



The Printer Working Group

May 24, 2019  
Working Draft

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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-ippjobext20-20190524.docx>

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## 299 1. Introduction

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

### 307 1.1 Document Natural Language and Character Set

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

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### 315 1.2 Attribute Fidelity

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

### 320 1.3 Rendering Optimizations

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

### 326 1.4 Printing on a Specific Output Device

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

## 331 1.5 Results of Job/Document Processing

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

## 336 1.6 Job Scheduling and Lifecycle

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

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

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

## 348 1.7 Job Operations

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

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

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

## 359 1.8 Obsolete Attributes and Values

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

## 363 2. Terminology

### 364 2.1 Conformance Terminology

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

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

### 373 2.2 Printing Terminology

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

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

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

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

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

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

### 386 2.3 Protocol Role Terminology

387 This document also defines the following protocol roles to specify unambiguous  
388 conformance requirements:

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

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

## 394 2.4 Other Terminology

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

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

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

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

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

## 405 2.5 Acronyms and Organizations

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

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

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

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

## 410 3. Requirements

### 411 3.1 Rationale

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

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

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

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

## 433 **3.2 Use Cases**

### 434 **3.2.1 Print a Plain Text File**

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

### 438 **3.2.2 Print a Document Using a Matching Size**

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

### 442 **3.2.3 Force a Document to Print on a Specific Media Size**

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

### 446 **3.2.4 Print a Presentation with Best Quality**

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

### 449 **3.2.5 Print Using a Specific Output Device**

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

### 453 **3.2.6 Print Using Loaded Media**

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

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

458 highest print quality. The User selects additional processing intent for the Job and confirms  
459 the print action. The Client sends a print job request to the Printer with the Job Ticket and  
460 local photo. The Printer validates the Job Ticket and document data and then prints the  
461 photo.

462 Preconditions: Printer can report loaded media information such as size, type, coating, and  
463 weight. This may be detected automatically or manually entered by the User or Operation  
464 when loading the media.

### 465 **3.2.7 Print on a Roll**

466 Mike has a series of photos to print on a roll of photo media. Mike submits a multi-document  
467 job for printing and specifies that the roll be cut between each document in the job.

### 468 **3.2.8 Manual Duplex Printing**

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

### 477 **3.2.9 Monitor Whether Jobs are Printed Correctly**

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

### 481 **3.2.10 Hold a Job Until a Specific Date and Time**

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

### 484 **3.2.11 Delay Output Until a Specific Time Period**

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

### 487 **3.2.12 Submit a Variable Number of Documents in a Job**

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

**492 3.2.13 Cancel a Job After a Specific Time Period**

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

**496 3.2.14 Cancel Multiple Jobs**

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

**500 3.2.15 Resubmit a Job**

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

**505 3.2.16 Retain Jobs for a Specific Time Period**

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

**509 3.2.17 Keep Job History Information for a Specific Time Period**

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

**513 3.3 Exceptions****514 3.3.1 Too Many Jobs on a Printer**

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

**517 3.3.2 Too Many Documents in a Job**

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

**520 3.4 Out of Scope**

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

- 522 1. Definition of new file formats; and
- 523 2. Definition of new protocol bindings.

### 524 3.5 Design Requirements

525 The design requirements for this specification are:

- 526 1. Define attributes for supported languages and character sets in Document data;
- 527 2. Define attributes and values to describe the kind of processing optimizations that
- 528 should be performed on Document data;
- 529 3. Define an attribute to specify fidelity requirements;
- 530 4. Define attributes to select an Output Device for printing;
- 531 5. Define attributes and values to report processing errors and warnings;
- 532 6. Define attributes to hold Jobs until a specific date and time;
- 533 7. Define attributes to cancel Jobs after a specific time period;
- 534 8. Define attributes and values to retain Jobs for a specific time period;
- 535 9. Define an operation to close an open Job;
- 536 10. Define attributes and operations to cancel groups of Jobs;
- 537 11. Define an operation to resubmit a Job with new Job Template attributes; and
- 538 12. Define sections to register all attributes, values, and operations with IANA.
- 539



## 540 4. New Operations

### 541 4.1 Cancel-Jobs

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

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

#### 551 4.1.1 Cancel-Jobs Request

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

553 Group 1: Operation Attributes

554 "attributes-charset" (charset) and  
555 "attributes-natural-language" (naturalLanguage):

556 The Client MUST supply and the Printer MUST support both of these  
557 attributes.

558 "printer-uri" (uri):

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

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

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

564 "requesting-user-name" (name(MAX)) and  
565 "requesting-user-uri" (uri):

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

567 "message" (text(127)):

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

**571 4.1.2 Cancel-Jobs Response**

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

573 Group 1: Operation Attributes

574 "attributes-charset" (charset) and  
575 "attributes-natural-language" (naturalLanguage):

576 The Printer MUST return both of these attributes.

577 "status-message" (text(255)) and/or  
578 "detailed-status-message" (text(MAX)):

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

580 Group 2: Unsupported Attributes

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

**582 4.2 Cancel-My-Jobs**

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

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

**591 4.2.1 Cancel-My-Jobs Request**

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

593 Group 1: Operation Attributes

594 "attributes-charset" (charset) and  
595 "attributes-natural-language" (naturalLanguage):

596 The Client MUST supply and the Printer MUST support both of these  
597 attributes.

598 "printer-uri" (uri):

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

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

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

604 "requesting-user-name" (name(MAX)) and  
605 "requesting-user-uri" (uri):

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

607 "message" (text(127)):

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

#### 611 4.2.2 Cancel-My-Jobs Response

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

613 Group 1: Operation Attributes

614 "attributes-charset" (charset) and  
615 "attributes-natural-language" (naturalLanguage):

616 The Printer MUST return both of these attributes.

617 "status-message" (text(255)) and/or  
618 "detailed-status-message" (text(MAX)):

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

620 Group 2: Unsupported Attributes

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

#### 622 4.3 Close-Job

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

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

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

#### 634 4.3.1 Close-Job Request

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

636 Group 1: Operation Attributes

637 "attributes-charset" (charset) and  
638 "attributes-natural-language" (naturalLanguage):

639 The Client MUST supply and the Printer MUST support both of these  
640 attributes.

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

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

644 "requesting-user-name" (name(MAX)) and  
645 "requesting-user-uri" (uri):

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

#### 647 4.3.2 Close-Job Response

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

649 Group 1: Operation Attributes

650 "attributes-charset" (charset) and  
651 "attributes-natural-language" (naturalLanguage):

652 The Printer MUST return both of these attributes.

653 "status-message" (text(255)) and/or  
654 "detailed-status-message" (text(MAX)):

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

656 Group 2: Unsupported Attributes

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

658 Group 3: Job Attributes

659 "job-state" (type1 enum):

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

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

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

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

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

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

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

#### 677 4.4 Resubmit-Job

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

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

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

**693 4.4.1 Resubmit-Job Request**

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

**695 Group 1: Operation Attributes**

696 "attributes-charset" (charset) and  
697 "attributes-natural-language" (naturalLanguage):

698 The Client MUST supply and the Printer MUST support both of these  
699 attributes.

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

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

703 "requesting-user-name" (name(MAX)) and  
704 "requesting-user-uri" (uri):

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

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

707 The Client MAY supply and the Printer MUST support either of these  
708 attributes.

**709 Group 2: Job Template Attributes**

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

**713 4.4.2 Resubmit-Job Response**

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

**715 Group 1: Operation Attributes**

716 "attributes-charset" (charset) and  
717 "attributes-natural-language" (naturalLanguage):

718 The Printer MUST return both of these attributes.

719 "status-message" (text(255)) and/or  
720 "detailed-status-message" (text(MAX)):

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

## 722 Group 2: Unsupported Attributes

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

## 724 Group 3: Job Attributes

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

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

727 "job-state" (type1 enum):

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

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

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

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

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

739 "job-uri" (uri):

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

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

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

747 **5. Attributes**748 **5.1 Operation Attributes**749 **5.1.1 document-format-details (collection)**

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

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

758 **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))

759 **5.1.1.1 document-source-application-name (name(MAX))**

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

765 **5.1.1.2 document-source-application-version (text(127))**

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

770 **5.1.1.3 document-source-os-name (name(40))**

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



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

#### 780 **5.1.1.4 document-source-os-version (text(40))**

781 This member attribute identifies the version number of the operating system that created the  
782 Document data. If specified, the "document-source-os-name" member attribute **MUST** also  
783 be specified. The value **MUST** be all lowercase in order to facilitate matching, e.g., "10.14.4",  
784 "18.04", "10 (1903)", etc.

#### 785 **5.1.2 job-hold-until-time (dateTime)**

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

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

#### 792 **5.1.3 job-ids (1setOf integer(1:MAX))**

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

#### 795 **5.1.4 job-mandatory-attributes (1setOf keyword)**

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

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

**807 5.2 Document and Job Status Attributes****808 5.2.1 document-format-details (collection)**

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

**811 5.2.2 document-format-details-detected (collection)**

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

**815 5.2.3 errors-count (integer(0:MAX))**

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

**821 5.2.4 print-content-optimize-actual (1setOf type2 keyword)**

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

**824 5.2.5 warnings-count (integer(0:MAX))**

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

**828 5.3 Document and Job Template Attributes****829 5.3.1 media-col (collection)**

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

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

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

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

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

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

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

864 A Printer MUST implement either the above algorithm or one that produces equivalent  
 865 results.

866 Table 2 lists the member attributes of the "media-col" collection attribute.

867 **Table 2 - "media-col" Member Attributes**

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

Deleted: MAY

Deleted: MAY

Deleted: MAY

Deleted: MAY

Member Attribute	Conformance
media-left-margin (integer(0:MAX))	MUST
media-order-count (integer(1:MAX))	SHOULD
media-pre-printed (type2 keyword   name(MAX))	SHOULD
media-recycled (type2 keyword   name(MAX))	SHOULD
media-right-margin (integer(0:MAX))	MUST
media-size (collection)	MUST
media-size-name (type2 keyword   name(MAX))	SHOULD
media-source (type2 keyword   name(MAX))	MUST
media-source-properties (collection) (note 1)	MUST
media-thickness (integer(1:MAX))	SHOULD
media-tooth (type2 keyword   name(MAX))	SHOULD
media-top-margin (integer(0:MAX))	MUST
media-type (type2 keyword   name(MAX))	MUST
media-weight-metric (integer(0:MAX))	SHOULD

Deleted: MAY

Deleted: MAY

Deleted: MAY

Deleted: MAY

872 Note 1: The "media-source-properties" member attribute is only used for values of  
 873 the "media-col-database" and "media-col-ready" Printer Description attributes.

874 **5.3.1.1 Media Selection and Full-Bleed Printing**

875 The "media-bottom-margin", "media-left-margin", "media-right-margin", and "media-top-  
 876 margin" member attributes specify the Printer's physical margins, allowing a Printer to  
 877 determine how the content needs to be printed. A Client specifies that it has borderless or  
 878 "full-bleed" content by setting all of the margins to 0.

879 Printers that support full-bleed printing MUST accept margins of 0 and MAY scale and center  
 880 the print document to fill as needed to achieve full-bleed output. Printers SHOULD use the  
 881 document Image Box when scaling for full-bleed output.

882 **5.3.1.2 media-back-coating (type2 keyword | name(MAX))**

883 This **RECOMMENDED** member attribute specifies which pre-process coating has been  
 884 applied to the back of the desired media. Standard keyword values include:

Deleted: OPTIONAL

885 'none': The media does not have any coating.

886 'glossy': The media has a "glossy" coating.

887 'high-gloss': The media has a "high-gloss" coating.

