



The Printer Working Group

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**IPP Job Extensions v2.0  
(JOBEXT)**

Status: Stable

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

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

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

This specification is available electronically at:

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295

## 296 **1. Introduction**

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

### 304 **1.1 Document Natural Language and Character Set**

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

### 312 **1.2 Attribute Fidelity**

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

### 317 **1.3 Rendering Optimizations**

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

### 323 **1.4 Printing on a Specific Output Device**

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

## 327 **1.5 Results of Job/Document Processing**

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

## 332 **1.6 Job Scheduling and Lifecycle**

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

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

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

## 344 **1.7 Job Operations**

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

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

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

## 355 **1.8 Obsolete Attributes and Values**

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

## 359 **2. Terminology**

### 360 **2.1 Conformance Terminology**

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

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

### 369 **2.2 Printing Terminology**

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

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

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

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

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

380 *Physical Device*: a hardware implementation of a endpoint device, e.g., a marking engine, a  
381 fax modem, etc.

### 382 **2.3 Protocol Role Terminology**

383 This document also defines the following protocol roles to specify unambiguous  
384 conformance requirements:

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

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

## 390 **2.4 Other Terminology**

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

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

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

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

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

## 401 **2.5 Acronyms and Organizations**

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

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

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

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

## 406 **3. Requirements**

### 407 **3.1 Rationale**

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

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

- 422 9. Attributes for retaining a Job for a specified time period;  
423 10. Attributes for configuring the Job history attributes and time period;  
424 11. Attributes for automatically canceling a Job after a specified time period;  
425 12. Operations for managing one or more Jobs; and  
426 13. Values that allow a Client to monitor specific groups of Jobs.

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

## 429 **3.2 Use Cases**

### 430 **3.2.1 Print a Plain Text File**

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

### 434 **3.2.2 Print a Document Using a Matching Size**

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

### 438 **3.2.3 Force a Document to Print on a Specific Media Size**

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

### 442 **3.2.4 Print a Presentation with Best Quality**

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

### 445 **3.2.5 Print Using a Specific Output Device**

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

### 449 **3.2.6 Print Using Loaded Media**

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

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

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

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

### 461 **3.2.7 Print on a Roll**

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

### 464 **3.2.8 Manual Duplex Printing**

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

### 473 **3.2.9 Monitor Whether Jobs are Printed Correctly**

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

### 477 **3.2.10 Hold a Job Until a Specific Date and Time**

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

### 480 **3.2.11 Delay Output Until a Specific Time Period**

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

### 483 **3.2.12 Submit a Variable Number of Documents in a Job**

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

**488 3.2.13 Cancel a Job After a Specific Time Period**

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

**492 3.2.14 Cancel Multiple Jobs**

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

**496 3.2.15 Resubmit a Job**

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

**501 3.2.16 Retain Jobs for a Specific Time Period**

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

**505 3.2.17 Keep Job History Information for a Specific Time Period**

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

**509 3.3 Exceptions****510 3.3.1 Too Many Jobs on a Printer**

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

**513 3.3.2 Too Many Documents in a Job**

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

**516 3.4 Out of Scope**

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

- 518 1. Definition of new file formats; and  
519 2. Definition of new protocol bindings.

### 520 **3.5 Design Requirements**

521 The design requirements for this specification are to define:

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

## 536 4. New Operations

### 537 4.1 Cancel-Jobs

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

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

#### 547 4.1.1 Cancel-Jobs Request

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

549 Group 1: Operation Attributes

550 "attributes-charset" (charset) and  
551 "attributes-natural-language" (naturalLanguage):

552 The Client MUST supply and the Printer MUST support both of these  
553 attributes.

554 "printer-uri" (uri):

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

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

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

560 "requesting-user-name" (name(MAX)) and  
561 "requesting-user-uri" (uri):

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

563 "message" (text(127)):

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

## 567 **4.1.2 Cancel-Jobs Response**

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

569 Group 1: Operation Attributes

570 "attributes-charset" (charset) and  
571 "attributes-natural-language" (naturalLanguage):

572 The Printer **MUST** return both of these attributes.

573 "status-message" (text(255)) and/or  
574 "detailed-status-message" (text(MAX)):

575 The Printer **MAY** return one or both of these attributes.

576 Group 2: Unsupported Attributes

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

## 578 **4.2 Cancel-My-Jobs**

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

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

### 587 **4.2.1 Cancel-My-Jobs Request**

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

589 Group 1: Operation Attributes

590 "attributes-charset" (charset) and  
591 "attributes-natural-language" (naturalLanguage):

592 The Client **MUST** supply and the Printer **MUST** support both of these  
593 attributes.

594 "printer-uri" (uri):

595 The Client **MUST** supply and the Printer **MUST** support the "printer-uri"  
596 operation attribute which is the target Printer for the operation.

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

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

600 "requesting-user-name" (name(MAX)) and  
601 "requesting-user-uri" (uri):

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

603 "message" (text(127)):

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

#### 607 **4.2.2 Cancel-My-Jobs Response**

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

609 Group 1: Operation Attributes

610 "attributes-charset" (charset) and  
611 "attributes-natural-language" (naturalLanguage):

612 The Printer MUST return both of these attributes.

613 "status-message" (text(255)) and/or  
614 "detailed-status-message" (text(MAX)):

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

616 Group 2: Unsupported Attributes

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

#### 618 **4.3 Close-Job**

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

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

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

#### 630 **4.3.1 Close-Job Request**

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

##### 632 Group 1: Operation Attributes

633 "attributes-charset" (charset) and  
634 "attributes-natural-language" (naturalLanguage):

635 The Client MUST supply and the Printer MUST support both of these  
636 attributes.

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

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

640 "requesting-user-name" (name(MAX)) and  
641 "requesting-user-uri" (uri):

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

#### 643 **4.3.2 Close-Job Response**

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

##### 645 Group 1: Operation Attributes

646 "attributes-charset" (charset) and  
647 "attributes-natural-language" (naturalLanguage):

648 The Printer MUST return both of these attributes.

649 "status-message" (text(255)) and/or  
650 "detailed-status-message" (text(MAX)):

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

##### 652 Group 2: Unsupported Attributes

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

##### 654 Group 3: Job Attributes

655 "job-state" (type1 enum):

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

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

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

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

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

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

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

#### 673 **4.4 Resubmit-Job**

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

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

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

#### 689 **4.4.1 Resubmit-Job Request**

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

##### 691 Group 1: Operation Attributes

692 "attributes-charset" (charset) and  
693 "attributes-natural-language" (naturalLanguage):

694 The Client MUST supply and the Printer MUST support both of these  
695 attributes.

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

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

699 "requesting-user-name" (name(MAX)) and  
700 "requesting-user-uri" (uri):

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

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

703 The Client MAY supply and the Printer MUST support either of these  
704 attributes.

##### 705 Group 2: Job Template Attributes

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

#### 709 **4.4.2 Resubmit-Job Response**

710 The following attributes are part of a Resubmit-Job response.

##### 711 Group 1: Operation Attributes

712 "attributes-charset" (charset) and  
713 "attributes-natural-language" (naturalLanguage):

714 The Printer MUST return both of these attributes.

715 "status-message" (text(255)) and/or  
716 "detailed-status-message" (text(MAX)):

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

## 718 Group 2: Unsupported Attributes

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

## 720 Group 3: Job Attributes

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

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

723 "job-state" (type1 enum):

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

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

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

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

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

735 "job-uri" (uri):

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

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

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

## 743 5. Attributes

### 744 5.1 Operation Attributes

#### 745 5.1.1 document-format-details (collection)

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

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

754 **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))

#### 755 5.1.1.1 document-source-application-name (name(MAX))

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

#### 761 5.1.1.2 document-source-application-version (text(127))

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

#### 766 5.1.1.3 document-source-os-name (name(40))

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

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

#### 776 **5.1.1.4 document-source-os-version (text(40))**

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

#### 781 **5.1.2 job-hold-until-time (dateTime)**

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

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

#### 788 **5.1.3 job-ids (1setOf integer(1:MAX))**

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

#### 791 **5.1.4 job-mandatory-attributes (1setOf keyword)**

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

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

## 803 **5.2 Document and Job Status Attributes**

### 804 **5.2.1 document-format-details (collection)**

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

### 807 **5.2.2 document-format-details-detected (collection)**

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

### 811 **5.2.3 errors-count (integer(0:MAX))**

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

### 817 **5.2.4 print-content-optimize-actual (1setOf type2 keyword)**

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

### 820 **5.2.5 warnings-count (integer(0:MAX))**

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

## 824 **5.3 Document and Job Template Attributes**

### 825 **5.3.1 media-col (collection)**

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

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

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

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

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

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

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

860 A Printer MUST implement either the above algorithm or one that produces equivalent  
 861 results.

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

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

<b>Member Attribute</b>	<b>Conformance</b>
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

<b>Member Attribute</b>	<b>Conformance</b>
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

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

### 866 5.3.1.1 Media Selection and Full-Bleed Printing

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

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

### 874 5.3.1.2 media-back-coating (type2 keyword | name(MAX))

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

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

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

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

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

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

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

**883 5.3.1.3 media-bottom-margin (integer(0:MAX))**

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

**887 5.3.1.4 media-color (type2 keyword | name(MAX))**

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

**890 5.3.1.5 media-front-coating (type2 keyword | name(MAX))**

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

**894 5.3.1.6 media-grain (type2 keyword | name(MAX))**

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

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

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

**902 5.3.1.7 media-hole-count (integer(0:MAX))**

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

**905 5.3.1.8 media-info (text(255))**

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

**908 5.3.1.9 media-key (type2 keyword | name(MAX))**

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

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

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

#### 916 **5.3.1.10 media-left-margin (integer(0:MAX))**

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

#### 920 **5.3.1.11 media-order-count (integer(1:MAX))**

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

#### 927 **5.3.1.12 media-pre-printed (type2 keyword | name(MAX))**

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

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

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

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

#### 935 **5.3.1.13 media-recycled (type2 keyword | name(MAX))**

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

938 'none': The media is not recycled.

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

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

#### 942 **5.3.1.14 media-right-margin (integer(0:MAX))**

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

946 **5.3.1.15 media-size (collection)**

947 This REQUIRED member attribute is a collection that explicitly specifies the numerical media  
948 width and height dimensions. Clients SHOULD localize the dimensions to the size names  
949 that users are familiar with, such as Letter and A4, and/or provide the exact dimensions units  
950 appropriate for the user's locale, e.g. 8.5 x 11" and 210 x 297mm.

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

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

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

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

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

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

961 **5.3.1.16 media-size-name (type2 keyword | name(MAX))**

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

966 **5.3.1.17 media-source (type2 keyword | name(MAX))**

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

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

971 **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

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

972 **5.3.1.18 media-source-properties (collection)**

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

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

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

982 **5.3.1.18.1 media-source-feed-direction (type2 keyword)**

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

985 **5.3.1.18.2 media-source-feed-orientation (type2 enum)**

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

988 **5.3.1.19 media-thickness (integer(1:MAX))**

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

991 **5.3.1.20 media-tooth (type2 keyword | name(MAX))**

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

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

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

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

999 'coarse': Rough finish.

