



The Printer Working Group

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## IPP Job Extensions v2.0 (JOBEXT)

Status: Stable

Abstract: This specification [defines the "media-col" Job Template attribute and](#) extends the Job management, monitoring, and processing capabilities of IPP.

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

<https://ftp.pwg.org/pub/pwg/general/pwg-process30.pdf>

This specification is available electronically at:

<https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippjobext20-20190510.docx>

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80 a stable, well understood, and technically competent specification that is widely used with  
81 multiple independent and interoperable implementations. Printer manufacturers and  
82 vendors of printer related software benefit from the interoperability provided by voluntary  
83 conformance to these standards.

84 For additional information regarding the Printer Working Group visit:

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## 297 1. Introduction

298 This specification [defines the "media-col" Job Template attribute and](#) extends the Job  
299 management, monitoring, and processing capabilities of IPP. This specification obsoletes  
300 portions of the previous version of this specification [PWG5100.7-2003] - a list of changes  
301 can be found in section 15. This specification also incorporates portions of the [IPP](#)  
302 [Production Printing Attributes - Set 1 \[PWG5100.3-2001\]](#), obsolete IPP Job and Printer  
303 [Extensions - Set 2 \[PWG5100.11-2010\]](#), [and IPP Job and Printer Extensions - Set 3 \(JPS3\)](#)  
304 [\[PWG5100.13-2012\]](#) specifications.

Deleted: the relevant

### 305 1.1 Document Natural Language and Character Set

306 Certain Document formats are ambiguous about the natural language and character set  
307 used in a file. The Internet Printing Protocol/1.1 [STD92] defines the "document-natural-  
308 language" operation attribute to specify the natural language in Document Creation  
309 operations, but does not provide a way to specify the character set. In addition, there is no  
310 way for a Client to discover which languages and character sets are supported by a Printer  
311 for a given Document format. This specification defines attributes for specifying and  
312 discovering supported languages and character sets.

### 313 1.2 Attribute Fidelity

314 The Internet Printing Protocol/1.1 [STD92] defines the "ipp-attribute-fidelity" operation  
315 attribute to enforce the fidelity of all attributes in the Job Creation request. This specification  
316 defines an operation attribute to enforce the fidelity of a subset of attributes in the Job  
317 Creation request.

### 318 1.3 Rendering Optimizations

319 Most Printers are able to optimize output for different kinds of Document data, for example  
320 using a higher resolution for black text and lines, however the Internet Printing Protocol/1.1  
321 [STD92] only defines the "print-quality" and "printer-resolution" Job Template attributes that  
322 specify the overall quality and resolution of the output. This specification defines an attribute  
323 with corresponding values for specifying the type of optimizations to perform.

### 324 1.4 Printing on a Specific Output Device

325 The Internet Printing Protocol/1.1 [STD92] defines the "output-device-assigned" Job Status  
326 attribute but does not define corresponding Job Template or Printer Description attributes  
327 for specifying which Output Device to use for a Job.

## 329 **1.5 Results of Job/Document Processing**

330 The Internet Printing Protocol/1.1 [STD92] defines some Job Status attributes and values  
331 but none of them provide information about processing issues that do not prevent a Job or  
332 Document from being printed. This specification defines attributes and values for discovering  
333 those processing issues.

## 334 **1.6 Job Scheduling and Lifecycle**

335 The Internet Printing Protocol/1.1 [STD92] defines the "job-hold-until (keyword |  
336 name(MAX))" Job Template attribute to hold a Job for processing until a named time period.  
337 This specification defines an additional Job Template attribute that holds the Job for  
338 processing until the specified date and time.

339 This specification also includes the "job-delay-output-until (keyword | name(MAX))" and "job-  
340 delay-output-until-time (dateTime)" Job Template attributes [PWG5100.11-2010] that delay  
341 output of a Job until the specified time.

342 In addition, this specification defines Job Template attributes to schedule when a pending  
343 Job is canceled automatically, Job Template attributes to specify when a Job should  
344 transition from the retained phase to the history phase, and Printer Description attributes to  
345 specify how long a Job stays in the history phase.

## 346 **1.7 Job Operations**

347 The Internet Printing Protocol/1.1 [STD92] defines many operations that operate on a single  
348 Job object. This specification defines new operations that:

- 349 • Cancel all Jobs on a given Printer;
- 350 • Cancel all Jobs owned by a User on a given Printer;
- 351 • Close a Job in the 'pending' state that is still open for additional Document  
352 submissions; and
- 353 • Resubmit an existing Job for processing as a new Job, potentially with different Job  
354 Template attributes and values.

355 This specification also extends the Get-Jobs operation to support additional values for the  
356 "which-jobs" operation attribute.

## 357 **1.8 Obsolete Attributes and Values**

358 The original version of this specification [PWG5100.7-2003] defines several attributes and  
359 values that have proven problematic from an interoperability and privacy standpoint. This  
360 specification obsoletes these attributes and values.

## 361 2. Terminology

### 362 2.1 Conformance Terminology

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

368 The term DEPRECATED is used for previously defined and approved protocol elements that  
369 SHOULD NOT be used or implemented. The term OBSOLETE is used for previously defined  
370 and approved protocol elements that MUST NOT be used or implemented.

### 371 2.2 Printing Terminology

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

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

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

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

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

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

### 384 2.3 Protocol Role Terminology

385 This document also defines the following protocol roles to specify unambiguous  
386 conformance requirements:

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

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

## 392 2.4 Other Terminology

393 *Completed Job*: a Job in the 'aborted', 'canceled', or 'completed' state.

394 *Document Creation Operation*: operations that accept Document Content. Specifically:  
395 Print-Job, Print-URI, Send-Document and Send-URI. Note: Print-Job and Print-URI are  
396 both Job Creation and Document Creation operations.

397 *Job Creation Operation*: operations that create Job objects, specifically: Print-Job, Print-URI,  
398 and Create-Job [STD92].

399 *Not Completed Job*: a Job in the 'pending', 'pending-held', 'processing', or 'processing-  
400 stopped' state.

401 *Retained Job*: a Completed Job whose attributes and Document data are still available to  
402 the Printer.

## 403 2.5 Acronyms and Organizations

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

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

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

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

## 408 3. Requirements

### 409 3.1 Rationale

410 The Internet Printing Protocol/1.1 [STD92] defines many attributes and values for specifying  
411 how Jobs and Documents are processed by a Printer. Given the need for managing Jobs,  
412 specifying Job processing options, and retrieving processing status information, this  
413 specification should:

- 414 [1. Define attributes and values that specify detailed media requirements;](#)
- 415 [2. Define attributes that specify Job accounting identifiers;](#)
- 416 3. Define attributes and values that specify the Document character set and  
417 rendering optimizations;
- 418 4. Define an attribute for doing selective fidelity enforcement;
- 419 5. Define a media size for automatically printing Documents on the correct size;
- 420 6. Define attributes and values that allow a Client to discover the results of  
421 Document processing;
- 422 7. Define attributes for delaying the output from a Job until a specified time period;
- 423 8. Define attributes for holding a Job until a specified date and time;

- 424 9. Define attributes for retaining a Job for a specified time period;  
425 10. Define attributes for configuring the Job history attributes and time period;  
426 11. Define attributes for automatically canceling a Job after a specified time period;  
427 12. Define operations for managing one or more Jobs; and  
428 13. Define values that allow a Client to monitor specific groups of Jobs.

429 Rationale for the changes from the previous versions of this specification can be found in  
430 section 15.

## 431 **3.2 Use Cases**

### 432 **3.2.1 Print a Plain Text File**

433 Jane has a plain text file report using a character set other than UTF-8 that she would like  
434 to print. She submits the file for printing using her Client software, which allows her to specify  
435 the exact character set used for the report.

### 436 **3.2.2 Print a Document Using a Matching Size**

437 John is viewing a document in a web browser and decides to print it. He submits the file for  
438 printing from the browser which specifies the output should be formatted for US Letter or  
439 ISO A4 media, as available on the printer.

### 440 **3.2.3 Force a Document to Print on a Specific Media Size**

441 Elizabeth has a contract that must be printed on US Legal media. She uses her Client  
442 software to submit the print job, specifying that US Legal size must be used with no  
443 substitutions.

### 444 **3.2.4 Print a Presentation with Best Quality**

445 Bob wants to print a presentation. He submits the presentation for printing using his Client  
446 software, specifying that the output should be optimized for text and graphics.

### 447 **3.2.5 Print Using a Specific Output Device**

448 Sally needs to print a poster on a specific output device. She uses her Client software to  
449 select the large format printer associated with the local print service and submit the poster  
450 for printing.

### 451 **3.2.6 Print Using Loaded Media**

452 User is viewing a photo and would like to print the photo on the largest borderless  
453 photographic media loaded on her Printer.

454 After the User initiates a print from the phone and selects a Printer, the Client automatically  
455 selects the largest borderless photographic media loaded on the Selected Printer and the

456 [highest print quality. The User selects additional processing intent for the Job and confirms](#)  
457 [the print action. The Client sends a print job request to the Printer with the Job Ticket and](#)  
458 [local photo. The Printer validates the Job Ticket and document data and then prints the](#)  
459 [photo.](#)

460 [Preconditions: Printer can report loaded media information such as size, type, coating, and](#)  
461 [weight. This may be detected automatically or manually entered by the User or Operation](#)  
462 [when loading the media.](#)

### 463 **[3.2.7 Print on a Roll](#)**

464 [Mike has a series of photos to print on a roll of photo media. Mike submits a multi-document](#)  
465 [job for printing and specifies that the roll be cut between each document in the job.](#)

### 466 **[3.2.8 Manual Duplex Printing](#)**

467 [Larry has a long whitepaper he would like to print 2-sided on an entry-level laser printer](#)  
468 [without an automatic duplexer accessory. Larry submits the document for printing and](#)  
469 [specifies 2-sided printing. The Client software queries the Printer to determine the page](#)  
470 [stacking order and delivery order for both the input and output trays and then sends the even](#)  
471 [numbered pages in the correct order to the Printer. When those pages have been printed,](#)  
472 [the Client software instructs Larry to insert the pages back in the input tray in the correct](#)  
473 [orientation. Once the pages are loaded in the input tray, the Client software sends the odd](#)  
474 [numbered pages to the Printer.](#)

### 475 **3.2.9 Monitor Whether Jobs are Printed Correctly**

476 Mary is the administrator for the office printers and wants to know whether users are having  
477 difficulty printing their documents. She uses Client software to query the history of jobs on  
478 each printer, including any errors or warnings that were encountered during processing.

### 479 **3.2.10 Hold a Job Until a Specific Date and Time**

480 John wants to withhold printing of a weekly newsletter until Monday morning. He uses his  
481 Client software to submit the print job with the correct date and time.

### 482 **3.2.11 Delay Output Until a Specific Time Period**

483 Bob has a large print job he would like printed overnight. He uses his Client software to  
484 submit the job for printing, specifying that output should not begin until 6pm.

### 485 **3.2.12 Submit a Variable Number of Documents in a Job**

486 Elizabeth has a print job that contains a variable number of documents for printing. She uses  
487 her Client software to create a new job and then add each document to the job. When she  
488 is sure she has all of the documents for the job, she uses her Client software to close the  
489 job so that the printer can begin processing the documents for printing.

**490 3.2.13 Cancel a Job After a Specific Time Period**

491 Sally operates a high-volume printer for her company. She configures the printer to  
492 automatically cancel any jobs that take longer than four hours to print so as to maintain the  
493 availability of the printer to other users.

**494 3.2.14 Cancel Multiple Jobs**

495 Bob needs to cancel a group of jobs that were incorrectly submitted to a printer. He uses his  
496 Client software to send a request to cancel a list of those jobs. The printer then cancels the  
497 jobs all at once.

**498 3.2.15 Resubmit a Job**

499 Mary needs to reprint a job with different settings. She uses her Client software to pick a  
500 retained job on the printer, chooses the settings to use for the reprint, and submits the reprint  
501 request. The printer then makes a copy of the original job, substituting any new settings for  
502 the copied job.

**503 3.2.16 Retain Jobs for a Specific Time Period**

504 John's company needs to retain all print jobs for at least one year for legal reasons. He  
505 configures the printer with a default retention policy of one year, allowing users to specify  
506 longer periods of time as needed.

**507 3.2.17 Keep Job History Information for a Specific Time Period**

508 Bob's company needs to keep an accounting history of all print jobs for at least one year.  
509 He configures the printer to keep the job history for at least one year, including the job  
510 identifier, owner, name, and number of pages.

**511 3.3 Exceptions****512 3.3.1 Too Many Jobs on a Printer**

513 Jane has several documents to print for a meeting. While submitting the documents for  
514 printing from her Client software, the printer responds that there are too many queued jobs.

**515 3.3.2 Too Many Documents in a Job**

516 Bob is submitting multiple documents in a single job. While submitting the documents from  
517 his Client software, the printer responds that there are too many documents in the job.

**518 3.4 Out of Scope**

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

- 520 1. Definition of new file formats; and
- 521 2. Definition of new protocol bindings.

### 522 3.5 Design Requirements

523 The design requirements for this specification are:

- 524 1. Define attributes for supported languages and character sets in Document data;
- 525 2. Define attributes and values to describe the kind of processing optimizations that
- 526 should be performed on Document data;
- 527 3. Define an attribute to specify fidelity requirements;
- 528 4. Define attributes to select an Output Device for printing;
- 529 5. Define attributes and values to report processing errors and warnings;
- 530 6. Define attributes to hold Jobs until a specific date and time;
- 531 7. Define attributes to cancel Jobs after a specific time period;
- 532 8. Define attributes and values to retain Jobs for a specific time period;
- 533 9. Define an operation to close an open Job;
- 534 10. Define attributes and operations to cancel groups of Jobs;
- 535 11. Define an operation to resubmit a Job with new Job Template attributes; and
- 536 12. Define sections to register all attributes, values, and operations with IANA.
- 537



## 538 4. New Operations

### 539 4.1 Cancel-Jobs

540 This REQUIRED operation allows the Operator or Administrator for the Printer to cancel a  
541 list of Not Completed Jobs or *all* Not Completed Jobs on the Printer. This operation works  
542 like the Cancel-Job operation [STD92] except that it works on a number of Jobs at once. If  
543 the Printer cannot cancel all of the requested Jobs successfully, it MUST NOT cancel any  
544 and MUST return an error code along with the list of offending "job-id" values.

545 Access Rights: The authenticated user [STD92] performing this operation must be an  
546 Operator or Administrator of the Printer. Otherwise, the Printer MUST reject the operation  
547 and return 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-  
548 authorized' as appropriate.

#### 549 4.1.1 Cancel-Jobs Request

550 The following groups of attributes are part of a Cancel-Jobs request.

551 Group 1: Operation Attributes

552 "attributes-charset" (charset) and  
553 "attributes-natural-language" (naturalLanguage):

554 The Client MUST supply and the Printer MUST support both of these  
555 attributes.

556 "printer-uri" (uri):

557 The Client MUST supply and the Printer MUST support the "printer-uri"  
558 operation attribute which is the target Printer for the operation.

559 "job-ids" (1setOf integer(1:MAX)):

560 The Client MAY supply and the Printer MUST support this operation attribute  
561 which specifies the target Job(s) for the operation.

562 "requesting-user-name" (name(MAX)) and  
563 "requesting-user-uri" (uri):

564 The Client SHOULD supply and the Printer MUST support these attributes.

565 "message" (text(127)):

566 The Client MAY supply and the Printer MAY support this attribute, which  
567 provides a message to the Operator. How or where to display this message  
568 to the Operator (if at all) is an implementation decision.

**569 4.1.2 Cancel-Jobs Response**

570 The following groups of attributes are part of Cancel-Jobs response.

571 Group 1: Operation Attributes

572 "attributes-charset" (charset) and  
573 "attributes-natural-language" (naturalLanguage):

574 The Printer MUST return both of these attributes.

575 "status-message" (text(255)) and/or  
576 "detailed-status-message" (text(MAX)):

577 The Printer MAY return one or both of these attributes.

578 Group 2: Unsupported Attributes

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

**580 4.2 Cancel-My-Jobs**

581 This REQUIRED operation allows a User to cancel a list of Not Completed Jobs or *all* their  
582 own Not Completed Jobs on the Printer. This operation works like the Cancel-Job operation  
583 [STD92] except that it works on a number of Jobs at once. If the Printer cannot cancel all of  
584 the requested Jobs successfully, it MUST NOT cancel any and MUST return an error code  
585 along with the list of offending "job-id" values.

