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12  
13 Internet Printing Protocol (IPP):  
14 LDAP Schema for Printer Services  
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16  
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18  
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34  
35 Abstract

36  
37 This document defines a common printer schema for use with LDAP  
38 directories (a directory service supporting the Lightweight Directory  
39 Access Protocol (LDAP)). Using this common printer schema enables  
40 client applications to use LDAP to search for printers using  
41 application or user specified search criteria. Searches are defined  
42 based on the entry's type and attributes independent of the LDAP  
43 directory being used.

44  
45 This document describes the LDAP schema, object classes and  
46 attributes, for SLP printer templates. This document uses the  
47 printer attributes defined in Appendix E. of [IPPMOD], the  
48 'printer:' service template defined in [SLPPRT], and the mapping  
49 between SLP service advertisements and LDAP descriptions of services  
50 defined in [SLPLDAP] to define an LDAP printer schema.

51  
52 The goal of this document is to define a consistent schema to be used  
53 by printers and print servers. The LDAP printer schema described in  
54 this document MAY be used in part or whole.

Table of Contents

1. Introduction ..... 4

2. Terminology ..... 4

3. Definition of Object Classes ..... 5

    3.1. slpServicePrinter ..... 6

    3.2. servicePrinter ..... 6

    3.3. printerService ..... 7

    3.4. printerServiceAuxClass ..... 7

    3.5. printerIPP ..... 7

    3.6. printerLPR ..... 8

    3.7. sunPrinter ..... 8

4. Definition of Attribute Types ..... 9

    4.1. printer-uri ..... 10

    4.2. printer-xri-supported ..... 10

    4.3. printer-name ..... 11

    4.4. printer-natural-language-configured ..... 12

    4.5. printer-location ..... 12

    4.6. printer-info ..... 12

    4.7. printer-more-info ..... 13

    4.8. printer-make-and-model ..... 13

    4.9. printer-ipp-versions-supported ..... 13

    4.10. printer-multiple-document-jobs-supported ..... 14

    4.11. printer-charset-configured ..... 14

    4.12. printer-charset-supported ..... 14

    4.13. printer-generated-natural-language-supported ..... 15

    4.14. printer-document-format-supported ..... 15

    4.15. printer-color-supported ..... 15

    4.16. printer-compression-supported ..... 15

    4.17. printer-pages-per-minute ..... 16

    4.18. printer-pages-per-minute-color ..... 16

    4.19. printer-finishings-supported ..... 16

    4.20. printer-number-up-supported ..... 17

    4.21. printer-sides-supported ..... 17

    4.22. printer-media-supported ..... 17

    4.23. printer-media-local-supported ..... 18

    4.24. printer-resolution-supported ..... 18

    4.25. printer-print-quality-supported ..... 18

    4.26. printer-job-priority-supported ..... 19

    4.27. printer-copies-supported ..... 19

    4.28. printer-job-k-octets-supported ..... 19

    4.29. printer-current-operator ..... 20

    4.30. printer-service-person ..... 20

    4.31. printer-delivery-orientation-supported ..... 20

    4.32. printer-stacking-order-supported ..... 21

    4.33. printer-output-features-supported ..... 21

    4.34. sun-printer-bsdaddr ..... 21

    4.35. sun-printer-kvp ..... 21

5. Definition of Syntaxes ..... 23

6. IANA Considerations ..... 23

7. Internationalization Considerations ..... 23

8. Security Considerations ..... 23

1  
2 Internet Draft           LDAP Schema for Printer Services           8 March 2000  
3  
4 9. References ..... 23  
5 10. Acknowledgments ..... 24  
6 11. Author's Addresses ..... 25  
7 12. Full Copyright Statement ..... 26  
8  
9

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11  
12  
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6 1. Introduction  
7

8     The use of directory services based on the Lightweight Directory  
9     Access Protocol [RFC 2251] is becoming increasingly popular for  
10    distributed services. To ensure interoperability between vendor  
11    implementations it is crucial to standardize the schemas which  
12    describe these services.  
13

14    Under the auspices of the IETF IPP Working Group the IPP protocol is  
15    being developed to bring a standards based printing solution to the  
16    Internet.  
17

18    Section 16 of [IPPMOD] describes a list of attributes which should be  
19    included in a general directory schema describing IPP print services.  
20    The syntax for each of these attributes is described in detail in  
21    [IPPMOD] and [SLPPRT]. This document will take these attributes and  
22    map them to LDAP attributes and object classes.  
23

24    This document defines several object classes to provide LDAP  
25    applications with multiple options in defining printer information  
26    using LDAP schema. Classes are provided for defining directory  
27    entries with common printer information and for extending existing  
28    directory entries with SLP, IPP, and LPR specific information.  
29

30    An additional object class, sunPrinter, is defined to illustrate how  
31    Sun Microsystems will support its current installed base. These  
32    systems currently use a "nameservice" to obtain information about  
33    printers. The nameservice may be, at its simplest, a collection of  
34    files in the local filesystem which are opened and searched. Other  
35    nameservices include the Network Information Name Service (NIS) and  
36    the next version of this product (NIS+). Printer information which  
37    is now being kept in these nameservices will be available in LDAP  
38    through the use of this Sun specific object class. This extends  
39    current support for [RFC 2307]. The reader is encouraged to refer to  
40    this RFC for more information regarding LDAP as a nameservice.  
41    Extensions for similar mapping of nameservices to LDAP are  
42    anticipated on various other operating system platforms.  
43  
44  
45

