



The Printer Working Group

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IPP Document Object v1.1 (DOCOBJECT)

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Abstract: This specification defines the IPP Document object and its associated attributes, values, group, and operations.

This is a PWG Working Draft. For a definition of a "PWG Working Draft", see:

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74 multiple independent and interoperable implementations. Printer manufacturers and
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76 conformance to these standards.

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184 **1. Introduction**

185 This specification extends the Internet Printing Protocol/1.1 [STD92] by defining the IPP
186 Document object and its associated attributes, values, group, and operations. The IPP Job
187 object is extended to contain zero or more addressable Document objects representing the
188 Documents submitted for and operated on by the Job.

189 This specification obsoletes portions of the previous version of this specification
190 [PWG5100.5-2003]. A list of changes can be found in section 15.

191 **2. Terminology**

192 **2.1 Conformance Terminology**

193 Capitalized terms, such as MUST, MUST NOT, RECOMMENDED, REQUIRED, SHOULD,
194 SHOULD NOT, MAY, and OPTIONAL, have special meaning relating to conformance as
195 defined in Key words for use in RFCs to Indicate Requirement Levels [BCP14]. The term
196 CONDITIONALLY REQUIRED is additionally defined for a conformance requirement that
197 applies when a specified condition is true.

198 [The term DEPRECATED is used for previously defined and approved protocol elements that](#)
199 [SHOULD NOT be used or implemented. The term OBSOLETE is used for previously defined](#)
200 [and approved protocol elements that MUST NOT be used or implemented.](#)

201 **2.2 Printing Terminology**

202 Normative definitions and semantics of printing terms are imported from the Internet Printing
203 Protocol/1.1 [STD92].

204 *Document*: An object created and managed by a Printer that contains description,
205 processing, and status information. A Document object may have attached data and is
206 bound to a single Job.

207 *Job*: An object created and managed by a Printer that contains description, processing, and
208 status information. The Job also contains zero or more Document objects.

209 *Logical Device*: a print server, software service, or gateway that processes jobs and either
210 forwards or stores the processed job or uses one or more Physical Devices to render output.

211 *Output Device*: a single Logical or Physical Device

212 *Physical Device*: a hardware implementation of an endpoint device, e.g., a marking engine,
213 a fax modem, etc.

214 **2.3 Protocol Role Terminology**

215 This specification also defines the following protocol roles to specify unambiguous
216 conformance requirements:

217 *Client*: Initiator of outgoing connections and sender of outgoing operation requests
218 (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] User Agent).

219 *Printer*: Listener for incoming connections and receiver of incoming operation requests
220 (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] Server) that represents one or more
221 Physical Devices or a Logical Device.

222 **2.4 Other Terminology**

223 *Attribute Precedence*: The rules which dictate which attribute value takes precedence when
224 the same attribute is supplied at different points in the workflow with different values, such
225 as at both the Job Level and the Document Level.

226 *Document Creation Operation*: Operations that create Document objects including Print-Job,
227 Print-URI, Send-Document, and Send-URI as defined in the IPP/1.1 Model and Semantics
228 [STD92].

229 *Document Level*: Operation and Document Template attributes supplied in the Send-
230 Document and Send-URI operations are referred to as being supplied at the Document
231 Level. Attributes supplied in the Print-Job and Print-URI operations are considered as being
232 supplied at the Job Level only, *not* also at the Document Level, even though Print-Job and
233 Print-URI also create Document objects.

234 *Document Template*: An attribute that the Client supplies in a Send-Document or Send-URI
235 request in the Document attributes group, e.g., “media”.

236 *Honor*: A Printer is said to honor an attribute supplied by the Client if the Printer supports
237 the attribute and supplied value and conforms to the defined semantics.

238 *Job Creation Operation*: Operations that create Job objects including Create-Job, Print-Job,
239 and Print-URI as defined in the IPP/1.1 Model and Semantics [STD92].

240 *Job Level*: Operation and Job Template attributes supplied in Print-Job, Print-URI, and
241 Create-Job requests are referred to as being supplied at the Job Level.

242 **2.5 Acronyms and Organizations**

243 *IANA*: Internet Assigned Numbers Authority, <http://www.iana.org/>

244 *IETF*: Internet Engineering Task Force, <http://www.ietf.org/>

245 *ISO*: International Organization for Standardization, <http://www.iso.org/>

246 *PWG*: Printer Working Group, <http://www.pwg.org/>

247 **3. Requirements**

248 **3.1 Rationale**

249 The Internet Printing Protocol/1.1 [STD92] defines the IPP Model and Semantics, including
250 abstract objects for a Printer that processes Jobs and the Jobs themselves which process
251 Documents. Given the need to directly address Documents in a Job, the IPP Document
252 Object v1.1 should:

- 253 1. Define an abstract IPP Document object and its attributes;
254 2. Define new IPP operations for the IPP Document object; and
255 3. Extend existing IPP operations as needed to support the IPP Document object.

256 [Rationale for the changes from the previous versions of this specification can be found in](#)
257 [section 15.](#)

258 **3.2 Use Cases**

259 **3.2.1 Specify Per-Document Print Intent**

260 Jane is printing a multi-volume report and would like the output printed together. She uses
261 an application on her computer to select each volume in the report and a shipping envelope.
262 She then initiates a print action, specifying the media and finishing processes for each
263 volume and the media for the shipping envelope. The printer processes all of the documents
264 as a single job, placing the hardcopy output in a mailbox together.

265 **3.2.2 See a List of Documents in a Job**

266 John has submitted a multi-document job to a printer but cannot remember if he included all
267 of the documents needed. He uses an application on his mobile device to query the list of
268 documents in the print job and display them on the screen.

269 **3.2.3 Cancel a Single Document**

270 Bob has submitted a multi-document job to a printer but realizes there was a typographical
271 error in one of the documents that has not yet printed. He uses an application on his
272 computer to view the list of jobs on the printer, views the list of documents in the job he
273 submitted, and initiates a cancel action for the document containing the error.

274 **3.3 Exceptions**

275 There are no exceptions defined for this specification.

276 **3.4 Out of Scope**

277 The following are considered out of scope for this specification:

- 278 1. Definition of copy or page level semantics; and
279 2. Definition of per-page or per-copy overrides.

280 **3.5 Design Requirements**

281 The design requirements for this specification are:

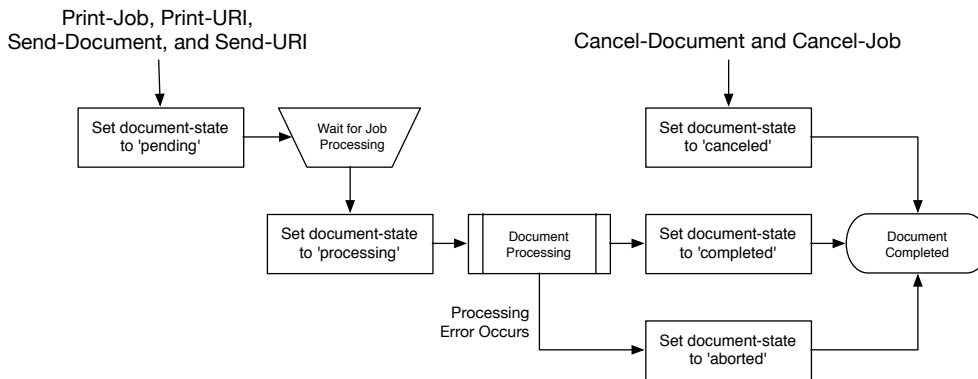
- 282 1. Define an abstract IPP Document object and its semantics;
283 2. Define an attribute group tag for attributes of an IPP Document object;
284 3. Define attributes and values to describe an IPP Document object;
285 4. Define operations for querying and manipulating IPP Document objects;
286 5. Extend existing operations to explicitly create IPP Document objects;
287 6. Define security requirements necessary to support IPP Document objects; and
288 7. Define sections to register all objects, attribute groups, attributes, values, and
289 operations with IANA.
290

291 **4. Model**

292 The Internet Printing Protocol/1.1 [STD92] defines an object model containing a Printer that
293 processes Jobs and a Job that processes Documents. This specification extends the Model
294 with an addressable Document object with its own attributes and state. Printers MAY support
295 multiple Documents per Job.