586 Access Rights: The authenticated user [STD92] performing this operation must be the Job  
587 owner. Otherwise, the Printer MUST reject the operation and return 'client-error-forbidden',  
588 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

**589 4.2.1 Cancel-My-Jobs Request**

590 The following groups of attributes are part of a Cancel-My-Jobs request.

591 Group 1: Operation Attributes

592 "attributes-charset" (charset) and  
593 "attributes-natural-language" (naturalLanguage):

594 The Client MUST supply and the Printer MUST support both of these  
595 attributes.

596 "printer-uri" (uri):

597 The Client MUST supply and the Printer MUST support the "printer-uri"  
598 operation attribute which is the target Printer for the operation.

599 "job-ids" (1setOf integer(1:MAX)):

600 The Client MAY supply and the Printer MUST support this operation attribute  
601 which specifies the target Job(s) for the operation.

602 "requesting-user-name" (name(MAX)) and  
603 "requesting-user-uri" (uri):

604 The Client SHOULD supply and the Printer MUST support these attributes.

605 "message" (text(127)):

606 The Client MAY supply and the Printer MAY support this attribute, which  
607 provides a message to the Operator. How or where to display this message  
608 to the Operator (if at all) is an implementation decision.

#### 609 4.2.2 Cancel-My-Jobs Response

610 The following groups of attributes are part of a Cancel-My-Jobs response.

611 Group 1: Operation Attributes

612 "attributes-charset" (charset) and  
613 "attributes-natural-language" (naturalLanguage):

614 The Printer MUST return both of these attributes.

615 "status-message" (text(255)) and/or  
616 "detailed-status-message" (text(MAX)):

617 The Printer MAY return one or both of these attributes.

618 Group 2: Unsupported Attributes

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

#### 620 4.3 Close-Job

621 This REQUIRED operation allows a Client to close a Job that was created using the Create-  
622 Job [STD92] operation. It is semantically similar to a Send-Document [STD92] operation  
623 with the "last-document" operation attribute supplied with a 'true' value with no Document  
624 data, except that the Printer MUST NOT add an additional Document object when accepting  
625 a Close-Job operation.

626 A Client SHOULD check whether the Printer supports the Close-Job operation by querying  
627 the values of the "operations-supported" [STD92] Printer Description attribute.

628 Access Rights: The authenticated user [STD92] performing this operation must be either the  
629 Job owner or an Operator or Administrator of the Printer. Otherwise, the Printer MUST reject  
630 the operation and return 'client-error-forbidden', 'client-error-not-authenticated', or 'client-  
631 error-not-authorized' as appropriate.

#### 632 4.3.1 Close-Job Request

633 The following attributes are part of a Close-Job request.

634 Group 1: Operation Attributes

635 "attributes-charset" (charset) and  
636 "attributes-natural-language" (naturalLanguage):

637 The Client MUST supply and the Printer MUST support both of these  
638 attributes.

639 "printer-uri" (uri) and "job-id" (integer(1:MAX)):

640 The Client MUST supply and the Printer MUST support the "printer-uri" and  
641 "job-id" operation attributes which are the target Job for the operation.

642 "requesting-user-name" (name(MAX)) and  
643 "requesting-user-uri" (uri):

644 The Client SHOULD supply and the Printer MUST support these attributes.

#### 645 4.3.2 Close-Job Response

646 The following attributes are part of a Close-Job response.

647 Group 1: Operation Attributes

648 "attributes-charset" (charset) and  
649 "attributes-natural-language" (naturalLanguage):

650 The Printer MUST return both of these attributes.

651 "status-message" (text(255)) and/or  
652 "detailed-status-message" (text(MAX)):

653 The Printer MAY return one or both of these attributes.

654 Group 2: Unsupported Attributes

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

656 Group 3: Job Attributes

657 "job-state" (type1 enum):

658 The Printer MUST return the Job's REQUIRED "job-state" attribute. The  
659 value of this attribute along with the value of the "job-state-reasons" attribute  
660 is a "snapshot" of the new Job's state when the Printer returns the response.

661 "job-state-reasons" (1setOf type2 keyword):

662 The Printer MUST return the Job's REQUIRED "job-state-reasons" attribute.

663 "job-state-message" (text(MAX)):

664 The Printer SHOULD return the Job's RECOMMENDED "job-state-message"  
665 attribute. If the Printer supports this attribute, then it MUST be returned in the  
666 response. If this attribute is not returned in the response, the Client can  
667 assume that the "job-state-message" attribute is not supported and will not  
668 be returned in a subsequent Job query.

669 "number-of-intervening-jobs" (integer(0:MAX)):

670 The Printer SHOULD return the Job's RECOMMENDED "number-of-  
671 intervening-jobs" attribute. If the Printer supports this attribute, then it MUST  
672 be returned in the response. If this attribute is not returned in the response,  
673 the Client can assume that the "number-of-intervening-jobs" attribute is not  
674 supported and will not be returned in a subsequent Job query.

#### 675 4.4 Resubmit-Job

676 This RECOMMENDED operation allows a Client to create a copy of a Retained Job and  
677 change or add attributes for the new Job. Once accepted, a Printer MUST create a new Job  
678 object and assign a unique "job-id" and "job-uri" value for the new Job, just as if the Client  
679 had sent a Create-Job request. Operation and Job Template attributes from the original Job  
680 are copied to the new Job unless overridden in the Resubmit-Job request. If any of the  
681 Documents in the Job were passed by reference (Print-URI or Send-URI), the Printer MUST  
682 re-fetch the data.

683 Printers MUST reject a Resubmit-Job request if the Job is not retained or is in the 'pending',  
684 'pending-held', 'processing', or 'processing-stopped' states with the status 'client-error-not-  
685 possible'. Otherwise, the Printer returns a status code as defined for the Print-Job [STD92]  
686 operation.

687 Access Rights: The authenticated user [STD92] performing this operation must be either the  
688 Job owner or an Operator or Administrator of the Printer. Otherwise, the Printer MUST reject  
689 the operation and return 'client-error-forbidden', 'client-error-not-authenticated', or 'client-  
690 error-not-authorized' as appropriate.

691 **4.4.1 Resubmit-Job Request**

692 The following attributes are part of a Resubmit-Job request.

693 Group 1: Operation Attributes

694 "attributes-charset" (charset) and  
695 "attributes-natural-language" (naturalLanguage):

696 The Client MUST supply and the Printer MUST support both of these  
697 attributes.

698 "printer-uri" (uri) and "job-id" (integer(1:MAX)):

699 The Client MUST supply and the Printer MUST support the "printer-uri" and  
700 "job-id" operation attributes which are the target Job for the operation.

701 "requesting-user-name" (name(MAX)) and  
702 "requesting-user-uri" (uri):

703 The Client SHOULD supply and the Printer MUST support these attributes.

704 "ipp-attribute-fidelity" (boolean) or "job-mandatory-attributes" (1setOf keyword):

705 The Client MAY supply and the Printer MUST support either of these  
706 attributes.

707 Group 2: Job Template Attributes

708 The Client MAY supply and the Printer MUST support Job Template attributes to  
709 apply to the newly created Job. The 'delete-attribute' out-of-band value MAY be  
710 used to remove an attribute that was specified in the original Job.

711 **4.4.2 Resubmit-Job Response**

712 The following attributes are part of a Close-Job response.

713 Group 1: Operation Attributes

714 "attributes-charset" (charset) and  
715 "attributes-natural-language" (naturalLanguage):

716 The Printer MUST return both of these attributes.

717 "status-message" (text(255)) and/or  
718 "detailed-status-message" (text(MAX)):

719 The Printer MAY return one or both of these attributes.

720 Group 2: Unsupported Attributes

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

722 Group 3: Job Attributes

723 "job-id" (integer(1:MAX)):

724 The Printer MUST return the new Job's "job-id" attribute.

725 "job-state" (type1 enum):

726 The Printer MUST return the Job's REQUIRED "job-state" attribute. The  
727 value of this attribute along with the value of the "job-state-reasons" attribute  
728 is a "snapshot" of the new Job's state when the Printer returns the response.

729 "job-state-reasons" (1setOf type2 keyword):

730 The Printer MUST return the Job's REQUIRED "job-state-reasons" attribute.

731 "job-state-message" (text(MAX)):

732 The Printer SHOULD return the Job's RECOMMENDED "job-state-message"  
733 attribute. If the Printer supports this attribute, then it MUST be returned in the  
734 response. If this attribute is not returned in the response, the Client can  
735 assume that the "job-state-message" attribute is not supported and will not  
736 be returned in a subsequent Job query.

737 "job-uri" (uri):

738 The Printer MUST return the new Job's "job-uri" attribute.

739 "number-of-intervening-jobs" (integer(0:MAX)):

740 The Printer SHOULD return the Job's RECOMMENDED "number-of-  
741 intervening-jobs" attribute. If the Printer supports this attribute, then it MUST  
742 be returned in the response. If this attribute is not returned in the response,  
743 the Client can assume that the "number-of-intervening-jobs" attribute is not  
744 supported and will not be returned in a subsequent Job query.

745 **5. Attributes**746 **5.1 Operation Attributes**747 **5.1.1 document-format-details (collection)**

748 This DEPRECATED attribute specifies details about the source of the Document data and  
 749 can be included in any Job or Document Creation request. The values supplied by a Client  
 750 are purely informational and MUST NOT be used for access control, accounting, or policy  
 751 enforcement. Table 1 lists the member attributes.

752 Note: The previous version of this document [PWG5100.7-2003] allowed Clients to send  
 753 multiple values for this attribute in order to support "packaging" MIME media types. However,  
 754 since such formats are not used for IPP printing, Clients MUST NOT send and Printers  
 755 MUST NOT accept multiple values for "document-format-details".

756 **Table 1 - "document-format-details" Member Attributes****Member Attribute**

document-source-application-name (name(MAX))

document-source-application-version (text(127))

document-source-os-name (name(40))

document-source-os-version (text(40))

757 **5.1.1.1 document-source-application-name (name(MAX))**

758 This member attribute identifies the application that generated the Document data. The  
 759 value MUST be all lowercase with any version number portion removed in order to facilitate  
 760 matching, e.g., "photoshop", "microsoft word", "unknown", etc. The version number MUST  
 761 NOT be included in this attribute since the "document-source-application-version" member  
 762 attribute contains that information.

763 **5.1.1.2 document-source-application-version (text(127))**

764 This member attribute identifies the version number of the application that created the  
 765 Document data. If specified, the "document-source-application-name" member attribute  
 766 MUST also be specified. The value MUST be all lowercase in order to facilitate matching,  
 767 e.g., "8.1 (4331)", "5.0.5 10/26/2001", "2000 (9.0.4119 sr-1)", etc.

768 **5.1.1.3 document-source-os-name (name(40))**

769 This member attribute identifies the name of the operating system that created the  
 770 Document data. The value MUST be all lowercase with any version number portion removed  
 771 in order to facilitate matching, e.g., "android", "chromeos", "ios", "linux", "macos", "solaris",  
 772 "unix", "windows", etc. The version number MUST NOT be included in this attribute since  
 773 the "document-source-os-version" member attribute contains that information.



774 Note: The previous version of this specification [PWG5100.7-2003] specified that the IANA  
775 Operating System name registry was the source of values, however since this registry is no  
776 longer being updated implementors can simply use the marketing name of the Client  
777 operating system.

#### 778 **5.1.1.4 document-source-os-version (text(40))**

779 This member attribute identifies the version number of the operating system that created the  
780 Document data. If specified, the "document-source-os-name" member attribute **MUST** also  
781 be specified. The value **MUST** be all lowercase in order to facilitate matching, e.g., "10.14.4",  
782 "18.04", "10 (1903)", etc.

#### 783 **5.1.2 job-hold-until-time (dateTime)**

784 This **RECOMMENDED** attribute specifies the date and time after which the Job **MUST**  
785 become a candidate for processing. Printers that support this attribute **MUST** support the  
786 "job-hold-until" [STD92] operation attribute.

787 Clients **MUST NOT** supply both the "job-hold-until-time" and "job-hold-until" [STD92]  
788 operation attributes in a Hold-Job request. If a Client supplies both attributes, the Printer  
789 **MUST** reject the request and return the 'client-error-conflicting-attributes' status code.

#### 790 **5.1.3 job-ids (1setOf integer(1:MAX))**

791 This **REQUIRED** attribute specifies a list of "job-id" [STD92] values for the Cancel-Jobs  
792 (section 4.1), Cancel-My-Jobs (section 4.2), and Get-Jobs (section 6.1) operations.

#### 793 **5.1.4 job-mandatory-attributes (1setOf keyword)**

794 This **REQUIRED** attribute identifies which Job Template attributes the Printer **MUST** support  
795 in the Job Creation request in order to accept the Job. The values are the names of Job  
796 Template attributes, for example, 'job-hold-until', 'copies', and 'media'. In order to identify a  
797 member attribute of a collection attribute, the keyword names of both the collection attribute  
798 and the member attribute are given separated by a period (.) character. For example, to  
799 make the "media" attribute of the "cover-front" collection attribute mandatory, supply the  
800 keyword value 'cover-front.media'.

801 Note: As with "ipp-attribute-fidelity", the "job-mandatory-attributes" attribute does not  
802 determine whether the Printer overrides the PDL with the identified Job Template attributes,  
803 as that functionality is defined by the "pdl-override-supported" Printer Description attribute  
804 [STD92].

**805 5.2 Document and Job Status Attributes****806 5.2.1 document-format-details (collection)**

807 This DEPRECATED attribute specifies details about the source of the Document data as  
808 provided by the Client in the operation attribute of the same name (section 5.1.1).

**809 5.2.2 document-format-details-detected (collection)**

810 This DEPRECATED attribute specifies details about the source of the Document data as  
811 detected by the Printer. Member attributes are the same as for the "document-format-details"  
812 operation attribute (section 5.1.1).

**813 5.2.3 errors-count (integer(0:MAX))**

814 This RECOMMENDED attribute reports the number of errors encountered processing the  
815 Job as a whole. An error is reported when some portion of the printed output is not present,  
816 such as a glyph encountered which isn't in a Printer's font or an image in a page was in a  
817 format that the Printer didn't support, though the Printer did support the overall Document  
818 format.

**819 5.2.4 print-content-optimize-actual (1setOf type2 keyword)**

820 This RECOMMENDED attribute reports the "print-content-optimize" value(s) that the Printer  
821 actually used to produce the Job.

**822 5.2.5 warnings-count (integer(0:MAX))**

823 This RECOMMENDED attribute reports the number of warnings encountered processing  
824 the Job as a whole. A warning is reported when no information is lost but the appearance  
825 of the printed output might not be as expected.

**826 5.3 Document and Job Template Attributes****827 5.3.1 media-col (collection)**

828 [This REQUIRED attribute augments the "media" Job Template attribute \[STD92\] and allows](#)  
829 [a Client to specify detailed media characteristics for the Job. Each member attribute of the](#)  
830 [collection identifies a media characteristic. Clients MUST NOT supply both the "media" and](#)  
831 ["media-col" attributes in any request to the Printer. Printers that support the "media-col"](#)  
832 [attribute MUST also support the "media" attribute.](#)

833 [Note: Historically some Printers have used common aliases \('folio'\), names that combine](#)  
834 [media size and color \('iso-a4-white'\), or names that identify specific input trays \('tray-1'\).](#)  
835 [However, the PWG Media Standardized Names v2.0 \(MSN2\) \[PWG5101.1\] have replaced](#)  
836 [this ad-hoc convention and were specifically written to support media specification using](#)  
837 [either a self-describing "media" value or separate "media-col" member attribute values.](#)

838 When a Printer receives a “media-col” attribute in a Job Creation or Validate-Job request, it  
 839 searches for matching “media-col” values. Any member attribute not supplied by the Client  
 840 can match any supported value of the corresponding member attribute in the Printer. The  
 841 Printer ignores any member attributes supplied by the Client that are not supported by the  
 842 Printer.

843 If the number of matched “media-col” values is 0, the Printer MUST either treat the Client-  
 844 supplied “media-col” value as an unsupported value [STD92] or accept the “media-col” value  
 845 and put the Job in the ‘pending-held’ state if the Job is otherwise accepted.

846 If the number of matched “media-col” values is 1, the Printer MUST either use this single  
 847 value of “media-col” as the value specified by the Client or eliminate it if the matching media  
 848 is unsuitable for the Job.

849 If the number of matched “media-col” values is 2 or more, the Printer MUST reduce the  
 850 number of matching “media-col” values in an implementation-defined manner to 1 or 0. To  
 851 reduce the number of “media-col” values, an implementation SHOULD pick an algorithm  
 852 that gives reproducible results, such as:

- 853 • Apply defaults for member attributes not specified by the Client and perform the  
 854 matching algorithm again on the matched values. This algorithm may result in 0  
 855 matches.
- 856 • Find the “closest” or “best” match of the matched “media-col” values, resulting in a  
 857 single match.
- 858 • Find the “closest” or “best” match of the matched “media-col” values that are also  
 859 ready (i.e. loaded in trays). This algorithm has a chance of being less reproducible  
 860 but may still be sufficiently reproducible to be useful. This algorithm may yield 0  
 861 matches unless there is a fallback such as to the preceding algorithm.