1000 'fine': Smoother finish than 'smooth'.

1001 'linen': Finish like coarse woven cloth [JDF].

1002 'medium': Regular finish.

1003 'smooth': Smooth finish [JDF].

1004 'stipple': Fine pebble finish [JDF].

1005 'uncalendared': Rough, unpolished and uncoated papers [JDF].

1006 'vellum': Slightly rough surface [JDF].

#### 1007 **5.3.1.21 media-top-margin (integer(0:MAX))**

1008 The REQUIRED "media-top-margin" member attribute defines the Printer's physical top  
1009 margin in hundredths of millimeters from the top edge, without respect to the value of the  
1010 "orientation-requested" Job Template attribute.

#### 1011 **5.3.1.22 media-type (type2 keyword | name(MAX))**

1012 This REQUIRED member attribute identifies the type of media, for example: 'stationery',  
1013 'photographic', 'transparency', 'envelope', and 'labels'. Depending on implementation, the  
1014 Printer MAY need to behave differently or perform different validation depending on the type  
1015 of the media. For example, a Printer might prohibit stapling of transparencies or selecting a  
1016 different paper path for an envelope. Standard keyword values for media type are defined  
1017 in the PWG Media Standardized Names v2.0 (MSN2) [PWG5101.1].

#### 1018 **5.3.1.23 media-weight-metric (integer(0:MAX))**

1019 This RECOMMENDED member attribute indicates the weight of the desired media rounded  
1020 to the nearest whole number of grams per square meter.

#### 1021 **5.3.2 output-device (name(127))**

1022 This attribute requests a named Output Device for a Printer that fans-out to multiple devices.  
1023 If omitted, the Printer selects the best Output Device for the Job in an implementation  
1024 dependent manner.

#### 1025 **5.3.3 print-content-optimize (type2 keyword)**

1026 This RECOMMENDED attribute specifies the type of content optimization to perform on the  
1027 Document data. Keyword values specify the type of content to optimize, including:

1028 'graphics': Graphs and line drawings.

1029 'photo': Photographs.

1030 'text': Text.

1031 'text-and-graphics': Text and graphics.

## 1032 **5.4 Job Template Attributes**

### 1033 **5.4.1 job-account-id (name(MAX))**

1034 This RECOMMENDED attribute specifies the account associated with the Job, such as a  
1035 customer name, a sequence of digits referencing an internal billing number, or even a credit  
1036 card number. How the Printer uses this attribute is implementation dependent.

1037 A zero-length value indicates that there is no account name.

### 1038 **5.4.2 job-accounting-user-id (name(MAX))**

1039 This RECOMMENDED attribute specifies the user ID associated with the account specified  
1040 by the "job-account-id" attribute (see section 5.4.1) used for this Job. These two attributes  
1041 can be used for account tracking.

1042 A zero-length value indicates that there is no user accounting ID.

### 1043 **5.4.3 job-cancel-after (integer(0:MAX))**

1044 This RECOMMENDED attribute specifies the maximum number of seconds allowed for  
1045 processing a Job. When specified, the Printer cancels the Job automatically if it cannot be  
1046 completed within the specified timeframe. The completion timer does not begin until the Job  
1047 enters the 'processing' state'.

### 1048 **5.4.4 job-delay-output-until (type2 keyword | name(MAX))**

1049 This RECOMMENDED attribute specifies a time period in the future when the Printer will  
1050 produce the output for the Job. If the specified time period has not yet arrived, the Printer  
1051 MUST set the Job's "job-state-reasons" value to 'job-delay-output-until-specified'. The  
1052 Printer MUST NOT produce any output until the time period arrives but MAY perform pre-  
1053 processing. When the time period arrives, the Job MUST become a candidate for output,  
1054 including any processing required to produce the output. The only way to alter the delay  
1055 period for a Job is by using the Set-Job-Attributes [RFC3380] operation.

1056 Standard keyword values for named time periods are:

1057 'day-time': Delay output until daylight, typically 6am to 6pm.

1058 'evening': Delay output until the evening, typically from 6pm to 12am.

1059 'indefinite': Delay output indefinitely; the time period can be changed using the Set-  
1060 Job-Attributes [RFC3380] operation.

1061 'night': Delay output until the night, typically from 12am to 6am.

1062 'no-delay-output': Do not delay the output.

1063 'second-shift': Delay output until the second work shift, typically from 4pm to 12am.

1064 'third-shift': Delay output until the third work shift, typically from 12am to 8am.

1065 'weekend': Delay output until the weekend.

1066 Clients MUST NOT supply both the "job-delay-output-until" and "job-delay-output-until-time"  
1067 (section 5.4.5) Job Template attributes in a Job Creation request. If a Client supplies both  
1068 attributes, the Printer MUST reject the request and return the 'client-error-conflicting-  
1069 attributes' status code.

1070 Note: Unlike the "job-hold-until" [STD92] Job Template attribute, the "job-delay-output-until"  
1071 attribute does not cause the Job to enter the 'pending-held' state.

#### 1072 **5.4.5 job-delay-output-until-time (dateTime)**

1073 This RECOMMENDED attribute specifies a date and time when the Printer will produce the  
1074 output for the Job. If the specified time period has not yet arrived, the Printer MUST set the  
1075 Job's "job-state-reasons" value to 'job-delay-output-until-specified'. The Printer MUST NOT  
1076 produce any output until the time period arrives but MAY perform pre-processing. When the  
1077 time period arrives, the Job MUST become a candidate for output, including any processing  
1078 required to produce the output. The only way to alter the delay period for a Job is by using  
1079 the Set-Job-Attributes [RFC3380] operation.

1080 Clients MUST NOT supply both the "job-delay-output-until-time" and "job-delay-output-until"  
1081 (section 5.4.4) Job Template attributes in a Job Creation request. If a Client supplies both  
1082 attributes, the Printer MUST reject the request and return the 'client-error-conflicting-  
1083 attributes' status code.

1084 Note: Unlike the "job-hold-until-time" (section 5.4.6) Job Template attribute, the "job-delay-  
1085 output-until-time" attribute does not cause the Job to enter the 'pending-held' state.

#### 1086 **5.4.6 job-hold-until-time (dateTime)**

1087 This RECOMMENDED attribute specifies the date and time after which the Job MUST  
1088 become a candidate for processing. Printers that support this attribute MUST support the  
1089 "job-hold-until" [STD92] Job Template attribute.

1090 Clients MUST NOT supply both the "job-hold-until-time" and "job-hold-until" [STD92] Job  
1091 Template attributes in a Job Creation request. If a Client supplies both attributes, the Printer  
1092 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

#### 1093 **5.4.7 job-retain-until (type2 keyword | name(MAX))**

1094 This RECOMMENDED attribute specifies how long the Job remains in the Job Retention  
1095 phase of a Job's life cycle [STD92]. Standard values include:

- 1096 'end-of-day': Retain the Job until the end of the current day.
- 1097 'end-of-month': Retain the Job until the end of the current month.
- 1098 'end-of-week': Retain the Job until the end of the current week.
- 1099 'indefinite': Retain the Job indefinitely.
- 1100 'none': Do not retain the Job.

1101 Clients MUST NOT supply the "job-retain-until", "job-retain-until-interval" (section 5.4.8),  
 1102 and/or "job-retain-until-time" (section 5.4.9) Job Template attributes together in a Job  
 1103 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
 1104 reject the request and return the 'client-error-conflicting-attributes' status code.

#### 1105 **5.4.8 job-retain-until-interval (integer(0:MAX))**

1106 This RECOMMENDED attribute specifies the number of seconds the Job remains in the Job  
 1107 Retention phase of a Job's life cycle [STD92].

1108 Clients MUST NOT supply the "job-retain-until" (section 5.4.7), "job-retain-until-interval",  
 1109 and/or "job-retain-until-time" (section 5.4.9) Job Template attributes together in a Job  
 1110 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
 1111 reject the request and return the 'client-error-conflicting-attributes' status code.

#### 1112 **5.4.9 job-retain-until-time (dateTime)**

1113 This RECOMMENDED attribute specifies the date and time when the Job can leave the Job  
 1114 Retention phase of a Job's life cycle [STD92].

1115 Clients MUST NOT supply the "job-retain-until" (section 5.4.7), "job-retain-until-interval"  
 1116 (section 5.4.8), and/or "job-retain-until-time" Job Template attributes together in a Job  
 1117 Creation request. If a Client supplies more than one of these attributes, the Printer MUST  
 1118 reject the request and return the 'client-error-conflicting-attributes' status code.

#### 1119 **5.4.10 job-sheets-col (collection)**

1120 This RECOMMENDED attribute augments the "job-sheets" Job Template attribute [STD92]  
 1121 and allows a Client to specify media for Job Sheets that is different than the current media  
 1122 being used for the Job. Table 5 lists the member attributes.

#### 1123 **Table 5 - "job-sheets-col" Member Attributes**

##### **Member Attribute**

job-sheets (type2 keyword | name(MAX))

media (type2 keyword | name(MAX))

media-col (collection)

**1124 5.4.10.1 job-sheets (type2 keyword | name(MAX))**

1125 This REQUIRED member attribute specifies which Job Sheets to print on the specified  
1126 media. The values for this member attribute are identical to the keyword and name values  
1127 for the "job-sheets" Job Template attribute [STD92] itself, including the 'none' value, and  
1128 convey the same semantics.

**1129 5.4.10.2 media (type2 keyword | name(MAX))**

1130 This REQUIRED member attribute specifies which media to use for the Job Sheets. If  
1131 specified, the "media-col" member attribute (section 5.4.10.3) MUST NOT be specified.

**1132 5.4.10.3 media-col (collection)**

1133 This REQUIRED member attribute specifies which media to use for the Job Sheets. If  
1134 specified, the "media" member attribute (section 5.4.10.2) MUST NOT be specified.

**1135 5.5 Printer Description Attributes****1136 5.5.1 document-charset-default (charset)**

1137 This CONDITIONALLY REQUIRED attribute specifies the default charset that the Printer  
1138 will assume for charset-ambiguous Document formats when the Client omits the "document-  
1139 charset" operation attribute [PWG5100.5]. Printers that support the "document-charset"  
1140 operation attribute MUST support this attribute.

**1141 5.5.2 document-charset-supported (1setOf charset)**

1142 This CONDITIONALLY REQUIRED attribute lists the charsets that the Printer supports for  
1143 charset-ambiguous Document formats. Printers that support the "document-charset"  
1144 operation attribute [PWG5100.5] MUST support this attribute.

**1145 5.5.3 document-format-details-supported (1setOf keyword)**

1146 This DEPRECATED attribute lists the supported member attributes of the "document-  
1147 format-details" operation attribute (section 5.1.1) and "document-format-details"  
1148 Document/Job Status attributes (section 5.2.1).