296 **4.1 Document Object**

297 The Document object represents a single Document in a Job that contains Document-
298 specific Description, Status, and Template attributes. Document Description attributes
299 provide information about the Document, Document Status attributes provide state
300 information for the Document, and Document Template attributes override the
301 corresponding Job Template attributes for the Document. A Document object also contains
302 the Document data and/or a URI that references the Document data. Figure 1 shows the life
303 cycle of the Document object.



304
305 **Figure 1 - Document Object Life Cycle**

306 **4.2 Operations**

307 The Print-Job and Print-URI operations [STD92] create a Job object containing a single
308 Document object while the Create-Job operation [STD92] creates a Job object with no
309 Document objects. The Send-Document and Send-URI operations [STD92] add Document
310 objects to the specified Job object. Printers conforming to this specification MUST support
311 the Create-Job and Send-Document operations.

312 This specification extends the Send-Document and Send-URI operations to accept
313 Document Template attributes in the Document Attributes group. The Document Template

314 attributes are applied to the Document object being created, overriding any corresponding
 315 Job Template attributes supplied at the Job Level which allows the Client to vary the
 316 Document Template attributes between Document objects in a single Job.

317 This specification also defines one new Job operation and four new Document operations.
 318 Table 1 lists the operations and their conformance requirements.

319 **Table 1 - IPP Operations**

Operation	Target	Conformance	Reference
Cancel-Document	Document	MUST	Section 5.1.1
Create-Job	Printer	MUST	STD 92
Get-Document-Attributes	Document	MUST	Section 5.1.2
Get-Documents	Job	MUST	Section 5.2.1
Print-Job	Printer	MUST	STD 92, Section 8.3
Print-URI	Printer	MAY	STD 92, Section 8.3
Send-Document	Job	MUST	STD 92, Section 8.4
Send-URI	Job	MAY	STD 92, Section 8.5
Set-Document-Attributes	Document	MAY	Section 5.1.3

320 4.3 Job and Document Template Attributes

321 Clients OPTIONALLY supply Job Template attributes in Create-Job, Print-Job, and Print-
 322 URI requests, and OPTIONALLY supply Document Template attributes in Print-Job, Print-
 323 URI, Send-Document, and Send-URI requests. Job Template attributes apply to the Job as
 324 a whole. Document Template attributes apply only to the corresponding Document object.

325 Printers MUST support the following Attribute Precedence from highest to lowest when
 326 processing a Document:

- 327 1. Document Level - The Document Template attributes supplied in the Document
 328 Creation request or a subsequent Set-Document-Attributes request;
- 329 2. Job Level - The Job Template attributes supplied in the Job Creation request or
 330 a subsequent Set-Job-Attributes request; and
- 331 3. Printer Default - The Printer Default attributes as supplied by the manufacturer
 332 or configured by the operator or administrator using a Set-Printer-Attributes
 333 request.

334 Note: Depending on the value of the "pdl-override-supported" Printer Description attribute
 335 [STD92], device commands embedded in the Document data could override attributes
 336 specified at any of the previous levels.

337 **5. New Operations**

338 This section defines the new IPP operations for this specification.

339 Note: The Internet Printing Protocol/1.1 [STD92] deprecates the "job-uri" operation attribute
340 for specifying the target Job and recommends that Clients send the "printer-uri" and "job-id"
341 operation attributes instead.

342 **5.1 Document Operations**

343 **5.1.1 Cancel-Document**

344 This REQUIRED Document operation allows a Client to cancel a specified Document in a
345 specified Print Job any time from the time the Document is created up to, but not including,
346 the time that the Document is completed, canceled, or aborted. Since a Document might
347 already be printing by the time a Cancel-Document request is received, some media sheet
348 pages might be printed before the Document processing is actually terminated.

349 The Cancel-Document operation does not remove the Document from the Job and Printer,
350 but only sets the specified Document's "document-state" Document Status attribute to
351 'canceled' and the Document's "document-state-reasons" Document Status attribute with
352 'canceled-by-user' or 'canceled-by-operator'. If the Job object is printed again using
353 operations such as Resubmit-Job [PWG5100.11], any canceled Documents are also printed
354 again. Thus Cancel-Document has the same semantics as Cancel-Job [STD92] which only
355 cancels the processing of the Job and doesn't delete the Job object itself.

356 The Printer MUST accept or reject the request based on the Document's current state and
357 transition the Document to the indicated new state as shown in Table 2.

358 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
359 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
360 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
361 appropriate.
362

363

Table 2 - Document State Transitions for Cancel-Document

Current "document-state"	New "document-state"	Printer's response status code and action:
'pending'	'canceled'	'successful-ok'
'processing'	'canceled'	'successful-ok'
'processing'	'processing'	'successful-ok' (note 1)
'processing'	'processing'	'client-error-not-possible' (note 2)
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

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Note 1: If the implementation requires some measurable time to cancel the Document in the 'processing' state, the Printer MUST add the 'processing-to-stop-point' value to the Document's "document-state-reasons" attribute and then transition the Document to the 'canceled' state when the processing ceases.

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Note 2: If the Document object already has the 'processing-to-stop-point' value in its "document-state-reasons" attribute, then the Printer MUST reject the Cancel-Document request.

371 5.1.1.1 Cancel-Document Request

372 The following groups of attributes are part of the Cancel-Document request:

373 Group 1: Operation Attributes

374 Natural Language and Character Set:

375 The "attributes-charset" and "attributes-natural-language" attributes as
376 described in [STD92].

377 Target:

378 Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"
379 (uri) operation attribute(s) [STD92] which define the target Job object for this
380 operation, followed by the "document-number" (integer(1:MAX)) operation
381 attribute which defines the target Document object for this operation. If the
382 Client omits the "document-number" operation attribute, the Printer MUST
383 reject the request and return the 'client-error-bad-request' status code.

384 Requesting User Name:

385 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by
386 the Client as described in [STD92].

387 "document-message" (text(MAX)):

388 The Client MAY supply this attribute. If supported by the Printer, the Printer
389 MUST also support the corresponding "document-message" (text(MAX))
390 Document Status attribute (see section 6.2.3) and copy the value to the
391 Document's "document-message" attribute.

392 **5.1.1.2 Cancel-Document Response**

393 The following groups of attributes are part of the Cancel-Document response:

394 Group 1: Operation Attributes

395 Status Message:

396 In addition to the REQUIRED status code returned in every response, the
397 response OPTIONALLY includes a "status-message" (text(255)) and/or a
398 "detailed-status-messages" (text(MAX)) Operation attribute as described in
399 [STD92].

400 Natural Language and Character Set:

401 The "attributes-charset" and "attributes-natural-language" attributes as
402 described in [STD92].

403 Group 2: Unsupported Attributes

404 See [STD92] for details on returning Unsupported Attributes.

405 **5.1.2 Get-Document-Attributes**

406 This REQUIRED Document operation allows a Client to request the values of selected
407 attributes of a Document object. The Printer MUST only return attributes that were submitted
408 by a Client or generated by the Printer.

409 The Client requests attributes using the "requested-attributes (keyword)" operation attribute
410 [STD92] which lists the attribute names and groups of interest. For Document objects the
411 possible names of attribute groups are:

412 'document-template': The subset of Document Template that the implementation
413 supports for Document objects.

414 'document-description': The subset of Document Description and Document Status
415 attributes that the implementation supports for Document objects.

416 'all': All attributes that the implementation supports for Document objects.