46 2. Terminology  
47

48    The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",  
49    "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this  
50    document are to be interpreted as described in [RFC 2119].  
51  
52  
53  
54  
55

6 3. Definition of Object Classes  
7

8 We define the following LDAP object classes for use with both generic  
9 printer related information and services specific to SLP, IPP, LPR  
10 and Sun Microsystems.  
11

- 12 slpServicePrinter - auxiliary class for SLP registered printers
- 13 servicePrinter - abstract class for all printer classes
- 14 printerService - structural class for printers
- 15 printerServiceAuxClass - auxiliary class for printers
- 16 printerIPP - auxiliary class for IPP printers
- 17 printerLPR - auxiliary class for LPR printers
- 18 sunPrinter - auxiliary class for Sun Microsystems printers

19  
20 The following are some examples of how applications MAY choose to use  
21 these classes when creating directory entries:  
22

- 23 1) Use printerService for directory entries containing common printer  
24 information.  
25
- 26 2) Use both printerService and slpServicePrinter for directory  
27 entries containing common printer information for SLP registered  
28 printers.  
29
- 30 3) Use printerService, printerLPR and printerIPP for directory  
31 entries containing common printer information for printers that  
32 support both LPR and IPP.  
33
- 34 4) Use printerServiceAuxClass and object classes not defined by this  
35 document for directory entries containing common printer information.  
36 In this example, printerServiceAuxClass is used for extending other  
37 structural classes defining printer information with common printer  
38 information defined in this document.  
39

40 Note that the use of the abstract object class servicePrinter is  
41 OPTIONAL when using printerService or printerServiceAuxClass to  
42 create directory entries per [RFC 2251].  
43

44 Refer to section 4 for definition of attribute types referenced by  
45 these object classes. We use names instead of OIDs in MUST and MAY  
46 for clarity. Some attribute names described in [IPPMOD] have been  
47 prefixed with 'printer-' as recommended in [SLPPRT] and [SLPLDAP].  
48

49 For the object classes defined in this section, schema developers MAY  
50 modify the list of MAY OIDs, but MUST NOT modify the list of MUST  
51 OIDs. Schema developers MAY derive additional classes from the  
52 abstract and structural classes defined in this section. Note, an  
53 object class definition SHOULD NOT be changed without having a new  
54 name and OID assigned to it.  
55

7 3.1. slpServicePrinter  
8

9        This auxiliary class defines Service Location Protocol (SLP) specific  
10 information. It MUST be used with a structural class such as  
11 printerService. It MAY be used to create new or extend existing  
12 directory entries with SLP 'service:printer' abstract service type  
13 information as defined in [SLPPRT]. This object class is derived  
14 from 'slpService', the parent class for all SLP services, defined in  
15 [SLPLDAP].  
16

```
17 ( 1.3.6.1.4.1.42.2.27.5.2.8  
18 NAME 'slpServicePrinter'  
19 DESC 'Service Location Protocol (SLP) information.'  
20 SUP slpService  
21 AUXILIARY  
22 )  
23  
24
```

25 3.2. servicePrinter  
26

27        This abstract class defines printer information. It is a base class  
28 for deriving other printer related classes, such as, but not limited  
29 to, classes defined in this document. It defines a common set of  
30 printer attributes that are not specific to any one type of service,  
31 protocol or operating system.  
32

```
33 ( 1.3.6.1.4.1.42.2.27.5.2.9  
34 NAME 'servicePrinter'  
35 DESC 'Printer related information.'  
36 ABSTRACT  
37 SUP top  
38 MUST ( printer-uri $ printer-xri-supported $ printer-name )  
39 MAY ( printer-natural-language-configured $  
40 printer-location $ printer-info $ printer-more-info $  
41 printer-make-and-model $  
42 printer-multiple-document-jobs-supported $  
43 printer-charset-configured $ printer-charset-supported $  
44 printer-generated-natural-language-supported $  
45 printer-document-format-supported $ printer-color-supported $  
46 printer-compression-supported $ printer-pages-per-minute $  
47 printer-pages-per-minute-color $  
48 printer-finishings-supported $ printer-number-up-supported $  
49 printer-sides-supported $ printer-media-supported $  
50 printer-media-local-supported $  
51 printer-resolution-supported $  
52 printer-print-quality-supported $  
53 printer-job-priority-supported $ printer-copies-supported $  
54 printer-job-k-octets-supported $ printer-current-operator $  
55 )  
56
```

4            printer-service-person \$  
5            printer-delivery-orientation-supported \$  
6            printer-stacking-order-supported \$  
7            printer-output-features-supported )  
8            )  
9

10  
11 3.3. printerService

12  
13 This structural class defines printer information. It is derived  
14 from class servicePrinter and thus inherits common printer  
15 attributes. This class can be used with or without auxiliary classes  
16 to define printer information. Auxiliary classes can be used to  
17 extend the common printer information with protocol, service or  
18 operating system specific information. Note that when extending  
19 other structural classes with auxiliary classes, printerService MUST  
20 NOT be used.  
21

