage**555 **5.3.1 Printer Description**

Printer Description				
ID	Attribute	Syntax	Mandatory	Tested
PD01	printer-uri-supported	uri	Yes	
PD01	uri-security-supported	1setOf type2 keyword	Yes	
PD03	printer-name	name	Yes	
PD04	printer-state	type1 enum	Yes	
PD05	operations-supported	1setOf type2 enum	Yes	
PD06	charset-configured	charset	Yes	
PD07	charset-supported	1setOf charset	Yes	
PD08	natural-language-configured	naturalLanguage	Yes	
PD09	generated-natural-language-supported	1setOf naturalLanguage	Yes	
PD10	printer-is-accepting-jobs	boolean	Yes	
PD11	pdl-override-supported	type2 keyword	Yes	
PD12	printer-up-time	integer	Yes	
PD13	printer-location	text	No	
PD14	printer-info	text	No	
PD15	printer-more-info	uri	No	
PD16	printer-driver-installer	uri	No	
PD17	printer-make-and-model	text	No	
PD18	printer-more-info-manufacturer	uri	No	
PD19	printer-state-reasons	1setOf type2 keyword	No	
PD20	printer-state-message	text	No	
PD21	document-format-default	mimeMediaType	No	
PD22	document-format-supported	1setOf mimeMediaType	No	

Printer Description				
ID	Attribute	Syntax	Mandatory	Tested
PD23	queued-job-count	integer	No	
PD24	printer-message-from-operator	text	No	
PD25	color-supported	boolean	No	
PD26	reference-uri-schemes-supported	1 setOf uriScheme	No	
PD27	printer-current-time	dateTime	No	
PD28	multiple-operation-time-out	integer	No	
PD29	compression-supported	1 setOf type3 keyword	No	
PD30	job-k-octets-supported	rangeOfInteger	No	
PD31	job-impressions-supported	rangeOfInteger	No	
PD32	job-media-sheets-supported	rangeOfInteger	No	

556

557 4.1.25.3.2 Job Template

Job Template				
ID	Attribute	Syntax	Mandatory	Tested
JT01	job-priority	integer	No	
JT02	job-priority-default	integer	No	
JT03	job-priority-supported	integer	No	
JT04	job-hold-until	type4 keyword name	No	
JT05	job-hold-until-default	type4 keyword name	No	
JT06	job-hold-until-supported	1 setOf type4 keyword name	No	
JT07	job-sheets	type4 keyword name	No	
JT08	job-sheets-default	type4 keyword name	No	
JT09	job-sheets-supported	1 setOf type4 keyword name	No	
JT10	multiple-document-handling	type2 keyword	No	
JT11	multiple-document-handling-default	type2 keyword	No	
JT12	multiple-document-handling-supported	1 setOf type2 keyword	No	
JT13	copies	integer	No	
JT14	copies-default	integer	No	
JT15	copies-supported	integer	No	
JT16	finishings	1 setOf type2 enum	No	
JT17	finishings-default	1 setOf type2 enum	No	
JT18	finishings-supported	1 setOf type2 enum	No	
JT19	page-ranges	1 setOf rangeOfInteger	No	

Job Template				
ID	Attribute	Syntax	Mandatory	Tested
JT20	page-ranges-supported	boolean	No	
JT21	sides	type2 keyword	No	
JT22	sides-default	type2 keyword	No	
JT23	sides-supported	1setOf type2 keyword	No	
JT24	number-up	integer	No	
JT25	number-up-default	integer	No	
JT26	number-up-supported	1setOf integer rangeOfInteger	No	
JT27	orientation-requested	type2	No	
JT28	orientation-requested-default	type2	No	
JT29	orientation-requested-supported	1setOf type2	No	
JT30	media	type4 keyword name	No	
JT31	media-default	type4 keyword name	No	
JT32	media-supported	1setOf type4 keyword name	No	
JT33	media-ready	1setOf type4 keyword name	No	
JT34	printer-resolution	resolution	No	
JT35	printer-resolution-default	resolution	No	
JT36	printer-resolution-supported	1setOf resolution	No	
JT37	print-quality	type2 enum	No	
JT38	print-quality-default	type2 enum	No	
JT39	print-quality-supported	1setOf type2 enum	No	

558

559 **4.1.35.3.3** Job Description

Job Description				
ID	Attribute	Syntax	Mandatory	Tested
JD01	job-uri	uri	Yes	
JD02	job-id	integer	Yes	
JD03	job-printer-uri	uri	Yes	
JD04	job-name	name	Yes	
JD05	job-originating-user-name	name	Yes	
JD06	job-state	type1 enum	Yes	
JD07	attributes-charset	charset	Yes	
JD08	attributes-natural-language	naturalLanguage	Yes	
JD09	job-more-info	uri	No	
JD10	job-state-reasons	1setOf type2 keyword	No	
JD11	job-state-message	text	No	
JD12	number-of-documents	integer	No	
JD13	output-device-assigned	name	No	
JD14	time-at-creation	integer	No	
JD15	time-at-processing	integer	No	
JD16	time-at-completed	integer	No	
JD17	number-of-intervening-jobs	integer	No	

Job Description				
ID	Attribute	Syntax	Mandatory	Tested
JD18	job-message-from-operator	text	No	
JD19	job-k-octets	integer	No	
JD20	job-impressions	integer	No	
JD21	job-media-sheets	integer	No	
JD22	job-k-octets-processed	integer	No	
JD23	job-impressions-completed	integer	No	
JD24	job-media-sheets-completed	integer	No	

560 5.4 Syntax Coverage

Syntax Coverage				
ID	Syntax	Attribute	Mandatory	Tested
SC01	text	printer-location	No	
SC02	textWithLanguage			
SC03	name	printer-name	Yes	
SC04	nameWithLanguage			
SC05	keyword	pdl-override-supported	Yes	
SC06	enum	printer-state	Yes	
SC07	uri	printer-uri-supported	Yes	
SC08	UriScheme (1 setOf)	reference-uri-schemes-supported	No	
SC09	charset	charset-configured	Yes	
SC10	naturalLanguage	natural-language-configured	Yes	
SC11	mimeMediaType	document-format-default	No	
SC12	octetString			
SC13	boolean	printer-is-accepting-jobs	Yes	
SC14	integer	printer-up-time	Yes	
SC15	rangeOfInteger	job-k-octets-supported	No	
SC16	dateTime	printer-current-time	No	
SC17	resolution	printer-resolution	No	
SC18	1setOf X (1setOf type2 enum)	operations-supported	Yes	

561 6 Issues

562 Use this area to record any issues, comments or concerns. The items should relate to the IPP specification
 563 or interoperability testing.

- 564
- 565 • There is no on-line/off-line.
- 566 • Requested attribute groups are not well explained in MOD document

567

568