862 A Printer MUST implement either the above algorithm or one that produces equivalent  
 863 results.

864 Table 2 lists the member attributes of the “media-col” collection attribute.

**Table 2 - “media-col” Member Attributes**

<b>Member Attribute</b>	<b>Conformance</b>
<u>media-back-coating (type2 keyword   name(MAX))</u>	<u>MAY</u>
<u>media-bottom-margin (integer(0:MAX))</u>	<u>MUST</u>
<u>media-color (type2 keyword   name(MAX))</u>	<u>SHOULD</u>
<u>media-front-coating (type2 keyword   name(MAX))</u>	<u>MAY</u>
<u>media-grain (type2 keyword   name(MAX))</u>	<u>MAY</u>
<u>media-hole-count (integer(0:MAX))</u>	<u>MAY</u>
<u>media-info (text(255))</u>	<u>SHOULD</u>
<u>media-key (type2 keyword   name(MAX))</u>	<u>SHOULD</u>

<b>Member Attribute</b>	<b>Conformance</b>
<a href="#">media-left-margin (integer(0:MAX))</a>	MUST
<a href="#">media-order-count (integer(1:MAX))</a>	MAY
<a href="#">media-pre-printed (type2 keyword   name(MAX))</a>	SHOULD
<a href="#">media-recycled (type2 keyword   name(MAX))</a>	SHOULD
<a href="#">media-right-margin (integer(0:MAX))</a>	MUST
<a href="#">media-size (collection)</a>	MUST
<a href="#">media-size-name (type2 keyword   name(MAX))</a>	SHOULD
<a href="#">media-source (type2 keyword   name(MAX))</a>	MUST
<a href="#">media-source-properties (collection) (note 1)</a>	MUST
<a href="#">media-thickness (integer(1:MAX))</a>	MAY
<a href="#">media-tooth (type2 keyword   name(MAX))</a>	MAY
<a href="#">media-top-margin (integer(0:MAX))</a>	MUST
<a href="#">media-type (type2 keyword   name(MAX))</a>	MUST
<a href="#">media-weight-metric (integer(0:MAX))</a>	MAY

866 [Note 1: The "media-source-properties" member attribute is only used for values of](#)  
867 [the "media-col-database" and "media-col-ready" Printer Description attributes.](#)

#### 868 [5.3.1.1 Media Selection and Full-Bleed Printing](#)

869 [The "media-bottom-margin", "media-left-margin", "media-right-margin", and "media-top-](#)  
870 [margin" member attributes specify the Printer's physical margins, allowing a Printer to](#)  
871 [determine how the content needs to be printed. A Client specifies that it has borderless or](#)  
872 ["full-bleed" content by setting all of the margins to 0.](#)

873 [Printers that support full-bleed printing MUST accept margins of 0 and MAY scale and center](#)  
874 [the print document to fill as needed to achieve full-bleed output. Printers SHOULD use the](#)  
875 [document Image Box when scaling for full-bleed output.](#)

#### 876 [5.3.1.2 media-back-coating \(type2 keyword | name\(MAX\)\)](#)

877 [This OPTIONAL member attribute specifies which pre-process coating has been applied to](#)  
878 [the back of the desired media. Standard keyword values include:](#)

879 ['none': The media does not have any coating.](#)

880 ['glossy': The media has a "glossy" coating.](#)

881 ['high-gloss': The media has a "high-gloss" coating.](#)

882 ['semi-gloss': The media has a "semi-gloss" coating.](#)

883 ['satin': The media has a "satin" coating.](#)

884 ['matte': The media has a "matte" coating.](#)

885 **5.3.1.3 media-bottom-margin (integer(0:MAX))**

886 The REQUIRED "media-bottom-margin" member attribute defines the Printer's physical  
887 bottom margin in hundredths of millimeters from the bottom edge, without respect to the  
888 value of the "orientation-requested" Job Template attribute.

889 **5.3.1.4 media-color (type2 keyword | name(MAX))**

890 This RECOMMENDED member attribute specifies the color of the media. Standard keyword  
891 values are defined in the PWG Media Standardized Names v2.0 (MSN2) [PWG5101.1].

892 **5.3.1.5 media-front-coating (type2 keyword | name(MAX))**

893 This OPTIONAL member attribute specifies which pre-process coating has been applied to  
894 the front of the desired media. Standard keyword values are the same as the "media-back-  
895 coating" member attribute (section 5.3.1.2).

896 **5.3.1.6 media-grain (type2 keyword | name(MAX))**

897 This OPTIONAL member attribute specifies the desired grain of the media being specified  
898 [ISO10175]. Grain affects the curl and the folding of the media. Some marking engines are  
899 sensitive to the resulting curl. Standard keyword values for "media-grain" include:

900 'x-direction': The direction of the paper fibers is in the cross-feed direction of the  
901 media.

902 'y-direction': The direction of the paper fibers is in the feed direction of the media.

903 **5.3.1.7 media-hole-count (integer(0:MAX))**

904 This OPTIONAL member attribute specifies the number of pre-drilled holes in the desired  
905 media. A value of 0 (zero) indicates that no holes are present in the media.

906 **5.3.1.8 media-info (text(255))**

907 This RECOMMENDED member attribute provides a human-readable description of the  
908 media.

909 **5.3.1.9 media-key (type2 keyword | name(MAX))**

910 This RECOMMENDED member attribute contains a unique identifier of the media  
911 represented as a keyword or name. Valid "media-key" values are also valid "media" values.

912 Because Printers often support many different kinds and sizes of media, Printers that  
913 support this attribute SHOULD automatically assign unique values for all supported  
914 combinations of media characteristics, even for values that are locally-defined by an  
915 Administrator or Operator. A Client can supply such a Printer-generated value with either  
916 the "media-key" member attribute or the "media" Job Template attribute [STD92].

917 **5.3.1.10 media-left-margin (integer(0:MAX))**

918 The REQUIRED "media-left-margin" member attribute defines the Printer's physical left  
919 margin in hundredths of millimeters from the left edge, without respect to the value of the  
920 "orientation-requested" Job Template attribute.

921 **5.3.1.11 media-order-count (integer(1:MAX))**

922 This OPTIONAL member attribute indicates the number of Media Sheets, within an ordered  
923 sequence of Media Sheets, after which the sequence begins to repeat. For example, third  
924 cut tab stock in which all three forms are present has an order count of 3. This is also  
925 sometimes called the modulus of the ordered media. Full-cut tab stock can have an order  
926 count greater than 1 if it has an ordered sequence, such as a cycle of colors or cycle of pre-  
927 printing. If the "media-order-count" is 1, then all media is the same.

928 **5.3.1.12 media-pre-printed (type2 keyword | name(MAX))**

929 This RECOMMENDED member attribute specifies that the pre-printed characteristics of the  
930 desired media. Examples of pre-printed media include forms and company letterhead. The  
931 standard keyword values for "media-pre-printed" are:

932 'blank': The desired medium is not pre-printed.

933 'pre-printed': The desired medium is pre-printed; the other attributes identify which  
934 medium instance and so what is actually pre-printed.

935 'letter-head': The site-defined letterhead is desired.

936 **5.3.1.13 media-recycled (type2 keyword | name(MAX))**

937 This RECOMMENDED member attribute specifies the recycled characteristics of the media.  
938 The standard keyword values are:

939 'none': The media is not recycled.

940 'standard': The media is the site-defined standard recycled stock.

941 If this member attribute is supported, the Printer MUST support at least the 'none' and  
942 'standard' values.

943 **5.3.1.14 media-right-margin (integer(0:MAX))**

944 The REQUIRED "media-right-margin" member attribute defines the Printer's physical right  
945 margin in hundredths of millimeters from the right edge, without respect to the value of the  
946 "orientation-requested" Job Template attribute.

947 **5.3.1.15 media-size (collection)**

948 This REQUIRED member attribute is a collection that explicitly specifies the numerical media  
 949 width and height dimensions. Clients SHOULD localize the dimensions to the size names  
 950 that users are familiar with, such as 'Letter' and 'A4', and/or provide the exact dimensions  
 951 units appropriate for the user's locale, e.g. "8.5x11in" and "210x297mm".

952 A requested media size dimension matches a supported media dimension if it is within an  
 953 implementation-defined tolerance. For example, PostScript [redbook] specifies a tolerance  
 954 of 5 points (5/72 of an inch = 1.7 mm) of a supported dimension, i.e., within 176 units of the  
 955 value of the dimension.

956 Table 3 lists the "media-size" collection member attributes.

957 **Table 3 - "media-size" Member Attributes**

<b>Member Attribute</b>	<b>Conformance</b>
<u>x-dimension (integer(0:MAX))</u>	<u>MUST</u>
<u>y-dimension (integer(0:MAX))</u>	<u>MUST</u>

958 The REQUIRED "x-dimension" member attribute specifies the width of the media in  
 959 hundredths of a millimeter (1/2540th of an inch) along the bottom edge of the media.

960 The REQUIRED "y-dimension" member attribute specifies the height of the media in  
 961 hundredths of a millimeter (1/2540th of an inch) along the left edge of the media.

962 **5.3.1.16 media-size-name (type2 keyword | name(MAX))**

963 The RECOMMENDED "media-size-name" member attribute defines the media size using a  
 964 PWG media size name [PWG5101.1] instead of the dimensions in the "media-size" member  
 965 attribute. Clients and Printers MUST NOT specify both the "media-size" and "media-size-  
 966 name" member attributes in a collection.

967 **5.3.1.17 media-source (type2 keyword | name(MAX))**

968 The REQUIRED "media-source" member attribute specifies the input tray, slot, roll, or other  
 969 source for the media. The standard keyword values are shown in Table 4.

970 Note: The name "media-source" was chosen over "media-input-tray" since the values  
 971 represent more than trays.

972 **Table 4 - "media-source" Keyword Values**

<b>Keyword</b>	<b>Description</b>
<u>alternate</u>	<u>The alternate or secondary input tray</u>
<u>alternate-roll</u>	<u>The alternate or secondary roll</u>
<u>auto</u>	<u>The Printer's automatic choice</u>
<u>bottom</u>	<u>The bottom input tray</u>

<b>Keyword</b>	<b>Description</b>
<a href="#">by-pass-tray</a>	The by-pass ("multi-purpose") tray
<a href="#">center</a>	The center feed slot/tray
<a href="#">disc</a>	The CD/DVD/Bluray disc feed slot/tray
<a href="#">envelope</a>	The envelope feed slot/tray
<a href="#">hagaki</a>	The Hagaki feed slot/tray
<a href="#">large-capacity</a>	The large capacity input tray
<a href="#">left</a>	The left feed slot/tray
<a href="#">main</a>	The main or primary input tray
<a href="#">main-roll</a>	The main or primary roll
<a href="#">manual</a>	The manual feed slot
<a href="#">middle</a>	The middle input tray
<a href="#">photo</a>	The photo feed slot/tray
<a href="#">rear</a>	The rear feed slot/tray
<a href="#">right</a>	The right feed slot/tray
<a href="#">roll-1</a>	The first roll
<a href="#">roll-2</a>	The second roll
<a href="#">roll-3</a>	The third roll
<a href="#">roll-4</a>	The fourth roll
<a href="#">roll-5</a>	The fifth roll
<a href="#">roll-6</a>	The sixth roll
<a href="#">roll-7</a>	The seventh roll
<a href="#">roll-8</a>	The eighth roll
<a href="#">roll-9</a>	The ninth roll
<a href="#">roll-10</a>	The tenth roll
<a href="#">side</a>	The side feed slot/tray
<a href="#">top</a>	The topmost input tray
<a href="#">tray-1</a>	The first tray
<a href="#">tray-2</a>	The second tray
<a href="#">tray-3</a>	The third tray
<a href="#">tray-4</a>	The fourth tray
<a href="#">tray-5</a>	The fifth tray
<a href="#">tray-6</a>	The sixth tray
<a href="#">tray-7</a>	The seventh tray
<a href="#">tray-8</a>	The eighth tray
<a href="#">tray-9</a>	The ninth tray
<a href="#">tray-10</a>	The tenth tray
<a href="#">tray-11</a>	The eleventh tray
<a href="#">tray-12</a>	The twelfth tray
<a href="#">tray-13</a>	The thirteenth tray
<a href="#">tray-14</a>	The fourteenth tray
<a href="#">tray-15</a>	The fifteenth tray
<a href="#">tray-16</a>	The sixteenth tray
<a href="#">tray-17</a>	The seventeenth tray
<a href="#">tray-18</a>	The eighteenth tray
<a href="#">tray-19</a>	The nineteenth tray



<u>Keyword</u>	<u>Description</u>
tray-20	The twentieth tray

973 **5.3.1.18 media-source-properties (collection)**

974 The REQUIRED "media-source-properties" member attribute is provided in the "media-col-  
 975 database" and "media-col-ready" collections to describe the media path and natural  
 976 orientation for the specified collection. For example, when printing an envelope or form it is  
 977 important to know which orientation to use for the Document Data.

978 Clients SHOULD use "media-col-ready" instead of "media-col-database" since the latter  
 979 includes all possible media combinations, including potentially multiple instances of the  
 980 same media with different "media-source-properties" values.

981 This member attribute MUST NOT be included in the "media-col" Document and Job  
 982 Template attributes since it is informational rather than specifying intent.

983 **5.3.1.18.1 media-source-feed-direction (type2 keyword)**

984 This REQUIRED member attribute defines whether the long edge ('long-edge-first') or  
 985 short edge ('short-edge-first') of the media is pulled from the source.

986 **5.3.1.18.2 media-source-feed-orientation (type2 enum)**

987 This REQUIRED member attribute defines the orientation of the media as pulled from the  
 988 source. The value is an "orientation-requested" [STD92] enumeration.

989 **5.3.1.19 media-thickness (integer(1:MAX))**

990 This OPTIONAL member attribute specifies the thickness of the media [JDF] in hundreds of  
 991 millimeters (1/2540th of an inch).

992 **5.3.1.20 media-tooth (type2 keyword | name(MAX))**

993 This OPTIONAL member attribute specifies the tooth (or roughness) of the media  
 994 [ISO10175]. The tooth is particularly important for marking engines that use pens (e.g.  
 995 plotters) to mark the media - the type of pen used matches the tooth of the media for best  
 996 resolution.

997 Standard keyword values for "media-tooth" include:

998 'antique': Rougher than 'vellum' [JDF].

999 'calendared': Extra smooth or polished, uncoated paper [JDF].

1000 'coarse': Rough finish.

1001 'fine': Smoother finish than 'smooth'.

1002 ['linen': Finish like coarse woven cloth \[JDF\].](#)

1003 ['medium': Regular finish.](#)

1004 ['smooth': Smooth finish \[JDF\].](#)

1005 ['stipple': Fine pebble finish \[JDF\].](#)

1006 ['uncalendared': Rough, unpolished and uncoated papers \[JDF\].](#)

1007 ['vellum': Slightly rough surface \[JDF\].](#)

#### 1008 **[5.3.1.21 media-top-margin \(integer\(0:MAX\)\)](#)**

1009 [The REQUIRED "media-top-margin" member attribute defines the Printer's physical top](#)  
1010 [margin in hundredths of millimeters from the top edge, without respect to the value of the](#)  
1011 ["orientation-requested" Job Template attribute.](#)

#### 1012 **[5.3.1.22 media-type \(type2 keyword | name\(MAX\)\)](#)**

1013 [This REQUIRED member attribute identifies the type of media, i.e., the media instance's](#)  
1014 [predominate characteristic. Depending on implementation, the Printer MAY need to behave](#)  
1015 [differently or perform different validation, depending on the type of the media. For example,](#)  
1016 [prohibiting stapling transparencies or selecting a different paper path for an envelope.](#)  
1017 [Standard keyword values for media type are defined in the PWG Media Standardized](#)  
1018 [Names v2.0 \(MSN2\) \[PWG5101.1\].](#)

#### 1019 **[5.3.1.23 media-weight-metric \(integer\(0:MAX\)\)](#)**

1020 [This OPTIONAL member attribute indicates the weight of the desired media rounded to the](#)  
1021 [nearest whole number of grams per square meter.](#)

#### 1022 **5.3.2 output-device (name(127))**

1023 This attribute requests a named Output Device for a Printer that fans-out to multiple devices.  
1024 If omitted, the Printer selects the best Output Device for the Job in an implementation  
1025 dependent manner.