22 LDAP applications SHOULD use printer-uri as the naming attribute.  
23 That is, when using printerService, printer-uri MUST be used as the  
24 attribute type of the directory entry's relative distinguished name  
25 (RDN).  
26

27 ( 1.3.6.1.4.1.42.2.27.5.2.10  
28 NAME 'printerService'  
29 DESC 'Printer information.'  
30 SUP servicePrinter  
31 STRUCTURAL  
32 )  
33

34  
35 3.4. printerServiceAuxClass

36  
37 This auxiliary class defines printer information. It is derived from  
38 class servicePrinter and thus inherits common printer attributes.  
39 This class MUST be used with a structural class, such as  
40 printerService.  
41

42 ( 1.3.6.1.4.1.42.2.27.5.2.11  
43 NAME 'printerServiceAuxClass'  
44 DESC 'Printer information.'  
45 SUP servicePrinter  
46 AUXILIARY  
47 )  
48  
49

50 3.5. printerIPP

51  
52 This auxiliary class defines Internet Printing Protocol (IPP)  
53 information. It MUST be used with a structural class such as  
54 printerService. It is used to extend structural classes with IPP  
55

4        specific printer information.

5  
6        ( 1.3.6.1.4.1.42.2.27.5.2.12  
7        NAME 'printerIPP'  
8        DESC 'Internet Printing Protocol (IPP) information.'  
9        SUP top  
10        AUXILIARY  
11        MAY ( printer-ipp-versions-supported \$  
12            printer-multiple-document-jobs-supported )  
13        )  
14

15  
16 3.6. printerLPR  
17

18        This auxiliary class defines LPR information. It MUST be used with a  
19        structural class such as printerService. It is used to extend  
20        structural classes with LPR specific printer information.  
21

22        ( 1.3.6.1.4.1.42.2.27.5.2.13  
23        NAME 'printerLPR'  
24        DESC 'LPR information.'  
25        SUP top  
26        AUXILIARY  
27        )  
28

29  
30 3.7. sunPrinter  
31

32        Current Sun Microsystems print implementations use the Line Printer  
33        Daemon (LPD) Protocol described in [RFC 1179] to communicate between  
34        print clients and servers. In addition to this print clients make  
35        use of nameservices to obtain information about the printer. It is  
36        desirable to extend the current print client nameservice support to  
37        include LDAP while keeping existing functionality. This is done by  
38        defining a Sun specific object class. The "sunPrinter" object  
39        contains two attributes. The sun-printer-bsdaddr attribute  
40        identifies the server host name associated with a print queue and  
41        whether or not Solaris specific extensions to the LPD protocol should  
42        be generated. The second attribute sun-printer-kvp contains a set of  
43        key values pairs. These values may have meaning to the print  
44        subsystem or they may be user defined.  
45

46        ( 1.3.6.1.4.1.42.2.27.5.2.14  
47        NAME 'sunPrinter'  
48        DESC 'Sun printer information'  
49        SUP top  
50        AUXILIARY  
51        MAY ( sun-printer-bsdaddr \$ sun-printer-kvp )  
52        )  
53  
54  
55

4. Definition of Attribute Types

The following attribute types are referenced by the object classes defined in section 3.

The following table is a summary of the attribute names referenced by this document and their corresponding names from [IPPMOD]. Some attribute names described in [IPPMOD] have been prefixed with 'printer-' as recommended in [SLPLDAP], to address the flat namespace for LDAP identifiers.

LDAP & SLP Printer Schema	IPP Model [IPPMOD]
-----	
printer-uri	
printer-xri-supported	[IPP printer-uri-supported]
	[IPP uri-authentication-supported]
	[IPP uri-security-supported]
printer-name	printer-name
printer-natural-language-configured	natural-language-configured
printer-location	printer-location
printer-info	printer-info
printer-more-info	printer-more-info
printer-make-and-model	printer-make-and-model
printer-ipp-versions-supported	ipp-versions-supported
printer-multiple-document-jobs-supported	multiple-document-jobs-supported
printer-charset-configured	charset-configured
printer-charset-supported	charset-supported
printer-generated-natural-language-supported	generated-natural-language-supported
printer-document-format-supported	document-format-supported
printer-color-supported	color-supported
printer-compression-supported	compression-supported
printer-pages-per-minute	pages-per-minute
printer-pages-per-minute-color	pages-per-minute-color
printer-finishings-supported	finishings-supported
printer-number-up-supported	number-up-supported
printer-sides-supported	sides-supported
printer-media-supported	media-supported
printer-media-local-supported	[site names from IPP media-supported]
printer-resolution-supported	printer-resolution-supported
printer-print-quality-supported	print-quality-supported
printer-job-priority-supported	job-priority-supported
printer-copies-supported	copies-supported
printer-job-k-octets-supported	job-k-octets-supported
printer-current-operator	

4 printer-service-person  
5 printer-delivery-orientation-supported  
6 printer-stacking-order-supported  
7 printer-output-features-supported  
8 sun-printer-bsdaddr  
9 sun-print-kvp

