

Working Draft, May ~~18~~¹⁶19, 2003

Maturity Level: Development ~~2-2~~ ISSUES are highlighted like this.

Important information to review is highlighted like this.

The Printer Working Group (PWG) Standard for The Internet Printing Protocol (IPP): Document Object

Abstract: This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a Document object. The [rfc2911] Job object is extended to contain one or more Document objects that are passive objects operated on by the Job. Multi-Document Jobs exist in IPP [rfc2911] but are not objects in their own right. This specification elevates the Document to an IPP object thus giving access to a document's metadata within a Job. A Document object allows template attributes to be applied at both the Job and Document level. This enables document overrides of Job Template attributes.

This specification defines [new operations](#) or extends RFC2911 operations as follows:

[1 RFC 2911 operation that creates a Job object: Create-Job](#)

~~2 existing rfc~~ RFC 2911 operations that create a Job and Document ~~object: or just a Job: PrintJob, CreateJob~~
[Print-URI](#)

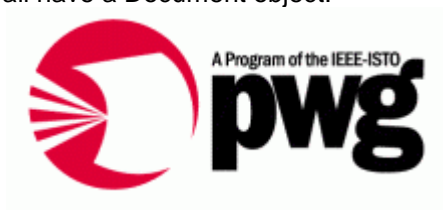
~~2 extended rfc~~ RFC 2911 operations that create Document ~~objects:~~ [Send-Document](#), [Send-URI](#) ~~Send-~~
[Document](#)

5 new operations: [Get-Documents](#), ~~+~~[Get-Documents-Attributes](#), [Set-Documents-Attributes](#), [Cancel-Documents](#),
[Delete-Documents](#)

This specification ~~defines some~~ [uses the](#) new Operation attributes ([defined in \[jobx\]](#)) that describe the contents of the Document and permit the Printer to reject requests that it cannot process correctly [to define new Document Description attributes](#). The Printer copies these Operation attributes to the corresponding Document Description attributes, which clients may query.

This specification also uses existing Job Template attributes [as to define](#) Document Template attributes ("xxx" Document attribute, "xxx-actual" Document Description, "xxx-default" Printer attribute, and "xxx-supported" Printer attribute. In addition this specification lists all of the attributes defined in other IPP specifications to show their relationship to corresponding attributes defined in this IPP specification for use with the Document object.

32 The purpose for specifying the Document object is so that the print industry can have a common semantic
33 specification for use in IPP, the PWG Semantic Model, the PWG Print Service Interface (PSI) project, and the Free
34 Standards Group Job Ticket API which all have a Document object.



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Working Draft, May 189, 2003

The Printer Working Group (PWG) Standard for The Internet Printing Protocol (IPP): Document Object

This version of the PWG Proposed Standard is available electronically at:

ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc2003051846.pdf, .doc, .rtf

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1 Introduction and Summary

This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a Document object. The [rfc2911] Job object is extended to contain one or more Document objects that are passive objects operated on by the Job. The REQUIRED Print-Job and OPTIONAL Print-URI operations ([rfc2911] sections 3.2.1 and 3.2.2) create a Job object containing a single Document object. The REQUIRED Create-Job operation ([rfc2911] section 3.2.4) creates a Job object. The REQUIRED Send-Document and OPTIONAL Send-URI operations ([rfc2911] section 3.3.1 and 3.3.2) add a Document object to the specified Job object. The Job object is created by the REQUIRED Print-Job or the OPTIONAL Create-Job (see [rfc2911] sections 3.2.2 and 3.2.4) operations. The Document object is created by the REQUIRED Print-Job or the OPTIONAL Send-Document or the OPTIONAL Send-URI (see [rfc2911] section 3.2.2, 3.3.1 and 3.3.2 respectively) operations. This specification also adds a Document Attributes group (and tag) to the Send-Document and Send-URI requests and responses. The Document Attributes group contains any Document Template attributes to be applied to this Document object being created, overriding any corresponding Job Template attribute supplied at the job level (by Create-Job) and thereby allowing the client to vary the Document Template attributes between Document objects in a single Job. A new OPTIONAL Create-Document operation allows a client to supply the Document Attributes without the data (like Create-Job does for a Job object). Then the client sends the data content for that Document object using the new OPTIONAL Send-Data operation.

This specification defines two new operation for Job objects, five new operations for Document objects once they have been created, and extends RFC 2911 operations as follows:

- 1 REQUIRED Job operation: Get-Documents ISSUE01: Should Close-Job [jobx] be REQUIRED?
- 1 REQUIRED Job and Document eCcreation operation: PrintJob [rfc2911]
- 1 OPTIONAL Job and Document Creation operation: Print-URI [rfc2911]
- 1 REQUIRED Document Creation operation: Send-Document [rfc2911]
- 2 OPTIONAL Document creation operation: Send-URI [rfc2911], Send-Document [rfc2911],
- 2 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes
- 2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

This specification defines some uses the new Operation attributes (defined in [jobx]) that describe the contents of the Document and permit the Printer to reject requests that it cannot process correctly to define new Document Description attributes. The Printer copies these Operation attributes to the corresponding Document Description attributes which client may query.

This specification also defines most uses existing Job Template attributes as to define Document Template attributes ("xxx" Document attribute, "xxx-actual" Document Description [ippact], "xxx-default" Printer attribute, and "xxx-supported" Printer attribute. In addition this specification lists all of the attributes defined in other IPP specifications¹ to show their relationship to corresponding attributes defined in this IPP specification for use with the Document object. The full semantics of the "document-state", "document-state-reasons", and "document-state-message" Document Description attributes are given along side of the corresponding [rfc2911] "job-state", "job-state-reasons", and "job-state-message" Job Description attributes. Finally, the analogous Document Descriptions attributes that correspond to the Job Description attributes are defined.

The intent is to propose this specification as an IPP extension and which will be referenced as part of the PWG Semantic Model. The purpose for specifying the Document object is so that the print industry can have a common semantic specification for use in IPP, the PWG Semantic Model [pwg-sm], the PWG Print Service Interface (PSI) project [pwg-psi], and the Free Standards Group Job Ticket API [fsg-jt] which all have a Document object.

¹ This specification lists all attributes defined in other IPP specifications at the time of publication of this specification. No attempt will be made to keep this specification up to date after publication.

1.1 Scope

Part of the extension is to allow the client to supply printing instructions, called Document Template attributes, when creating each Document object. An IPP Printer implementation MAY support most of the existing Job Template attributes as Document Template attributes as well. (The PWG Semantic Model [pwg-sm] currently calls the Job Template attributes and Document Template attributes simply “Job Processing” and “Document Processing” attributes). Note: There are a number of footnotes which relate this IPP specification to the PWG Semantic model and other PWG projects, such as the Print Service Interface (PSI) [pwg-psi].

The Document object is a passive object² and is operated upon by the Job. The client uses ~~the new Create-Document operation or~~ either of the existing Send-Document and Send-URI operations to create a Document object. In addition there are 8 new operations that affect the Document object after it has been created as summarized in ~~Table 1~~[Table 4](#).

Table 1 - Summary of operations

Operation Name	Printer support	Brief Description
Print-Job [rfc2911]	REQUIRED	Creates a Job object as in [rfc2911] which contains a single Document object with pushed data in-line. Some additional Operation attributes are defined in this spec [jobx] for use in creating the Document object with Document Description attributes .
Print-URI [rfc2911]	OPTIONAL	Creates a Job object as in [rfc2911] which contains a single Document object with a reference to the document data. Some additional Operation attributes are defined in [jobx] this spec for use in creating the Document object with Document Description attributes .
Create-Job [rfc2911]	REQUIRED³	Creates the Job object as defined in [rfc2911] with Job Attributes. Job Template attributes that affect individual documents, such as “media”, are inherited by the Document objects that are subsequently created for the Job using Send-Document and/or Send-URI.
Send-Document [rfc2911]	REQUIRED ³	Creates a Document object with Document attributes and data. Some additional Operation attributes are defined in [jobx] this spec for use in creating the Document object with Document Description attributes , along with a new Document attributes group to pass Document Template attributes.
Send-URI [rfc2911]	OPTIONAL	Creates a Document object with Document attributes and a URL reference to the data (print-by-reference). Some additional Operation attributes are defined in [jobx] this spec for use in creating the Document object with Document Description attributes , along with a new Document attributes group to pass Document Template attributes.
Close-Job [jobx]	OPTIONAL	Closes the Job object that was created with Document objects.
Get-Document-Attributes	REQUIRED	Get requested attributes of specified Document in the specified Job.
Get-Documents	REQUIRED	Get requested attributes of all of the Documents in the specified Job.
Set-Document-Attributes	OPTIONAL	Set the supplied Document attributes on the specified Document.
Cancel-Document	REQUIRED	Cancel the specified Document in the specified Job, but don't remove it.
Delete-Document	OPTIONAL	Remove the specified Document object and its data from the Job.

This specification ~~defines new uses existing~~ Operation attributes ~~that allow the client to provide hints⁴ or requirements to the Printer about individual Document Object contents at request time as~~ summarized in ~~Table 2~~[Table 2](#) to define

² The Document object is *not* a sub-job. If Job trees are desired where sub-jobs can be on different network nodes, such as in JDF, then a separate specification should be generated for Job trees.

³ In [rfc2911] the Create-Job and Send-Document operations are OPTIONAL for a Printer to support.

341 | [new Document Description attributes](#). The Printer copies these Operation attributes supplied by the client in the
 342 | request to the corresponding Job or Document Description attributes.

343 | **Table 2 - Summary of New Operation/Description attributes**

Operation attribute	Creation operation	Printer support	Description
ipp-attribute-fidelity (boolean) *	Job	MUST	Allows the client to indicate whether or not the Printer MUST support all Job Template and Document Template attributes.
job-mandatory-attributes (1setOf type2 keyword)	Job	MUST	Allows the client to list which Job Template and Document Template attributes that the Printer MUST support.
document-charset (charset)	Document	CMUST ⁵	The charset of the Document Object content
document-digital-signature (type2 keyword)	Document	MAY	The type of digital signature, if any used in the Document Object content.
document-format (mimeType) *	Document	MUST	The document format of the Document Object content
document-format-details (1setOf collection)	Document	CMUST ⁶	The details of the Document Object content, including when its package of files (zip, multipart/related), such as application and operating system that created the document, the intended device type (when the format is device-dependent), the natural languages of the document.
document-format-version (text(127))	Document	MAY	The level or version of the document format.
document-natural-language (naturalLanguage) *	Document	MAY	The primary language of the Document Object content.

344 | * - indicates Operation attributes defined in [rfc2911] that are extended to apply to the Document Creation operations
 345 | defined in this specification.

346 | 2 Terminology

347 | This section defines terminology used throughout this document.

348 | 2.1 Conformance Terminology

349 | Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, and **OPTIONAL**, have
 350 | special meaning relating to conformance as defined in RFC 2119 [rfc2119]. If an implementation supports the
 351 | extension defined in this document, then these terms apply; otherwise, they do not. These terms define
 352 | conformance to *this document (and [rfc2911]) only*; they do not affect conformance to other documents, unless

⁴ A hint is an attribute supplied by the client that the Printer can safely not support and still process the document meaningfully. An attribute like “document-format” or “compression” is not a hint, since the Printer will not be able to interpret the Document object content if the Printer doesn’t support the supplied value.

⁵ The Printer MUST support the “document-charset” operation/Document Description attributes if the Printer supports a document-format in which the charset may be ambiguous in the Document content, such as ‘application/vnd.hp-PCL’ where the charset escape sequence MAY be omitted from the data (see section **Error! Reference source not found.**).

⁶ The Printer MUST support the “document-format-details” operation/Document Description attributes, if the Printer supports a packaging document format, such as ‘application/zip’ or ‘multipart/related’

explicitly stated otherwise. For example, the term REQUIRED in this document means “REQUIRED if this OPTIONAL Document Object specification is implemented”.

The term **CONDITIONALLY REQUIRED** means that the Printer **MUST** support the feature, if the specified condition is true. The term **CMUST** means **MUST** if the specified “condition” is true.

2.2 Other Terminology

This document uses the same terminology as [rfc2911], such as “client”, “Printer”, “attribute”, “attribute value”, “keyword”, “Job Template attribute”, “Operation attribute”, “operation”, “request”, “response”, and “support” with the same meaning. In addition, the following terms are defined for use in this document:

Attribute Precedence - the precedence rules which dictate which attribute value takes precedence when the same attribute is supplied at different points in the workflow with different values, such as at both the **Job Level** and the **Document Level**. See section 6.

Document attribute - an **Operation attribute** or a **Document Template attribute** that applies to a **Document object** as a whole. For example, “document-format” is an Operation attribute and “media” is a Document Template attribute.

Document Creation operation - operations that create Document objects. Specifically: ~~Create-Document~~, Print-Job, Print-URI, Send-Document, and Send-URI. Note: the Print-Job and Print-URI are both **Job Creation** and **Document Creation** operations, since they create both Job and a **Document object** at the same time. Also this specification does not extend the Print-Job and Print-URI operations. However, this specification does extend the Send-Document and Send-URI operations to allow the client to supply **Document Template** attributes in each request.

Document Level - Operation and Document Template attributes supplied in the Send-Document, ~~and~~ Send-URI, ~~and Create-Document~~ operations are referred to as being supplied at the **Document Level**. Note: attribute supplied in the Print-Job and Print-URI requests are considered as being supplied at the **Job Level** only, *not* also at the **Document Level**, even though Print-Job and Print-URI also create **Document objects** (see ~~Table 3~~ **Table 3**).

Document object - the object to represent the logical concept of a document in a Job. A **Job object** can contain one or more **Document objects**.

Document Template attribute - an attribute that the client supplies in a ~~Create-Document~~, Send-Document, or Send-URI operation request in the Document Attributes group. For example, “media”.

Honor - a Printer is said to **Honor** an attribute supplied by the client, if the Printer **supports** that attribute and the supplied value and performs the indicated semantics. If the client supplies the “ipp-attribute-fidelity” or “job-mandatory-attributes” Operation attribute, the client is indicating which supplied Job Template and Document Template attributes the Printer **MUST Honor**.

Job Attribute - an **Operation attribute** or a **Job Template attribute** that applies to the Job (object) as a whole. For example, “job-name” is an **Operation attribute** and “job-priority” is a **Job Template attribute**.

Job Creation operation - operations that create Job objects, specifically: Print-Job, Print-URI, and Create-Job as defined in [rfc2911].

⁷ [rfc2911] uses the terms “Printer object” and “Printer” interchangeably to mean the same thing. For simplicity, this document uses the term “Printer” exclusively, except for definitions copied directly from [rfc2911]. None the less, the intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server as in [rfc2911].

Job Level - Operation and **Job Template** attributes supplied in the Print-Job, Print-URI, and Create-Job are referred to as being supplied at the **Job Level** (see [Table 3Table-3](#)). Attributes supplied at the **Job Level** are a mixture of **Job attributes** and **Document attributes**. **Job Template attributes** apply to the Job as a whole, while **Document Template attributes** provide defaults for the **Document objects** in case the client does not supply a **Document Template attribute** at the **Document Level** for a **Document object**. Put another way, **Document objects inherit Document Template attributes** from the **Job object** which are used if the client didn't supply a corresponding **Document Template attribute** for the **Document object**.

Operation attribute - an attribute supplied by a client in the Operation Attribute group of a request in order to affect the behavior of the operation or an attributer returned by the Printer in the Operation Attributes group in an operation response in order to report the results of the operation. For some Operation attributes the Printer copies the values supplied by the client to corresponding Job Description or Document Description attributes.

[Table 3Table-3](#) shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job Creation operations and Document Creation operations, though they only create single Document jobs. In other words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a separate Document group in which the client can supply Document attributes. Note also that for the "Level" concept, no operation supplies attributes at more than one level.⁸

Table 3 - Job Creation and Document Creation operations

Operation	Job Creation operation	Document Creation operation	Attribute Group in Request		Level
			Job Attributes	Document Attributes	
Create-Job	yes		Job attributes and Document attributes mixed together		Job Level
Print-Job	yes	yes	Job attributes and Document attributes mixed together		
Print-URI	yes	yes	Job attributes and Document attributes mixed together		
Create-Document		yes		Document attributes	Document Level
Send-Document		yes		Document attributes	
Send-URI		yes		Document attributes	

⁸ The PWG Semantic Model [pwg-sm] calls the Operation attributes supplied by the client: Job Description attributes or Document Description attributes for the Job Creation and Document Creation operations, respectively. The [pwg-sm] also calls Job Template attributes and Document Template attributes: Job Processing and Document Processing attributes, respectively. Each Processing attribute is defined to be a Job Processing or a Document Processing attribute, but is not both. The client can supply both Job Processing and Document Processing attributes in a Job Creation operation, in which case the Document Processing attributes server as defaults for the Document objects. In the [pwg-sm] the Printer copies all of these client's supplied attributes to the Job or Document object. [pwg-sm] Read-only Job and Document attributes that the Printer sets are called Job Status and Document Status attributes (instead of Description attributes).

3 New Job operations and semantic extensions to Job operations

This section defines the semantic extensions to Job operations that affect Document objects. Printer and Subscription object (Event Notification [ntfy]) operations MUST have no effect on the Document object and the Document object has no effect on the semantics of the Printer and Subscription operations. The Job operations that MUST NOT have any effect on the Document object because they are defined to affect the Job object as a whole are: **Get-Job-Attributes**⁹ ([rfc2911] section 3.3.4), **Get-Jobs**¹⁰ ([rfc2911] section 3.2.6), **Hold-Job** ([rfc2911] section 3.3.5), **Release-Job** ([rfc2911] section 3.3.6), **Promote-Job** ([adm-ops] section 4.4.1), **Release-Held-New-Jobs** ([adm-ops] section 3.3.2), **Resume-Job** ([adm-ops] section 4.3.2), **Schedule-Job-After** ([adm-ops] section 4.4.2), **Set-Job-Attributes** ([rfc3380] section 4.2), and **Validate-Job** ([rfc2911] section 3.2.3).

The Job operations that affect Document objects or that Document objects affect the semantics of the Job operations are, in alphabetical order:

3.1 Job Creation operations

This section defines the extensions to [the](#) Job Creation [operations](#).

~~Note: Using the Get-Job-Attributes and Get-Documents-Attributes, a Job created by Print-Job will be indistinguishable to a client from a Job created with Create-Job and Send-Document with no Document Template attributes supplied. Also an old client performing just a Get-Job-Attributes will see the same results from (1) an old Printer that accepted the Print-Job, (2) a new Printer that accepted the Print-Job, and (3) a new Printer that accepted the Create-Job and Send-Document (with no Document Template attributes supplied). However, if a new client supplies Document Template attributes on the Send-Document, instead of the same attributes as Job Template attributes on the Create-Job, then an old client will not see any of the Document Template attributes when it performs the Get-Job-Attributes operation (since the Printer does not "copy up" Document Template attributes to the Job Level on a Get-Job-Attributes on a one document job~~

3.1.1 [Operation](#) Attributes

The following Operation attribute extensions have additional semantics when used with document objects. These attributes apply for all the Job Creation operations and Validate-Job:

3.1.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)

This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client supplies unsupported Job Template or Document Template attributes¹¹ or value in a Job Creation operation or a subsequent Document Creation operation for this job. The value 'true' indicates that total fidelity to client supplied Job Template and Document Template attributes and values is required for this Job Creation operation and all subsequent Document Creation operations for this job. If the client supplies the value 'false' or omits the attribute, then the Printer MUST accept the Job Creation operation and all subsequent Document Creation operations even if the client supplies unsupported attributes or values in them.

⁹ The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in Create-Document, Send-Document, or Send-URI to the Job object as observable by the client in any Get-Job-Attributes operation responses.

¹⁰ The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in Create-Document, Send-Document, or Send-URI to the Job object as observable by the client in any Get-Job-Attributes operation responses.

¹¹ The value of the "ipp-attribute-fidelity" Operation attribute has no effect on other *Operation* attributes supplied by the client, only on Job Template and Document Template attributes supplied by the client.

The Printer MUST copy this attribute to the corresponding ~~(new)~~ Job Description attribute (see [\[jobx\]](#) section 6.1~~Error! Reference source not found.~~) and use its value for validating subsequent Document Creation operations for this job.

Note: The inheritance of the effect of the “ipp-attribute-fidelity” Operation attribute by subsequent Document Creation operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting the behavior of the Document Level (see [Table 3Table-3](#)).

3.1.1.2 job-mandatory-attributes (1setOf type2 keyword) Operation attribute

This REQUIRED¹² Operation attribute identifies which Job Template and Document Template attributes the Printer MUST Honor in this Job Creation request and all subsequent Document Creation requests for this Job. ~~The Printer MUST reject this Job Creation operation or any subsequent Document Creation operations for this job, if the client supplies an unsupported Job Template or Document Template attribute or value in the request that is also identified in this list. The client MAY supply this attribute in a Job Creation operation. The Printer MUST support this attribute in Job Creation operations and the Validate Job operation.~~

A client MUST NOT supply this “job-mandatory-attributes” Operation attribute in a Document Creation operation. If a client does supply ~~the~~[this](#) attribute in a Document Creation operation, ~~the Printer MUST~~, the Printer MUST ignore and otherwise accept the request and return this attribute without any values in the Unsupported Attributes Group in the response (see [rfc2911] section 3.1.7). Thus the Printer only supports the “job-mandatory-attributes” Operation attribute supplied at the Job level. Thus the “job-mandatory-attributes” Operation attribute controls all other Job Template and Document Template attributes supplied at the Job Level and Document Level uniformly. Note: The inheritance of the effect of “job-mandatory-attributes” Operation attribute supplied at the Job Level by subsequent Document Creation operations is like the inheritance of Job Template attributes.

The Printer MUST copy this attribute to the corresponding “job-mandatory-attributes” Job Description attribute (see [\[jobx\]](#) section [6.3-3.1.1.2](#)) for auditing and trouble shooting purposes and use its value for validating subsequent Document Creation operations for this job.

Note: The inheritance of the effect of the “job-mandatory-attributes” Operation attribute by subsequent Document Creation operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting the behavior of the Document Level (see [Table 3Table-3](#)).

~~The values of the “job-mandatory-attributes” attribute are the keyword attribute names that identify Job Template and/or Document Template attributes, for example, ‘job-hold-until’, ‘job-finishings’ (see section [Error! Reference source not found.](#)), ‘copies’ and ‘media’. In order to identify a member attribute of a collection attribute, the keyword names of both the collection attribute and the member attribute are given separated by a period (.) character. For example, to make the “media” attribute of the “cover-front” collection attribute mandatory, supply the keyword value: ‘cover-front.media’.~~

~~The Printer MUST accept any keyword values whether or not supported by the Printer. If the client supplies this “job-mandatory-attributes” Operation attribute in a Job Creation operation with values that represent Template attributes that the Printer doesn’t support, the Printer MUST otherwise accept the attribute anyway. The Printer MUST reject this Job Creation or a subsequent Document Creation operation only if the client actually supplies any of the identified Template attributes that the Printer doesn’t support. Because the Printer doesn’t reject when the “job-mandatory-attributes” Operation attribute has the unsupported attribute keyword names, the client MAY supply all of the attribute keyword names that the client supports without having to tailor the list to the particular Printer that the client is submitting the Job Creation operation, thereby, simplifying client use of this attribute.~~

¹² The Printer MUST support the “job-mandatory-attributes” Operation/Job Description attributes for conformance to this Document Object specification. However, an implementation that isn’t supporting the Document Object MAY still support the “job-mandatory-attributes” Operation attribute. See the definition of REQUIRED in section 2.1.

3.1.2 Create-Job ([rfc2911] section 3.2.4)

This REQUIRED¹³ operation creates the Job object with all of the mixture of Job and Document attributes supplied in the Create-Job operation. All Operation attributes supplied affect the Job as a whole. The client supplies Job Template attribute [rfc2911] that are a mixture of Job and Document attributes supplied together in the Job attribute group in the request¹⁴. For example, such Job Template attributes as “job-priority” and “job-hold-until” are Job attributes that affect the Job as a whole. On the other hand, such Job Template attributes as “media” and “number-up” are Document attributes that the client is supplying as defaults for the Document objects. The Document objects that are subsequently created for the specified Job are said to inherit the Document attributes from the Job object, unless the Document Creation operation supplies a corresponding Document Template attribute. However, the Printer MUST NOT copy down any Job Level attributes to the Document object as observable by a client in any Get-Documents or Get-Documents-Attributes operation responses.

~~A Printer that supports the Document object MUST support the Create-Job operation¹⁵ since the Create-Job operation is the only operation that creates a Job object so that subsequent Document objects can be created in the Job object.~~

3.1.3 Print-Job ([rfc2911] section 3.2.1)

This REQUIRED operation creates one Document object as a side effect of the Print-Job operation in addition to creating the Job object. The Printer MUST copy all of the supported Operation attributes supplied by the client to the corresponding Job Description or Document Description attributes as indicated in ~~Table 8~~Table 8. For example, the Printer copies the “job-name” and “attributes-charset” operation attributes to the corresponding Job Description attributes, while copying the “document-format” and “document-charset” Operation attributes to the corresponding Document Description attributes. The Printer MUST copy the supported Job Template attributes supplied by the client to the Job object and MUST NOT copy them down to the Document object. In other words, the Document object created by Print-Job has an empty group of Document (and Job) Template attributes. Any Job Template attributes supplied that affect Documents have effect on the Document object because the Document object inherits them from the Job object.

The Printer MUST populate the single Document object's “document-state”, “document-state-reasons”, and “document-number” Document Description attributes with appropriate values. Thus a Get-Job-Attributes operation returns the same attributes for a Job created with Print-Job as a Printer that doesn't support the Document object. However, a Get-Documents or Get-Documents-Attributes for a Job created by Print-Job will return no Document Templates attributes (since the client can't submit any with Print-Job), but will return the populated Document Description attributes, such as “document-format”, supplied by the client.

Note: Using the Get-Job-Attributes and Get-Documents-Attributes, a Job created by Print-Job will be indistinguishable to a client from a Job created with Create-Job and Send-Document with no Document Template attributes supplied. Also an old client performing just a Get-Job-Attributes will see the same results from (1) an old Printer that accepted the Print-Job, (2) a new Printer that accepted the Print-Job, and (3) a new Printer that accepted the Create-Job and Send-Document (with no Document Template attributes supplied). However, if a new client supplies Document Template attributes on the Send-Document, instead of the same attributes as Job Template attributes on the Create-Job, then an old client will not see any of the Document Template attributes when it performs the Get-Job-Attributes operation (since the Printer does not “copy up” Document Template attributes to the Job Level on a Get-Job-Attributes on a one document job

¹³ In [rfc2911] the Create-Job operation is OPTIONAL for a Printer to support.

¹⁴ In the PWG Semantic Model, attributes are classified as Job Processing versus Document Processing in their definition. The client supplies them in separate Job Processing or Document Processing groups in the Job Creation operation. Such Document Processing attributes are defaults for subsequent Document Creation operations for that Job.

¹⁵ In [rfc2911] the Create-Job operation is OPTIONAL for a Printer to support.

3.1.4 Print-URI ([rfc2911] section 3.2.2)

This OPTIONAL operation creates one Document object as a side effect of the Print-URI operation [in creating the Document object with Document Description attributes](#). The Printer MUST copy all of the [supported](#) Operation attributes [supplied by the client](#) and the Job Template attributes as indicated for Print-Job in section 3.1.3. In addition the Printer MUST copy the "document-uri" Operation attribute to the corresponding Document Description attribute.

Note: Using the Get-Job-Attributes and Get-Documents-Attributes, a Job created by Print-URI will be indistinguishable to a client from a Job created with Create-Job, Send-URI with no Document Template attributes supplied, and Close-Job (see Note in section 3.1.3).