**1149 5.5.4 document-natural-language-default (naturalLanguage)**

1150 This CONDITIONALLY REQUIRED attribute specifies the default natural language that the  
1151 Printer will assume for Document data when the Client omits the "document-natural-  
1152 language" operation attribute [STD92]. Printers that support the "document-natural-  
1153 language" attribute MUST support this attribute.

**1154 5.5.5 document-natural-language-supported (1setOf naturalLanguage)**

1155 This CONDITIONALLY REQUIRED attribute lists the natural languages supported for  
1156 Printer-supported Document formats. Printers that support the "document-natural-language"  
1157 attribute MUST support this attribute.

**1158 5.5.6 job-account-id-default (name(MAX) | no-value)**

1159 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-account-  
1160 id" Job Template attribute (section 5.4.1). Printers MUST support this attribute if the "job-  
1161 account-id" attribute is supported.

**1162 5.5.7 job-account-id-supported (boolean)**

1163 This CONDITIONALLY REQUIRED attribute specifies whether the "job-account-id" Job  
1164 Template attribute (section 5.4.1) is supported. Printers MUST support this attribute if the  
1165 "job-account-id" attribute is supported.

**1166 5.5.8 job-accounting-user-id-default (name(MAX) | no-value)**

1167 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-  
1168 accounting-user-id" Job Template attribute (section 5.4.2). Printers MUST support this  
1169 attribute if the "job-accounting-user-id" attribute is supported.

**1170 5.5.9 job-accounting-user-id-supported (boolean)**

1171 This CONDITIONALLY REQUIRED attribute specifies whether the "job-accounting-user-id"  
1172 Job Template attribute (section 5.4.2) is supported. Printers MUST support this attribute if  
1173 the "job-accounting-user-id" attribute is supported.

**1174 5.5.10 job-cancel-after-default (integer(0:MAX) | no-value)**

1175 This CONDITIONALLY REQUIRED attribute specifies the default value for the "job-cancel-  
1176 after" (section 5.4.3) Job Template attribute. Printers that support the "job-cancel-after"  
1177 attribute MUST support this attribute.

**1178 5.5.11 job-cancel-after-supported (rangeOfInteger(0:MAX))**

1179 This CONDITIONALLY REQUIRED attribute specifies the range of values supported for the  
1180 "job-cancel-after" (section 5.4.3) Job Template attribute. Printers that support the "job-  
1181 cancel-after" attribute MUST support this attribute.

**1182 5.5.12 job-creation-attributes-supported (1setOf keyword)**

1183 This REQUIRED attribute lists the names of the operation and Job Template attributes that  
1184 can be sent in a Job Creation or Validate-Job request.

**1185 5.5.13 job-delay-output-until-default (type2 keyword | name(MAX))**

1186 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-delay-  
1187 output-until" (section 5.4.4) Job Template attribute. Printers that support the "job-delay-  
1188 output-until" attribute MUST support this attribute.

**1189 5.5.14 job-delay-output-until-supported (1setOf (type2 keyword | name(MAX)))**

1190 This CONDITIONALLY REQUIRED attribute lists the supported values of the "job-delay-  
1191 output-until" (section 5.4.4) Job Template attribute. Printers that support the "job-delay-  
1192 output-until" attribute MUST support this attribute.

**1193 5.5.15 job-delay-output-until-time-supported (rangeOfInteger(0:MAX))**

1194 This CONDITIONALLY REQUIRED attribute specifies the range of time values supported  
1195 by the "job-delay-output-until-time" (section 5.4.5) Job Template attribute. Printers that  
1196 support the "job-delay-output-until-time" attribute MUST support this attribute.

**1197 5.5.16 job-history-attributes-configured (1setOf keyword)**

1198 This REQUIRED attribute lists the Job attributes that will be retained in the history phase of  
1199 each Job. IPP/1.1 [STD92] specifies that at least the "job-id", "job-printer-uri", "job-state",  
1200 and "job-state-reasons" attributes MUST be retained in the history phase. Printers that  
1201 support the "job-history-attributes-supported" (section 5.5.17) attribute MUST support this  
1202 attribute.

**1203 5.5.17 job-history-attributes-supported (1setOf keyword)**

1204 This REQUIRED attribute lists the Job attributes that can be retained in the history phase of  
1205 each Job. Printers that support the "job-history-attributes-configured" (section 5.5.16)  
1206 attribute MUST support this attribute.

**1207 5.5.18 job-history-interval-configured (integer(0:MAX))**

1208 This REQUIRED attribute specifies the minimum number of seconds that a Job will remain  
1209 in the history phase of its lifecycle [STD92]. Printers SHOULD have a default configured  
1210 value of at least 60 seconds to allow Clients to discover the disposition of any Jobs that have  
1211 reached a terminating state. Printers that support the "job-history-interval-supported"  
1212 (section 5.5.19) attribute MUST support this attribute.

**1213 5.5.19 job-history-interval-supported (rangeOfInteger(0:MAX))**

1214 This REQUIRED attribute specifies the range of values that are supported for the "job-  
1215 history-interval-configured" Printer Description attribute. Printers that support the "job-  
1216 history-interval-configured" (section 5.5.18) attribute MUST support this attribute.

**1217 5.5.20 job-ids-supported (boolean)**

1218 This REQUIRED attribute specifies whether the "job-ids" operation attribute (section 5.1.3)  
1219 is supported.

**1220 5.5.21 job-mandatory-attributes-supported (boolean)**

1221 This REQUIRED attribute specifies that the "job-mandatory-attributes" operation attribute  
1222 (section 5.1.4) is supported. Printers MUST report a value of 'true' for this attribute.

**1223 5.5.22 job-retain-until-default (type2 keyword | name(MAX))**

1224 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-retain-  
1225 until" (section 5.4.7) Job Template attribute. Printers that support the "job-retain-until"  
1226 attribute MUST support this attribute.

**1227 5.5.23 job-retain-until-interval-default (integer(0:MAX) | no-value)**

1228 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-retain-  
1229 until-interval" (section 5.4.8) Job Template attribute. Printers that support the "job-retain-  
1230 until-interval" attribute MUST support this attribute.

**1231 5.5.24 job-retain-until-interval-supported (rangeOfInteger(0:MAX))**

1232 This CONDITIONALLY REQUIRED attribute specifies the supported values of the "job-  
1233 retain-until-interval" (section 5.4.8) Job Template attribute. Printers that support the "job-  
1234 retain-until-interval" attribute MUST support this attribute.

**1235 5.5.25 job-retain-until-supported (1setOf (type2 keyword | name(MAX)))**

1236 This CONDITIONALLY REQUIRED attribute lists the supported values of the "job-retain-  
1237 until" (section 5.4.7) Job Template attribute. Printers that support the "job-retain-until"  
1238 attribute MUST support this attribute.

**1239 5.5.26 job-retain-until-time-supported (rangeOfInteger(0:MAX))**

1240 This CONDITIONALLY REQUIRED attribute specifies the supported values of the "job-  
1241 retain-until-time" (section 5.4.9) Job Template attribute. Printers that support the "job-retain-  
1242 until-time" attribute MUST support this attribute.

**1243 5.5.27 job-sheets-col-default (collection)**

1244 This CONDITIONALLY REQUIRED attribute specifies the default value of the "job-sheets-  
1245 col" Job Template attribute (section 5.4.10). Printers that support the "job-sheets-col"  
1246 attribute MUST support this attribute.

**1247 5.5.28 job-sheets-col-supported (1setOf keyword)**

1248 This CONDITIONALLY REQUIRED attribute lists the supported member attributes of the  
1249 "job-sheets-col" Job Template attribute (section 5.4.10). Printers that support the "job-  
1250 sheets-col" attribute MUST support this attribute.

**1251 5.5.29 job-spooling-supported (type2 keyword)**

1252 This REQUIRED attribute specifies whether Jobs are spooled before the Document data is  
1253 processed. The value of this attribute returned in a Get-Printer-Attributes response MAY  
1254 depend on the "document-format" attribute supplied in the Get-Printer-Attributes request  
1255 [STD92]. If the Printer does not support this attribute, then the spooling behavior is  
1256 implementation dependent.

1257 Standard keyword values include:

1258 'automatic': The Printer chooses whether to process the Document data as it is  
1259 received or after spooling (storage).

1260 'spool': The printer processes the Document data after it has been spooled (stored).

1261 'stream': The printer processes the Document data as it is received.

**1262 5.5.30 media-back-coating-supported (1setOf (type2 keyword | name(MAX)))**

1263 This CONDITIONALLY REQUIRED attribute lists the supported values of the "media-back-  
1264 coating" member attribute (section 5.3.1.2). Printers that support the "media-back-coating"  
1265 member attribute MUST support this attribute.

**1266 5.5.31 media-bottom-margin-supported (1setOf integer(0:MAX))**

1267 This REQUIRED attribute lists the supported values for the "media-bottom-margin" member  
1268 attribute (section 5.3.1.3).

**1269 5.5.32 media-col-database (1setOf collection)**

1270 This REQUIRED attribute lists the set of pre-defined "media-col" collections available in the  
1271 Printer's media database. This attribute is similar to "media-col-ready" (section 5.5.34) but  
1272 returns the entire set of pre-defined "media-col" collections known by the Printer instead of  
1273 just the media loaded in the Printer.

1274 Because the number and size of values of this attribute can be very large, the Printer MUST  
1275 NOT return this attribute in the response to the Get-Printer-Attributes operation unless the  
1276 Client explicitly requests it by including the 'media-col-database' value in the "requested-  
1277 attributes" [STD92] operation attribute.

1278 In order to limit the number and size of values of this attribute, Printers MAY exclude the  
1279 "media-source" and/or "media-type" member attributes from collection values when all

1280 values of the corresponding member attribute are supported when combined with the other  
1281 member attributes and values.

1282 Because a Printer may support multiple values for the "media-bottom-margin", "media-left-  
1283 margin", "media-right-margin", and "media-top-margin" member attributes, a Printer MAY  
1284 only enumerate the best (smallest) values of these attributes to reduce the number of  
1285 collection values returned in the "media-col-database" attribute. However, if full-bleed and  
1286 non-full-bleed margins have a significant performance, scaling, or quality differences, a  
1287 Printer MUST enumerate both the full-bleed (all zeroes) and smallest non-zero hardware  
1288 margins in the "media-col-database" attribute.