10  
11 In the following definitions, we use matching rule names instead of  
12 OIDs for clarity. Note that if the printer information is not known,  
13 the attribute value is not set (for optional attributes). In the  
14 following definitions, referenced matching rules are defined in  
15 section 8 of [RFC 2252].  
16

17 The following definitions reference syntax OIDs as defined in [RFC  
18 2252], which are summarized below:

19 Syntax OID	Syntax Description
20 -----	-----
21 1.3.6.1.4.1.1466.115.121.1.7	Boolean
22 1.3.6.1.4.1.1466.115.121.1.15	Directory String (UTF-8 [RFC 2279])
23 1.3.6.1.4.1.1466.115.121.1.27	Integer

24  
25  
26  
27 4.1. printer-uri  
28

29 Note, that for SLP registered printers, the LDAP printer-uri  
30 attribute should set to the value of the registered URL of the  
31 printer.  
32

```
33 ( 1.3.6.1.4.1.42.2.27.5.1.30  
34 NAME 'printer-uri'  
35 DESC 'The URI supported by this printer.'  
36 EQUALITY caseIgnoreMatch  
37 ORDERING caseIgnoreOrderingMatch  
38 SUBSTR caseIgnoreSubstringMatch  
39 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15  
40 SINGLE-VALUE  
41 )  
42  
43
```

44 4.2. printer-xri-supported  
45

46 A list of XRI (extended resource identifiers) supported by this  
47 printer. Each value of this list consists of a URI (uniform resource  
48 identifier) followed by optional authentication and security  
49 metaparameters. The keywords for URI and their metaparameters are:

```
50 'uri' == IPP 'printer-uri-supported' value  
51 'auth' == IPP 'uri-authentication-supported' value  
52 'sec' == IPP 'uri-security-supported' value
```

53 Legal values of the 'auth' metaparameter include  
54  
55

4        'none' (no authentication for this URI)  
5        'requesting-user-name' (from operation request)  
6        'basic' (HTTP/1.1 Basic [RFC 2617])  
7        'digest' (HTTP/1.1 Basic, [RFC 2617])  
8        'certificate' (from certificate)

9 per IPP Model [3] (extensions MAY also be used). A missing 'auth'  
10 metaparameter SHALL mean 'none'. Legal values of the 'sec'  
11 metaparameter include

12        'none' (no security for this URI)  
13        'ssl3' (Netscape SSL3)  
14        'tls' (IETF TLS/1.0, [RFC 2246])

15 per IPP Model [3] (extensions MAY also be used). A missing 'sec'  
16 metaparameter SHALL mean 'none'. Each metaparameter of a list member  
17 is delimited by '<'. For example:

18        'uri=ipp://foo.com< auth=digest< sec=tls<'  
19        'uri=lpr://bar.com< auth=none< sec=none<'

20 Registrations MAY consolidate values for metaparameters, as in the  
21 following example:

22        'uri=ipp://foo.com< auth=basic,digest< sec=tls,ssl3<'

23  
24 ( 1.3.6.1.4.1.42.2.27.5.1.31  
25 NAME 'printer-xri-supported'  
26 DESC 'The unordered list of XRI (extended resource identifiers)  
27 supported by this printer. Each member of the list consists of  
28 a URI (uniform resource identifier) followed by optional  
29 authentication and security metaparameters.'  
30 EQUALITY caseIgnoreMatch  
31 ORDERING caseIgnoreOrderingMatch  
32 SUBSTR caseIgnoreSubstringMatch  
33 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15  
34 )  
35  
36

#### 37 4.3. printer-name

38  
39 The site-specific administrative name of this printer. This value of  
40 this attribute SHOULD be in the language specified in  
41 'printer-natural-language-configured' (although the printer's name  
42 may be in any language). This name MAY be the last part of the  
43 printer's URI or it MAY be completely unrelated. This name MAY  
44 contain characters that are not allowed in a conventional URI (which  
45 conforms to [RFC 2396]).  
46

47 ( 1.3.6.1.4.1.42.2.27.5.1.32  
48 NAME 'printer-name'  
49 DESC 'The site-specific administrative name of this printer, more  
50 end-user friendly than a URI.'  
51 EQUALITY caseIgnoreMatch  
52 ORDERING caseIgnoreOrderingMatch  
53 SUBSTR caseIgnoreSubstringMatch  
54 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
55

4        SINGLE-VALUE  
5        )  
6  
7

8 4.4. printer-natural-language-configured  
9

10        ( 1.3.6.1.4.1.42.2.27.5.1.33  
11        NAME 'printer-generated-natural-language-configured'  
12        DESC 'The configured language in which error and status messages will  
13            be generated (by default) by this printer. Also, a possible  
14            language for printer string attributes set by operator, system  
15            administrator, or manufacturer. Also, the (declared) language  
16            of the "printer-name", "printer-location", "printer-info", and  
17            "printer-make-and-model" attributes of this printer. For  
18            example: "en-us" (US English) or "fr-fr" (French in France)  
19            Legal values of language tags conform to [RFC 1766] "Tags for  
20            the Identification of Languages".'  
21        EQUALITY caseIgnoreMatch  
22        ORDERING caseIgnoreOrderingMatch  
23        SUBSTR caseIgnoreSubstringMatch  
24        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
25        SINGLE-VALUE  
26        )  
27  
28