888 'semi-gloss': The media has a "semi-gloss" coating.

889 'satin': The media has a "satin" coating.

890 'matte': The media has a "matte" coating.

**896 5.3.1.3 media-bottom-margin (integer(0:MAX))**

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

**900 5.3.1.4 media-color (type2 keyword | name(MAX))**

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

**903 5.3.1.5 media-front-coating (type2 keyword | name(MAX))**

904 This **RECOMMENDED** member attribute specifies which pre-process coating has been  
905 applied to the front of the desired media. Standard keyword values are the same as the  
906 "media-back-coating" member attribute (section 5.3.1.2).

Deleted: OPTIONAL

**907 5.3.1.6 media-grain (type2 keyword | name(MAX))**

908 This **RECOMMENDED** member attribute specifies the desired grain of the media being  
909 specified [ISO10175]. Grain affects the curl and the folding of the media. Some marking  
910 engines are sensitive to the resulting curl. Standard keyword values for "media-grain"  
911 include:

Deleted: OPTIONAL

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

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

**915 5.3.1.7 media-hole-count (integer(0:MAX))**

916 This **RECOMMENDED** member attribute specifies the number of pre-drilled holes in the  
917 desired media. A value of 0 (zero) indicates that no holes are present in the media.

Deleted: OPTIONAL

**918 5.3.1.8 media-info (text(255))**

919 This RECOMMENDED member attribute provides a human-readable description of the  
920 media.

**921 5.3.1.9 media-key (type2 keyword | name(MAX))**

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

924 Because Printers often support many different kinds and sizes of media, Printers that  
925 support this attribute SHOULD automatically assign unique values for all supported  
926 combinations of media characteristics, even for values that are locally-defined by an

930 Administrator or Operator. A Client can supply such a Printer-generated value with either  
931 the "media-key" member attribute or the "media" Job Template attribute [STD92].

932 **5.3.1.10 media-left-margin (integer(0:MAX))**

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

936 **5.3.1.11 media-order-count (integer(1:MAX))**

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

Deleted: OPTIONAL

943 **5.3.1.12 media-pre-printed (type2 keyword | name(MAX))**

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

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

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

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

951 **5.3.1.13 media-recycled (type2 keyword | name(MAX))**

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

954 'none': The media is not recycled.

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

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

958 **5.3.1.14 media-right-margin (integer(0:MAX))**

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

963 **5.3.1.15 media-size (collection)**

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

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

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

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

Member Attribute	Conformance
x-dimension (integer(0:MAX))	MUST
y-dimension (integer(0:MAX))	MUST

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

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

978 **5.3.1.16 media-size-name (type2 keyword | name(MAX))**

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

983 **5.3.1.17 media-source (type2 keyword | name(MAX))**

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

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

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

Keyword	Description
alternate	The alternate or secondary input tray
alternate-roll	The alternate or secondary roll
auto	The Printer's automatic choice
bottom	The bottom input tray

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



Keyword	Description
tray-20	The twentieth tray

989 **5.3.1.18 media-source-properties (collection)**

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

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

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

999 **5.3.1.18.1 media-source-feed-direction (type2 keyword)**

1000 This REQUIRED member attribute defines whether the long edge ('long-edge-first') or  
1001 short edge ('short-edge-first') of the media is pulled from the source.

1002 **5.3.1.18.2 media-source-feed-orientation (type2 enum)**

1003 This REQUIRED member attribute defines the orientation of the media as pulled from the  
1004 source. The value is an "orientation-requested" [STD92] enumeration.

1005 **5.3.1.19 media-thickness (integer(1:MAX))**

1006 This **RECOMMENDED** member attribute specifies the thickness of the media [JDF] in  
1007 hundreds of millimeters (1/2540th of an inch).

Deleted: OPTIONAL

1008 **5.3.1.20 media-tooth (type2 keyword | name(MAX))**

1009 This **RECOMMENDED** member attribute specifies the tooth (or roughness) of the media  
1010 [ISO10175]. The tooth is particularly important for marking engines that use pens (e.g.  
1011 plotters) to mark the media - the type of pen used matches the tooth of the media for best  
1012 resolution.

Deleted: OPTIONAL

1013 Standard keyword values for "media-tooth" include:

1014 'antique': Rougher than 'vellum' [JDF].

1015 'calendared': Extra smooth or polished, uncoated paper [JDF].

1016 'coarse': Rough finish.

1017 'fine': Smoother finish than 'smooth'.

1020 'linen': Finish like coarse woven cloth [JDF].

1021 'medium': Regular finish.

1022 'smooth': Smooth finish [JDF].

1023 'stipple': Fine pebble finish [JDF].

1024 'un calendared': Rough, unpolished and uncoated papers [JDF].

1025 'vellum': Slightly rough surface [JDF].

#### 1026 **5.3.1.21 media-top-margin (integer(0:MAX))**

1027 The REQUIRED "media-top-margin" member attribute defines the Printer's physical top  
1028 margin in hundredths of millimeters from the top edge, without respect to the value of the  
1029 "orientation-requested" Job Template attribute.

#### 1030 **5.3.1.22 media-type (type2 keyword | name(MAX))**

1031 This REQUIRED member attribute identifies the type of media, i.e., the media instance's  
1032 predominate characteristic. Depending on implementation, the Printer MAY need to behave  
1033 differently or perform different validation, depending on the type of the media. For example,  
1034 prohibiting stapling transparencies or selecting a different paper path for an envelope.  
1035 Standard keyword values for media type are defined in the PWG Media Standardized  
1036 Names v2.0 (MSN2) [PWG5101.1].

#### 1037 **5.3.1.23 media-weight-metric (integer(0:MAX))**

1038 This RECOMMENDED member attribute indicates the weight of the desired media rounded  
1039 to the nearest whole number of grams per square meter.

Deleted: OPTIONAL

#### 1040 **5.3.2 output-device (name(127))**

1041 This attribute requests a named Output Device for a Printer that fans-out to multiple devices.  
1042 If omitted, the Printer selects the best Output Device for the Job in an implementation  
1043 dependent manner.

#### 1044 **5.3.3 print-content-optimize (type2 keyword)**

1045 This RECOMMENDED attribute specifies the type of content optimization to perform on the  
1046 Document data. Keyword values specify the type of content to optimize, including:

1047 'graphics': Graphs and line drawings.

1048 'photo': Photographs.

1049 'text': Text.

1051 'text-and-graphics': Text and graphics.

## 1052 5.4 Job Template Attributes

### 1053 5.4.1 job-account-id (name(MAX))

1054 This **RECOMMENDED** attribute specifies the account associated with the Job, such as a  
1055 customer name, a sequence of digits referencing an internal billing number, or even a credit  
1056 card number. How the Printer uses this attribute is implementation dependent.

1057 A zero-length value indicates that there is no account name.

### 1058 5.4.2 job-accounting-user-id (name(MAX))

1059 This **RECOMMENDED** attribute specifies the user ID associated with the account specified  
1060 by the "job-account-id" attribute (see section 5.4.1) used for this Job. These two attributes  
1061 can be used for account tracking.

Deleted: 5.4.1

1062 A zero-length value indicates that there is no user accounting ID.

### 1063 5.4.3 job-cancel-after (integer(0:MAX))

1064 This **RECOMMENDED** attribute specifies the maximum number of seconds allowed for  
1065 processing a Job. When specified, the Printer cancels the Job automatically if it cannot be  
1066 completed within the specified timeframe. The completion timer does not begin until the Job  
1067 enters the 'processing' state'.

### 1068 5.4.4 job-delay-output-until (type2 keyword | name(MAX))

1069 This **RECOMMENDED** attribute specifies a time period in the future when the Printer will  
1070 produce the output for the Job. If the specified time period has not yet arrived, the Printer  
1071 **MUST** set the Job's "job-state-reasons" value to 'job-delay-output-until-specified'. The  
1072 Printer **MUST NOT** produce any output until the time period arrives but **MAY** perform pre-  
1073 processing. When the time period arrives, the Job **MUST** become a candidate for output,  
1074 including any processing required to produce the output. The only way to alter the delay  
1075 period for a Job is by using the Set-Job-Attributes [RFC3380] operation.

1076 Standard keyword values for named time periods are:

1077 'day-time': Delay output until daylight, typically 6am to 6pm.

1078 'evening': Delay output until the evening, typically from 6pm to 12am.

1079 'indefinite': Delay output indefinitely; the time period can be changed using the Set-  
1080 Job-Attributes [RFC3380] operation.

1081 'night': Delay output until the night, typically from 12am to 6am.

1083 'no-delay-output': Do not delay the output.

1084 'second-shift': Delay output until the second work shift, typically from 4pm to 12am.

1085 'third-shift': Delay output until the third work shift, typically from 12am to 8am.

1086 'weekend': Delay output until the weekend.

1087 Clients MUST NOT supply both the "job-delay-output-until" and "job-delay-output-until-time"  
1088 (section 5.4.5) Job Template attributes in a Job Creation request. If a Client supplies both  
1089 attributes, the Printer MUST reject the request and return the 'client-error-conflicting-  
1090 attributes' status code.

1091 Note: Unlike the "job-hold-until" [STD92] Job Template attribute, the "job-delay-output-until"  
1092 attribute does not cause the Job to enter the 'pending-held' state.

#### 1093 **5.4.5 job-delay-output-until-time (dateTime)**

1094 This RECOMMENDED attribute specifies a date and time when the Printer will produce the  
1095 output for the Job. If the specified time period has not yet arrived, the Printer MUST set the  
1096 Job's "job-state-reasons" value to 'job-delay-output-until-specified'. The Printer MUST NOT  
1097 produce any output until the time period arrives but MAY perform pre-processing. When the  
1098 time period arrives, the Job MUST become a candidate for output, including any processing  
1099 required to produce the output. The only way to alter the delay period for a Job is by using  
1100 the Set-Job-Attributes [RFC3380] operation.

1101 Clients MUST NOT supply both the "job-delay-output-until-time" and "job-delay-output-until"  
1102 (section 5.4.4) Job Template attributes in a Job Creation request. If a Client supplies both  
1103 attributes, the Printer MUST reject the request and return the 'client-error-conflicting-  
1104 attributes' status code.

1105 Note: Unlike the "job-hold-until-time" (section 5.4.6) Job Template attribute, the "job-delay-  
1106 output-until-time" attribute does not cause the Job to enter the 'pending-held' state.

#### 1107 **5.4.6 job-hold-until-time (dateTime)**

1108 This RECOMMENDED attribute specifies the date and time after which the Job MUST  
1109 become a candidate for processing. Printers that support this attribute MUST support the  
1110 "job-hold-until" [STD92] Job Template attribute.

1111 Clients MUST NOT supply both the "job-hold-until-time" and "job-hold-until" [STD92] Job  
1112 Template attributes in a Job Creation request. If a Client supplies both attributes, the Printer  
1113 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

#### 1114 **5.4.7 job-retain-until (type2 keyword | name(MAX))**

1115 This RECOMMENDED attribute specifies how long the Job remains in the Job Retention  
1116 phase of a Job's life cycle [STD92]. Standard values include:

1117 'end-of-day': Retain the Job until the end of the current day.

1118 'end-of-month': Retain the Job until the end of the current month.

1119 'end-of-week': Retain the Job until the end of the current week.

1120 'indefinite': Retain the Job indefinitely.

1121 'none': Do not retain the Job.

1122 Clients MUST NOT supply the "job-retain-until", "job-retain-until-interval" (section 5.4.8),  
 1123 and/or "job-retain-until-time" (section 5.4.9) Job Template attributes together in a Job  
 1124 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
 1125 reject the request and return the 'client-error-conflicting-attributes' status code.