1289 For example, a Printer that supports ISO A4, ISO DL Envelope, US Letter, US Legal, and  
1290 US #10 Envelope media, a single removable tray and a multi-purpose tray, and cardstock,  
1291 envelopes, plain paper, labels, letterhead, and transparency media types might report the  
1292 following attributes and values:

```
1293     media-size-supported={...}
1294     media-source-supported='by-pass-tray','main','manual'
1295     media-type-supported='cardstock','envelope','labels','stationery',
1296                          'stationery-letterhead','transparency'
1297     media-col-database={
1298         /* ISO A4 cardstock only from manual feed */
1299         media-size={
1300             x-dimension=21000
1301             y-dimension=29700
1302         }
1303         media-source='manual'
1304         media-type='cardstock'
1305     },{
1306         /* ISO A4 transparency only from manual feed */
1307         media-size={
1308             x-dimension=21000
1309             y-dimension=29700
1310         }
1311         media-source='manual'
1312         media-type='transparency'
1313     },{
1314         /* ISO A4 plain paper from any source */
1315         media-size={
1316             x-dimension=21000
1317             y-dimension=29700
1318         }
1319         media-type='stationery'
1320     },{
1321         /* ISO A4 letterhead from any source */
1322         media-size={
1323             x-dimension=21000
1324             y-dimension=29700
1325         }
1326         media-type='stationery-letterhead'
1327     },... /* Lots of other values */
```

**1328 5.5.33 media-col-default (collection)**

1329 This REQUIRED attribute specifies the default value of the "media-col" Job Template  
1330 attribute (section 5.3.1). Printers that conform to this specification MUST support the "media-  
1331 default" Printer Description attribute [STD92]. The "media-default" and "media-col-default"  
1332 Printer attributes MUST both be configured to specify the same media instance. If the  
1333 Administrator sets one of them to a value (either locally or with the Set-Printer-Attributes  
1334 [RFC3380] operation), the Printer MUST set the other attribute's value to the same media  
1335 instance or to the 'unknown' out-of-band value, if there isn't a corresponding value to be set  
1336 for the other attribute. If a Client attempts to set both attributes, but their values specify  
1337 different media instances, the Printer MUST reject the Set-Printer-Attributes operation and  
1338 return the 'client-error-conflicting-attributes' status code.

**1339 5.5.34 media-col-ready (1setOf collection)**

1340 This REQUIRED attribute lists the "media-col" (section 5.3.1) values representing media  
1341 that are available for use without human intervention, i.e., the media that are ready to be  
1342 printed on without interaction. Printers that conform to this specification MUST support the  
1343 "media-ready" Printer Description attribute [STD92]. The  $i^{\text{th}}$  value of the "media-col-ready"  
1344 attribute corresponds to the  $i^{\text{th}}$  value of the "media-ready" attribute so that the Client can  
1345 correlate the media names or keywords with the collection values and determine the  
1346 characteristics of each ready media instance.

**1347 5.5.35 media-col-supported (1setOf keyword)**

1348 This REQUIRED attribute lists the supported member attributes of the "media-col"  
1349 Job/Document Template attribute (section 5.3.1).

**1350 5.5.36 media-color-supported (1setOf (type2 keyword | name(MAX)))**

1351 This CONDITIONALLY REQUIRED attribute lists the supported values of the "media-color"  
1352 member attribute (section 5.3.1.4). Printers that support the "media-color" member attribute  
1353 MUST support this attribute.

**1354 5.5.37 media-front-coating-supported (1setOf (type2 keyword | name(MAX)))**

1355 This CONDITIONALLY REQUIRED attribute lists the supported values of the "media-front-  
1356 coating" member attribute (section 5.3.1.5). Printers that support the "media-front-coating"  
1357 member attribute MUST support this attribute.

**1358 5.5.38 media-grain-supported (1setOf (type2 keyword | name(MAX)))**

1359 This CONDITIONALLY REQUIRED attribute lists the supported values of the "media-grain"  
1360 member attribute (section 5.3.1.6). Printers that support the "media-grain" member attribute  
1361 MUST support this attribute.

**1362 5.5.39 media-hole-count-supported (1setOf rangeOfInteger(0:MAX))**

1363 This CONDITIONALLY REQUIRED attribute lists the supported ranges of values of the  
1364 "media-hole-count" member attribute (section 5.3.1.7). Printers that support the "media-  
1365 hole-count" member attribute MUST support this attribute.

**1366 5.5.40 media-key-supported (1setOf (type2 keyword | name(MAX)))**

1367 This CONDITIONALLY REQUIRED attribute lists the supported values of the "media-key"  
1368 member attribute (section 5.3.1.9). Printers that support the "media-key" member attribute  
1369 MUST support this attribute.

**1370 5.5.41 media-left-margin-supported (1setOf integer(0:MAX))**

1371 This REQUIRED attribute lists the supported values for the "media-left-margin" member  
1372 attribute (section 5.3.1.10).

**1373 5.5.42 media-order-count-supported (1setOf rangeOfInteger(1:MAX))**

1374 This CONDITIONALLY REQUIRED attribute lists the ranges of supported values of the  
1375 "media-order-count" member attribute (section 5.3.1.8). Printers that support the "media-  
1376 order-count" member attribute MUST support this attribute.

**1377 5.5.43 media-pre-printed-supported (1setOf (type2 keyword | name(MAX)))**

1378 This CONDITIONALLY REQUIRED attribute lists the supported values of the "media-pre-  
1379 printed" member attribute (section 5.3.1.12). Printers that support the "media-pre-printed"  
1380 member attribute MUST support this attribute.

**1381 5.5.44 media-recycled-supported (1setOf (type2 keyword | name(MAX)))**

1382 This CONDITIONALLY REQUIRED attribute lists the supported values of the "media-  
1383 recycled" member attribute (section 5.3.1.13). Printers that support the "media-recycled"  
1384 member attribute MUST support this attribute and MUST include the 'none' keyword value.

**1385 5.5.45 media-right-margin-supported (1setOf integer(0:MAX))**

1386 This REQUIRED attribute lists the supported values for the "media-right-margin" member  
1387 attribute (section 5.3.1.14).

**1388 5.5.46 media-size-supported (1setOf collection)**

1389 This REQUIRED attribute lists the supported values of the "media-size" member attribute  
1390 (section 5.3.1.15). Unlike the "media-size" member attribute, the "x-dimension" and "y-  
1391 dimension" member attributes of "media-size-supported" have a syntax of "integer(1:MAX)  
1392 | rangeOfInteger(1:MAX)" to allow for arbitrary ranges of sizes for custom and roll-fed media.

1393 **5.5.47 media-source-supported (1setOf (type2 keyword | name(MAX)))**

1394 This REQUIRED attribute lists the supported values of the "media-source" member attribute  
1395 (section 5.3.1.17).

1396 **5.5.48 media-thickness-supported (1setOf rangeOfInteger(1:MAX))**

1397 This CONDITIONALLY REQUIRED attribute lists the ranges of supported values for the  
1398 "media-thickness" member attribute (section 5.3.1.19). Printers that support the "media-  
1399 thickness" member attribute MUST support this attribute.

1400 **5.5.49 media-tooth-supported (1setOf (type2 keyword | name(MAX)))**

1401 This CONDITIONALLY REQUIRED attribute lists the supported values of the "media-tooth"  
1402 member attribute (section 5.3.1.20). Printers that support the "media-tooth" member  
1403 attribute MUST support this attribute.

1404 **5.5.50 media-top-margin-supported (1setOf integer(0:MAX))**

1405 This REQUIRED attribute lists the supported values for the "media-top-margin" member  
1406 attribute (section 5.3.1.21).

1407 **5.5.51 media-type-supported (1setOf (type2 keyword | name(MAX)))**

1408 This REQUIRED attribute lists the supported values of the "media-type" member attribute  
1409 (section 5.3.1.22).

1410 **5.5.52 media-weight-metric-supported (1setOf rangeOfInteger(1:MAX))**

1411 This CONDITIONALLY REQUIRED attribute lists the supported ranges of values of the  
1412 "media-weight-metric" member attribute (section 5.3.1.23). Printers that support the "media-  
1413 weight-metric" member attribute MUST support this attribute.

1414 **5.5.53 output-device-supported (1setOf name(127))**

1415 This CONDITIONALLY REQUIRED attribute lists the supported "output-device" values.  
1416 Printers MUST support this attribute if the "output-device" Job Template attribute (section  
1417 5.3.1) is supported.

1418 **5.5.54 print-content-optimize-default (type2 keyword)**

1419 This CONDITIONALLY REQUIRED attribute specifies the default "print-content-optimize"  
1420 (section 5.3.3) value. Printers that support the "print-content-optimize" attribute MUST  
1421 support this attribute.

**1422 5.5.55 print-content-optimize-supported (1setOf type2 keyword)**

1423 This CONDITIONALLY REQUIRED attribute lists the supported “print-content-optimize”  
1424 (section 5.3.3) values. Printers that support the "print-content-optimize" attribute MUST  
1425 support this attribute.

**1426 5.5.56 which-jobs-supported (1setOf type2 keyword)**

1427 This REQUIRED attribute lists the supported values for the "which-jobs" operation attribute  
1428 [STD92] that is used with the Get-Jobs operation [STD92].

**1429 5.6 Printer Status Attributes****1430 5.6.1 printer-detailed-status-messages (1setOf text(MAX))**

1431 This attribute specifies additional detailed and technical information about the Printer,  
1432 including information such as fault and warning messages, in the same way that the “job-  
1433 detailed-status-messages” [STD92] Job Status attribute provides additional information  
1434 about a Job. Because the messages are human-readable text, Clients MUST NOT attempt  
1435 to parse the value(s) of this attribute.

**1436 6. Additional Semantics for Existing Operations****1437 6.1 Create-Job, Print-Job, Print-URI, Validate-Job: job-mandatory-  
1438 attributes**

1439 This specification extends the Create-Job, Print-Job, Print-URI, and Validate-Job operations  
1440 to support the "job-mandatory-attributes" operation attribute (section 5.1.4) in the request  
1441 sent by the Client, which specifies a list of Job Template attributes that MUST be supported  
1442 by the Printer for the request to be accepted.

1443 The Client MAY supply and the Printer MUST accept the “job-mandatory-attributes”  
1444 operation attribute in any Job Creation or Validate-Job request.

1445 The Printer MUST reject the Job Creation request if the Client supplies an unsupported Job  
1446 Template attribute or value in the request that is included in this list of "job-mandatory-  
1447 attributes" values.

1448 If the Client supplies both the “job-mandatory-attributes” and "ipp-attribute-fidelity” operation  
1449 attributes, the Printer MUST ignore the “job-mandatory-attributes” attribute.

1450 **6.2 Create-Job, Print-Job, Print-URI: server-error-too-many-jobs Status**  
1451 **Code**

1452 This specification extends the Job Creation operations to return the 'server-error-too-many-  
1453 jobs' status code value when the Printer is currently unable to create a new Job object.

1454 **6.3 Get-Jobs Operation: "job-ids (1setOf integer(1:MAX))"**

1455 The "job-ids" (section 5.1.3) operation attribute, if supplied, specifies a list of target Jobs to  
1456 be returned in the response to a Get-Jobs [STD92] request. Printers MUST support it in Get-  
1457 Jobs requests to limit the list of Jobs that are returned.