417 Since a Client MAY request specific attributes or named groups, there is a potential that
418 there is some overlap. For example, if a Client requests 'document-name' and 'document-
419 description', the Client is actually requesting the "document-name" attribute once by naming
420 it explicitly and once by inclusion in the 'document-description' group. In such cases, the
421 Printer returns the attribute only once in the response even if it is requested multiple times.
422 The Client SHOULD NOT request the same attribute in multiple ways.

423 Printers MUST support all group names and MUST return all supported attributes belonging
424 to the group.

425 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
426 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
427 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
428 appropriate.

429 **5.1.2.1 Get-Document-Attributes Request**

430 The following groups of attributes are part of the Get-Document-Attributes request:

431 Group 1: Operation Attributes

432 Natural Language and Character Set:

433 The "attributes-charset" and "attributes-natural-language" attributes as
434 described in [STD92].

435 Target:

436 Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"
437 (uri) operation attribute(s) [STD92] which define the target Job object for this
438 operation, followed by the "document-number" (integer(1:MAX)) operation
439 which defines the target Document object for this operation. If the Client
440 omits the "document-number" operation attribute, the Printer MUST reject the
441 request and return the 'client-error-bad-request' status code.

442 Requesting User Name:

443 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by
444 the Client as described in [STD92].

445 "requested-attributes" (1setOf keyword):

446 The Client OPTIONALLY supplies and the Printer MUST support this
447 attribute, which is a list of Document attribute names and/or attribute group
448 names that are returned to the Client for each Document object. If the Client
449 does not supply this attribute, the Printer MUST respond as if the Client had
450 supplied this attribute with the single value 'all'.

451 5.1.2.2 Get-Document-Attributes Response

452 The following groups of attributes are part of the Get-Document-Attributes response:

453 Group 1: Operation Attributes

454 Status Message:

455 In addition to the REQUIRED status code returned in every response, the
456 response OPTIONALLY includes a "status-message" (text(255)) and/or a
457 "detailed-status-messages" (text(MAX)) Operation attribute as described in
458 [STD92].

459 Natural Language and Character Set:

460 The "attributes-charset" and "attributes-natural-language" attributes as
461 described in [STD92]. The "attributes-natural-language" MAY be the natural
462 language of the Document object rather than the one in the Get-Document-
463 Attributes request.

464 Group 2: Unsupported Attributes

465 See [STD92] for details on returning Unsupported Attributes.

466 The response MAY contain the "requested-attributes" operation attribute with
467 any supplied values (attribute keywords) that were requested by the Client
468 but are not supported by the Printer. If the Printer does return unsupported
469 attributes referenced in the "requested-attributes" operation attribute and that
470 attribute included group names such as 'all', the unsupported attributes
471 MUST NOT include attributes described in the standard but not supported by
472 the implementation.

473 Group 3: Document Attributes

474 The Printer responds with the Document Description, Document Status, and
475 Document Template attributes for each returned Document object as
476 requested by the "requested-attributes" operation attribute supplied by the
477 Client in the request. The Printer ignores (does not respond with) any
478 requested attribute or value which is not supported or which is restricted by
479 the security policy in force, including whether the requesting user is the Job
480 owner. However, the Printer MUST respond with the 'unknown' out of band
481 value [STD92] for any supported attribute (including all REQUIRED
482 attributes) for which the Printer does not know the value, unless it would
483 violate the security policy.

484 **5.1.3 Set-Document-Attributes**

485 This OPTIONAL Document operation allows a Client to set the values of the attributes of a
 486 Document object after the Document object is submitted to the Printer. In the request, the
 487 Client supplies the set of Document attributes and values that are to be set. In the response,
 488 the Printer returns success or rejects the entire request with indications of which attribute or
 489 attributes could not be set.

490 This operation is similar to the Set-Job-Attributes operation [RFC3380] and follows the same
 491 rules for validation. As with the Set-Job-Attributes operation, the Set-Document-Attributes
 492 operation can add a new attribute, replace the value of an existing attribute, or remove an
 493 attribute using 'delete-attribute' out-of-band value.

494 If the Client supplies an attribute in a Set-Document-Attributes request with the 'delete-
 495 attribute' out-of-band value and that attribute is not present on the Document object, the
 496 Printer ignores the attribute and does not return the attribute in the Unsupported Attributes
 497 group. The Printer also returns the 'successful-ok' status code if there are no other problems
 498 with the request.

499 The Printer MUST accept or reject this operation when the Document's "document-state"
 500 attribute has the values shown in Table 3 but MUST NOT change the state of the Document
 501 object since the Document is a passive object and the Document state is a subset of the Job
 502 State. For example, in the case where the operation creates a request for unavailable
 503 resources, the Job (but not the Document) transitions to a new state.

504 **Table 3 - Allowed Document States for the Set-Document-Attributes operation**

"document-state"	Printer's response status code and "action"
'pending'	'successful-ok'
'pending'	'successful-ok' - needed resources are not ready (the Job MAY change state)
'processing'	'successful-ok' or 'client-error-not-possible' depending on implementation, including the attributes being set, whether the document has started marking media, etc.
'completed'	'client-error-not-possible'
'canceled'	'client-error-not-possible'
'aborted'	'client-error-not-possible'

505 This operation MUST NOT change the value of attributes not specified in the operation
 506 unless the definition of the attribute explicitly specifies such side effects. In general,
 507 Document attributes that are settable do not define side effects on other attributes that are
 508 settable, only side effects on READ-ONLY attributes, if any.

509 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support
 510 setting of all Document Description and Document Template attributes that the

511 implementation supports. Document Status attributes are READ-ONLY and cannot be set
512 directly using this operation.

513 Note: There is no way for the Client to set all of a Job's Document objects to the same
514 attribute values in a single operation. Either a) the Client sets the corresponding attribute in
515 each Document object in the Job with separate Set-Document-Attributes requests, or b) the
516 Client sets the corresponding attribute at the Job Level using the Set-Job-Attributes
517 operation. Setting the corresponding attribute at the Job Level (or supplying that attribute
518 initially in the Job Creation operation) causes each Document object to inherit the Job Level
519 attribute value, if the Document object doesn't have a corresponding explicit attribute
520 supplied at the Document Level. In other words, supplying an attribute at the Job Level will
521 affect all the Job's Document objects that don't have that attribute also explicitly supplied at
522 the Document Level.

523 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
524 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
525 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
526 appropriate.

527 **5.1.3.1 Set-Document-Attributes Request**

528 The following groups of attributes are part of the Set-Document-Attributes request:

529 Group 1: Operation Attributes

530 Natural Language and Character Set:

531 The "attributes-charset" and "attributes-natural-language" attributes as
532 described in [STD92].

533 Target:

534 Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"
535 (uri) operation attribute(s) [STD92] which define the target Job object for this
536 operation, followed by the "document-number" (integer(1:MAX)) operation
537 which defines the target Document object for this operation. If the Client
538 omits the "document-number" operation attribute, the Printer MUST reject the
539 request and return the 'client-error-bad-request' status code.

540 Requesting User Name:

541 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by
542 the Client as described in [STD92].

543 Group 2: Document Attributes

544 The Client supplies one or more Document Description or Document
545 Template attributes. If supported, the Printer MUST either add the attribute (if
546 it does not already exist in the Document object), replace all values for the
547 attribute (if it already exists in the Document object), or remove the attribute
548 (if the 'delete-attribute' out-of-band value is supplied by the Client).

549 5.1.3.2 Set-Document-Attributes Response

550 The Printer returns the following groups of attributes as part of the Set-Document-Attributes
551 response:

552 Group 1: Operation Attributes

553 Status Message:

554 In addition to the REQUIRED status code returned in every response, the
555 response OPTIONALLY includes a "status-message" (text(255)) and/or a
556 "detailed-status-messages" (text(MAX)) Operation attribute as described in
557 [STD92].