1126 **5.4.8 job-retain-until-interval (integer(0:MAX))**

1127 This RECOMMENDED attribute specifies the number of seconds the Job remains in the Job  
 1128 Retention phase of a Job's life cycle [STD92].

1129 Clients MUST NOT supply the "job-retain-until" (section 5.4.7), "job-retain-until-interval",  
 1130 and/or "job-retain-until-time" (section 5.4.9) Job Template attributes together in a Job  
 1131 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
 1132 reject the request and return the 'client-error-conflicting-attributes' status code.

1133 **5.4.9 job-retain-until-time (dateTime)**

1134 This RECOMMENDED attribute specifies the date and time when the Job can leave the Job  
 1135 Retention phase of a Job's life cycle [STD92].

1136 Clients MUST NOT supply the "job-retain-until" (section 5.4.7), "job-retain-until-interval"  
 1137 (section 5.4.8), and/or "job-retain-until-time" Job Template attributes together in a Job  
 1138 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
 1139 reject the request and return the 'client-error-conflicting-attributes' status code.

1140 **5.4.10 job-sheets-col (collection)**

1141 This RECOMMENDED attribute augments the "job-sheets" Job Template attribute [STD92]  
 1142 and allows a Client to specify media for Job Sheets that is different than the current media  
 1143 being used for the Job. Table 5 lists the member attributes.

1144 **Table 5 - "job-sheets-col" Member Attributes**

Member Attribute
job-sheets (type2 keyword   name(MAX))
media (type2 keyword   name(MAX))
media-col (collection)

**1145 5.4.10.1 job-sheets (type2 keyword | name(MAX))**

1146 This REQUIRED member attribute specifies which Job Sheets to print on the specified  
1147 media. The values for this member attribute are identical to the keyword and name values  
1148 for the "job-sheets" Job Template attribute [STD92] itself, including the 'none' value, and  
1149 convey the same semantics.

**1150 5.4.10.2 media (type2 keyword | name(MAX))**

1151 This REQUIRED member attribute specifies which media to use for the Job Sheets. If  
1152 specified, the "media-col" member attribute (section 5.4.10.3) MUST NOT be specified.

**1153 5.4.10.3 media-col (collection)**

1154 This REQUIRED member attribute specifies which media to use for the Job Sheets. If  
1155 specified, the "media" member attribute (section 5.4.10.2) MUST NOT be specified.

**1156 5.5 Printer Description Attributes****1157 5.5.1 document-charset-default (charset)**

1158 This CONDITIONALLY REQUIRED attribute specifies the default charset that the Printer  
1159 will assume for charset-ambiguous Document formats when the Client omits the "document-  
1160 charset" operation attribute [PWG5100.5]. Printers that support the "document-charset"  
1161 operation attribute MUST support this attribute.

**1162 5.5.2 document-charset-supported (1setOf charset)**

1163 This CONDITIONALLY REQUIRED attribute lists the charsets that the Printer supports for  
1164 charset-ambiguous Document formats. Printers that support the "document-charset"  
1165 operation attribute [PWG5100.5] MUST support this attribute.

**1166 5.5.3 document-format-details-supported (1setOf keyword)**

1167 This DEPRECATED attribute lists the supported member attributes of the "document-  
1168 format-details" operation (section 5.1.1) and Document/Job Status (section 5.2.1) attributes.

**1169 5.5.4 document-natural-language-default (naturalLanguage)**

1170 This CONDITIONALLY REQUIRED attribute specifies the default natural language that the  
1171 Printer will assume for Document data when the Client omits the "document-natural-  
1172 language" operation attribute [STD92]. Printers that support the "document-natural-  
1173 language" attribute MUST support this attribute.

**1174 5.5.5 document-natural-language-supported (1setOf naturalLanguage)**

1175 This **CONDITIONALLY REQUIRED** attribute lists the natural languages supported for  
1176 Printer-supported Document formats. Printers that support the "document-natural-language"  
1177 attribute **MUST** support this attribute.

**1178 5.5.6 job-account-id-default (name(MAX) | no-value)**

1179 This **CONDITIONALLY REQUIRED** attribute specifies the default value of the "job-account-  
1180 id" Job Template attribute (section 5.4.1). Printers **MUST** support this attribute if the "job-  
1181 account-id" attribute is supported.

**1182 5.5.7 job-account-id-supported (boolean)**

1183 This **CONDITIONALLY REQUIRED** attribute specifies whether the "job-account-id" Job  
1184 Template attribute (section 5.4.1) is supported. Printers **MUST** support this attribute if the  
1185 "job-account-id" attribute is supported.

**1186 5.5.8 job-accounting-user-id-default (name(MAX) | no-value)**

1187 This **CONDITIONALLY REQUIRED** attribute specifies the default value of the "job-  
1188 accounting-user-id" Job Template attribute (section 5.4.2). Printers **MUST** support this  
1189 attribute if the "job-accounting-user-id" attribute is supported.

**1190 5.5.9 job-accounting-user-id-supported (boolean)**

1191 This **CONDITIONALLY REQUIRED** attribute specifies whether the "job-accounting-user-id"  
1192 Job Template attribute (section 5.4.2) is supported. Printers **MUST** support this attribute if  
1193 the "job-accounting-user-id" attribute is supported.

**1194 5.5.10 job-cancel-after-default (integer(0:MAX) | no-value)**

1195 This **CONDITIONALLY REQUIRED** attribute specifies the default value for the "job-cancel-  
1196 after" (section 5.4.1) Job Template attribute. Printers that support the "job-cancel-after"  
1197 attribute **MUST** support this attribute.

**1198 5.5.11 job-cancel-after-supported (rangeOfInteger(0:MAX))**

1199 This **CONDITIONALLY REQUIRED** attribute specifies the range of values supported for the  
1200 "job-cancel-after" (section 5.4.1) Job Template attribute. Printers that support the "job-  
1201 cancel-after" attribute **MUST** support this attribute.

**1202 5.5.12 job-creation-attributes-supported (1setOf keyword)**

1203 This **REQUIRED** attribute lists the names of the operation and Job Template attributes that  
1204 can be sent in a Job Creation or Validate-Job request.

**1205 5.5.13 job-delay-output-until-default (type2 keyword | name(MAX))**

1206 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-delay-  
1207 output-until" (section 5.4.4) Job Template attribute. Printers that support the "job-delay-  
1208 output-until" attribute MUST support this attribute.

**1209 5.5.14 job-delay-output-until-supported (1setOf (type2 keyword | name(MAX)))**

1210 This CONDITIONALLY REQUIRED attribute lists the supported values of the "job-delay-  
1211 output-until" (section 5.4.4) Job Template attribute. Printers that support the "job-delay-  
1212 output-until" attribute MUST support this attribute.

**1213 5.5.15 job-delay-output-until-time-supported (rangeOfInteger(0:MAX))**

1214 This CONDITIONALLY REQUIRED attribute specifies the range of time values supported  
1215 by the "job-delay-output-until-time" (section 5.4.5) Job Template attribute. Printers that  
1216 support the "job-delay-output-until-time" attribute MUST support this attribute.

**1217 5.5.16 job-history-attributes-configured (1setOf keyword)**

1218 This REQUIRED attribute lists the Job attributes that will be retained in the history phase of  
1219 each Job. IPP/1.1 [STD92] specifies that at least the "job-id", "job-printer-uri", "job-state",  
1220 and "job-state-reasons" attributes MUST be retained in the history phase. Printers that  
1221 support the "job-history-attributes-supported" (section N.M.P) attribute MUST support this  
1222 attribute.

**1223 5.5.17 job-history-attributes-supported (1setOf keyword)**

1224 This REQUIRED attribute lists the Job attributes that can be retained in the history phase of  
1225 each Job. Printers that support the "job-history-attributes-configured" (section N.M.P)  
1226 attribute MUST support this attribute.

**1227 5.5.18 job-history-interval-configured (integer(0:MAX))**

1228 This REQUIRED attribute specifies the minimum number of seconds that a Job will remain  
1229 in the history phase of its lifecycle [STD92]. Printers SHOULD have a default configured  
1230 value of at least 60 seconds to allow Clients to discover the disposition of any Jobs that have  
1231 reached a terminating state. Printers that support the "job-history-interval-supported"  
1232 (section N.M.P) attribute MUST support this attribute.

**1233 5.5.19 job-history-interval-supported (rangeOfInteger(0:MAX))**

1234 This REQUIRED attribute specifies the range of values that are supported for the "job-  
1235 history-interval-configured" Printer Description attribute. Printers that support the "job-  
1236 history-interval-configured" (section N.M.P) attribute MUST support this attribute.



**1237 5.5.20 job-ids-supported (boolean)**

1238 This REQUIRED attribute specifies whether the "job-ids" operation attribute (section 5.1.3)  
1239 is supported.

**1240 5.5.21 job-mandatory-attributes-supported (boolean)**

1241 This REQUIRED attribute specifies that the "job-mandatory-attributes" operation attribute  
1242 (section 5.1.4) is supported. Printers MUST report a value of 'true' for this attribute.

**1243 5.5.22 job-retain-until-default (type2 keyword | name(MAX))**

1244 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-retain-  
1245 until" (section 5.4.7) Job Template attribute. Printers that support the "job-retain-until"  
1246 attribute MUST support this attribute.

**1247 5.5.23 job-retain-until-interval-default (integer(0:MAX) | no-value)**

1248 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-retain-  
1249 until-interval" (section 5.4.8) Job Template attribute. Printers that support the "job-retain-  
1250 until-interval" attribute MUST support this attribute.

**1251 5.5.24 job-retain-until-interval-supported (rangeOfInteger(0:MAX))**

1252 This CONDITIONALLY REQUIRED attribute specifies the supported values of the "job-  
1253 retain-until-interval" (section 5.4.8) Job Template attribute. Printers that support the "job-  
1254 retain-until-interval" attribute MUST support this attribute.

**1255 5.5.25 job-retain-until-supported (1setOf (type2 keyword | name(MAX)))**

1256 This CONDITIONALLY REQUIRED attribute lists the supported values of the "job-retain-  
1257 until" (section 5.4.7) Job Template attribute. Printers that support the "job-retain-until"  
1258 attribute MUST support this attribute.

**1259 5.5.26 job-retain-until-time-supported (rangeOfInteger(0:MAX))**

1260 This CONDITIONALLY REQUIRED attribute specifies the supported values of the "job-  
1261 retain-until-time" (section 5.4.9) Job Template attribute. Printers that support the "job-retain-  
1262 until-time" attribute MUST support this attribute.

**1263 5.5.27 job-sheets-col-default (collection)**

1264 This [CONDITIONALLY REQUIRED](#) attribute specifies the default value of the "job-sheets-  
1265 col" Job Template attribute (section 5.4.10). Printers that support the "job-sheets-col"  
1266 attribute MUST support this attribute.

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**1268 5.5.28 job-sheets-col-supported (1setOf keyword)**

1269 This **CONDITIONALLY REQUIRED** attribute lists the supported member attributes of the  
1270 "job-sheets-col" Job Template attribute (section 5.4.10). Printers that support the "job-  
1271 sheets-col" attribute MUST support this attribute.

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**1272 5.5.29 job-spooling-supported (type2 keyword)**

1273 This **REQUIRED** attribute specifies whether Jobs are spooled before the Document data is  
1274 processed. The value of this attribute returned in a Get-Printer-Attributes response MAY  
1275 depend on the "document-format" attribute supplied in the Get-Printer-Attributes request  
1276 [STD92]. If the Printer does not support this attribute, then the spooling behavior is  
1277 implementation dependent.

1278 Standard keyword values include:

1279 'automatic': The Printer chooses whether to process the Document data as it is  
1280 received or after spooling (storage).