#### 1026 **5.3.3 print-content-optimize (type2 keyword)**

1027 This RECOMMENDED attribute specifies the type of content optimization to perform on the  
1028 Document data. Keyword values specify the type of content to optimize, including:

1029 ['graphics': Graphs and line drawings.](#)

1030 ['photo': Photographs.](#)

1031 ['text': Text.](#)

1032 'text-and-graphics': Text and graphics.

## 1033 **5.4 Job Template Attributes**

### 1034 **5.4.1 job-account-id (name(MAX))**

1035 [This attribute specifies the account associated with the Job, such as a customer name, a](#)  
1036 [sequence of digits referencing an internal billing number, or even a credit card number. How](#)  
1037 [the Printer uses this attribute is implementation dependent.](#)

1038 [A zero-length value indicates that there is no account name.](#)

### 1039 **5.4.2 job-accounting-user-id (name(MAX))**

1040 [This attribute specifies the user ID associated with the account specified by the "job-account-](#)  
1041 [id" attribute \(see section 5.4.15.4.1\) used for this Job. These two attributes can be used for](#)  
1042 [account tracking.](#)

1043 [A zero-length value indicates that there is no user accounting ID.](#)

### 1044 **5.4.3 job-cancel-after (integer(0:MAX))**

1045 This RECOMMENDED attribute specifies the maximum number of seconds allowed for  
1046 processing a Job. When specified, the Printer cancels the Job automatically if it cannot be  
1047 completed within the specified timeframe. The completion timer does not begin until the Job  
1048 enters the 'processing' state'.

### 1049 **5.4.4 job-delay-output-until (type2 keyword | name(MAX))**

1050 This RECOMMENDED attribute specifies a time period in the future when the Printer will  
1051 produce the output for the Job. If the specified time period has not yet arrived, the Printer  
1052 MUST set the Job's "job-state-reasons" value to 'job-delay-output-until-specified'. The  
1053 Printer MUST NOT produce any output until the time period arrives but MAY perform pre-  
1054 processing. When the time period arrives, the Job MUST become a candidate for output,  
1055 including any processing required to produce the output. The only way to alter the delay  
1056 period for a Job is by using the Set-Job-Attributes [RFC3380] operation.

1057 Standard keyword values for named time periods are:

1058 'day-time': Delay output until daylight, typically 6am to 6pm.

1059 'evening': Delay output until the evening, typically from 6pm to 12am.

1060 'indefinite': Delay output indefinitely; the time period can be changed using the Set-  
1061 Job-Attributes [RFC3380] operation.

1062 'night': Delay output until the night, typically from 12am to 6am.

1063 'no-delay-output': Do not delay the output.

1064 'second-shift': Delay output until the second work shift, typically from 4pm to 12am.

1065 'third-shift': Delay output until the third work shift, typically from 12am to 8am.

1066 'weekend': Delay output until the weekend.

1067 Clients MUST NOT supply both the "job-delay-output-until" and "job-delay-output-until-time"  
1068 (section 5.4.5) Job Template attributes in a Job Creation request. If a Client supplies both  
1069 attributes, the Printer MUST reject the request and return the 'client-error-conflicting-  
1070 attributes' status code.

1071 Note: Unlike the "job-hold-until" [STD92] Job Template attribute, the "job-delay-output-until"  
1072 attribute does not cause the Job to enter the 'pending-held' state.

#### 1073 **5.4.5 job-delay-output-until-time (dateTime)**

1074 This RECOMMENDED attribute specifies a date and time when the Printer will produce the  
1075 output for the Job. If the specified time period has not yet arrived, the Printer MUST set the  
1076 Job's "job-state-reasons" value to 'job-delay-output-until-specified'. The Printer MUST NOT  
1077 produce any output until the time period arrives but MAY perform pre-processing. When the  
1078 time period arrives, the Job MUST become a candidate for output, including any processing  
1079 required to produce the output. The only way to alter the delay period for a Job is by using  
1080 the Set-Job-Attributes [RFC3380] operation.

1081 Clients MUST NOT supply both the "job-delay-output-until-time" and "job-delay-output-until"  
1082 (section 5.4.4) Job Template attributes in a Job Creation request. If a Client supplies both  
1083 attributes, the Printer MUST reject the request and return the 'client-error-conflicting-  
1084 attributes' status code.

1085 Note: Unlike the "job-hold-until-time" (section 5.4.6) Job Template attribute, the "job-delay-  
1086 output-until-time" attribute does not cause the Job to enter the 'pending-held' state.

#### 1087 **5.4.6 job-hold-until-time (dateTime)**

1088 This RECOMMENDED attribute specifies the date and time after which the Job MUST  
1089 become a candidate for processing. Printers that support this attribute MUST support the  
1090 "job-hold-until" [STD92] Job Template attribute.

1091 Clients MUST NOT supply both the "job-hold-until-time" and "job-hold-until" [STD92] Job  
1092 Template attributes in a Job Creation request. If a Client supplies both attributes, the Printer  
1093 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

#### 1094 **5.4.7 job-retain-until (type2 keyword | name(MAX))**

1095 This RECOMMENDED attribute specifies how long the Job remains in the Job Retention  
1096 phase of a Job's life cycle [STD92]. Standard values include:

1097 'end-of-day': Retain the Job until the end of the current day.

1098 'end-of-month': Retain the Job until the end of the current month.

1099 'end-of-week': Retain the Job until the end of the current week.

1100 'indefinite': Retain the Job indefinitely.

1101 'none': Do not retain the Job.

1102 Clients MUST NOT supply the "job-retain-until", "job-retain-until-interval" (section 5.4.8),  
1103 and/or "job-retain-until-time" (section 5.4.9) Job Template attributes together in a Job  
1104 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
1105 reject the request and return the 'client-error-conflicting-attributes' status code.

Deleted: 0

1106 **5.4.8 job-retain-until-interval (integer(0:MAX))**

1107 This RECOMMENDED attribute specifies the number of seconds the Job remains in the Job  
1108 Retention phase of a Job's life cycle [STD92].

1109 Clients MUST NOT supply the "job-retain-until" (section 5.4.7), "job-retain-until-interval",  
1110 and/or "job-retain-until-time" (section 5.4.9) Job Template attributes together in a Job  
1111 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
1112 reject the request and return the 'client-error-conflicting-attributes' status code.

Deleted: 0

1113 **5.4.9 job-retain-until-time (dateTime)**

1114 This RECOMMENDED attribute specifies the date and time when the Job can leave the Job  
1115 Retention phase of a Job's life cycle [STD92].

1116 Clients MUST NOT supply the "job-retain-until" (section 5.4.7), "job-retain-until-interval"  
1117 (section 5.4.8), and/or "job-retain-until-time" Job Template attributes together in a Job  
1118 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
1119 reject the request and return the 'client-error-conflicting-attributes' status code.

1120 **5.4.10 job-sheets-col (collection)**

1121 This RECOMMENDED attribute augments the "job-sheets" Job Template attribute [STD92]  
1122 and allows a Client to specify media for Job Sheets that is different than the current media  
1123 being used for the Job. Table 5 lists the member attributes.

1124 **Table 5 - "job-sheets-col" Member Attributes**

<u>Member Attribute</u>
<u>job-sheets (type2 keyword   name(MAX))</u>
<u>media (type2 keyword   name(MAX))</u>
<u>media-col (collection)</u>

1127 **5.4.10.1 job-sheets (type2 keyword | name(MAX))**

1128 [This REQUIRED member attribute specifies which Job Sheets to print on the specified](#)  
1129 [media. The values for this member attribute are identical to the keyword and name values](#)  
1130 [for the "job-sheets" Job Template attribute \[STD92\] itself, including the 'none' value, and](#)  
1131 [convey the same semantics.](#)

1132 **5.4.10.2 media (type2 keyword | name(MAX))**

1133 [This REQUIRED member attribute specifies which media to use for the Job Sheets. If](#)  
1134 [specified, the "media-col" member attribute \(section 5.4.10.3\) MUST NOT be specified.](#)

1135 **5.4.10.3 media-col (collection)**

1136 [This REQUIRED member attribute specifies which media to use for the Job Sheets. If](#)  
1137 [specified, the "media" member attribute \(section 5.4.10.2\) MUST NOT be specified.](#)

1138 **5.5 Printer Description Attributes**

1139 **5.5.1 document-charset-default (charset)**

1140 This CONDITIONALLY REQUIRED attribute specifies the default charset that the Printer  
1141 will assume for charset-ambiguous Document formats when the Client omits the "document-  
1142 charset" operation attribute [PWG5100.5]. Printers that support the "document-charset"  
1143 operation attribute MUST support this attribute.

1144 **5.5.2 document-charset-supported (1setOf charset)**

1145 This CONDITIONALLY REQUIRED attribute lists the charsets that the Printer supports for  
1146 charset-ambiguous Document formats. Printers that support the "document-charset"  
1147 operation attribute [PWG5100.5] MUST support this attribute.

1148 **5.5.3 document-format-details-supported (1setOf keyword)**

1149 This DEPRECATED attribute lists the supported member attributes of the "document-  
1150 format-details" operation (section 5.1.1) and Document/Job Status (section 5.2.1) attributes.

1151 **5.5.4 document-natural-language-default (naturalLanguage)**

1152 This CONDITIONALLY REQUIRED attribute specifies the default natural language that the  
1153 Printer will assume for Document data when the Client omits the "document-natural-  
1154 language" operation attribute [STD92]. Printers that support the "document-natural-  
1155 language" attribute MUST support this attribute.

**1156 5.5.5 document-natural-language-supported (1setOf naturalLanguage)**

1157 This CONDITIONALLY REQUIRED attribute lists the natural languages supported for  
1158 Printer-supported Document formats. Printers that support the "document-natural-language"  
1159 attribute MUST support this attribute.

**1160 [5.5.6 job-account-id-default \(name\(MAX\) | no-value\)](#)**

1161 [This attribute specifies the default value of the "job-account-id" Job Template attribute](#)  
1162 [\(section 5.4.1\). Printers MUST support this attribute if the "job-account-id" attribute is](#)  
1163 [supported.](#)

**1164 [5.5.7 job-account-id-supported \(boolean\)](#)**

1165 [This attribute specifies whether the "job-account-id" Job Template attribute \(section 5.4.1\)](#)  
1166 [is supported. Printers MUST support this attribute if the "job-account-id" attribute is](#)  
1167 [supported.](#)

**1168 [5.5.8 job-accounting-user-id-default \(name\(MAX\) | no-value\)](#)**

1169 [This attribute specifies the default value of the "job-accounting-user-id" Job Template](#)  
1170 [attribute \(section 5.4.2\). Printers MUST support this attribute if the "job-accounting-user-id"](#)  
1171 [attribute is supported.](#)

**1172 [5.5.9 job-accounting-user-id-supported \(boolean\)](#)**

1173 [This attribute specifies whether the "job-accounting-user-id" Job Template attribute \(section](#)  
1174 [5.4.2\) is supported. Printers MUST support this attribute if the "job-accounting-user-id"](#)  
1175 [attribute is supported.](#)

**1176 5.5.10 job-cancel-after-default (integer(0:MAX) | no-value)**

1177 This CONDITIONALLY REQUIRED attribute specifies the default value for the "job-cancel-  
1178 after" (section 5.4.1) Job Template attribute. Printers that support the "job-cancel-after"  
1179 attribute MUST support this attribute.

**1180 5.5.11 job-cancel-after-supported (rangeOfInteger(0:MAX))**

1181 This CONDITIONALLY REQUIRED attribute specifies the range of values supported for the  
1182 "job-cancel-after" (section 5.4.1) Job Template attribute. Printers that support the "job-  
1183 cancel-after" attribute MUST support this attribute.

**1184 5.5.12 job-creation-attributes-supported (1setOf keyword)**

1185 This REQUIRED attribute lists the names of the operation and Job Template attributes that  
1186 can be sent in a Job Creation or Validate-Job request.

**1187 5.5.13 job-delay-output-until-default (type2 keyword | name(MAX))**

1188 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-delay-  
1189 output-until" (section 5.4.4) Job Template attribute. Printers that support the "job-delay-  
1190 output-until" attribute MUST support this attribute.

**1191 5.5.14 job-delay-output-until-supported (1setOf (type2 keyword | name(MAX)))**

1192 This CONDITIONALLY REQUIRED attribute lists the supported values of the "job-delay-  
1193 output-until" (section 5.4.4) Job Template attribute. Printers that support the "job-delay-  
1194 output-until" attribute MUST support this attribute.

**1195 5.5.15 job-delay-output-until-time-supported (rangeOfInteger(0:MAX))**

1196 This CONDITIONALLY REQUIRED attribute specifies the range of time values supported  
1197 by the "job-delay-output-until-time" (section 5.4.5) Job Template attribute. Printers that  
1198 support the "job-delay-output-until-time" attribute MUST support this attribute.

**1199 5.5.16 job-history-attributes-configured (1setOf keyword)**

1200 This REQUIRED attribute lists the Job attributes that will be retained in the history phase of  
1201 each Job. IPP/1.1 [STD92] specifies that at least the "job-id", "job-printer-uri", "job-state",  
1202 and "job-state-reasons" attributes MUST be retained in the history phase. Printers that  
1203 support the "job-history-attributes-supported" (section N.M.P) attribute MUST support this  
1204 attribute.

**1205 5.5.17 job-history-attributes-supported (1setOf keyword)**

1206 This REQUIRED attribute lists the Job attributes that can be retained in the history phase of  
1207 each Job. Printers that support the "job-history-attributes-configured" (section N.M.P)  
1208 attribute MUST support this attribute.

**1209 5.5.18 job-history-interval-configured (integer(0:MAX))**

1210 This REQUIRED attribute specifies the minimum number of seconds that a Job will remain  
1211 in the history phase of its lifecycle [STD92]. Printers SHOULD have a default configured  
1212 value of at least 60 seconds to allow Clients to discover the disposition of any Jobs that have  
1213 reached a terminating state. Printers that support the "job-history-interval-supported"  
1214 (section N.M.P) attribute MUST support this attribute.

**1215 5.5.19 job-history-interval-supported (rangeOfInteger(0:MAX))**

1216 This REQUIRED attribute specifies the range of values that are supported for the "job-  
1217 history-interval-configured" Printer Description attribute. Printers that support the "job-  
1218 history-interval-configured" (section N.M.P) attribute MUST support this attribute.



**1219 5.5.20 job-ids-supported (boolean)**

1220 This REQUIRED attribute specifies whether the "job-ids" operation attribute (section 5.1.3)  
1221 is supported.

**1222 5.5.21 job-mandatory-attributes-supported (boolean)**

1223 This REQUIRED attribute specifies that the "job-mandatory-attributes" operation attribute  
1224 (section 5.1.4) is supported. Printers MUST report a value of 'true' for this attribute.

**1225 5.5.22 job-retain-until-default (type2 keyword | name(MAX))**

1226 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-retain-  
1227 until" (section 5.4.7) Job Template attribute. Printers that support the "job-retain-until"  
1228 attribute MUST support this attribute.

**1229 5.5.23 job-retain-until-interval-default (integer(0:MAX) | no-value)**

1230 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-retain-  
1231 until-interval" (section 5.4.8) Job Template attribute. Printers that support the "job-retain-  
1232 until-interval" attribute MUST support this attribute.

**1233 5.5.24 job-retain-until-interval-supported (rangeOfInteger(0:MAX))**

1234 This CONDITIONALLY REQUIRED attribute specifies the supported values of the "job-  
1235 retain-until-interval" (section 5.4.8) Job Template attribute. Printers that support the "job-  
1236 retain-until-interval" attribute MUST support this attribute.

**1237 5.5.25 job-retain-until-supported (1setOf (type2 keyword | name(MAX)))**

1238 This CONDITIONALLY REQUIRED attribute lists the supported values of the "job-retain-  
1239 until" (section 5.4.7) Job Template attribute. Printers that support the "job-retain-until"  
1240 attribute MUST support this attribute.

**1241 5.5.26 job-retain-until-time-supported (rangeOfInteger(0:MAX))**

1242 This CONDITIONALLY REQUIRED attribute specifies the supported values of the "job-  
1243 retain-until-time" (section 5.4.9) Job Template attribute. Printers that support the "job-retain-  
1244 until-time" attribute MUST support this attribute.