1458 If the Client supplies the "job-ids" operation attribute in a Get-Jobs request, the Client MUST  
1459 NOT also supply any of the following operation attributes in the same request: "limit", "my-  
1460 jobs", or "which-jobs". If the Client does supply prohibited operation attributes, the Printer  
1461 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

1462 **6.4 Hold-Job Operation: "job-hold-until-time (dateTime)"**

1463 The "job-hold-until-time" (section 5.1.2) operation attribute can be provided to specify a date  
1464 and time when the Job will become a candidate for processing. Printers that support the  
1465 "job-hold-until-time" attribute and Hold-Job operation MUST support its use with the Hold-  
1466 Job operation. If accepted, the "job-hold-until-time" operation attribute is copied to the Job,  
1467 replacing any existing "job-hold-until" [STD92] or "job-hold-until-time" attribute.

1468 Clients MUST NOT send both the "job-hold-until" [STD92] and "job-hold-until-time" operation  
1469 attributes in a Hold-Job request. If both attributes are sent, Printers MUST reject the request  
1470 and return the 'client-error-conflicting-attributes' status code.

1471 **6.5 Print-Job, Print-URI, Send-Document, Send-URI: server-error-too-**  
1472 **many-documents Status Code**

1473 This specification extends the Document Creation operations to return the 'server-error-too-  
1474 many-documents' status code value when the Printer is currently unable to create a new  
1475 Document object.

1476 **6.6 Set-Job-Attributes Operation: "job-hold-until-time (dateTime)"**

1477 The "job-hold-until-time" (section 5.4.6) Job Template attribute can be provided to specify a  
1478 date and time when the Job will become a candidate for processing. Printers that support  
1479 the "job-hold-until-time" attribute and Set-Job-Attributes operation MUST support its use with  
1480 the Set-Job-Attributes operation. If accepted, the "job-hold-until-time" operation attribute is  
1481 copied to the Job, replacing any existing "job-hold-until" [STD92] or "job-hold-until-time"  
1482 attribute.

1483 Clients MUST NOT send both the "job-hold-until" [STD92] and "job-hold-until-time" Job  
1484 Template attributes in a Set-Job-Attributes request. If both attributes are sent, Printers  
1485 MUST reject the request and return the 'client-error-conflicting-attributes' status code.

## 1486 **7. Additional Values for Existing Attributes**

### 1487 **7.1 job-sheets (type2 keyword | name(MAX))**

1488 The following additional values are defined for the "job-sheets" Job Template attribute  
1489 [STD92]:

1490 'job-start-sheet': A Job Sheet is printed to indicate the start of the Job.

1491 'job-end-sheet': A Job Sheet is printed to indicate the end of the Job.

1492 'job-both-sheets': Job Sheets is printed to indicate the start and end of all the output  
1493 associated with the Job.

1494 'first-print-stream-page': The first Input Page in the Document Data is printed as the  
1495 Job Sheet and the Printer's standard Job Sheet is suppressed.

### 1496 **7.2 job-state-reasons (1setOf type2 keyword)**

1497 This specification adds the following new keyword values for the "job-state-reasons" Job  
1498 Status attribute [STD92]:

1499 'digital-signature-did-not-verify': One or more documents in the Job contains a  
1500 digital signature that could not be verified by the Printer.

1501 'errors-detected': The Printer has detected one or more errors during processing of  
1502 the Job.

1503 'job-delay-until-specified': The Job's output is delayed because the "job-delay-  
1504 output-until" or "job-delay-output-until-time" Job Template attribute was specified.

1505 'warnings-detected': The Printer has detected one or more warnings during  
1506 processing of the Job.

### 1507 **7.3 media (type2 keyword | name(MAX))**

1508 This specification adds the following new keyword value for the "media" Job Template  
1509 attribute [STD92]:

1510 'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in': Print using US Letter or ISO A4  
1511 media (whichever is available).

1512 Note: The semantics of the 'choice' prefix are documented in the PWG Media Standardized  
1513 Names v2.0 (MSN2) specification [PWG5101.1].

## 1514 **7.4 pdl-override-supported (type2 keyword)**

1515 This specification defines a new 'guaranteed' value for the "pdl-override-supported" [STD92]  
1516 Printer Description attribute. This value indicates that the Printer guarantees that:

- 1517 1. Document and/or Job Template attribute values take precedence over instructions of  
1518 any form embedded anywhere in the Document data;
- 1519 2. Document and/or Job Template attributes that have only a single supported value  
1520 take precedence over instructions of any form embedded anywhere in the Document  
1521 data, even if the attribute is not included in the Job or Document Creation request;  
1522 and
- 1523 3. No PDL instruction is performed that does not correspond to a current value in the  
1524 corresponding "xxx-supported" Printer Description attribute.

1525 If a Printer cannot honor the advertised "pdl-override-supported" value for a Job, it can abort  
1526 the Job, stop the Printer, hold the Job, or substitute a supported value. This choice can be  
1527 fixed by the implementation or configurable by the Administrator and can depend on the  
1528 Document and/or Job Template attribute.

## 1529 **7.5 which-jobs (type2 keyword)**

1530 This specification adds the following new keyword values for the "which-jobs" operation  
1531 attribute [STD92]:

1532 'aborted': Any Job in the 'aborted' state.

1533 'all': All Jobs regardless of state.

1534 'canceled': Any Job in the 'canceled' state.

1535 'pending': Any Job in the 'pending' state.

1536 'pending-held': Any Job in the 'pending-held' state.

1537 'processing': Any Job in the 'processing' state.

1538 'processing-stopped': Any Job in the 'processing-stopped' state.

## 1539 **8. New Status Codes**

1540 This section defines additional status code values.

1541 **8.1 server-error-too-many-jobs (0x050B)**

1542 The Client has attempted to create a Job using any of the Job Creation operations which  
1543 would exceed the capacity of the Printer. The Client can retry the unmodified request.

1544 **8.2 server-error-too-many-documents (0x050C)**

1545 The Client has attempted to create a Document using any of the Document Creation  
1546 operations which would exceed the capacity of the Printer for this Job. The Client can retry  
1547 the unmodified request.

1548

1549 **9. Obsolete Attributes**1550 **9.1 Obsolete Operation Attributes**

1551 Table 6 lists the operation attributes from the previous version of this specification  
 1552 [PWG5100.7-2003] which are now OBSOLETE.

1553 **Table 6 - OBSOLETE Operation Attributes**

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

1554 **9.2 Obsolete Member Attributes**

1555 Table 7 lists the member attributes of the "document-format-details" operation attribute  
 1556 (section ) which are now OBSOLETE.

1557 **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, not used

1558 **9.3 Obsolete Job Status Attributes**

1559 Table 8 lists the Job Status attributes from the previous version of this specification  
 1560 [PWG5100.7-2003] which are now OBSOLETE.

1561 **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

## 1562 9.4 Obsolete Job Template Attributes

1563 Table 9 lists the Job Templates attributes from the previous version of this specification  
1564 [PWG5100.7-2003] which are now OBSOLETE.

1565 **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

## 1566 9.5 Obsolete Printer Description Attributes

1567 The following Printer Description attributes from the previous version of this specification  
1568 [PWG5100.7-2003] which are now OBSOLETE.

1569 **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

## 1570 10. Obsolete Values

### 1571 10.1 Obsolete "job-state-reasons" Values

1572 The 'digital-signature-type-not-supported' and 'job-digital-signature-wait' keyword values  
 1573 from the previous version of this specification [PWG5100.7-2003] are now OBSOLETE  
 1574 because the corresponding Job Template attribute is OBSOLETE.

## 1575 11. Conformance Requirements

### 1576 11.1 Printer Conformance Requirements

1577 In order for a Printer to claim conformance to this specification, a Printer MUST support:

- 1578 1. The new operations defined in section 4;
- 1579 2. The operation attributes defined in 5.1;
- 1580 3. The Job Status attributes defined in section 5.2 that correspond to any  
 1581 supported Job Template attributes defined in section 5.3;
- 1582 4. The Document Status attributes defined in section 5.2 that correspond to any  
 1583 supported Document Template attributes defined in section 5.3;
- 1584 5. The Printer Description attributes defined in section 5.5 that correspond to any  
 1585 supported Document/Job Template attributes defined in section 5.3;
- 1586 6. The additional semantics defined in section 6;
- 1587 7. The additional values defined in section 7;
- 1588 8. The internationalization considerations defined in section 12; and
- 1589 9. The security considerations defined in section 13.

1590 Printers MUST NOT support the OBSOLETE attributes listed in section 9 and MUST NOT  
 1591 support the OBSOLETE values in section 10.

### 1592 11.2 Client Conformance Requirements

1593 In order for a Client to claim conformance to this specification, a Client MUST support:

- 1594 1. The internationalization considerations defined in section 12; and
- 1595 2. The security considerations defined in section 13.

## 1596 **12. Internationalization Considerations**

1597 For interoperability and basic support for multiple languages, conforming implementations  
1598 MUST support:

- 1599 1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)  
1600 [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
- 1601 2. The Unicode Format for Network Interchange [RFC5198] which requires  
1602 transmission of well-formed UTF-8 strings and recommends transmission of  
1603 normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

1604 Unicode NFC is defined as the result of performing Canonical Decomposition (into base  
1605 characters and combining marks) followed by Canonical Composition (into canonical  
1606 composed characters wherever Unicode has assigned them).

1607 WARNING – Performing normalization on UTF-8 strings received from Clients and  
1608 subsequently storing the results (e.g., in Job objects) could cause false negatives in Client  
1609 searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now  
1610 'hidden').

1611 Implementations of this specification SHOULD conform to the following standards on  
1612 processing of human-readable Unicode text strings, see:

1613 Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical

1614 Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping

1615 Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]

1616 Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences

1617 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization

1618 Unicode Collation Algorithm [UTS10] – sorting

1619 Unicode Locale Data Markup Language [UTS35] – locale databases

1620 Implementations of this specification are advised to also review the following informational  
1621 documents on processing of human-readable Unicode text strings:

1622 Unicode Character Encoding Model [UTR17] – multi-layer character model

1623 Unicode Character Property Model [UTR23] – character properties

1624 Unicode Conformance Model [UTR33] – Unicode conformance basis

## 1625 13. Security Considerations

1626 The IPP extensions defined in this document require the same security considerations as  
1627 defined in the Internet Printing Protocol/1.1 [STD92].