1281 'spool': The printer processes the Document data after it has been spooled (stored).

1282 'stream': The printer processes the Document data as it is received.

**1283 5.5.30 media-back-coating-supported (1setOf (type2 keyword | name(MAX)))**

1284 This **CONDITIONALLY REQUIRED** attribute lists the supported values of the "media-back-  
1285 coating" member attribute (section 5.3.1.2). Printers that support the "media-back-coating"  
1286 member attribute MUST support this attribute.

**1287 5.5.31 media-bottom-margin-supported (1setOf integer(0:MAX))**

1288 This **REQUIRED** attribute lists the supported values for the "media-bottom-margin" member  
1289 attribute (section 5.3.1.3).

**1290 5.5.32 media-col-database (1setOf collection)**

1291 This **REQUIRED** attribute lists the set of pre-defined "media-col" collections available in the  
1292 Printer's media database. This attribute is similar to "media-col-ready" (section 5.5.34) but  
1293 returns the entire set of pre-defined "media-col" collections known by the Printer instead of  
1294 just the media loaded in the Printer.

1295 Because the number and size of values of this attribute can be very large, the Printer MUST  
1296 NOT return this attribute in the response to the Get-Printer-Attributes operation unless the  
1297 Client explicitly requests it by including the 'media-col-database' value in the "requested-  
1298 attributes" [STD92] operation attribute.

1299 In order to limit the number and size of values of this attribute, Printers MAY exclude the  
1300 "media-source" and/or "media-type" member attributes from collection values when all

1302 values of the corresponding member attribute are supported when combined with the other  
1303 member attributes and values.

1304 Because a Printer may support multiple values for the "media-bottom-margin", "media-left-  
1305 margin", "media-right-margin", and "media-top-margin" member attributes, a Printer MAY  
1306 only enumerate the best (smallest) values of these attributes to reduce the number of  
1307 collection values returned in the "media-col-database" attribute. However, if full-bleed and  
1308 non-full-bleed margins have a significant performance, scaling, or quality differences, a  
1309 Printer MUST enumerate both the full-bleed (all zeroes) and smallest non-zero hardware  
1310 margins in the "media-col-database" attribute.

1311 For example, a Printer that supports ISO A4, ISO DL Envelope, US Letter, US Legal, and  
1312 US #10 Envelope media, a single removable tray and a multi-purpose tray, and cardstock,  
1313 envelopes, plain paper, labels, letterhead, and transparency media types might report the  
1314 following attributes and values:

```
1315     media-size-supported={...}
1316     media-source-supported='by-pass-tray','main','manual'
1317     media-type-supported='cardstock','envelope','labels','stationery',
1318                          'stationery-letterhead','transparency'
1319     media-col-database={
1320       /* ISO A4 cardstock only from manual feed */
1321       media-size={
1322         x-dimension=21000
1323         y-dimension=29700
1324       }
1325       media-source='manual'
1326       media-type='cardstock'
1327     },{
1328       /* ISO A4 transparency only from manual feed */
1329       media-size={
1330         x-dimension=21000
1331         y-dimension=29700
1332       }
1333       media-source='manual'
1334       media-type='transparency'
1335     },{
1336       /* ISO A4 plain paper from any source */
1337       media-size={
1338         x-dimension=21000
1339         y-dimension=29700
1340       }
1341       media-type='stationery'
1342     },{
1343       /* ISO A4 letterhead from any source */
1344       media-size={
1345         x-dimension=21000
1346         y-dimension=29700
1347       }
1348       media-type='stationery-letterhead'
1349     },... /* Lots of other values */
```

**1350 5.5.33 media-col-default (collection)**

1351 This REQUIRED attribute specifies the default value of the "media-col" Job Template  
1352 attribute (section 5.3.1). Printers that conform to this specification MUST support the "media-  
1353 default" Printer Description attribute [STD92]. The "media-default" and "media-col-default"  
1354 Printer attributes MUST both be configured to specify the same media instance. If the  
1355 Administrator sets one of them to a value (either locally or with the Set-Printer-Attributes  
1356 [RFC3380] operation), the Printer MUST set the other attribute's value to the same media  
1357 instance or to the 'unknown' out-of-band value, if there isn't a corresponding value to be set  
1358 for the other attribute. If a Client attempts to set both attributes, but their values specify  
1359 different media instances, the Printer MUST reject the Set-Printer-Attributes operation and  
1360 return the 'client-error-conflicting-attributes' status code.

**1361 5.5.34 media-col-ready (1setOf collection)**

1362 This REQUIRED attribute lists the "media-col" (section 5.3.1) values representing media  
1363 that are available for use without human intervention, i.e., the media that are ready to be  
1364 printed on without interaction. Printers that conform to this specification MUST support the  
1365 "media-ready" Printer Description attribute [STD92]. The  $i^{\text{th}}$  value of the "media-col-ready"  
1366 attribute corresponds to the  $i^{\text{th}}$  value of the "media-ready" attribute so that the Client can  
1367 correlate the media names or keywords with the collection values and determine the  
1368 characteristics of each ready media instance.

**1369 5.5.35 media-col-supported (1setOf keyword)**

1370 This REQUIRED attribute lists the supported member attributes of the "media-col"  
1371 Job/Document Template attribute (section 5.3.1).

**1372 5.5.36 media-color-supported (1setOf (type2 keyword | name(MAX)))**

1373 This [CONDITIONALLY REQUIRED](#) attribute lists the supported values of the "media-color"  
1374 member attribute (section 5.3.1.4). Printers that support the "media-color" member attribute  
1375 MUST support this attribute.

**1376 5.5.37 media-front-coating-supported (1setOf (type2 keyword | name(MAX)))**

1377 This [CONDITIONALLY REQUIRED](#) attribute lists the supported values of the "media-front-  
1378 coating" member attribute (section 5.3.1.5). Printers that support the "media-front-coating"  
1379 member attribute MUST support this attribute.

**1380 5.5.38 media-grain-supported (1setOf (type2 keyword | name(MAX)))**

1381 This [CONDITIONALLY REQUIRED](#) attribute lists the supported values of the "media-grain"  
1382 member attribute (section 5.3.1.6). Printers that support the "media-grain" member attribute  
1383 MUST support this attribute.

**1384 5.5.39 media-hole-count-supported (1setOf rangeOfInteger(0:MAX))**

1385 This [CONDITIONALLY REQUIRED](#) attribute lists the supported ranges of values of the  
1386 "media-hole-count" member attribute (section 5.3.1.6). Printers that support the "media-  
1387 hole-count" member attribute MUST support this attribute.

**1388 5.5.40 media-key-supported (1setOf (type2 keyword | name(MAX)))**

1389 This [CONDITIONALLY REQUIRED](#) attribute lists the supported values of the "media-key"  
1390 member attribute (section 5.3.1.9). Printers that support the "media-key" member attribute  
1391 MUST support this attribute.

**1392 5.5.41 media-left-margin-supported (1setOf integer(0:MAX))**

1393 This REQUIRED attribute lists the supported values for the "media-left-margin" member  
1394 attribute (section 5.3.1.10).

**1395 5.5.42 media-order-count-supported (1setOf rangeOfInteger(1:MAX))**

1396 This [CONDITIONALLY REQUIRED](#) attribute lists the ranges of supported values of the  
1397 "media-order-count" member attribute (section 5.3.1.8). Printers that support the "media-  
1398 order-count" member attribute MUST support this attribute.

**1399 5.5.43 media-pre-printed-supported (1setOf (type2 keyword | name(MAX)))**

1400 This [CONDITIONALLY REQUIRED](#) attribute lists the supported values of the "media-pre-  
1401 printed" member attribute (section 5.3.1.5). Printers that support the "media-pre-printed"  
1402 member attribute MUST support this attribute.

**1403 5.5.44 media-recycled-supported (1setOf (type2 keyword | name(MAX)))**

1404 This [CONDITIONALLY REQUIRED](#) attribute lists the supported values of the "media-  
1405 recycled" member attribute (section 5.3.1.13). Printers that support the "media-recycled"  
1406 member attribute MUST support this attribute and MUST include the 'none' keyword value.

**1407 5.5.45 media-right-margin-supported (1setOf integer(0:MAX))**

1408 This REQUIRED attribute lists the supported values for the "media-right-margin" member  
1409 attribute (section 5.3.1.14).

**1410 5.5.46 media-size-supported (1setOf collection)**

1411 This REQUIRED attribute lists the supported values of the "media-size" member attribute  
1412 (section 5.3.1.12). Unlike the "media-size" member attribute, the "x-dimension" and "y-  
1413 dimension" member attributes of "media-size-supported" have a syntax of "integer(1:MAX)  
1414 | rangeOfInteger(1:MAX)" to allow for arbitrary ranges of sizes for custom and roll-fed media.

**1415 5.5.47 media-source-supported (1setOf (type2 keyword | name(MAX)))**

1416 This REQUIRED attribute lists the supported values of the "media-source" member attribute  
1417 (section 5.3.1.17).

**1418 5.5.48 media-thickness-supported (1setOf rangeOfInteger(1:MAX))**

1419 This [CONDITIONALLY REQUIRED](#) attribute lists the ranges of supported values for the  
1420 "media-thickness" member attribute (section 5.3.1.19). Printers that support the "media-  
1421 thickness" member attribute MUST support this attribute.

**1422 5.5.49 media-tooth-supported (1setOf (type2 keyword | name(MAX)))**

1423 This [CONDITIONALLY REQUIRED](#) attribute lists the supported values of the "media-tooth"  
1424 member attribute (section 5.3.1.20). Printers that support the "media-tooth" member  
1425 attribute MUST support this attribute.

**1426 5.5.50 media-top-margin-supported (1setOf integer(0:MAX))**

1427 This REQUIRED attribute lists the supported values for the "media-top-margin" member  
1428 attribute (section 5.3.1.21).

**1429 5.5.51 media-type-supported (1setOf (type2 keyword | name(MAX)))**

1430 This REQUIRED attribute lists the supported values of the "media-type" member attribute  
1431 (section 5.3.1.21).

**1432 5.5.52 media-weight-metric-supported (1setOf rangeOfInteger(1:MAX))**

1433 This [CONDITIONALLY REQUIRED](#) attribute lists the supported ranges of values of the  
1434 "media-weight-metric" member attribute (section 5.3.1.23). Printers that support the "media-  
1435 weight-metric" member attribute MUST support this attribute.

**1436 5.5.53 output-device-supported (1setOf name(127))**

1437 This CONDITIONALLY REQUIRED attribute lists the supported "output-device" values.  
1438 Printers MUST support this attribute if the "output-device" Job Template attribute (section  
1439 5.3.1) is supported.

**1440 5.5.54 print-content-optimize-default (type2 keyword)**

1441 This CONDITIONALLY REQUIRED attribute specifies the default "print-content-optimize"  
1442 (section 5.3.3) value. Printers that support the "print-content-optimize" attribute MUST  
1443 support this attribute.

1444 **5.5.55 print-content-optimize-supported (1setOf type2 keyword)**

1445 This CONDITIONALLY REQUIRED attribute lists the supported “print-content-optimize”  
1446 (section 5.3.3) values. Printers that support the "print-content-optimize" attribute MUST  
1447 support this attribute.

1448 **5.5.56 which-jobs-supported (1setOf type2 keyword)**

1449 This REQUIRED attribute lists the supported values for the "which-jobs" operation attribute  
1450 [STD92] that is used with the Get-Jobs operation [STD92].