558 Natural Language and Character Set:

559 The "attributes-charset" and "attributes-natural-language" attributes as
560 described in [STD92].

561 Group 2: Unsupported Attributes

562 See [STD92] for details on returning Unsupported Attributes.

563 If some of the attributes in the operation fail to validate, the Printer MUST
564 reject the operation, MUST NOT change any Document attributes, and
565 MUST return the indicated status code below. In this group, the Printer
566 MUST also return all attributes that fail to validate. The following are the
567 reasons that an attribute fails to validate and the value returned for the
568 attribute, along with the indicated status code and order of detection:

- 569 1. The number of attributes supplied by the client exceeds the maximum
570 number that the Printer supports in a Set-Document-Attributes
571 request: return the 'client-error-request-entity-too-large' status code
572 [STD92].
- 573 2. The Printer doesn't support the attribute: return the attribute with the
574 'unsupported' out-of-band attribute value and the 'client-error-
575 attributes-or-values-not-supported' status code [STD92].
- 576 3. The attribute is READ-ONLY (in its definition) or is not-settable in this
577 implementation: return the attribute with the 'not-settable' out-of-band

578 attribute value and the 'client-error-attributes-not-settable' status code
579 [RFC3380].

580 4. The Printer doesn't support the value: if the attribute in the operation
581 has a single value, return it. If the attribute in the operation is multi-
582 valued, return only those values in a 1setOf that are not supported.
583 Return the 'client-error-attributes-or-values-not-supported' status code
584 [STD92].

585 5. The values of some of the supplied attributes conflict with one another
586 and/or other Document attribute values not being set: if the conflicting
587 attribute in the operation has a single value, return the attribute and
588 the value. If the attribute in the operation is multi-valued, return only
589 the attribute and those values in a 1setOf that are conflicting with
590 other attributes. Return the 'client-error-conflicting-attributes' status
591 code [STD92].

592 5.2 Job Operations

593 5.2.1 Get-Documents

594 This REQUIRED Job operation allows a Client to retrieve the list of Document objects
595 belonging to the target Job object. The Client MAY also supply a list of Document attribute
596 names and/or attribute group names. A group of Document object attributes will be returned
597 for each Document object in the Job.

598 This operation is similar to the Get-Document-Attributes operation (see section 5.1.2),
599 except that this operation returns attributes from all Document objects contained in the Job
600 object instead of from a single selected Document object in the Job object. As with the Get-
601 Document-Attributes operation, the Printer MUST only return attributes that were submitted
602 by a Client or generated by the Printer.

603 This operation is also similar to the Get-Jobs operation [STD92] except that there are no
604 equivalents to the "which-jobs" and "my-jobs" operation attributes.

605 It is not an error for the Printer to return 0 Documents. If the response returns 0 Documents
606 because there are no Documents in the Job, then the status code for 0 Documents MUST
607 be 'successful-ok'.

608 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
609 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
610 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
611 appropriate.

612 5.2.1.1 Get-Documents Request

613 The following groups of attributes are part of the Get-Documents request:

614 Group 1: Operation Attributes

615 Natural Language and Character Set:

616 The "attributes-charset" and "attributes-natural-language" attributes [STD92]

617 Target:

618 Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"
619 (uri) operation attribute(s) [STD92] which define the target Job object for this
620 operation.

621 Requesting User Name:

622 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by
623 the Client as described in [STD92].

624 "limit" (integer(1:MAX)):

625 The client OPTIONALLY supplies and the Printer MUST support this
626 operation attribute, which determines the maximum number of Documents
627 that a Client will receive from the Printer. The limit is a "stateless limit" in that
628 if the value supplied by the Client is 'N', then only the first 'N' Documents are
629 returned in the Get-Documents Response. There is no mechanism to allow
630 for the next 'M' Documents after the first 'N' Documents. If the Client does not
631 supply the "limit" attribute, the Printer responds with all Documents in the
632 Job.

633 "requested-attributes" (1setOf keyword):

634 The client OPTIONALLY supplies and the Printer MUST support this
635 attribute, which is a list of Document attribute names and/or attribute group
636 names that are returned to the Client for each Document object. The allowed
637 attribute group names are the same as those defined in the Get-Documents-
638 Attributes operation in section 5.1.2. If the Client does not supply this
639 attribute, the Printer MUST respond as if the Client had supplied this attribute
640 with the single value 'document-number'.

641 5.2.1.2 Get-Documents Response

642 The following groups of attributes are part of the Get-Documents request:

643 Group 1: Operation Attributes

644 Status Message:

645 In addition to the REQUIRED status code returned in every response, the
646 response OPTIONALLY includes a "status-message" (text(255)) and/or a
647 "detailed-status-messages" (text(MAX)) operation attribute as described in
648 [STD92].

649 Natural Language and Character Set:

650 The "attributes-charset" and "attributes-natural-language" attributes as
651 described in [STD92].

652 Group 2: Unsupported Attributes

653 See [STD92] for details on returning Unsupported Attributes.

654 The response MAY contain the "requested-attributes" operation attribute with
655 any supplied values (attribute keywords) that were requested by the Client
656 but are not supported by the Printer. If the Printer does return unsupported
657 attributes referenced in the "requested-attributes" operation attribute and that
658 attribute included group names such as 'all', the unsupported attributes
659 MUST NOT include attributes described in the standard but not supported by
660 the implementation.

661 Groups 3 to N: Document Attributes

662 The Printer responds with the Document Description, Document Status, and
663 Document Template attributes for each returned Document object as
664 requested by the "requested-attributes" operation attribute supplied by the
665 Client in the request. The Printer ignores (does not respond with) any
666 requested attribute or value which is not supported or which is restricted by
667 the security policy in force, including whether the requesting user is the Job
668 owner. However, the Printer MUST respond with the 'unknown' out of band
669 value [STD92] for any supported attribute (including all REQUIRED
670 attributes) for which the Printer does not know the value, unless it would
671 violate the security policy.

672 The Printer MUST return the groups in order of increasing "document-
673 number" value.

674 **6. New Attributes**675 **6.1 Document Description Attributes**676 **6.1.1 document-name (name(MAX))**

677 This REQUIRED Document Description attribute specifies the name of the document and is
 678 copied from the "document-name" operation attribute [STD92] supplied by the Client in the
 679 Document Creation request.

680 **6.2 Document Status Attributes**

681 Table 4 lists the Document Status attributes defined by this specification. Printers that
 682 support a given operation or Job Status attribute MUST support the corresponding
 683 Document Status attribute.

684 **Table 4 - Document Status Attributes**

Document Attribute	Operation/Job Attribute	Reference
attributes-charset (charset)	attributes-charset	[STD92]
attributes-natural-language (naturalLanguage)	attributes-natural-language	[STD92]
current-page-order (type2 keyword)	current-page-order	[PWG5100.3]
date-time-at-completed (dateTime)	date-time-at-completed	[STD92]
date-time-at-creation (dateTime)	date-time-at-creation	[STD92]
date-time-at-processing (dateTime)	date-time-at-processing	[STD92]
detailed-status-messages (1setOf text(MAX))	job-detailed-status-messages	[STD92]
document-access-errors (1setOf text(MAX))	job-document-access-errors	[STD92]
document-charset (charset)	document-charset	Sections 6.2.1 and 6.4.1
document-format (mimeType)	document-format	[STD92]
document-format-detected (mimeType)	<none>	Section 6.2.2
document-job-id (integer(1:MAX))	job-id	[STD92]