**1245 [5.5.27 job-sheets-col-default \(collection\)](#)**

1246 [This attribute specifies the default value of the "job-sheets-col" Job Template attribute](#)  
1247 [\(section Error! Reference source not found.\). Printers that support the "job-sheets-col"](#)  
1248 [attribute MUST support this attribute.](#)

1249 **5.5.28 job-sheets-col-supported (1setOf keyword)**

1250 [This attribute lists the supported member attributes of the "job-sheets-col" Job Template](#)  
 1251 [attribute \(section Error! Reference source not found.\). Printers that support the "job-](#)  
 1252 [sheets-col" attribute MUST support this attribute.](#)

1253 **5.5.29 job-spooling-supported (type2 keyword)**

1254 This REQUIRED attribute specifies whether Jobs are spooled before the Document data is  
 1255 processed. The value of this attribute returned in a Get-Printer-Attributes response MAY  
 1256 depend on the "document-format" attribute supplied in the Get-Printer-Attributes request  
 1257 [STD92]. If the Printer does not support this attribute, then the spooling behavior is  
 1258 implementation dependent.

1259 Standard keyword values include:

1260 'automatic': The Printer chooses whether to process the Document data as it is  
 1261 received or after spooling (storage).

1262 'spool': The printer processes the Document data after it has been spooled (stored).

1263 'stream': The printer processes the Document data as it is received.

1264 **5.5.30 media-back-coating-supported (1setOf (type2 keyword | name(MAX)))**

1265 [This attribute lists the supported values of the "media-back-coating" member attribute](#)  
 1266 [\(section 5.3.1.2\). Printers that support the "media-back-coating" member attribute MUST](#)  
 1267 [support this attribute.](#)

1268 **5.5.31 media-bottom-margin-supported (1setOf integer(0:MAX))**

1269 [This REQUIRED attribute lists the supported values for the "media-bottom-margin" member](#)  
 1270 [attribute \(section 5.3.1.3\).](#)

1271 **5.5.32 media-col-database (1setOf collection)**

1272 This REQUIRED attribute lists the set of pre-defined "media-col" collections available in the  
 1273 Printer's media database. This attribute is similar to "media-col-ready" ([section 5.5.34](#)) but  
 1274 returns the entire set of pre-defined "media-col" collections known by the Printer instead of  
 1275 just the media loaded in the Printer.

1276 Because the number and size of values of this attribute can be very large, the Printer MUST  
 1277 NOT return this attribute in the response to the Get-Printer-Attributes operation unless the  
 1278 Client explicitly requests it by including the 'media-col-database' value in the "requested-  
 1279 attributes" [STD92] operation attribute.

1280 In order to limit the number and size of values of this attribute, Printers MAY exclude the  
 1281 "media-source" and/or "media-type" member attributes from collection values when all

Deleted: [PWG5100.3]

Deleted: If this attribute is supported, the members of the collections correspond to the supported members of the "media-col" [PWG5100.3] Job/Document Template attribute.

1287 values of the corresponding member attribute are supported when combined with the other  
1288 member attributes and values.

1289 [Because a Printer may support multiple values for the "media-bottom-margin", "media-left-](#)  
1290 [margin", "media-right-margin", and "media-top-margin" member attributes, a Printer MAY](#)  
1291 [only enumerate the best \(smallest\) values of these attributes to reduce the number of](#)  
1292 [collection values returned in the "media-col-database" attribute. However, if full-bleed and](#)  
1293 [non-full-bleed margins have a significant performance, scaling, or quality differences, a](#)  
1294 [Printer MUST enumerate both the full-bleed \(all zeroes\) and smallest non-zero hardware](#)  
1295 [margins in the "media-col-database" attribute.](#)

1296 For example, a Printer that supports ISO A4, ISO DL Envelope, US Letter, US Legal, and  
1297 US #10 Envelope media, a single removable tray and a multi-purpose tray, and cardstock,  
1298 envelopes, plain paper, labels, letterhead, and transparency media types might report the  
1299 following attributes and values:

```
1300     media-size-supported={...}
1301     media-source-supported='by-pass-tray','main','manual'
1302     media-type-supported='cardstock','envelope','labels','stationery',
1303                          'stationery-letterhead','transparency'
1304     media-col-database={
1305         /* ISO A4 cardstock only from manual feed */
1306         media-size={
1307             x-dimension=21000
1308             y-dimension=29700
1309         }
1310         media-source='manual'
1311         media-type='cardstock'
1312     },{
1313         /* ISO A4 transparency only from manual feed */
1314         media-size={
1315             x-dimension=21000
1316             y-dimension=29700
1317         }
1318         media-source='manual'
1319         media-type='transparency'
1320     },{
1321         /* ISO A4 plain paper from any source */
1322         media-size={
1323             x-dimension=21000
1324             y-dimension=29700
1325         }
1326         media-type='stationery'
1327     },{
1328         /* ISO A4 letterhead from any source */
1329         media-size={
1330             x-dimension=21000
1331             y-dimension=29700
1332         }
1333         media-type='stationery-letterhead'
1334     },... /* Lots of other values */
```

1335 **5.5.33 media-col-default (collection)**

1336 [This REQUIRED attribute specifies the default value of the "media-col" Job Template](#)  
1337 [attribute \(section 5.3.1\). Printers that conform to this specification MUST support the "media-](#)  
1338 [default" Printer Description attribute \[STD92\]. The "media-default" and "media-col-default"](#)  
1339 [Printer attributes MUST both be configured to specify the same media instance. If the](#)  
1340 [Administrator sets one of them to a value \(either locally or with the Set-Printer-Attributes](#)  
1341 [\[RFC3380\] operation\), the Printer MUST set the other attribute's value to the same media](#)  
1342 [instance or to the 'unknown' out-of-band value, if there isn't a corresponding value to be set](#)  
1343 [for the other attribute. If a Client attempts to set both attributes, but their values specify](#)  
1344 [different media instances, the Printer MUST reject the Set-Printer-Attributes operation and](#)  
1345 [return the 'client-error-conflicting-attributes' status code.](#)

1346 **5.5.34 media-col-ready (1setOf collection)**

1347 [This REQUIRED attribute lists the "media-col" \(section 5.3.1\) values representing media](#)  
1348 [that are available for use without human intervention, i.e., the media that are ready to be](#)  
1349 [printed on without interaction. Printers that conform to this specification MUST support the](#)  
1350 ["media-ready" Printer Description attribute \[STD92\]. The  \$i^{\text{th}}\$  value of the "media-col-ready"](#)  
1351 [attribute corresponds to the  \$i^{\text{th}}\$  value of the "media-ready" attribute so that the Client can](#)  
1352 [correlate the media names or keywords with the collection values and determine the](#)  
1353 [characteristics of each ready media instance.](#)

1354 **5.5.35 media-col-supported (1setOf keyword)**

1355 [This REQUIRED attribute lists the supported member attributes of the "media-col"](#)  
1356 [Job/Document Template attribute \(section 5.3.1\).](#)

1357 **5.5.36 media-color-supported (1setOf (type2 keyword | name(MAX)))**

1358 [This attribute lists the supported values of the "media-color" member attribute \(section](#)  
1359 [5.3.1.4\). Printers that support the "media-color" member attribute MUST support this](#)  
1360 [attribute.](#)

1361 **5.5.37 media-front-coating-supported (1setOf (type2 keyword | name(MAX)))**

1362 [This attribute lists the supported values of the "media-front-coating" member attribute](#)  
1363 [\(section 5.3.1.5\). Printers that support the "media-front-coating" member attribute MUST](#)  
1364 [support this attribute.](#)

1365 **5.5.38 media-grain-supported (1setOf (type2 keyword | name(MAX)))**

1366 [This attribute lists the supported values of the "media-grain" member attribute \(section](#)  
1367 [5.3.1.6\). Printers that support the "media-grain" member attribute MUST support this](#)  
1368 [attribute.](#)

1369 **5.5.39 media-hole-count-supported (1setOf rangeOfInteger(0:MAX))**

1370 This attribute lists the supported ranges of values of the "media-hole-count" member  
1371 attribute (section 5.3.1.6). Printers that support the "media-hole-count" member attribute  
1372 MUST support this attribute.

1373 **5.5.40 media-key-supported (1setOf (type2 keyword | name(MAX)))**

1374 This attribute lists the supported values of the "media-key" member attribute (section  
1375 5.3.1.9). Printers that support the "media-key" member attribute MUST support this attribute.

1376 **5.5.41 media-left-margin-supported (1setOf integer(0:MAX))**

1377 This REQUIRED attribute lists the supported values for the "media-left-margin" member  
1378 attribute (section 5.3.1.10).

1379 **5.5.42 media-order-count-supported (1setOf rangeOfInteger(1:MAX))**

1380 This attribute lists the ranges of supported values of the "media-order-count" member  
1381 attribute (section 5.3.1.8). Printers that support the "media-order-count" member attribute  
1382 MUST support this attribute.

1383 **5.5.43 media-pre-printed-supported (1setOf (type2 keyword | name(MAX)))**

1384 This attribute lists the supported values of the "media-pre-printed" member attribute (section  
1385 5.3.1.5). Printers that support the "media-pre-printed" member attribute MUST support this  
1386 attribute.

1387 **5.5.44 media-recycled-supported (1setOf (type2 keyword | name(MAX)))**

1388 This attribute lists the supported values of the "media-recycled" member attribute (section  
1389 5.3.1.13). Printers that support the "media-recycled" member attribute MUST support this  
1390 attribute and MUST include the 'none' keyword value.

1391 **5.5.45 media-right-margin-supported (1setOf integer(0:MAX))**

1392 This REQUIRED attribute lists the supported values for the "media-right-margin" member  
1393 attribute (section 5.3.1.14).

1394 **5.5.46 media-size-supported (1setOf collection)**

1395 This REQUIRED attribute lists the supported values of the "media-size" member attribute  
1396 (section 5.3.1.12). Unlike the "media-size" member attribute, the "x-dimension" and "y-  
1397 dimension" member attributes of "media-size-supported" have a syntax of "integer(1:MAX)  
1398 |rangeOfInteger(1:MAX)" to allow for arbitrary ranges of sizes for custom and roll-fed media.

- 1399 **[5.5.47 media-source-supported \(1setOf \(type2 keyword | name\(MAX\)\)\)](#)**
- 1400 [This REQUIRED attribute lists the supported values of the "media-source" member attribute](#)  
1401 [\(section 5.3.1.17\).](#)
- 1402 **[5.5.48 media-thickness-supported \(1setOf rangeOfInteger\(1:MAX\)\)](#)**
- 1403 [This attribute lists the ranges of supported values for the "media-thickness" member attribute](#)  
1404 [\(section 5.3.1.19\). Printers that support the "media-thickness" member attribute MUST](#)  
1405 [support this attribute.](#)
- 1406 **[5.5.49 media-tooth-supported \(1setOf \(type2 keyword | name\(MAX\)\)\)](#)**
- 1407 [This attribute lists the supported values of the "media-tooth" member attribute \(section](#)  
1408 [5.3.1.20\). Printers that support the "media-tooth" member attribute MUST support this](#)  
1409 [attribute.](#)
- 1410 **[5.5.50 media-top-margin-supported \(1setOf integer\(0:MAX\)\)](#)**
- 1411 [This REQUIRED attribute lists the supported values for the "media-top-margin" member](#)  
1412 [attribute \(section 5.3.1.21\).](#)
- 1413 **[5.5.51 media-type-supported \(1setOf \(type2 keyword | name\(MAX\)\)\)](#)**
- 1414 [This REQUIRED attribute lists the supported values of the "media-type" member attribute](#)  
1415 [\(section 5.3.1.21\).](#)
- 1416 **[5.5.52 media-weight-metric-supported \(1setOf rangeOfInteger\(1:MAX\)\)](#)**
- 1417 [This attribute lists the supported ranges of values of the "media-weight-metric" member](#)  
1418 [attribute \(section 5.3.1.23\). Printers that support the "media-weight-metric" member attribute](#)  
1419 [MUST support this attribute.](#)
- 1420 **[5.5.53 output-device-supported \(1setOf name\(127\)\)](#)**
- 1421 This CONDITIONALLY REQUIRED attribute lists the supported "output-device" values.  
1422 Printers MUST support this attribute if the "output-device" Job Template attribute (section  
1423 5.3.1) is supported.
- 1424 **[5.5.54 print-content-optimize-default \(type2 keyword\)](#)**
- 1425 This CONDITIONALLY REQUIRED attribute specifies the default "print-content-optimize"  
1426 (section 5.3.3) value. Printers that support the "print-content-optimize" attribute MUST  
1427 support this attribute.

1428 **5.5.55 print-content-optimize-supported (1setOf type2 keyword)**

1429 This CONDITIONALLY REQUIRED attribute lists the supported “print-content-optimize”  
1430 (section 5.3.3) values. Printers that support the "print-content-optimize" attribute MUST  
1431 support this attribute.

1432 **5.5.56 which-jobs-supported (1setOf type2 keyword)**

1433 This REQUIRED attribute lists the supported values for the "which-jobs" operation attribute  
1434 [STD92] that is used with the Get-Jobs operation [STD92].

1435 **5.6 Printer Status Attributes**

1436 **5.6.1 printer-detailed-status-messages (1setOf text(MAX))**

1437 This attribute specifies additional detailed and technical information about the Printer,  
1438 including information such as fault and warning messages, in the same way that the “job-  
1439 detailed-status-messages” [STD92] Job Status attribute provides additional information  
1440 about a Job. Because the messages are human-readable text, Clients MUST NOT attempt  
1441 to parse the value(s) of this attribute.

1442 **6. Additional Semantics for Existing Operations**

1443 **6.1 Create-Job, Print-Job, Print-URI, Validate-Job: job-mandatory-  
1444 attributes**

1445 This specification extends the Create-Job, Print-Job, Print-URI, and Validate-Job operations  
1446 to support the "job-mandatory-attributes" operation attribute (section 5.1.4) in the request  
1447 sent by the Client, which specifies a list of Job Template attributes that MUST be supported  
1448 by the Printer for the request to be accepted.

1449 The Client MAY supply and the Printer MUST accept the “job-mandatory-attributes”  
1450 operation attribute in any Job Creation or Validate-Job request.

1451 The Printer MUST reject the Job Creation request if the Client supplies an unsupported Job  
1452 Template attribute or value in the request that is included in this list of "job-mandatory-  
1453 attributes" values.

1454 If the Client supplies both the “job-mandatory-attributes” and "ipp-attribute-fidelity” operation  
1455 attributes, the Printer MUST ignore the “job-mandatory-attributes” attribute.

1456 **6.2 Create-Job, Print-Job, Print-URI: server-error-too-many-jobs Status**  
1457 **Code**

1458 This specification extends the Job Creation operations to return the 'server-error-too-many-  
1459 jobs' status code value when the Printer is currently unable to create a new Job object.

1460 **6.3 Get-Jobs Operation: "job-ids (1setOf integer(1:MAX))"**

1461 The "job-ids" (section 5.1.3) operation attribute, if supplied, specifies a list of target Jobs to  
1462 be returned in the response to a Get-Jobs [STD92] request. Printers MUST support it in Get-  
1463 Jobs requests to limit the list of Jobs that are returned.

1464 If the Client supplies the "job-ids" operation attribute in a Get-Jobs request, the Client MUST  
1465 NOT also supply any of the following operation attributes in the same request: "limit", "my-  
1466 jobs", or "which-jobs". If the Client does supply prohibited operation attributes, the Printer  
1467 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

1468 **6.4 Hold-Job Operation: "job-hold-until-time (dateTime)"**

1469 The "job-hold-until-time" (section 5.1.1) operation attribute can be provided to specify a date  
1470 and time when the Job will become a candidate for processing. Printers that support the  
1471 "job-hold-until-time" attribute and Hold-Job operation MUST support its use with the Hold-  
1472 Job operation. If accepted, the "job-hold-until-time" operation attribute is copied to the Job,  
1473 replacing any existing "job-hold-until" [STD92] or "job-hold-until-time" attribute.

1474 Clients MUST NOT send both the "job-hold-until" [STD92] and "job-hold-until-time" operation  
1475 attributes in a Hold-Job request. If both attributes are sent, Printers MUST reject the request  
1476 and return the 'client-error-conflicting-attributes' status code.

1477 **6.5 Print-Job, Print-URI, Send-Document, Send-URI: server-error-too-**  
1478 **many-documents Status Code**

1479 This specification extends the Document Creation operations to return the 'server-error-too-  
1480 many-documents' status code value when the Printer is currently unable to create a new  
1481 Document object.

1482 **6.6 Set-Job-Attributes Operation: "job-hold-until-time (dateTime)"**

1483 The "job-hold-until-time" (section 5.4.6) Job Template attribute can be provided to specify a  
1484 date and time when the Job will become a candidate for processing. Printers that support  
1485 the "job-hold-until-time" attribute and Set-Job-Attributes operation MUST support its use with  
1486 the Set-Job-Attributes operation. If accepted, the "job-hold-until-time" operation attribute is  
1487 copied to the Job, replacing any existing "job-hold-until" [STD92] or "job-hold-until-time"  
1488 attribute.