1451 **5.6 Printer Status Attributes**

1452 **5.6.1 printer-detailed-status-messages (1setOf text(MAX))**

1453 This attribute specifies additional detailed and technical information about the Printer,  
1454 including information such as fault and warning messages, in the same way that the “job-  
1455 detailed-status-messages” [STD92] Job Status attribute provides additional information  
1456 about a Job. Because the messages are human-readable text, Clients MUST NOT attempt  
1457 to parse the value(s) of this attribute.

1458 **6. Additional Semantics for Existing Operations**

1459 **6.1 Create-Job, Print-Job, Print-URI, Validate-Job: job-mandatory-  
1460 attributes**

1461 This specification extends the Create-Job, Print-Job, Print-URI, and Validate-Job operations  
1462 to support the "job-mandatory-attributes" operation attribute (section 5.1.4) in the request  
1463 sent by the Client, which specifies a list of Job Template attributes that MUST be supported  
1464 by the Printer for the request to be accepted.

1465 The Client MAY supply and the Printer MUST accept the “job-mandatory-attributes”  
1466 operation attribute in any Job Creation or Validate-Job request.

1467 The Printer MUST reject the Job Creation request if the Client supplies an unsupported Job  
1468 Template attribute or value in the request that is included in this list of "job-mandatory-  
1469 attributes" values.

1470 If the Client supplies both the “job-mandatory-attributes” and "ipp-attribute-fidelity” operation  
1471 attributes, the Printer MUST ignore the “job-mandatory-attributes” attribute.

1472 **6.2 Create-Job, Print-Job, Print-URI: server-error-too-many-jobs Status**  
1473 **Code**

1474 This specification extends the Job Creation operations to return the 'server-error-too-many-  
1475 jobs' status code value when the Printer is currently unable to create a new Job object.

1476 **6.3 Get-Jobs Operation: "job-ids (1setOf integer(1:MAX))"**

1477 The "job-ids" (section 5.1.3) operation attribute, if supplied, specifies a list of target Jobs to  
1478 be returned in the response to a Get-Jobs [STD92] request. Printers MUST support it in Get-  
1479 Jobs requests to limit the list of Jobs that are returned.

1480 If the Client supplies the "job-ids" operation attribute in a Get-Jobs request, the Client MUST  
1481 NOT also supply any of the following operation attributes in the same request: "limit", "my-  
1482 jobs", or "which-jobs". If the Client does supply prohibited operation attributes, the Printer  
1483 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

1484 **6.4 Hold-Job Operation: "job-hold-until-time (dateTime)"**

1485 The "job-hold-until-time" (section 5.1.1) operation attribute can be provided to specify a date  
1486 and time when the Job will become a candidate for processing. Printers that support the  
1487 "job-hold-until-time" attribute and Hold-Job operation MUST support its use with the Hold-  
1488 Job operation. If accepted, the "job-hold-until-time" operation attribute is copied to the Job,  
1489 replacing any existing "job-hold-until" [STD92] or "job-hold-until-time" attribute.

1490 Clients MUST NOT send both the "job-hold-until" [STD92] and "job-hold-until-time" operation  
1491 attributes in a Hold-Job request. If both attributes are sent, Printers MUST reject the request  
1492 and return the 'client-error-conflicting-attributes' status code.

1493 **6.5 Print-Job, Print-URI, Send-Document, Send-URI: server-error-too-  
1494 many-documents Status Code**

1495 This specification extends the Document Creation operations to return the 'server-error-too-  
1496 many-documents' status code value when the Printer is currently unable to create a new  
1497 Document object.

1498 **6.6 Set-Job-Attributes Operation: "job-hold-until-time (dateTime)"**

1499 The "job-hold-until-time" (section 5.4.6) Job Template attribute can be provided to specify a  
1500 date and time when the Job will become a candidate for processing. Printers that support  
1501 the "job-hold-until-time" attribute and Set-Job-Attributes operation MUST support its use with  
1502 the Set-Job-Attributes operation. If accepted, the "job-hold-until-time" operation attribute is  
1503 copied to the Job, replacing any existing "job-hold-until" [STD92] or "job-hold-until-time"  
1504 attribute.



1505 Clients MUST NOT send both the "job-hold-until" [STD92] and "job-hold-until-time" Job  
1506 Template attributes in a Set-Job-Attributes request. If both attributes are sent, Printers  
1507 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

## 1508 **7. Additional Values for Existing Attributes**

### 1509 **7.1 job-sheets (type2 keyword | name(MAX))**

1510 The following additional values are defined for the "job-sheets" Job Template attribute  
1511 [STD92]:

1512 'job-start-sheet': A Job Sheet is printed to indicate the start of the Job.

1513 'job-end-sheet': A Job Sheet is printed to indicate the end of the Job.

1514 'job-both-sheets': Job Sheets is printed to indicate the start and end of all the output  
1515 associated with the Job.

1516 'first-print-stream-page': The first Input Page in the Document Data is printed as the  
1517 Job Sheet and the Printer's standard Job Sheet is suppressed.

### 1518 **7.2 job-state-reasons (1setOf type2 keyword)**

1519 This specification adds the following new keyword values for the "job-state-reasons" Job  
1520 Status attribute [STD92]:

1521 'digital-signature-did-not-verify': One or more documents in the Job contains a  
1522 digital signature that could not be verified by the Printer.

1523 'errors-detected': The Printer has detected one or more errors during processing of  
1524 the Job.

1525 'job-delay-until-specified': The Job's output is delayed because the "job-delay-  
1526 output-until" or "job-delay-output-until-time" Job Template attribute was specified.

1527 'warnings-detected': The Printer has detected one or more warnings during  
1528 processing of the Job.

### 1529 **7.3 media (type2 keyword | name(MAX))**

1530 This specification adds the following new keyword value for the "media" Job Template  
1531 attribute [STD92]:

1532 'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in': Print using US Letter or ISO A4  
1533 media (whichever is available).

1534 Note: The semantics of the 'choice' prefix are documented in the PWG Media Standardized  
1535 Names v2.0 (MSN2) specification [PWG5101.1].

#### 1536 **7.4 pdl-override-supported (type2 keyword)**

1537 This specification defines a new 'guaranteed' value for the "pdl-override-supported" [STD92]  
1538 Printer Description attribute. This value indicates that the Printer guarantees that:

- 1539 1. Document and/or Job Template attribute values take precedence over instructions of  
1540 any form embedded anywhere in the Document data;
- 1541 2. Document and/or Job Template attributes that have only a single supported value  
1542 take precedence over instructions of any form embedded anywhere in the Document  
1543 data, even if the attribute is not included in the Job or Document Creation request;  
1544 and
- 1545 3. No PDL instruction is performed that does not correspond to a current value in the  
1546 corresponding "xxx-supported" Printer Description attribute.

1547 If a Printer cannot honor the advertised "pdl-override-supported" value for a Job, it can abort  
1548 the Job, stop the Printer, hold the Job, or substitute a supported value. This choice can be  
1549 fixed by the implementation or configurable by the Administrator and can depend on the  
1550 Document and/or Job Template attribute.

#### 1551 **7.5 which-jobs (type2 keyword)**

1552 This specification adds the following new keyword values for the "which-jobs" operation  
1553 attribute [STD92]:

- 1554 'aborted': Any Job in the 'aborted' state.
- 1555 'all': All Jobs regardless of state.
- 1556 'canceled': Any Job in the 'canceled' state.
- 1557 'pending': Any Job in the 'pending' state.
- 1558 'pending-held': Any Job in the 'pending-held' state.
- 1559 'processing': Any Job in the 'processing' state.
- 1560 'processing-stopped': Any Job in the 'processing-stopped' state.

### 1561 **8. New Status Codes**

1562 This section defines additional status code values.

1563 **8.1 server-error-too-many-jobs (0x050B)**

1564 The Client has attempted to create a Job using any of the Job Creation operations which  
1565 would exceed the capacity of the Printer. The Client can retry the unmodified request.

1566 **8.2 server-error-too-many-documents (0x050C)**

1567 The Client has attempted to create a Document using any of the Document Creation  
1568 operations which would exceed the capacity of the Printer for this Job. The Client can retry  
1569 the unmodified request.

1570

1571 **9. Obsolete Attributes**1572 **9.1 Obsolete Operation Attributes**

1573 Table 6 lists the operation attributes from the previous version of this specification  
1574 [PWG5100.7-2003] which are now OBSOLETE.

1575 **Table 6 - OBSOLETE Operation Attributes**

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

1576 **9.2 Obsolete Member Attributes**

1577 Table 7 lists the member attributes of the "document-format-details" operation attribute  
1578 (section ) which are now OBSOLETE.

1579 **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

1580 **9.3 Obsolete Job Status Attributes**

1581 Table 8 lists the Job Status attributes from the previous version of this specification  
1582 [PWG5100.7-2003] which are now OBSOLETE.

1583 **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

#### 1584 9.4 Obsolete Job Template Attributes

1585 Table 9 lists the Job Templates attributes from the previous version of this specification  
1586 [PWG5100.7-2003] which are now OBSOLETE.

1587 **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

#### 1588 9.5 Obsolete Printer Description Attributes

1589 The following Printer Description attributes from the previous version of this specification  
1590 [PWG5100.7-2003] which are now OBSOLETE.

1591 **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

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
media-info-supported (boolean)	Unnecessary attribute

## 1592 10. Obsolete Values

### 1593 10.1 Obsolete "job-state-reasons" Values

1594 The 'digital-signature-type-not-supported' and 'job-digital-signature-wait' keyword values  
 1595 from the previous version of this specification [PWG5100.7-2003] are now OBSOLETE  
 1596 because the corresponding Job Template attribute is OBSOLETE.

## 1597 11. Conformance Requirements

### 1598 11.1 Printer Conformance Requirements

1599 In order for a Printer to claim conformance to this specification, a Printer MUST support:

- 1600 1. The new operations defined in section 4;
- 1601 2. The operation attributes defined in 5.1;
- 1602 3. The Job Status attributes defined in section 5.2 that correspond to any  
 1603 supported Job Template attributes defined in section 5.3;
- 1604 4. The Document Status attributes defined in section 5.2 that correspond to any  
 1605 supported Document Template attributes defined in section 5.3;
- 1606 5. The Printer Description attributes defined in section 5.5 that correspond to any  
 1607 supported Document/Job Template attributes defined in section 5.3;
- 1608 6. The additional semantics defined in section 6;
- 1609 7. The additional values defined in section 7;
- 1610 8. The internationalization considerations defined in section 12; and
- 1611 9. The security considerations defined in section 13.

### 1612 11.2 Client Conformance Requirements

1613 In order for a Client to claim conformance to this specification, a Client MUST support:

- 1614 1. The internationalization considerations defined in section 12; and
- 1615 2. The security considerations defined in section 13.

## 1616 **12. Internationalization Considerations**

1617 For interoperability and basic support for multiple languages, conforming implementations  
1618 MUST support:

- 1619 1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)  
1620 [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
- 1621 2. The Unicode Format for Network Interchange [RFC5198] which requires  
1622 transmission of well-formed UTF-8 strings and recommends transmission of  
1623 normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

1624 Unicode NFC is defined as the result of performing Canonical Decomposition (into base  
1625 characters and combining marks) followed by Canonical Composition (into canonical  
1626 composed characters wherever Unicode has assigned them).

1627 WARNING – Performing normalization on UTF-8 strings received from Clients and  
1628 subsequently storing the results (e.g., in Job objects) could cause false negatives in Client  
1629 searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now  
1630 'hidden').