29 4.5. printer-location  
30

31        ( 1.3.6.1.4.1.42.2.27.5.1.34  
32        NAME 'printer-location'  
33        DESC 'Identifies the location of the printer. This could include  
34            things like: "in Room 123A", "second floor of building XYZ".'  
35        EQUALITY caseIgnoreMatch  
36        ORDERING caseIgnoreOrderingMatch  
37        SUBSTR caseIgnoreSubstringMatch  
38        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
39        SINGLE-VALUE  
40        )  
41  
42

43 4.6. printer-info  
44

45        ( 1.3.6.1.4.1.42.2.27.5.1.35  
46        NAME 'printer-info'  
47        DESC 'Identifies the descriptive information about this printer.  
48            This could include things like: "This printer can be used for  
49            printing color transparencies for HR presentations", or "Out  
50            of courtesy for others, please print only small (1-5 page) jobs  
51            at this printer", or even "This printer is going away on July  
52            1, 1997, please find a new printer".'  
53        EQUALITY caseIgnoreMatch  
54        ORDERING caseIgnoreOrderingMatch  
55

4        SUBSTR caseIgnoreSubstringMatch  
5        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
6        SINGLE-VALUE  
7        )

8  
9  
10 4.7. printer-more-info

11        ( 1.3.6.1.4.1.42.2.27.5.1.36  
12        NAME 'printer-more-info'  
13        DESC 'A URI used to obtain more information about this specific  
14            printer. For example, this could be an HTTP type URI  
15            referencing an HTML page accessible to a Web Browser. The  
16            information obtained from this URI is intended for end user  
17            consumption.'  
18        EQUALITY caseExactMatch  
19        ORDERING caseExactOrderingMatch  
20        SUBSTR caseExactSubstringMatch  
21        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15  
22        SINGLE-VALUE  
23        )

24  
25  
26  
27 4.8. printer-make-and-model

28        ( 1.3.6.1.4.1.42.2.27.5.1.37  
29        NAME 'printer-make-and-model'  
30        DESC 'Identifies the make and model of the device. The device  
31            manufacturer may initially populate this attribute.'  
32        EQUALITY caseIgnoreMatch  
33        ORDERING caseIgnoreOrderingMatch  
34        SUBSTR caseIgnoreSubstringMatch  
35        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
36        SINGLE-VALUE  
37        )

38  
39  
40  
41 4.9. printer-ipp-versions-supported

42        ( 1.3.6.1.4.1.42.2.27.5.1.38  
43        NAME 'printer-ipp-versions-supported'  
44        DESC 'Identifies the IPP protocol version(s) that this printer  
45            supports, including major and minor versions, i.e., the version  
46            numbers for which this Printer implementation meets the  
47            conformance requirements.'  
48        EQUALITY caseIgnoreMatch  
49        ORDERING caseIgnoreOrderingMatch  
50        SUBSTR caseIgnoreSubstringMatch  
51        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
52        )

6 4.10. printer-multiple-document-jobs-supported  
7

8 ( 1.3.6.1.4.1.42.2.27.5.1.39  
9 NAME 'printer-multiple-document-jobs-supported'  
10 DESC 'Indicates whether or not the printer supports more than one  
11 document per job, i.e., more than one Send-Document or  
12 Send-Data operation with document data.'  
13 EQUALITY booleanMatch  
14 SYNTAX 1.3.6.1.4.1.1466.115.121.1.7  
15 SINGLE-VALUE  
16 )  
17  
18

19 4.11. printer-charset-configured  
20

21 ( 1.3.6.1.4.1.42.2.27.5.1.40  
22 NAME 'printer-charset-configured'  
23 DESC 'The configured charset in which error and status messages will  
24 be generated (by default) by this printer. Also, a possible  
25 charset for printer string attributes set by operator, system  
26 administrator, or manufacturer. For example: "utf-8" (ISO  
27 10646/Unicode) or "iso-8859-1" (Latin1). Legal values are  
28 defined by the IANA Registry of Coded Character Sets and the  
29 "(preferred MIME name)" SHALL be used as the tag. For  
30 coherence with IPP Model, charset tags in this attribute SHALL  
31 be lowercase normalized. This attribute SHOULD be static (time  
32 of registration) and SHOULD NOT be dynamically refreshed  
33 (subsequently).'