1489 Clients MUST NOT send both the "job-hold-until" [STD92] and "job-hold-until-time" Job  
1490 Template attributes in a Set-Job-Attributes request. If both attributes are sent, Printers  
1491 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

## 1492 7. Additional Values for Existing Attributes

### 1493 7.1 job-sheets (type2 keyword | name(MAX))

1494 The following additional values are defined for the "job-sheets" Job Template attribute  
1495 [STD92]:

1496 'job-start-sheet': A Job Sheet is printed to indicate the start of the Job.

1497 'job-end-sheet': A Job Sheet is printed to indicate the end of the Job.

1498 'job-both-sheets': Job Sheets is printed to indicate the start and end of all the output  
1499 associated with the Job.

1500 'first-print-stream-page': The first Input Page in the Document Data is printed as the  
1501 Job Sheet and the Printer's standard Job Sheet is suppressed.

### 1502 7.2 job-state-reasons (1setOf type2 keyword)

1503 This specification adds the following new keyword values for the "job-state-reasons" Job  
1504 Status attribute [STD92]:

1505 'digital-signature-did-not-verify': One or more documents in the Job contains a  
1506 digital signature that could not be verified by the Printer.

1507 'errors-detected': The Printer has detected one or more errors during processing of  
1508 the Job.

1509 'job-delay-until-specified': The Job's output is delayed because the "job-delay-  
1510 output-until" or "job-delay-output-until-time" Job Template attribute was specified.

1511 'warnings-detected': The Printer has detected one or more warnings during  
1512 processing of the Job.

### 1513 7.3 media (type2 keyword | name(MAX))

1514 This specification adds the following new keyword value for the "media" Job Template  
1515 attribute [STD92]:

1516 'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in': Print using US Letter or ISO A4  
1517 media (whichever is available).

1518 Note: The semantics of the 'choice' prefix are documented in the PWG Media Standardized  
1519 Names v2.0 (MSN2) specification [PWG5101.1].

#### 1520 7.4 pdl-override-supported (type2 keyword)

1521 This specification defines a new 'guaranteed' value for the "pdl-override-supported" [STD92]  
1522 Printer Description attribute. This value indicates that the Printer guarantees that:

- 1523 1. Document and/or Job Template attribute values take precedence over instructions of  
1524 any form embedded anywhere in the Document data;
- 1525 2. Document and/or Job Template attributes that have only a single supported value  
1526 take precedence over instructions of any form embedded anywhere in the Document  
1527 data, even if the attribute is not included in the Job or Document Creation request;  
1528 and
- 1529 3. No PDL instruction is performed that does not correspond to a current value in the  
1530 corresponding "xxx-supported" Printer Description attribute.

1531 If a Printer cannot honor the advertised "pdl-override-supported" value for a Job, it can abort  
1532 the Job, stop the Printer, hold the Job, or substitute a supported value. This choice can be  
1533 fixed by the implementation or configurable by the Administrator and can depend on the  
1534 Document and/or Job Template attribute.

#### 1535 7.5 which-jobs (type2 keyword)

1536 This specification adds the following new keyword values for the "which-jobs" operation  
1537 attribute [STD92]:

- 1538 'aborted': Any Job in the 'aborted' state.
- 1539 'all': All Jobs regardless of state.
- 1540 'canceled': Any Job in the 'canceled' state.
- 1541 'pending': Any Job in the 'pending' state.
- 1542 'pending-held': Any Job in the 'pending-held' state.
- 1543 'processing': Any Job in the 'processing' state.
- 1544 'processing-stopped': Any Job in the 'processing-stopped' state.

### 1545 8. New Status Codes

1546 This section defines additional status code values.

**Deleted: <#>media-col (collection)** ¶  
 <#>This specification adds the "media-grain", "media-thickness", and "media-tooth" member attributes to the "media-col" Job/Document Template attribute. ¶  
 <#>**media-grain (type2 keyword | name(MAX))** ¶  
 <#>This member attribute specifies the desired grain of the media being specified [ISO10175]. Grain affects the curl and the folding of the media. Some marking engines are sensitive to the resulting curl. Standard keyword values for "media-grain" include: ¶  
 <#>'x-direction': The direction of the paper fibers is in the cross-feed direction of the media. ¶  
 <#>'y-direction': The direction of the paper fibers is in the feed direction of the media. ¶  
 <#>**media-thickness (integer(1:MAX))** ¶  
 <#>This member attribute specifies the thickness of the media [JDF] in hundreds of millimeters (1/2540th of an inch). ¶  
 <#>**media-tooth (type2 keyword | name(MAX))** ¶  
 <#>This member attribute specifies the tooth (or roughness) of the media [ISO10175]. The tooth is particularly important for marking engines that use pens (e.g. plotters) to mark the media - the type of pen used matches the tooth of the media for best resolution. ¶  
 <#>Standard keyword values for "media-tooth" include: ¶  
 <#>'antique': Rougher than 'vellum' [JDF]. ¶  
 <#>'calendared': Extra smooth or polished, uncoated paper [JDF]. ¶  
 <#>'coarse': Rough finish. ¶  
 <#>'fine': Smoother finish than 'smooth'. ¶  
 <#>'linen': Finish like coarse woven cloth [JDF]. ¶  
 <#>'medium': Regular finish. ¶  
 <#>'smooth': Smooth finish [JDF]. ¶  
 <#>'stipple': Fine pebble finish [JDF]. ¶  
 <#>'uncalendared': Rough, unpolished and uncoated papers [JDF]. ¶  
 <#>'vellum': Slightly rough surface [JDF]. ¶

1590 **8.1 server-error-too-many-jobs (0x050B)**

1591 The Client has attempted to create a Job using any of the Job Creation operations which  
1592 would exceed the capacity of the Printer. The Client can retry the unmodified request.

1593 **8.2 server-error-too-many-documents (0x050C)**

1594 The Client has attempted to create a Document using any of the Document Creation  
1595 operations which would exceed the capacity of the Printer for this Job. The Client can retry  
1596 the unmodified request.

1597

1598 **9. Obsolete Attributes**1599 **9.1 Obsolete Operation Attributes**

1600 Table 6 lists the operation attributes from the previous version of this specification  
1601 [PWG5100.7-2003] which are now OBSOLETE.

1602 **Table 6 - OBSOLETE Operation Attributes**

Attribute	Notes
document-digital-signature (type2 keyword)	Not usable
document-format-version (text(127))	Interoperability issues

1603 **9.2 Obsolete Member Attributes**

1604 Table 7 lists the member attributes of the "document-format-details" operation attribute  
1605 (section ) which are now OBSOLETE.

1606 **Table 7 - OBSOLETE "document-format-details" Member Attributes**

Member Attribute	Notes
document-format (mimeMediaType)	Redundant, security issues
document-format-device-id (text(127))	Too short, not used
document-format-version (text(127))	Redundant, obsolete parent attribute
document-natural-language (1setOf naturalLanguage)	Redundant, nnot used

1607 **9.3 Obsolete Job Status Attributes**

1608 Table 8 lists the Job Status attributes from the previous version of this specification  
1609 [PWG5100.7-2003] which are now OBSOLETE.

1610 **Table 8 - OBSOLETE Job Status Attributes**

Attribute	Notes
compression-supported (type2 keyword)	Not usable
document-charset-supported (charset)	Superseded by PWG 5100.5
document-digital-signature-supplied (type2 keyword)	Obsolete parent attribute
document-format-supplied (mimeMediaType)	Superseded by PWG 5100.5
document-format-version-supplied (text(127))	Obsolete parent attribute
document-message-supplied (text(MAX))	Superseded by PWG 5100.5
document-name-supplied	Superseded by PWG 5100.5
document-natural-language-supplied (naturalLanguage)	Superseded by PWG 5100.5
ipp-attribute-fidelity (boolean)	Only used at time of creation
job-copies-actual (integer(1:MAX))	Obsolete parent attribute

Attribute	Notes
job-cover-back-actual (collection)	Obsolete parent attribute
job-cover-front-actual (collection)	Obsolete parent attribute
job-finishings-actual (1setOf type2 enum)	Obsolete parent attribute
job-finishings-col-actual (1setOf collection)	Obsolete parent attribute
job-mandatory-attributes (1setOf keyword)	Only used at time of creation
output-device-actual (1setOf name(127))	Redundant

#### 1611 9.4 Obsolete Job Template Attributes

1612 Table 9 lists the Job Templates attributes from the previous version of this specification  
1613 [PWG5100.7-2003] which are now OBSOLETE.

1614 **Table 9 - OBSOLETE Job Template Attributes**

Attribute	Notes
job-copies (integer(1:MAX))	Interoperability issues
job-cover-back (collection)	Interoperability issues
job-cover-front (collection)	Interoperability issues
job-finishings (1setOf type2 enum)	Interoperability issues
job-finishings-col (1setOf collection)	Interoperability issues

#### 1615 9.5 Obsolete Printer Description Attributes

1616 The following Printer Description attributes from the previous version of this specification  
1617 [PWG5100.7-2003] which are now OBSOLETE.

1618 **Table 10 - OBSOLETE Printer Description Attributes**

Attribute	Notes
document-digital-signature-default (type2 keyword)	Obsolete parent attribute
document-digital-signature-supported (1setOf type2 keyword)	Obsolete parent attribute
document-format-details-default (collection)	Does not make sense
document-format-version-default (text(127))	Obsolete parent attribute
document-format-version-supported (1setOf text(127))	Obsolete parent attribute
job-copies-default (integer(1:MAX))	Obsolete parent attribute
job-copies-supported (rangeOfInteger(1:MAX))	Obsolete parent attribute
job-cover-back-default (collection)	Obsolete parent attribute
job-cover-back-supported (1setOf keyword)	Obsolete parent attribute
job-cover-front-default (collection)	Obsolete parent attribute
job-cover-front-supported (1setOf keyword)	Obsolete parent attribute
job-finishings-col-default (1setOf collection)	Obsolete parent attribute
job-finishings-col-ready (1setOf collection)	Obsolete parent attribute
job-finishings-col-supported (1setOf keyword)	Obsolete parent attribute

Deleted: r

Attribute	Notes
job-finishings-default (1setOf type2 enum)	Obsolete parent attribute
job-finishings-ready (1setOf type2 enum)	Obsolete parent attribute
job-finishings-supported (1setOf type2 enum)	Obsolete parent attribute
<a href="#">media-info-supported (boolean)</a>	<a href="#">Unnecessary attribute</a>

## 1620 10. Obsolete Values

### 1621 10.1 Obsolete "job-state-reasons" Values

1622 The 'digital-signature-type-not-supported' and 'job-digital-signature-wait' keyword values  
 1623 from the previous version of this specification [PWG5100.7-2003] are now OBSOLETE  
 1624 because the corresponding Job Template attribute is OBSOLETE.

## 1625 11. Conformance Requirements

### 1626 11.1 Printer Conformance Requirements

1627 In order for a Printer to claim conformance to this specification, a Printer MUST support:

- 1628 1. The new operations defined in section 4;
- 1629 2. The operation attributes defined in 5.1;
- 1630 3. The Job Status attributes defined in section 5.2 that correspond to any  
 1631 supported Job Template attributes defined in section 5.3;
- 1632 4. The Document Status attributes defined in section 5.2 that correspond to any  
 1633 supported Document Template attributes defined in section 5.3;
- 1634 5. The Printer Description attributes defined in section 5.5 that correspond to any  
 1635 supported Document/Job Template attributes defined in section 5.3;
- 1636 6. The additional semantics defined in section 6;
- 1637 7. The additional values defined in section 7;
- 1638 8. The internationalization considerations defined in section 12; and
- 1639 9. The security considerations defined in section 13.

### 1640 11.2 Client Conformance Requirements

1641 In order for a Client to claim conformance to this specification, a Client MUST support:

- 1642 1. The internationalization considerations defined in section 12; and
- 1643 2. The security considerations defined in section 13.

**1644 12. Internationalization Considerations**

1645 For interoperability and basic support for multiple languages, conforming implementations  
1646 MUST support:

- 1647 1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)  
1648 [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
- 1649 2. The Unicode Format for Network Interchange [RFC5198] which requires  
1650 transmission of well-formed UTF-8 strings and recommends transmission of  
1651 normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

1652 Unicode NFC is defined as the result of performing Canonical Decomposition (into base  
1653 characters and combining marks) followed by Canonical Composition (into canonical  
1654 composed characters wherever Unicode has assigned them).

1655 WARNING – Performing normalization on UTF-8 strings received from Clients and  
1656 subsequently storing the results (e.g., in Job objects) could cause false negatives in Client  
1657 searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now  
1658 'hidden').

1659 Implementations of this specification SHOULD conform to the following standards on  
1660 processing of human-readable Unicode text strings, see:

- 1661 Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical
- 1662 Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping
- 1663 Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]
- 1664 Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences
- 1665 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization
- 1666 Unicode Collation Algorithm [UTS10] – sorting
- 1667 Unicode Locale Data Markup Language [UTS35] – locale databases

1668 Implementations of this specification are advised to also review the following informational  
1669 documents on processing of human-readable Unicode text strings:

- 1670 Unicode Character Encoding Model [UTR17] – multi-layer character model
- 1671 Unicode Character Property Model [UTR23] – character properties
- 1672 Unicode Conformance Model [UTR33] – Unicode conformance basis

## 1673 13. Security Considerations

1674 The IPP extensions defined in this document require the same security considerations as  
1675 defined in the Internet Printing Protocol/1.1 [STD92].

1676 Implementations of this specification SHOULD conform to the following standard on  
1677 processing of human-readable Unicode text strings, see:

1678       Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

1679 Implementations of this specification are advised to also review the following informational  
1680 document on processing of human-readable Unicode text strings:

1681       Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

## 1682 14. IANA Considerations

### 1683 14.1 Attribute Registrations

1684 The attributes defined in this specification will be published by IANA according to the  
1685 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1686       <http://www.iana.org/assignments/ipp-registrations>

1687 The registry entries will contain the following information:

1688	Document Status attributes:	Reference
1689	-----	-----
1690	document-format-details(deprecated) (collection)	[PWG5100.7]
1691	document-format-details-detected(deprecated) (collection)	[PWG5100.7]
1692	document-format-supplied(obsolete) (mimeMediaType)	[PWG5100.7]
1693	document-format-version-supplied(obsolete) (text(127))	[PWG5100.7]
1694	document-message-supplied(obsolete) (text(MAX))	[PWG5100.7]
1695	document-name-supplied(obsolete) (name(MAX))	[PWG5100.7]
1696	errors-count (integer(0:MAX))	[PWG5100.7]
1697	output-device-actual(obsolete) (1setOf name(127))	[PWG5100.7]
1698	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
1699	warnings-count (integer(0:MAX))	[PWG5100.7]
1700		
1701	Document Template attributes:	Reference
1702	-----	-----
1703	<a href="#">media-col (collection)</a>	[PWG5100.7]
1704	<a href="#">&lt;Any "media-col" member attribute&gt;</a>	[PWG5100.7]
1705	output-device (name(127))	[PWG5100.7]
1706	print-content-optimize (type2 keyword)	[PWG5100.7]
1707		
1708	Job Status attributes:	Reference
1709	-----	-----
1710	compression-supplied(obsolete) (type2 keyword)	[PWG5100.7]
1711	document-charset-supplied(obsolete) (charset)	[PWG5100.7]



