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11 Internet Printing Protocol (IPP):  
12 LDAP Schema for Printer Services  
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18  
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35  
36 Abstract

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

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

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



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115	Internet Draft	LDAP Schema for Printer Services	27 April 2000
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117	12. Full Copyright Statement .....		25
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175 1. Introduction

176  
177 The use of directory services based on the Lightweight Directory  
178 Access Protocol [RFC 2251] is becoming increasingly popular for  
179 distributed services. To ensure interoperability between vendor  
180 implementations it is crucial to standardize the schemas which  
181 describe these services.

182  
183 Under the auspices of the IETF IPP Working Group the IPP protocol is  
184 being developed to bring a standards based printing solution to the  
185 Internet.

186  
187 Section 16 of [IPPMOD] describes a list of attributes which should be  
188 included in a general directory schema describing IPP print services.  
189 The syntax for each of these attributes is described in detail in  
190 [IPPMOD] and [SLPPRT]. This document will take these attributes and  
191 map them to LDAP attributes and object classes.

192  
193 This document defines several object classes to provide LDAP  
194 applications with multiple options in defining printer information  
195 using LDAP schema. Classes are provided for defining directory  
196 entries with common printer information and for extending existing  
197 directory entries with SLP, IPP, and LPR specific information.

198  
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201

202 2. Terminology

203  
204 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",  
205 "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this  
206 document are to be interpreted as described in [RFC 2119].

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230  
231 3. Definition of Object Classes  
232

233 We define the following LDAP object classes for use with both generic  
234 printer related information and services specific to SLP, IPP, and  
235 LPR.

- 236  
237 slpServicePrinter - auxiliary class for SLP registered printers  
238 printerAbstract - abstract class for all printer classes  
239 printerService - structural class for printers  
240 printerServiceAuxClass - auxiliary class for printers  
241 printerIPP - auxiliary class for IPP printers  
242 printerLPR - auxiliary class for LPR printers  
243

244 The following are some examples of how applications MAY choose to use  
245 these classes when creating directory entries:  
246

247 1) Use printerService for directory entries containing common printer  
248 information.

249  
250 2) Use both printerService and slpServicePrinter for directory  
251 entries containing common printer information for SLP registered  
252 printers.

253  
254 3) Use printerService, printerLPR and printerIPP for directory  
255 entries containing common printer information for printers that  
256 support both LPR and IPP.

257  
258 4) Use printerServiceAuxClass and object classes not defined by this  
259 document for directory entries containing common printer information.  
260 In this example, printerServiceAuxClass is used for extending other  
261 structural classes defining printer information with common printer  
262 information defined in this document.

263  
264 Note that specifying the abstract object class printerAbstract is  
265 OPTIONAL when using printerService or printerServiceAuxClass to  
266 create directory entries per [RFC 2251].  
267

268 Refer to section 4 for definition of attribute types referenced by  
269 these object classes. We use names instead of OIDs in MUST and MAY  
270 for clarity. Some attribute names described in [IPPMOD] have been  
271 prefixed with 'printer-' as recommended in [SLPPRT] and [SLPLDAP].  
272

273 For the object classes defined in this section, schema developers MAY  
274 add to the list of MAY OIDs, but MUST NOT modify the list of MUST  
275 OIDs and MUST NOT remove OIDs from the list of MAY OIDs. Schema  
276 developers MAY derive additional classes from the abstract and  
277 structural classes defined in this section. Note, an object class  
278 definition SHOULD NOT be changed without having a new name and OID  
279 assigned to it.  
280

288 3.1. slpServicePrinter  
289

290 This auxiliary class defines Service Location Protocol (SLP) specific  
291 information. It MUST be used with a structural class such as  
292 printerService. It MAY be used to create new or extend existing  
293 directory entries with SLP 'service:printer' abstract service type  
294 information as defined in [SLPPRT]. This object class is derived  
295 from 'slpService', the parent class for all SLP services, defined in  
296 [SLPLDAP].  
297

```
298 ( <id-oc>.8  
299 NAME 'slpServicePrinter'  
300 DESC 'Service Location Protocol (SLP) information.'  
301 SUP slpService  
302 AUXILIARY  
303 )
```