3.2 [Validate-Job \(\[rfc2911\] section 3.2.4\)](#)

[This REQUIRED operation is similar to the Print-Job operation \(\[rfc2911\] section 3.2.1 and \[this spec\] section 3.1.3\) except that a client supplies no document data and the Printer allocates no resources \(i.e., it creates neither a new Job object nor a Document object\). This operation is used only to verify capabilities of a Printer object against whatever attributes are supplied by the client in the Validate-Job request. By using the Validate-Job operation a client can validate that an identical Print-Job operation \(with the document data\) would be accepted. A client can also use the Validate-Job operation to validate that an identical Send-Document operation \(with the document data\) would be accepted. Such a client MAY either:](#)

[\(1\) perform all of the Validate-Job operations for each of the documents before doing the Create-Job in order to validate all documents before creating the Job and transmitting any document data OR](#)

[\(2\) perform a Create-Job and then a Validate-Job before each Send-Document \(or Send-URI\) operation.](#)

[There are certain configurations and implementations where the above validation will not completely validate a multi-document job with differing Document Template attributes for the same Job. Consider a Printer that is representing several dissimilar devices in which no device is a superset of the others. In such a case, the Printer MAY reject a Send-Document operation that cannot be supported in the Job because the combination of its supplied Document Template attributes cannot be supported in the same Job in combination with the differing Document Template attributes of the previously supplied documents. In such a case, there is no way to completely validate a multi-document job which has documents with differing Document Template attributes using Validate-Job, since each Validate-Job is a separate independent operation. An administrator can avoid such a configuration by making sure that one of the devices is a superset of all of the other devices.](#)

3.3 Get-Documents Operation

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

This operation is similar to the Get-Documents-Attributes operation (see section 4.3), except that this Get-Documents operation returns attributes from all Document objects contained in the Job object, instead of from a single selected Document object in the Job object. As with the Get-Documents-Attributes operation the Printer MUST only return attributes that were submitted by a client when the Document object was created by the [Create-Document](#), [Send-Document](#), or [Send-URI](#) operations and possibly modified by the Set-Documents-Attributes operation (see section 4.4).

3.3.1 Get-Documents Request

The client submits the Get-Documents request to a Printer. The Get-Documents is similar to the Get-Jobs operations (see [rfc2911] section 3.2.6) except that there are no equivalents to the "which-jobs" and "my-jobs" Operation attributes.

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

Group 1: Operation Attributes

Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

Target:

Either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s) which define the target Job object for this operation as described in [rfc2911] section 3.1.5.

Requesting User Name:

The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in [rfc2911] section 8.3.

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

The client OPTIONALLY supplies this Operation attribute. The Printer MUST support this Operation attribute. It is an integer value that determines the maximum number of Documents that a client will receive from the Printer. The limit is a "stateless limit" in that if the value supplied by the client is 'N', then only the first 'N' Documents are returned in the Get-Documents Response. There is no mechanism to allow for the next 'M' Documents after the first 'N' Documents. If the client does not supply the "limit" attribute, the Printer responds with all Documents in the Job.

3.3.1.2 "requested-attributes" (1setOf type2 keyword):

The client OPTIONALLY supplies this attribute. The Printer MUST support this attribute. It is a set of Document attribute names and/or attribute groups names in whose values the requester is interested. This set of attributes is returned for each Document object that is returned. The allowed attribute group names are the same as those defined in the Get-Documents operation in section 4.3.1.

If the client does not supply this attribute, the Printer MUST respond as if the client had supplied this attribute with the single value:

'document-number' (see section 9.1.21)

3.3.2 Get-Documents Response

The Printer returns all of the Document objects up to the number specified by the "limit" attribute that match the criteria as defined by the attribute values supplied by the client in the request. If the client requests any Document attributes at all, there is a set of Document Object Attributes returned for each Document object.

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

Group 1: Operation Attributes**Status Message:**

In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as described in [rfc2911] sections 13 and 3.1.6.

Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

Group 2: Unsupported Attributes

See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

The response MAY contain or MAY omit the "requested-attributes" Operation attribute with any supplied values (attribute keywords) that were requested by the client but are not supported by the Printer. If the Printer does return unsupported attributes referenced in the "requested-attributes" Operation attribute and that attribute included group names, such as 'all', the unsupported attributes MUST NOT include attributes described in the standard but not supported by the implementation.

Groups 3 to N: Document Object Attributes

The Printer responds with one set of [Document Template attributes \(see the D column in Table 10Table 10\)](#) and [Document Description attributes \(see the Doc column in Table 11Table 11\)](#) [Document Object Attributes](#) for each returned Document object as specified by the "requested-attributes" Operation attribute supplied by the client in the request. The Printer ignores (does not respond with) any requested attribute or value which is not supported or which is restricted by the security policy in force, including whether the requesting user is the user that submitted the job (job originating user) or not (see [rfc2911] section 8). However, the Printer MUST respond with the 'unknown' value for any supported attribute (including all REQUIRED attributes) for which the Printer does not know the value, unless it would violate the security policy. See the description of the "out-of-band" values in the beginning of [rfc2911] section 4.1.

The Printer MUST return the Groups for the requested Job in order of increasing "document-number" Document Description attribute value.

3.4 Cancel-Job ([rfc2911] section 3.3.3)

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

3.5 Close-Job([JobXjobx] section 3.1z.z.z)

This **OPTIONAL** operation defined in [JobXjobx] closes the Job¹⁶. The Printer SHOULD support this operation. The client SHOULD issue this operation to close the job, instead of supplying the "last-document" Operation attribute (see section 4.1 **Error! Reference source not found.**) with a 'true' value in a Document Creation operation (or a Send-Document operation with no data - see [rfc2911] section 3.3.1). The Printer MUST support both means of closing jobs for backward compatibility with [rfc2911].

ISSUE02: Should Close-Job be REQUIRED for the Document object spec?

¹⁶ Close-Job is a operation defined by [JobX] and is not defined in [rfc2911].

633 3.6 Send-Document ([rfc2911] section 3.3.1)

634 This REQUIRED Job operation is a Document Creation operation that has been extended to accept a new Document
635 Attributes group (Group 4) that the client can supply Document Template attribute and creates a Document object
636 (see section 4.1 for the extension semantics).

637 3.7 Send-URI ([rfc2911] section 3.3.2)

638 This OPTIONAL Job operation is a Document Creation operation that has been extended to accept a new Document
639 Attributes group (Group 4) that the client can supply Document Template attribute and creates a Document object
640 (see section 4.2 for the extension semantics).

641 3.8 Hold-Job ([rfc2911] section 3.3.5)

642 This OPTIONAL operation moves the job to the 'pending-held' state, and sets the Job's "job-state-reasons" Job
643 Description attribute as description in [rfc2911] section 3.3.5. The values of the Documents' "document-state-
644 reasons" Document Description attributes MUST NOT be affected by this operation.

645 3.9 Release-Job ([rfc2911] section 3.3.6)

646 This OPTIONAL operation moves the job to the 'pending-held' state, if there are no other "job-state-reasons" to hold
647 the job as described in [rfc2911] section 3.3.6. The values of the Documents' "document-state-reasons" Document
648 Description attributes MUST NOT be affected by this operation.

649 3.10 Restart-Job ([rfc2911] section 3.3.7)

650 This OPTIONAL operation starts the Job over again by processing *all* Documents in the Job as described in [rfc2911]
651 section 3.3.7, including Documents that have been canceled by a previous Cancel-Document operation (see section
652 4.5). Therefore, the Printer removes any 'canceled-by-xxx' values from any of the "document-state-reasons"
653 attributes and the Job's "job-state-reasons" attributes so that any canceled Documents are reprocessed along with
654 the other Documents.

655 3.11 Reprocess-Job ([adm-ops] section 4.1)

656 This OPTIONAL operation processes the Job again by processing *all* Documents in the Job, including ones that have
657 been canceled by a previous Cancel-Document operation. Therefore, the Printer removes any 'canceled-by-xxx'
658 values from any of the "document-state-reasons" attributes and the Job's "job-state-reasons" attributes so that any
659 canceled Documents are reprocessed along with the other Documents.

660 4 Document Operations

661 This section defines the Document Creation and Document operations. The Document object semantics are as
662 parallel to the Job object semantics as possible. Therefore, most of the Job operations have analogous Document
663 operations as shown in ~~Table 17~~Table 17 in section "Appendix A: Document operations compared to Job
664 operations". Operations that can apply only to an entire job, have no analogous document operation as indicated.
665 This extension adds 7-5 new Document operations that operate on the Document object once it is created by ~~the~~
666 ~~new Create-Document operation or~~ either of the existing two operations: Send-Document and Send-URI operations.

Note: By Document object this specification means the object once it become a contained part of a Job object, not before or after. So in this specification a Document object does not represent data in a repository.

The signatures of the operation requests that create ~~and/or validate~~ Document objects are very similar as shown in ~~Table 4~~ ~~Table 4 and defined in section Error! Reference source not found. through section 4.2.~~ The entries in the table show what a client MUST, MAY, or MUST NOT supply in the indicated operation requests.

Table 4 - Client-supplied Document Creation and Validation Request Signatures

	Create-Document	Send-Data	Send-Document	Send-URI
Target job	MUST	MUST	MUST	MUST
"document-uri"	MUST NOT	MUST NOT	MUST NOT	MUST
Document Template attributes	MAY	MUST NOT	MAY	MAY
Data	MUST NOT	MUST	MUST	MUST NOT

The entries in ~~Table 5~~ ~~Table 5~~ show what a Printer MUST or MAY support and return in the indicated operations responses.

Table 5 - Printer-returned Document Creation and Validation Response Signatures

	Create-Job	Send-Document	Send-URI
Status code/message	MUST	MUST	MUST
Unsupported Attributes	MUST, if any	MUST, if any	MUST, if any
Job status attributes	MUST	MUST	MUST
Document status attributes:			
"document-number"	MUST NOT	MUST	MUST
"document-state"	MUST NOT	MUST	MUST
"document-state-reasons"	MUST NOY	MUST	MUST
"document-state-message"	MUST NOT	MAY	MAY

4.1 Send-Document [\(\[rfc2911\] section 3.3.1\) extension](#)

This REQUIRED¹⁷ Document Creation operation allows a client to submit multiple documents in a single Job by making a Send-Document request for each Document. In this specification, the Send-Document creates a Document object ([rfc2911] did not have a Document object). A Printer MUST support this operation with the semantics specified in [rfc2911] and with the extension defined in this specification, since this specification REQUIRES the Printer to support multiple document jobs.

See [rfc2911] section 3.3.1 for the semantics of the Send-Document operation not reproduced here.

Access Rights: The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job owner (as determined in the Create-Job operation) or an operator or administrator of the Printer (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

¹⁷ This specification REQUIRES the Printer to support the Send-Document operation while [rfc2911] did not. This difference is because this specification REQUIRES the Printer to support multiple document jobs, while [rfc2911] did not.

4.1.1 Send-Document Request

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

Group 1: Operation Attributes (as in [rfc2911])

As specified in [rfc2911] section 3.3.1 Send-Document request, plus any extensions indicated in [Table 8](#)~~Table 8~~. For example, "compression", "document-format", and "document-name". ~~So this group is the same as for Create-Document (see section Error! Reference source not found.).~~

Group 2: Document Template Attributes (new - not in [rfc2911])

The client OPTIONALLY supplies a set of Document Template attributes as listed in [Table 10](#)~~Table 10~~. For example, "media" and "number-up". If the client is not supplying any Document Template attributes in the request, the client SHOULD omit Group 2 rather than sending an empty group. However, a Printer MUST be able to accept an empty group.

Group 3: Document Content (as in [rfc2911] Group 2)

The client MUST supply the document data in-line to be processed for this Document if the "last-document" flag is set to 'false' [or omitted](#). However, since a client might not know that the previous Document Creation operation that the client had supplied (~~Create-Document/Send-Data pair~~, a Send-Document, or a Send-URI operation) was the last document (i.e., the client had supplied the "last-document" attribute with a 'false' value), the client MUST use either (1) the Close-Job operation (see section 3.5) or (2) a Send-Document request with no document data where the "last-document" flag is set to 'true' ([see \[rfc2911\] section 3.3.1](#)). For this Send-Document case with no data, the Printer MUST NOT increment the value of the Job object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it is not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and Send-Document request with a "last-document" Operation attribute set to 'true' with no document data; it is only an empty job which is scheduled and processed normally.

4.1.2 Send-Document Response

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

Group 1: Operation Attributes (as in [rfc2911] Group 1)

Status Message:

In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as described in [rfc2911] sections 13 and 3.1.6.

Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

Group 2: Unsupported Attributes (as in [rfc2911] Group 2)

See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

Group 3: Job Object Attributes (as in [rfc2911] Group 3)

The Printer MUST return the same set of Job status attributes as for the Print-Job, ~~Send-Document, and Create-Document~~ response [as specified in \[rfc2911\] section 3.2.1.2s](#) (~~see section Error! Reference source not found.~~).

Group 4: Document Object Attributes (new ~~as in Create-Document Group 3~~ ~~see section Error! Reference source not found.~~)

The ~~Printer MUST return the following Document Description attributes are defined for this Group: same set of Document status attributes as for the Create-Document operation response (see section Error! Reference source not found.)~~.

4.1.2.1 document-number (integer(1:MAX))

The Printer MUST return the document number of this Document object that was assigned by the Printer starting with 1 for each Job (see section 9.1.21).

4.1.2.2 document-state (type1 enum)

The Printer MUST return the state of this Document object (see section 9.1.23).

4.1.2.3 document-state-reasons (1setOf type2 keyword)

The Printer MUST return the associated state reasons for this Document (see section 9.1.25).

4.1.2.4 document-state-message (text(MAX))

The Printer MAY return the localized description of the "document-state" and "document-state-reasons" values for this Document (see section 9.1.24).

4.2 Send-URI ([rfc2911] section 3.3.2) extension

This OPTIONAL Document Creation operation has the same request and response semantics as the Send-Document operation (see section 4.1) except that a client MUST supply a URI reference ("document-uri" Operation attribute) rather than the document data itself. If a Printer supports this operation, clients can use ~~any either this operation or the of (1) Send-URI, (2) Send-Document, and/or (3) Create-Document/Send-Data~~ operations to add new ~~d~~Document objects to an existing multi-document Job object. However, if a client needs to indicate that the previous Send-URI, ~~or~~ Send-Document, ~~or Create-Document/Send-Data~~ was the last document, the client MUST use either (1) the Close-Job operation (see section 3.5) or (2) the Send-Document operation (see section 4.1) with no document data and the "last-document" flag set to 'true' as specified in [rfc2911] section 3.3.2 (rather than using a Send-URI operation with no "document-uri" Operation attribute).

If a Printer supports this operation, it MUST also support the Print-URI operation (see [rfc2911] section 3.2.2).

The Printer MUST validate the syntax and URI scheme of the supplied URI before returning a response, just as in the Print-URI operation. The IPP Printer MAY validate the accessibility of the document as part of the operation or subsequently (see [rfc2911] section 3.2.2).

4.3 Get-Document-Attributes

This REQUIRED Document operation allows a client to request the values of selected attributes of a Document object. This operation is almost identical to the Get-Job-Attributes operation (see [rfc2911] section 3.3.4). The only differences are that the operation is directed at a Document object rather than a Job object and the returned attribute group is a set of Document object attributes rather than a set of Job object attributes.

The Printer MUST return the Document Description attributes that a client supplied in the Document Creation operation (Print-Job, Print-URI, ~~Create-Document~~, Send-Document, or Send-URI) as Operation attributes (see the PJ/PU and SD/SU columns in Table 8Table 8 and the Doc column in Table 11Table 11), any Document Template

attribute supplied by Send-Document or Send-URI-operations (see the D column in Table 10Table 10), plus any additional Document Description attributes that the Printer has generated, such as "document-state" (see the Doc column in Table 11Table 11). The Printer MUST NOT return any Job Level attributes that the Document object inherits and MUST NOT factor out common Document object attributes and return them as Job object attributes. Thus the Get-Document-Attributes returns to clients only the attributes that clients submitted with the Job object and with the Document object in Document Creation operations, plus the additional Document Description attributes that the Printer sets.

The client MAY display to the user any Document attributes inherited from the Job object. However, such a client MUST query both the Job object using Get-Job-Attributes and the Document object using Get-Document-Attributes in order to be able to merge the inherited attributes with the explicitly-supplied Document attributes. Furthermore, the client MAY factor out common explicitly-supplied Document object attributes and display them once as Job object attributes, instead of with each Document object. However, any such regularization of the display for users is the policy of the client and is outside the scope of this client-Printer protocol specification. Note: specify any such regularization or canonicalization policy in the Printer response would have been impossible to agree to.

For Document objects, the possible names of attribute groups are:

- 'document-template': the subset of the Document Template attributes that apply to a Document object (the "D" column in Table 10Table 10) that the implementation supports for Document objects.
- 'document-description': the subset of the Document Description attributes specified in the "Doc" column of Table 11Table 11 that the implementation supports for Document objects.
- 'all': the special group 'all' that includes all attributes that the implementation supports for Document objects.

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

It is NOT REQUIRED that a Document object to support all attributes belonging to a group (since some attributes are OPTIONAL). However, it is REQUIRED that the Printer support all these group names for the Document object.

4.3.1 Get-Document-Attributes Request

The following groups of attributes are part of the Get-Document-Attributes Request when the request is directed at a Document object:

Group 1: Operation Attributes

Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

Target:

The "document-number" (integer(1:MAX)) Operation attribute MUST be supplied immediately after either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s) which define the target Document object for this operation as described in [rfc2911] section 3.1.5. If the client omits the "document-number" Operation attribute, the Printer MUST reject the request and return the 'client-error-bad-request' status code.

803 **Requesting User Name:**

804 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
805 [rfc2911] section 8.3.

806 **4.3.1.1 "requested-attributes" (1setOf keyword):**

807 The client OPTIONALLY supplies this attribute. The Printer MUST support this attribute. It is a set of
808 attribute names and/or attribute group names in whose values the requester is interested. If the client omits
809 this attribute, the Printer MUST respond as if this attribute had been supplied with a value of 'all'.

810 **4.3.2 Get-Document-Attributes Response**

811 The Printer returns the following sets of attributes as part of the Get-Document-Attributes Response:

812 **Group 1: Operation Attributes**

813 **Status Message:**

814 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
815 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as
816 described in [rfc2911] sections 13 and 3.1.6.

817 **Natural Language and Character Set:**

818 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.
819 The "attributes-natural-language" MAY be the natural language of the Document object, rather than the one
820 requested.

821 **Group 2: Unsupported Attributes**

822 See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

823 The response MAY contain or MAY omit the "requested-attributes" Operation attribute with any supplied
824 values (attribute keywords) that were requested by the client but are not supported by the Printer. If the
825 Printer does return unsupported attributes referenced in the "requested-attributes" Operation attribute and
826 that attribute included group names, such as 'all', the unsupported attributes MUST NOT include attributes
827 described in the standard but not supported by the implementation.

828 **Group 3: Document Object Attributes**

829 ~~This is~~ The Printer returns the set of requested [Document Template attributes \(see the D column in Table](#)
830 [10Table 10\)](#) and [Document Description attributes \(see the Doc column in Table 11Table 11\)](#) attributes and
831 their current values. The Printer ignores (does not respond with) any requested attribute or value which is
832 not supported. Furthermore, the Printer MUST NOT return Document Template attributes that were not
833 supplied by a client in a [Create-Document](#), [Send-Document](#), or [Send-URI](#) request or set by a [Set-Document-](#)
834 [Attributes](#) request. So the response reflects what was submitted. The Printer MAY omit returning attributes
835 that are restricted by the Printer's security policy in force, including whether the requesting user is the user
836 that submitted the job (job originating user) or not (see [rfc2911] section 8). However, the Printer MUST
837 respond with the 'unknown' value for any supported attribute (including all REQUIRED attributes) for which
838 the Printer does not know the value, unless it would violate the security policy. See the description of the
839 "out-of-band" values in the beginning of [rfc2911] Section 4.1.

4.4 Set-Documents-Attributes

This OPTIONAL Document operation allows a client to set the values of the attributes of a Document object after the Document object was submitted to the Printer. In the request, the client supplies the set of Document keyword attribute names and values that are to be set. In the response, the Printer returns success or rejects the entire request with indications of which attribute or attributes could not be set.

This operation is almost identical to the Set-Job-Attributes operation and follows the same rules for validation (see [rfc3380] section 4.2). The only differences are that the Set-Documents-Attributes operation is directed at a Document object rather than a Job object. As with the Set-Job-Attributes operation, The Set-Documents-Attributes operation can add an attribute to the Target object, accepts the 'delete-attributes' out-of-band value to remove an attribute from the Target object. In addition the validation is the same as the [Create Document](#), [Send Document](#), and [Send-URI](#) operations that create Document objects, i.e., the Printer validation depends on the "xxx-supported" Printer Description attributes (see [rfc2911] section 3.1).

If a client supplies a document attribute in a Set-Documents-Attributes request that the Printer supports, and the document was originally submitted without supplying that attribute, the Printer adds the attribute to the Document object.

If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [rfc3380] section 8.2), then the Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic effect of the client supplying the 'delete-attribute' value in a Set-Documents-Attributes operation MUST be the same as if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer applies its default attribute or behavior with lower precedence than the PDL (see the beginning of [rfc2911] section 4.2 and [rfc2911] 3.2.1.1). Any subsequent query of the Document object using Get-Documents-Attributes or Get-Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value. However, a client can re-establish such a deleted Document attribute with any supported value(s) using a subsequent Set-Documents-Attributes operation.

If the client supplies an attribute in a Set-Documents-Attributes request with the 'delete-attribute' value and that attribute is not present on the Document object, the Printer ignores that supplied attribute in the request, does not return the attribute in the Unsupported Attributes group, and returns the 'successful-ok' status code, if there are no other problems with the request.

The validation of the Set-Documents-Attributes request is performed by the Printer as if the document had been submitted originally with the new attribute values (and the deleted attributes removed) and with "ipp-attribute-fidelity" set to 'true', i.e., all modified attributes Document attributes and values MUST be supported in combination with the Document attributes not modified. If such a Document Creation operation would have been accepted, then the Set-Documents-Attributes MUST be accepted. If such a Document Creation operation would have been rejected, then the Set-Documents-Attributes MUST be rejected and the Document MUST be unchanged. In addition, if any of the supplied attributes are not supported, are not settable, or the values are not supported, the Printer MUST reject the entire operation; the Printer MUST NOT partially set some of the supplied attributes. In other words, after the operation, all the supplied attributes MUST be set or none of them MUST be set, thus making the Set-Documents-Attributes an atomic operation.

The value of the "ipp-attribute-fidelity" and "job-mandatory-attributes" Operation attribute supplied in the original Job Creation request, if any, MUST have no effect on the behavior of the Set-Documents-Attributes operation, since the Set-Documents-Attributes request MUST behave as if "ipp-attribute-fidelity" = 'true'. In other words, the Printer MUST reject any attempt to set a Document attribute to an unsupported value or to a value that would conflict with another Document attribute value.

The Printer MUST accept or reject this operations when the Document's READ-ONLY "document-state" attribute has the values shown in [Table 6](#)~~Table 6~~. The document's current state MUST affect whether the Printer accepts or rejects the request. However, the Set-Documents-Attributes operation MUST NOT change the state of the Document

object (since the Document is a passive object and the Document state is a subset of the Job State). For example, in the case where the operation creates a request for unavailable resources, the Job (but not the Document) transitions to a new state. [Table 6](#) shows the allowed behaviors in each document state.

Table 6 - Document State Table for the Set-Documents-Attributes operation

Current "document-state"	New "document-state" (no change)	Printer's response status code and "action":
'pending'	'pending'	'successful-ok'
'pending'	'pending'	'successful-ok' - needed resources are not ready (the Job MAY change state, but the Document MUST NOT).
'processing'	'processing'	'successful-ok' or 'client-error-not-possible' depending on implementation, including the attributes being set, whether the document has started marking media, etc.
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

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

4.4.1 Settable and READ-ONLY Document Description attributes

If the Printer supports the Set-Documents-Attributes operation, then it SHOULD support setting of:
all Document Template document ("xxx") attributes
that the implementation supports (see the column labeled "D" in [Table 10](#)).

Almost all Document Description attributes (see [rfc2911] section 4.3) MUST NOT be settable, i.e., they are defined to be READ-ONLY. Only Document Description attributes marked with "(r/w)" in [Table 10](#) MAY be settable using Set-Documents-Attributes. The Printer MUST reject a Set-Documents-Attributes request that attempts to set any attributes in [Table 11](#) that are not marked "(r/w)".

Note: From now on, all extensions that define new Document object attributes will indicate whether or not the attributes are READ-ONLY, by including the "READ-ONLY" adjective in their descriptions and/or explicitly stating whether they MAY be settable.

Access Rights: The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job owner (as determined in the Job Creation operation) or an operator or administrator of the Printer (see [rfc2911] Sections 1 and 8.5).

4.4.2 Set-Documents-Attributes Request

The following sets of attributes are part of the Set-Documents-Attributes Request:

Group 1: Operation Attributes

Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

Target:

The client MUST supply the "document-number" (integer(1:MAX)) Operation attribute immediately after either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s) which define the target Document object for this operation as described in [rfc2911] section 3.1.5. If the client omits the "document-number" Operation attribute, the Printer MUST reject the request and return the 'client-error-bad-request' status code.

Note: There is no way in a single operation for the client to set all of a Job's Document objects to the same attribute value. Either (1) the client sets the corresponding attribute in each Document object in the Job with separate Set-Documents requests, or (2) the client sets the corresponding attribute at the Job Level using the Set-Job-Attributes operation. Setting the corresponding attribute at the Job Level (or supplying that attribute initially in the Job Creation operation) causes each Document object to inherit the Job Level attribute value, if the Document object doesn't have a corresponding explicit attribute supplied at the Document Level. In other words, supplying an attribute at the Job Levels will affect all the Job's Document objects that don't have that attribute also explicitly supplied at the Document Level.

Requesting User Name:

The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in [rfc2911] section 8.3.

Group 2: Document Attributes

The client MUST supply a set of Document Template attributes with one or more values (including explicitly allowed out-of-band values) as listed in column labeled "D" in [Table 10 - Job Template and Document Template attributes](#) and Document Description attributes flagged with "(r/w)" and listed in the column labeled "Doc" in [Table 11 - Job and Document Description attributes](#), and any attribute extensions supported by the Printer. The value(s) of each Document attribute supplied in Group 2 replaces the value(s) of the corresponding Document attribute on the target Document object. For attributes that can have multiple values (1setOf), all values supplied by the client replace all values of the corresponding Document object attribute.

In order to set the Document's "document-message" Document Description attribute (see section 9.1.18), the client MUST supply the attribute in Group 2, rather than supplying a "document-message" Operation attribute in Group 1.

If the client supplies an "xxx" attribute with the 'delete-attribute' out-of-band value (see [rfc3380] section 8.2), the Printer MUST remove the "xxx" attribute from the Document object, if present.

4.4.3 Set-Documents Response

The Printer returns the following sets of attributes as part of the Set-Documents Response:

Group 1: Operation Attributes**Status Message:**

In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as described in [rfc2911] sections 13 and 3.1.6.

Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

954 **Group 2: Unsupported Attributes**

955 See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

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

- 961 1. The number of attributes supplied by the client exceeds the maximum number that the Printer
 962 supports in a Set-Printer-Attributes request: return the 'client-error-request-entity-too-large' (see
 963 [rfc2911] section 13.1.4.9).
- 964 2. The Printer doesn't support the attribute: return the attribute with the 'unsupported' out-of-band
 965 attribute value (see [rfc2911] section 3.1.7 and [rfc2910]) and the 'client-error-attributes-or-values-
 966 not-supported' (see [rfc2911] section 13.1.4.12).
- 967 3. The attribute is READ-ONLY (in its definition) or is not-settable in this implementation: return the
 968 attribute with the 'not-settable' out-of-band attribute value (see [rfc3380] section 8.1) and the
 969 'client-error-attributes-not-settable' status code (see [rfc3380] section 7.1).
- 970 4. The Printer doesn't support the value: if the attribute in the operation has a single value return it.
 971 If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not
 972 supported. Return the 'client-error-attributes-or-values-not-supported' status code (see [rfc2911]
 973 section 13.1.4.12).
- 974 5. The values of some of the supplied attributes conflict with one another and/or other Document
 975 attribute values not being set: if the conflicting attribute in the operation has a single value return
 976 the attribute and the value. If the attribute in the operation is multi-valued, return only the attribute
 977 and those values in a 1setOf that are conflicting with other attributes. Return the 'client-error-
 978 conflicting-attributes' status code (see [rfc2911] section 13.1.4.15).

979 **4.5 Cancel-Document**

980 This REQUIRED Document operation allows a client to cancel a specified Document in a specified Print Job any time
 981 from the time the Document is created up to, but not including, the time that the Document is completed, canceled, or
 982 aborted. Since a Document might already be printing by the time a Cancel-Document is received, some media sheet
 983 pages might be printed before the document processing is actually terminated.