Document Attribute	Operation/Job Attribute	Reference
document-job-uri (uri)	job-uri	[STD92]
document-message (text(MAX))	<none>	Section 6.2.3
document-natural-language (naturalLanguage)	document-natural-language	[STD92]
document-number (integer(1:MAX))	<none>	Section 6.2.4
document-printer-uri (uri)	job-printer-uri	[STD92]
document-state (type1 enum)	job-state (note 1)	[STD92]
document-state-message (text(MAX))	job-state-message	[STD92]
document-state-reasons (1setOf type2 keyword)	job-state-reasons	[STD92]
document-uri (uri)	document-uri (note 2)	[STD92]
impressions (integer(0:MAX))	job-impressions	[STD92]
impressions-completed (integer(0:MAX))	job-impressions-completed	[STD92]
k-octets (integer(0:MAX))	job-k-octets	[STD92]
k-octets-processed (integer(0:MAX))	job-k-octets-processed	[STD92]
last-document (boolean)	<none>	Section 6.2.5
media-sheets (integer(0:MAX))	job-media-sheets	[STD92]
media-sheets-completed (integer(0:MAX))	job-media-sheets- completed	[STD92]
more-info (uri)	job-more-uri	[STD92]
output-device-assigned (name(MAX))	output-device-assigned	[STD92]
printer-up-time (integer(1:MAX))	job-printer-up-time	[STD92]
time-at-completed (integer(MIN:MAX))	time-at-completed	[STD92]
time-at-creation (integer(MIN:MAX))	time-at-creation	[STD92]
time-at-processing (integer(MIN:MAX))	time-at-processing	[STD92]

685 Note 1: The "document-state" attribute supports all of the "job-state" values *except*
686 '4' (pending-held).

687 Note 2: The "document-uri" attribute identifies the source location of the Document
688 data and is not an identifier for the Document object. The simple identifier of the
689 Document is the "document-number" Document Status attribute.

690 6.2.1 document-charset (charset)

691 This RECOMMENDED Document Status attribute specifies the charset used in the
692 Document data. The Printer sets this attribute from the corresponding operation attribute
693 supplied by the Client in the Document Creation request. Printers that support the
694 "document-charset" operation attribute MUST support this attribute.

695 6.2.2 document-format-detected (mimeMediaType)

696 This Document Status attribute is generated by the Printer to indicate the format of the
697 Document object content as detected by the Printer.

698 6.2.3 document-message (text(MAX))

699 This Document Status attribute contains a message from either a) the User to the Operator
700 about the Document or b) from the Operator, Administrator, or "intelligent" process to
701 indicate to the End User the reasons for modification or other management action taken on
702 the Document. The Printer populates this attribute from the "document-message" operation
703 attribute value supplied by the Client in any of the Document Creation requests or in a
704 Cancel-Document request.

705 6.2.4 document-number (integer(1:MAX))

706 This REQUIRED Document Status attribute is the ordinal number of the Document within
707 the Job, and determines its order of being printed in a multi-Documnt Job. The Printer
708 MUST generate the values monotonically increasing from 1 for each Job.

709 6.2.5 last-document (boolean)

710 This REQUIRED Document Status attribute indicates whether this Document is the last
711 Document in the Job [STD92]. The Printer sets this attribute from the corresponding
712 operation attribute supplied by the Client in the Document Creation request, when the Client
713 sends a Close-Job request [PWG5100.11], or when the "multiple-operation-time-out" time
714 interval has passed.

715 6.3 Document Template Attributes

716 This specification defines Document Template attributes for every Job Template attribute
717 that does not apply to the whole Job. Table 5 lists the new attributes.

718 **Table 5 - Document Template Attributes**

Attribute	Reference
copies (integer(1:MAX))	[STD92]
cover-back (collection)	[PWG5100.3]
cover-front (collection)	[PWG5100.3]
finishings (1setOf type2 enum)	[STD92]
finishings-col (1setOf collection)	[PWG5100.1]
force-front-side (1setOf integer(1:MAX))	[PWG5100.3]
imposition-template (type2 keyword name(MAX))	[PWG5100.3]
media (type2 keyword name(MAX))	[STD92]
media-col (collection)	[PWG5100.3]
media-input-tray-check (type2 keyword name(MAX))	[PWG5100.3]
number-up (integer(1:MAX))	[STD92]
orientation-requested (type2 enum)	[STD92]
output-bin (type2 keyword name(MAX))	[PWG5100.2]
page-delivery (type2 keyword)	[PWG5100.3]
page-order-received (type2 keyword)	[PWG5100.3]
page-ranges (1setOf rangeOfInteger(1:MAX))	[STD92]
presentation-direction-number-up (type2 keyword)	[PWG5100.3]
print-quality (type2 enum)	[STD92]
printer-resolution (resolution)	[STD92]
sides (type2 keyword)	[STD92]
x-image-position (type2 keyword)	[PWG5100.3]
x-image-shift (integer(MIN:MAX))	[PWG5100.3]
x-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
x-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-image-position (type2 keyword)	[PWG5100.3]
y-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]

719 6.4 Operation Attributes

720 6.4.1 document-charset (charset)

721 This RECOMMENDED operation attribute specifies the character set used by the Document
722 data.

723 6.4.2 document-number (integer(1:MAX))

724 This REQUIRED operation attribute specifies the ordinal number of the Document within the
725 Job.

726 **6.5 Printer Description Attributes**

727 **6.5.1 document-creation-attributes-supported (1setOf type2 keyword)**

728 This REQUIRED attribute lists the keyword names of the Document Template and operation
729 attributes that the Printer will accept in the Send-Document and Send-URI Document
730 Creation operations. Implementations that support the Send-URI operation MUST include
731 the 'document-uri' keyword in "document-creation-attributes-supported". Implementations
732 that do not support Send-URI MUST NOT include the 'document-uri' keyword in "document-
733 creation-attributes-supported".

734 Note: The "document-uri" attribute is specific to the Send-URI operation. Inclusion of the
735 'document-uri' keyword in "document-creation-attributes-supported" does not imply that the
736 "document-uri" attribute is valid for the Send-Document operation.

737 **7. New Attribute Group Tags**

738 **7.1 document-attributes-tag**

739 The document-attributes-tag (0x09) attribute group tag is used to delimit Document object
740 attributes in IPP messages.

741

742 **8. Additional Semantics for Existing Operations**

743 **8.1 Cancel-Job: "document-state" and "document-state-reasons"**

744 This REQUIRED operation sets the "document-state" Document Status attribute to
745 'canceled' and the "document-state-reasons" Document Status attribute with 'canceled-by-
746 user' or 'canceled-by-operator' for *all* Document objects in the identified Job that have not
747 yet reached a terminating state ('completed', 'canceled', or 'aborted').

748 **8.2 Hold-Job and Release-Job: "document-state-reasons"**

749 These OPTIONAL operations affect the state of the target Job. The values of the
750 Documents' "document-state-reasons" Document Status attributes MUST NOT be affected
751 by these operations.

752 **8.3 Print-Job, Print-URI: Document Object and Attributes**

753 This specification extends the REQUIRED Print-Job and OPTIONAL Print-URI operations
754 [STD92] to explicitly create a Document object and copy the request operation attributes
755 listed in Table 6 to the corresponding Document attributes. Printers MUST NOT copy Job
756 Template attributes to the created Document object.
757 Printers can also return the attributes listed in

758 Table 7 in the Document attributes group after the Job attributes group.

759 **Table 6 - Operation Attributes Copied to Document Objects**

Operation Attribute	Document Attribute	Reference
attributes-charset	attributes-charset	[STD92]
attributes-natural-language	attributes-natural-language	[STD92]
document-charset	document-charset	Sections 6.2.1 and 6.4.1
document-format	document-format	[STD92]
	document-format-detected	Section 6.2.2
document-message	document-message	Section 6.2.3
document-name	document-name	[STD92]
document-natural-language	document-natural-language	[STD92]
document-uri	document-uri	[STD92]
job-impressions	impressions	[STD92], Section 6.2
job-k-octets	k-octets	[STD92], Section 6.2
job-media-sheets	media-sheets	[STD92], Section 6.2

760

761 **Table 7 - Returned Document Status Attributes**

Document Status Attribute	Print-xxx Conformance	Send-xxx Conformance	Reference
document-number	OPTIONAL	REQUIRED	Section 6.2.4
document-state	OPTIONAL	REQUIRED	Section 6.2
document-state-message	OPTIONAL	OPTIONAL	Section 6.2
document-state-reasons	OPTIONAL	REQUIRED	Section 6.2

762 **8.3.1 Print-Job/Print-URI Response**

763 The following sets of attributes are part of the Print-Job and Print-URI responses:

764 Group 1: Operation Attributes

765 As specified in [STD92].

766 Group 2: Unsupported Attributes

767 As specified in [STD92].

768 Group 3: Job Object Attributes

769 As specified in [STD92].

770 Group 4: Document Object Attributes (new)

771 "document-number" (integer(1:MAX)):

772 The Printer MAY return the number of this Document object that was
773 assigned by the Printer starting with 1 for each Job.