304  
305  
306 3.2. printerAbstract  
307

308 This abstract class defines printer information. It is a base class  
309 for deriving other printer related classes, such as, but not limited  
310 to, classes defined in this document. It defines a common set of  
311 printer attributes that are not specific to any one type of service,  
312 protocol or operating system.  
313

```
314 ( <id-oc>.9  
315 NAME 'printerAbstract'  
316 DESC 'Printer related information.'  
317 ABSTRACT  
318 SUP top  
319 MAY ( printer-name $  
320 printer-natural-language-configured $  
321 printer-location $ printer-info $ printer-more-info $  
322 printer-make-and-model $  
323 printer-multiple-document-jobs-supported $  
324 printer-charset-configured $ printer-charset-supported $  
325 printer-generated-natural-language-supported $  
326 printer-document-format-supported $ printer-color-supported $  
327 printer-compression-supported $ printer-pages-per-minute $  
328 printer-pages-per-minute-color $  
329 printer-finishings-supported $ printer-number-up-supported $  
330 printer-sides-supported $ printer-media-supported $  
331 printer-media-local-supported $  
332 printer-resolution-supported $  
333 printer-print-quality-supported $  
334 printer-job-priority-supported $ printer-copies-supported $  
335 printer-job-k-octets-supported $ printer-current-operator $  
336
```

```
341            printer-service-person $  
342            printer-delivery-orientation-supported $  
343            printer-stacking-order-supported $  
344            printer-output-features-supported )  
345        )
```

### 348 3.3. printerService

349  
350 This structural class defines printer information. It is derived  
351 from class printerAbstract and thus inherits common printer  
352 attributes. This class can be used with or without auxiliary classes  
353 to define printer information. Auxiliary classes can be used to  
354 extend the common printer information with protocol, service or  
355 operating system specific information. Note that when extending  
356 other structural classes with auxiliary classes, printerService MUST  
357 NOT be used.

358  
359 LDAP applications SHOULD use printer-uri as the naming attribute.  
360 That is, when using printerService, printer-uri SHOULD be used as the  
361 attribute type of the directory entry's relative distinguished name  
362 (RDN). printer-uri uniquely identifies each of the printer services  
363 for a given printer. Note that if the printer service changes  
364 domains, printer-uri must be updated with the new domain name.

```
365  
366 ( <id-oc>.10  
367 NAME 'printerService'  
368 DESC 'Printer information.'  
369 SUP printerAbstract  
370 MAY ( printer-uri $ printer-xri-supported )  
371 STRUCTURAL  
372 )
```

### 375 3.4. printerServiceAuxClass

376  
377 This auxiliary class defines printer information. It is derived from  
378 class printerAbstract and thus inherits common printer attributes.  
379 This class MUST be used with a structural class.

380  
381 LDAP applications SHOULD use printer-uri as the naming attribute.  
382 That is, when using printerService, printer-uri SHOULD be used as the  
383 attribute type of the directory entry's relative distinguished name  
384 (RDN). printer-uri uniquely identifies each of the printer services  
385 for a given printer. Note that if the printer service changes  
386 domains, printer-uri must be updated with the new domain name.

```
387  
388 ( <id-oc>.11  
389 NAME 'printerServiceAuxClass'  
390 DESC 'Printer information.'  
391 SUP printerAbstract
```

```
397     MAY    ( printer-uri $ printer-xri-supported )  
398     AUXILIARY  
399     )
```