1628 Implementations of this specification SHOULD conform to the following standard on  
1629 processing of human-readable Unicode text strings, see:

1630       Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

1631 Implementations of this specification are advised to also review the following informational  
1632 document on processing of human-readable Unicode text strings:

1633       Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

## 1634 14. IANA Considerations

### 1635 14.1 Attribute Registrations

1636 The attributes defined in this specification will be published by IANA according to the  
1637 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1638       <http://www.iana.org/assignments/ipp-registrations>

1639 The registry entries will contain the following information:

1640	Document Status attributes:	Reference
1641	-----	-----
1642	document-format-details(deprecated) (collection)	[PWG5100.7]
1643	document-format-details-detected(deprecated) (collection)	[PWG5100.7]
1644	document-format-supplied(obsolete) (mimeType)	[PWG5100.7]
1645	document-format-version-supplied(obsolete) (text(127))	[PWG5100.7]
1646	document-message-supplied(obsolete) (text(MAX))	[PWG5100.7]
1647	document-name-supplied(obsolete) (name(MAX))	[PWG5100.7]
1648	errors-count (integer(0:MAX))	[PWG5100.7]
1649	output-device-actual(obsolete) (1setOf name(127))	[PWG5100.7]
1650	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
1651	warnings-count (integer(0:MAX))	[PWG5100.7]
1652		
1653	Document Template attributes:	Reference
1654	-----	-----
1655	media-col (collection)	[PWG5100.7]
1656	<Any "media-col" member attribute>	[PWG5100.7]
1657	output-device (name(127))	[PWG5100.7]
1658	print-content-optimize (type2 keyword)	[PWG5100.7]
1659		
1660	Job Status attributes:	Reference
1661	-----	-----
1662	compression-supplied(obsolete) (type2 keyword)	[PWG5100.7]
1663	document-charset-supplied(obsolete) (charset)	[PWG5100.7]

1664	document-digital-signature-supplied(obsolete) (type2 keyword)	
1665		[PWG5100.7]
1666	document-format-details(deprecated) (collection)	[PWG5100.7]
1667	document-format-details-detected(deprecated) (collection)	[PWG5100.7]
1668	document-format-details-supplied(obsolete) (1setOf collection)	
1669		[PWG5100.7]
1670	document-format-supplied(obsolete) (mimeType)	[PWG5100.7]
1671	document-format-version-supplied(obsolete) (text(127))	[PWG5100.7]
1672	document-message-supplied(obsolete) (text(MAX))	[PWG5100.7]
1673	document-name-supplied(obsolete) (name(MAX))	[PWG5100.7]
1674	document-natural-language-supplied(obsolete) (naturalLanguage)	
1675		[PWG5100.7]
1676	errors-count (integer(0:MAX))	[PWG5100.7]
1677	ipp-attribute-fidelity(obsolete) (boolean)	[PWG5100.7]
1678	job-copies-actual(obsolete) (integer(1:MAX))	[PWG5100.7]
1679	job-cover-back-actual(obsolete) (collection)	[PWG5100.7]
1680	job-cover-front-actual(obsolete) (collection)	[PWG5100.7]
1681	job-finishings-actual(obsolete) (1setOf type2 enum)	[PWG5100.7]
1682	job-finishings-col-actual(obsolete) (1setOf collection)	[PWG5100.7]
1683	job-mandatory-attributes(obsolete) (1setOf keyword)	[PWG5100.7]
1684	output-device-actual(obsolete) (1setOf name(127))	[PWG5100.7]
1685	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
1686	warnings-count (integer(0:MAX))	[PWG5100.7]
1687		
1688	Job Template attributes:	Reference
1689	-----	-----
1690	job-account-id (name(MAX))	[PWG5100.7]
1691	job-accounting-user-id (name(MAX))	[PWG5100.7]
1692	job-cancel-after (integer(0:MAX))	[PWG5100.7]
1693	job-copies(obsolete) (integer(1:MAX))	[PWG5100.7]
1694	job-cover-back(obsolete) (collection)	[PWG5100.7]
1695	job-cover-front(obsolete) (collection)	[PWG5100.7]
1696	job-delay-output-until (type2 keyword   name(MAX))	[PWG5100.7]
1697	job-delay-output-until-time (dateTime)	[PWG5100.7]
1698	job-hold-until-time (dateTime)	[PWG5100.7]
1699	job-finishings(obsolete) (1setOf type2 enum)	[PWG5100.7]
1700	job-finishings-col(obsolete) (1setOf collection)	[PWG5100.7]
1701	job-retain-until (type2 keyword   name(MAX))	[PWG5100.7]
1702	job-retain-until-interval (integer(0:MAX))	[PWG5100.7]
1703	job-retain-until-time (dateTime)	[PWG5100.7]
1704	job-sheets-col (collection)	[PWG5100.7]
1705	job-sheets (type2 keyword   name(MAX))	[PWG5100.7]
1706	media (type2 keyword   name(MAX))	[PWG5100.7]
1707	media-col (collection)	[PWG5100.7]
1708	media-col (collection)	[PWG5100.7]
1709	media-back-coating (type2 keyword   name(MAX))	[PWG5100.7]
1710	media-bottom-margin (integer(0:MAX))	[PWG5100.7]
1711	media-color (type2 keyword   name(MAX))	[PWG5100.7]
1712	media-front-coating (type2 keyword   name(MAX))	[PWG5100.7]
1713	media-grain (type2 keyword   name(MAX))	[PWG5100.7]
1714	media-hole-count (integer(0:MAX))	[PWG5100.7]
1715	media-info (text(255))	[PWG5100.7]
1716	media-key (type2 keyword   name(MAX))	[PWG5100.7]
1717	media-left-margin (integer(0:MAX))	[PWG5100.7]
1718	media-order-count (integer(1:MAX))	[PWG5100.7]
1719	media-pre-printed (type2 keyword   name(MAX))	[PWG5100.7]

1720	media-recycled (type2 keyword   name(MAX))	[PWG5100.7]
1721	media-right-margin (integer(0:MAX))	[PWG5100.7]
1722	media-size (collection)	[PWG5100.7]
1723	x-dimension (integer(0:MAX))	[PWG5100.7]
1724	y-dimension (integer(0:MAX))	[PWG5100.7]
1725	media-size-name (type2 keyword   name(MAX))	[PWG5100.7]
1726	media-source (type2 keyword   name(MAX))	[PWG5100.7]
1727	media-thickness (integer(1:MAX))	[PWG5100.7]
1728	media-tooth (type2 keyword   name(MAX))	[PWG5100.7]
1729	media-top-margin (integer(0:MAX))	[PWG5100.7]
1730	media-type (type2 keyword   name(MAX))	[PWG5100.7]
1731	media-weight-metric (integer(0:MAX))	[PWG5100.7]
1732	output-device (name(127))	[PWG5100.7]
1733	print-content-optimize (type2 keyword)	[PWG5100.7]
1734		
1735	Operation attributes:	Reference
1736	-----	-----
1737	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.7]
1738	document-format-details(deprecated) (collection)	[PWG5100.7]
1739	document-format(obsolete) (mimeMediaType)	[PWG5100.7]
1740	document-format-device-id(obsolete) (text(127))	[PWG5100.7]
1741	document-format-version(obsolete) (text(127))	[PWG5100.7]
1742	document-natural-language(obsolete) (1setOf naturalLanguage)	[PWG5100.7]
1743		[PWG5100.7]
1744	document-source-application-name (name(MAX))	[PWG5100.7]
1745	document-source-application-version (text(127))	[PWG5100.7]
1746	document-source-os-name (name(40))	[PWG5100.7]
1747	document-source-os-version (text(40))	[PWG5100.7]
1748	document-format-version(obsolete) (text(127))	[PWG5100.7]
1749	job-hold-until-time (dateTime)	[PWG5100.7]
1750	job-ids (1setOf integer(1:MAX))	[PWG5100.7]
1751	job-mandatory-attributes (1setOf keyword)	[PWG5100.7]
1752		
1753	Printer Description attributes:	Reference
1754	-----	-----
1755	document-charset-default (charset)	[PWG5100.7]
1756	document-charset-supported (1setOf charset)	[PWG5100.7]
1757	document-digital-signature-default(obsolete) (type2 keyword)	[PWG5100.7]
1758		[PWG5100.7]
1759	document-digital-signature-supported(obsolete) (1setOf type2 keyword)	[PWG5100.7]
1760		[PWG5100.7]
1761	document-format-details-default(obsolete) (collection)	[PWG5100.7]
1762	document-format-details-supported (1setOf keyword)	[PWG5100.7]
1763	document-format-version-default(obsolete) (text(127))	[PWG5100.7]
1764	document-format-version-supported(obsolete) (1setOf text(127))	[PWG5100.7]
1765		[PWG5100.7]
1766	document-natural-language-default (naturalLanguage)	[PWG5100.7]
1767	document-natural-language-supported (1setOf naturalLanguage)	[PWG5100.7]
1768		[PWG5100.7]
1769	job-cancel-after-default (integer(0:MAX)   no-value)	[PWG5100.7]
1770	job-cancel-after-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1771	job-copies-default(obsolete) (integer(1:MAX))	[PWG5100.7]
1772	job-copies-supported(obsolete) (rangeOfInteger(1:MAX))	[PWG5100.7]
1773	job-cover-back-default(obsolete) (collection)	[PWG5100.7]
1774	job-cover-back-supported(obsolete) (1setOf keyword)	[PWG5100.7]
1775	job-cover-front-default(obsolete) (collection)	[PWG5100.7]

1776	job-cover-front-supported(obsolete) (1setOf keyword)	[PWG5100.7]
1777	job-creation-attributes-supported (1setOf keyword)	[PWG5100.7]
1778	job-delay-output-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1779	job-delay-output-until-interval-supported (rangeOfInteger(0:MAX))	
1780		[PWG5100.7]
1781	job-delay-output-until-supported (1setOf (type2 keyword   name(MAX)))	
1782		[PWG5100.7]
1783	job-delay-output-until-time-supported (rangeOfInteger(0:MAX))	
1784		[PWG5100.7]
1785	job-finishings-col-default(obsolete) (1setOf collection)	[PWG5100.7]
1786	job-finishings-col-ready(obsolete) (1setOf collection)	[PWG5100.7]
1787	job-finishings-col-supported(obsolete) (1setOf keyword)	[PWG5100.7]
1788	job-finishings-default(obsolete) (1setOf type2 enum)	[PWG5100.7]
1789	job-finishings-ready(obsolete) (1setOf type2 enum)	[PWG5100.7]
1790	job-finishings-supported(obsolete) (1setOf type2 enum)	[PWG5100.7]
1791	job-history-attributes-configured (1setOf keyword)	[PWG5100.7]
1792	job-history-attributes-supported (1setOf keyword)	[PWG5100.7]
1793	job-history-interval-configured (integer(0:MAX))	[PWG5100.7]
1794	job-history-interval-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1795	job-ids-supported (boolean)	[PWG5100.7]
1796	job-mandatory-attributes-supported (boolean)	[PWG5100.7]
1797	job-retain-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1798	job-retain-until-interval-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1799	job-retain-until-supported (1setOf (type2 keyword   name(MAX)))	
1800		[PWG5100.7]
1801	job-retain-until-time-supported (rangeOfInteger(0:MAX))	[PWG5100.7]
1802	job-spooling-supported (type2 keyword)	[PWG5100.7]
1803	media-back-coating-supported (1setOf (type2 keyword   name(MAX)))	
1804		[PWG5100.7]
1805	media-bottom-margin-supported (1setOf integer(0:MAX))	[PWG5100.7]
1806	media-col-database (1setOf collection)	[PWG5100.7]
1807	<Any "media-col" member attribute>	[PWG5100.7]
1808	media-source-properties (collection)	[PWG5100.7]
1809	media-source-feed-direction (type2 keyword)	[PWG5100.7]
1810	media-source-feed-orientation (type2 enum)	[PWG5100.7]
1811	media-col-default (collection)	[PWG5100.7]
1812	<Any "media-col" member attribute>	[PWG5100.7]
1813	media-col-ready (1setOf collection)	[PWG5100.7]
1814	<Any "media-col" member attribute>	[PWG5100.7]
1815	media-source-properties (collection)	[PWG5100.7]
1816	media-source-feed-direction (type2 keyword)	[PWG5100.7]
1817	media-source-feed-orientation (type2 enum)	[PWG5100.7]
1818	media-col-supported (1setOf keyword)	[PWG5100.3]
1819	media-color-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1820	media-front-coating-supported (1setOf (type2 keyword   name(MAX)))	
1821		[PWG5100.7]
1822	media-grain-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1823	media-hole-count-supported (1setOf rangeOfInteger(0:MAX))	[PWG5100.7]
1824	media-key-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1825	media-info-supported(obsolete) (boolean)	[PWG5100.7]
1826	media-left-margin-supported (1setOf integer(0:MAX))	[PWG5100.7]
1827	media-order-count-supported (1setOf rangeOfInteger(1:MAX))	[PWG5100.7]
1828	media-pre-printed-supported (1setOf (type2 keyword   name(MAX)))	
1829		[PWG5100.7]
1830	media-recycled-supported (1setOf (type2 keyword   name(MAX)))	
1831		[PWG5100.7]