774 "document-state" (type1 enum):

775 The Printer MAY return the state of this Document object.

776 "document-state-reasons" (1setOf type2 keyword):

777 The Printer MAY return the associated state reasons for this Document.

778 "document-state-message" (text(MAX)):

779 The Printer MAY return the localized description of the "document-state" and
780 "document-state-reasons" values for this Document.

781 **8.4 Send-Document: Document Object and Attributes**

782 This specification extends the REQUIRED Send-Document operation [STD92] to explicitly
783 create a Document object and copy the operation attributes listed in Table 6 to the
784 corresponding Document attributes.

785 The Send-Document request is also extended to support an additional Document Template
786 attribute group after the operation attribute group. Document Template attributes are copied
787 to the Document object after validation as described in section 4.3. Printers MUST NOT
788 copy Document Template attributes to the Job object.
789 Finally, Printers also return the attributes listed in

790 Table 7 in the Document attributes group after the Job attributes group.

791 **8.4.1 Send-Document Request**

792 The following attribute sets are part of the Send-Document request:

793 Group 1: Operation Attributes

794 As specified in [STD92].

795 Group 2: Document Template Attributes (new)

796 The Client OPTIONALLY supplies and the Printer MUST support a set of
797 Document Template attributes. If the Client is not supplying any Document
798 Template attributes in the request, the Client SHOULD omit Group 2 rather
799 than sending an empty group. However, a Printer MUST be able to accept
800 an empty group.

801 Group 3: Document Data

802 As specified in [STD92].

803 **8.4.2 Send-Document Response**

804 The following sets of attributes are part of the Send-Document response:

805 Group 1: Operation Attributes

806 As specified in [STD92].

807 Group 2: Unsupported Attributes

808 As specified in [STD92].

809 Group 3: Job Object Attributes

810 As specified in [STD92].

811 Group 4: Document Object Attributes (new)

812 "document-number" (integer(1:MAX)):

813 The Printer MUST return the number of this Document object that was
814 assigned by the Printer starting with 1 for each Job.

815 "document-state" (type1 enum):

- 816 The Printer MUST return the state of this Document object.
- 817 "document-state-reasons" (1setOf type2 keyword):
- 818 The Printer MUST return the associated state reasons for this Document.
- 819 "document-state-message" (text(MAX)):
- 820 The Printer MAY return the localized description of the "document-state" and
- 821 "document-state-reasons" values for this Document.

822 **8.5 Send-URI: Document Object and Attributes**

823 This specification extends the OPTIONAL Send-URI operation [STD92] to explicitly create

824 a Document object and copy the operation attributes listed in Table 6 to the corresponding

825 Document attributes.

826 The Send-URI request is also extended to support an additional Document Template

827 attribute group after the operation attribute group. Document Template attributes are copied

828 to the Document object after validation as described in section 4.3. Printers MUST NOT

829 copy Document Template attributes to the Job object.

830 Finally, Printers also return the attributes listed in

831 Table 7 in the Document attributes group after the Job attributes group.

832 **8.5.1 Send-URI Request**

833 The following attribute sets are part of the Send-URI request:

834 Group 1: Operation Attributes

835 As specified in [STD92].

836 Group 2: Document Template Attributes (new)

837 The Client OPTIONALLY supplies and the Printer MUST support a set of
838 Document Template attributes. If the Client is not supplying any Document
839 Template attributes in the request, the Client SHOULD omit Group 2 rather
840 than sending an empty group. However, a Printer MUST be able to accept
841 an empty group.

842 **8.5.2 Send-URI Response**

843 The following sets of attributes are part of the Send-URI response:

844 Group 1: Operation Attributes

845 As specified in [STD92].

846 Group 2: Unsupported Attributes

847 As specified in [STD92].

848 Group 3: Job Object Attributes

849 As specified in [STD92].

850 Group 4: Document Object Attributes (new)

851 "document-number" (integer(1:MAX)):

852 The Printer MUST return the number of this Document object that was
853 assigned by the Printer starting with 1 for each Job.

854 "document-state" (type1 enum):

855 The Printer MUST return the state of this Document object.

856 "document-state-reasons" (1setOf type2 keyword):

857 The Printer MUST return the associated state reasons for this Document.

858 "document-state-message" (text(MAX)):

859 The Printer MAY return the localized description of the "document-state" and
860 "document-state-reasons" values for this Document.

861 9. Additional Values for Existing Attributes

862 9.1 operations-supported (1setOf type2 enum)

863 Table 8 lists the "operation-id" values for the new operations defined in this specification.

864 **Table 8 – Operation-id Values**

Value	Operation Name	Reference
0x0033	Cancel-Document	Section 5.1.1
0x0034	Get-Document-Attributes	Section 5.1.2
0x0035	Get-Documents	Section 5.2.1
0x0036	Delete-Document (obsolete)	Section 10.1
0x0037	Set-Document-Attributes	Section 5.1.3

865 9.2 requested-attributes (1setOf type2 keyword)

866 This specification defines the following additional values for the "requested-attributes"
867 operation attribute [STD92]:

868 'document-description': All Document Description and Document Status attributes.

869 'document-template': All Document Template and Printer "xxx-supported" attributes.

870

871 **10. Obsolete Operations and Attributes**

872 **10.1 Obsolete Delete-Document Operation**

873 The **OBSOLETE** Delete-Document operation removes the specified Document object and
 874 its data immediately from the specified Job. This operation is **OBSOLETE** because it
 875 destroys accounting information about the target Document and **MUST NOT** be supported
 876 by new implementations of this specification.

Deleted: obsolete
 Deleted: obsolete

877 **10.2 Obsolete Document Status Attributes**

878 Table 9 lists the **OBSOLETE** Document Status attributes that were defined in the previous
 879 version of this specification [PWG5100.5-2003].

Deleted: obsolete

880 Note: This specification does not change the status of the original operation or Job Status
 881 attributes [that have the same names](#).

882 **Table 9 - Obsolete Document Status Attributes**

Attribute	Origin
compression (type2 keyword)	[STD92]
document-digital-signature (type2 keyword)	[PWG5100.7-2003]
document-format-details (1setOf collection)	[PWG5100.7-2003]
document-format-details-detected (1setOf collection)	[PWG5100.7-2003]
document-format-version (text(127))	[PWG5100.7-2003]
document-format-version-detected (text(127))	[PWG5100.7-2003]
impressions-completed-current-copy (integer(0:MAX))	[RFC3381-OBSOLETE]
sheet-completed-copy-number (integer(0:MAX))	[RFC3381-OBSOLETE]

883 **11. Conformance Requirements**

884 **11.1 Printer Conformance Requirements**

885 In order for a Printer to claim conformance to this specification, a Printer **MUST** support:

- 886 1. The required operations defined in section 5;
- 887 2. The required attributes and values defined in section 6;
- 888 3. The new attribute group tag defined in section 7;
- 889 4. The additional semantics defined in section 8;
- 890 5. The additional values defined in section 9;

- 894 6. The internationalization considerations defined in section 12; and
895 7. The security considerations defined in section 13.