1712	document-digital-signature-supplied(obsolete) (type2 keyword)	
1713		[PWG5100.7]
1714	document-format-details(deprecated) (collection)	[PWG5100.7]
1715	document-format-details-detected(deprecated) (collection)	[PWG5100.7]
1716	document-format-details-supplied(obsolete) (1setOf collection)	
1717		[PWG5100.7]
1718	document-format-supplied(obsolete) (mimeMediaType)	[PWG5100.7]
1719	document-format-version-supplied(obsolete) (text(127))	[PWG5100.7]
1720	document-message-supplied(obsolete) (text(MAX))	[PWG5100.7]
1721	document-name-supplied(obsolete) (name(MAX))	[PWG5100.7]
1722	document-natural-language-supplied(obsolete) (naturalLanguage)	
1723		[PWG5100.7]
1724	errors-count (integer(0:MAX))	[PWG5100.7]
1725	ipp-attribute-fidelity(obsolete) (boolean)	[PWG5100.7]
1726	job-copies-actual(obsolete) (integer(1:MAX))	[PWG5100.7]
1727	job-cover-back-actual(obsolete) (collection)	[PWG5100.7]
1728	job-cover-front-actual(obsolete) (collection)	[PWG5100.7]
1729	job-finishings-actual(obsolete) (1setOf type2 enum)	[PWG5100.7]
1730	job-finishings-col-actual(obsolete) (1setOf collection)	[PWG5100.7]
1731	job-mandatory-attributes(obsolete) (1setOf keyword)	[PWG5100.7]
1732	output-device-actual(obsolete) (1setOf name(127))	[PWG5100.7]
1733	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
1734	warnings-count (integer(0:MAX))	[PWG5100.7]
1735		
1736	Job Template attributes:	Reference
1737	-----	-----
1738	<a href="#">job-account-id (name(MAX))</a>	[PWG5100.7]
1739	<a href="#">job-accounting-user-id (name(MAX))</a>	[PWG5100.7]
1740	job-cancel-after (integer(0:MAX))	[PWG5100.7]
1741	job-copies(obsolete) (integer(1:MAX))	[PWG5100.7]
1742	job-cover-back(obsolete) (collection)	[PWG5100.7]
1743	job-cover-front(obsolete) (collection)	[PWG5100.7]
1744	job-delay-output-until (type2 keyword   name(MAX))	[PWG5100.7]
1745	job-delay-output-until-time (dateTime)	[PWG5100.7]
1746	job-hold-until-time (dateTime)	[PWG5100.7]
1747	job-finishings(obsolete) (1setOf type2 enum)	[PWG5100.7]
1748	job-finishings-col(obsolete) (1setOf collection)	[PWG5100.7]
1749	job-retain-until (type2 keyword   name(MAX))	[PWG5100.7]
1750	job-retain-until-interval (integer(0:MAX))	[PWG5100.7]
1751	job-retain-until-time (dateTime)	[PWG5100.7]
1752	<a href="#">job-sheets-col (collection)</a>	[PWG5100.7]
1753	<a href="#">job-sheets (type2 keyword   name(MAX))</a>	[PWG5100.7]
1754	<a href="#">media (type2 keyword   name(MAX))</a>	[PWG5100.7]
1755	<a href="#">media-col (collection)</a>	[PWG5100.7]
1756	<a href="#">media-col (collection)</a>	[PWG5100.7]
1757	<a href="#">media-back-coating (type2 keyword   name(MAX))</a>	[PWG5100.7]
1758	<a href="#">media-bottom-margin (integer(0:MAX))</a>	[PWG5100.7]
1759	<a href="#">media-color (type2 keyword   name(MAX))</a>	[PWG5100.7]
1760	<a href="#">media-front-coating (type2 keyword   name(MAX))</a>	[PWG5100.7]
1761	<a href="#">media-grain (type2 keyword   name(MAX))</a>	[PWG5100.7]
1762	<a href="#">media-hole-count (integer(0:MAX))</a>	[PWG5100.7]
1763	<a href="#">media-info (text(255))</a>	[PWG5100.7]
1764	<a href="#">media-key (type2 keyword   name(MAX))</a>	[PWG5100.7]
1765	<a href="#">media-left-margin (integer(0:MAX))</a>	[PWG5100.7]
1766	<a href="#">media-order-count (integer(1:MAX))</a>	[PWG5100.7]
1767	<a href="#">media-pre-printed (type2 keyword   name(MAX))</a>	[PWG5100.7]

1768	<a href="#">media-recycled (type2 keyword   name(MAX))</a>	[PWG5100.7]
1769	<a href="#">media-right-margin (integer(0:MAX))</a>	[PWG5100.7]
1770	<a href="#">media-size (collection)</a>	[PWG5100.7]
1771	<a href="#">x-dimension (integer(0:MAX))</a>	[PWG5100.7]
1772	<a href="#">y-dimension (integer(0:MAX))</a>	[PWG5100.7]
1773	<a href="#">media-size-name (type2 keyword   name(MAX))</a>	[PWG5100.7]
1774	<a href="#">media-source (type2 keyword   name(MAX))</a>	[PWG5100.7]
1775	<a href="#">media-thickness (integer(1:MAX))</a>	[PWG5100.7]
1776	<a href="#">media-tooth (type2 keyword   name(MAX))</a>	[PWG5100.7]
1777	<a href="#">media-top-margin (integer(0:MAX))</a>	[PWG5100.7]
1778	<a href="#">media-type (type2 keyword   name(MAX))</a>	[PWG5100.7]
1779	<a href="#">media-weight-metric (integer(0:MAX))</a>	[PWG5100.7]
1780	<a href="#">output-device (name(127))</a>	[PWG5100.7]
1781	<a href="#">print-content-optimize (type2 keyword)</a>	[PWG5100.7]
1782		
1783	Operation attributes:	Reference
1784	-----	-----
1785	<a href="#">document-digital-signature(obsolete) (type2 keyword)</a>	[PWG5100.7]
1786	<a href="#">document-format-details(deprecated) (collection)</a>	[PWG5100.7]
1787	<a href="#">document-format(obsolete) (mimeMediaType)</a>	[PWG5100.7]
1788	<a href="#">document-format-device-id(obsolete) (text(127))</a>	[PWG5100.7]
1789	<a href="#">document-format-version(obsolete) (text(127))</a>	[PWG5100.7]
1790	<a href="#">document-natural-language(obsolete) (1setOf naturalLanguage)</a>	[PWG5100.7]
1791		
1792	<a href="#">document-source-application-name (name(MAX))</a>	[PWG5100.7]
1793	<a href="#">document-source-application-version (text(127))</a>	[PWG5100.7]
1794	<a href="#">document-source-os-name (name(40))</a>	[PWG5100.7]
1795	<a href="#">document-source-os-version (text(40))</a>	[PWG5100.7]
1796	<a href="#">document-format-version(obsolete) (text(127))</a>	[PWG5100.7]
1797	<a href="#">job-hold-until-time (dateTime)</a>	[PWG5100.7]
1798	<a href="#">job-ids (1setOf integer(1:MAX))</a>	[PWG5100.7]
1799	<a href="#">job-mandatory-attributes (1setOf keyword)</a>	[PWG5100.7]
1800		
1801	Printer Description attributes:	Reference
1802	-----	-----
1803	<a href="#">document-charset-default (charset)</a>	[PWG5100.7]
1804	<a href="#">document-charset-supported (1setOf charset)</a>	[PWG5100.7]
1805	<a href="#">document-digital-signature-default(obsolete) (type2 keyword)</a>	[PWG5100.7]
1806		
1807	<a href="#">document-digital-signature-supported(obsolete) (1setOf type2 keyword)</a>	[PWG5100.7]
1808		
1809	<a href="#">document-format-details-default(obsolete) (collection)</a>	[PWG5100.7]
1810	<a href="#">document-format-details-supported (1setOf keyword)</a>	[PWG5100.7]
1811	<a href="#">document-format-version-default(obsolete) (text(127))</a>	[PWG5100.7]
1812	<a href="#">document-format-version-supported(obsolete) (1setOf text(127))</a>	[PWG5100.7]
1813		
1814	<a href="#">document-natural-language-default (naturalLanguage)</a>	[PWG5100.7]
1815	<a href="#">document-natural-language-supported (1setOf naturalLanguage)</a>	[PWG5100.7]
1816		
1817	<a href="#">job-cancel-after-default (integer(0:MAX)   no-value)</a>	[PWG5100.7]
1818	<a href="#">job-cancel-after-supported (rangeOfInteger(0:MAX))</a>	[PWG5100.7]
1819	<a href="#">job-copies-default(obsolete) (integer(1:MAX))</a>	[PWG5100.7]
1820	<a href="#">job-copies-supported(obsolete) (rangeOfInteger(1:MAX))</a>	[PWG5100.7]
1821	<a href="#">job-cover-back-default(obsolete) (collection)</a>	[PWG5100.7]
1822	<a href="#">job-cover-back-supported(obsolete) (1setOf keyword)</a>	[PWG5100.7]
1823	<a href="#">job-cover-front-default(obsolete) (collection)</a>	[PWG5100.7]

1824	job-cover-front-supported(obsolete) (1setOf keyword)	[PWG5100.7]
1825	job-creation-attributes-supported (1setOf keyword)	[PWG5100.7]
1826	job-delay-output-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1827	job-delay-output-until-interval-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1828		[PWG5100.7]
1829	job-delay-output-until-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1830		[PWG5100.7]
1831	job-delay-output-until-time-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1832		[PWG5100.7]
1833	job-finishings-col-default(obsolete) (1setOf collection)	[PWG5100.7]
1834	job-finishings-col-ready(obsolete) (1setOf collection)	[PWG5100.7]
1835	job-finishings-col-supported(obsolete) (1setOf keyword)	[PWG5100.7]
1836	job-finishings-default(obsolete) (1setOf type2 enum)	[PWG5100.7]
1837	job-finishings-ready(obsolete) (1setOf type2 enum)	[PWG5100.7]
1838	job-finishings-supported(obsolete) (1setOf type2 enum)	[PWG5100.7]
1839	job-history-attributes-configured (1setOf keyword)	[PWG5100.7]
1840	job-history-attributes-supported (1setOf keyword)	[PWG5100.7]
1841	job-history-interval-configured (integer(0:MAX))	[PWG5100.7]
1842	job-history-interval-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1843	job-ids-supported (boolean)	[PWG5100.7]
1844	job-mandatory-attributes-supported (boolean)	[PWG5100.7]
1845	job-retain-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1846	job-retain-until-interval-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1847	job-retain-until-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1848		[PWG5100.7]
1849	job-retain-until-time-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1850	job-spooling-supported (type2 keyword)	[PWG5100.7]
1851	media-back-coating-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1852		[PWG5100.7]
1853	media-bottom-margin-supported (1setOf integer(0:MAX))	[PWG5100.7]
1854	media-col-database (1setOf collection)	[PWG5100.7]
1855	<Any "media-col" member attribute>	[PWG5100.7]
1856	media-source-properties (collection)	[PWG5100.7]
1857	media-source-feed-direction (type2 keyword)	[PWG5100.7]
1858	media-source-feed-orientation (type2 enum)	[PWG5100.7]
1859	media-col-default (collection)	[PWG5100.7]
1860	<Any "media-col" member attribute>	[PWG5100.7]
1861	media-col-ready (1setOf collection)	[PWG5100.7]
1862	<Any "media-col" member attribute>	[PWG5100.7]
1863	media-source-properties (collection)	[PWG5100.7]
1864	media-source-feed-direction (type2 keyword)	[PWG5100.7]
1865	media-source-feed-orientation (type2 enum)	[PWG5100.7]
1866	media-col-supported (1setOf keyword)	[PWG5100.3]
1867	media-color-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1868	media-front-coating-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1869		[PWG5100.7]
1870	media-grain-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1871	media-hole-count-supported (1setOf rangeOfInteger(0:MAX))	[PWG5100.7]
1872	media-key-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1873	media-info-supported(obsolete) (boolean)	[PWG5100.7]
1874	media-left-margin-supported (1setOf integer(0:MAX))	[PWG5100.7]
1875	media-order-count-supported (1setOf rangeOfInteger(1:MAX))	[PWG5100.7]
1876	media-pre-printed-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1877		[PWG5100.7]
1878	media-recycled-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1879		[PWG5100.7]

1880	<a href="#">media-right-margin-supported (1setOf integer(0:MAX))</a>	[PWG5100.7]
1881	<a href="#">media-size-supported (1setOf collection)</a>	[PWG5100.7]
1882	<a href="#">x-dimension (integer(1:MAX)   rangeOfInteger(1:MAX))</a>	[PWG5100.7]
1883	<a href="#">y-dimension (integer(1:MAX)   rangeOfInteger(1:MAX))</a>	[PWG5100.7]
1884	<a href="#">media-source-supported (1setOf (type2 keyword   name(MAX)))</a>	[PWG5100.7]
1885		[PWG5100.7]
1886	<a href="#">media-thickness-supported (1setOf rangeOfInteger(1:MAX))</a>	[PWG5100.7]
1887	<a href="#">media-tooth-supported (1setOf (type2 keyword   name(MAX)))</a>	[PWG5100.7]
1888	<a href="#">media-top-margin-supported (1setOf integer(0:MAX))</a>	[PWG5100.7]
1889	<a href="#">media-type-supported (1setOf (type2 keyword   name(MAX)))</a>	[PWG5100.7]
1890	<a href="#">media-weight-metric-supported (1setOf rangeOfInteger(1:MAX))</a>	[PWG5100.7]
1891		[PWG5100.7]
1892	<a href="#">output-device-supported (1setOf name(127))</a>	[PWG5100.7]
1893	<a href="#">print-content-optimize-default (type2 keyword)</a>	[PWG5100.7]
1894	<a href="#">print-content-optimize-supported (1setOf type2 keyword)</a>	[PWG5100.7]
1895	<a href="#">which-jobs-supported (1setOf type2 keyword)</a>	[PWG5100.7]
1896		
1897	Printer Status attributes:	Reference
1898	-----	-----
1899	<a href="#">printer-detailed-status-messages (1setOf text(MAX))</a>	[PWG5100.7]

## 1900 14.2 Type2 keyword Value Registrations

1901 The keyword values defined in this specification will be published by IANA according to the  
1902 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1903 <http://www.iana.org/assignments/ipp-registrations>

1904 The registry entries will contain the following information:

1905	Attributes (attribute syntax)	
1906	Keyword Attribute Value	Reference
1907	-----	-----
1908	<a href="#">job-delay-output-until (type2 keyword   name(MAX))</a>	[PWG5100.7]
1909	day-time	[PWG5100.7]
1910	evening	[PWG5100.7]
1911	indefinite	[PWG5100.7]
1912	night	[PWG5100.7]
1913	no-delay-output	[PWG5100.7]
1914	second-shift	[PWG5100.7]
1915	third-shift	[PWG5100.7]
1916	weekend	[PWG5100.7]
1917	<a href="#">job-delay-output-until-default (type2 keyword   name(MAX))</a>	[PWG5100.7]
1918	<Any "job-delay-output-until" value>	[PWG5100.7]
1919	<a href="#">job-delay-output-until-supported (1setOf (type2 keyword   name(MAX)))</a>	[PWG5100.7]
1920		[PWG5100.7]
1921	<Any "job-delay-output-until" value>	[PWG5100.7]
1922		
1923	<a href="#">job-retain-until (type2 keyword   name(MAX))</a>	[PWG5100.7]
1924	end-of-day	[PWG5100.7]
1925	end-of-month	[PWG5100.7]
1926	end-of-week	[PWG5100.7]
1927	indefinite	[PWG5100.7]
1928	none	[PWG5100.7]

1929	job-retain-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1930	<Any "job-retain-until" value>	[PWG5100.7]
1931	job-retain-until-supported (1setOf (type2 keyword   name(MAX)))	
1932		[PWG5100.7]
1933	<Any "job-retain-until" value>	[PWG5100.7]
1934		
1935	<u>job-sheets (type2 keyword)</u>	<u>[STD92]</u>
1936	<u>first-print-stream-page</u>	<u>[PWG5100.7]</u>
1937	<u>job-both-sheets</u>	<u>[PWG5100.7]</u>
1938	<u>job-end-sheet</u>	<u>[PWG5100.7]</u>
1939	<u>job-start-sheet</u>	<u>[PWG5100.7]</u>
1940		
1941	job-state-reasons (1setOf type2 keyword)	[STD92]
1942	digital-signature-did-not-verify	[PWG5100.7]
1943	digital-signature-type-not-supported(obsolete)	[PWG5100.7]
1944	errors-detected	[PWG5100.7]
1945	job-delay-output-until-specified	[PWG5100.7]
1946	job-digital-signature-wait(obsolete)	[PWG5100.7]
1947	warnings-detected	[PWG5100.7]
1948		
1949	media (type2 keyword   name(MAX))	[STD92]
1950	choice_iso_a4_210x297mm_na_letter_8.5x11in	[PWG5100.7]
1951		
1952	<u>media-back-coating (type2 keyword   name(MAX))</u>	<u>[PWG5100.7]</u>
1953	<u>media-back-coating-supported (1setOf (type2 keyword   name(MAX)))</u>	
1954		<u>[PWG5100.7]</u>
1955	<u>&lt;Any "media-back-coating" value&gt;</u>	<u>[PWG5100.7]</u>
1956		
1957	<u>media-color (type2 keyword   name(MAX))</u>	<u>[PWG5100.7]</u>
1958	<u>media-color-supported (1setOf (type2 keyword   name(MAX)))</u>	<u>[PWG5100.7]</u>
1959	<u>&lt;Any "media-color" value&gt;</u>	<u>[PWG5100.7]</u>
1960		
1961	<u>media-front-coating (type2 keyword   name(MAX))</u>	<u>[PWG5100.7]</u>
1962	<u>&lt;Any "media-back-coating" value&gt;</u>	<u>[PWG5100.7]</u>
1963	<u>media-front-coating-supported (1setOf (type2 keyword   name(MAX)))</u>	
1964		<u>[PWG5100.7]</u>
1965	<u>&lt;Any "media-front-coating" value&gt;</u>	<u>[PWG5100.7]</u>
1966		
1967	<u>media-pre-printed (type2 keyword   name(MAX))</u>	<u>[PWG5100.7]</u>
1968	<u>blank</u>	<u>[PWG5100.7]</u>
1969	<u>letter-head</u>	<u>[PWG5100.7]</u>
1970	<u>pre-printed</u>	<u>[PWG5100.7]</u>
1971	<u>media-pre-printed-supported (1setOf (type2 keyword   name(MAX)))</u>	
1972		<u>[PWG5100.7]</u>
1973	<u>&lt;Any "media-pre-printed" value&gt;</u>	<u>[PWG5100.7]</u>
1974		
1975	<u>media-recycled (type2 keyword   name(MAX))</u>	<u>[PWG5100.7]</u>
1976	<u>none</u>	<u>[PWG5100.7]</u>
1977	<u>standard</u>	<u>[PWG5100.7]</u>
1978	<u>media-recycled-supported (1setOf (type2 keyword   name(MAX)))</u>	
1979		<u>[PWG5100.7]</u>
1980	<u>&lt;Any "media-recycled" value&gt;</u>	<u>[PWG5100.7]</u>
1981		
1982	<u>media-source-feed-direction (type2 keyword)</u>	<u>[PWG5100.7]</u>
1983	<u>long-edge-first</u>	<u>[PWG5100.7]</u>
1984	<u>short-edge-first</u>	<u>[PWG5100.7]</u>