984 The Cancel-Document operation does not remove the Document from the Job and Printer, but only sets the specified
 985 Document's "document-state" Document Description attribute to 'canceled' and the Document's "document-state-
 986 reasons" Document Description attribute to 'canceled-by-user' or 'cancel-by-operator'. If the Job object is printed
 987 again using operations such as the Reprocess-Job operation (see [adm-ops] section 4.1) or the Restart-Job
 988 operation (see [rfc2911] section 3.3.7), any canceled Documents are also printed again. Thus Cancel-Document has
 989 the same semantics as Cancel-Job (see [rfc2911] section 3.3.3), which only cancels the processing of the job, and
 990 doesn't delete the Job object itself. See the Delete-Document operation (section 5.4) to remove the Document object
 991 itself immediately from the Job and Printer.

992 The Cancel-Document operation does not affect the states of any of the other Document objects in the job. If the Job
 993 was processing and there are more Documents to be processed, the Printer does so. If there are no further
 994 Documents to process, the Job moves to the 'completed' state as usual whenever there is no more processing to be
 995 done.

The Printer MUST accept or reject the request based on the document's current state and transition the document to the indicated new state as follows:

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

Rule 1: If the implementation requires some measurable time to cancel the document in the 'processing' document states, the Printer MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons" attribute and then transition the document to the 'canceled' state when the processing ceases (see [rfc2911] section 4.3.8).

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

Access Rights: The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job owner or an operator or administrator of the Printer (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

4.5.1 Cancel-Document Request

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

Group 1: Operation Attributes

Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

Target:

The client MUST supply the "document-number" (integer(1:MAX)) Operation attribute immediately after either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s) which define the target Document object for this operation as described in section [rfc2911] 3.1.5. If the client omits the "document-number" Operation attribute, the Printer MUST reject the request and return the 'client-error-bad-request' status code.

Requesting User Name:

The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in [rfc2911] section 8.3.

4.5.1.1 document-message (text(MAX)) Operation attribute

The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also support the corresponding "document-message" (text(MAX)) Document Description attribute (see section 9.1.18) and copy this value to the "document-message" Document Description attribute. The end user can use this Document Description attribute as a message to the operator and the operator can use it as a

1028 message to the user. The Printer MAY print this message on a document start sheet for this document, if
1029 any.

1030 The Printer MUST ignore the new "job-message-from-operator" Operation attribute (see [adm-ops] section 6)
1031 for this operation, since that is a job only attribute and Cancel-Document is a Document operation.

1032 4.5.2 Cancel-Document Response

1033 The following sets of attributes are part of the Cancel-Document Response:

1034 Group 1: Operation Attributes

1035 Status Message:

1036 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
1037 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as
1038 described in [rfc2911] sections 13 and 3.1.6.

1039 Natural Language and Character Set:

1040 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

1041 Group 2: Unsupported Attributes

1042 See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

1043 Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
1044 in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document
1045 enters the 'canceled' document-state (see section 9.1.23), the "document-state-reasons" attribute (see section
1046 9.1.25) SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the
1047 Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

1048 5 Administrative Job and Document operations

1049 This section summarizes the extensions to existing Administrative Job and Printer operations and defines new
1050 Document Administrative operations. [The following administrative operations: Promote-Job \(\[adm-ops\] section 4.4.1\), Release-Held-New-Jobs \(\[adm-ops\] section 3.3.2\), Resume-Job \(\[adm-ops\] section 4.3.2\), Schedule-Job-After \(\[adm-ops\] section 4.4.2\) do not affect the Document objects because they are defined to affect the Job object as a whole.](#)

1054 5.1 Purge-Jobs ([rfc2911] section 3.2.9)

1055 This OPTIONAL Administrative Printer operation removes all Job and all of their contained Document objects.

1056 5.2 Cancel-Current-Job ([adm-ops] section 4.2)

1057 This OPTIONAL Administrative Printer operation sets the "document-state" Document Description attribute to
1058 'canceled' and the "document-state-reasons" Document Description attribute to 'canceled-by-xxx' for any documents
1059 in the current Job that have not yet reached a terminal state ('completed', 'canceled', or 'aborted'), where "xxx" is
1060 'user' or 'operator'. See [adm-ops] section 4.2.

1061 Note: There is no Cancel-Current-Documment operation defined, since it is too likely that the Printer would have
1062 moved onto the next document before the operation could issue the request.

1063 **5.3 Suspend-Current-Job** ([adm-ops] section 4.3.1)

1064 This OPTIONAL Administrative Printer operation suspends the current job and sets the Job's "job-state" Job
 1065 Description attribute to 'processing-stopped' and "job-state-reasons" to 'job-suspended-by-xxx', where 'xxx' is 'user'
 1066 or 'operator'. The Documents' "document-state" and "document-state-reasons" Document Description attributes are
 1067 unaffected (but the Documents are not processed any further, since the Job is stopped).

1068 **5.4 Delete-Document**

1069 This OPTIONAL Administrative Document operation removes the specified Document object and its data
 1070 immediately from the specified Job. The Printer MUST reject the request if the Document is in any state, but
 1071 'pending' (there is no 'pending-held' state for Documents). The Printer does not reassign the "document-number"
 1072 Document Description attribute values of the remaining Document objects in the Job, so that the deleted Document
 1073 object leaves a gap in the document numbering space for the Job. The Printer MUST return a 'client-error-not-found'
 1074 status code, in a subsequent Get-Document-Attributes operation for this Document object specifying its former
 1075 "document-number". This operation is similar to the Purge-Jobs operation that immediately deletes all jobs from the
 1076 Printer. However, the Delete-Document operation only deletes a single Document from the specified Job.

1077 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation MUST be an operator or
 1078 administrator of the Printer (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and
 1079 return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate. This
 1080 operation requires operator/administrator privileges, otherwise a rogue client could submit, then delete, at will using
 1081 up valuable spooling space. Instead of using this operation, unprivileged users use Cancel-Document which goes
 1082 through the normal accounting, if any.

1083 The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the
 1084 Cancel-Document operation (see section 4.5).

1085 **6 Job and Document Template Attribute Precedence during Job processing**

1086 This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including
 1087 instructions in the PDL data. These rules cover Queue Override attributes, Page Override attributes, Document
 1088 Object attributes (Operation/Document Description and Document Template), Document Override attributes, Job
 1089 Object attributes (Operation/Job Description and Job Template), PDL instructions, PDL Interpreter initialization files,
 1090 and Printer's defaults. Since each attribute can be specified for all of these levels, it is important to define which level
 1091 takes precedence when the same attribute occurs at different levels with differing values.

1092 The attribute precedence model has the following features:

- 1093 1) In principle, each defined attribute can occur at each of the precedence levels.
- 1094 2) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
 1095 driver, submission client, protocol, and Printer:
 - 1096 • Attributes are supplied by different agents in the system: application, user, print driver, administrator,
 1097 operator, Printer, and the output device hardware.
 - 1098 • Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job
 1099 pending, job processing.
- 1100 3) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
 1101 driver, submission client, protocol, and Printer.

- 4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is to the affected object, the higher the precedence is assigned to that attribute, since precedence is intended to reflect the user's wishes.

The following levels of Attribute Precedence are defined in order of decreasing priority:

1. **queue override** - The value that the Printer enforces for any job submitted to it (see [ippsave] section 3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" = 'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the long edge.

Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for its "pdl-override-supported" attribute (see [ippsave] section 8.1). All other levels are available for all Printers independent of the "pdl-override-supported" value.

2. **Document Level - page override programming** - The special "page-overrides" collection Document Template attribute (see [pwg5100.4]) supplied at the Document Level, that is, in a [Create-Document](#), [Send-Document](#), or [Send-URI](#) operation, that contains the attributes that are to have the page override status for the specified ranges of pages in the [Input-Document](#) or the [Output-Document](#). Supplied by the client when submitting a Document object, or set by the user or operator after the Document has been accepted either using the [Set-Document-Attributes](#) operation, or by the operator using means local to the Printer. Example: "page-overrides" = {"input-documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

3. **Job Level - page override programming** - The special "page-overrides" collection Job Template attribute (see [pwg5100.4]) supplied at the Job Level, that is, in a Job Creation operation, that contains the attributes that are to have the page override status for the specified ranges of pages in the [Input-Document](#) or the [Output-Document](#). Supplied by the client when submitting a job either in the protocol, or set by the user or operator after the job has been accepted either using the [Set-Job-Attributes](#) operation, or by the operator using means local to the Printer. Example: "page-overrides" = {"input-documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

4. **Document Level - Document object attributes** - The Document attributes supplied at the Document Level, that is, Operation/Document Description and Document Template attributes supplied in a [Create-Document](#), [Send-Document](#), or [Send-URI](#) operation to apply to the Input Document. Supplied by the client when submitting a Document object, or set by the user or operator after the Document has been accepted either using the [Set-Job-Attributes](#) operation, or by the operator using means local to the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

5. **Job Level - Job object and Document object attributes** - The Job attributes (Operation/Job Description and Job Template) and Document attributes (Operation/Document Description and Document Template) supplied at the Job Level, i.e., with a [Create-Job](#), [Print-Job](#), or [Print-URI](#) operation. Supplied by the client when submitting a Job in the protocol, or set by the user or operator after the job has been accepted either using the [Set-Job-Attributes](#) operation, or by the operator using means local to the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

6. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether PDL document data is actually lower precedence than the preceding levels depends on the implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911] section 4.4.28 and [ippsave] section 8.1).

Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-requested" (see [rfc2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a

1148 corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
 1149 attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
 1150 requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation
 1151 and PCL MAY omit orientation, in which case, "orientation-requested" takes affect.

1152 7. **PDL Init File data** - a file that the Printer uses to initialize the PDL Interpreter before it starts interpreting
 1153 each document in a Job. See description of "pdl-init-file" Job Template attribute in [ippsave] Section 5.8.
 1154 It is immaterial how this file is specified, whether it be by a queue override, job object attribute or printer
 1155 default – the precedence of the contents of this file is at this level.

1156 8. **printer default** - a Printer "xxx-default" attribute that is applied by the Printer provided that none of the
 1157 higher levels have supplied a value. The Printer implementation MUST supply values for all of the
 1158 Printer's "xxx-default" attributes that reflect the out-of-the-box action by the output device. For example,
 1159 if the output device will use media from the large-capacity input tray if not directed otherwise, the
 1160 implementation MUST supply the Printer's "media-default" attribute with the 'large-capacity' keyword
 1161 value without requiring the administrator to configure that value. The implementation MUST allow the
 1162 administrator to configure the Printer's "xxx-default" attributes to other values, if other value are
 1163 supported by the implementation. Example: The administrator changes the Printer's "media-default"
 1164 from 'large-capacity' to 'na-letter'.

1165 Note: Because of the requirement that the implementation supply pre-configured values for the
 1166 Printer's "xxx-default" attributes, there is no need for a lower "hardware default" precedence
 1167 level.

1168 7 Operation Attributes for the Job and Document Creation operations

1169 This section defines some new Operation/Description attributes and lists *all* the Operation/Description attributes that
 1170 have been defined in other IPP specifications that are used in Job Creation operations and extends their use to the
 1171 Document Creation operations. In addition, some new Job/Document Description attributes have been defined to be
 1172 set from existing Operation attributes. Note: Operation attributes relate to the operation and do not depend on the
 1173 printing capabilities of the Printer.

1174 7.1 Operation Attributes *supplied* at the Job and Document Levels for Creation

1175 ~~Table 7~~Table 7 lists all the Operation attributes and their attributes syntaxes supplied in Job Creation and Document
 1176 Creation operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer
 1177 Description attributes, if any. A "-" indicates that there isn't a "xxx-default" or "xxx-supported" Printer Description
 1178 attribute.

1179 **Table 7- Operation, Default, and Supported Attributes**

Operation attribute	Operation attribute syntax	Printer: Default Value attribute syntax	Printer: Supported Values attribute syntax
attributes-charset	charset	-	1setOf charset ¹⁸
attributes-natural-language	naturalLanguage	-	1setOf naturalLanguage
compression	type3 keyword	-	1setOf type3 keyword
document-charset	charset	charset	1setOf charset
document-digital-signature	type2 keyword	type2 keyword	1setOf type2 keyword
document-format	mimeMediaType	mimeMediaType	1setOf mimeMediaType

¹⁸ The Supported Printer attribute is named "charset-supported" (see [rfc2911] section 4.4.18), rather than "attributes-charset-supported".

Operation attribute	Operation attribute syntax	Printer: Default Value attribute syntax	Printer: Supported Values attribute syntax
document-format-details	1setOf collection	1setOf collection	1setOf type2 keyword ¹⁹
document-source-application-name	name(MAX)	name(MAX)	-
document-source-application-version	text(127)	text(127)	-
document-source-os-name	name(40)	name(40)	-
document-source-os-version	text(40)	text(40)	-
document-format	mimeMediaType	mimeMediaType	-
document-format-device-id	text(127)	text(127)	-
document-format-version	text(127)	text(127)	-
document-natural-language	naturalLanguage	naturalLanguage	-
document-format-version	text(127)	text(127)	1setOf text(127)
document-message	text(MAX)	-	-
document-name	name(MAX)	-	-
document-natural-language	naturalLanguage	naturalLanguage	1setOf naturalLanguage
document-uri	uri	-	1setOf uriScheme ²⁰
ipp-attribute-fidelity	boolean	-	-
[job-]impressions	integer(0:MAX)	-	rangeOfInteger(0:MAX)
[job-]k-octets	integer(0:MAX)	-	rangeOfInteger(0:MAX)
job-mandatory-attributes	1setOf type2 keyword	-	-
[job-]media-sheets	integer(0:MAX)	-	rangeOfInteger(0:MAX)
job-name	name(MAX)	-	-
job-password	octetString(255)	-	integer(0:127)
job-password-encryption	type3 keyword name(MAX)	-	1setOf (type3 keyword name(MAX))
last-document	boolean	-	-
operation-id	integer(1:0x8FFF)	-	1setOf type2 enum ²¹
original-requesting-user-name	name(MAX)	-	-
output-device-requested	name(127)	-	1setOf name(MAX)
page-overrides	1setOf collection ²²	-	1setOf type2 keyword
printer-uri	uri	-	1setOf uri
request-id	integer(1:MAX)	-	-
requesting-user-name	name(MAX)	-	-
version-number	X.Y	-	1setOf type2 keyword ²³

1180

1181 | **Table 8** lists the Operation attributes that clients supply at the Job Level and/or the Document Level and
1182 | whether the Printer copies (indicated by “⇒”) the supplied value to corresponding Job Description and/or Document
1183 | Description attributes.

1184 Legend:

1185 **[job-]** an attribute that shouldn't have had a “job-” prefix in its name in [rfc2911], so that the same attribute name
1186 | could also be used for the Document object as an Operation/Document Description attribute. When this

¹⁹ There is also a “document-format-details-implemented” (1setOf collection), see section **Error! Reference source not found.**

²⁰ The Supported Printer attribute is named “reference-uri-schemes-supported” (see [rfc2911] section 4.4.27), rather than “document-uri-supported”.

²¹ The Supported Printer attribute is named “operations-supported” (see [rfc2911] section 4.4.15), rather than “operation-id-supported”.

²² See “page-overrides” in **Table 10** for the list of its member attributes.

²³ The Supported Printer attribute is named “ipp-versions-supported” (see [rfc2911] section 4.4.14), rather than “version-number-supported”.

1187 attribute is used as an Operation/Document Description attribute, the **[job-]** prefix is dropped. Note: For the
 1188 PWG Semantic Model, the “**job-**” prefix is dropped.
 1189 “**Level Supplied**” column indicates whether the Operation attribute can be supplied at the Job Level (PJ=Print-Job,
 1190 PU=Print-URI, and CJ=Create-Job) and at the Document Level (~~CD=Create-Document~~, SD=Send-
 1191 Document, and SU=Send-URI) .
 1192 “**y**” the Operation attribute is defined for the indicated operation, but does not have a corresponding Job
 1193 Description or Document Description attribute (no “**⇒**”).
 1194 “**y⇒**” the Operation attribute has a corresponding Job Description (**y⇒J**) or Document Description (**y⇒D**) attribute
 1195 to which the Printer MUST copy this Operation attribute. See ~~Table 11~~**Table 44** for the corresponding Job
 1196 and Document Description attributes ~~and whether there are corresponding “xxx-default” and “xxx-supported”~~
 1197 ~~Printer Description attribute defined.~~
 1198 “**-**” the Operation attribute is *not* defined for the indicated operation.
 1199 “******” these Operation attributes are defined for *all* operations, not just Job Creation and Document Creation
 1200 operations
 1201 “**Conformance**” column indicates the conformance requirements for what the client supplies in a request and the
 1202 Printer supports in a request.
 1203 “**Reference and Section**” column indicates where the Operation attribute is defined in other IPP specs and this spec.
 1204

Table 8 - Operation Attributes supplied at the Job and Document Levels in Job and Document Creation Requests

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc			
		CJ	PJ, PU	CD, SD, SU	Client supply	Printer support	
attributes-charset **	charset	y⇒J	y⇒J	y⇒	MUST	MUST	[rfc2911] §3.1.4
attributes-natural-language **	naturalLanguage	y⇒J	y⇒J	y⇒	MUST	MUST	[rfc2911] §3.1.4
compression	type3 keyword	-	y⇒D	y⇒	MAY	MUST	[rfc2911] §3.2.1.1
document-charset	charset	-	y⇒D	y⇒	MAY	CMUS T ²⁴	[jobx] §4.2.1
document-digital-signature	type2 keyword	-	y⇒D	y⇒	MAY	MAY	[jobx] §4.2.2
document-format	mimeMediaType	-	y⇒ ²⁵ D	y⇒ ²⁷	MAY	MUST	[rfc2911] §3.2.1.1, [jobx] §4.2.3
document-format-details	1setOf collection	-	y⇒D	y⇒	MAY	CMUS T ²⁶	[jobx] §4.2.4

²⁴ The Printer MUST support the “document-charset” Operation/Document Description attributes, if the Printer supports a charset-ambiguous document format (see section **Error! Reference source not found.**).

²⁵ The Printer MUST copy the “document-format” Operation attribute to the corresponding (new) Document Description attribute defined in this specification.

²⁶ The Printer MUST support the “document-format-details” Operation/Document Description attributes if the Printer supports a *packaging* MIME type document format, such as ‘application/zip’ or ‘multipart/related’.

Operation attribute name for Job and Document Creation <i>requests</i>	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc	Client supply	Printer support	
		CJ	PJ, PU	CD, SD, SU			
document-source-application-name	name(MAX)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.1
document-source-application-version	text(127)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.2
document-source-os-name	name(40)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.3
document-source-os-version	text(40)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.4
document-format	mimeMediaType	-	y⇒ <u>D</u>	y⇒	MUST	MUST	[jobx] §4.2.4.5
document-format-device-id	text(127)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.6
document-format-version	text(127)	-	y⇒ <u>D</u>	y⇒	SHOULD	MUST	[jobx] §4.2.4.7
document-natural-language	naturalLanguage	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.8
document-format-version	text(127)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.6
document-format	mimeMediaType	-	y⇒ ²⁷	y⇒ ²⁵	MAY	MUST	[rfc2911] §3.2.1.1, [this spec] §3.1.1.1
document-name	name(MAX)	-	y⇒ <u>D</u>	y⇒	MAY	MUST	[rfc2911] §3.2.1.1
document-natural-language	naturalLanguage	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[rfc2911] §3.2.1.1, [this spec] §7.2.1
document-uri	uri	-	y	y⇒	CMUST ₂₈	MAY	[rfc2911] §3.2.2
ipp-attribute-fidelity	boolean	y⇒ ²⁹ J Error! Bookmark not defined.	y⇒ ²⁹ <u>J</u>	-	MAY	MUST	[rfc2911] §3.2.1.1, [this spec] §3.1.1.1
[job-]impressions	integer(0:MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
[job-]k-octets	integer(0:MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
job-mandatory-attributes	1setOf type2 keyword	y⇒ <u>J</u>	y⇒ <u>J</u>	-	MAY	MUST	[this spec] §3.1.1.2
[job-]media-sheets	integer(0:MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
job-name	name(MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	-	MAY	MUST	[rfc2911] §4.3.5
job-password	octetString(255)	y⇒ <u>J</u>	y⇒ <u>J</u>	-	MAY	MAY	[ippsave] §4.1
job-password-encryption	type3 keyword name(MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	-	MAY	MAY	[ippsave] §4.2
last-document	boolean	-	-	y⇒ ³⁰	MUST	MUST	[rfc2911] §3.3.1.1, [jobx] §???
operation-id **	integer(1:0x8FFF)	y	y	y	MUST	MUST	[rfc2911] §3.1.2

The Printer MUST copy the “document-format” Operation attribute to the corresponding (new) Document Description attribute defined in this specification.

²⁸ The “document-uri” Operation attribute MUST be supplied in the Print-URI Job Creation operation and the Send-URI Document Creation operation, and MUST NOT be supplied in other operations.

²⁹ The Printer MUST copy the “ipp-attribute-fidelity” Operation attribute to the corresponding (new) Job Description attribute defined in this specification so that the Printer can remember its value for subsequent Document Creation operations.

³⁰ The Printer MUST copy the “last-document” Operation attribute to the corresponding (new) Document Description attribute defined in this specification so that the client can determine the last document when querying the Document objects.

Operation attribute name for Job and Document Creation <i>requests</i>	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc			
		CJ	PJ, PU	CD, SD, SU	Client supply	Printer support	
original-requesting-user-name **	name(MAX)	y⇒J	y⇒J	-	MAY	MAY	[adm-ops] §11.7.2.2
output-device-requested	name(127)	y⇒J-	y⇒J	-	MAY	MAY	[jobx] §
page-overrides	1 setOf collection ³¹	-	-	y⇒ ³²	MAY	MAY	[pwg5100.4] §5.2, [OvrRide]§9.2.3
printer-uri **	uri	y⇒ ³⁴ J	y⇒ ³³ J	y	MUST	MUST	[rfc2911] §3.1.5
printer-uri **	uri	y⇒ ³⁴ J	y⇒ ³⁴ J	y	MUST	MUST	[rfc2911] §3.1.5
request-id **	integer(1:MAX)	y	y	y	MUST	MUST	[rfc2911] §3.1.2
requesting-user-name **	name(MAX)	y	y	y	SHOUL D	MUST	[rfc2911] §3.2.1.1
version-number **	X.Y	y	y	y	MUST	MUST	[rfc2911] §3.1.8

“y”, “y⇒”, and “***”. See Legend at the beginning of the Table.

7.2 Operation/Document Description attributes

The rest of this section defines the semantics for the Operation attributes that a client MAY supply in a Document Creation operation and their corresponding Document Description attributes. The following statements apply to all of these Operation/Document Description attributes and are *not* repeated in each Description:

If the Printer doesn’t support the “xxx” Operation attribute, the Printer MUST ignore the “xxx” attribute (as with any OPTIONAL Operation attribute) and return the “xxx” attribute with the supplied value as unsupported in the Unsupported attributes group as specified in [rfc2911] section 3.1.7.

If the Printer supports the “xxx” Operation attribute, the Printer MUST support it at the Job and Document level. The Printer MUST also:

- support the corresponding “xxx” Document Description attribute of the same name (see section 9.1) and vice versa.
- copy the value of the “xxx” Operation attribute, if supplied by the client, to the corresponding “xxx” Document Description attribute.

³¹ See “page-overrides” in [Table 10Table 10](#) for the list of its member attributes.

³² The preferred method for a client to supply “page-overrides” is as a Document Template attribute (see section 8). However, the “page-overrides” attribute is also an Operation attribute that the client MAY supply in the Send-Document or Send-URI operation in [pwg5100.4] as an Operation attribute, since there was no place for supplying Job Template or Document Template attributes until this IPP Document Object specification. The Printer copies the “page-overrides” Operation attribute to the corresponding Job Template Document attribute. There is no “page-overrides” Job or Document Description attribute.

³³ The Printer MUST copy the “printer-uri” Operation attribute to the Job’s “job-printer-uri” Job Description attribute and Document’s “document-printer-uri” Document Description attribute.

The Printer MUST copy the “printer-uri” Operation attribute to the Job’s “job-printer-uri” Job Description attribute and Document’s “document-printer-uri” Document Description attribute.

1222 3. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if defined
1223 (see section 10) and vice versa.

1224 4. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated in the
1225 Printer's corresponding "xxx-supported" Printer Description attribute (see section 10). If the values do not
1226 validate, the Printer MUST either reject the operation or accept the operation as indicated for each of the
1227 attributes described below.

1228 If the client supplies one of the "xxx" Operation/Document attributes with a value that the Printer does not support,
1229 the Printer MUST perform one of the actions indicated for that Operation, unless specified otherwise, such as (1)
1230 reject the request, (2) accept the request and either (a) hold the job for operator intervention or (b) print the Job
1231 ignoring the attribute. In all of these cases, the Printer MUST return the Operation attribute with the unsupported
1232 value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

1233

1234 **7.2.1 document-natural-language (naturalLanguage)**

1235 This OPTIONAL Operation attribute specifies the natural language of the Document Object content (see [rfc2911]
1236 section 3.2.1.1 and section 4.1.8).

1237 If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't
1238 support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept the request and
1239 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 7.2 above
1240 for more details.

1241 The values MAY include region as well as the language according to [rfc2911] section 4.1.8. If the document
1242 contains more than one language, the value is the first or primary language of the document. The Printer MAY use
1243 this value to select fonts or other Globalization processing. As indicated in [rfc2911] section 4.1.8, example include:

1244 'en': for English
1245 'en-us': for US English
1246 'fr': for French
1247 'de': for German
1248

1249 **7.3 Override Operation attributes in Send-Document and Send-URI**

1250 **ACTION ITEM PZ: Rework to align with new override spec**

1251 With the introduction of the Document Object, there is no longer a need for the "document-overrides" (1setOf
1252 collection) attribute [pwg5100.4] as an Operation attribute or a Document Template attribute. Also we are unaware
1253 of any implementations of the "document-overrides" attribute. Therefore, the intent is to republish the Overrides
1254 document [pwg5100.4] with only the "page-overrides" attribute. With the introduction of the Document object, the
1255 client simply supplies the Document Template attributes (see [Table 10](#)~~Table 10~~) for each Document Creation request
1256 (in a new Document Template attribute group) without needing a collection (and without needing the "document-
1257 overrides" attribute).

1258 The "document-overrides" attribute is also useful in combination with the "pages-per-subset" (1setOf integer) Job
1259 Template attribute (see [pwg5100.4]) which divides up the Input Page stream concatenated across the Input
1260 Documents into separate Output Documents. For example, making every 10 Input Pages be a separate Output
1261 Document but the client only wants to staple the first Output Document, so the client supplies a single "document-
1262 overrides" Job Template attribute with "finishings" that affects Output-Documents 1 only. With the removal of the
1263 "document-overrides" attribute, the client uses the "page-overrides" Job Template attribute to affect the stapling of
1264 pages 1:10 only.

Similarly, according to [pwg5100.4], the “page-overrides” (collection) attribute MAY be supplied by the client in a Send-Document or Send-URI request as an Operation attribute to apply page overrides to this and/or subsequent documents in the job (by supplying either the “input-documents” (1setOf rangeOfInteger (1:MAX)) or the “output-documents” (1setOf rangeOfInteger) member attribute). See the “page-overrides” Job Template attribute in [Table 10](#) for the listing of the member attributes. However, with the introduction of the Document object, the “page-overrides” (collection) attribute MUST be supplied as a Document Template attribute in the Create-Document operation and SHOULD be more simply supplied as one of the Document Template attributes for the document being created in the Send-Document or Send-URI operation and for this Document only. However, if a Printer supports the “page-overrides” attribute as a Document Template attribute (in any Document Creation operations), a Printer MUST also support the “page-overrides” attribute as an Operation attribute in the Send-Document and Send-URI operations according to [pwg5100.4] for backward compatibility with clients that do not support the Document object.