400  
401  
402 3.5. printerIPP  
403

404 This auxiliary class defines Internet Printing Protocol (IPP)  
405 information. It MUST be used with a structural class such as  
406 printerService. It is used to extend structural classes with IPP  
407 specific printer information.

```
408  
409 ( <id-oc>.12  
410 NAME 'printerIPP'  
411 DESC 'Internet Printing Protocol (IPP) information.'  
412 SUP top  
413 AUXILIARY  
414 MAY    ( printer-ipp-versions-supported $  
415         printer-multiple-document-jobs-supported )  
416     )
```

417  
418  
419 3.6. printerLPR  
420

421 This auxiliary class defines LPR information. It MUST be used with a  
422 structural class such as printerService. It is used to identify  
423 directory entries that support LPR.

```
424  
425 ( <id-oc>.13  
426 NAME 'printerLPR'  
427 DESC 'LPR information.'  
428 SUP top  
429 AUXILIARY  
430     )
```



454  
 455 4. Definition of Attribute Types

456 The following attribute types are referenced by the object classes  
 457 defined in section 3.  
 458

459 The following table is a summary of the attribute names referenced by  
 460 this document and their corresponding names from [IPPMOD]. Some  
 461 attribute names described in [IPPMOD] have been prefixed with  
 462 'printer-' as recommended in [SLPLDAP], to address the flat namespace  
 463 for LDAP identifiers.  
 464

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	

509 printer-service-person  
510 printer-delivery-orientation-supported  
511 printer-stacking-order-supported  
512 printer-output-features-supported  
513

514 In the following definitions, we use matching rule names instead of  
515 OIDs for clarity. Note that if the printer information is not known,  
516 the attribute value is not set (for optional attributes). In the  
517 following definitions, referenced matching rules are defined in  
518 section 8 of [RFC 2252].  
519

520 The following definitions reference syntax OIDs as defined in [RFC  
521 2252], which are summarized below:

522 Syntax OID	Syntax Description
523 -----	-----
524 1.3.6.1.4.1.1466.115.121.1.7	Boolean
525 1.3.6.1.4.1.1466.115.121.1.15	Directory String (UTF-8 [RFC 2279])
526 1.3.6.1.4.1.1466.115.121.1.27	Integer

527  
528  
529  
530 4.1. printer-uri  
531

532 Note, that for SLP registered printers, the LDAP printer-uri  
533 attribute should set to the value of the registered URL of the  
534 printer.  
535

```
536 ( <id-at>.1  
537 NAME 'printer-uri'  
538 DESC 'The URI supported by this printer.'  
539 EQUALITY caseIgnoreMatch  
540 ORDERING caseIgnoreOrderingMatch  
541 SUBSTR caseIgnoreSubstringMatch  
542 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15  
543 SINGLE-VALUE  
544 )
```

545  
546  
547 4.2. printer-xri-supported  
548

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

```
553 'uri' == IPP 'printer-uri-supported' value  
554 'auth' == IPP 'uri-authentication-supported' value  
555 'sec' == IPP 'uri-security-supported' value
```

556 Legal values of the 'auth' metaparameter include  
557 'none' (no authentication for this URI)  
558 'requesting-user-name' (from operation request)  
559 'basic' (HTTP/1.1 Basic [RFC 2617])  
560

565       'digest' (HTTP/1.1 Basic, [RFC 2617])  
566       'certificate' (from certificate)  
567 per IPP Model [3] (extensions MAY also be used). A missing 'auth'  
568 metaparameter SHALL mean 'none'. Legal values of the 'sec'  
569 metaparameter include  
570       'none' (no security for this URI)  
571       'ssl3' (Netscape SSL3)  
572       'tls' (IETF TLS/1.0, [RFC 2246])  
573 per IPP Model [3] (extensions MAY also be used). A missing 'sec'  
574 metaparameter SHALL mean 'none'. Each metaparameter of a list member  
575 is delimited by '<'. For example:  
576       'uri=ipp://foo.com< auth=digest< sec=tls<'  
577       'uri=lpr://bar.com< auth=none< sec=none<'  
578 Registrations MAY consolidate values for metaparameters, as in the  
579 following example:  
580       'uri=ipp://foo.com< auth=basic,digest< sec=tls,ssl3<'

