

Working Draft, May 9, 2003
Maturity Level: Development

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The Printer Working Group (PWG) Standard for Internet Printing Protocol (IPP): Page Overrides

Abstract: This IPP specification extends the IPP Model and Semantics [rfc2911] object model by relaxing the restriction that each attribute value is the same for all pages within a Document. For example, with this extension, page 1 of a job could have a different media from the other pages in the job.

This extension supports page Overrides by adding a new Template attribute: “page-overrides” – it has a syntax type of “1setOf collection”. Each ‘collection’ value contains attributes that identify the attributes to override and its associated value as well as the range of pages for the override. The range of pages is specified by the “document-copies” attribute and the “pages” attribute to allow overrides of pages in specific copies of the document.



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

ftp://www.pwg.org/pub/pwg/ipp/new_EXC/wd-ippOverride10-20030509.pdf, .doc

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Title: The Printer Working Group Standard for the Internet Printing Protocol (IPP): Page Overrides

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1 Introduction

The Internet Printing Protocol (IPP) is an application level protocol for distributed printing using Internet tools and technologies. IPP version 1.1 (IPP/1.1) requires that each attribute value be the same for all pages within a document within a job. This document defines OPTIONAL extensions to the IPP/1.1 model which relax this restriction and allow pages to have attributes that are overrides. For example, with this extension, page 1 of a Document could have a different media or different value of “sides” from the other pages in the document. Another example is that the 1st copy of the Document could be printed single sided on transparency and the remaining copies printed 4-up two sided and stapled. Page overrides always applies to pages within a document without regard to the “multiple-documents-handling” attribute.

This document is a proposal for an extension to IPP/1.0 and IPP/1.1. This document and the Document Object document[DocObj] replace the deprecated “Override Attributes for Documents and Pages document” [PWG5100.4]. The Document object provides overrides at the document level. This specification provides overrides at the page level.

This extension supports page overrides by adding a new Template attribute: “overrides” -- having a syntax type of “1setOf collection”. Each ‘collection’ value for “overrides” contains

A CONDITIONALLY MANDATORY attribute that identifies the documents containing the overridden pages, namely “document-numbers”. This attribute MUST be supplied if the Override is specified at the Job level and the Overrides apply only to specific Documents. If this attribute is not supplied at the Job level, the Override applies to all Documents in the Job. This attribute is SHOULD NOT be supplied and is ignored if the Override is specified at the Document level[DocObj].

A MANDATORY attribute that identifies the overridden pages, namely “pages”.

an OPTIONAL attribute that identifies the document copies of the specified documents, i.e. “document-copies”. If this attribute is absent, the Overrides apply to all document copies.

The ‘collection’ value also contains one or more attributes that are overrides for the identified pages, e.g. “sides” and “media”.

2 Terminology

This section defines the following additional terms that are used throughout this document:

2.1 Conformance Terminology

Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, and **OPTIONAL**, have special meaning relating to conformance as defined in RFC 2119 [rfc2119]. If an implementation supports the extension defined in this document, then these terms apply; otherwise, they do not. These terms define conformance to *this document (and [rfc2911]) only*; they do not affect conformance to other documents, unless explicitly stated otherwise. For example, the term **REQUIRED** in this document means “**REQUIRED** if this **OPTIONAL** Override 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

2.2.1 Sheet

A Sheet is the unit of media that a printer puts marks on. It is the most basic unit of output from a printer. A printer may mark on one side or on both sides of a sheet.

2.2.2 Overrides

In IPP/1.1 each attribute value is the same for the entire Job. When an attribute is an “Overrides” attribute, it is different for identified pages. Pages can be identified within a Document or a specific copy of a Document.

3 Requirements

The following is a list of requirements for the Overrides-Extension.

1. There **MUST** be a mechanism for specifying Job Template attributes that are Overrides for particular pages. A Printer and a client **OPTIONALLY** support this mechanism.
2. There **MUST** be a mechanism for specifying Job Template attributes that are Overrides for particular pages in specific copies of Documents. A Printer and a client **OPTIONALLY** support this mechanism.
3. The mechanism for Overrides **MUST** be supported by all Job-Submission operations and Validate-Job.