1631 Implementations of this specification SHOULD conform to the following standards on  
1632 processing of human-readable Unicode text strings, see:

- 1633 Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical
- 1634 Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping
- 1635 Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]
- 1636 Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences
- 1637 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization
- 1638 Unicode Collation Algorithm [UTS10] – sorting
- 1639 Unicode Locale Data Markup Language [UTS35] – locale databases

1640 Implementations of this specification are advised to also review the following informational  
1641 documents on processing of human-readable Unicode text strings:

- 1642 Unicode Character Encoding Model [UTR17] – multi-layer character model
- 1643 Unicode Character Property Model [UTR23] – character properties
- 1644 Unicode Conformance Model [UTR33] – Unicode conformance basis

## 1645 13. Security Considerations

1646 The IPP extensions defined in this document require the same security considerations as  
1647 defined in the Internet Printing Protocol/1.1 [STD92].

1648 Implementations of this specification SHOULD conform to the following standard on  
1649 processing of human-readable Unicode text strings, see:

1650       Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

1651 Implementations of this specification are advised to also review the following informational  
1652 document on processing of human-readable Unicode text strings:

1653       Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

## 1654 14. IANA Considerations

### 1655 14.1 Attribute Registrations

1656 The attributes defined in this specification will be published by IANA according to the  
1657 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1658       <http://www.iana.org/assignments/ipp-registrations>

1659 The registry entries will contain the following information:

1660	Document Status attributes:	Reference
1661	-----	-----
1662	document-format-details(deprecated) (collection)	[PWG5100.7]
1663	document-format-details-detected(deprecated) (collection)	[PWG5100.7]
1664	document-format-supplied(obsolete) (mimeMediaType)	[PWG5100.7]
1665	document-format-version-supplied(obsolete) (text(127))	[PWG5100.7]
1666	document-message-supplied(obsolete) (text(MAX))	[PWG5100.7]
1667	document-name-supplied(obsolete) (name(MAX))	[PWG5100.7]
1668	errors-count (integer(0:MAX))	[PWG5100.7]
1669	output-device-actual(obsolete) (1setOf name(127))	[PWG5100.7]
1670	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
1671	warnings-count (integer(0:MAX))	[PWG5100.7]
1672		
1673	Document Template attributes:	Reference
1674	-----	-----
1675	media-col (collection)	[PWG5100.7]
1676	<Any "media-col" member attribute>	[PWG5100.7]
1677	output-device (name(127))	[PWG5100.7]
1678	print-content-optimize (type2 keyword)	[PWG5100.7]
1679		
1680	Job Status attributes:	Reference
1681	-----	-----
1682	compression-supplied(obsolete) (type2 keyword)	[PWG5100.7]
1683	document-charset-supplied(obsolete) (charset)	[PWG5100.7]



1684	document-digital-signature-supplied(obsolete) (type2 keyword)	
1685		[PWG5100.7]
1686	document-format-details(deprecated) (collection)	[PWG5100.7]
1687	document-format-details-detected(deprecated) (collection)	[PWG5100.7]
1688	document-format-details-supplied(obsolete) (1setOf collection)	
1689		[PWG5100.7]
1690	document-format-supplied(obsolete) (mimeMediaType)	[PWG5100.7]
1691	document-format-version-supplied(obsolete) (text(127))	[PWG5100.7]
1692	document-message-supplied(obsolete) (text(MAX))	[PWG5100.7]
1693	document-name-supplied(obsolete) (name(MAX))	[PWG5100.7]
1694	document-natural-language-supplied(obsolete) (naturalLanguage)	
1695		[PWG5100.7]
1696	errors-count (integer(0:MAX))	[PWG5100.7]
1697	ipp-attribute-fidelity(obsolete) (boolean)	[PWG5100.7]
1698	job-copies-actual(obsolete) (integer(1:MAX))	[PWG5100.7]
1699	job-cover-back-actual(obsolete) (collection)	[PWG5100.7]
1700	job-cover-front-actual(obsolete) (collection)	[PWG5100.7]
1701	job-finishings-actual(obsolete) (1setOf type2 enum)	[PWG5100.7]
1702	job-finishings-col-actual(obsolete) (1setOf collection)	[PWG5100.7]
1703	job-mandatory-attributes(obsolete) (1setOf keyword)	[PWG5100.7]
1704	output-device-actual(obsolete) (1setOf name(127))	[PWG5100.7]
1705	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
1706	warnings-count (integer(0:MAX))	[PWG5100.7]
1707		
1708	Job Template attributes:	Reference
1709	-----	-----
1710	job-account-id (name(MAX))	[PWG5100.7]
1711	job-accounting-user-id (name(MAX))	[PWG5100.7]
1712	job-cancel-after (integer(0:MAX))	[PWG5100.7]
1713	job-copies(obsolete) (integer(1:MAX))	[PWG5100.7]
1714	job-cover-back(obsolete) (collection)	[PWG5100.7]
1715	job-cover-front(obsolete) (collection)	[PWG5100.7]
1716	job-delay-output-until (type2 keyword   name(MAX))	[PWG5100.7]
1717	job-delay-output-until-time (dateTime)	[PWG5100.7]
1718	job-hold-until-time (dateTime)	[PWG5100.7]
1719	job-finishings(obsolete) (1setOf type2 enum)	[PWG5100.7]
1720	job-finishings-col(obsolete) (1setOf collection)	[PWG5100.7]
1721	job-retain-until (type2 keyword   name(MAX))	[PWG5100.7]
1722	job-retain-until-interval (integer(0:MAX))	[PWG5100.7]
1723	job-retain-until-time (dateTime)	[PWG5100.7]
1724	job-sheets-col (collection)	[PWG5100.7]
1725	job-sheets (type2 keyword   name(MAX))	[PWG5100.7]
1726	media (type2 keyword   name(MAX))	[PWG5100.7]
1727	media-col (collection)	[PWG5100.7]
1728	media-col (collection)	[PWG5100.7]
1729	media-back-coating (type2 keyword   name(MAX))	[PWG5100.7]
1730	media-bottom-margin (integer(0:MAX))	[PWG5100.7]
1731	media-color (type2 keyword   name(MAX))	[PWG5100.7]
1732	media-front-coating (type2 keyword   name(MAX))	[PWG5100.7]
1733	media-grain (type2 keyword   name(MAX))	[PWG5100.7]
1734	media-hole-count (integer(0:MAX))	[PWG5100.7]
1735	media-info (text(255))	[PWG5100.7]
1736	media-key (type2 keyword   name(MAX))	[PWG5100.7]
1737	media-left-margin (integer(0:MAX))	[PWG5100.7]
1738	media-order-count (integer(1:MAX))	[PWG5100.7]
1739	media-pre-printed (type2 keyword   name(MAX))	[PWG5100.7]

1740	media-recycled (type2 keyword   name(MAX))	[PWG5100.7]
1741	media-right-margin (integer(0:MAX))	[PWG5100.7]
1742	media-size (collection)	[PWG5100.7]
1743	x-dimension (integer(0:MAX))	[PWG5100.7]
1744	y-dimension (integer(0:MAX))	[PWG5100.7]
1745	media-size-name (type2 keyword   name(MAX))	[PWG5100.7]
1746	media-source (type2 keyword   name(MAX))	[PWG5100.7]
1747	media-thickness (integer(1:MAX))	[PWG5100.7]
1748	media-tooth (type2 keyword   name(MAX))	[PWG5100.7]
1749	media-top-margin (integer(0:MAX))	[PWG5100.7]
1750	media-type (type2 keyword   name(MAX))	[PWG5100.7]
1751	media-weight-metric (integer(0:MAX))	[PWG5100.7]
1752	output-device (name(127))	[PWG5100.7]
1753	print-content-optimize (type2 keyword)	[PWG5100.7]
1754		
1755	Operation attributes:	Reference
1756	-----	-----
1757	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.7]
1758	document-format-details(deprecated) (collection)	[PWG5100.7]
1759	document-format(obsolete) (mimeMediaType)	[PWG5100.7]
1760	document-format-device-id(obsolete) (text(127))	[PWG5100.7]
1761	document-format-version(obsolete) (text(127))	[PWG5100.7]
1762	document-natural-language(obsolete) (1setOf naturalLanguage)	[PWG5100.7]
1763		
1764	document-source-application-name (name(MAX))	[PWG5100.7]
1765	document-source-application-version (text(127))	[PWG5100.7]
1766	document-source-os-name (name(40))	[PWG5100.7]
1767	document-source-os-version (text(40))	[PWG5100.7]
1768	document-format-version(obsolete) (text(127))	[PWG5100.7]
1769	job-hold-until-time (dateTime)	[PWG5100.7]
1770	job-ids (1setOf integer(1:MAX))	[PWG5100.7]
1771	job-mandatory-attributes (1setOf keyword)	[PWG5100.7]
1772		
1773	Printer Description attributes:	Reference
1774	-----	-----
1775	document-charset-default (charset)	[PWG5100.7]
1776	document-charset-supported (1setOf charset)	[PWG5100.7]
1777	document-digital-signature-default(obsolete) (type2 keyword)	[PWG5100.7]
1778		
1779	document-digital-signature-supported(obsolete) (1setOf type2 keyword)	[PWG5100.7]
1780		
1781	document-format-details-default(obsolete) (collection)	[PWG5100.7]
1782	document-format-details-supported (1setOf keyword)	[PWG5100.7]
1783	document-format-version-default(obsolete) (text(127))	[PWG5100.7]
1784	document-format-version-supported(obsolete) (1setOf text(127))	[PWG5100.7]
1785		
1786	document-natural-language-default (naturalLanguage)	[PWG5100.7]
1787	document-natural-language-supported (1setOf naturalLanguage)	[PWG5100.7]
1788		
1789	job-cancel-after-default (integer(0:MAX)   no-value)	[PWG5100.7]
1790	job-cancel-after-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1791	job-copies-default(obsolete) (integer(1:MAX))	[PWG5100.7]
1792	job-copies-supported(obsolete) (rangeOfInteger(1:MAX))	[PWG5100.7]
1793	job-cover-back-default(obsolete) (collection)	[PWG5100.7]
1794	job-cover-back-supported(obsolete) (1setOf keyword)	[PWG5100.7]
1795	job-cover-front-default(obsolete) (collection)	[PWG5100.7]