7.4 Operation Attributes returned in Job and Document Creation responses

[Table 9](#) lists the Operation attributes that Printers return in Job Creation operation responses: Print-Job, Print-URI, and Create-Job and in Document Creation operation responses: Send-Document and Send-URI. The column labeled “Conformance” indicates the conformance for what the Printer returns and what the Printer supports. The Reference and Section columns list the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

Table 9 - Operation attributes returned in Job and Document Creation operation responses

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
attributes-charset *	charset	MUST	MUST	[rfc2911] §3.1.4
	‘utf-8’	MAY	MUST	[rfc2911] §4.1.7
	‘us-ascii’	MAY	MAY	[rfc2911] §4.1.7
	‘iso-8859-1’	MAY	MAY	[rfc2911] §4.1.7
	‘iso-10646-ucs-2’	MAY	MAY	[rfc2911] §4.1.7
attributes-natural-language *	naturalLanguage	MUST	MUST	[rfc2911] §3.1.4
	‘en-US’	MAY	MAY	[rfc2911] §4.1.8
detailed-status-message *	text	MAY	MAY	[rfc2911] §3.1.6.3
document-access-error	text	MAY	MAY	[rfc2911] §3.1.6.4
document-number	integer(1:MAX)	MUST	MUST	§9.1.21
job-id	integer(1:MAX)	MUST	MUST	[rfc2911] §4.3.2
job-uri	uri	MUST	MUST	[rfc2911] §4.3.1
redirect-uri (uri) ³⁵	uri	MAY	MAY	[not-srv] §5.2
request-id *	integer(1:32767)	MUST	MUST	[rfc2911] §3.1.2
status-code *	integer(0:32767)	MUST	MUST	[rfc2911] §3.1.6.1
status-message *	text(255)	MAY	MAY	[rfc2911] §3.1.6.2
version-number *	integer(1:255), integer(0:255)	MUST	MUST	[rfc2911] §3.1.8

* - indicates attributes that are defined for *all* operations, not just Job Creation operations

³⁵ The Printer or Notification Server returns the “redirect-uri” Operation attribute in order to redirect the Get-Notification operation to a Notification Server or back to the original Printer.

8 Job Template and Document Template attributes

~~Table 10~~Table 10 lists all of the Job Template attributes defined in other IPP specifications and lists their corresponding Document Template attributes defined in this IPP specification. The Job Template attributes can be supplied in the Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

A subset of these Job Template attributes (e.g., “number-up” and “media”, but not “job-priority”) are also defined to apply to Documents and are called Document Template attributes when supplied at the Document Level. Document Template attributes can be supplied in the ~~Create-Document~~, Send-Document, and Send-URI operations.

A subset of the Document Template attributes that apply to pages (e.g., “media”, but not “document-format” or “job-priority”) can also be supplied as Page Overrides using the “page-overrides” Job Template collection attribute (see [pwg5100.4]) or as a Document Template attribute.

Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation or Document Creation request or Page Overrides. If a Printer supports a Job Template or Document Template attribute, then it MUST copy the supplied attribute to the Job or Document object, respectively so that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-Document-Attributes/Get-Documents operations, respectively. The effect of Job Template Attributes supplied in Job Creation requests are inherited by the Document objects, unless the Document Creation operation supplies the attribute with a different value.

If a Job Template collection attribute is supported (see [rfc3382]), then there are conformance requirements for which member attributes MUST be supported and which member attributes a client MUST supply as indicated in the Conformance column for each collection member attribute in ~~Table 10~~Table 10.

The “Defined for use” column indicates whether the client MAY supply and the Printer support the attribute at the Job, Document, or Page Level with the following semantics:

Supplied	Description
J=y:	Job Level: The attributes MAY be supplied as Job Template attributes at the Job Level in a Job Creation request (Print-Job, Print-URI, Create-Job) in which case each Document inherits the Job Template attribute as a default which is used unless an attribute at the document level is also supplied. Note: The “multiple-document-handling” attribute controls whether extensive attributes, such as “finishing”, “copies”, affect the entire job as a whole (‘single-xxx’ values) or affect each document separately (‘separate-xxx’ values).
D=y:	Document Level: The attribute MAY be supplied at the Document Level as Document Template attributes in a Document Creation operation (Send-Document, Send-URI), in which case the supplied Document Templates override any Job Template attributes supplied at the Job Level and any “document-overrides” supplied at the Job or Document level.
P=y:	Page Level: The attribute MAY be supplied as a member of the (1) “page-ranges” Job Template attribute at the Job Level in a Job Creation operation or (2) “page-ranges” Document Template attribute at the Document Level to affect the specified range of pages.

“***” - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job Processing and Document Processing attributes, respectively. However, 4 of the IPP Job Template attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job Processing attributes. These are indicated in the first column with “***”.

1312

Table 10 - Job Template and Document Template attributes

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
copies	integer(1:MAX)	y ³⁶	y	n	MAY	MAY	[rfc2911] §4.2.5
cover-back	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.1
cover-type	type2 keyword				MUST	MUST	[pwg5100.3] §3.1.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.1.1
media-col	collection					MAY	[pwg5100.3] §3.1.1
cover-front	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.1
cover-type	type2 keyword				MUST	MUST	[pwg5100.3] §3.1.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.1.1
media-col	collection					MAY	[pwg5100.3] §3.1.1
feed-orientation	type3 keyword	y	y	n	MAY	MAY	[ippsave] §5.1
finishings	1setOf type2 enum	y ³⁷	y	y	MAY be neither or one of, but NOT both	MAY, MUST if "finishing-col" is supported	[rfc2911] §4.2.6 [pwg5100.1] §2
finishings-col	collection	y ³⁷	y	y		MAY	[pwg5100.3] §3.2
finishing-template	name(MAX)				MAY	MAY	[pwg5100.3] §3.2.1
stitching	collection				MAY	MAY	[pwg5100.3] §3.2.2
stitching-reference-edge	type2 keyword				MUST	MUST	[pwg5100.3] §3.2.2.1
stitching-offset	integer (0:MAX)				MUST	MUST	[pwg5100.3] §3.2.2.2
stitching-locations	1setOf integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.2.2.3
font-name-requested	name(MAX)	y	y	y	MAY	MAY	[ippsave] §5.2
font-size-requested	integer (1:MAX)	y	y	y	MAY	MAY	[ippsave] §5.3
force-front-side	1setOf integer(1:MAX)	y ³⁸	y	y	MAY	MAY	[pwg5100.3] §3.3
imposition-template	type2 keyword name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.4

³⁶ The IPP "copies" attribute is an *extensive* attribute, so its effect when supplied at the job level is not always inherited by the documents in a multi-document job. Instead, its effect depends on the value of the "multiple-document-handling" Job Template attribute. The 'single-document' and 'single-document-new-sheet' values produce copies of the job as a whole with the multiple input documents concatenated into a single output document for each job copy. The 'separate-document-uncollated-copies' value produce N copies of the first input document followed by N copies of the second input document, etc. The 'separate-document-collated-copies' produce N successive job copies, each job copy consisting of 1 copy of the first document followed by 1 copy of the second document, etc.

³⁷ The IPP "finishings" and "finishings-col" attributes are *extensive* attributes, so their effect when supplied at the Job Level is not always inherited by the documents in a multi-document job. Instead, their effect depends on the value of the "multiple-document-handling" Job Template attribute. The 'single-document' and 'single-document-new-sheet' cause the finishing to be applied to each job copy as a whole. The 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values cause the finishing to be applied to each document.

³⁸ The effect of the IPP "force-front-side" and "insert-sheet" attributes when supplied at the job level of a multi-document job depends on the value of the "multiple-document-handling" Job Template attribute. For the 'single-document' and 'single-document-new-sheet' values, the pages are numbered as a single set from 1 to n for the job as a whole. For the 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values, the pages are numbered from 1 to n for each document separately.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
insert-sheet	1setOf collection	y ³⁸	y	y	MAY	MAY	[pwg5100.3] §3.5
insert-after-page-number	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.5.1
insert-count	integer(0:MAX)				MAY	MUST	[pwg5100.3] §3.5.2
media	type3 keyword name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.5.3
media-col	collection					MAY	[pwg5100.3] §3.5.3
job-account-id **	name(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.6
job-accounting-sheets	collection	y	n	n	MAY	MAY	[pwg5100.3] §3.8
job-accounting-sheets-type	type3 keyword name(MAX)				MUST	MUST	[pwg5100.3] §3.8.1
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.8.2
media-col	collection					MAY	[pwg5100.3] §3.8.2
job-accounting-output-bin	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.8.3
job-accounting-user-id**	name(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.7
job-copies	integer(1:MAX)	y	n ³⁹	n	MAY	MAY	[jobx] §5.1.1 Error! Reference source not found.

³⁹ The “job-copies” Job Template attribute makes copies of the entire job and MUST NOT be supplied at the Document or Page Level. The “job-copies” Job Template attribute is equivalent to “copies” with “multiple-document-handling” = ‘single-document-new-sheet’.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-cover-back	collection	y	n ⁴⁰	n	MAY	MAY	[jobx] §5.1.2 Error! Reference source not found.
<i>same as cover-back</i>	<i>see cover-back</i>						
job-cover-front	collection	y	n ⁴¹	n	MAY	MAY	[jobx] §5.1.3 Error! Reference source not found.
<i>same as cover-front</i>	<i>see cover-front</i>						
job-error-sheet	collection	y	n	n	MAY	MAY	[pwg5100.3] §3.9
job-error-sheet-type	type3 keyword name(MAX)				MUST	MUST	[pwg5100.3] §3.9.1
job-error-sheet-when	type2 keyword				MAY	MAY	[pwg5100.3] §3.9.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.9.3
media-col	collection					MAY	[pwg5100.3] §3.9.3
job-finishings	1setOf type2 enum	y	n ⁴²	n	MAY	MAY	[jobx] §5.1.4 Error! Reference source not found.
job-finishings-col	collection	y	n ⁴³	n	MAY	MAY	[jobx] §5.1.5 Error! Reference source not found.
<i>same as finishings-col</i>	<i>see finishings-col</i>						
job-hold-until	type3 keyword name(MAX)	y	n	n	MAY	MAY	[rfc2911] §4.2.2
job-hold-until-time	dateTime	y	n	n	MAY	MAY	[ippsave] §5.4
job-message-to-operator	text(MAX)	y	n ⁴⁴	n	MAY	MAY	[pwg5100.3] §3.10
job-phone-number	text(127)	y	n	n	MAY	MAY	[ippsave] §5.5
job-priority	integer(1:100)	y	n	n	MAY	MAY	[rfc2911] §4.2.1
job-recipient-name **	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.6

⁴⁰ The “job-cover-back” Job Template attribute makes a single back cover for each job copy and MUST NOT be supplied at the Document or Page Level. The “job-cover-back” Job Template attribute is equivalent to “cover-back” with “multiple-document-handling” = ‘single-document-new-sheet’.

⁴¹ The “job-cover-front” Job Template attribute makes a single front cover for each job copy and MUST NOT be supplied at the Document or Page Level. The “job-cover-front” Job Template attribute is equivalent to “cover-front” with “multiple-document-handling” = ‘single-document-new-sheet’.

⁴² The “job-finishing” Job Template attribute finishes each job copy as a whole and MUST NOT be supplied at the Document or Page Level. The “job-finishings” Job Template attribute is equivalent to “finishings” with “multiple-document-handling” = ‘single-document-new-sheet’.

⁴³ The “job-finishing-col” Job Template attribute finishes each job copy as a whole and MUST NOT be supplied at the Document or Page Level. The “job-finishings-col” Job Template attribute is equivalent to “finishings-col” with “multiple-document-handling” = ‘single-document-new-sheet’.

⁴⁴ The “job-message-to-operator” Job Template attribute has no corresponding Document Template attribute. Instead, the user and operator communicate with each other using the same “document-message” Operation attribute which the Printer copies to the “document-message” Document Description attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-save-disposition	collection	y	n	n	MAY	MAY	[ippsave] §5.7
save-disposition	type3 keyword	y	n	n	MAY	MAY	[ippsave] §5.7.1.1
save-info	1setOf collection	y	n	n	MAY	MAY	[ippsave] §5.7.1.2
save-location	uri	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.1
save-name	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.2
save-document-format	mimeMediaType	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.3
job-sheet-message	text(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.12

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-sheets	type3 keyword name(MAX)	y	n	n	MAY be neither or one of, but NOT both	MAY, MUST if "job-sheets-col" supported	[rfc2911] §4.2.3
job-sheets-col	collection	y	n	n		MAY	[pwg5100.3] §3.11
job-sheets	type3 keyword name(MAX)				MUST	MUST	[pwg5100.3] §3.11.1
media	type3 keyword name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.11.2
media-col	collection					MAY	[pwg5100.3] §3.11.2
media	type3 keyword name(MAX)	y	y	y	MAY be neither or one of, but NOT both	MAY, MUST if "media-col" supported	[rfc2911] §4.2.11
media-col	collection	y	y	y		MAY	[pwg5100.3] §3.13
media-back-coating	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
media-color	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.4
media-front-coating	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
media-grain	type3 keyword name(MAX)				MAY	MAY	[ippsave] §8.4.2
media-hole-count	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.6
media-info	text(255)				MAY	MAY	[pwg5100.3] §3.13.3
media-key	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.1
media-material	type3 keyword name(MAX)				MAY	MAY	[ippsave] §8.4.3
media-order-count	integer(1:MAX)				MAY	MAY	[pwg5100.3] §3.13.7
media-preprinted	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.5
media-recycled	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.11
media-size	collection				MAY	MUST	[pwg5100.3] §3.13.8
x-dimension	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.1
y-dimension	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.2
media-thickness	integer(1:MAX)				MAY	MAY	[ippsave] §8.4.4
media-tooth	type3 keyword name(MAX)				MAY	MAY	[ippsave] §8.4.1
media-type	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.2
media-weight-metric	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.9
media-input-tray-check	type3 keyword name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.14
media-type ⁴⁵	type3 keyword name(MAX)	y	y	y	MAY	MAY	[upnp], [pwg5100.3] §3.13.2
multiple-document-handling	type2 keyword	y	n	n	MAY	MUST ⁴⁶	[rfc2911] §4.2.4
number-up	integer(1:MAX)	y	y	y	MAY	MAY	[rfc2911] §4.2.9
orientation-requested	type2 enum	y	y	y	MAY	MAY	[rfc2911] §4.2.10

⁴⁵ UPnPv1 and UPnPv2 define a separate MediaType Job Template attribute with the same values as the "media-type" member attribute of "media-col".

⁴⁶ A Printer MUST support the "multiple-document-handling" Job Template attribute with at least one value.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
output-bin	type2 keyword name(MAX)	y	n	n	MAY	MAY	[pwg5100.2] §2.1
page-delivery	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.15
page-order-received**	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.16
page-overrides	1setOf collection	y ⁴⁷	y	n	MAY	MAY	[pwg5100.4] §5.2
input-documents	1setOf rangeOfInteger(1:MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.4] §5.2.1
output-documents	1setOf rangeOfInteger(1:MAX)					MUST	[pwg5100.4] §5.2.2
document-copies	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[pwg5100.4] §5.2.3
pages	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[pwg5100.4] §5.2.4
<i>any other Job Template attributes that affect pages, such as “media” or “media-col”</i>					MAY	MAY	
page-ranges	1setOf rangeOfInteger(1:MAX)	y	y	n	MAY	MAY	[rfc2911] §4.2.7
pages-per-subset	1setOf integer(1:MAX)	y ⁴⁸	n	n	MAY	MAY	[pwg5100.3] §5.3
pdl-init-file	1setOf collection	y	y	n	MAY	MAY	[ippsave] §5.8
pdl-init-file-location	uri				MAY	MAY	[ippsave] §5.8.1.1
pdl-init-file-name	name(MAX)				MAY	MAY	[ippsave] §5.8.1.2
pdl-init-file-entry	name(MAX)				MAY	MAY	[ippsave] §5.8.1.3
presentation-direction-number-up	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.17
print-quality	type2 enum	y	y	y	MAY	MAY	[rfc2911] §4.2.13
printer-resolution	resolution	y	y	y	MAY	MAY	[rfc2911] §4.2.12
proof-print	collection	y	n	n	MAY	MAY	[ippsave] §5.9
proof-print-copies	integer (0:MAX)	y	n	n	MAY	MAY	[ippsave] §5.9.1.1
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[ippsave] §5.8.1.2
media-col	collection					MAY	[ippsave] §5.8.1.2
separator-sheets	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.18
separator-sheets-type	type3 keyword name(MAX)				MUST	MUST	[pwg5100.3] §3.18.1
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.18.2
media-col	collection					MAY	[pwg5100.3] §3.18.2
sheet-collate	type2 keyword	y	y	n	MAY	MAY	[rfc3381] §3.1
sides	type2 keyword	y	y	y	MAY	MAY	[rfc2911] §4.2.8

⁴⁷ The effect of the IPP “page-overrides” Job Template attribute when supplied at the job level of a multi-document job depends on the value of the “multiple-document-handling” Job Template attribute. For the ‘single-document’ and ‘single-document-new-sheet’ values, the pages are numbered as a single set from 1 to n for the job as a whole. For the ‘separate-documents-collated-copies’ and ‘separate-document-uncollated-copies’ values, the pages are numbered from 1 to n for each document separately.

⁴⁸ The client MUST supply the “pages-per-subset” Job Template attribute at the Job Level and can only be used when the “multiple-document-handling” Job Template attribute is ‘separate-documents-collated-copies’ or ‘separate-documents-uncollated-copies’, since the purpose of the “pages-per-subset” attribute is to produce separate output documents for each subset. Otherwise, the Printer MUST ignore the “pages-per-subset” attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
x-image-position	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.19.2
x-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.3
x-side1-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.4
x-side2-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.5
y-image-position	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.19.6
y-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.7
y-side1-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.8
y-side2-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.9

“***” - These 4 attributes are Job Description attributes, not Job Processing attributes, in the PWG Semantic Model [pwg-sm] - see Legend before the Table.

8.1 Document Template attributes

Most Job Template attributes can be used as Document Template attributes for use in Document Creation operations to apply to the Document object. However, the Job Template attributes that have the “job-” prefix MUST NOT be used as Document Template attributes, since they are defined to apply to the job as a whole. Table 10Table 40 shows lists all of the Document Template attributes for use with the Document Creation operations and the Document object. All of the definitions of the Document Template attributes are done by reference to the corresponding Job Template attributes in other specifications. However, the semantics of each Document Template attribute only applies to the Document object with which the attribute is associated either by being supplied by the client in the Document Creation operation or supplied by the Printer as a default because the client did not (and the PDL did not have any corresponding instruction). See section 6 for defaulting semantics.

The Document Template attribute share the same “xxx-default”, “xxx-supported”, and “xxx-ready” Printer attributes with the Job Template attributes of the same name.

The Document object also has the corresponding “xxx-actual” READ-ONLY Document Description attributes defined that correspond to the “xxx” Document Template attributes (see [ippact]).

9 Job Description and Document Description attributes

Table 11Table 44 lists all the Job Description defined in other IPP specifications and the corresponding Document Description attributes defined in this IPP specification. Job Description and Document Description attributes are Job object and Document object attributes, respectively, that are filled in by the Printer. Some Job/Document Description attribute values are supplied by the client in the Job/Document Creation operation using corresponding Operation attributes as flagged with “”. Unless specified otherwise herein, the Printer MUST NOT support modification of Job Description and Document Descriptions attributes.

1337 The column labeled “attribute syntax” indicates the attribute syntax (see [rfc2911] section 4.1). The Printer
 1338 conformance is indicated along with the reference to the specification in which the attribute is defined. The
 1339 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the
 1340 corresponding Job Description attributes.

1341 Each of the Document Description attributes have a sub-section in section 9.1. The column labeled References
 1342 column contains references to the sub-section in this document if there is significant information there. Those
 1343 subsections that are only references to other specifications contain only that reference in the Reference column.
 1344 Those attributes that are only Job Description attributes with no subsection in this specification have a “n/a” in the
 1345 “Doc Desc” column.

1346 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
 1347 object with a state and it cannot be queried.

1348 Legend:

1349 **[job-]** indicates an attribute that shouldn't have had a “job-” prefix in its name in [rfc2911], so that the same attribute
 1350 name could also be used for the Document object as a Document Description attribute. Note: For the PWG
 1351 Semantic Model, the “job-” prefix is dropped.
 1352 “-” indicates that the Job or Document attribute is *not* defined.
 1353 “⇒y” the Printer MUST populate this Job or Document Description attribute by copying *from* the corresponding
 1354 Operation attribute that the client MAY supply⁴⁹ in a Job or Document Creation operation. See [Table 8](#) ~~Table~~
 1355 ~~8~~ for the corresponding Operation attribute.
 1356 (r/w) indicates that the Job Description or Document Description attribute is read/write, so that the client can
 1357 changes its value using the Set-Job-Attributes or Set-Docment-Attributes operation (see section 4.4).

1358 **Table 11 - Job and Document Description attributes**

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
attributes-charset	charset	-	⇒y	MUST	[rfc2911] §4.3.19	§9.1.1
attributes-natural-language	naturalLanguage	-	⇒y	MUST	[rfc2911] §4.3.20	§9.1.2
compression	type3 keyword	-	⇒y	MUST	[rfc2911] §3.2.1.1	§9.1.3
current-page-order	type2 keyword	y	y	MAY	[pwg5100.3] §4.1	§9.1.4
date-time-at-completed	dateTime	y	y	MAY	[rfc2911] §4.3.14.7	§9.1.5
date-time-at-creation	dateTime	y	y	MAY	[rfc2911] §4.3.14.5	§9.1.6
date-time-at-processing	dateTime	y	y	MAY	[rfc2911] §4.3.14.6	§9.1.7
document-charset	charset	-	⇒y	CMUST ⁵⁰	-	§9.1.8
document-digital-signature	type2 keyword	-	⇒y	MAY	-	§9.1.9
document-format	mimeMediaType	-	⇒y	MUST	[rfc2911] §3.2.1.1	§9.1.8
document-format-details	1setOf collection	-	⇒y	CMUST ⁵¹	-	§9.1.11

⁴⁹ Document Description attributes that the client can supply in a Job or Document operation as Operation attributes (indicated with ⇒) comprise *all* of the Document Description attributes in the PWG Semantic Model ([pwgsm]). Those Document Description attributes that clients cannot supply values correspond to Document Status attributes in the PWG Semantic Model.

⁵⁰ The Printer MUST support the “document-charset” Operation/Document Description attributes if the Printer supports any charset-ambiguous document formats (see section **Error! Reference source not found.**).

⁵¹ The Printer MUST support the “document-format-details” Operation/Document Description attributes if the Printer supports a packaging MIME type document format, such as ‘application/zip’ or ‘multipart/related’.

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
document-source-application-name	name(MAX)	-	⇒y	MAY	-	§Error! Reference source not found.
document-source-application-version	text(127)	-	⇒y	MAY	-	§Error! Reference source not found.
document-source-os-name	name(40)	-	⇒y	MAY	-	§Error! Reference source not found.
document-source-os-version	text(40)	-	⇒y	MAY	-	§Error! Reference source not found.
document-format	mimeMediaType	-	⇒y	MUST	-	§Error! Reference source not found.
document-format-device-id	text(127)	-	⇒y	MUST	-	§Error! Reference source not found.
document-format-version	text(127)	-	⇒y	MAY	-	§Error! Reference source not found.
document-natural-language	naturalLanguage	-	⇒y	MAY	-	§Error! Reference source not found.
document-format-details-detected	1setOf collection	-	y	MAY	-	§9.1.12
document-format-detected	mimeMediaType	-	y	MAY	-	§9.1.13
document-format-version	text(127)	-	⇒y	MAY	-	§9.1.14
document-format-version-detected	text(127)	-	y	MAY	-	§9.1.15
document-job-id	integer(1:MAX)	-	y	MUST	-	§9.1.11
document-job-uri	uri	-	y	MUST	-	§9.1.17
document-number	integer(0:MAX)	-	y	MUST	-	§9.1.21
document-printer-uri	uri	-	y	MUST	-	§9.1.22
document-state	type1 enum	-	y	MUST	-	§9.1.23
document-state-message	text(MAX)	-	y	MAY	-	§9.1.24
document-state-reasons	1setOf type2 keyword	-	y	MUST	-	§9.1.25
document-uri	uri	-	⇒y	MAY	-	§9.1.26
impressions-completed-current-copy	integer(0:MAX)	y	y	MAY	[rfc3381] §4.4	§9.1.27

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference Job Description Attr	Doc Desc.
ipp-attribute-fidelity	boolean	⇒y	-	MUST	[rfc2911] §3.2.1.1 [jobx] §6.1 Error! Reference source not found.	-
job-collation-type	type2 enum	y	-	MAY	[rfc3381] §4.1	-
[job-]detailed-status-message	1setOf text (MAX)	y	y	MAY	[rfc2911] §4.3.10	§9.1.28
[job-]document-access-errors	1setOf text(MAX)	y	y	MAY	[rfc2911] §4.3.11	§9.1.29
job-id	integer (1:MAX)	y	-	MUST	[rfc2911] §4.3.2	-
[job-]impressions	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.2	§9.1.31
[job-]impressions-completed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.2	§9.1.32
[job-]k-octets	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.1	§9.1.33
[job-]k-octets-processed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.1	§9.1.34
job-mandatory-attributes	1setOf type2 keyword	⇒y	-	MUST	[jobx] §6.3 Error! Reference source not found.	-
[job-]media-sheets	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.3	§9.1.35
[job-]media-sheets-completed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.3	§9.1.36
job-message-from-operator	text(127)	y	- ⁵²	MAY	[rfc2911] §4.3.16	-
[job-]more-info	uri	y	y	MAY	[rfc2911] §4.3.4	§9.1.37
job-name(r/w)	name(MAX)	⇒y	- ⁵³	MUST	[rfc2911] §4.3.5	-
job-originating-user-name	name (MAX)	y	-	MUST	[rfc2911] §4.3.6	-
job-password	octetString(255)	⇒y	-	MAY	[ippsave] §6.2	-
job-password-encryption	type3 keyword name(MAX)	⇒y	-	MAY	[ippsave] §6.3	-
job-printer-make-and-model	text(127)	y	-	CMUST ⁵⁴	[ippsave] §6.1	-
[job-]printer-up-time	integer (1:MAX)	y	y	MUST	[rfc2911] §4.3.14.4	§9.1.38
job-printer-uri	uri	⇒ ⁵⁵ y	-	MUST	[rfc2911] §4.3.3	-
job-state	type1 enum	y	- ⁵⁶	MUST	[rfc2911] §4.3.7	-
job-state-message	text(MAX)	y	- ⁵⁷	MAY	[rfc2911] §4.3.9	-
job-state-reasons	1setOf type2 keyword	y	- ⁵⁸	MUST	[rfc2911] §4.3.8	-
job-uri	uri	y	-	MUST	[rfc2911] §4.3.1	-

⁵² The “job-message-from-operator” Job Description attribute has no corresponding “document-message-from-operator” (text(127)) Document Description attribute. Instead, both the user and the operator use the “document-message” (text(127)) operation/Document Description attribute (see section 9.1.189.4.11) to communicate with each other.

⁵³ The Document Description attribute that corresponds to the “job-name” Job Description attribute is the (existing) “document-name” attribute defined in [rfc2911].

⁵⁴ The Printer MUST support the “job-printer-make-and-model” Job Description attribute if the “job-save-disposition” Job Template attribute is supported.

⁵⁵ The Printer sets the “job-printer-uri” Job Description attribute from the “printer-uri” Operation attribute.

⁵⁶ The Document Description attribute that corresponds to the “job-state” Job Description attribute is the (new) “document-state” attribute.

⁵⁷ The Document Description attribute that corresponds to the “job-state-message” Job Description attribute is the (new) “document-state-message” attribute.

⁵⁸ The Document Description attribute that corresponds to the “job-state-reasons” Job Description attribute is the (new) “document-state-reasons” attribute.

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
[job-]warnings-count	integer(0:MAX)	y	y	MAY	[pwg5100.4] §6.1	§9.1.39
last-document	boolean	-	⇒y	MAY	[rfc2911] §4.3.12	§9.1.39
number-of-documents	integer(0:MAX)	y	-	MAY	[rfc2911] §4.3.15	-
number-of-intervening-jobs	integer(0:MAX)	y	-	MAY	[rfc2911] §4.3.13	-
output-device-requested	name(127)	y	-	MAY	[this spec] Error! §6.5 Reference source not found.	-
output-device-assigned	name(127)	y	y	MAY	[rfc2911] §4.3.7.2	§9.1.41
sheet-completed-copy-number	integer(0:MAX)	y	y	MAY	[rfc3381] §4.2	§9.1.42
sheet-completed-document-number	integer(0:MAX)	y	-	MAY	[rfc3381] §4.3	-
time-at-completed	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.3	§9.1.43
time-at-creation	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.1	§9.1.44
time-at-processing	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.2	§9.1.45

"y", "⇒y", "-" See the description in the Legend before the table.

Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning, faxing, formatting processes as well. The job state reasons have a number of reasons that are print service specific, but most can apply to other types of service as well. The reason for separating state from reasons, is so that the states can be the fundamental states that most implementations have, while the state reasons can vary depending on the sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state reasons are more information, both for programs and people.

The descriptions of the new "document-state" and "document-state-reasons" attributes are merged in with the existing "job-state" and "job-state-reasons". Such merging shows the parallelism in the description to aid understanding and implementation and so that future maintenance will continue this strong parallelism. The "/" character separates the words: Job from Document so that the same description can serve for both Job and Document objects.