581  
582 ( <id-at>.2  
583 NAME 'printer-xri-supported'  
584 DESC 'The unordered list of XRI (extended resource identifiers)  
585 supported by this printer. Each member of the list consists of  
586 a URI (uniform resource identifier) followed by optional  
587 authentication and security metaparameters.'  
588 EQUALITY caseIgnoreMatch  
589 ORDERING caseIgnoreOrderingMatch  
590 SUBSTR caseIgnoreSubstringMatch  
591 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15  
592 )

593  
594  
595 4.3. printer-name

596  
597 The site-specific administrative name of this printer. This value of  
598 this attribute SHOULD be in the language specified in  
599 'printer-natural-language-configured' (although the printer's name  
600 may be in any language). This name MAY be the last part of the  
601 printer's URI or it MAY be completely unrelated. This name MAY  
602 contain characters that are not allowed in a conventional URI (which  
603 conforms to [RFC 2396]).

604  
605 ( <id-at>.3  
606 NAME 'printer-name'  
607 DESC 'The site-specific administrative name of this printer, more  
608 end-user friendly than a URI.'  
609 EQUALITY caseIgnoreMatch  
610 ORDERING caseIgnoreOrderingMatch  
611 SUBSTR caseIgnoreSubstringMatch  
612 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
613 SINGLE-VALUE  
614 )

622  
623 4.4. printer-natural-language-configured  
624

```
625 ( <id-at>.4  
626 NAME 'printer-generated-natural-language-configured'  
627 DESC 'The configured language in which error and status messages will  
628 be generated (by default) by this printer. Also, a possible  
629 language for printer string attributes set by operator, system  
630 administrator, or manufacturer. Also, the (declared) language  
631 of the "printer-name", "printer-location", "printer-info", and  
632 "printer-make-and-model" attributes of this printer. For  
633 example: "en-us" (US English) or "fr-fr" (French in France)  
634 Legal values of language tags conform to [RFC 1766] "Tags for  
635 the Identification of Languages".'  
636 EQUALITY caseIgnoreMatch  
637 ORDERING caseIgnoreOrderingMatch  
638 SUBSTR caseIgnoreSubstringMatch  
639 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
640 SINGLE-VALUE  
641 )
```

642  
643  
644 4.5. printer-location  
645

```
646 ( <id-at>.5  
647 NAME 'printer-location'  
648 DESC 'Identifies the location of the printer. This could include  
649 things like: "in Room 123A", "second floor of building XYZ".'  
650 EQUALITY caseIgnoreMatch  
651 ORDERING caseIgnoreOrderingMatch  
652 SUBSTR caseIgnoreSubstringMatch  
653 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
654 SINGLE-VALUE  
655 )
```

656  
657  
658 4.6. printer-info  
659

```
660 ( <id-at>.6  
661 NAME 'printer-info'  
662 DESC 'Identifies the descriptive information about this printer.  
663 This could include things like: "This printer can be used for  
664 printing color transparencies for HR presentations", or "Out  
665 of courtesy for others, please print only small (1-5 page) jobs  
666 at this printer", or even "This printer is going away on July  
667 1, 1997, please find a new printer".'  
668 EQUALITY caseIgnoreMatch  
669 ORDERING caseIgnoreOrderingMatch  
670 SUBSTR caseIgnoreSubstringMatch  
671 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
```

677        SINGLE-VALUE  
678        )

679  
680  
681 4.7. printer-more-info

682        ( <id-at>.7  
683        NAME 'printer-more-info'  
684        DESC 'A URI used to obtain more information about this specific  
685            printer. For example, this could be an HTTP type URI  
686            referencing an HTML page accessible to a Web Browser. The  
687            information obtained from this URI is intended for end user  
688            consumption.'  
689        EQUALITY caseIgnoreMatch  
690        ORDERING caseIgnoreOrderingMatch  
691        SUBSTR caseIgnoreSubstringMatch  
692        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15  
693        SINGLE-VALUE  
694        )