1832	media-right-margin-supported (1setOf integer(0:MAX))	[PWG5100.7]
1833	media-size-supported (1setOf collection)	[PWG5100.7]
1834	x-dimension (integer(1:MAX)   rangeOfInteger(1:MAX))	[PWG5100.7]
1835	y-dimension (integer(1:MAX)   rangeOfInteger(1:MAX))	[PWG5100.7]
1836	media-source-supported (1setOf (type2 keyword   name(MAX)))	
1837		[PWG5100.7]
1838	media-thickness-supported (1setOf rangeOfInteger(1:MAX))	[PWG5100.7]
1839	media-tooth-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1840	media-top-margin-supported (1setOf integer(0:MAX))	[PWG5100.7]
1841	media-type-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1842	media-weight-metric-supported (1setOf rangeOfInteger(1:MAX))	
1843		[PWG5100.7]
1844	output-device-supported (1setOf name(127))	[PWG5100.7]
1845	print-content-optimize-default (type2 keyword)	[PWG5100.7]
1846	print-content-optimize-supported (1setOf type2 keyword)	[PWG5100.7]
1847	which-jobs-supported (1setOf type2 keyword)	[PWG5100.7]
1848		
1849	Printer Status attributes:	Reference
1850	-----	-----
1851	printer-detailed-status-messages (1setOf text(MAX))	[PWG5100.7]

## 1852 14.2 Type2 keyword Value Registrations

1853 The keyword values defined in this specification will be published by IANA according to the  
1854 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1855 <http://www.iana.org/assignments/ipp-registrations>

1856 The registry entries will contain the following information:

1857	Attributes (attribute syntax)	
1858	Keyword Attribute Value	Reference
1859	-----	-----
1860	job-delay-output-until (type2 keyword   name(MAX))	[PWG5100.7]
1861	day-time	[PWG5100.7]
1862	evening	[PWG5100.7]
1863	indefinite	[PWG5100.7]
1864	night	[PWG5100.7]
1865	no-delay-output	[PWG5100.7]
1866	second-shift	[PWG5100.7]
1867	third-shift	[PWG5100.7]
1868	weekend	[PWG5100.7]
1869	job-delay-output-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1870	<Any "job-delay-output-until" value>	[PWG5100.7]
1871	job-delay-output-until-supported (1setOf (type2 keyword   name(MAX)))	
1872		[PWG5100.7]
1873	<Any "job-delay-output-until" value>	[PWG5100.7]
1874		
1875	job-retain-until (type2 keyword   name(MAX))	[PWG5100.7]
1876	end-of-day	[PWG5100.7]
1877	end-of-month	[PWG5100.7]
1878	end-of-week	[PWG5100.7]
1879	indefinite	[PWG5100.7]
1880	none	[PWG5100.7]

1881	job-retain-until-default (type2 keyword   name(MAX))	[PWG5100.7]
1882	<Any "job-retain-until" value>	[PWG5100.7]
1883	job-retain-until-supported (1setOf (type2 keyword   name(MAX)))	
1884		[PWG5100.7]
1885	<Any "job-retain-until" value>	[PWG5100.7]
1886		
1887	job-sheets (type2 keyword)	[STD92]
1888	first-print-stream-page	[PWG5100.7]
1889	job-both-sheets	[PWG5100.7]
1890	job-end-sheet	[PWG5100.7]
1891	job-start-sheet	[PWG5100.7]
1892		
1893	job-state-reasons (1setOf type2 keyword)	[STD92]
1894	digital-signature-did-not-verify	[PWG5100.7]
1895	digital-signature-type-not-supported(obsolete)	[PWG5100.7]
1896	errors-detected	[PWG5100.7]
1897	job-delay-output-until-specified	[PWG5100.7]
1898	job-digital-signature-wait(obsolete)	[PWG5100.7]
1899	warnings-detected	[PWG5100.7]
1900		
1901	media (type2 keyword   name(MAX))	[STD92]
1902	choice_iso_a4_210x297mm_na_letter_8.5x11in	[PWG5100.7]
1903		
1904	media-back-coating (type2 keyword   name(MAX))	[PWG5100.7]
1905	media-back-coating-supported (1setOf (type2 keyword   name(MAX)))	
1906		[PWG5100.7]
1907	<Any "media-back-coating" value>	[PWG5100.7]
1908		
1909	media-color (type2 keyword   name(MAX))	[PWG5100.7]
1910	media-color-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1911	<Any "media-color" value>	[PWG5100.7]
1912		
1913	media-front-coating (type2 keyword   name(MAX))	[PWG5100.7]
1914	<Any "media-back-coating" value>	[PWG5100.7]
1915	media-front-coating-supported (1setOf (type2 keyword   name(MAX)))	
1916		[PWG5100.7]
1917	<Any "media-front-coating" value>	[PWG5100.7]
1918		
1919	media-pre-printed (type2 keyword   name(MAX))	[PWG5100.7]
1920	blank	[PWG5100.7]
1921	letter-head	[PWG5100.7]
1922	pre-printed	[PWG5100.7]
1923	media-pre-printed-supported (1setOf (type2 keyword   name(MAX)))	
1924		[PWG5100.7]
1925	<Any "media-pre-printed" value>	[PWG5100.7]
1926		
1927	media-recycled (type2 keyword   name(MAX))	[PWG5100.7]
1928	none	[PWG5100.7]
1929	standard	[PWG5100.7]
1930	media-recycled-supported (1setOf (type2 keyword   name(MAX)))	
1931		[PWG5100.7]
1932	<Any "media-recycled" value>	[PWG5100.7]
1933		
1934	media-source-feed-direction (type2 keyword)	[PWG5100.7]
1935	long-edge-first	[PWG5100.7]
1936	short-edge-first	[PWG5100.7]

1937		
1938	media-source (type2 keyword   name(MAX))	[PWG5100.7]
1939	alternate	[PWG5100.7]
1940	alternate-roll	[PWG5100.7]
1941	auto	[PWG5100.7]
1942	bottom	[PWG5100.7]
1943	by-pass-tray	[PWG5100.7]
1944	center	[PWG5100.7]
1945	disc	[PWG5100.7]
1946	envelope	[PWG5100.7]
1947	hagaki	[PWG5100.7]
1948	large-capacity	[PWG5100.7]
1949	left	[PWG5100.7]
1950	main	[PWG5100.7]
1951	main-roll	[PWG5100.7]
1952	manual	[PWG5100.7]
1953	middle	[PWG5100.7]
1954	photo	[PWG5100.7]
1955	rear	[PWG5100.7]
1956	right	[PWG5100.7]
1957	roll-1	[PWG5100.7]
1958	roll-10	[PWG5100.7]
1959	roll-2	[PWG5100.7]
1960	roll-3	[PWG5100.7]
1961	roll-4	[PWG5100.7]
1962	roll-5	[PWG5100.7]
1963	roll-6	[PWG5100.7]
1964	roll-7	[PWG5100.7]
1965	roll-8	[PWG5100.7]
1966	roll-9	[PWG5100.7]
1967	side	[PWG5100.7]
1968	top	[PWG5100.7]
1969	tray-1	[PWG5100.7]
1970	tray-10	[PWG5100.7]
1971	tray-11	[PWG5100.7]
1972	tray-12	[PWG5100.7]
1973	tray-13	[PWG5100.7]
1974	tray-14	[PWG5100.7]
1975	tray-15	[PWG5100.7]
1976	tray-16	[PWG5100.7]
1977	tray-17	[PWG5100.7]
1978	tray-18	[PWG5100.7]
1979	tray-19	[PWG5100.7]
1980	tray-2	[PWG5100.7]
1981	tray-20	[PWG5100.7]
1982	tray-3	[PWG5100.7]
1983	tray-4	[PWG5100.7]
1984	tray-5	[PWG5100.7]
1985	tray-6	[PWG5100.7]
1986	tray-7	[PWG5100.7]
1987	tray-8	[PWG5100.7]
1988	tray-9	[PWG5100.7]
1989	media-source-supported (1setOf (type2 keyword   name(MAX))	
1990		[PWG5100.7]
1991	<Any "media-source" value>	[PWG5100.7]
1992		

1993	media-tooth (type2 keyword   name(MAX))	[PWG5100.7]
1994	media-tooth-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1995	<Any "media-tooth" value>	[PWG5100.7]
1996		
1997	media-type (type2 keyword   name(MAX))	[PWG5100.7]
1998	media-type-supported (1setOf (type2 keyword   name(MAX)))	[PWG5100.7]
1999	<Any "media-type" value>	[PWG5100.7]
2000		
2001	pdl-override-supported (type2 keyword)	[STD92]
2002	guaranteed	[PWG5100.7]
2003		
2004	print-content-optimize (type2 keyword)	[PWG5100.7]
2005	graphics	[PWG5100.7]
2006	photo	[PWG5100.7]
2007	text	[PWG5100.7]
2008	text-and-graphics	[PWG5100.7]
2009	print-content-optimize-actual (1setOf type2 keyword)	[PWG5100.7]
2010	<Any "print-content-optimize" value>	[PWG5100.7]
2011	print-content-optimize-default (type2 keyword)	[PWG5100.7]
2012	<Any "print-content-optimize" value>	[PWG5100.7]
2013	print-content-optimize-supported (1setOf type2 keyword)	[PWG5100.7]
2014	<Any "print-content-optimize" value>	[PWG5100.7]
2015		
2016	which-jobs (type2 keyword)	[STD92]
2017	aborted	[PWG5100.7]
2018	all	[PWG5100.7]
2019	canceled	[PWG5100.7]
2020	pending	[PWG5100.7]
2021	pending-held	[PWG5100.7]
2022	processing	[PWG5100.7]
2023	processing-stopped	[PWG5100.7]