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1796 job-cover-front-supported(obsolete) (1setOf keyword) [PWG5100.7]
1797 job-creation-attributes-supported (1setOf keyword) [PWG5100.7]
1798 job-delay-output-until-default (type2 keyword | name(MAX)) [PWG5100.7]
1799 job-delay-output-until-interval-supported (rangeOfInteger(0:MAX))
1800 [PWG5100.7]
1801 job-delay-output-until-supported (1setOf (type2 keyword | name(MAX)))
1802 [PWG5100.7]
1803 job-delay-output-until-time-supported (rangeOfInteger(0:MAX))
1804 [PWG5100.7]
1805 job-finishings-col-default(obsolete) (1setOf collection) [PWG5100.7]
1806 job-finishings-col-ready(obsolete) (1setOf collection) [PWG5100.7]
1807 job-finishings-col-supported(obsolete) (1setOf keyword) [PWG5100.7]
1808 job-finishings-default(obsolete) (1setOf type2 enum) [PWG5100.7]
1809 job-finishings-ready(obsolete) (1setOf type2 enum) [PWG5100.7]
1810 job-finishings-supported(obsolete) (1setOf type2 enum) [PWG5100.7]
1811 job-history-attributes-configured (1setOf keyword) [PWG5100.7]
1812 job-history-attributes-supported (1setOf keyword) [PWG5100.7]
1813 job-history-interval-configured (integer(0:MAX)) [PWG5100.7]
1814 job-history-interval-supported (rangeOfInteger(0:MAX)) [PWG5100.7]
1815 job-ids-supported (boolean) [PWG5100.7]
1816 job-mandatory-attributes-supported (boolean) [PWG5100.7]
1817 job-retain-until-default (type2 keyword | name(MAX)) [PWG5100.7]
1818 job-retain-until-interval-supported (rangeOfInteger(0:MAX)) [PWG5100.7]
1819 job-retain-until-supported (1setOf (type2 keyword | name(MAX)))
1820 [PWG5100.7]
1821 job-retain-until-time-supported (rangeOfInteger(0:MAX)) [PWG5100.7]
1822 job-spooling-supported (type2 keyword) [PWG5100.7]
1823 media-back-coating-supported (1setOf (type2 keyword | name(MAX)))
1824 [PWG5100.7]
1825 media-bottom-margin-supported (1setOf integer(0:MAX)) [PWG5100.7]
1826 media-col-database (1setOf collection) [PWG5100.7]
1827 <Any "media-col" member attribute> [PWG5100.7]
1828 media-source-properties (collection) [PWG5100.7]
1829 media-source-feed-direction (type2 keyword) [PWG5100.7]
1830 media-source-feed-orientation (type2 enum) [PWG5100.7]
1831 media-col-default (collection) [PWG5100.7]
1832 <Any "media-col" member attribute> [PWG5100.7]
1833 media-col-ready (1setOf collection) [PWG5100.7]
1834 <Any "media-col" member attribute> [PWG5100.7]
1835 media-source-properties (collection) [PWG5100.7]
1836 media-source-feed-direction (type2 keyword) [PWG5100.7]
1837 media-source-feed-orientation (type2 enum) [PWG5100.7]
1838 media-col-supported (1setOf keyword) [PWG5100.3]
1839 media-color-supported (1setOf (type2 keyword | name(MAX))) [PWG5100.7]
1840 media-front-coating-supported (1setOf (type2 keyword | name(MAX)))
1841 [PWG5100.7]
1842 media-grain-supported (1setOf (type2 keyword | name(MAX))) [PWG5100.7]
1843 media-hole-count-supported (1setOf rangeOfInteger(0:MAX)) [PWG5100.7]
1844 media-key-supported (1setOf (type2 keyword | name(MAX))) [PWG5100.7]
1845 media-info-supported(obsolete) (boolean) [PWG5100.7]
1846 media-left-margin-supported (1setOf integer(0:MAX)) [PWG5100.7]
1847 media-order-count-supported (1setOf rangeOfInteger(1:MAX)) [PWG5100.7]
1848 media-pre-printed-supported (1setOf (type2 keyword | name(MAX)))
1849 [PWG5100.7]
1850 media-recycled-supported (1setOf (type2 keyword | name(MAX)))
1851 [PWG5100.7]

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1852	media-right-margin-supported (1setOf integer(0:MAX))	[PWG5100.7]
1853	media-size-supported (1setOf collection)	[PWG5100.7]
1854	x-dimension (integer(1:MAX)   rangeOfInteger(1:MAX))	[PWG5100.7]
1855	y-dimension (integer(1:MAX)   rangeOfInteger(1:MAX))	[PWG5100.7]
1856	media-source-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1857		[PWG5100.7]
1858	media-thickness-supported (1setOf rangeOfInteger(1:MAX))	[PWG5100.7]
1859	media-tooth-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1860	media-top-margin-supported (1setOf integer(0:MAX))	[PWG5100.7]
1861	media-type-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1862	media-weight-metric-supported (1setOf rangeOfInteger(1:MAX))	[PWG5100.7]
1863		[PWG5100.7]
1864	output-device-supported (1setOf name(127))	[PWG5100.7]
1865	print-content-optimize-default (type2 keyword)	[PWG5100.7]
1866	print-content-optimize-supported (1setOf type2 keyword)	[PWG5100.7]
1867	which-jobs-supported (1setOf type2 keyword)	[PWG5100.7]
1868		
1869	Printer Status attributes:	Reference
1870	-----	-----
1871	printer-detailed-status-messages (1setOf text(MAX))	[PWG5100.7]

## 1872 14.2 Type2 keyword Value Registrations

1873 The keyword values defined in this specification will be published by IANA according to the  
1874 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1875 <http://www.iana.org/assignments/ipp-registrations>

1876 The registry entries will contain the following information:

1877	Attributes (attribute syntax)	
1878	Keyword Attribute Value	Reference
1879	-----	-----
1880	job-delay-output-until (type2 keyword   name(MAX))	[PWG5100.7]
1881	day-time	[PWG5100.7]
1882	evening	[PWG5100.7]
1883	indefinite	[PWG5100.7]
1884	night	[PWG5100.7]
1885	no-delay-output	[PWG5100.7]
1886	second-shift	[PWG5100.7]
1887	third-shift	[PWG5100.7]
1888	weekend	[PWG5100.7]
1889	job-delay-output-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1890	<Any "job-delay-output-until" value>	[PWG5100.7]
1891	job-delay-output-until-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1892	<Any "job-delay-output-until" value>	[PWG5100.7]
1893	<Any "job-delay-output-until" value>	[PWG5100.7]
1894		
1895	job-retain-until (type2 keyword   name(MAX))	[PWG5100.7]
1896	end-of-day	[PWG5100.7]
1897	end-of-month	[PWG5100.7]
1898	end-of-week	[PWG5100.7]
1899	indefinite	[PWG5100.7]
1900	none	[PWG5100.7]

1901	job-retain-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1902	<Any "job-retain-until" value>	[PWG5100.7]
1903	job-retain-until-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1904		[PWG5100.7]
1905	<Any "job-retain-until" value>	[PWG5100.7]
1906		
1907	job-sheets (type2 keyword)	[STD92]
1908	first-print-stream-page	[PWG5100.7]
1909	job-both-sheets	[PWG5100.7]
1910	job-end-sheet	[PWG5100.7]
1911	job-start-sheet	[PWG5100.7]
1912		
1913	job-state-reasons (1setOf type2 keyword)	[STD92]
1914	digital-signature-did-not-verify	[PWG5100.7]
1915	digital-signature-type-not-supported(obsolete)	[PWG5100.7]
1916	errors-detected	[PWG5100.7]
1917	job-delay-output-until-specified	[PWG5100.7]
1918	job-digital-signature-wait(obsolete)	[PWG5100.7]
1919	warnings-detected	[PWG5100.7]
1920		
1921	media (type2 keyword   name(MAX))	[STD92]
1922	choice_iso_a4_210x297mm_na_letter_8.5x11in	[PWG5100.7]
1923		
1924	media-back-coating (type2 keyword   name(MAX))	[PWG5100.7]
1925	media-back-coating-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1926		[PWG5100.7]
1927	<Any "media-back-coating" value>	[PWG5100.7]
1928		
1929	media-color (type2 keyword   name(MAX))	[PWG5100.7]
1930	media-color-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1931	<Any "media-color" value>	[PWG5100.7]
1932		
1933	media-front-coating (type2 keyword   name(MAX))	[PWG5100.7]
1934	<Any "media-back-coating" value>	[PWG5100.7]
1935	media-front-coating-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1936		[PWG5100.7]
1937	<Any "media-front-coating" value>	[PWG5100.7]
1938		
1939	media-pre-printed (type2 keyword   name(MAX))	[PWG5100.7]
1940	blank	[PWG5100.7]
1941	letter-head	[PWG5100.7]
1942	pre-printed	[PWG5100.7]
1943	media-pre-printed-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1944		[PWG5100.7]
1945	<Any "media-pre-printed" value>	[PWG5100.7]
1946		
1947	media-recycled (type2 keyword   name(MAX))	[PWG5100.7]
1948	none	[PWG5100.7]
1949	standard	[PWG5100.7]
1950	media-recycled-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1951		[PWG5100.7]
1952	<Any "media-recycled" value>	[PWG5100.7]
1953		
1954	media-source-feed-direction (type2 keyword)	[PWG5100.7]
1955	long-edge-first	[PWG5100.7]
1956	short-edge-first	[PWG5100.7]

1957		
1958	media-source (type2 keyword   name(MAX))	[PWG5100.7]
1959	alternate	[PWG5100.7]
1960	alternate-roll	[PWG5100.7]
1961	auto	[PWG5100.7]
1962	bottom	[PWG5100.7]
1963	by-pass-tray	[PWG5100.7]
1964	center	[PWG5100.7]
1965	disc	[PWG5100.7]
1966	envelope	[PWG5100.7]
1967	hagaki	[PWG5100.7]
1968	large-capacity	[PWG5100.7]
1969	left	[PWG5100.7]
1970	main	[PWG5100.7]
1971	main-roll	[PWG5100.7]
1972	manual	[PWG5100.7]
1973	middle	[PWG5100.7]
1974	photo	[PWG5100.7]
1975	rear	[PWG5100.7]
1976	right	[PWG5100.7]
1977	roll-1	[PWG5100.7]
1978	roll-10	[PWG5100.7]
1979	roll-2	[PWG5100.7]
1980	roll-3	[PWG5100.7]
1981	roll-4	[PWG5100.7]
1982	roll-5	[PWG5100.7]
1983	roll-6	[PWG5100.7]
1984	roll-7	[PWG5100.7]
1985	roll-8	[PWG5100.7]
1986	roll-9	[PWG5100.7]
1987	side	[PWG5100.7]
1988	top	[PWG5100.7]
1989	tray-1	[PWG5100.7]
1990	tray-10	[PWG5100.7]
1991	tray-11	[PWG5100.7]
1992	tray-12	[PWG5100.7]
1993	tray-13	[PWG5100.7]
1994	tray-14	[PWG5100.7]
1995	tray-15	[PWG5100.7]
1996	tray-16	[PWG5100.7]
1997	tray-17	[PWG5100.7]
1998	tray-18	[PWG5100.7]
1999	tray-19	[PWG5100.7]
2000	tray-2	[PWG5100.7]
2001	tray-20	[PWG5100.7]
2002	tray-3	[PWG5100.7]
2003	tray-4	[PWG5100.7]
2004	tray-5	[PWG5100.7]
2005	tray-6	[PWG5100.7]
2006	tray-7	[PWG5100.7]
2007	tray-8	[PWG5100.7]
2008	tray-9	[PWG5100.7]
2009	media-source-supported (1setOf (type2 keyword   name(MAX))	
2010		[PWG5100.7]
2011	<Any "media-source" value>	[PWG5100.7]
2012		

2013	media-tooth (type2 keyword   name(MAX))	[PWG5100.7]
2014	media-tooth-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
2015	<Any "media-tooth" value>	[PWG5100.7]
2016		
2017	media-type (type2 keyword   name(MAX))	[PWG5100.7]
2018	media-type-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
2019	<Any "media-type" value>	[PWG5100.7]
2020		
2021	pdl-override-supported (type2 keyword)	[STD92]
2022	guaranteed	[PWG5100.7]
2023		
2024	print-content-optimize (type2 keyword)	[PWG5100.7]
2025	graphics	[PWG5100.7]
2026	photo	[PWG5100.7]
2027	text	[PWG5100.7]
2028	text-and-graphics	[PWG5100.7]
2029	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
2030	<Any "print-content-optimize" value>	[PWG5100.7]
2031	print-content-optimize-default (type2 keyword)	[PWG5100.7]
2032	<Any "print-content-optimize" value>	[PWG5100.7]
2033	print-content-optimize-supported (1setOf type2 keyword)	[PWG5100.7]
2034	<Any "print-content-optimize" value>	[PWG5100.7]
2035		
2036	which-jobs (type2 keyword)	[STD92]
2037	aborted	[PWG5100.7]
2038	all	[PWG5100.7]
2039	canceled	[PWG5100.7]
2040	pending	[PWG5100.7]
2041	pending-held	[PWG5100.7]
2042	processing	[PWG5100.7]
2043	processing-stopped	[PWG5100.7]