9.1 Document Description attributes

This section contains *all* of the Document Description attributes for use with the Document object. Most of these definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the semantics of each Document Description attribute only applies to the Document object containing the Document Description attribute. The Printer MAY support changing these Document Description attributes with the Set-Documents-Attributes operation (see section 4.4), but only if indicated explicitly in this section.

Important Implementer's note: The brief descriptions in this section are not a substitute for the detailed specification in the referenced specifications. You need to read the referenced specifications when implementing!

9.1.1 attributes-charset (charset)

This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.19) applied to the Document object. The Printer sets this Document Description attribute

from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section 4.1). ~~Error! Reference source not found.~~.

9.1.2 attributes-natural-language (naturalLanguage)

This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.20) applied to the Document object. The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section 4.1 ~~Error! Reference source not found.~~).

9.1.3 compression (type3 keyword)

This REQUIRED Document Description attribute specifies the compression used to represent this document (see [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section 4.1 ~~Error! Reference source not found.~~).

9.1.4 current-page-order (type2 keyword)

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [pwg5100.3] §4.1) applied to the Document object.

9.1.5 date-time-at-completed (dateTime)

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

9.1.6 date-time-at-creation (dateTime)

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

9.1.7 date-time-at-processing (dateTime)

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

9.1.8 document-charset (charset)

This OPTIONAL Document Description attribute specifies the charset used to represent this document (see [JobX] §4.2.1). The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section 4.1).

9.1.9 document-digital-signature (type2 keyword)

This OPTIONAL Description attribute specifies the digital signature technology used in the Document content. The Printer sets this Document Description attribute from the corresponding “document-digital-signature” Operation attribute ([JobX] §4.2.2 for the semantics), if supplied by the client in the Document Creation operation (see section 4.1). If a Printer supports the “document-digital-signature” Operation attribute, the Printer MUST support this “document-digital-signature” Document Description attribute.

9.1.10 document-format (mimeMediaType)

This REQUIRED⁵⁹ Document Description attribute specified the document format of the Document Object content. The Printer sets this Document Description attribute from the corresponding “document-format” Operation attribute (see section [JobX] §4.2.3 ~~Error! Reference source not found.~~ for the semantics), if supplied by the client in the Document Creation operation (see section 4.1 ~~Error! Reference source not found.~~).

9.1.11 document-format-details (1setOf collection)

This OPTIONAL Description attribute specifies the details of the document format(s) of the Document Object content. The Printer sets this Document Description attribute from the corresponding “document-format-details” Operation attribute ([JobX] §4.2.4 for the semantics), if supplied by the client in the Document Creation operation (see section 4.1). If a Printer supports the “document-format-details” Operation attribute, the Printer MUST support this “document-format-details” Document Description attribute.

9.1.12 document-format-details-detected (1setOf collection)

This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format details of the Document object as detected by the Printer. The member attributes are the same as the “document-format-details” Operation attribute. (see [JobX] §6.6.4 for details)

9.1.13 document-format-detected (mimeMediaType)

This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format of the Document object content as detected by the Printer. See [JobX] §6.6.5 for detailed semantics.

9.1.14 document-format-version (text(127))

This OPTIONAL Description attribute specifies the version of the document format of the Document Object content. The Printer sets this Document Description attribute from the corresponding “document-format-version” Operation attribute ([JobX] §4.2.6 for the semantics), if supplied by the client in the Document Creation operation (see section 4.1). If a Printer supports the “document-format-version” Operation attribute, the Printer MUST support this “document-format-version” Document Description attribute.

9.1.15 document-format-version-detected (text(127))

This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format version of the Document content as detected by the Printer. See [JobX] §6.6.7 for detailed semantics.

9.1.16 document-job-id (integer(1:MAX))

This REQUIRED Document Description attribute is a copy of the Job’s “job-id” Job Description attribute (see [rfc2911] §4.3.2), i.e., the “job-id” of the Job containing this Document.

9.1.17 document-job-uri (uri)

This REQUIRED Document Description attribute is a copy of the Job’s “job-uri” Job Description attribute (see [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document. Example:
ipp://www.company.com/printers/myprinter/jobs/22

⁵⁹ [rfc2911] did not define a “document-format” Document Description attribute; it is a new attribute defined in this specification.

9.1.18 document-message (text(MAX))

This OPTIONAL Document Description contains a message from either (1) the user to the operator about the Document or (2) from the operator, system administrator, or "intelligent" process to indicate to the end user the reasons for modification or other management action taken on the Document. The Printer populates this Document Description attribute from the "document-message" (text(MAX)) Operation attribute value supplied by the client in any of the Document Creation operations (see section 4.1 ~~Error! Reference source not found.~~) or in a Cancel-Document operation (see section 4.5).

In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-Document-Attributes operation (see section 4.4).

9.1.19 document-name (name(MAX))

This REQUIRED Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section 4.1 ~~Error! Reference source not found.~~).

This attribute may be modified by a client using the Set-Document-Attributes operation (see section 4.4).

9.1.20 document-natural-language (naturalLanguage)

This OPTIONAL Document Description attribute specifies the natural language of the Document Object content. The Printer sets this Document Description attribute from the corresponding "document-natural-language" Operation attribute (section 7.2.1 for the semantics), if supplied by the client in the Document Creation operation (see section 4.1 ~~Error! Reference source not found.~~). If a Printer supports the "document-natural-language" Operation attribute, the Printer MUST support this "document-natural-language" Document Description attribute.

9.1.21 document-number (integer(1:MAX))

This REQUIRED Document Description attribute is the ordinal number of the document within the job which determines its order of being printed in a multi-document job. The Printer MUST generate the values monotonically increasing from 1 for each job.

9.1.22 document-printer-uri (uri)

This REQUIRED Document Description attribute is a copy of the "printer-uri" Operation attribute (see [rfc2911] §3.1.5), i.e., the URI of the Printer containing the Job which contains this Document. Example:
ipp://www.company.com/printers/myprinter.

9.1.23 document-state (type1 enum) and job-state (type1 enum)

The ~~REQUIRED "job-state" and the~~ REQUIRED "document-state" Document Description attributes identify the current state of the ~~job and document, respectively~~. Even though IPP defines ~~seven five~~ values for ~~job/document~~ states (plus the out-of-band 'unknown' value - see [rfc2911] section 4.1), implementations only need to support those states which are appropriate for the particular implementation. In other words, an IPP Printer implementation supports only those ~~job/document~~ states implemented by the output device and available to the IPP Printer implementation.

~~Table 12~~Table 12 lists the ~~"job-state" and~~ "document-state" attribute values.

Table 12 - ~~"job-state"~~ and "document-state" attribute values

<u>"document-state"</u> Values
3 pending
5 processing
7 canceled
8 aborted
9 completed

~~The (JD) and (J) notation below indicates whether the keyword is defined for the "job-state" and "document-state" attributes or just the "job-state" attribute as indicated in Table 12. Standard enum values are:~~

Value	Symbolic Name and Description
'3'	'pending' (JD): The job is a candidate to start processing, but is not yet processing. The document has not started to be processed at all.
'4'	'pending-held' (J): The job is not a candidate for processing for any number of reasons but will return to the 'pending' state as soon as the reasons are no longer present. The job's "job-state-reason" attribute MUST indicate why the job is no longer a candidate for processing. The 'pending-held' state does not apply to the Document object's "document-state" attribute.
'5'	'processing' (JD): One or more of: <div><div>1. The job is-has begun using, or is attempting to use, one or more purely software processes that are analyzing, creating, or interpreting a PDL, etc. for the Document. 2. The job is-has begun using, or is attempting to use, one or more hardware devices that are interpreting a PDL, making marks on a medium, and/or performing finishing, such as stapling, etc. for the Document. 3. The Printer has made the job <u>Document is</u> ready for printing, but the output device is not yet printing it, either because the job-Document hasn't reached the output device or because the job-Document is queued in the output device or some other spooler, awaiting the output device to print it. When the job is in the 'processing' state, the entire job/document state includes the detailed status represented in the Printer's "printer-state", "printer-state-reasons", and "printer-state-message" attributes. On the other hand, the<u>The</u> 'processing' state for the Document indicates that the Document has begun to be processed. Even if the Jjob stops being processed, the Document remains in the 'processing' state until it moves to one of the three terminal states. Implementations MAY include additional values in the job's/document's "job-state-reasons"/"document-state-reasons" attribute to indicate the progress of the job/document, such as adding the 'job-printing'/"printing" value to indicate when the output device is actually making marks on paper and/or the 'processing-to-stop-point' value to indicate that the Printer is in the process of canceling or aborting the job/document. Most implementations won't bother with this nuance.</div></div>
'6'	'processing-stopped' (J): The job has stopped while processing for any number of reasons and will return to the 'processing' state as soon as the reasons are no longer present. The job's "job-state-reason" attribute MAY indicate why the job has stopped processing.

Value	Symbolic Name and Description
	<p>For example, if the output device is stopped, the 'printer-stopped' value MAY be included in the job's "job-state-reasons" attribute.</p> <p>Note: When an output device is stopped, the device usually indicates its condition in human readable form locally at the device. A client can obtain more complete device status remotely by querying the Printer's "printer-state", "printer-state-reasons" and "printer-state-message" attributes.</p> <p>The 'processing-stopped' state does not apply to the Document object's "document-state" attribute.</p>
'7'	<p>'canceled' (JD): The job/document has been canceled by a Cancel-Job/Cancel-Document operation and the Printer has completed canceling the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer is canceling the job/document, the job/document remains in its current state, but the job's/document's " job-state-reasons"/"document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' value and one of the 'canceled-by-user', 'canceled-by-operator', or 'canceled-at-device' value. When the job/document moves to the 'canceled' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'canceled-by-xxx', if present, MUST remain.</p>
'8'	<p>'aborted' (JD): The job/document has been aborted by the system, usually while the job/document was in the 'processing' or 'processing-stopped' state and the Printer has completed aborting the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer is aborting the job/document, the job/document remains in its current state, but the job's/document's " job-state-reasons"/"document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' and 'aborted-by-system' values. When the job/document moves to the 'aborted' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'aborted-by-system' value, if present, MUST remain.</p>
'9'	<p>'completed' (JD): The job/document has completed successfully or with warnings or errors after processing and all of the job/document media sheets have been successfully stacked in the appropriate output bin(s) and all job/document status attributes have reached their final values for the job/document. The job's/document's " job-state-reasons"/"document-state-reasons" attribute SHOULD contain one of: 'completed-successfully', 'completed-with-warnings', or 'completed-with-errors' values.</p>

1490 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
1491 ~~job~~/document altogether. The length of time that ~~jobs~~/documents remain in the 'canceled', 'aborted', and 'completed'
1492 states depends on implementation.

1493 ~~Jobs/ Documents~~ reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the
1494 ~~J~~jobs/documents have completed all activity for the Document, including stacking output media, ~~after the~~
1495 ~~jobs/documents have completed all activity~~, and all ~~job/d~~document status attributes have reached their final values
1496 for the ~~job~~/document.

1497 ~~9.1.23.1 The "job-state" Job Description attribute and the Job Life Cycle~~

1498 ~~The "job-state" attribute is one of the most important Job Description attributes. Figure 1 shows the values of the "job-~~
1499 ~~state" attribute and the Job object life cycle as affected by actions on the Job, Printer, and job processing.~~

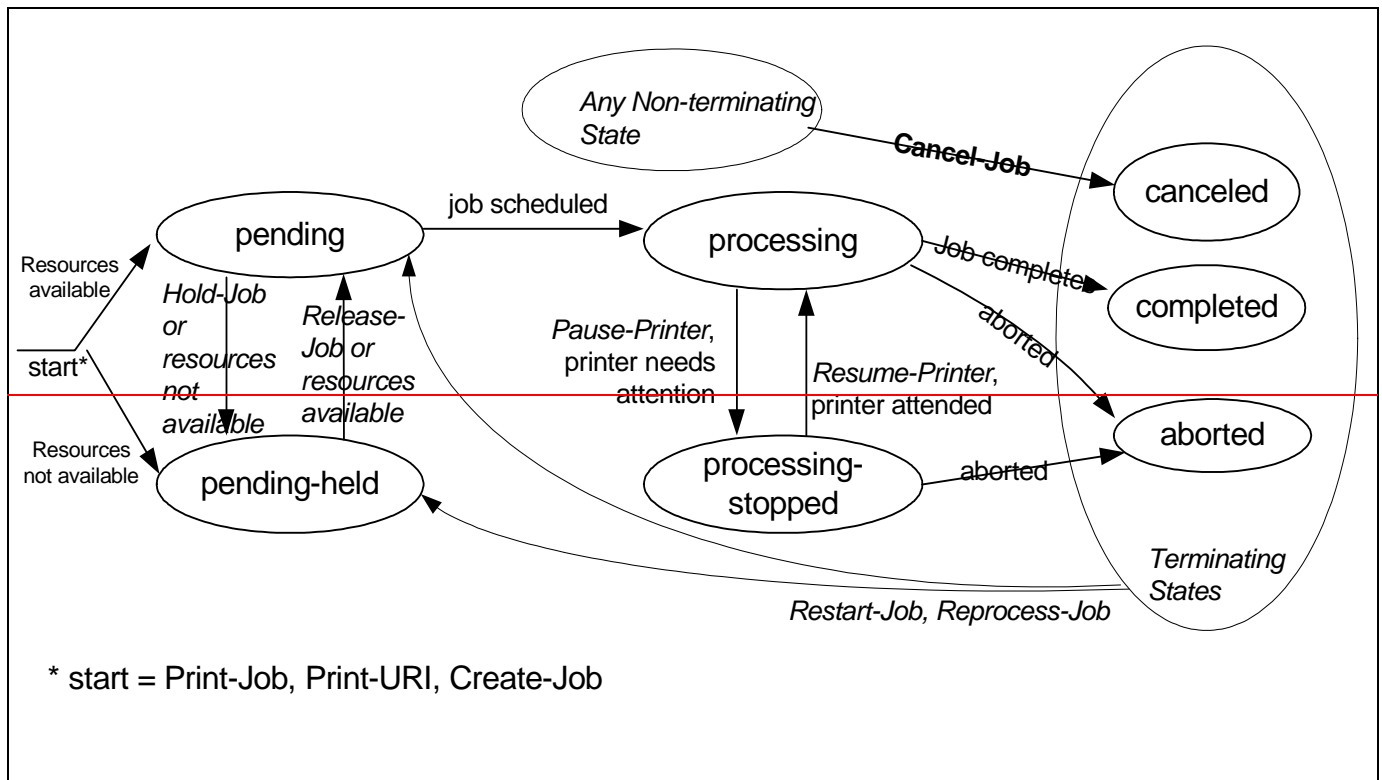


Figure 1 - The "job-state" Job Description attribute and the Job object life cycle

Normally a job progresses from left to right. Other state transitions are unlikely, but are not forbidden. Not shown are the transitions to the 'canceled' state from the 'pending', 'pending-held', and 'processing-stopped' states.

9.1.23.29.1.23.1 The "document-state" Document Description attribute and the Document object life Cycle

The "document-state" attribute is one of the most important Document Description attributes. Figure 2 shows the values of the "document-state" attribute and the Document object life cycle as affected by actions on the Job, Document, Printer, and job processing. Documents are not active objects and their life cycle is closely tied to the lifecycle of a Job⁶⁰. Documents basically have three states. The first is waiting to be processed by a Job (i.e. pending). The second state is from the time the Job first starts processing the Document (i.e., processing) and until it reaches one of its terminal states. The third state for a Document is one of its terminal states (i.e., completed, canceled, or aborted).

⁶⁰ The Document object is not really a sub-job. If the Document object were its own independent active object, i.e., were a sub-job, then the Document state would affect the job state and there would be complex and debatable roll-up rules for how the various "document-state" values of all of the Job's document are rolled up to give a single value for the Job's "job-state" attribute. Instead, the Job state reflects the overall processing of the job and is the same whether or not the Document object is supported.

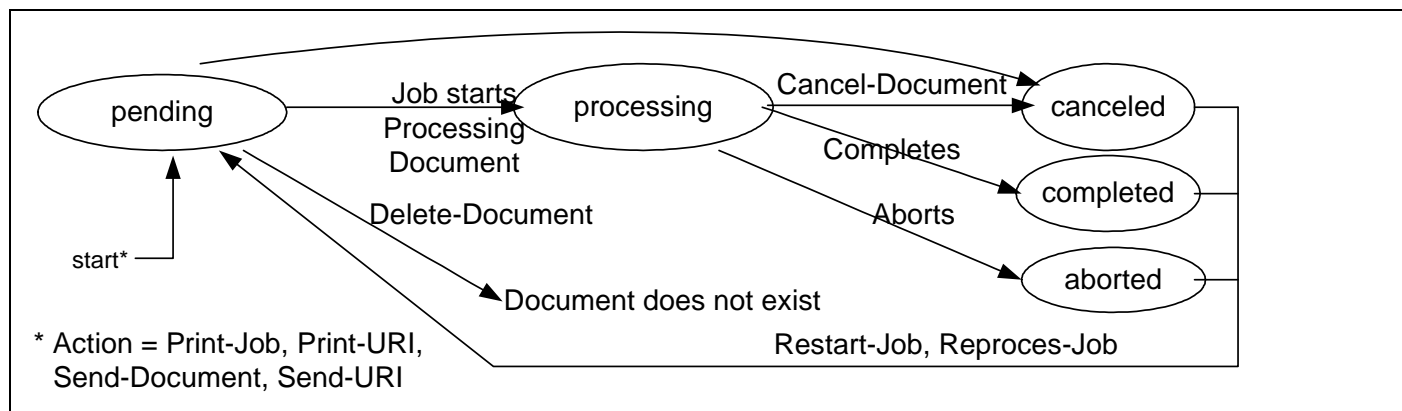


Figure 2 - The "document-state" Document Description attribute and the Document object life cycle

A Document object has a much simpler life cycle than a Job object. A Document always progresses from left to right in the state diagram. No other state transitions are defined.

9.1.23.39.1.23.2 Forwarding Servers

As with all other IPP attributes, if the implementation can not determine the correct value for this attribute, it SHOULD respond with the out-of-band value 'unknown' (see [rfc2911] Section 4.1) rather than try to guess at some possibly incorrect value and give the end user the wrong impression about the state of the Job/Document object. For example, if the implementation is just a gateway into some printing system from which it can normally get status, but temporarily is unable, then the implementation should return the 'unknown' value. However, if the implementation is a gateway to a printing system that never provides detailed status about the ~~print-job~~ document, the implementation MAY set the IPP ~~Job~~ Document object's state to 'completed', provided that it also sets the 'queued-in-device' value in the ~~job's~~ document's "~~job-state-reasons~~" / "document-state-reasons" attribute (see "~~job-state-reasons~~" / "document-state-reasons" attribute below).

9.1.23.4 Partitioning of Job/Document States

~~This section partitions the job/document states into phases: Job/Document Not Completed, Job/Document Retention, Job/Document History, and Job/Document Removal. This section also explains the 'job-restartable' value of the "job-state-reasons" Job Description attribute for use with the Restart-Job operation.~~

~~**Job/Document Not Completed:** When a job is in the 'pending', 'pending-held', 'processing', or 'processing-stopped' states, the job is not completed. When a Document is in the 'pending' or 'processing' state, it is not completed.~~

~~**Job Retention:** When a job enters one of the three terminal job states: 'completed', 'canceled', or 'aborted', the IPP Printer MAY "retain" the job in a restartable condition for an implementation-defined time period. This time period MAY be zero seconds and MAY depend on the terminal job state. This phase is called Job Retention. While in the Job Retention phase, the job's document data is retained and a client may restart the job using the Restart-Job operation. If the Printer supports the Restart-Job operation, then it SHOULD indicate that the job is restartable by adding the 'job-restartable' value to the job's "job-state-reasons" attribute (see section 9.1.25) during the Job Retention phase. If the Printer supports the Document object, then the Get-Document-Attributes and Get-Documents operations MUST be supported while the job is in the Job Retention phase.~~

~~**Job History:** After the Job Retention phase expires for a job, the Printer deletes the document data for the job and the job becomes part of the Job History. The Printer MAY also delete any number of the job and document attributes. Since the job is no longer restartable, the Printer MUST remove the 'job-restartable' value from the job's "job-state-reasons" attribute, if present. If the implementation supports the Document object, it SHOULD retain at least the "document-state" and "document-state-reasons" attributes on the Document object during the Job History phase which can be queried using the Get-Document-Attributes and Get-Documents operations.~~

~~**Job Removal:** After the job has remained in the Job History for an implementation-defined time, such as when the number of jobs exceeds a fixed number or after a fixed time period (which MAY be zero seconds), the IPP Printer removes the Job and Document objects from the system.~~

~~Using the Get-Jobs/Get-Documents operation and supplying the 'not-completed' value for the "which-jobs" Operation attribute, a client is requesting jobs/documents in the Job/Document Not Completed phase. Using the Get-Jobs/Get-Documents operation and supplying the 'completed' value for the "which-jobs" Operation attribute, a client is requesting jobs/documents in the Job Retention and Job History phases. Using the Get-Job-Attributes/Get-Documents operation, a client is requesting a job/documents in any phase except Job Removal. After Job Removal, the Get-Job-Attributes/Get-Documents and Get-Jobs/Get-Documents operations no longer are capable of returning any information about a job/document.~~

~~**NOTE:** The semantics of this attribute or the set of valid values may be different for different document formats.~~

9.1.24 document-state-message (text(MAX)) and job-state-message (text(MAX))

This OPTIONAL Document Description attribute specifies information about the "~~job-state~~"/"document-state" and "~~job-state-reasons~~"/"document-state-reasons" attributes in human readable text. If the Printer supports this attribute, the Printer MUST be able to generate this message in any of the natural languages identified by the Printer's "generated-natural-language-supported" attribute (see the "attributes-natural-language" Operation attribute specified in [rfc2911] Section 3.1.4.1).

The value SHOULD NOT contain additional information not contained in the values of the "job-state" and "job-states-reasons" attributes, such as interpreter error information. Otherwise, application programs might attempt to parse the (localized text). For such additional information such as interpreter errors for application program consumption or specific document access errors, new attributes with keyword values, needs to be developed and registered.

9.1.25 document-state-reasons (1setOf type2 keyword) and job-state-reasons(1setOf type2 keyword)

~~The REQUIRED "job-state-reasons" and the REQUIRED "document-state-reasons" Document Description attributes provide additional information about the job's and each document's current state, i.e., information that augments the value of the job's "job-state" attribute and each Document's "document-state" attribute, respectively. The Printer SHOULD support the same values for both the "job-state-reasons" and the "document-state-reasons" attribute for those attributes that are defined for both as indicated in the "Job" and "Doc" columns in Table 13.~~

These values MAY be used with any ~~job or~~ document state ~~or states~~ for which the reason makes sense. Some of these value definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when implemented, the Printer MUST return these values when the reason applies and MUST NOT return them when the reason no longer applies whether the value of the ~~Job's "job-state" attribute or the~~ Document's "document-state" attribute changed or not. When the ~~Job or~~ Document does not have any reasons for being in its current state, the value of the ~~Job's "job-state-reasons" attribute or~~ Document's "document-state-reasons" attribute MUST be 'none'.

Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document objects are passive objects operated on by the containing Job object.

Note: While values cannot be added to the "~~job-state~~" or "document-state" attributes without impacting deployed clients that take actions upon receiving "~~job-state~~" or "document-state" values, it is the intent that additional "~~job-state-reasons~~" and "document-state-reasons" values can be defined and registered without impacting such deployed clients. In other words, the "~~job-state-reasons~~" and the "document-state-reasons" attributes are intended to be extensible.

1588 ~~Table 13~~Table 13 lists the standard keyword values for the “~~job-state-reasons~~” and/or “document-state-reasons”
 1589 attributes defined in this and other IPP specifications as indicated in the References column. In ~~Table 13~~Table 13
 1590 the keywords are listed in alphabetic order (observing the “[job-]” prefix), while in their descriptions following ~~Table~~
 1591 ~~13~~Table 13, they are listed in the most likely order of occurrence to help understanding.

1592 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
 1593 level “job-state-reasons”, so that clients that do not support the Document object will receive the same information.
 1594 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
 1595 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
 1596 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1597 **Notation:**

1598 [job-] indicates a state reason keyword value that has the ‘job-’ prefix when it is a value of the “job-state-reasons”
 1599 attribute, but does not have the ‘job-’ prefix when it is a value of the “document-state-reasons” attribute⁶¹. For
 1600 purposes of sorting in ~~Table 13~~Table 13, the “[job-]” prefix is observed, ~~since this is an IPP specification.~~
 1601 “-” indicates that the Job or Document value is *not* defined.