## 2024 14.3 Type2 enum Registrations

2025 The attributes defined in this specification will be published by IANA according to the  
 2026 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2027 <http://www.iana.org/assignments/ipp-registrations>

2028 The registry entries will contain the following information:

2029	Attributes (attribute syntax)	
2030	Enum Value Enum Symbolic Name	Reference
2031	-----	-----
2032	media-source-feed-orientation (type2 enum)	[PWG5100.7]
2033	<Any "orientation-requested" value>	[PWG5100.7]
2034		
2035	operations-supported (1setOf type2 enum)	[STD92]
2036	0x0038 Cancel-Jobs	[PWG5100.7]
2037	0x0039 Cancel-My-Jobs	[PWG5100.7]
2038	0x003A Close-Job	[PWG5100.7]
2039	0x003B Resubmit-Job	[PWG5100.7]

## 2040 14.4 Operation Registrations

2041 The operations defined in this specification will be published by IANA according to the  
2042 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2043 <http://www.iana.org/assignments/ipp-registrations>

2044 The registry entries will contain the following information:

2045	Operation Name	Reference
2046	-----	-----
2047	Cancel-Jobs	[PWG5100.7]
2048	Cancel-My-Jobs	[PWG5100.7]
2049	Close-Job	[PWG5100.7]
2050	Create-Job (Extension)	[PWG5100.7]
2051	Hold-Job (Extension)	[PWG5100.7]
2052	Print-Job (Extension)	[PWG5100.7]
2053	Print-URI (Extension)	[PWG5100.7]
2054	Resubmit-Job	[PWG5100.7]
2055	Send-Document (Extension)	[PWG5100.7]
2056	Send-URI (Extension)	[PWG5100.7]
2057	Set-Job-Attributes (Extension)	[PWG5100.7]
2058	Validate-Job (Extension)	[PWG5100.7]

## 2059 14.5 Status Code Registrations

2060 The status codes defined in this specification will be published by IANA according to the  
2061 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

2062 <http://www.iana.org/assignments/ipp-registrations>

2063 The registry entries will contain the following information:

2064	Value	Status Code Name	Reference
2065	-----	-----	-----
2066	0x0500:0x05FF	- Server Error:	
2067	0x050B	server-error-too-many-jobs	[PWG5100.7]
2068	0x050C	server-error-too-many-documents	[PWG5100.7]

2069

## 2070 **15. Overview of Changes**

### 2071 **15.1 IPP Job Extensions v2.0**

2072 The following changes were made to the previous version of this specification [PWG5100.7-  
2073 2003]:

- 2074 • A rationale section was added, including use cases, exceptions, and requirements;
- 2075 • References now point to the current versions of dependent documents and  
2076 specifications at the time of publication;
- 2077 • Read-only attributes are now defined and registered as status attributes;
- 2078 • A REQUIRED "job-mandatory-attributes-supported" Printer Description attribute has  
2079 been added to indicate support for the "job-mandatory-attributes" Job Template  
2080 attribute;
- 2081 • The RECOMMENDED "job-hold-until-time" and REQUIRED "job-ids" operation  
2082 attributes were moved from the OBSOLETE IPP Job and Printer Extensions - Set 2  
2083 [PWG5100.11-2010] specification;
- 2084 • The RECOMMENDED "job-delay-output-until", "job-delay-output-until-time", and  
2085 "job-hold-until-time" Job Template attributes were moved from the OBSOLETE IPP  
2086 Job and Printer Extensions - Set 2 [PWG5100.11-2010] specification;
- 2087 • The REQUIRED "job-creation-attributes-supported", "job-spooling-supported",  
2088 "media-col-database", "printer-detailed-status-messages", and "which-jobs-  
2089 supported" Printer attributes were moved from the OBSOLETE IPP Job and Printer  
2090 Extensions - Set 2 [PWG5100.11-2010] specification;
- 2091 • The RECOMMENDED "job-account-id" and "job-accounting-user-id" Job Template  
2092 and related Printer Description attributes were moved from the IPP Production  
2093 Printing Attributes - Set 1 [PWG5100.3-2001] specification;
- 2094 • The RECOMMENDED "job-sheets-col" Job Template and related Printer Description  
2095 attributes were moved from the IPP Production Printing Attributes - Set 1  
2096 [PWG5100.3-2001] specification;
- 2097 • The additional values for the "job-sheets" Job Template attribute were moved from  
2098 the IPP Production Printing Attributes - Set 1 [PWG5100.3-2001] specification;
- 2099 • The REQUIRED "media-col" Document/Job Template attribute and related Printer  
2100 Description attributes were moved from the original IPP Production Printing Attributes  
2101 - Set 1 [PWG5100.3-2001], OBSOLETE IPP Job and Printer Extensions - Set 2

- 2102 [PWG5100.11-2010], and IPP Job and Printer Extensions - Set 3 [PWG5100.13-  
2103 2012] specifications;
- 2104 • The RECOMMENDED "job-retain-until", "job-retain-until-interval", and "job-retain-  
2105 until-time" Job Template attributes were added to control the Job Retention phase of  
2106 a Job's lifecycle;
  - 2107 • The REQUIRED "job-history-attributes-configured", "job-history-attributes-  
2108 supported", "job-history-interval-configured", and "job-history-interval-supported"  
2109 Printer Description attributes were added to control the Job History phase of a Job's  
2110 lifecycle;
  - 2111 • The "document-charset" operation attribute and corresponding operation semantics  
2112 are now defined in PWG 5100.5: IPP Document Object v1.1;
  - 2113 • The "document-digital-signature" operation attribute and corresponding Document  
2114 Status, Job Status, and Printer Description attributes have been made OBSOLETE  
2115 because of interoperability issues;
  - 2116 • The "document-format-details" operation attribute and corresponding Document  
2117 Status, Job Status, and Printer Description attributes have been made  
2118 DEPRECATED because of interoperability issues and privacy concerns;
  - 2119 • The "document-format", "document-format-version", and "document-natural-  
2120 language" member attributes of "document-format-details" have been made  
2121 OBSOLETE because the attributes are redundant;
  - 2122 • The "document-format-device-id" member attribute of "document-format-details"  
2123 have been made OBSOLETE because the attribute syntax is too short to be useful;
  - 2124 • The "document-format-version" operation attribute and corresponding Document  
2125 Status, Job Status, and Printer Description attributes have been made OBSOLETE  
2126 because of interoperability issues;
  - 2127 • The "job-copies" Job Template attribute and corresponding Job Status and Printer  
2128 Description attributes have been made OBSOLETE because of interoperability  
2129 issues;
  - 2130 • The "job-cover-back" Job Template attribute and corresponding Job Status and  
2131 Printer Description attributes have been made OBSOLETE because of  
2132 interoperability issues;
  - 2133 • The "job-cover-front" Job Template attribute and corresponding Job Status and  
2134 Printer Description attributes have been made OBSOLETE because of  
2135 interoperability issues;

- 2136 • The "job-finishings" Job Template attribute and corresponding Job Status and Printer  
2137 Description attributes have been made OBSOLETE because of interoperability  
2138 issues;
- 2139 • The "job-finishings-col" Job Template attribute and corresponding Job Status and  
2140 Printer Description attributes have been made OBSOLETE because of  
2141 interoperability issues; and
- 2142 • The 'digital-signature-type-not-supported' and 'job-digital-signature-wait' values for  
2143 the "job-state-reasons" attribute have been made OBSOLETE because of  
2144 interoperability issues.

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2219

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2230 To subscribe, see the PWG web page:

2231 <http://www.pwg.org/>

2232 Implementers of this specification document are encouraged to join the IPP Mailing List in  
2233 order to participate in any discussions of clarification issues and review of registration  
2234 proposals for additional attributes and values.

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2236 significantly to the development of this document:

2237 Tom Hastings (author of v1.0)

2238 Peter Zehler (author of v1.0)

2239

## 2240 **18. Change History**

### 2241 **18.1 July 18, 2019**

- 2242 • Fixed typos seen during LCRC review in section 5.3.1.15 (media-size)

### 2243 **18.2 June 24, 2019**

- 2244 • AS1: Fixed typo in section 4.4.2 (Resubmit-Job response, not Close-Job...)
- 2245 • AS2: Clarified references in section 5.5.3
- 2246 • AS3: Fixed references in sections 5.5.10 and 5.5.11
- 2247 • AS4: Fixed references in sections 5.5.16 to 5.5.19
- 2248 • AS5: Fixed typo and reference in section 5.5.39
- 2249 • AS6: Fixed reference in section 5.5.43
- 2250 • AS7: Fixed reference in section 5.5.46
- 2251 • AS8: Fixed reference in section 5.5.51
- 2252 • AS9: Fixed reference in section 5.5.53
- 2253 • AS10: Fixed reference in section 6.4
- 2254 • SK1: Cleaned up list in section 3.1
- 2255 • SK2: Cleaned up list in section 3.5
- 2256 • SK4: Added MUST NOT for OBSOLETE stuff
- 2257 • WW1: Reworded text in section 1.3
- 2258 • WW2: Use a colon after "for example" in section 5.1.4
- 2259 • WW3: Removed bogus PostScript Red Book reference in section 5.3.1.15
- 2260 • WW4: Reworded with a list of example values in section 5.3.1.22
- 2261 • WW5: Reworded example constraints in section 5.3.1.22
- 2262 • WW6: Fixed typo in table 7

- 2263
- WW7: Fixed typo in table 9

2264 **18.3 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 **18.4 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 **18.5 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 **18.6 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  
2290 Completed Job, and Retained Job
- 2291 • Sections 5 and 6: Updated conformance requirements

## 2292 **18.7 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  
2296 moving here
- 2297 • Section 2.1: Added definitions of OBSOLETE and DEPRECATED
- 2298 • Section 3: Added rationale, use cases, and design requirements for attributes and  
2299 operations from JPS2.
- 2300 • New section 4 for operations from JPS2
- 2301 • Section 5: Made most attributes RECOMMENDED, added job-creation-attributes-  
2302 supported, job-delay-output-until-xxx, job-history-xxx, job-retain-until-time, job-ids, job-  
2303 spooling-supported, media-col-database, printer-detail-status-messages from JPS2
- 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  
2307 attributes.

## 2308 **18.8 October 23, 2018**

- 2309 • Status: Interim
- 2310 • Updated references to the first version of 5100.7 to include year and exclude the full  
2311 name.
- 2312 • Abstract and intro: Clarified that this specification is defining attributes and values.
- 2313 • Editorial changes
- 2314 • Added reference to the MSN2 spec.

2315 **18.9 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 **18.10 September 25, 2018**

2324 Initial revision.