695  
696  
697  
698 4.8. printer-make-and-model

699        ( <id-at>.8  
700        NAME 'printer-make-and-model'  
701        DESC 'Identifies the make and model of the device. The device  
702            manufacturer may initially populate this attribute.'  
703        EQUALITY caseIgnoreMatch  
704        ORDERING caseIgnoreOrderingMatch  
705        SUBSTR caseIgnoreSubstringMatch  
706        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
707        SINGLE-VALUE  
708        )

709  
710  
711  
712 4.9. printer-ipp-versions-supported

713        ( <id-at>.9  
714        NAME 'printer-ipp-versions-supported'  
715        DESC 'Identifies the IPP protocol version(s) that this printer  
716            supports, including major and minor versions, i.e., the version  
717            numbers for which this Printer implementation meets the  
718            conformance requirements.'  
719        EQUALITY caseIgnoreMatch  
720        ORDERING caseIgnoreOrderingMatch  
721        SUBSTR caseIgnoreSubstringMatch  
722        SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
723        )

734  
735 4.10. printer-multiple-document-jobs-supported  
736

737 ( <id-at>.10  
738 NAME 'printer-multiple-document-jobs-supported'  
739 DESC 'Indicates whether or not the printer supports more than one  
740 document per job, i.e., more than one Send-Document or  
741 Send-Data operation with document data.'  
742 EQUALITY booleanMatch  
743 SYNTAX 1.3.6.1.4.1.1466.115.121.1.7  
744 SINGLE-VALUE  
745 )  
746  
747

748 4.11. printer-charset-configured  
749

750 ( <id-at>.11  
751 NAME 'printer-charset-configured'  
752 DESC 'The configured charset in which error and status messages will  
753 be generated (by default) by this printer. Also, a possible  
754 charset for printer string attributes set by operator, system  
755 administrator, or manufacturer. For example: "utf-8" (ISO  
756 10646/Unicode) or "iso-8859-1" (Latin1). Legal values are  
757 defined by the IANA Registry of Coded Character Sets and the  
758 "(preferred MIME name)" SHALL be used as the tag. For  
759 coherence with IPP Model, charset tags in this attribute SHALL  
760 be lowercase normalized. This attribute SHOULD be static (time  
761 of registration) and SHOULD NOT be dynamically refreshed  
762 (subsequently).'

763 EQUALITY caseIgnoreMatch  
764 SUBSTR caseIgnoreSubstringMatch  
765 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}  
766 SINGLE-VALUE  
767 )  
768  
769

770 4.12. printer-charset-supported  
771

772 ( <id-at>.12  
773 NAME 'printer-charset-supported'  
774 DESC 'Identifies the set of charsets supported for attribute type  
775 values of type Directory String for this directory entry. For  
776 example: "utf-8" (ISO 10646/Unicode) or "iso-8859-1" (Latin1).  
777 Legal values are defined by the IANA Registry of Coded  
778 Character Sets and the preferred MIME name.'  
779 EQUALITY caseIgnoreMatch  
780 SUBSTR caseIgnoreSubstringMatch  
781 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}  
782 )  
783  
784

790  
791 4.13. printer-generated-natural-language-supported  
792

793     ( <id-at>.13  
794     NAME 'printer-generated-natural-language-supported'  
795     DESC 'Identifies the natural language(s) supported for this directory  
796           entry. For example: "en-us" (US English) or "fr-fr" (French in  
797           France). Legal values conform to [RFC 1766], Tags for the  
798           Identification of Languages.'  
799     EQUALITY caseIgnoreMatch  
800     ORDERING caseIgnoreOrderingMatch  
801     SUBSTR caseIgnoreSubstringMatch  
802     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}  
803     )  
804  
805