4 Overview

In IPP 1.1 all attributes that a client includes with job creation operations affect the entire Job in a uniform way. That is, there is no way for one Document in a given Job to be stapled and another drilled. Also, there is no way for the first sheet of each Document to be on a different media or to have a different value of “sides” from the other Sheets in the Document. In addition, there is no way for one document copy to be printed on paper and another on transparencies. An IPP/1.1 client can specify features, such as finishing, media and sides only at the job level.

The Override Extension defined in this document allows some pages, to be affected by attribute values that are Overrides to those specified for the Job as a whole. For example, the first page of a Document has a different media from the rest.

4.1 Numbering of Components

The Override Extension defines a system for numbering of components.

- Each Document has a number. The single Document that a client sends with Print-Job or Print-URI and the first Document that a client sends with Send-Document or Send-URI has a number of 1. Each subsequent Document that a clients sends has a number that is one higher than the previous.
- Each Page in a Document is numbered sequentially, starting at 1 for the first Page. If a Job has several Documents, the first Page of each Document has the number of 1.
- The Documents are numbered as if the value of “copies” were 1, i.e. if a Document produces multiple copies, each copy has the same document number.

- Each copy of a Document has a number. The first copy of each Document has a number of '1', and each subsequent copy has a number that is one higher than the previous copy.

4.2 Effect of the “document-copies” attribute

The “document-copies” attribute causes some copies of a document to be printed differently from others. For example, 10 copies are duplex printed on letter paper with a staple. One copy is simplex printed on transparencies without a staple. As another example, the first page of 100 copies of a 3 page document are printed on letterhead paper and the first page of the 101st copy of the document is printed on regular letter paper.

If an attribute can affect a Document, it can affect particular Document-Copies. If an attribute can affect Sheets, it can affect Sheets of particular Document-Copies.

5 New Job Template Attributes

The Override Extension adds a new Job Template attributes: “overrides”. The “overrides” attribute supercedes the “page-overrides” from PWG51000.4

Job Attribute	Printer: Default Value Attribute	Printer: Supported Values Attribute
overrides (1setOf collection)	none	overrides-supported (1setOf type2 keyword)

5.1 overrides (1setOf collection)

This OPTIONAL Job/Document Template attribute contains attributes that are associated with Pages and that are treated as page Overrides. Such attributes are called “Overrides” attributes. The remainder of this section describes features that an implementation MUST support or MAY support if an implementation supports this attribute

If this attribute is present in a Job or Document, there are Page Overrides. If it is present, the value consists of one or more ‘collection’ values, where each ‘collection’ value identifies one or more jobs, one or more Pages and contains one or more Job Template attributes which act as Overrides to the corresponding Template attribute(s) for the specified Page(s) in the specified Job(s).

The first attribute CMUST be the “document-numbers”. The condition is if the Override is specified at the Job level and the Overrides apply only to specific Documents. If this attribute is not supplied at the Job level, the Override applies to all Documents in the Job. Specifying the Override at the Job level means that the attribute is included with a PrintJob, CreateJob or SetJob operation. This attribute is SHOULD NOT be supplied and is ignored if the Override is specified at the Document level[DocObj].

The second attribute MAY be “document-copies”. If present, this attributes identifies the copies of the Document. If this attribute is not present, then the Override applies to all copies of the Document.

If “document-number” and “document-copies” is present, the “pages” attribute MUST be the third attribute; if either “document-number” or “document-copies” attribute is present, the “pages” attribute MUST be the second attribute;

otherwise, it MUST be the first attribute. The “pages” attribute identifies the pages to which the Override applies. The identified pages need not be contiguous.

The remaining attributes in the ‘collection’ value are the Template attributes that are Overrides for the specified pages.

There may be more than one way for a client to arrange ‘overrides’ attributes in ‘collection’ values. For example, if a Document contains 10 pages to be printed 1-sided on white letter paper and page 1 is to be two sided with blue letter paper and Document 2 is to be two sided with white letter paper, there is more than 1 possible way to group the Overrides. The client could specify the two Overrides for page 1 in one ‘collection’ value and the single Override for Page 2 in second ‘collection’ values, or it could specify “two-sided” for pages 1 and 2 in one ‘collection’ value and “blue letter paper” for Document 1 in another ‘collection’ value. Other variations include specifying Overrides at Job and at Document levels.