34 EQUALITY caseIgnoreMatch  
35 ORDERING caseIgnoreOrderingMatch  
36 SUBSTR caseIgnoreSubstringMatch  
37 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}  
38 SINGLE-VALUE  
39 )  
40  
41

42 4.12. printer-charset-supported  
43

44 ( 1.3.6.1.4.1.42.2.27.5.1.41  
45 NAME 'printer-charset-supported'  
46 DESC 'Identifies the set of charsets supported for attribute type  
47 values of type Directory String for this directory entry. For  
48 example: "utf-8" (ISO 10646/Unicode) or "iso-8859-1" (Latin1).  
49 Legal values are defined by the IANA Registry of Coded  
50 Character Sets and the preferred MIME name.'  
51 EQUALITY caseIgnoreMatch  
52 ORDERING caseIgnoreOrderingMatch  
53 SUBSTR caseIgnoreSubstringMatch  
54 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}  
55

4     )

5  
6  
7 4.13. printer-generated-natural-language-supported  
8

9     ( 1.3.6.1.4.1.42.2.27.5.1.42  
10     NAME 'printer-generated-natural-language-supported'  
11     DESC 'Identifies the natural language(s) supported for this directory  
12         entry. For example: "en-us" (US English) or "fr-fr" (French in  
13         France). Legal values conform to [RFC 1766], Tags for the  
14         Identification of Languages.'  
15     EQUALITY caseIgnoreMatch  
16     ORDERING caseIgnoreOrderingMatch  
17     SUBSTR caseIgnoreSubstringMatch  
18     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}  
19     )

20  
21  
22 4.14. printer-document-format-supported  
23

24     ( 1.3.6.1.4.1.42.2.27.5.1.43  
25     NAME 'printer-document-format-supported'  
26     DESC 'The possible document formats in which data may be interpreted  
27         and printed by this printer. Legal values are MIME types come  
28         from the IANA Registry of Internet Media Types.'  
29     EQUALITY caseIgnoreMatch  
30     ORDERING caseIgnoreOrderingMatch  
31     SUBSTR caseIgnoreSubstringMatch  
32     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
33     )

34  
35  
36 4.15. printer-color-supported  
37

38     ( 1.3.6.1.4.1.42.2.27.5.1.44  
39     NAME 'printer-color-supported'  
40     DESC 'Indicates whether this printer is capable of any type of color  
41         printing at all, including highlight color.'  
42     EQUALITY booleanMatch  
43     SYNTAX 1.3.6.1.4.1.1466.115.121.1.7  
44     SINGLE-VALUE  
45     )

46  
47  
48 4.16. printer-compression-supported  
49

50     ( 1.3.6.1.4.1.42.2.27.5.1.45  
51     NAME 'printer-compression-supported'  
52     DESC 'Compression algorithms supported by this printer. For example:  
53         "deflate, gzip". Legal values include; "none", "deflate"  
54         (public domain ZIP), "gzip" (GNU ZIP), "compress" (UNIX).'  
55

4        EQUALITY caseIgnoreMatch  
5        ORDERING caseIgnoreOrderingMatch  
6        SUBSTR caseIgnoreSubstringMatch  
7        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}  
8        )  
9

10  
11 4.17. printer-pages-per-minute  
12

13        ( 1.3.6.1.4.1.42.2.27.5.1.46  
14        NAME 'printer-pages-per-minute'  
15        DESC 'The nominal number of pages per minute which may be output by  
16            this printer (e.g., a simplex or black-and-white printer).  
17            This attribute is informative, NOT a service guarantee.  
18            Typically, it is the value used in marketing literature to  
19            describe this printer.'  
20        EQUALITY integerMatch  
21        ORDERING integerOrderingMatch  
22        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
23        SINGLE-VALUE  
24        )  
25  
26

27 4.18. printer-pages-per-minute-color  
28

29        ( 1.3.6.1.4.1.42.2.27.5.1.47  
30        NAME 'printer-pages-per-minute-color'  
31        DESC 'The nominal number of color pages per minute which may be  
32            output by this printer (e.g., a simplex or color printer).  
33            This attribute is informative, NOT a service guarantee.  
34            Typically, it is the value used in marketing literature to  
35            describe this printer.'  
36        EQUALITY integerMatch  
37        ORDERING integerOrderingMatch  
38        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
39        SINGLE-VALUE  
40        )  
41  
42

43 4.19. printer-finishings-supported  
44

45        ( 1.3.6.1.4.1.42.2.27.5.1.48  
46        NAME 'printer-finishings-supported'  
47        DESC 'The possible finishing operations supported by this printer.  
48            Legal values include; "none", "staple", "punch", "cover",  
49            "bind", "saddle-stitch", "edge-stitch", "staple-top-left",  
50            "staple-bottom-left", "staple-top-right",  
51            "staple-bottom-right", "edge-stitch-left", "edge-stitch-top",  
52            "edge-stitch-right", "edge-stitch-bottom", "staple-dual-left",  
53            "staple-dual-top", "staple-dual-right", "staple-dual-bottom".'  
54        EQUALITY caseIgnoreMatch  
55

4        ORDERING caseIgnoreOrderingMatch  
5        SUBSTR caseIgnoreSubstringMatch  
6        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}  
7        )  
8  
9

10 4.20. printer-number-up-supported

11        ( 1.3.6.1.4.1.42.2.27.5.1.49  
12        NAME 'printer-number-up-supported'  
13        DESC 'The possible numbers of print-stream pages to impose upon a  
14            single side of an instance of a selected medium. Legal values  
15            include; 1, 2, and 4. Implementations may support other  
16            values.'  
17        EQUALITY integerMatch  
18        ORDERING integerOrderingMatch  
19        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
20        )  
21  
22  
23