806 4.14. printer-document-format-supported  
807

808     ( <id-at>.14  
809     NAME 'printer-document-format-supported'  
810     DESC 'The possible document formats in which data may be interpreted  
811           and printed by this printer. Legal values are MIME types come  
812           from the IANA Registry of Internet Media Types.'  
813     EQUALITY caseIgnoreMatch  
814     SUBSTR caseIgnoreSubstringMatch  
815     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
816     )  
817  
818

819 4.15. printer-color-supported  
820

821     ( <id-at>.15  
822     NAME 'printer-color-supported'  
823     DESC 'Indicates whether this printer is capable of any type of color  
824           printing at all, including highlight color.'  
825     EQUALITY booleanMatch  
826     SYNTAX 1.3.6.1.4.1.1466.115.121.1.7  
827     SINGLE-VALUE  
828     )  
829  
830

831 4.16. printer-compression-supported  
832

833     ( <id-at>.16  
834     NAME 'printer-compression-supported'  
835     DESC 'Compression algorithms supported by this printer. For example:  
836           "deflate, gzip". Legal values include; "none", "deflate"  
837           (public domain ZIP), "gzip" (GNU ZIP), "compress" (UNIX).'  
838     EQUALITY caseIgnoreMatch  
839     SUBSTR caseIgnoreSubstringMatch  
840

845       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}  
846       )

847  
848  
849 4.17. printer-pages-per-minute  
850

851       ( <id-at>.17  
852       NAME 'printer-pages-per-minute'  
853       DESC 'The nominal number of pages per minute which may be output by  
854           this printer (e.g., a simplex or black-and-white printer).  
855           This attribute is informative, NOT a service guarantee.  
856           Typically, it is the value used in marketing literature to  
857           describe this printer.'  
858       EQUALITY integerMatch  
859       ORDERING integerOrderingMatch  
860       SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
861       SINGLE-VALUE  
862       )

863  
864  
865 4.18. printer-pages-per-minute-color  
866

867       ( <id-at>.18  
868       NAME 'printer-pages-per-minute-color'  
869       DESC 'The nominal number of color pages per minute which may be  
870           output by this printer (e.g., a simplex or color printer).  
871           This attribute is informative, NOT a service guarantee.  
872           Typically, it is the value used in marketing literature to  
873           describe this printer.'  
874       EQUALITY integerMatch  
875       ORDERING integerOrderingMatch  
876       SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
877       SINGLE-VALUE  
878       )

879  
880  
881 4.19. printer-finishings-supported  
882

883       ( <id-at>.19  
884       NAME 'printer-finishings-supported'  
885       DESC 'The possible finishing operations supported by this printer.  
886           Legal values include; "none", "staple", "punch", "cover",  
887           "bind", "saddle-stitch", "edge-stitch", "staple-top-left",  
888           "staple-bottom-left", "staple-top-right",  
889           "staple-bottom-right", "edge-stitch-left", "edge-stitch-top",  
890           "edge-stitch-right", "edge-stitch-bottom", "staple-dual-left",  
891           "staple-dual-top", "staple-dual-right", "staple-dual-bottom.'  
892       EQUALITY caseIgnoreMatch  
893       SUBSTR caseIgnoreSubstringMatch  
894       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}  
895       )



901  
902

903 4.20. printer-number-up-supported

904       ( <id-at>.20  
905       NAME 'printer-number-up-supported'  
906       DESC 'The possible numbers of print-stream pages to impose upon a  
907           single side of an instance of a selected medium. Legal values  
908           include; 1, 2, and 4. Implementations may support other  
909           values.'  
910       EQUALITY integerMatch  
911       ORDERING integerOrderingMatch  
912       SYNTAX 1.3.6.1.4.1.1466.115.121.1.27  
913       )  
914