If the “document-number”, “document-copies” and “pages” identify pages that either don’t exist or are within nonexistent Document-Copies or Documents, the Printer silently ignores them and associates the Overrides with the pages that do exist. A client MUST not allow two ‘collection’s values to be associated with the same page and to contain the same Override attribute with different values. If there is such a conflict, the Printer can use either value, and it MUST issue a warning. It does so by adding ‘job-warnings-detected’ to the “job-state-reasons” and by increasing the value of the “job-warnings-count” Job Description attribute by 1. If the Printer detects this conflict while it is processing a Job-Submission operation, it MUST return the ignored value in the Unsupported attributes.

When a Client receives this attribute in a Get-Jobs or Get-Job-Attributes, the value MUST contain the same ‘collection’ values received in Job-Submission operations, except for those ‘collection’ values the Printer returned in the Unsupported Attributes.

To allow the specification of the last page, copy or document the MAX integer value (2147483647) is used. To allow the specification of the page, copy or document before the last a special value of MAX-1(2147483646) is used. No other special values are defined.

<u>Attribute name</u>	<u>syntax</u>	<u>In request</u>	<u>Printer Support</u>
document-numbers	1setOf rangeOfInteger(MAX)	MAY	MUST
document-copies	1setOf rangeOfInteger(MAX)	MAY	MAY
pages	1setOf rangeOfInteger(MAX)	MUST	MUST
Any template attribute		MAY	MAY

The following sections describe each member attribute in the above table.

5.1.1 Document-numbers ([1setOf](#) rangeOfInteger (1:MAX))

This attribute identifies one or more Documents by specifying a range of numbers. The Overrides apply to the pages within the Documents specified.

A Printer MUST support this attribute. A client MAY supply this attribute in each ‘collection’ value. If supplied, it MUST be the first attribute of each ‘collection’ value.

Note: To allow the specification of the last document the MAX integer value (2147483647) is used. To allow the specification of the next to last document a special value of MAX-1(2147483646) is used. No other special values are defined.

5.1.2 document-copies ([1setOf rangeOfInteger \(1:MAX\)](#))

This attribute identifies one or more Document-Copies by specifying a range of numbers. The Overrides apply to the pages within the identified Documents-Copies within the Documents specified.

A Printer MUST support this attribute. A client MAY supply this attribute in each 'collection' value. It MUST be the second attribute of each 'collection' value if the client supplied "document-numbers"; otherwise it MUST be first.

Note: To allow the specification of the last document copy the MAX integer value (2147483647) is used. To allow the specification of the next to last document copy a special value of MAX-1(2147483646) is used. No other special values are defined.

5.1.3 Pages ([1setOf rangeOfInteger\(1:MAX\)](#))

This attribute identifies one or more pages by specifying one or more ranges of numbers (see section 4.1 for the rules on associating a number with each page). The "1setOf" allows noncontiguous pages. The Overrides apply to the identified pages within the Documents specified. The "document-copies" specifies particular copies of the Documents.

If the "page-ranges" attribute is associated with a Document, the pages identified by this attribute are the same as when "page-ranges" is not present. However, this attribute may identify pages that are deselected for printing by the "page-ranges" attribute. For example, if the value of "page-ranges" is "5:10" and this attribute identifies pages "3:6", this attribute identifies two pages (3 and 4) that are not printed and two that are (5 and 6)

If a Printer support the "overrides" attribute, it MUST support this attribute. A client MUST supply this attribute in each 'collection' value of the "overrides" attribute and it MUST be the second attribute of each 'collection' value.

A client MAY supply this attribute in a Send-Document or Send-URI request. This attribute MAY identify pages sent in an earlier Job operation. If a Printer receives such an Override, The Override for the Document MUST take precedence over the Job level Override. In other word the Document level Override is bound more tightly to the Document than the Job level Override.

ISSUE01: Should we allow overlapping overrides at the same level and specify that the behavior is the later the override the higher the precedence?