24 4.21. printer-sides-supported

25        ( 1.3.6.1.4.1.42.2.27.5.1.50  
26        NAME 'printer-sides-supported'  
27        DESC 'The number of impression sides (one or two) and the two-sided  
28            impression rotations supported by this printer. Legal values  
29            include; "one-sided", "two-sided-long-edge",  
30            "two-sided-short-edge".'  
31        EQUALITY caseIgnoreMatch  
32        ORDERING caseIgnoreOrderingMatch  
33        SUBSTR caseIgnoreSubstringMatch  
34        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
35        )  
36  
37  
38

39 4.22. printer-media-supported

40        ( 1.3.6.1.4.1.42.2.27.5.1.51  
41        NAME 'printer-media-supported'  
42        DESC 'The standard names/types/sizes (and optional color suffixes) of  
43            the media supported by this printer. For example: "iso-a4",  
44            "envelope", or "na-letter-white". Legal values conform to ISO  
45            10175, Document Printing Application (DPA), and any IANA  
46            registered extensions.'  
47        EQUALITY caseIgnoreMatch  
48        ORDERING caseIgnoreOrderingMatch  
49        SUBSTR caseIgnoreSubstringMatch  
50        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}  
51        )  
52  
53  
54  
55

6 4.23. printer-media-local-supported  
7

8     ( 1.3.6.1.4.1.42.2.27.5.1.52  
9     NAME 'printer-media-local-supported'  
10    DESC 'Site-specific names of media supported by this printer, in the  
11        language in "printer-generated-natural-language-configured".  
12        For example: "purchasing-form" (site-specific name) as opposed  
13        to (in "printer-media-supported"): "na-letter" (standard  
14        keyword from ISO 10175).'  
15    EQUALITY caseIgnoreMatch  
16    ORDERING caseIgnoreOrderingMatch  
17    SUBSTR caseIgnoreSubstringMatch  
18    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}  
19    )  
20  
21

22 4.24. printer-resolution-supported  
23

24     ( 1.3.6.1.4.1.42.2.27.5.1.53  
25     NAME 'printer-resolution-supported'  
26    DESC 'List of resolutions supported for printing documents by this  
27        printer. Each resolution value is a string with 3 fields:  
28        1) Cross feed direction resolution (positive integer), 2) Feed  
29        direction resolution (positive integer), 3) Resolution unit.  
30        Legal values are "dpi" (dots per inch) and "dpcm" (dots per  
31        centimeter). Each resolution field is delimited by ">". For  
32        example: "300> 300> dpi>".'  
33    EQUALITY caseIgnoreMatch  
34    ORDERING caseIgnoreOrderingMatch  
35    SUBSTR caseIgnoreSubstringMatch  
36    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}  
37    )  
38  
39

40 4.25. printer-print-quality-supported  
41

42     ( 1.3.6.1.4.1.42.2.27.5.1.54  
43     NAME 'printer-print-quality-supported'  
44    DESC 'List of print qualities supported for printing documents on  
45        this printer. For example: "draft, normal". Legal values  
46        include; "unknown", "draft", "normal", "high".'  
47    EQUALITY caseIgnoreMatch  
48    ORDERING caseIgnoreOrderingMatch  
49    SUBSTR caseIgnoreSubstringMatch  
50    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
51    )  
52  
53  
54  
55

6 4.26. printer-job-priority-supported  
7

8 ( 1.3.6.1.4.1.42.2.27.5.1.55  
9 NAME 'printer-job-priority-supported'  
10 DESC 'Indicates the number of job priority levels supported. An IPP  
11 conformant printer which supports job priority must always  
12 support a full range of priorities from "1" to "100" (to ensure  
13 consistent behavior), therefore this attribute describes the  
14 "granularity". Legal values of this attribute are from "1" to  
15 "100".'  
16 EQUALITY integerMatch  
17 ORDERING integerOrderingMatch  
18 SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
19 SINGLE-VALUE  
20 )  
21  
22

23 4.27. printer-copies-supported  
24

25 ( 1.3.6.1.4.1.42.2.27.5.1.56  
26 NAME 'printer-copies-supported'  
27 DESC 'The maximum number of copies of a document that may be printed  
28 as a single job. A value of "0" indicates no maximum limit. A  
29 value of "-1" indicates unknown.'  
30 EQUALITY integerMatch  
31 ORDERING integerOrderingMatch  
32 SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
33 SINGLE-VALUE  
34 )  
35  
36

37 4.28. printer-job-k-octets-supported  
38

39 ( 1.3.6.1.4.1.42.2.27.5.1.57  
40 NAME 'printer-job-k-octets-supported'  
41 DESC 'The maximum size in kilobytes (1,024 octets actually) incoming  
42 print job that this printer will accept. A value of "0"  
43 indicates no maximum limit. A value of "-1" indicates  
44 unknown.'  
45 EQUALITY integerMatch  
46 ORDERING integerOrderingMatch  
47 SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
48 SINGLE-VALUE  
49 )  
50  
51  
52  
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54  
55