915  
916

917 4.21. printer-sides-supported

918       ( <id-at>.21  
919       NAME 'printer-sides-supported'  
920       DESC 'The number of impression sides (one or two) and the two-sided  
921           impression rotations supported by this printer. Legal values  
922           include; "one-sided", "two-sided-long-edge",  
923           "two-sided-short-edge".'  
924       EQUALITY caseIgnoreMatch  
925       SUBSTR caseIgnoreSubstringMatch  
926       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
927       )  
928

929  
930

931 4.22. printer-media-supported

932       ( <id-at>.22  
933       NAME 'printer-media-supported'  
934       DESC 'The standard names/types/sizes (and optional color suffixes) of  
935           the media supported by this printer. For example: "iso-a4",  
936           "envelope", or "na-letter-white". Legal values conform to ISO  
937           10175, Document Printing Application (DPA), and any IANA  
938           registered extensions.'  
939       EQUALITY caseIgnoreMatch  
940       SUBSTR caseIgnoreSubstringMatch  
941       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}  
942       )  
943

944  
945

946 4.23. printer-media-local-supported

947       ( <id-at>.23  
948       NAME 'printer-media-local-supported'  
949       DESC 'Site-specific names of media supported by this printer, in the  
950           language in "printer-generated-natural-language-configured".  
951       )  
952

```

954
955 Internet Draft      LDAP Schema for Printer Services      27 April 2000
956
957     For example: "purchasing-form" (site-specific name) as opposed
958     to (in "printer-media-supported"): "na-letter" (standard
959     keyword from ISO 10175).'
960 EQUALITY caseIgnoreMatch
961 SUBSTR caseIgnoreSubstringMatch
962 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}
963 )
964
965
966 4.24. printer-resolution-supported
967
968     ( <id-at>.24
969     NAME 'printer-resolution-supported'
970     DESC 'List of resolutions supported for printing documents by this
971     printer.  Each resolution value is a string with 3 fields:
972     1) Cross feed direction resolution (positive integer), 2) Feed
973     direction resolution (positive integer), 3) Resolution unit.
974     Legal values are "dpi" (dots per inch) and "dpcm" (dots per
975     centimeter).  Each resolution field is delimited by ">".  For
976     example: "300> 300> dpi>".'
977 EQUALITY caseIgnoreMatch
978 SUBSTR caseIgnoreSubstringMatch
979 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}
980 )
981
982
983 4.25. printer-print-quality-supported
984
985     ( <id-at>.25
986     NAME 'printer-print-quality-supported'
987     DESC 'List of print qualities supported for printing documents on
988     this printer.  For example: "draft, normal".  Legal values
989     include; "unknown", "draft", "normal", "high".'
990 EQUALITY caseIgnoreMatch
991 SUBSTR caseIgnoreSubstringMatch
992 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
993 )
994
995
996 4.26. printer-job-priority-supported
997
998     ( <id-at>.26
999     NAME 'printer-job-priority-supported'
1000    DESC 'Indicates the number of job priority levels supported.  An IPP
1001    conformant printer which supports job priority must always
1002    support a full range of priorities from "1" to "100" (to ensure
1003    consistent behavior), therefore this attribute describes the
1004    "granularity".  Legal values of this attribute are from "1" to
1005    "100".'
1006    EQUALITY integerMatch
1007    ORDERING integerOrderingMatch
1008
1009 Fleming, Jones, Lewis, McDonald      Expires 27 October 2000      [Page 18]