Note: To allow the specification of the last page the MAX integer value (2147483647) is used. To allow the specification of the next to last page a special value of MAX-1(2147483646) is used. No other special values are defined.

5.1.4 Overriding template attributes

These attributes have the same meaning as in IPP/1.1. Any template attribute supported by the printer may be supplied. Only those supported attributes that affect pages will be honored. For example an Override that specifies "job-priority" will ignore "job-priority" The Printer MAY support this attribute. A client OPTIONALLY supplies it.

ISSUE02: How should non-page oriented template attributes be handled and how will fidelity interact?

5.1.5 Handling of Error conditions

If a client puts a member attribute in some position other than its required position (e.g. “document-numbers” MUST be first), a Printer MUST either:

- a) use the specified value of the member attribute and ignore its wrong position or
- b) reject all attributes in the ‘collection’ value and treat the ‘collection’ values, but not other sibling ‘collection’ values, as unsupported.

5.1.6 Why not “overrides-default”

There is no “overrides-default” attribute because it adds complicated rules for a Printer to implement. The problems are best illustrated with examples.

If there were a “overrides-default” and it contained a “sides” and “media” override for the first page, and if a client submitted a Job with no “sides” attribute and with “media” as a Job attribute with no overrides, a possible meaning is that the Printer uses the client’s requested media for the entire Job and the sides specified by the “sides-default” and the “sides” value in “overrides-default”. So in this example, the Printer ignores the “overrides-default” attribute for “media”, but uses it for “sides” because the Printer uses it for an attribute “xxx” only when it uses “xxx-default”.

5.1.7 overrides-supported (1setOf type2 keyword)

This attribute specifies the supported values of the “overrides” attribute. A client can use this attribute to determine what override attributes the Printer supports.

This attribute contains the name of each attribute that the Printer supports in a ‘collection’ value of the “overrides” attribute. This attribute MUST contain the keywords “document-numbers” and “pages” because a Printer MUST support these attributes. This attribute MUST contain the keywords “document-copies” if the Printer supports overriding of individual copies of a Document. This attribute MUST also contain the name of each attribute that can be a page-override. For example, this attribute contains the keyword “sides” if and only if the Printer supports “sides” in a ‘collection’ value of the “page-overrides” attribute.

There are no corresponding “document-numbers-supported”, “document-copies-supported”, and “pages-supported” Printer attributes. However, the supported values for all of the other member attributes are indicated by the corresponding “xxx-supported” Printer attributes which are the same values as for the corresponding “xxx” operation or Job/Document Template attribute. For example, if “sides” is supported as a member attribute of the “override” collection, then the “sides-supported” Printer attribute indicates the values that are supported at the job level and as an Override.

6 Extensions to Printer Operations

The sections below specify the extensions to the groups within IPP 1.1 operations. If an operation or a group within an operation is not mentioned, this extension does not change that operation or group, respectively.

6.1 Send-Document and Send-URI Operation Requests

Attributes are added to the Operation Attributes group.

Group 1: Operation Attributes

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"page-overrides" (1setOf collection):

The client OPTIONALLY supplies this attribute. See section 5.1 for details. The Printer MUST support this attribute if it supports the "page-overrides" Job Template attribute. If the job doesn't contain a "page-overrides" attribute, this attribute is added to the Job. Otherwise, the 'collection' values from this attribute are appended to the existing "page-overrides" attribute. See section 5.1 for rules of resolving conflicts. Also the "input-documents" attribute is added to any 'collection' value that contains neither an "input-documents" nor "output-documents" attribute.

7 Examples

This section currently contains examples Overrides.
 Brackets are used to delimit the beginning and end of each Collection value.

7.1 First Page of Single Document is Letterhead

In the first example, the Printer produces 1 copy of a single Document. It is printed on letter-paper using Print-Job. The first Page of the Document is letterhead paper.

7.1.1 Request.

There is one Document A which produces one Document.

```
Print-Job
  job attributes group
    media: letter
    overrides: {
      documents-numbers: 1:1
      pages: 1:1
      media: letterhead }
  end-of-attributes
  Document A
```

7.2 First Page of Several Documents is Blue

In the second example, the Printer produces 3 copies of each Document. Each is stapled and printed on letter-paper, two-sided using Create-Job. The first Page of each Document is blue-letter paper and one-sided.