6 4.29. printer-current-operator  
7

8     ( 1.3.6.1.4.1.42.2.27.5.1.58  
9     NAME 'printer-current-operator'  
10    DESC 'The name of the current human operator responsible for  
11        operating this printer. It is suggested that this string  
12        include information that would enable other humans to reach the  
13        operator, such as a phone number.'  
14    EQUALITY caseIgnoreMatch  
15    ORDERING caseIgnoreOrderingMatch  
16    SUBSTR caseIgnoreSubstringMatch  
17    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
18    SINGLE-VALUE  
19    )  
20  
21

22 4.30. printer-service-person  
23

24     ( 1.3.6.1.4.1.42.2.27.5.1.59  
25     NAME 'printer-service-person'  
26    DESC 'The name of the current human service person responsible for  
27        servicing this printer. It is suggested that this string  
28        include information that would enable other humans to reach the  
29        service person, such as a phone number.'  
30    EQUALITY caseIgnoreMatch  
31    ORDERING caseIgnoreOrderingMatch  
32    SUBSTR caseIgnoreSubstringMatch  
33    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
34    SINGLE-VALUE  
35    )  
36  
37

38 4.31. printer-delivery-orientation-supported  
39

40     ( 1.3.6.1.4.1.42.2.27.5.1.60  
41     NAME 'printer-delivery-orientation-supported'  
42    DESC 'The possible delivery orientations of pages as they are printed  
43        and ejected from this printer. Legal values include;  
44        "unknown", "face-up", and "face-down".'  
45    EQUALITY caseIgnoreMatch  
46    ORDERING caseIgnoreOrderingMatch  
47    SUBSTR caseIgnoreSubstringMatch  
48    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
49    )  
50  
51  
52  
53  
54  
55

6 4.32. printer-stacking-order-supported  
7

8     ( 1.3.6.1.4.1.42.2.27.5.1.61  
9     NAME 'printer-stacking-order-supported'  
10    DESC 'The possible stacking order of pages as they are printed and  
11        ejected from this printer. Legal values include; "unknown",  
12        "first-to-last", "last-to-first".'  
13    EQUALITY caseIgnoreMatch  
14    ORDERING caseIgnoreOrderingMatch  
15    SUBSTR caseIgnoreSubstringMatch  
16    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
17    )  
18  
19

20 4.33. printer-output-features-supported  
21

22     ( 1.3.6.1.4.1.42.2.27.5.1.62  
23     NAME 'printer-output-features-supported'  
24    DESC 'The possible output features supported by this printer. Legal  
25        values include; "unknown", "bursting", "decollating",  
26        "page-collating", "offset-stacking".'  
27    EQUALITY caseIgnoreMatch  
28    ORDERING caseIgnoreOrderingMatch  
29    SUBSTR caseIgnoreSubstringMatch  
30    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
31    )  
32  
33

34 4.34. sun-printer-bsdaddr  
35

36     ( 1.3.6.1.4.1.42.2.27.5.1.63  
37     NAME 'sun-printer-bsdaddr'  
38    DESC 'Sets the server, print queue destination name and whether the  
39        client generates protocol extensions. "Solaris" specifies a  
40        Solaris print server extension. The value is represented by  
41        the following value: server ", " destination ", Solaris".'  
42    EQUALITY caseIgnoreIA5Match  
43    SYNTAX 1.3.6.1.4.1.1466.115.121.1.15  
44    SINGLE-VALUE  
45    )  
46  
47

48 4.35. sun-printer-kvp  
49

50     ( 1.3.6.1.4.1.42.2.27.5.1.64  
51     NAME 'sun-print-kvp'  
52    DESC 'This attribute contains a set of key value pairs which may have  
53        meaning to the print subsystem or may be user defined. Each  
54        value is represented by the following: key "=" value.'  
55

4       EQUALITY caseIgnoreIA5Match  
5       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15  
6       )  
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6 5. Definition of Syntaxes  
7

8     No new syntaxes are defined by this document.  
9

10  
11 6. IANA Considerations  
12

13     There are no IANA registration considerations defined by this  
14 document.  
15

16  
17 7. Internationalization Considerations  
18

19     All text string attribute values in objects of the printerService  
20 class MUST be encoded in UTF-8 [RFC 2279] characters, as required by  
21 the syntax 'Directory String' [RFC 2252]. Also, a language tag for  
22 all of the text string attributes in objects of the printerService  
23 class SHOULD be supplied in 'printer-natural-language-configured'.  
24 Therefore, all objects of the printerService class conform to "IETF  
25 Policy on Character Sets and Languages" [RFC 2277].  
26  
27  
28

29 8. Security Considerations  
30

31     As with any LDAP schema, it is important to protect specific entries  
32 and attributes with the appropriate access control. It is  
33 particularly important that only administrators can modify entries  
34 defined in this schema. For additional considerations of deploying  
35 printers in an IPP environment the reader is referred to section 8 of  
36 [IPPMOD].  
37

38     By advertising the security methods for each supported printer URL  
39 the printer may expose information useful to attackers. Suitable  
40 security methods SHOULD be used to authenticate any service  
41 advertisements.  
42

43     Obtaining a reference to an object and storing it in the directory  
44 may make a handle to the object available to a wider audience. This  
45 may have security implications.  
46  
47  
48

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50

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45  
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47  
48 10. Acknowledgments

49     This document is a submission to the IPP Working group.  
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