1602 **Table 13 - “~~job-state-reasons~~” and “document-state-reasons” attribute values**

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
document-state-reasons	1setOf type2 keyword	MUST	9.1.25
	aborted-by-system	MAY	[rfc2911] §4.3.8
	compression-error	MAY	[rfc2911] §4.3.8
	digital-signature-did-not-verify	MAY	[jobx] §
	digital-signature-type-not-supported	MAY	[jobx] §
	document-access-error	MAY	[rfc2911] §4.3.8
	document-format-error	MAY	[rfc2911] §4.3.8
	[job-]canceled-at-device	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-operator	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-user	MAY	[rfc2911] §4.3.8
	[job-]completed-successfully	MAY	[rfc2911] §4.3.8
	[job-]completed-with-errors	MAY	[rfc2911] §4.3.8
	[job-]completed-with-warnings	MAY	[rfc2911] §4.3.8
	[job-]data-insufficient	MAY	[rfc2911] §4.3.8
	[job-]digital-signature-wait	MAY	[jobx] §
	[job-]errors-detected	MAY	[jobx] §
	[job-]incoming	MAY	[rfc2911] §4.3.8
	[job-]interpreting	MAY	[rfc2911] §4.3.8
	[job-]outgoing	MAY	[rfc2911] §4.3.8
	[job-]printing	MAY	[rfc2911] §4.3.8
	[job-]queued	MAY	[rfc2911] §4.3.8
	[job-]queued-for-marker	MAY	[rfc2911] §4.3.8
	[job-]spooling	MAY	[ippsave] §8.3.1
	[job-]streaming	MAY	[ippsave] §8.3.1
	[job-]transforming	MAY	[rfc2911] §4.3.8
	[job-]warnings-detected	MAY	[pwg5100.4] §7.1
	none	MUST	[rfc2911] §4.3.8
	processing-to-stop-point	MAY	[rfc2911] §4.3.8

⁶¹ For the PWG Semantic Model [pwg-sm], the “job-” prefix is being dropped altogether so that the same values can be used for both the JobStateReasons and DocumentStateReasons attributes.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
	queued-in-device	MAY	[rfc2911] §4.3.8
	resources-are-not-ready	MAY	[rfc2911] §4.3.8
	resources-are-not-supported	MAY	[pwg5100.3] §6.1
	submission-interrupted	MAY	[rfc2911] §4.3.8
	unsupported-compression	MUST	[rfc2911] §4.3.8
	unsupported-document-format	MUST	[rfc2911] §4.3.8

For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely to occur (if implemented), starting with the 'none' value. ~~Note: The order is improved over that in [rfc2911]. The (JD), (J), and (D) notation is identical to the "Job" and "Doc" columns in Table 13 indicating whether the keyword is defined for the "job-state-reasons" and/or "document-state-reasons" attributes:~~

- 'none' (JD):** There are no reasons for the ~~job's or~~ document's current state. This state reason is semantically equivalent to ~~"job-state-reasons" or~~ "document-state-reasons" attribute without any value and MUST be used when there is no other value, since the 1setOf attribute syntax requires at least one value. [rfc2911] §4.3.8
- ~~**'job-hold-until-specified' (J):** The value of the job's "job-hold-until" attribute was specified with a time period that is still in the future. The job MUST NOT be a candidate for processing until this reason is removed and there are no other reasons to hold the job. This value SHOULD be supported if the "job-hold-until" Job Template attribute is supported. [rfc2911] §4.3.8~~
- ~~**'job-password-wait' (J):** The Job is currently being held until the correct password is entered at the device. If the "job-password" (octetString(255)) Operation attribute (See [ippsave] section 4.1) is supported, this value MUST be supported. [ippsave] §8.3.4~~
- ~~**'proof-print-wait' (J):** The job is currently being held until the operator verifies the output of the proof print and performs a Release-Job operation. If the "proof-print" (collection) Job Template attribute (See [ippsave] section 5.9) is supported, this value MUST be supported. [ippsave] §8.3.4~~
- ~~**'job-digital-signature-wait' (J):** The Job is currently being held because the Job was submitted with a "document-digital-signature" attribute value that is not supported. The operator MAY either cancel the job or release it to be processed. [jobx] §~~
- 'digital-signature-did-not-verify' (JD):** The ~~Job/~~Document contains a digital signature type that is supported (see section ~~Error! Reference source not found.~~, [JobX] §) but the signature did not verify when the Printer attempted to verify the signature. [jobx] §
- 'resources-are-not-supported' (JD):** At least one of the resources needed by the ~~job/~~document, such as media, fonts, resource objects, etc., is not supported on any of the physical printers for which the ~~job/~~document is a candidate. This condition MAY be detected when the ~~job/~~document is accepted, or subsequently while the ~~job/~~document is pending or processing, depending on implementation. The job containing the ~~/~~document may (1) remain in its current state, (2) be moved to the 'pending-held' state, depending on implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer is put into the 'stopped' state when the ~~job/~~document is attempted to be processed on the Printer. This value is intended for use with an implementation that supports the "user-defined-values-supported" Printer attribute (see [pwg5100.3] section 6.1) ~~-which~~, which allows a job to be accepted with an unsupported 'name' value. [pwg5100.3] §6.1
- 'resources-are-not-ready' (JD):** At least one of the resources needed by the ~~job/~~document, such as media, fonts, resource objects, etc., is not ready on any of the physical printer's for which the ~~job/~~document is a candidate. This condition MAY be detected when the ~~job/~~document is accepted, or subsequently while the ~~job/~~document is pending or processing, depending on implementation. The

job ~~containing the~~ /document may remain in its current state or be moved to the 'pending-held' state, depending on implementation and/or ~~job/document~~-scheduling policy. [rfc2911] §4.3.8

'~~job-~~incoming' (JD): ~~Either (1) the Printer has accepted the Create-Job operation and is expecting additional Send-Document and/or Send-URI operations or (2) T~~the Printer is retrieving/accepting document data as a result of a Print-Job, Print-URI, Send-Document or Send-URI operation. [rfc2911] §4.3.8

'~~job-~~spooling' (JD): Same as 'job-incoming' with the specialization that the Printer is spooling the ~~Job/~~Document data before processing it. This value corresponds to the 'spool' or 'automatic' value of the "job-spooling-supported" Printer Description attribute. [ippsave] §8.3.1

'~~job-~~streaming' (JD): Same as 'job-incoming' with the specialization that the Printer is processing the ~~Job/~~Document data as it is being received (that is, the document is not being spooled, but rather is being processed in chunks by the output device and is being imaged during reception). This value corresponds to the 'stream' or 'automatic' value of the "job-spooling-supported" Printer Description attribute. [ippsave] §8.3.1

'~~job-~~data-insufficient' (J): The ~~Create-Job operation has been accepted by the Printer, but the~~ Printer is expecting additional document data before it can move the ~~job/document~~ into the 'processing' state. If a Printer starts processing before it has received all data, the Printer removes the 'job-data-insufficient' reason, but the 'job-incoming' remains. If a Printer starts processing after it has received all data, the Printer removes the 'job-data-insufficient' reason and the 'job-incoming' at the same time. [rfc2911] §4.3.8

'unsupported-compression' (JD): The ~~job/document/document~~ was aborted by the system because the Printer determined while attempting to decompress the document-data's that the compression is actually not among those supported by the Printer. This value MUST be supported, since "compressions" is a REQUIRED Operation attribute. [rfc2911] §4.3.8

'compression-error' (JD): The ~~job/document/document~~ was aborted by the system because the Printer encountered an error in the document-data while decompressing it. If the Printer posts this reason, the document-data has already passed any tests that would have led to the 'unsupported-compression' job-state-reason/document-state-reason. [rfc2911] §4.3.8

'document-access-error' (JD): After accepting a Print-URI or Send-URI request, the Printer could not access ~~one or more the~~ documents ~~passed by~~ reference. This reason is intended to cover any file access problem, including file does not exist and access denied because of an access control problem. The Printer MAY also indicate the document access error using the "~~job-~~document-access-errors" ~~Job-Printer~~ Description attribute (~~see the description of "job-document-access-errors" above~~). Whether the Printer aborts the ~~job/document/document~~ and moves the ~~job/document/document~~ to the 'aborted' job state or prints all documents that are accessible and moves the ~~job/document/document~~ to the 'completed' ~~job/document/document~~ state and adds the 'completed-with-errors' value in the job's "job-state-reasons" or document's "document-state-reasons" attribute depends on implementation and/or site policy. This value SHOULD be supported if the Print-URI or Send-URI operations are supported. [rfc2911] §4.3.8

'unsupported-document-format' (JD): The ~~job/document/document~~ was aborted by the system because the document-data's document-format is not among those supported by the Printer. If the client specifies the document-format as 'application/octet-stream', the printer MAY abort the ~~job/document/document~~ and post this reason even though the format is a member of the "document-format-supported" printer attribute, but not among the auto-sensed document-formats. This value MUST be supported, since "document-format" is a REQUIRED Operation attribute. [rfc2911] §4.3.8

'document-format-error' (JD): The ~~job/document/document~~ was aborted by the system because the Printer encountered an error in the document-data while processing it. If the Printer posts this reason, the document-data has already passed any tests that would have led to the 'unsupported-document-format' job-state-reason/document-state-reason. [rfc2911] §4.3.8

- 1691 **'submission-interrupted' (JD):** The ~~job-or~~ document was not completely submitted for some unforeseen
 1692 reason, such as: (1) the Printer has crashed before the job-document was closed by the client, (2)
 1693 the Printer or the document transfer method has crashed in some non-recoverable way before the
 1694 document data was entirely transferred to the Printer, (3) the client crashed or failed to close the job
 1695 before the time-out period. See the description of the "multiple-operation-time-out" Printer attribute in
 1696 [rfc2911] Section 4.4.31. [rfc2911] §4.3.8
- 1697 **'~~job-~~outgoing' (JD):** The Printer is transmitting the job/documentdocument to the output device. [rfc2911]
 1698 §4.3.8
- 1699 ~~'job-scheduling' (J): The printer is in the process of scheduling the processing for the Job. [ippsave] §8.3.1~~
- 1700 **'~~job-~~queued' (JD):** Job-Document is in the 'processing' state, but more specifically, the Printer has queued
 1701 the Document data. [rfc2911] §4.3.8
- 1702 **'~~job-~~transforming' (JD):** Job/documentDocument is in the 'processing' state, but more specifically, the
 1703 Printer is interpreting document data and producing another electronic representation. [ippsave]
 1704 §8.3.1
- 1705 **'~~job-~~interpreting' (JD):** Job/documentDocument is in the 'processing' state, but more specifically, the
 1706 Printer is interpreting the document data. [rfc2911] §4.3.8
- 1707 **'~~job-~~queued-for-marker' (JD):** Job/documentDocument is in ~~any-of-the~~ 'pending-held', 'pending', or
 1708 'processing' states, but more specifically, the Printer has completed enough processing of the
 1709 document to be able to start marking and the job/documentdocument is waiting for the marker.
 1710 ~~Systems that require human intervention to release jobs using the Release-Job operation, put the job~~
 1711 ~~into the 'pending-held' job state. Systems that automatically select a job to use the marker put the~~
 1712 ~~job into the 'pending' job state or keep the job in the 'processing' job state while waiting for the~~
 1713 ~~marker, depending on implementation. All implementations put the~~ job/documentdocument ~~into (or~~
 1714 ~~back into) the 'processing' state when marking does begin. rfc2911] §4.3.8~~
- 1715 **'~~job-~~printing' (JD):** The output device is marking media. This value is useful for Printers which spend a
 1716 great deal of time processing (1) when no marking is happening and then want to show that marking
 1717 is now happening or (2) when the job/documentdocument is in the process of being canceled or
 1718 aborted while the job/documentdocument remains in the 'processing' state, but the marking has not
 1719 yet stopped so that impression or sheet counts are still increasing for the job/documentdocument.
 1720 [rfc2911] §4.3.8
- 1721 ~~'printer-stopped-partly' (J): The value of the Printer's "printer-state-reasons" attribute contains the value~~
 1722 ~~'stopped-partly'. [rfc2911] §4.3.8~~
- 1723 ~~'printer-stopped' (J): The value of the Printer's "printer-state" attribute is 'stopped'. [rfc2911] §4.3.8~~
- 1724 ~~'job-suspending' (J): The printer is in the process of moving the Job from a processing condition to a~~
 1725 ~~suspended condition where other jobs can be processed. [ippsave] §8.3.1~~
- 1726 ~~'job-suspended' (J): The job has been suspended while processing using the Suspend-Current-Job~~
 1727 ~~operation and other jobs can be processed on the Printer. The Job can be resumed using the~~
 1728 ~~Resume-Job operation which removes this value. Note: Documents cannot be suspended and there~~
 1729 ~~is no Suspend-Current-Documnet operation. [adm-ops] §9.1~~
- 1730 ~~'job-suspended-by-operator' (J): The Job has been indefinitely suspended by the printer operator.~~
 1731 ~~[ippsave] §8.3.1~~
- 1732 ~~'job-suspended-by-user' (J): The Job has been indefinitely suspended by the user. [ippsave] §8.3.1~~
- 1733 ~~'job-suspended-by-system' (J): The Job has been indefinitely suspended by the Printer's system software~~
 1734 ~~during normal processing of the job. [ippsave] §8.3.1~~
- 1735 ~~'job-resuming' (J): The printer is in the process of moving the Job from a suspended condition to become a~~
 1736 ~~candidate for processing. [ippsave] §8.3.1~~

- '[job-]canceled-by-user' (JD):** The job/documentdocument was canceled by the owner of the job using the Cancel-Job/Cancel-Document request, i.e., by a user whose authenticated identity is the same as the value of the originating user that created the Job object, or by some other authorized end-user, such as a member of the job owner's security group. ~~This 'job-canceled' value SHOULD be supported.~~ The 'canceled-by-user' value SHOULD be supported for the "document-state-reasons" attributes for use with the Cancel-Document. [rfc2911] §4.3.8
- '[job-]canceled-by-operator' (JD):** The job/documentdocument was canceled by the operator using the Cancel-Job/Cancel-Document request, i.e., by a user who has been authenticated as having operator privileges (whether local or remote). If the security policy is to allow anyone to cancel anyone's job/documentdocument, then these values may be used when the job/documentdocument is canceled by other than the owner of the job. For such a security policy, in effect, everyone is an operator as far as canceling jobs/documents is concerned. These values SHOULD be supported if the implementation permits canceling by other than the owner of the job. [rfc2911] §4.3.8
- '[job-]canceled-at-device' (JD):** The job/documentdocument was canceled by an unidentified local user, i.e., a user at a console at the device. This value SHOULD be supported if the implementation supports canceling jobs/documents at the console. [rfc2911] §4.3.8
- 'aborted-by-system' (JD):** The job/documentdocument (1) is in the process of being aborted, or (2) has been aborted by the system and placed in the 'aborted' state, ~~or (3) has been aborted by the system and placed in the 'pending-held' state, so that a user or operator can manually try the job/document again.~~ This value SHOULD be supported. [rfc2911] §4.3.8
- 'processing-to-stop-point' (J):** The requester has issued a Cancel-Job/Cancel-Document operation or the Printer has aborted the job/documentdocument, but is still performing some actions on the job/documentdocument until a specified stop point occurs or job/documentdocument termination/cleanup is completed. If the implementation requires some measurable time to cancel the job/documentdocument in the 'processing' or 'processing-stopped' job/documentdocument states, the Printer MUST use this value to indicate that the Printer is still performing some actions on the job/documentdocument while the job/documentdocument remains in the 'processing' or 'processing-stopped' state. After all the job-s/document's job/documentdocument description attributes have stopped incrementing, the Printer moves the job/documentdocument from the 'processing' state to the 'canceled' or 'aborted' job/documentdocument states. [rfc2911] §4.3.8
- 'service-off-line' (J):** ~~The Printer is off-line and accepting no jobs. All 'pending' jobs are put into the 'pending-held' state. This situation could be true if the service's or document transform's input is impaired or broken.~~ [rfc2911] §4.3.8
- '[job-]errors-detected' (JD):** If the Printer supports these values, the Printer MUST add the value to "job-state-reasons" / "document-state-reasons" when it generates the first error message. That is, a single occurrence of this value is present in the "job-state-reasons" / "document-state-reasons" if the Printer has generated one or more errors. An error indicates loss of information, such as a page not imaged. A warning indicates no loss of information (see '[job-]warnings-count' state reason). [job-] §
- '[job-]warnings-detected' (JD):** If the Printer supports these values, the Printer MUST add the value to "job-state-reasons" / "document-state-reasons" when it generates the first warning message. That is, a single occurrence of this value is present in the "job-state-reasons" / "document-state-reasons" if the Printer has generated one or more warnings. A warning indicates something did not go as expected, but there was no loss of information. For example, a font substitution. An error indicates loss of information (see '[job-]errors-count' state reason). [job-] §
- '[job-]completed-successfully' (JD):** The job/documentdocument completed successfully. There were no warnings or errors in printing. This value SHOULD be supported. [rfc2911] §4.3.8
- '[job-]completed-with-warnings' (JD):** The print part of the job/documentdocument completed with warnings (whether or not there were save errors). This value SHOULD be supported if the implementation detects warnings. [rfc2911] §4.3.8

'~~job-~~completed-with-errors' (JD): The print part of the ~~job/document~~document completed with errors (and possibly warnings too) (whether or not there were save errors). This value SHOULD be supported if the implementation detects errors. [rfc2911] §4.3.8

'~~job-saving~~' (J): The Printer is transmitting the Job to the save location. This is similar to the 'job-printing' value. ~~[ippsave] §8.3.4~~

'~~job-saved-successfully~~' (J): The Printer saved the Job successfully. ~~[ippsave] §8.3.4~~

'~~job-save-error~~' (J): The Printer did not save the Job successfully (whether or not it was printed successfully, printed with warnings, printed with errors, or not printed). The Printer MUST ensure that none of the saved job is accessible, if it was unable to successfully save all of the job. ~~[ippsave] §8.3.4~~

'~~job-restartable~~' (J): This job is retained (see the description of "job-state" above, specifically "Partitioning of Job States") and is currently able to be restarted using the Restart-Job operation (see [rfc2911] Section 3.3.7). If 'job-restartable' is a value of the job's "job-state-reasons" attribute, then the Printer MUST accept a Restart-Job operation for that job. This value SHOULD be supported if the Restart-Job operation is supported. ~~[rfc2911] §4.3.8~~

'~~queued-in-device~~' (JD): The ~~job/document~~document has been forwarded to a device or print system that is unable to send back status. The Printer sets the ~~job's/document's~~ "job-state"/"document-state" attribute to ~~'completed' and 'completed'~~ and adds the 'queued-in-device' value to the ~~job's/document's~~ "job-state-reasons"/"document-state-reasons" attribute to indicate that the Printer has no additional information about the ~~job/document~~document and never will have any better information. See the description of the "job-state"/"document-state" attribute above, specifically the portion on "Forwarding Servers". [rfc2911] §4.3.8

NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

9.1.26 document-uri (uri)

This Document Description attribute is the URI that the client supplied in the corresponding Operation attribute in a Send-URI operation (see [rfc2911] section 3.3.2). The Printer MUST support this attribute if the Printer supports the Send-URI operation (see section 4.2).

9.1.27 impressions-completed-current-copy (integer(0:MAX))

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc3381] §4.4) applied to the Document object.

9.1.28 ~~job-~~detailed-status-message (1setOf text(MAX))

This OPTIONAL "detailed-status-message" Document Description attribute has the same semantics as the corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.10) applied to the Document object.

9.1.29 ~~job-~~document-access-errors (1setOf text(MAX))

This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.11) applied to the Document object.

1824 9.1.30 [job]-errors-count (integer(0:MAX))

1825 This OPTIONAL "errors-count" Document Description attribute counts the number of errors that the Printer
 1826 encounters while processing and printing the Document object. An error indicates loss of information, such as a
 1827 page not imaged. A warning indicates no loss of information (see [jobx] §4.3.11).

1828 9.1.31 [job]-impressions (integer(0:MAX))

1829 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-
 1830 impressions" Job Description attribute (see [rfc2911] §4.3.17.2) applied to the Document object. The Printer sets
 1831 this Document Description attribute from the corresponding Operation attribute supplied by the client in the
 1832 Document Creation operation (see section **Error! Reference source not found.**).

1833 9.1.32 [job]-impressions-completed (integer(0:MAX))

1834 This OPTIONAL "impressions-completed" Document Description attribute has the same semantics as the
 1835 corresponding "job-impressions-completed" Job Description attribute (see [rfc2911] §4.3.18.2) applied to the
 1836 Document object.

1837 9.1.33 [job]-k-octets (integer(0:MAX))

1838 This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-
 1839 octets" Job Description attribute (see [rfc2911] §4.3.17.1) applied to the Document object. The Printer sets this
 1840 Document Description attribute from the corresponding Operation attribute supplied by the client in the Document
 1841 Creation operation (see section **Error! Reference source not found.**).

1842 9.1.34 [job]-k-octets-processed (integer(0:MAX))

1843 This OPTIONAL "k-octets-processed" Document Description attribute has the same semantics as the corresponding
 1844 "job-k-octets-processed" Job Description attribute (see [rfc2911] §4.3.18.1) applied to the Document object.

1845 9.1.35 [job]-media-sheets (integer(0:MAX))

1846 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
 1847 media-sheets" Job Description attribute (see [rfc2911] §4.3.17.3) applied to the Document object. The Printer sets
 1848 this Document Description attribute from the corresponding Operation attribute supplied by the client in the
 1849 Document Creation operation (see section **Error! Reference source not found.**).

1850 9.1.36 [job]-media-sheets-completed (integer(0:MAX))

1851 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
 1852 media-sheets-completed" Job Description attribute (see [rfc2911] 4.3.18.3) applied to the Document object.

1853 9.1.37 [job]-more-info (uri)

1854 This OPTIONAL "more-info" Document Description attribute has the same semantics as the corresponding "job-
 1855 more-info" Job Description attribute (see [rfc2911] §4.3.4) applied to the Document object.

1856 9.1.38 [job]-printer-up-time (integer (1:MAX))

1857 This REQUIRED "printer-up-time" Document Description attribute indicates the amount of time (in seconds) that the
 1858 Printer implementation has been up and running. This attribute is an alias for the "printer-up-time" Printer Description
 1859 attribute (see [rfc2911] section 4.4.29).

A client MAY request this attribute in a Get-Document-Attributes or Get-Documents request and use the value returned in combination with other requested Event Time Job Description Attributes in order to display time attributes to a user. The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the number of seconds ago that the "time-at-xxx" event occurred. A client can compute the wall-clock time at which the "time-at-xxx" event occurred by subtracting this difference from the client's wall-clock time.

9.1.39 [job-]warnings-count (integer(0:MAX))

This OPTIONAL "warnings-count" Document Description attribute has the same semantics as the corresponding "job-warnings-count" Job Description attribute (see [jobx] §.) applied to the Document object. See [pwg5100.4] §6.1. A warning indicates something did not go as expected, but there was no loss of information. For example, a font substitution. An error indicates loss of information (see section 9.1.30).

9.1.40 last-document (boolean)

This OPTIONAL Document Description attribute indicates whether or not this Document is the last Document in the Job. See [rfc2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section **Error! Reference source not found.**).

9.1.41 output-device-assigned (name(127))

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.7.2) applied to the Document object.

9.1.42 sheet-completed-copy-number (integer(0:MAX))

This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc3381] §4.2) applied to the Document object.

9.1.43 time-at-completed (integer (MIN:MAX))

This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.3) applied to the Document object.

9.1.44 time-at-creation (integer (MIN:MAX))

This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.1) applied to the Document object.

9.1.45 time-at-processing (integer (MIN:MAX))

This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description attribute (see [rfc2911] §4.3.14.2) applied to the Document object.

10 Printer attributes

This section lists *all* of the Printer attributes defined in other IPP documents. Printer attributes are divided into three disjoint groups:

Job Template attributes (JT)	These Printer attributes are related directly to the "xxx" Job Template attributes
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	<p>that a client can supply in a Job Creation request as follows:</p> <ol style="list-style-type: none"> 1. "xxx-supported" indicate the supported values 2. "xxx-default" indicate the values that will be used if the client and the PDL omit the attribute. 3. "xxx-ready" indicate the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "job-finishing". <p>These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'job-template'.</p>
Document Template attributes (DT)	<p>These Printer attributes are related directly to the "xxx" Document Template attributes that a client can supply in a Document Creation request as follows:</p> <ol style="list-style-type: none"> 1. "xxx-supported" indicate the supported values 2. "xxx-default" indicate the values that will be used if the client and the PDL omit the attribute. 3. "xxx-ready" indicate the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "finishing". <p>These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'document-template'.</p>
Printer Description attributes (PD)	<p>These Printer attributes describe the Printer, such as "printer-name" and "printer-location". Some of them are "xxx-supported" and "xxx-default" for Operation attributes that the client can supply in a Job Creation request.</p>
neither (-)	<p>These Printer attributes describe supported and defaults for member attributes of collection Job Template attributes.</p>

In a Get-Printer-Attributes request, a client can request all of the Printer attributes in the Job Template (JT) or Printer Description (PD) groups by supplying the 'job-template' or 'printer-description' group name, respectively. The client can also request "all". The column labels are:

"Attribute Syntax" - indicates the attribute syntax (see [rfc2911] section 4.1). Many "xxx-default" and "xxx-supported" attributes have the 'collection' syntax which consists of a number of member attributes. These member attributes are not listed in this table when they are the same as the corresponding "xxx" attribute in [Table 10](#)~~Table 10~~. Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table.

"Grp" - indicates to which group the attribute belongs. "PD" = Printer Description; "JT" = Job Template as explained above.

"Printer Conf." - indicates the IPP/1.1 Printer conformance requirements for supporting the attribute. Those attributes labeled as "MAY" may have conditional requirements that require their support, if the Printer supports a related attribute, operation, or feature. For example, all Job Template attributes are OPTIONAL for a Printer to support. However, if a Printer supports Job Template attribute "xxx", then it MUST also support the corresponding "xxx-default" and "xxx-supported" attributes. Similarly, if Event Notification is supported, then some of the attributes indicated as "MAY" in this table become MUST.

"Reference" - lists the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

Table 14 - Printer attributes (Job Template and Printer Description)

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
attributes-charset-supported	1 setOf charset	PD	MUST	[this-spec] §1.1
attributes-natural-language-supported	1 setOf naturalLanguage	PD	MUST	[this-spec] §1.1

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
charset-configured	charset	PD	MUST	[rfc2911] §4.4.17
charset-supported	1setOf charset	PD	MUST	[rfc2911] §4.4.18
color-supported	boolean	PD	MAY	[rfc2911] §4.4.26
compression-supported	type3 keyword	PD	MUST	[rfc2911] §4.4.32
copies-default	integer(1:MAX)	JT,DT	MAY	[rfc2911] §4.2.5
copies-supported	rangeOfInteger(1:MAX)	JT,DT	MAY	[rfc2911] §4.2.5
cover-back-default	collection	JT,DT	MAY	[pwg5100.3] §3.1.3
cover-back-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.1.4
cover-front-default	collection	JT,DT	MAY	[pwg5100.3] §3.1.3
cover-front-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.1.4
cover-type-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.1.2.1
document-charset-default	charset	PD	CMUST ⁶²	[jobx] §
document-charset-supported	1setOf charset	PD	CMUST ⁶²	[jobx] §
document-creation-attributes-supported	1setOf type2 keyword	PD	MUST	[this-spec] §10.1
document-digital-signature-default	type2 keyword	PD	MAY	[jobx] §
document-digital-signature-supported	1setOf type2 keyword	PD	MAY	[jobx] §z,.z.z
document-format-default	mimeMediaType	PD	MUST	[rfc2911] §4.4.21
document-format-details-supported	1setOf type2 keyword	PD	CMUST ⁶³	[jobx] §
document-format-details-implemented	1setOf collection	PD	CMUST ⁶³	[jobx] §
document-format-supported	1setOf mimeMediaType	PD	MUST	[rfc2911] §4.4.22
document-format-varying-attributes	1setOf type2 keyword	PD	MAY	[rfc3380] §6.3
document-format-version-default	text(127)	PD	MAY	[jobx] §
document-format-version-supported	1setOf text(127)	PD	MAY	[jobx] §
document-natural-language-default	naturalLanguage	PD	MAY	[jobxthis-spec] § Error! Reference source not found. z.z.z
document-natural-language-supported	1setOf naturalLanguage	PD	MAY	[jobxthis-spec] § Error! Reference source not found. z.z.z
feed-orientation-default	type3 keyword	JT,DT	MAY	[ippsave] §5.1.1
feed-orientation-supported	1setOf type3 keyword	JT,DT	MAY	[ippsave] §5.1.2
finishings-col-default	collection	JT,DT	MAY	[pwg5100.3] §3.2.3
finishings-col-ready	1setOf collection	JT,DT	MAY	[pwg5100.3] §3.2.4
finishings-col-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.2.5
finishings-default	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishings-ready	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishings-supported	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishing-template-supported	1setOf name(MAX)	-	MAY	[pwg5100.3] §3.2.1.1

⁶² The Printer MUST support the “document-charset-default” and “document-charset-supported” Printer Description attributes, if the Printer supports a charset-ambiguous document format (see section **Error! Reference source not found.**).