```

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1010
1011 Internet Draft      LDAP Schema for Printer Services      27 April 2000
1012
1013     SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
1014     SINGLE-VALUE
1015 )
1016
1017
1018 4.27. printer-copies-supported
1019
1020     ( <id-at>.27
1021     NAME 'printer-copies-supported'
1022     DESC 'The maximum number of copies of a document that may be printed
1023           as a single job. A value of "0" indicates no maximum limit. A
1024           value of "-1" indicates unknown.'
1025     EQUALITY integerMatch
1026     ORDERING integerOrderingMatch
1027     SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
1028     SINGLE-VALUE
1029 )
1030
1031
1032 4.28. printer-job-k-octets-supported
1033
1034     ( <id-at>.28
1035     NAME 'printer-job-k-octets-supported'
1036     DESC 'The maximum size in kilobytes (1,024 octets actually) incoming
1037           print job that this printer will accept. A value of "0"
1038           indicates no maximum limit. A value of "-1" indicates
1039           unknown.'
1040     EQUALITY integerMatch
1041     ORDERING integerOrderingMatch
1042     SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
1043     SINGLE-VALUE
1044 )
1045
1046
1047 4.29. printer-current-operator
1048
1049     ( <id-at>.29
1050     NAME 'printer-current-operator'
1051     DESC 'The name of the current human operator responsible for
1052           operating this printer. It is suggested that this string
1053           include information that would enable other humans to reach the
1054           operator, such as a phone number.'
1055     EQUALITY caseIgnoreMatch
1056     ORDERING caseIgnoreOrderingMatch
1057     SUBSTR caseIgnoreSubstringMatch
1058     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
1059     SINGLE-VALUE
1060 )
1061
1062
1063
1064
1065 Fleming, Jones, Lewis, McDonald Expires 27 October 2000 [Page 19]

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1070  
1071 4.30. printer-service-person

1072       ( <id-at>.30  
1073       NAME 'printer-service-person'  
1074       DESC 'The name of the current human service person responsible for  
1075            servicing this printer. It is suggested that this string  
1076            include information that would enable other humans to reach the  
1077            service person, such as a phone number.'  
1078       EQUALITY caseIgnoreMatch  
1079       ORDERING caseIgnoreOrderingMatch  
1080       SUBSTR caseIgnoreSubstringMatch  
1081       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
1082       SINGLE-VALUE  
1083       )  
1084  
1085  
1086

1087 4.31. printer-delivery-orientation-supported

1088       ( <id-at>.31  
1089       NAME 'printer-delivery-orientation-supported'  
1090       DESC 'The possible delivery orientations of pages as they are printed  
1091            and ejected from this printer. Legal values include;  
1092            "unknown", "face-up", and "face-down".'  
1093       EQUALITY caseIgnoreMatch  
1094       SUBSTR caseIgnoreSubstringMatch  
1095       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
1096       )  
1097  
1098  
1099

1100 4.32. printer-stacking-order-supported

1101       ( <id-at>.32  
1102       NAME 'printer-stacking-order-supported'  
1103       DESC 'The possible stacking order of pages as they are printed and  
1104            ejected from this printer. Legal values include; "unknown",  
1105            "first-to-last", "last-to-first".'  
1106       EQUALITY caseIgnoreMatch  
1107       SUBSTR caseIgnoreSubstringMatch  
1108       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
1109       )  
1110  
1111  
1112

1113 4.33. printer-output-features-supported

1114       ( <id-at>.33  
1115       NAME 'printer-output-features-supported'  
1116       DESC 'The possible output features supported by this printer. Legal  
1117            values include; "unknown", "bursting", "decollating",  
1118            "page-collating", "offset-stacking".'  
1119       )  
1120

1122  
1123 Internet Draft           LDAP Schema for Printer Services           27 April 2000  
1124  
1125       EQUALITY caseIgnoreMatch  
1126       SUBSTR caseIgnoreSubstringMatch  
1127       SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}  
1128       )  
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1177 Fleming, Jones, Lewis, McDonald       Expires 27 October 2000       [Page 21]

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5. Definition of Syntaxes

No new syntaxes are defined by this document.

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6. IANA Considerations

There are no IANA registration considerations defined by this document.

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7. Internationalization Considerations

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

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8. Security Considerations

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

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

Obtaining a reference to an object and storing it in the directory may make a handle to the object available to a wider audience. This may have security implications.

1223  
1224  
1225

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