896 **11.2 Client Conformance Requirements**

897 In order for a Client to claim conformance to this specification, a Client MUST support:

- 898 1. The required operations defined in section 5;
899 2. The required attributes and values defined in section 6;
900 3. The new attribute group tag defined in section 7;
901 4. The additional values defined in section 9;
902 5. The internationalization considerations defined in section 12; and
903 6. The security considerations defined in section 13.

904 **12. Internationalization Considerations**

905 For interoperability and basic support for multiple languages, conforming implementations
906 MUST support:

- 907 1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)
908 [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
909 2. The Unicode Format for Network Interchange [RFC5198] which requires
910 transmission of well-formed UTF-8 strings and recommends transmission of
911 normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

912 Unicode NFC is defined as the result of performing Canonical Decomposition (into base
913 characters and combining marks) followed by Canonical Composition (into canonical
914 composed characters wherever Unicode has assigned them).

915 **WARNING** – Performing normalization on UTF-8 strings received from Clients and
916 subsequently storing the results (e.g., in Job objects) could cause false negatives in Client
917 searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now
918 'hidden').

919 Implementations of this specification SHOULD conform to the following standards on
920 processing of human-readable Unicode text strings, see:

- 921 Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical
922 Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping
923 Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]
924 Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences

- 925 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization
- 926 Unicode Collation Algorithm [UTS10] – sorting
- 927 Unicode Locale Data Markup Language [UTS35] – locale databases
- 928 Implementations of this specification are advised to also review the following informational
- 929 documents on processing of human-readable Unicode text strings:
- 930 Unicode Character Encoding Model [UTR17] – multi-layer character model
- 931 Unicode Character Property Model [UTR23] – character properties
- 932 Unicode Conformance Model [UTR33] – Unicode conformance basis

933 **13. Security Considerations**

934 The IPP extensions defined in this specification require the same security considerations as
935 defined in the Internet Printing Protocol/1.1 [STD92].

936 Implementations of this specification SHOULD conform to the following standard on
937 processing of human-readable Unicode text strings, see:

938 Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

939 Implementations of this specification are advised to also review the following informational
940 document on processing of human-readable Unicode text strings:

941 Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

942 **14. IANA Considerations**

943 **14.1 Attribute Registrations**

944 The attributes defined in this specification will be published by IANA according to the
945 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

946 <http://www.iana.org/assignments/ipp-registrations>

947 The registry entries will contain the following information:

948	Document Description attributes:	Reference
949	-----	-----
950	document-name (name (MAX))	[PWG5100.5]

951	Document Status attributes:	Reference
952	-----	-----
953	-----	-----
954	attributes-charset (charset)	[PWG5100.5]
955	attributes-natural-language (naturalLanguage)	[PWG5100.5]
956	compression(obsolete) (type2 keyword)	[PWG5100.5]
957	current-page-order (type2 keyword)	[PWG5100.5]
958	date-time-at-completed (dateTime)	[PWG5100.5]
959	date-time-at-created (dateTime)	[PWG5100.5]
960	date-time-at-processing (dateTime)	[PWG5100.5]
961	detailed-status-messages (1setOf text(MAX))	[PWG5100.5]
962	document-access-errors (1setOf text(MAX))	[PWG5100.5]
963	document-charset (charset)	[PWG5100.5]
964	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.5]
965	document-format (mimeMediaType)	[PWG5100.5]
966	document-format-details(obsolete) (1setOf collection)	[PWG5100.5]
967	document-format-details-detected(obsolete) (1setOf collection)	[PWG5100.5]
968		[PWG5100.5]
969	document-format-detected (mimeMediaType)	[PWG5100.5]
970	document-format-version(obsolete) (text(127))	[PWG5100.5]
971	document-format-version-detected(obsolete) (text(127))	[PWG5100.5]
972	document-job-id (integer(1:MAX))	[PWG5100.5]
973	document-job-uri (uri)	[PWG5100.5]
974	document-message (text(MAX))	[PWG5100.5]
975	document-natural-language (naturalLanguage)	[PWG5100.5]
976	document-number (integer(1:MAX))	[PWG5100.5]
977	document-printer-uri (uri)	[PWG5100.5]
978	document-state (type1 enum)	[PWG5100.5]
979	document-state-message (text(MAX))	[PWG5100.5]
980	document-state-reasons (1setOf type2 keyword)	[PWG5100.5]
981	document-uri (uri)	[PWG5100.5]
982	impressions (integer(0:MAX))	[PWG5100.5]
983	impressions-completed (integer(0:MAX))	[PWG5100.5]
984	impressions-completed-current-copy(obsolete) (integer(0:MAX))	[PWG5100.5]
985		[PWG5100.5]
986	k-octets (integer(0:MAX))	[PWG5100.5]
987	k-octets-processed (integer(0:MAX))	[PWG5100.5]
988	last-document (boolean)	[PWG5100.5]
989	media-sheets (integer(0:MAX))	[PWG5100.5]
990	media-sheets-completed (integer(0:MAX))	[PWG5100.5]
991	more-info (uri)	[PWG5100.5]
992	output-device-assigned (name(MAX))	[PWG5100.5]
993	printer-up-time (integer(1:MAX))	[PWG5100.5]
994	sheet-completed-copy-number(obsolete) (integer(0:MAX))	[PWG5100.5]
995	time-at-completed (integer(MIN:MAX))	[PWG5100.5]
996	time-at-creation (integer(MIN:MAX))	[PWG5100.5]
997	time-at-processing (integer(MIN:MAX))	[PWG5100.5]
998		
999	Document Template attributes:	Reference
1000	-----	-----
1001	copies (integer(1:MAX))	[PWG5100.5]
1002	cover-back (collection)	[PWG5100.5]
1003	<Member attributes are the same as the "cover-back" Job Template	
1004	attribute>	[PWG5100.5]
1005	cover-front (collection)	[PWG5100.5]


```

1006     <Member attributes are the same as the "cover-front" Job Template
1007     attribute> [PWG5100.5]
1008     finishings (1setOf type2 enum) [PWG5100.5]
1009     finishings-col (1setOf collection) [PWG5100.5]
1010     <Member attributes are the same as the "finishings-col" Job Template
1011     attribute> [PWG5100.5]
1012     force-front-side (1setOf integer(1:MAX)) [PWG5100.5]
1013     imposition-template (type2 keyword | name(MAX)) [PWG5100.5]
1014     media (type2 keyword | name(MAX)) [PWG5100.5]
1015     media-col (collection) [PWG5100.5]
1016     <Member attributes are the same as the "media-col" Job Template
1017     attribute> [PWG5100.5]
1018     media-input-tray-check (type2 keyword | name(MAX)) [PWG5100.5]
1019     number-up (integer(1:MAX)) [PWG5100.5]
1020     orientation-requested (type2 enum) [PWG5100.5]
1021     output-bin (type2 keyword | name(MAX)) [PWG5100.5]
1022     page-delivery (type2 keyword) [PWG5100.5]
1023     page-order-received (type2 keyword) [PWG5100.5]
1024     page-ranges (1setOf rangeOfInteger(1:MAX)) [PWG5100.5]
1025     presentation-direction-number-up (type2 keyword) [PWG5100.5]
1026     print-quality (type2 enum) [PWG5100.5]
1027     printer-resolution (resolution) [PWG5100.5]
1028     sides (type2 keyword) [PWG5100.5]
1029     x-image-position (type2 keyword) [PWG5100.5]
1030     x-image-shift (integer(MIN:MAX)) [PWG5100.5]
1031     x-sidel-image-shift (integer(MIN:MAX)) [PWG5100.5]
1032     x-side2-image-shift (integer(MIN:MAX)) [PWG5100.5]
1033     y-image-position (type2 keyword) [PWG5100.5]
1034     y-image-shift (integer(MIN:MAX)) [PWG5100.5]
1035     y-sidel-image-shift (integer(MIN:MAX)) [PWG5100.5]
1036     y-side2-image-shift (integer(MIN:MAX)) [PWG5100.5]
1037
1038     Operation attributes: Reference
1039     -----
1040     document-charset (charset) [PWG5100.5]
1041     document-number (integer(1:MAX)) [PWG5100.5]
1042
1043     Printer Description attributes: Reference
1044     -----
1045     document-creation-attributes-supported (1setOf type2 keyword)
1046     [PWG5100.5]