⁶³ The Printer MUST support the “document-format-details-supported” and “document-format-details-implemented” Printer attributes if the Printer supports a packaging document format, such as application/zip or multipart/related.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
font-name-requested-default	name(MAX)	JT,DT	MAY	[ippsave] §5.2.1
font-name-requested-supported	1setOf name(MAX)	JT,DT	MAY	[ippsave] §5.2.2
font-size-requested-default	integer (1:MAX)	JT,DT	MAY	[ippsave] §5.3.1
font-size-requested-supported	1setOf integer (1:MAX)	JT,DT	MAY	[ippsave] §5.3.1
force-front-side-default	1setOf integer(1:MAX)	JT,DT	MAY	[pwg5100.3] §3.3
force-front-side-supported	rangeOfInteger(1:MAX)	JT,DT	MAY	[pwg5100.3] §3.3
generated-natural-language-supported	1setOf naturalLanguage	PD	MUST	[rfc2911] §4.4.20
imposition-template-default	type3 keyword name(MAX)	JT,DT	MAY	[pwg5100.3] §3.4
imposition-template-supported	1setOf (type3 keyword name(MAX))	JT,DT	MAY	[pwg5100.3] §3.4
insert-after-page-number-supported	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.1.1
insert-count-supported	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.2.1
insert-sheet-default	1setOf collection	JT,DT	MAY	[pwg5100.3] §3.5.4
insert-sheet-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.5.5
ippget-event-life	integer(15:MAX)	PD	MAY	[get-method] §8.1
ipp-versions-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.20
job-account-id-default	name(MAX)	JT	MAY	[pwg5100.3] §3.6
job-account-id-supported	boolean	JT	MAY	[pwg5100.3] §3.6
job-accounting-output-bin-default	type3 keyword name(MAX)	-	MAY	[pwg5100.3] §3.8.3.1
job-accounting-output-bin-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.8.3.2
job-accounting-sheets-default	collection	JT	MAY	[pwg5100.3] §3.8.4
job-accounting-sheets-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.8.5
job-accounting-sheets-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.8.1.1
job-accounting-user-id-default	name(MAX)	JT	MAY	[pwg5100.3] §3.7
job-accounting-user-id-supported	boolean	JT	MAY	[pwg5100.3] §3.7
job-copies-default	integer(1:MAX)	JT	MAY	[jobxthis-spec] §Z.Z.Z
job-copies-supported	reangeOfInteger(1:MAX)	JT	MAY	[jobxthis-spec] §Z.Z.Z
job-cover-back-default	collection	JT	MAY	[jobxthis-spec] §Error! Reference source not found.Z.Z.Z
job-cover-back-supported	1setOf type2 keyword	JT	MAY	[jobxthis-spec] §Error! Reference source not found.Z.Z.Z
job-cover-front-default	collection	JT	MAY	[jobxthis-spec] §Error! Reference source not found.Z.Z.Z
job-cover-front-supported	1setOf type2 keyword	JT	MAY	[jobxthis-spec] §Error! Reference source not found.Z.Z.Z
job-creation-attributes-supported	1setOf type2 keyword	PD	MAY	[ippsave] §7.1
job-error-sheet-default	collection	JT	MAY	[pwg5100.3] §3.7
job-error-sheet-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.9.5
job-error-sheet-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.9.1.1
job-error-sheet-when-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.9.2.1
job-finishings-default	1setOf type2 enum	JT	MAY	[jobxthis-spec] §Error! Reference source

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
				not found.z.z.z
job-finishings-supported	1setOf type2 enum	JT	MAY	[jobxthis-spec] \$Error! Reference source not found.z.z.z
job-finishings-col-default	collection	JT	MAY	[jobxthis-spec] \$Error! Reference source not found.z.z.z
job-finishings-col-supported	1setOf type2 keyword	JT	MAY	[jobxthis-spec] \$Error! Reference source not found.z.z.z
job-hold-until-default	type3 keyword name(MAX)	JT	MAY	[rfc2911] §4.2.2
job-hold-until-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[rfc2911] §4.2.2
job-impressions-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.34
job-k-octets-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.33
job-media-sheets-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.35
job-message-to-operator-default	text(MAX)	JT	MAY	[pwg5100.3] §3.12
job-message-to-operator-supported	boolean	JT	MAY	[pwg5100.3] §3.12
job-password-supported	integer(0:127)	PD	MAY	[ippsave] §7.2
job-password-encryption-supported	1setOf (type3 keyword name(MAX))	PD	MAY	[ippsave] §7.3
job-priority-default	integer(1:100)	JT	MAY	[rfc2911] §4.2.1
job-priority-supported	1setOf integer(1:100)	JT	MAY	[rfc2911] §4.2.1
job-settable-attributes-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.2
job-sheet-message-default	text(MAX)	JT	MAY	[pwg5100.3] §3.12
job-sheet-message-supported	boolean	JT	MAY	[pwg5100.3] §3.12
job-sheets-col-default	collection	JT	MAY	[pwg5100.3] §3.11.3
job-sheets-col-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.11.4
job-sheets-default	type3 keyword name(MAX)	JT	MAY	[rfc2911] §4.2.3
job-sheets-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[rfc2911] §4.2.3
job-spooling-supported	type2 keyword	PD	MAY	[ippsave] §7.4
max-save-info-supported	integer(1:MAX)	PD	MAY	[ippsave] §7.5
max-stitching-locations-supported	integer(1:MAX)	PD	MAY	[pwg5100.3] §5.2
media-back-coating-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.10.2
media-col-database	1setOf collection	- ⁶⁴	MAY	[ippsave] §7.6
<i>any "media-col" member attribute</i>				
media-col-default	collection	JT	MAY	[pwg5100.3] §3.13.12
<i>any "media-col" member attribute</i>				
media-color-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.13.4.1
media-col-ready	1setOf collection	JT	MAY	[pwg5100.3] §3.13.13
<i>any "media-col" member attribute</i>				
media-col-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.13.14
media-default	type3 keyword name(MAX)	JT,DT	MAY	[rfc2911] §4.2.11
media-front-coating-supported	1setOf (type3 keyword	-	MAY	[pwg5100.3]

⁶⁴ The Printer does not return the "media-col-database" attribute when the client requests 'all' or 'printer-description' attribute group because there MAY be a large number of values. Instead the client MUST query "media-col-database" explicitly in a Get-Printer-Attributes request.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
	name(MAX))			§3.13.10.1
media-hole-count-supported	1setOf rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.13.6.1
media-info-supported	boolean	-	MAY	[pwg5100.3] §3.13.3.1
media-input-tray-check-default	type3 keyword name(MAX)	JT	MAY	[pwg5100.3] §3.14
media-input-tray-check-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[pwg5100.3] §3.14
media-key-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.1.1
media-order-count-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.7.1
media-pre-printed-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.5.1
media-ready	1setOf (type3 keyword name(MAX))	JT,DT	MAY	[rfc2911] §4.2.11
media-recycled-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.11.1
media-size-supported	1setOf collection	-	MAY	[pwg5100.3] §3.13.8.3
media-supported	1setOf (type3 keyword name(MAX))	JT,DT	MAY	[rfc2911] §4.2.11
media-weight-metric-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.9.1
multiple-document-handling-default	type2 keyword	JT	MUST ⁶⁵	[rfc2911] §4.2.4
multiple-document-handling-supported	1setOf type2 keyword	JT	MUST ⁶⁵	[rfc2911] §4.2.4
multiple-document-jobs-supported	boolean	PD	MUST ⁶⁵	[rfc2911] §4.4.16
multiple-operation-time-out	integer(1:MAX)	PD	MUST ⁶⁵	[rfc2911] §4.4.31
natural-language-configured	naturalLanguage	PD	MUST	[rfc2911] §4.4.19
notify-attributes-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.4
notify-events-default	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-events-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-lease-duration-default	integer(0:67108863)	PD	MAY	[ntfy] §5.3.8
notify-lease-duration-supported	1setOf (integer(0: 67108863) rangeOfInteger(0:67108863))	PD	MAY	[ntfy] §5.3.8
notify-lease-expiration-time	integer(0:MAX)	PD	MAY	[ntfy] §5.4.3
notify-max-events-supported	integer(2:MAX)	PD	MAY	[ntfy] §5.3.3
notify-pull-method-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.2
notify-schemes-supported	1setOf uriScheme	PD	MAY	[ntfy] §5.3.1
number-up-default	integer(1:MAX)	JT,DT	MAY	[rfc2911] §4.2.9
number-up-supported	1setOf (integer(1:MAX) rangeOfInteger(1:MAX))	JT,DT	MAY	[rfc2911] §4.2.9
operations-supported	1setOf type2 enum	PD	MUST	[rfc2911] §4.4.15
orientation-requested-default	type2 enum	JT,DT	MAY	[rfc2911] §4.2.10
orientation-requested-supported	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.10
output-bin-default	type2 keyword name(MAX)	JT	MAY	[pwg5100.2] §2.1

⁶⁵ A Printer MUST support "multiple-document-handling-default", "multiple-document-handling-default", "multiple-document-jobs-supported", and "multiple-operation-time-out" Printer attributes since the Printer MUST support multiple document jobs, even though they are OPTIONAL for a Printer to conform to [rfc2911].

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
output-bin-supported	1setOf (type2 keyword name(MAX))	JT	MAY	[pwg5100.2] §2.1
output-device-requested-supported	1setOf name(127)	PD	MAY	[jobxthis-spee] \$Error! Reference source not found-z.z.z
page-delivery-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.15
page-delivery-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.15
page-order-received-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.16
page-order-received-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.16
page-overrides-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.4] §5.2.9
page-ranges-supported	boolean	JT,DT	MAY	[rfc2911] §4.2.7
pages-per-minute	integer(0:MAX)	PD	MAY	[rfc2911] §4.4.36
pages-per-minute-color	integer(0:MAX)	PD	MAY	[rfc2911] §4.4.37
pages-per-subset-supported	boolean	PD	MAY	[pwg5100.4] §5.3.2
parent-printers-supported	1setOf uri	PD	MAY	[adm-ops] §7.2
pdl-override-supported	type2 keyword	PD	MUST	[rfc2911] §4.4.28 [ippsave] §8.1
presentation-direction-number-up-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.17
presentation-direction-number-up-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.17
printer-current-time	dateTime	PD	MAY	[rfc2911] §4.4.30
printer-detailed-status-messages	1setOf text(MAX)	PD	MAY	[ippsave] §7.7
printer-driver-installer	uri	PD	MAY	[rfc2911] §4.4.8
printer-info	text(127)	PD	MAY	[rfc2911] §4.4.6
printer-is-accepting-jobs	boolean	PD	MUST	[rfc2911] §4.4.23
printer-location	text(127)	PD	MAY	[rfc2911] §4.4.5
printer-make-and-model	text(127)	PD	MAY	[rfc2911] §4.4.9
printer-message-date-time	dateTime	PD	MAY	[rfc3380] §6.5
printer-message-from-operator	text(127)	PD	MAY	[rfc2911] §4.4.25
printer-message-time	integer(MIN:MAX)	PD	MAY	[rfc3380] §6.4
printer-more-info	uri	PD	MAY	[rfc2911] §4.4.7
printer-more-info-manufacturer	uri	PD	MAY	[rfc2911] §4.4.10
printer-name	name(127)	PD	MUST	[rfc2911] §4.4.4
printer-notify-server-uri	uri	PD	MAY	[not-srv] §4.1
printer-resolution-default	resolution	JT,DT	MAY	[rfc2911] §4.2.12
printer-resolution-supported	1setOf resolution	JT,DT	MAY	[rfc2911] §4.2.12
printer-settable-attributes-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.1
printer-state	type1 enum	PD	MUST	[rfc2911] §4.4.11
printer-state-change-date-time	dateTime	PD	MAY	[ntfy] §6.2
printer-state-change-time	integer(1:MAX)	PD	MAY	[ntfy] §6.1
printer-state-message	text(MAX)	PD	MAY	[rfc2911] §4.4.13
printer-state-reasons	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.12
printer-up-time	integer(1:MAX))	PD	MUST	[rfc2911] §4.4.29
printer-uri-supported	1setOf uri	PD	MUST	[rfc2911] §4.4.1
printer-xri-supported	1setOf collection	PD	MAY	[rfc3380] §6.6
xri-uri	uri	PD	MUST	[rfc3380] §6.6
xri-authentication	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
xri-security	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
print-quality-default	type2 enum	JT,DT	MAY	[rfc2911] §4.2.13

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
print-quality-supported	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.13
queued-job-count	integer(0:MAX)	PD	MUST	[rfc2911] §4.4.24
reference-uri-schemes-supported	1setOf uriScheme	PD	MUST ⁶⁶	[rfc2911] §4.4.27
separator-sheets-default	collection	JT,DT	MAY	[pwg5100.3] §3.18.3
separator-sheets-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.18.4
separator-sheets-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.18.1.1
sheet-collate-default	type2 keyword	JT,DT	MAY	[rfc3381] §3.1
sheet-collate-supported	1setOf type2 keyword	JT,DT	MAY	[rfc3381] §3.1
sides-default	type2 keyword	JT,DT	MAY	[rfc2911] §4.2.8
sides-supported	1setOf type2 keyword	JT,DT	MAY	[rfc2911] §4.2.8
stitching-locations-supported	1setOf (integer(0:MAX) rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.3.1
stitching-offset-supported	1setOf (integer (0:MAX) rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.2.1
stitching-reference-edge-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.2.2.1.1
subordinate-printers-supported	1setOf uri	PD	MAY	[adm-ops] §7.1
uri-authentication-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.2
uri-security-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.3
user-defined-values-supported	1setOf type2 keyword	PD	MAY	[pwg5100.3] §5.1
which-jobs-supported	1setOf type2 keyword	PD	MAY	[ippsave] §7.8
x-image-position-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.2
x-image-position-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.2
x-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.3
x-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.3
xri-authentication-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.8
xri-security-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.9
xri-uri-scheme-supported	1setOf uriScheme	PD	MAY	[rfc3380] §6.7
x-side1-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.4
x-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.4
x-side2-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.5
x-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.5
y-image-position-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.6
y-image-position-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.6
y-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.7
y-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.7
y-side1-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.8
y-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.8
y-side2-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.9
y-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.9

The remainder of this section defines the Printer Description attributes that are not defined in other specifications. Most of these are “xxx-default” and “xxx-supported” Printer Description attributes. A Printer MUST support these Printer Description attributes, if it supports the corresponding Operation/Description attributes, in order to indicate the default and supported values that the Printer supports.

⁶⁶ The Printer MUST support “reference-uri-scheme-supported” Printer Description attribute, since the Send-URI operation is REQUIRED.

10.1attributes-charset-supported (1setOf charset)

This REQUIRED Printer Description attribute indicates the charsets that the Printer supports as values of text and name attributes, that is, supports as values of the “attributes-charset” Operation attribute ([rfc2911] section 3.1.4), Job Description ([rfc2911] section 4.3.19), and Document Description attributes (section 9.1.1).

10.2attributes-natural-language-supported (1setOf naturalLanguage)

This REQUIRED Printer Description attribute indicates the natural languages that the Printer supports as values of test and name attributes, that is, supports as values of the “attributes-natural-language” Operation attribute ([rfc2911] section 3.1.4), Job Description ([rfc2911] section 4.3.20), and Document Description attributes (section 9.1.2).

10.310.1 document-creation-attributes-supported (1setOf type2 keyword)

This REQUIRED Printer Description attribute lists the keyword names of the Document Template and Operation attributes that the Printer will accept in the [Create-Document](#), [Send-Document](#), and [Send-URI Document Creation](#) operations.

10.4printer-state-reasons (1setOf type2 keyword)

This Printer Description attribute augments the “printer-state” of the Printer with additional information about the state of the Printer. Table 15 lists all of the values defined for the “printer-state-reasons” Printer Description attribute.

Table 15 – Values of the “printer-state-reasons” Printer attribute

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
printer-state-reasons	1setOf type2-keyword	MUST	[rfc2911] §4.4.12
	other	MAY	[rfc2911] §4.4.12
	none	MUST	[rfc2911] §4.4.12
	connecting-to-device	MAY	[rfc2911] §4.4.12
	cover-open	MAY	[rfc2911] §4.4.12
	deactivated	MAY	[adm-ops] §8.2
	developer-empty	MAY	[rfc2911] §4.4.12
	developer-low	MAY	[rfc2911] §4.4.12
	door-open	MAY	[rfc2911] §4.4.12
	fuser-over-temp	MAY	[rfc2911] §4.4.12
	fuser-under-temp	MAY	[rfc2911] §4.4.12
	hold-new-jobs	MAY	[adm-ops] §8.1
	input-tray-missing	MAY	[rfc2911] §4.4.12
	interlock-open	MAY	[rfc2911] §4.4.12
	interpreter-resource-unavailable	MAY	[rfc2911] §4.4.12
	marker-supply-empty	MAY	[rfc2911] §4.4.12
	marker-supply-low	MAY	[rfc2911] §4.4.12
	marker-waste-almost-full	MAY	[rfc2911] §4.4.12
	marker-waste-full	MAY	[rfc2911] §4.4.12
	media-empty	MAY	[rfc2911] §4.4.12
	media-jam	MAY	[rfc2911] §4.4.12

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
	media-low	MAY	[rfc2911] §4.4.12
	media-needed	MAY	[rfc2911] §4.4.12
	moving-to-paused	CMUST ⁶⁷	[rfc2911] §4.4.12
	opc-life-over	MAY	[rfc2911] §4.4.12
	opc-near-eol	MAY	[rfc2911] §4.4.12
	output-area-almost-full	MAY	[rfc2911] §4.4.12
	output-area-full	MAY	[rfc2911] §4.4.12
	output-tray-missing	MAY	[rfc2911] §4.4.12
	paused	CMUST ⁶⁸	[rfc2911] §4.4.12
	shutdown	MAY	[rfc2911] §4.4.12
	spool-area-full	SHOULD	[rfc2911] §4.4.12
	stopped-partly	MAY	[rfc2911] §4.4.12
	stopping	MAY	[rfc2911] §4.4.12
	timed-out	MAY	[rfc2911] §4.4.12
	toner-empty	MAY	[rfc2911] §4.4.12
	toner-low	MAY	[rfc2911] §4.4.12

This description is taken from [rfc2911] with additions from other IPP extension documents:

This REQUIRED Printer attribute supplies additional detail about the device's state. Some of these value definitions indicate conformance requirements; the rest are OPTIONAL.

Each keyword value MAY have a suffix to indicate its level of severity. The three levels are: report (least severe), warning, and error (most severe).

'-report': This suffix indicates that the reason is a "report". An implementation may choose to omit some or all reports. Some reports specify finer granularity about the printer state; others serve as a precursor to a warning. A report MUST contain nothing that could affect the printed output.

'-warning': This suffix indicates that the reason is a "warning". An implementation may choose to omit some or all warnings. Warnings serve as a precursor to an error. A warning MUST contain nothing that prevents a job from completing, though in some cases the output may be of lower quality.

'-error': This suffix indicates that the reason is an "error". An implementation MUST include all errors. If this attribute contains one or more errors, printer MUST be in the stopped state.

If the implementation does not add any one of the three suffixes, all parties MUST assume that the reason is an "error".

If a Printer object controls more than one output device, each value of this attribute MAY apply to one or more of the output devices. An error on one output device that does not stop the Printer object as a whole MAY appear as a warning in the Printer's "printer-state-reasons attribute". If the "printer-state" for such a Printer has a value of 'stopped', then there MUST be an error reason among the values in the "printer-state-reasons" attribute.

The following standard keyword values are defined (in alphabetical order):

⁶⁷ The Printer MUST support the 'moving-to-paused' value if the Printer supports the Pause-Printer operation and the Printer takes significant time to move to paused.

⁶⁸ The Printer MUST support the 'paused' value if the Printer supports the Pause-Printer operation.

- 1956 ~~'other': The device has detected an error other than one listed in this document.~~
- 1957 ~~'none': There are not reasons. This state reason is semantically equivalent to "printer-state-reasons" without~~
- 1958 ~~any value and MUST be used, since the 1setOf attribute syntax requires at least one value.~~
- 1959 ~~'connecting-to-device': The Printer object has scheduled a job on the output device and is in the process of~~
- 1960 ~~connecting to a shared network output device (and might not be able to actually start printing the job~~
- 1961 ~~for an arbitrarily long time depending on the usage of the output device by other servers on the~~
- 1962 ~~network).~~
- 1963 ~~'cover-open': One or more covers on the device are open.~~
- 1964 ~~'deactivated': A client has issued a Deactivate-Printer operation for the Printer object (see [adm-ops]~~
- 1965 ~~section 3.4.1) and the Printer is in the process of becoming deactivated or has become deactivated.~~
- 1966 ~~The Printer MUST reject all requests except Activate-Printer, queries (Get-Printer-Attributes, Get-~~
- 1967 ~~Job-Attributes, Get-Jobs, etc.), Send-Document, and Send-URI (so that partial job submission can~~
- 1968 ~~be completed - see [adm-ops] section 3.1.1) and return the 'server-error-service-unavailable' status~~
- 1969 ~~code.~~
- 1970 ~~'developer-empty': The device is out of developer.~~
- 1971 ~~'developer-low': The device is low on developer.~~
- 1972 ~~'door-open': One or more doors on the device are open.~~
- 1973 ~~'fuser-over-temp': The fuser temperature is above normal.~~
- 1974 ~~'fuser-under-temp': The fuser temperature is below normal.~~
- 1975 ~~'hold-new-jobs': The operator has issued the Hold-New-Jobs operation (see [adm-ops] section 3.3.1) or~~
- 1976 ~~other means, but the output device(s) are taking an appreciable time to stop. Later, when all output~~
- 1977 ~~has stopped, the "printer-state" becomes 'stopped', and the 'paused' value replaces the 'moving-to-~~
- 1978 ~~paused' value in the "printer-state-reasons" attribute. This value MUST be supported, if the Hold-~~
- 1979 ~~New-Jobs operation is supported and the implementation takes significant time to pause a device in~~
- 1980 ~~certain circumstances.~~
- 1981 ~~'input-tray-missing': One or more input trays are not in the device.~~
- 1982 ~~'interlock-open': One or more interlock devices on the printer are unlocked.~~
- 1983 ~~'interpreter-resource-unavailable': An interpreter resource is unavailable (i.e. font, form)~~
- 1984 ~~'marker-supply-empty': The device is out of at least one marker supply. (e.g. toner, ink, ribbon)~~
- 1985 ~~'marker-supply-low': The device is low on at least one marker supply. (e.g. toner, ink, ribbon)~~
- 1986 ~~'marker-waste-almost-full': The device marker supply waste receptacle is almost full.~~
- 1987 ~~'marker-waste-full': The device marker supply waste receptacle is full.~~
- 1988 ~~'media-empty': At least one input tray is empty.~~
- 1989 ~~'media-jam': The device has a media jam.~~
- 1990 ~~'media-low': At least one input tray is low on media.~~
- 1991 ~~'media-needed': A tray has run out of media.~~
- 1992 ~~'moving-to-paused': Someone has paused the Printer object using the Pause-Printer operation (see~~
- 1993 ~~[rfc2911] section 3.2.7) or other means, but the device(s) are taking an appreciable time to stop.~~
- 1994 ~~Later, when all output has stopped, the "printer-state" becomes 'stopped', and the 'paused' value~~
- 1995 ~~replaces the 'moving-to-paused' value in the "printer-state-reasons" attribute. This value MUST be~~
- 1996 ~~supported, if the Pause-Printer operation is supported and the implementation takes significant time~~
- 1997 ~~to pause a device in certain circumstances.~~
- 1998 ~~'opc-life-over': The optical photo conductor is no longer functioning.~~

~~'opc-near-eol': The optical photo-conductor is near end of life.~~

~~'output-area-almost-full': One or more output area is almost full (e.g. tray, stacker, collator).~~

~~'output-area-full': One or more output area is full. (e.g. tray, stacker, collator)~~

~~'output-tray-missing': One or more output trays are not in the device~~

~~'paused': Someone has paused the Printer object using the Pause-Printer operation (see [rfc2911] section 3.2.7) or other means and the Printer object's "printer-state" is 'stopped'. In this state, a Printer MUST NOT produce printed output, but it MUST perform other operations requested by a client. If a Printer had been printing a job when the Printer was paused, the Printer MUST resume printing that job when the Printer is no longer paused and leave no evidence in the printed output of such a pause. This value MUST be supported, if the Pause-Printer operation is supported.~~

~~'shutdown': Someone has removed a Printer object from service, and the device may be powered down or physically removed. In this state, a Printer object MUST NOT produce printed output, and unless the Printer object is realized by a print server that is still active, the Printer object MUST perform no other operations requested by a client, including returning this value. If a Printer object had been printing a job when it was shutdown, the Printer MAY resume printing that job when the Printer is no longer shutdown. If the Printer resumes printing such a job, it MAY leave evidence in the printed output of such a shutdown, e.g. the part printed before the shutdown MAY be printed a second time after the shutdown.~~

~~'spool-area-full': The limit of persistent storage allocated for spooling has been reached. The Printer is temporarily unable to accept more jobs. The Printer will remove this value when it is able to accept more jobs. This value SHOULD be used by a non-spooling Printer that only accepts one or a small number jobs at a time or a spooling Printer that has filled the spool space.~~

~~'stopped-partly': When a Printer object controls more than one output device, this reason indicates that one or more output devices are stopped. If the reason is a report, fewer than half of the output devices are stopped. If the reason is a warning, fewer than all of the output devices are stopped.~~

~~'stopping': The Printer object is in the process of stopping the device and will be stopped in a while. When the device is stopped, the Printer object will change the Printer object's state to 'stopped'. The 'stopping-warning' reason is never an error, even for a Printer with a single output device. When an output device ceases accepting jobs, the Printer will have this reason while the output device completes printing.~~

~~'timed-out': The server was able to connect to the output device (or is always connected), but was unable to get a response from the output device.~~

~~'toner-empty': The device is out of toner.~~

~~'toner-low': The device is low on toner.~~

11 New Values for Existing Printer Description Attributes

This section contains those attributes for which additional values are added.

11.1 operations-supported (1setOf type2 enum)

The following "operation-id" values are added in order to support the new operations defined in this document:

2037 **Table 16 – Operation-id assignments**

Value	Operation Name	Reference
0x0033	Cancel-Documents	[this-spec] §4.5
0x0034	Get-Documents-Attributes	[this-spec] §4.3
0x0035	Get-Documents	[this-spec] §3.3
0x0036	Delete-Documents	[this-spec] §5.4
0x0037	Set-Documents-Attributes	[this-spec] §4.4

2038

2039 **12 Encodings of Additional Attribute Tags**

2040 This section assigns values to an attributes tags as an extension to the encoding defined in [rfc2910]).

2041 The “document-attributes-tag” delimits Document Template Attributes Groups in requests and Document Attributes
2042 Groups in responses.

2043 The following table specifies the values for the delimiter tag:

Tag Value (Hex)	Meaning
0x09	“document-attributes-tag”

2044

2045 **13 [Status codes](#)**

2046 [This section defines additional status codes for use with multi-document jobs.](#)

2047 **[13.1 server-error-too-many-jobs \(0x050B\)](#)**

2048 [The client has attempted to create a Job using any of the Job Creation operations which would exceed the capacity](#)
2049 [of the Printer and/or the policy for this user or type of job. The client SHOULD NOT try again later.](#)

2050 **[13.2 server-error-too-many-documents \(0x050C\)](#)**

2051 [The client has attempted to create a Document using any of the Document Creation operations which would exceed](#)
2052 [the capacity of the Printer for this Job and/or the policy for this user or type of job. The client SHOULD NOT try again](#)
2053 [later.](#)

2054 **14 Conformance Requirements**

2055 This section specifies the conformance requirements for Printers and clients.

2056 **14.1 Printer conformance requirements**

2057 In order to conform to this specification, a Printer:

- 2058 1. MUST meet the conformance requirements for Printers specified in [rfc2911].

- 2059 2. MUST support the Job operation that section 3 REQUIRES a Printer to support.
- 2060 3. MUST support the Document operations that section 4 REQUIRES a Printer to support.
- 2061 4. MAY support any of the Administrative operations in section 5.
- 2062 5. MUST support the Attribute Precedence semantics specified in section 6 for the levels that the Printer
2063 supports.
- 2064 6. MUST support the Operation attributes in the Send-Document operation and, if supported, the Send-URI
2065 operation that section 7 REQUIRES a Printer to support.
- 2066 7. MUST support any Operation attributes that section 7 REQUIRES a Printer to support along with the
2067 corresponding Document Description attributes that section 9 REQUIRES a Printer to support and any
2068 "xxx-default" and "xxx-supported" Printer attributes that section 10 REQUIRES a Printer to support.
- 2069 8. MAY support any of the Document Template attributes in Document Creation operations as indicated in
2070 section 8 and MUST NOT support them for contexts for where they are not defined as indicated in the
2071 Table 11~~Table 14~~ with an "-".
- 2072 9. MUST support the Document Description attributes that section 9 REQUIRES a Printer to support.
- 2073 10. MUST support the Printer attributes that section 10 REQUIRES a Printer to support.
- 2074 11. MUST support the values of Printer Description attributes that section 11 REQUIRES a Printer to
2075 support.

2076 14.2 Client conformance requirements

2077 In order to conform to this specification, a client:

- 2078 1. MUST meet the conformance requirements for clients specified in [rfc2911]
- 2079 2. MAY support any of the Document operations defined in section 3.8.
- 2080 3. MUST supply the Operation attributes that section 7 REQUIRES a client to supply in operation requests.
- 2081 4. MUST supply any Document Template attributes in the format that section 8 REQUIRES a client to supply in
2082 Document Creation operations and MUST NOT support them for contexts for where they are not defined as
2083 indicated in the Table 11~~Table 14~~ with an "n".
- 2084 5. SHOULD support any of the Document Description attributes that section 9 REQUIRES a Printer to support.
- 2085 6. MAY support any of the Printer attributes listed in section 10.
- 2086 7. MAY support any of the values of the Printer Descriptions attributes in section 11.

2087

15 Normative References

2088 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols
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2221 **17 IANA Considerations**

2222 This section contains the registration information for IANA to add to the various IPP Registries according to the
 2223 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
 2224 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations-registry>.

2225 *Note to the RFC Editor: Replace the References below to [this spec] with the RFC number for the appropriate*
 2226 *document, so that it accurately reflects the content of the information for the IANA Registry.*

2227 **17.1 Attribute Registrations**

2228 The following table lists all the attributes defined in this specification. These are to be registered according to the
 2229 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
 2230 specification, that sub-section is listed as the Reference. This specification lists most Job Template attributes as also
 2231 being Document Template attributes. However, the definitions of these Document Template attributes are not
 2232 duplicated in this specification. Instead, the Reference column in this sub-section indicates Section 8 which contains
 2233 a table of all Job Template and corresponding Document Template attributes (including dropping the "job-" prefix).
 2234 This table contains the reference in another specification that completely defines each attribute. These Document
 2235 Template attributes will also be added to the IANA IPP Registry under the Document Template attributes with a
 2236 reference to this specification and Section 8.