7.2.1 Request.

There are two Documents A and B.

```
Create-Job
  operations attributes group
```

```
    document-format: application/PostScript
  job attributes group
*   multiple-document-handling: separate-documents-collated-copies
    sides: two-sided-long-edge
    media: letter
    copies: 3
    finishings: stapling
    page-overrides: {
      document-numberss: 1:2
      pages: 1:1
      sides: one-sided
      media: blue-letter }
  end-of-attributes
Send-Document
  end-of-attributes
  Document A
Send-Document
  end-of-attributes
  Document B
```

8 Conformance Requirements

This section specifies the Conformance Requirements.

This specification describes overriding attributes on a particular page . If a Client or Printer supports this specification, it MUST support this mechanisms.

The following are the conformance rules for Overrides. See section 5.1 for further details on Overrides

1. If a Printer or Client supports Overrides, it MUST support
 - 1.1. the “overrides” attribute, and
 - 1.2. the “overrides-supported” attribute, and
 - 1.3. the following member attributes of “overrides”:
 - 1.3.1. “document-numberss”,
 - 1.3.2. “pages”, and
 - 1.3.3. at least one Job/Document Template attribute that can be overridden (e.g. “sides” or “media”) as defined in another specification.

A conforming Printer MUST handle unsupported attributes correctly. If a Printer receives a “overrides” attribute that contains one or more unsupported member, it MUST return in the Unsupported Attributes group of the response the

“overrides” attribute with the unsupported members attributes. The “ipp-attribute-fidelity” determines whether the Printer

- a) rejects the Job or
- b) accepts the Job and ignores the unsupported member attributes.

A Client or a Printer OPTIONALLY supports the “document-copies” attribute as a member attribute of “overrides”. If a Printer does not support the “document-copies” member attribute and receives it in a “page-overrides”, it treats the “document-copies” attributes as described in the previous paragraph. If the Printer accepts the Job, it behaves as if the overrides applied to all copies of the specified documents or pages, i.e. the way the Printer would behave if it supported “document-copies” and the client didn’t supply it.

9 IANA Considerations

This section contains the exact information for IANA to add to the IPP Registries according to the procedures defined in RFC 2911 [RFC2911] section 6.

9.1 Attribute Registration

The attributes defined in this document will be published by IANA according to the procedures in RFC 2911 [RFC2911] section 6.2 with the following path:

[ftp.isi.edu/iana/assignments/ipp/attributes/](ftp://ftp.isi.edu/iana/assignments/ipp/attributes/)

The registry entry will contain the following information:

Reference IEEE-ISTO 5100.n:
<ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.n.pdf>

Job Template attributes: overrides (1setOf collection)	Section: 5.1
---	-----------------

Operation attributes: overrides" (1setOf collection)	Section: 6.1
---	-----------------

9.2 Keyword Attribute Value Registrations

The keyword attribute values defined in this document will be published by IANA according to the procedures in RFC 2911 [RFC2911] section 6.1 with the following path:

[ftp.isi.edu/iana/assignments/ipp/attribute-values/](ftp://ftp.isi.edu/iana/assignments/ipp/attribute-values/)

The registry entry will contain the following information:

Reference IEEE-ISTO 5100.4:
<ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf>

10 Internationalization Considerations

The IPP extensions defined in this document require the same internationalization considerations as any of the Job Template attributes defined in IPP/1.1 [RFC2911].

11 Security Considerations

The IPP extensions defined in this document require the same security considerations as any of the Job Template attributes defined in IPP/1.1 [RFC2911].

12 References

[RFC2026]

Bradner, S., "The Internet Standards Process -- Revision 3", RFC 2026, October 1996.

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

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14 Annex A: Change Log (informative)

The following summaries of the changes in reverse chronological order:

Version May 9 2003:

1. Removed Document Overrides.
2. Moved warning counts and errors to another document(JobX)
3. Renamed Page Overrides to facilitate deprecation of PWG 5100.4