```

1047 14.2 Attribute Value Registrations

1048 The attribute values defined in this specification will be published by IANA according to the
 1049 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1050 <http://www.iana.org/assignments/ipp-registrations>

1051 The registry entries will contain the following information:

```

1052     Attributes (attribute syntax)
1053     Keyword Attribute Value Reference

```

1054	-----	-----
1055	requested-attributes (1setOf type2 keyword)	[STD92]
1056	document-description	[PWG5100.5]
1057	document-template	[PWG5100.5]

1058 14.3 Type2 enum Registrations

1059 The enum values defined in this specification will be published by IANA according to the
1060 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1061 <http://www.iana.org/assignments/ipp-registrations>

1062 The registry entries will contain the following information:

1063	Attributes (attribute syntax)		
1064	Enum Value	Enum Symbolic Name	Reference
1065	-----	-----	-----
1066	operations-supported (1setOf type2 enum)		[STD92]
1067	0x0033	Cancel-Document	[PWG5100.5]
1068	0x0034	Get-Document-Attributes	{PWG5100.5}
1069	0x0035	Get-Documents	[PWG5100.5]
1070	0x0036	Delete-Document (obsolete)	[PWG5100.5]
1071	0x0037	Set-Document-Attributes	[PWG5100.5]
1072			

1073 14.4 Operation Registrations

1074 The operations defined in this specification will be published by IANA according to the
1075 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1076 <http://www.iana.org/assignments/ipp-registrations>

1077 The registry entries will contain the following information:

1078	Operation Name	Reference
1079	-----	-----
1080	Cancel-Document	[PWG5100.5]
1081	Cancel-Job (extension)	[PWG5100.5]
1082	Delete-Document (obsolete)	[PWG5100.5]
1083	Get-Document-Attributes	[PWG5100.5]
1084	Get-Documents	[PWG5100.5]
1085	Hold-Job (extension)	[PWG5100.5]
1086	Print-Job (extension)	[PWG5100.5]
1087	Print-URI (extension)	[PWG5100.5]
1088	Release-Job (extension)	[PWG5100.5]
1089	Send-Document (extension)	[PWG5100.5]
1090	Send-URI (extension)	[PWG5100.5]
1091	Set-Document-Attributes	[PWG5100.5]

1092 **14.5 Attribute Group Registrations**

1093 The attribute groups defined in this specification will be published by IANA according to the
1094 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1095 <http://www.iana.org/assignments/ipp-registrations>

1096 The registry entries will contain the following information:

1097	Value	Attribute Group Name	Reference
1098	-----	-----	-----
1099	0x09	document-attributes-tag	[PWG5100.5]

1100 **15. Overview of Changes**

1101 **15.1 IPP Document Object v1.1**

1102 The following changes were made to the previous version of this specification [PWG5100.5-
1103 2003]:

- 1104 • Printers no longer need to support multiple Document Jobs, [as the Document object](#)
1105 [and associated operations are useful even for single Document Jobs](#);
- 1106 • Rationale and model sections have been added;
- 1107 • References now point to the current versions of dependent documents and
1108 specifications at the time of publication;
- 1109 • The "document-charset" operation attribute has been added to this specification;
- 1110 • The Delete-Document operation has been made **OBSOLETE because it destroys**
1111 [accounting information](#);
- 1112 • Additional semantics for the **DEPRECATED** Reprocess-Job and Restart-Job
1113 operations have been removed [because those operations SHOULD NOT be](#)
1114 [implemented or used](#);
- 1115 • The "ipp-attribute-fidelity" and "job-mandatory-attributes" operation attributes are no
1116 longer promoted to persistent Job and Document attributes [because they are only](#)
1117 [utilized during Job Creation](#);
- 1118 • The "compression" Document Status attribute has been made **OBSOLETE** because
1119 it serves no purpose;

Deleted: obsolete

Deleted: deprecated

Deleted: (incorrectly)

Deleted: obsolete

- 1124 • The "document-digital-signature" Document Status attribute has been made
1125 OBSOLETE because it serves no purpose;
- 1126 • The "document-format-details", "document-format-details-detected", "document-
1127 format-version", and "document-format-version-detected" Document Status
1128 attributes have been made OBSOLETE because they have serious interoperability
1129 issues; and
- 1130 • The "impressions-completed-current-copy" and "sheet-completed-copy-number"
1131 Document Status attributes have been made OBSOLETE because the parent
1132 specification (RFC 3381) is OBSOLETE.

Deleted: Several

Deleted: xxx

Deleted: obsolete

Deleted: obsolete

Deleted: obsolete

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1224 ipp@pwg.org (subscribers only)

1225 To subscribe, see the PWG web page:

1226 <http://www.pwg.org/>

1227 Implementers of this specification are encouraged to join the IPP Mailing List in order to
1228 participate in any discussions of clarification issues and review of registration proposals for
1229 additional attributes and values.

1230 The editors would like to especially thank the following individuals who also contributed
1231 significantly to the development of this specification:

1232 Dennis Carney (author of v1.0)

1233 Tom Hastings (author of v1.0)

1234 Ira McDonald (High North, Inc.)

1235 Peter Zehler (author of v1.0)

1236 **18. Change History**

1237 **[18.1 March 18, 2019](#)**

1238

- [Stable: Stable](#)

1239

- [Section 2.1: Added definitions of DEPRECATED and OBSOLETE](#)

1240

- [Section 3.1: Added forward reference to section 15](#)

1241

- [Section 15: Updated with rationale](#)

1242

- [Global: "obsolete" and "deprecated" are now "OBSOLETE" and "DEPRECATED"](#)

1243

-

1244 **18.2 January 29, 2019**

1245

- Status: Prototype

1246

- Fixed broken references throughout

1247

- Section 10.2: Say "operation and Job Status" instead of "non-document"

1248 **18.3 October 22, 2018**

- 1249 • Status: Interim.
- 1250 • Section 4: Changed to use "This specification" instead of "This document".
- 1251 • Figure 1: Updated with the list of operations.
- 1252 • Table 1: Added target object.
- 1253 • Editorial changes throughout.
- 1254 • Updated wording of the access rights section, per WG review comments on October
1255 11, 2018
- 1256 • Table 9: Changed "Reference" column title to "Origin"
- 1257 • Updated references to the old PWG 5100.5 and 5100.7 to include the year, note they
1258 are obsolete.
- 1259 • Updated RFC 3381 to note it is obsolete, obsoleted by RFC 8011

1260 **18.4 September 19, 2018**

- 1261 • Initial revision for v1.1.
- 1262 • Updated to use new working draft template, section organizations.
- 1263 • Updated references.
- 1264 • Added Changes section.
- 1265 • Added proper rationale and model sections.
- 1266 • Printers no longer need to support multiple Document Jobs.
- 1267 • Added the "document-charset" operation attribute from PWG 5100.7.
- 1268 • Made the Delete-Document operation obsolete.
- 1269 • Made the "compression" Document Status attribute obsolete because it serves no
1270 purpose.
- 1271 • Made several "document-format-xxx" Document Status attributes from PWG 5100.7
1272 obsolete because they have serious interoperability issues.

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1275
- Made the "impressions-completed-current-copy" and "sheet-completed-copy-number" Document Status attributes obsolete because the parent specification (RFC 3381) is obsolete.