Attribute Name (attribute syntax)	Reference	Section
-----	-----	-----
Document Description attributes:		
attributes-charset (charset)	[this spec]	9.1.1
attributes-natural-language (naturalLanguage)	[this spec]	9.1.2
compression (type3 keyword)	[this spec]	9.1.3
current-page-order (type2 keyword)	[this spec]	9.1.4
date-time-at-completed (dateTime)	[this spec]	9.1.5
date-time-at-creation (dateTime)	[this spec]	9.1.6
date-time-at-processing (dateTime)	[this spec]	9.1.7
detailed-status-message (1setOf text (MAX))	[this spec]	9.1.28
document-access-errors (1setOf text (MAX))	[this spec]	9.1.29
<u>document-charset (charset)</u>	<u>[this spec]</u>	9.1.8
<u>document-digital-signature (type2 keyword)</u>	<u>[this spec]</u>	9.1.9
document-format (mimeType)	[this spec]	9.1.8
<u>document-format-details (collection)</u>	<u>[this spec]</u>	9.1.11
<u>document-source-application-name (name (MAX))</u>	<u>[this spec]</u>	Error!
Reference source not found.		
<u>document-source-application-version (text (127))</u>		
	<u>[this spec]</u>	Error!
Reference source not found.		
<u>document-source-os-name (name (40))</u>	<u>[this spec]</u>	Error!
Reference source not found.		
<u>document-source-os-version (text (40))</u>	<u>[this spec]</u>	Error!
Reference source not found.		
<u>document-format (mimeType)</u>	<u>[this spec]</u>	Error!
Reference source not found.		
<u>document-format-device-id (text (127))</u>	<u>[this spec]</u>	Error!
Reference source not found.		
<u>document-format-version (text (127))</u>	<u>[this spec]</u>	Error!
Reference source not found.		
<u>document-natural-language (1setOf naturalLanguage)</u>		
	<u>[this spec]</u>	Error!
Reference source not found.		
<u>document-format-details-detected (1setOf collection)</u>		
	<u>[this spec]</u>	9.1.12

2274	<u>document-format-detected (mimeMediaType)</u>	<u>[this spec]</u>	9.1.13
2275	<u>document-format-version (text(127))</u>	<u>[this spec]</u>	9.1.14
2276	<u>document-format-version-detected (text(127))</u>	<u>[this spec]</u>	9.1.15
2277	document-job-id (integer(1:MAX))	[this spec]	9.1.11
2278	document-job-uri (uri)	[this spec]	9.1.17
2279	document-message (text(MAX))	[this spec]	9.1.18
2280	document-name (name(MAX))	[this spec]	9.1.19
2281	document-natural-language (naturalLanguage)	[this spec]	9.1.20
2282	document-number (integer(0:MAX))	[this spec]	9.1.21
2283	document-printer-uri (uri)	[this spec]	9.1.22
2284	document-state (type1 enum)	[this spec]	9.1.23
2285	document-state-message (text(MAX))	[this spec]	9.1.24
2286	document-state-reasons (1setOf type2 keyword)	[this spec]	9.1.25
2287	document-uri (uri)	[this spec]	9.1.26
2288	impressions (integer(0:MAX))	[this spec]	9.1.31
2289	impressions-completed (integer(0:MAX))	[this spec]	9.1.32
2290	impressions-completed-current-copy (integer(0:MAX))		
2291		[this spec]	9.1.27
2292	k-octets (integer(0:MAX))	[this spec]	9.1.33
2293	k-octets-processed (integer(0:MAX))	[this spec]	9.1.34
2294	last-document (boolean)	[this spec]	9.1.39
2295	media-sheets (integer(0:MAX))	[this spec]	9.1.35
2296	media-sheets-completed (integer(0:MAX))	[this spec]	9.1.36
2297	more-info (uri)	[this spec]	9.1.37
2298	output-device-assigned (name(127))	[this spec]	9.1.41
2299	printer-up-time (integer (1:MAX))	[this spec]	9.1.38
2300	sheet-completed-copy-number (integer(0:MAX))	[this spec]	9.1.42
2301	time-at-completed (integer (MIN:MAX))	[this spec]	9.1.43
2302	time-at-creation (integer (MIN:MAX))	[this spec]	9.1.44
2303	time-at-processing (integer (MIN:MAX))	[this spec]	9.1.45
2304			
2305			
2306	Document Templates attributes:		
2307	ACTION (Tom) - Need to add the xxx-default and xxx-supported for each.		
2308	copies (integer(1:MAX))	[this spec]	8
2309	cover-back (collection)	[this spec]	8
2310	cover-type (type2 keyword)	[this spec]	8
2311	media (type3 keyword name(MAX))	[this spec]	8
2312	media-col (collection)	[this spec]	8
2313	cover-front (collection)	[this spec]	8
2314	cover-type (type2 keyword)	[this spec]	8
2315	media (type3 keyword name(MAX))	[this spec]	8
2316	media-col (collection)	[this spec]	8
2317	feed-orientation (type3 keyword)	[this spec]	8
2318	finishings (1setOf type2 enum)	[this spec]	8
2319	finishings-col (collection)	[this spec]	8

2320	finishing-template (name(MAX))	[this spec]	8
2321	stitching (collection)	[this spec]	8
2322	stitching-locations (1setOf integer(0:MAX))	[this spec]	8
2323	stitching-offset (integer (0:MAX))	[this spec]	8
2324	stitching-reference-edge (type2 keyword)	[this spec]	8
2325	font-name-requested (name(MAX))	[this spec]	8
2326	font-size-requested (integer(1:MAX))	[this spec]	8
2327	force-front-side (1setOf integer(1:MAX))	[this spec]	8
2328	imposition-template (type2 keyword name(MAX))	[this spec]	8
2329	insert-sheet (1setOf collection)	[this spec]	8
2330	insert-after-page-number (integer(0:MAX))	[this spec]	8
2331	insert-count (integer(0:MAX))	[this spec]	8
2332	media (type3 keyword name(MAX))	[this spec]	8
2333	media-col (collection)	[this spec]	8
2334	media (type3 keyword name(MAX))	[this spec]	8
2335	media-col (collection)	[this spec]	8
2336	media-back-coating (type3 keyword name(MAX))	[this spec]	8
2337	media-color (type3 keyword name(MAX))	[this spec]	8
2338	media-front-coating (type3 keyword name(MAX))	[this spec]	8
2339	media-hole-count (integer(0:MAX))	[this spec]	8
2340	media-info (text(255))	[this spec]	8
2341	media-key (type3 keyword name(MAX))	[this spec]	8
2342	media-order-count (integer(1:MAX))	[this spec]	8
2343	media-preprinted (type3 keyword name(MAX))	[this spec]	8
2344	media-recycled (type3 keyword name(MAX))	[this spec]	8
2345	media-size (collection)	[this spec]	8
2346	x-dimension (integer(0:MAX))	[this spec]	8
2347	y-dimension (integer(0:MAX))	[this spec]	8
2348	media-type (type3 keyword name(MAX))	[this spec]	8
2349	media-weight-metric (integer(0:MAX))	[this spec]	8
2350	media-input-tray-check (type3 keyword name(MAX))		
2351		[this spec]	8
2352	number-up (integer(1:MAX))	[this spec]	8
2353	orientation-requested (type2 enum)	[this spec]	8
2354	output-bin (type2 keyword name(MAX))	[this spec]	8
2355	page-delivery (type2 keyword)	[this spec]	8
2356	page-order-received (type2 keyword)	[this spec]	8
2357	page-overrides (1setOf collection)	[this spec]	8
2358	document-copies (1setOf rangeOfInteger(MAX))	[this spec]	8
2359	input-documents (1setOf rangeOfInteger(MAX))	[this spec]	8
2360	output-documents (1setOf rangeOfInteger(MAX))	[this spec]	8
2361	pages (1setOf rangeOfInteger(MAX))	[this spec]	8
2362	<any other Job Template attributes that affect pages,		
2363	such as media or media-col>		
2364	page-ranges (1setOf rangeOfInteger(1:MAX))	[this spec]	8
2365	pages-per-subset (1setOf integer(1:MAX))	[this spec]	8

```

2366 presentation-direction-number-up (type2 keyword) [this spec]      8
2367 print-quality (type2 enum) [this spec]      8
2368 printer-resolution (resolution) [this spec]      8
2369 separator-sheets (collection) [this spec]      8
2370     media (type3 keyword | name(MAX)) [this spec]      8
2371     media-col (collection) [this spec]      8
2372     separator-sheets-type (type3 keyword | name(MAX)) [this spec]      8
2373
2374 sheet-collate (type2 keyword) [this spec]      8
2375 sides (type2 keyword) [this spec]      8
2376 x-image-position (type2 keyword) [this spec]      8
2377 x-image-shift (integer(MIN:MAX)) [this spec]      8
2378 x-side1-image-shift (integer(MIN:MAX)) [this spec]      8
2379 x-side2-image-shift (integer(MIN:MAX)) [this spec]      8
2380 y-image-position (type2 keyword) [this spec]      8
2381 y-image-shift (integer(MIN:MAX)) [this spec]      8
2382 y-side1-image-shift (integer(MIN:MAX)) [this spec]      8
2383 y-side2-image-shift (integer(MIN:MAX)) [this spec]      8
2384
2385

```

2386 ~~Job Description attributes:~~

2387 ~~job-mandatory-attributes (1setOf type2 keyword) [this spec] **Error!**~~

2388 ~~Reference source not found.~~

2389

2390

2391 ~~Job Template attributes:~~

2392 ~~ACTION (Tom) -- Need to add the JT and DT xxx-default and xxx-supported.~~

2393 ~~job-copies (integer(1:MAX)) [this spec] **Error!**~~

2394 ~~Reference source not found.~~

2395 ~~job-cover-back (collection) [this spec] **Error!**~~

2396 ~~Reference source not found.~~

2397 ~~--<member attributes are the same as "cover-back">~~

2398 ~~job-cover-front (collection) [this spec] **Error!**~~

2399 ~~Reference source not found.~~

2400 ~~--<member attributes are the same as "cover-front">~~

2401 ~~job-finishings (1setOf type2 enum) [this spec] **Error!**~~

2402 ~~Reference source not found.~~

2403 ~~job-finishings-col (1setOf collection) [this spec] **Error!**~~

2404 ~~Reference source not found.~~

2405 ~~--<member attributes are the same as "finishings-col">~~

2406 ~~media-size-name (type3 keyword | name(MAX)) [this spec] **Error!**~~

2407 ~~Reference source not found.~~

2408 ~~media-type (type3 keyword | name(MAX)) [this spec] **Error!**~~

2409 ~~Reference source not found.~~

2410

2411

Printer Description attributes:
document-creation-attributes-supported (1setOf type2 keyword)
[this spec] 10.1
Operation attributes:
document-message (text(MAX)) [this spec]
9.1.18~~Error! Reference source not found.~~
~~last-document (boolean) [this spec] Error!~~
~~Reference source not found.~~

17.2 Keyword attribute values

ACTION (Tom) - Need to list the keyword attribute values. Do so by reference to the values registered for corresponding attributes.

17.3 Enum Attribute Values

The following table lists all the new enum attribute values defined in this document as additional type2 enum values. These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

Value	Name	Reference	Section:
-----	-----	-----	-----
document-state (type1 enum)		[this spec]	9.1.23
3 pending		[this spec]	9.1.23
5 processing		[this spec]	9.1.23
7 canceled		[this spec]	9.1.23
8 aborted		[this spec]	9.1.23
9 completed		[this spec]	9.1.23
job-finishings (1setOf type2 enum)		[this spec]	Error!
Reference source not found.			
—<enum values are the same as "finishings">			
operations-supported (type2 enum)		[rfc2911]	4.4.15
0x0033 Cancel-Document		[this spec]	4.5
0x0034 Get-Document-Attributes		[this spec]	4.3
0x0035 Get-Documents		[this spec]	3.3
0x0036 Delete-Document		[this spec]	5.4
0x0037 Set-Document-Attributes		[this spec]	4.4
0x0039 Create-Document		[this spec]	Error!
Reference source not found.			
0x003A Send Data		[this spec]	Error!
Reference source not found.			

17.4 Operations

The following table lists all of the operations defined in this document. These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.4.

Operations	Reference	Section
-----	-----	-----
Cancel-Document	[this spec]	4.5
Create-Document	[this spec]	Error!
Reference source not found.		
Delete-Document	[this spec]	5.4
Get-Document-Attributes	[this spec]	4.3
Get-Documents	[this spec]	3.3
Send-Data	[this spec]	Error!
Reference source not found.		
Set-Document-Attributes	[this spec]	4.4

17.5 Attribute Group tags

The following table lists all the attribute group tags defined in this [documentspecification](#). These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.5.

Value	Name	Reference	Section
-----	-----	-----	-----
0x09	document-attributes-tag	[this spec]	12

17.6 Status codes

[The following table lists all the status codes defined in this specification. These are to be registered according to the procedures in RFC 2911 \[rfc2911\] section 6.6.](#)

Value	Status Code Name	Reference	Section
-----	-----	-----	-----
0x0500:0x05FF - Server Error:			
0x050B	server-error-too-many-jobs	[this spec]	
0x050C	server-error-too-many-documents	[this spec]	

18 Internationalization Considerations

The internationalization considerations for this extension for handling the Document object are the same as for handling the Job object in [rfc2911].

2486 19 Security Considerations

2487 The Document object should provide no more increased security considerations than the Job object. The Printer
2488 MUST provide the same access control for Document objects as for Job objects.

2489 ~~As with the Create-Job operation is [rfc2911], the~~ The Printer implementer needs to consider counter measures for
2490 denial of service attacks for the ~~Create-Document~~ Create-Job operation. For example, a rogue client could issue
2491 repeated ~~Create-Document~~ Create-Job and/or ~~Send-Document/Send-URI~~ requests in an attempt to exceed the capacity of
2492 the Printer to absorb such requests and thereby deny Job Creation and Document Creation requests from other
2493 clients. For example, avoid a fixed set of allocations for Jobs and Documents. Also be able to detect when an
2494 excessive number of Create-Job and ~~Create-Document~~ Send-Document/Send-URI requests have been supplied. In
2495 such a case, the Printer would return either a 'server-error-~~service-unavailable~~ too-many-jobs' status code (see
2496 ~~[rfc2911] section 13.1~~ 13.1.5.3) or a 'server-error-~~temporary-error~~ too-many-documents' status code (see section
2497 13.2 ~~[rfc2911] 13.1.5.6~~).

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2525 23 Appendix A: Document operations compared to Job operations

2526 This appendix compares the Document operations with the existing Job operations to show the parallelism.

2527 ~~Table 17~~ compares the Job and Document operations. The two Conf. columns indicate the conformance
 2528 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"
 2529 in the Document Conformance column means if the Document object is supported. Whether a Document operation
 2530 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
 2531 of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-
 2532 based protocols, APIs, and implementations.

2533 **Table 17 - Document operations compared to Job operations**

Job operations	Job Conf.	Document operations	Doc Conf
Cancel-Current-Job	OPT	<i>N/A, can only cancel a document explicitly by document number and explicit job id.</i>	OPT
Cancel-Job	REQ	Cancel-Document	REQ
Create-Job	OPT	Create-Document	OPT
Get-Job-Attributes	REQ	Get-Document-Attributes	REQ
Get-Jobs	REQ	Get-Documents	REQ
Hold-Job		<i>N/A, can only hold an entire job.</i>	
Print-Job	REQ	Send-Document (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.1)	OPT
Print-URI	OPT	Send-URI (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.2)	OPT
N/A		Send-Data	REQ
Promote-Job	OPT	<i>N/A, can only promote an entire job</i>	
Purge-Jobs	OPT	Delete-Document	OPT
Release-Held-New-Jobs	OPT	<i>N/A, can only release entire jobs</i>	
Release-Job	OPT	<i>N/A, can only release an entire job</i>	
Reprocess-Job	OPT	<i>N/A, can only reprocess an entire job</i>	
Restart-Job	OPT	<i>N/A, can only restart an entire job</i>	
Resume-Job	OPT	<i>N/A, can only resume an entire job</i>	
Schedule-Job-After	OPT	<i>N/A, can only schedule an entire job</i>	
Set-Job-Attributes	OPT	Set-Document-Attributes	OPT
Suspend-Current-Job	OPT	<i>N/A, can only suspend an entire job in order to run another one</i>	
Validate-Job	REQ	<i>N/A, use Validate-Job to validate a single document or use Create-Job with "ipp-attribute-fidelity" = 'true' and Create-Document request to validate each document in a multi-document job.</i>	REQ

2534
2535

2536 24 Annex B: Change Log (informative)

2537 The following summaries of the changes in chronological order:

2538 Version 0.3, 9 September 2002:

- 2539 1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
- 2540 2. Added "original-requesting-user-name" Operation attribute to ~~Table 8~~ ~~Table 8~~.
- 2541 3. Added "y" to "output-bin" in ~~Table 10~~ ~~Table 10~~ so it MAY be a Document Template attribute.
- 2542 4. Clarified the * and in ~~Table 11 - Job and Document Description attributes~~ ~~Table 11 - Job and Document~~
 2543 ~~Description attributes~~.
- 2544 5. Added section 9.1.1 all of the Printer attributes defined In any IPP standard.
- 2545 6. Allocated operation-id enums in section 11 to the 7 Document operations.

- 2546 7. Added the conformance section 14
- 2547 8. Completed the IANA Considerations section 0.
- 2548

2549 Version 0.4, 14 October 2002:

- 2550 1. Added the operation specifications.
- 2551 2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
- 2552 3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.
- 2553 4. Added the Attribute Precedence section 6.
- 2554 5. Added [ippsave] attributes.
- 2555 6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col.
- 2556 document-id-uri, and redirect-uri.
- 2557

2558 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:

- 2559 1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved by
- 2560 the PWG Last Call to progress as a Draft Standard.
- 2561 2. Changed Cancel-Document from OPTIONAL to REQUIRED.
- 2562 3. Added ~~Table 4~~Table 4 and ~~Table 5~~Table 5 to show the request and response signatures of the Document
- 2563 Creation and Validation operations.
- 2564 4. Renamed the "document-number" Operation attribute to "input-document-number", to agree with [pwg5100.4]
- 2565 and because the Document object is really the Input Document (as opposed to the Output Document). The
- 2566 Printer copies this value to the Document's "document-number" Document Description attribute.
- 2567 5. Clarified that the Printer MUST reject a Create-Document request if the "document-number" already exists.
- 2568 6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
- 2569 7. Added "document-message" (text(127)) Operation attribute to the Document Creation requests to go with the
- 2570 "document-message" agreement (see point #15).
- 2571 8. Fixed Create-Document response to return Job status attributes in Group 3 and Document status attributes in
- 2572 Group 4.
- 2573 9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description
- 2574 attribute in a Document Creation response.
- 2575 10. Added the "document-mandatory-attributes" Operation attribute.
- 2576 11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job
- 2577 Attributes and the other Document attributes.
- 2578 12. Allowed the client to supply or omit the "document-uri" Operation attribute in a Validate-Job request.
- 2579 13. Clarified that the "document-number" Operation attribute MUST follow the Printer and Job Target in Group 1.
- 2580 14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number"
- 2581 and "document-id-uri" to be parallel with the Get-Jobs operation.
- 2582 15. Changed the "message" Operation attribute in Cancel-Document and Cancel-Current-Document to
- 2583 "document-message" Operation attribute which the Printer copies to the "document-message" Document
- 2584 Description attribute for use both by the user and the operator.
- 2585 16. Clarified that the "document-state-reasons" values never affect Job scheduling.
- 2586 17. Made Job Level - page override programming higher precedence than Document level Document object
- 2587 attributes.
- 2588 18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-
- 2589 requested".
- 2590 19. In ~~Table 8~~Table 8, flagged the Operation attributes that the Printer copies to the corresponding Job and
- 2591 Document Description attributes in Document Creations operations.
- 2592 20. Fixed "job-mandatory-attributes" Operation attribute so its only supplied at Job level, now that we have
- 2593 "document-mandatory-attributes" Operation attribute.
- 2594 21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts
- 2595 with "job-mandatory-attributes" and "document-mandatory-attributes" Operation attributes.
- 2596 22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages
- 2597 across Input-Documents.
- 2598 23. Disallowed "page-ranges" at the Page Level.
- 2599 24. Disallowed "pages-per-subset" at the Document level (and Page Level).
- 2600 25. Disallowed "separator-sheets" at the Page Level.

26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Documents-Attributes responses that the Printer MUST support, just like "job-printer-up-time" Operation attribute for Get-Jobs and Get-Job-Attributes.

Version 0.6, 13 January 2003, agreements from New Orleans October PWG meeting and subsequent telecons:

1. Deleted the Cancel-Current-Documents and Validate-Documents operations.
2. Deprecated the "input-document-number" Operation attribute from the Document Creation operations.
3. Deleted the "document-mandatory-attributes" Operation attribute to align with the PWG Semantic model. So both specifications have only the "job-mandatory-attributes" Operation attribute. The client can only supply at the Job Level. The Document Level inherits from the Job Level.
4. Increased "document-message" Operation attribute length from 127 to MAX (1023) octets.
5. Clarified that "ipp-attribute-fidelity" and "job-mandatory-attributes" can only be supplied at the Job Level; the Document level inherits their values.
6. Added "ipp-attribute-fidelity" and "job-mandatory-attributes" Job Description attributes.
7. Added the "media-size-name" as a member attribute of "media-col" and as a separate Job Template attribute as used by UPnPv1 and UPnPv2.
8. Added the "media-type" as a Job and Document Template attribute on its own as used by UPnPv1 and UPnPv2 (as well as leaving it as a member attribute of the "media-col" Job and Document Template attributes).
9. Renamed "document-printer-up-time" Document Description attribute to simply "printer-up-time".
10. Added the following Job Description attributes: "ipp-attribute-fidelity", and "job-mandatory-attributes".
11. Removed the following Document Description attributes: "ipp-attribute-fidelity".
12. Added the following Document Description attributes: "document-format-detail", "document-format-detected", "job-id", "job-printer-uri", "job-uri", "output-device-assigned".
13. Defined all of the Document Description attributes, often with references to other specifications, so that they appear in the table of contents.

Version 0.7, 14 March 2003, agreements from the Maui January PWG meeting and subsequent telecons:

1. Fixed up the file naming and numbering to agree with the latest PWG process agreements.
2. Updated the Abstract and Introduction to reflect the additions.
3. Fixed cross references to use the standard numbers as agreed, rather than mnemonic references.
4. Deprecated the "input-document-number" Operation attribute ([pwg5100.4] section 9.2.1 in the Create-Documents Requests
5. Renamed Send-Data to Send-Documents-Data to more clearly reflect the scope of the operation.
6. Added the REQUIRED Close-Job operation to close a job that contains Document objects. Using "last-document" still works too and the Printer MUST support both ways.
7. Retained the idea that the Printer MUST NOT copy down any attributes supplied in the Job Creation operation to the Document object as observable in Document object query responses. Document objects inherit that effect from the Job object.
8. Added the following operation and Document Description attributes: document-container-summary (collection), document-creator-application-name (name(MAX)), document-creator-application-version (text(127)), document-creator-os-name (name(40)), document-creator-os-version (text(40)), document-format-device-id (text(127)), document-format-version (text(127)). The "document-container-summary" collection attribute may contain them, plus "document-format" and "document-natural-language".
9. REQUIRED Printers to support "document-format-version" Document Description.
10. Deprecated "document-overrides" and indicated that the agreement is to re-issue [pwg5100.4] without "document-overrides".
11. Prefixed the following three Document Description attributes that are copies of Job Description attributes with "document-" so that no Document attribute has a "job-" prefix: "job-printer-uri" becomes "document-job-printer-uri", "job-uri" becomes "document-job-uri", and "job-id" becomes "document-job-id".
12. Added the encoding for the "document-attributes-tag" as 0x09.
13. Updated the IANA Registration section, but still needs more work.

Version 0.8, 24 March 2003, agreements from the March 20 telecon:

1. Changed the name of the Send-Document-Data back to Send-Data to keep the name short. There wasn't support for keeping the name of the object affected in the name of the operation.
2. Changed "job-mandatory-attributes" operation/Job Description attribute so that a Printer MUST support it.
3. Changed the name of the collection attribute back to "document-format-details".
4. Removed the Operation attributes and Document Description attributes that were already in the member attributes of "document-format-details", so that any details must use the "document-format-details" (1setOf collection).
5. Clarified that with the removal of "document-overrides", that the client can achieve subset finishing using "pages-per-subset" and "page-overrides".
6. Clarified that a Printer that supports "page-overrides" Document Template attribute MUST also support it as an Operation attribute in Send-Document and Send-URI, but not Create-Document, for backward compatibility.
7. Clarified that containers may contain containers, but that the "document-format-details" MUST be flattened, if present.
8. Clarified that the collection values MAY describe the container format itself, in which case, it must be the first collection value.
9. Added "document-format-details-detected (1setOf collection) Document Description attribute.
10. Clarified that "document-natural-language" identifies the primary or first language if a Document contains more than one language.
11. Added document-format-details-supported (1setOf type2 keyword) Printer Description attribute.
12. Added document-format-details-implemented (1setOf collection) Printer Description attribute.
13. Clarified that a Printer MUST support the "document-creation-attributes-supported" (1setOf type2 keywords) Printer Description attribute.

Version 0.9, 7 April 2003, agreements from the April 3 telecon:

1. Added "document-charset" (charset), "document-digital-signature" (type2 keyword), "document-format-version" (text(127)), and "document-natural-language" (naturalLanguage) Operation and Document Description attributes and corresponding "xxx-default" and "xxx-supported" Printer Description attributes.
2. Changed the "document-natural-language" member attribute of "document-format-details" (1setOf collection) operation attribute to be 1setOf, but kept the top level "document-natural-language" Operation attribute as single-valued.
3. Added Summary ~~Table 2~~ of new Operation/Document Description attributes.
4. Defined CONDITIONALLY REQUIRED and CMUST Conformance Terms.
5. Deleted the "document-id-uri" Operation attribute no longer needed by PSI.
6. Changed "ipp-attribute-fidelity" so it doesn't affect operation attributes, so it is the same as in [rfc2911].
7. Clarified the operation attributes supplied at the Job Level in Print-Job and Print-URI versus Create-Job by introducing the "p" notation in ~~Table 8~~.
8. Added columns to ~~Table 8~~ to show the corresponding Document Description attributes and the "xxx-default" and "xxx-supported" Printer Description attributes.
9. Clarified that all of the new Operation attributes are hints, except "document-charset" and "document-format" and that the client can turn them into Must Honor by supplying their keyword attribute names in the "job-mandatory-attributes" Operation attribute.
10. Add the unique lang prefix from the Printer MIB to all "document-format-version" values, so that they can all be in a single flat list for the Printer's "document-format-version-supported" Printer Description attribute.

Version 0.10, May 1, 2003, agreements from the May 1 telecon:

1. Removed the conformance language from the Abstract.
2. Clarified that the "job-mandatory-attributes" can include keywords that the Printer doesn't support. The rejection occurs only if the client actually supplies the unsupported Template attribute in a request.
3. Clarified that a Print-Job is indistinguishable to Create-Job and one Send-Document.
4. Added that the Printer MUST reject a redundant Close-Job.
5. Clarified that the Printer MUST validate Create-Document in the context of the Job as a whole, including previous Documents in the same Job.
6. Split ~~Table 7~~ of Operation Attributes into two. Show the syntaxes for the "xxx-default" and "xxx-supported" attributes in the first table.

2710 7. Split the Print-Job/Print-URI from the Create-Job into two columns.
2711 8. Added "output-device-requested" Operation attribute.
2712 9. Added the Printer options (reject, hold, ignore) when the client supplies unsupported values in the Operation
2713 attributes for all but "compression", "document-charset", "document-format".
2714 10. Use the 'application/vnd.PWG-XXX' for unregistered Printer MIB printer languages.
2715 11. Added "output-device-requested (name(127) Operation/Job Description attribute for Job Creation operations.
2716 12. Added "document-format-target" (mimeMediaType) and "document-format-version-target" (text(127) Job
2717 Template and Document Template attributes.
2718 13. Clarified that a Document Template attribute share the "xxx-default" and "xxx-supported" Printer attribute
2719 values with the Job Template attribute of the same name.
2720 14. Added that Document Template attributes MAY have corresponding "xxx-actual" Document Description
2721 attributes.
2722 15. Added "document-format-version-detected" Document Description attribute.
2723 16. Added 'digital-signature-did-not-verify', and 'digital-signature-type-not-supported', and [job-]errors-detected' to
2724 "job-state-reasons" and "document-state-reasons".
2725 17. Added 'job-digital-signature-wait' to "job-state-reasons".
2726
2727 Version 0.11, May 9, 2003, agreements from the May 1 telecon:
2728 18.1. Split the document up into 3 separate documents.
2729 a. The Document Object extension to IPP
2730 b. Job and Document extensions to IPP from IPPFAX, PSI and others
2731 c. Future extensions
2732 2. Added 'server-error-too-many-jobs' and 'server-error-too-many-documents' status codes.
2733 3. Removed Create-Document and Send-Data operations.
2734 4. Removed Job State and job-state-reasons info
2735