### 2044 14.3 Type2 enum Registrations

2045 The attributes defined in this specification will be published by IANA according to the  
 2046 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2047 <http://www.iana.org/assignments/ipp-registrations>

2048 The registry entries will contain the following information:

2049	Attributes (attribute syntax)	
2050	Enum Value Enum Symbolic Name	Reference
2051	-----	-----
2052	media-source-feed-orientation (type2 enum)	[PWG5100.7]
2053	<Any "orientation-requested" value>	[PWG5100.7]
2054		
2055	operations-supported (1setOf type2 enum)	[STD92]
2056	0x0038 Cancel-Jobs	[PWG5100.7]
2057	0x0039 Cancel-My-Jobs	[PWG5100.7]
2058	0x003A Close-Job	[PWG5100.7]
2059	0x003B Resubmit-Job	[PWG5100.7]

2060 **14.4 Operation Registrations**

2061 The operations defined in this specification will be published by IANA according to the  
 2062 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2063 <http://www.iana.org/assignments/ipp-registrations>

2064 The registry entries will contain the following information:

2065	Operation Name	Reference
2066	-----	-----
2067	Cancel-Jobs	[PWG5100.7]
2068	Cancel-My-Jobs	[PWG5100.7]
2069	Close-Job	[PWG5100.7]
2070	Create-Job (Extension)	[PWG5100.7]
2071	Hold-Job (Extension)	[PWG5100.7]
2072	Print-Job (Extension)	[PWG5100.7]
2073	Print-URI (Extension)	[PWG5100.7]
2074	Resubmit-Job	[PWG5100.7]
2075	Send-Document (Extension)	[PWG5100.7]
2076	Send-URI (Extension)	[PWG5100.7]
2077	Set-Job-Attributes (Extension)	[PWG5100.7]
2078	Validate-Job (Extension)	[PWG5100.7]

2079 **14.5 Status Code Registrations**

2080 The status codes defined in this specification will be published by IANA according to the  
 2081 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2082 <http://www.iana.org/assignments/ipp-registrations>

2083 The registry entries will contain the following information:

2084	Value	Status Code Name	Reference
2085	-----	-----	-----
2086	0x0500:0x05FF	- Server Error:	
2087	0x050B	server-error-too-many-jobs	[PWG5100.7]
2088	0x050C	server-error-too-many-documents	[PWG5100.7]

2089



## 2090 15. Overview of Changes

### 2091 15.1 IPP Job Extensions v2.0

2092 The following changes were made to the previous version of this specification [PWG5100.7-  
2093 2003]:

- 2094 • A rationale section was added, including use cases, exceptions, and requirements;
- 2095 • References now point to the current versions of dependent documents and  
2096 specifications at the time of publication;
- 2097 • Read-only attributes are now defined and registered as status attributes;
- 2098 • A REQUIRED "job-mandatory-attributes-supported" Printer Description attribute has  
2099 been added to indicate support for the "job-mandatory-attributes" Job Template  
2100 attribute;
- 2101 • The [RECOMMENDED](#) "job-hold-until-time" and [REQUIRED](#) "job-ids" operation  
2102 attributes were moved from the OBSOLETE IPP Job and Printer Extensions - Set 2  
2103 [PWG5100.11-2010] specification;
- 2104 • The [RECOMMENDED](#) "job-delay-output-until", "job-delay-output-until-time", and  
2105 "job-hold-until-time" Job Template attributes were moved from the OBSOLETE IPP  
2106 Job and Printer Extensions - Set 2 [PWG5100.11-2010] specification;
- 2107 • The [REQUIRED](#) "job-creation-attributes-supported", "job-spooling-supported",  
2108 "media-col-database", "printer-detailed-status-messages", and "which-jobs-  
2109 supported" Printer attributes were moved from the OBSOLETE IPP Job and Printer  
2110 Extensions - Set 2 [PWG5100.11-2010] specification;
- 2111 • The [RECOMMENDED](#) "job-account-id" and "job-accounting-user-id" Job Template  
2112 and related Printer Description attributes were moved from the IPP Production  
2113 Printing Attributes - Set 1 [PWG5100.3-2001] specification;
- 2114 • The [RECOMMENDED](#) "job-sheets-col" Job Template and related Printer Description  
2115 attributes were moved from the IPP Production Printing Attributes - Set 1  
2116 [PWG5100.3-2001] specification;
- 2117 • The additional values for the "job-sheets" Job Template attribute were moved from  
2118 the IPP Production Printing Attributes - Set 1 [PWG5100.3-2001] specification;
- 2119 • The REQUIRED "media-col" Document/Job Template attribute and related Printer  
2120 Description attributes were moved from the [original](#) IPP Production Printing Attributes  
2121 - Set 1 [PWG5100.3-2001], OBSOLETE IPP Job and Printer Extensions - Set 2

Deleted: 3

Deleted: 3

Deleted: 3

- 2125 [PWG5100.11-2010], and IPP Job and Printer Extensions - Set 3 [PWG5100.13-  
2126 2012] specifications;
- 2127 • [The](#) RECOMMENDED "job-retain-until", "job-retain-until-interval", and "job-retain-  
2128 until-time" Job Template attributes were added to control the Job Retention phase of  
2129 a Job's lifecycle;
  - 2130 • [The](#) REQUIRED "job-history-attributes-configured", "job-history-attributes-  
2131 supported", "job-history-interval-configured", and "job-history-interval-supported"  
2132 Printer Description attributes were added to control the Job History phase of a Job's  
2133 lifecycle;
  - 2134 • The "document-charset" operation attribute and corresponding operation semantics  
2135 are now defined in PWG 5100.5: IPP Document Object v1.1;
  - 2136 • The "document-digital-signature" operation attribute and corresponding Document  
2137 Status, Job Status, and Printer Description attributes have been made OBSOLETE  
2138 because of interoperability issues;
  - 2139 • The "document-format-details" operation attribute and corresponding Document  
2140 Status, Job Status, and Printer Description attributes have been made  
2141 DEPRECATED because of interoperability issues and privacy concerns;
  - 2142 • The "document-format", "document-format-version", and "document-natural-  
2143 language" member attributes of "document-format-details" have been made  
2144 OBSOLETE because the attributes are redundant;
  - 2145 • The "document-format-device-id" member attribute of "document-format-details"  
2146 have been made OBSOLETE because the attribute syntax is too short to be useful;
  - 2147 • The "document-format-version" operation attribute and corresponding Document  
2148 Status, Job Status, and Printer Description attributes have been made OBSOLETE  
2149 because of interoperability issues;
  - 2150 • The "job-copies" Job Template attribute and corresponding Job Status and Printer  
2151 Description attributes have been made OBSOLETE because of interoperability  
2152 issues;
  - 2153 • The "job-cover-back" Job Template attribute and corresponding Job Status and  
2154 Printer Description attributes have been made OBSOLETE because of  
2155 interoperability issues;
  - 2156 • The "job-cover-front" Job Template attribute and corresponding Job Status and  
2157 Printer Description attributes have been made OBSOLETE because of  
2158 interoperability issues;

- 2159 • The "job-finishings" Job Template attribute and corresponding Job Status and Printer  
2160 Description attributes have been made OBSOLETE because of interoperability  
2161 issues;
- 2162 • The "job-finishings-col" Job Template attribute and corresponding Job Status and  
2163 Printer Description attributes have been made OBSOLETE because of  
2164 interoperability issues; and
- 2165 • The 'digital-signature-type-not-supported' and 'job-digital-signature-wait' values for  
2166 the "job-state-reasons" attribute have been made OBSOLETE because of  
2167 interoperability issues.

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2242

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2254 <http://www.pwg.org/>

2255 Implementers of this specification document are encouraged to join the IPP Mailing List in  
2256 order to participate in any discussions of clarification issues and review of registration  
2257 proposals for additional attributes and values.

2258 The editors would like to especially thank the following individuals who also contributed  
2259 significantly to the development of this document:

2260 Tom Hastings (author of v1.0)  
2261 Peter Zehler (author of v1.0)  
2262

2263 **18. Change History**

2264 **18.1 May 24, 2019**

- 2265 • [Section 1: Clarify as "original" version of production printing](#)
- 2266 • [Section 5.3.1: All optional member attributes are now recommended](#)
- 2267 • [Sections 5.4.1 and 5.4.2: The job-account-id and job-accounting-user-id attributes](#)  
2268 [are now recommended](#)
- 2269 • [Section 5.5.x: Make all xxx-default and xxx-supported attributes of recommended xxx](#)  
2270 [attributes conditionally required](#)
- 2271 • [Section 15.1: Updated with conformance of new attributes](#)
- 2272 • [Global: fixed broken references](#)

2273 **18.2 May 10, 2019**

- 2274 • Copied media-col and related attributes and extensions from PWG 5100.3 and  
2275 5100.13 (JPS3)
- 2276 • Copied job-account-id, job-accounting-user-id, and related attributes from PWG  
2277 5100.3
- 2278 • Section 15.1: Updated discussion of media-col, add reference to 5100.13
- 2279 • Section 16.1: Moved 5100.3 reference to section 16.2
- 2280 • Section 16.2: Added 5100.13 reference

2281 **18.3 April 18, 2019**

- 2282 • Status: stable
- 2283 • Make document-format-details DEPRECATED, only obsolete redundant member  
2284 attributes per April 2019 F2F
- 2285 • Use OBSOLETE and DEPRECATED (uppercase) in text

2286 **18.4 March 15, 2019**

- 2287 • Version: 2.0

- 2288
  - Section 2.1: OBSOLETE -> OBSOLETE
- 2289
  - Section 2.4: Cleaned out unused terms, added definitions of Completed Job, Not Completed Job, and Retained Job
- 2290
- 2291
  - Sections 5 and 6: Updated conformance requirements
- 2292 **18.5 March 8, 2019**
- 2293
  - Status: Prototype
- 2294
  - Abstract: Reworded for updated scope
- 2295
  - Section 1: Reworded for updated scope, added discussion of obsolete JPS2 bits moving here
- 2296
- 2297
  - Section 2.1: Added definitions of OBSOLETE and DEPRECATED
- 2298
  - Section 3: Added rationale, use cases, and design requirements for attributes and operations from JPS2.
- 2299
- 2300
  - New section 4 for operations from JPS2
- 2301
  - Section 5: Made most attributes RECOMMENDED, added job-creation-attributes-supported, job-delay-output-until-xxx, job-history-xxx, job-retain-until-xxx, job-ids, job-pooling-supported, media-col-database, printer-detail-status-messages from JPS2
- 2302
- 2303
- 2304
  - Section 5: Added new job-history-xxx and job-retain-until-xxx attributes
- 2305
  - New section 6 for additional semantics (imported from JPS2)
- 2306
  - Section 7: Added pdl-override-supported, which-jobs values, media-col member attributes.
- 2307
- 2308 **18.6 October 23, 2018**
- 2309
  - Status: Interim
- 2310
  - Updated references to the first version of 5100.7 to include year and exclude the full name.
- 2311
- 2312
  - Abstract and intro: Clarified that this specification is defining attributes and values.
- 2313
  - Editorial changes
- 2314
  - Added reference to the MSN2 spec.



2315 **18.7 September 26, 2018**

- 2316 • Brought back the job-mandatory-attributes operation attribute, which is still needed.
- 2317 • Added a rationale, use case, and design requirement for selective fidelity/job-  
2318 mandatory-attributes.
- 2319 • Added Additional Semantics and Operation Registrations sections for using job-  
2320 mandatory-attributes with job creation/validation operations.
- 2321 • Added Additional Semantics and Operation Registrations sections for returning the  
2322 too-many-jobs/documents status codes.

2323 **18.8 September 25, 2018**

2324 Initial revision.