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1987		
1988	media-source (type2 keyword   name(MAX))	[PWG5100.7]
1989	alternate	[PWG5100.7]
1990	alternate-roll	[PWG5100.7]
1991	auto	[PWG5100.7]
1992	bottom	[PWG5100.7]
1993	by-pass-tray	[PWG5100.7]
1994	center	[PWG5100.7]
1995	disc	[PWG5100.7]
1996	envelope	[PWG5100.7]
1997	hagaki	[PWG5100.7]
1998	large-capacity	[PWG5100.7]
1999	left	[PWG5100.7]
2000	main	[PWG5100.7]
2001	main-roll	[PWG5100.7]
2002	manual	[PWG5100.7]
2003	middle	[PWG5100.7]
2004	photo	[PWG5100.7]
2005	rear	[PWG5100.7]
2006	right	[PWG5100.7]
2007	roll-1	[PWG5100.7]
2008	roll-10	[PWG5100.7]
2009	roll-2	[PWG5100.7]
2010	roll-3	[PWG5100.7]
2011	roll-4	[PWG5100.7]
2012	roll-5	[PWG5100.7]
2013	roll-6	[PWG5100.7]
2014	roll-7	[PWG5100.7]
2015	roll-8	[PWG5100.7]
2016	roll-9	[PWG5100.7]
2017	side	[PWG5100.7]
2018	top	[PWG5100.7]
2019	tray-1	[PWG5100.7]
2020	tray-10	[PWG5100.7]
2021	tray-11	[PWG5100.7]
2022	tray-12	[PWG5100.7]
2023	tray-13	[PWG5100.7]
2024	tray-14	[PWG5100.7]
2025	tray-15	[PWG5100.7]
2026	tray-16	[PWG5100.7]
2027	tray-17	[PWG5100.7]
2028	tray-18	[PWG5100.7]
2029	tray-19	[PWG5100.7]
2030	tray-2	[PWG5100.7]
2031	tray-20	[PWG5100.7]
2032	tray-3	[PWG5100.7]
2033	tray-4	[PWG5100.7]
2034	tray-5	[PWG5100.7]
2035	tray-6	[PWG5100.7]
2036	tray-7	[PWG5100.7]
2037	tray-8	[PWG5100.7]
2038	tray-9	[PWG5100.7]
2039	media-source-supported (1setOf (type2 keyword   name(MAX))	
2040		[PWG5100.7]
2041	<Any "media-source" value>	[PWG5100.7]
2042		

2043	<a href="#">media-tooth (type2 keyword   name(MAX))</a>	[PWG5100.7]
2044	<a href="#">media-tooth-supported (1setOf (type2 keyword   name(MAX)))</a>	[PWG5100.7]
2045	<a href="#">&lt;Any "media-tooth" value&gt;</a>	[PWG5100.7]
2046		
2047	<a href="#">media-type (type2 keyword   name(MAX))</a>	[PWG5100.7]
2048	<a href="#">media-type-supported (1setOf (type2 keyword   name(MAX)))</a>	[PWG5100.7]
2049	<a href="#">&lt;Any "media-type" value&gt;</a>	[PWG5100.7]
2050		
2051	pdl-override-supported (type2 keyword)	[STD92]
2052	guaranteed	[PWG5100.7]
2053		
2054	print-content-optimize (type2 keyword)	[PWG5100.7]
2055	graphics	[PWG5100.7]
2056	photo	[PWG5100.7]
2057	text	[PWG5100.7]
2058	text-and-graphics	[PWG5100.7]
2059	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
2060	<Any "print-content-optimize" value>	[PWG5100.7]
2061	print-content-optimize-default (type2 keyword)	[PWG5100.7]
2062	<Any "print-content-optimize" value>	[PWG5100.7]
2063	print-content-optimize-supported (1setOf type2 keyword)	[PWG5100.7]
2064	<Any "print-content-optimize" value>	[PWG5100.7]
2065		
2066	which-jobs (type2 keyword)	[STD92]
2067	aborted	[PWG5100.7]
2068	all	[PWG5100.7]
2069	canceled	[PWG5100.7]
2070	pending	[PWG5100.7]
2071	pending-held	[PWG5100.7]
2072	processing	[PWG5100.7]
2073	processing-stopped	[PWG5100.7]

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2074 **14.3 Type2 enum Registrations**

2075 The attributes defined in this specification will be published by IANA according to the  
 2076 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2077 <http://www.iana.org/assignments/ipp-registrations>

2078 The registry entries will contain the following information:

2079	Attributes (attribute syntax)	
2080	Enum Value Enum Symbolic Name	Reference
2081	-----	-----
2082	<a href="#">media-source-feed-orientation (type2 enum)</a>	[PWG5100.7]
2083	<a href="#">&lt;Any "orientation-requested" value&gt;</a>	[PWG5100.7]
2084		
2085	operations-supported (1setOf type2 enum)	[STD92]
2086	0x0038 Cancel-Jobs	[PWG5100.7]
2087	0x0039 Cancel-My-Jobs	[PWG5100.7]
2088	0x003A Close-Job	[PWG5100.7]
2089	0x003B Resubmit-Job	[PWG5100.7]

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2093 **14.4 Operation Registrations**

2094 The operations defined in this specification will be published by IANA according to the  
 2095 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2096 <http://www.iana.org/assignments/ipp-registrations>

2097 The registry entries will contain the following information:

2098	Operation Name	Reference
2099	-----	-----
2100	Cancel-Jobs	[PWG5100.7]
2101	Cancel-My-Jobs	[PWG5100.7]
2102	Close-Job	[PWG5100.7]
2103	Create-Job (Extension)	[PWG5100.7]
2104	Hold-Job (Extension)	[PWG5100.7]
2105	Print-Job (Extension)	[PWG5100.7]
2106	Print-URI (Extension)	[PWG5100.7]
2107	Resubmit-Job	[PWG5100.7]
2108	Send-Document (Extension)	[PWG5100.7]
2109	Send-URI (Extension)	[PWG5100.7]
2110	Set-Job-Attributes (Extension)	[PWG5100.7]
2111	Validate-Job (Extension)	[PWG5100.7]

2112 **14.5 Status Code Registrations**

2113 The status codes defined in this specification will be published by IANA according to the  
 2114 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2115 <http://www.iana.org/assignments/ipp-registrations>

2116 The registry entries will contain the following information:

2117	Value	Status Code Name	Reference
2118	-----	-----	-----
2119	0x0500:0x05FF	- Server Error:	
2120	0x050B	server-error-too-many-jobs	[PWG5100.7]
2121	0x050C	server-error-too-many-documents	[PWG5100.7]

2122



2123 **15. Overview of Changes**

2124 **15.1 IPP Job Extensions v2.0**

2125 The following changes were made to the previous version of this specification [PWG5100.7-  
2126 2003]:

- 2127 • A rationale section was added, including use cases, exceptions, and requirements;
- 2128 • References now point to the current versions of dependent documents and  
2129 specifications at the time of publication;
- 2130 • Read-only attributes are now defined and registered as status attributes;
- 2131 • A REQUIRED "job-mandatory-attributes-supported" Printer Description attribute has  
2132 been added to indicate support for the "job-mandatory-attributes" Job Template  
2133 attribute;
- 2134 • The "job-hold-until-time" and "job-ids" operation attributes were moved from the  
2135 OBSOLETE IPP Job and Printer Extensions - Set 3 [PWG5100.11-2010]  
2136 specification;
- 2137 • The "job-delay-output-until", "job-delay-output-until-time", and "job-hold-until-time"  
2138 Job Template attributes were moved from the OBSOLETE IPP Job and Printer  
2139 Extensions - Set 3 [PWG5100.11-2010] specification;
- 2140 • The "job-creation-attributes-supported", "job-spooling-supported", "media-col-  
2141 database", "printer-detailed-status-messages", and "which-jobs-supported" Printer  
2142 attributes were moved from the OBSOLETE IPP Job and Printer Extensions - Set 3  
2143 [PWG5100.11-2010] specification;
- 2144 • [The "job-account-id" and "job-accounting-user-id" Job Template and related Printer  
2145 Description attributes were moved from the IPP Production Printing Attributes - Set 1  
2146 \[PWG5100.3-2001\] specification;](#)
- 2147 • [The "job-sheets-col" Job Template and related Printer Description attributes were  
2148 moved from the IPP Production Printing Attributes - Set 1 \[PWG5100.3-2001\]  
2149 specification;](#)
- 2150 • [The additional values for the "job-sheets" Job Template attribute were moved from  
2151 the IPP Production Printing Attributes - Set 1 \[PWG5100.3-2001\] specification;](#)
- 2152 • The [REQUIRED "media-col" Document/Job Template attribute and related Printer  
2153 Description attributes](#) were moved from the [IPP Production Printing Attributes - Set 1  
2154 \[PWG5100.3-2001\]](#), [OBSOLETE IPP Job and Printer Extensions - Set 2](#)

Deleted: "media-grain", "media-thickness",  
and "media-tooth" member attributes of the

Deleted: 3

- 2158 [PWG5100.11-2010], [and IPP Job and Printer Extensions - Set 3 \[PWG5100.13-](#)  
2159 [2012\]](#) specifications;
- 2160 • RECOMMENDED "job-retain-until", "job-retain-until-interval", and "job-retain-until-  
2161 time" Job Template attributes were added to control the Job Retention phase of a  
2162 Job's lifecycle;
  - 2163 • REQUIRED "job-history-attributes-configured", "job-history-attributes-supported",  
2164 "job-history-interval-configured", and "job-history-interval-supported" Printer  
2165 Description attributes were added to control the Job History phase of a Job's lifecycle;
  - 2166 • The "document-charset" operation attribute and corresponding operation semantics  
2167 are now defined in PWG 5100.5: IPP Document Object v1.1;
  - 2168 • The "document-digital-signature" operation attribute and corresponding Document  
2169 Status, Job Status, and Printer Description attributes have been made OBSOLETE  
2170 because of interoperability issues;
  - 2171 • The "document-format-details" operation attribute and corresponding Document  
2172 Status, Job Status, and Printer Description attributes have been made  
2173 DEPRECATED because of interoperability issues and privacy concerns;
  - 2174 • The "document-format", "document-format-version", and "document-natural-  
2175 language" member attributes of "document-format-details" have been made  
2176 OBSOLETE because the attributes are redundant;
  - 2177 • The "document-format-device-id" member attribute of "document-format-details"  
2178 have been made OBSOLETE because the attribute syntax is too short to be useful;
  - 2179 • The "document-format-version" operation attribute and corresponding Document  
2180 Status, Job Status, and Printer Description attributes have been made OBSOLETE  
2181 because of interoperability issues;
  - 2182 • The "job-copies" Job Template attribute and corresponding Job Status and Printer  
2183 Description attributes have been made OBSOLETE because of interoperability  
2184 issues;
  - 2185 • The "job-cover-back" Job Template attribute and corresponding Job Status and  
2186 Printer Description attributes have been made OBSOLETE because of  
2187 interoperability issues;
  - 2188 • The "job-cover-front" Job Template attribute and corresponding Job Status and  
2189 Printer Description attributes have been made OBSOLETE because of  
2190 interoperability issues;

- 2191 • The "job-finishings" Job Template attribute and corresponding Job Status and Printer  
2192 Description attributes have been made OBSOLETE because of interoperability  
2193 issues;
- 2194 • The "job-finishings-col" Job Template attribute and corresponding Job Status and  
2195 Printer Description attributes have been made OBSOLETE because of  
2196 interoperability issues; and
- 2197 • The 'digital-signature-type-not-supported' and 'job-digital-signature-wait' values for  
2198 the "job-state-reasons" attribute have been made OBSOLETE because of  
2199 interoperability issues.

## 2200 16. References

### 2201 16.1 Normative References

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2293 Implementers of this specification document are encouraged to join the IPP Mailing List in  
2294 order to participate in any discussions of clarification issues and review of registration  
2295 proposals for additional attributes and values.

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2297 significantly to the development of this document:

2298       Tom Hastings (author of v1.0)

2299       Peter Zehler (author of v1.0)

2300

2301 **18. Change History**

2302 **[18.1 May 10, 2019](#)**

- 2303 • [Copied media-col and related attributes and extensions from PWG 5100.3 and](#)
- 2304 [5100.13 \(JPS3\)](#)
- 2305 • [Copied job-account-id, job-accounting-user-id, and related attributes from PWG](#)
- 2306 [5100.3](#)
- 2307 • [Section 15.1: Updated discussion of media-col, add reference to 5100.13](#)
- 2308 • [Section 16.1: Moved 5100.3 reference to section 16.2](#)
- 2309 • [Section 16.2: Added 5100.13 reference](#)

2310 **18.2 April 18, 2019**

- 2311 • Status: stable
- 2312 • Make document-format-details DEPRECATED, only obsolete redundant member
- 2313 attributes per April 2019 F2F
- 2314 • Use OBSOLETE and DEPRECATED (uppercase) in text

2315 **18.3 March 15, 2019**

- 2316 • Version: 2.0
- 2317 • Section 2.1: OBSOLETE -> OBSOLETE
- 2318 • Section 2.4: Cleaned out unused terms, added definitions of Completed Job, Not
- 2319 Completed Job, and Retained Job
- 2320 • Sections 5 and 6: Updated conformance requirements

2321 **18.4 March 8, 2019**

- 2322 • Status: Prototype
- 2323 • Abstract: Reworded for updated scope
- 2324 • Section 1: Reworded for updated scope, added discussion of obsolete JPS2 bits
- 2325 moving here

- 2326 • Section 2.1: Added definitions of OBSOLETE and DEPRECATED
- 2327 • Section 3: Added rationale, use cases, and design requirements for attributes and  
2328 operations from JPS2.
- 2329 • New section 4 for operations from JPS2
- 2330 • Section 5: Made most attributes RECOMMENDED, added job-creation-attributes-  
2331 supported, job-delay-output-until-xxx, job-history-xxx, job-hold-until-time, job-ids, job-  
2332 spooling-supported, media-col-database, printer-detail-status-messages from JPS2
- 2333 • Section 5: Added new job-history-xxx and job-retain-until-xxx attributes
- 2334 • New section 6 for additional semantics (imported from JPS2)
- 2335 • Section 7: Added pdl-override-supported, which-jobs values, media-col member  
2336 attributes.
  
- 2337 **18.5 October 23, 2018**
- 2338 • Status: Interim
- 2339 • Updated references to the first version of 5100.7 to include year and exclude the full  
2340 name.
- 2341 • Abstract and intro: Clarified that this specification is defining attributes and values.
- 2342 • Editorial changes
- 2343 • Added reference to the MSN2 spec.
  
- 2344 **18.6 September 26, 2018**
- 2345 • Brought back the job-mandatory-attributes operation attribute, which is still needed.
- 2346 • Added a rationale, use case, and design requirement for selective fidelity/job-  
2347 mandatory-attributes.
- 2348 • Added Additional Semantics and Operation Registrations sections for using job-  
2349 mandatory-attributes with job creation/validation operations.
- 2350 • Added Additional Semantics and Operation Registrations sections for returning the  
2351 too-many-jobs/documents status codes.



2352 **18.7 September 25, 2018**

2353 Initial revision.