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11
12 Internet Printing Protocol (IPP):
13 LDAP Schema for Printer Services
14 <draft-ietf-ipp-ldap-printer-schema-03.txt>

15
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17
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36
37 Abstract

38
39 This document is a product of the Internet Printing Protocol Working
40 Group, chartered by the IETF. Comments should be sent to the
41 ipp@pwg.org mailing list and the principal editor
42 flemingp@us.ibm.com.

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

51
52 This document describes the LDAP schema, object classes and
53 attributes, for printers and printer services. This document uses
54 the printer attributes defined in Appendix E of [IPPMOD], the
55 'printer:' service template defined in [SLPPRT], and the mapping
56 between SLP service advertisements and LDAP descriptions of services
57

61
62 defined in [SLPLDAP] to define an LDAP printer schema.

63
64 The goal of this document is to define a consistent schema to be used
65 by printers and print servers. The LDAP printer schema described in
66 this document MAY be used in part or whole.

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231
232 1. Introduction
233

234 The use of directory services based on the Lightweight Directory
235 Access Protocol [RFC 2251] is becoming increasingly popular for
236 distributed services. To ensure interoperability between vendor
237 implementations it is crucial to standardize the schemas which
238 describe these services.
239

240 Under the auspices of the IETF IPP Working Group the IPP protocol is
241 being developed to bring a standards based printing solution to the
242 Internet.
243

244 Section 16 of [IPPMOD] describes a list of attributes which should be
245 included in a general directory schema describing IPP print services.
246 The syntax for each of these attributes is described in detail in
247 [IPPMOD] and [SLPPRT]. This document will take these attributes and
248 map them to LDAP attributes and object classes.
249

250 This document defines several object classes to provide LDAP
251 applications with multiple options in defining printer information
252 using LDAP schema. Classes are provided for defining directory
253 entries with common printer information and for extending existing
254 directory entries with SLP, IPP, and LPR specific information.
255

256
257
258
259 2. Terminology
260

261 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
262 "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
263 document are to be interpreted as described in [RFC 2119].
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281

288 3. Definition of Object Classes

289 We define the following LDAP object classes for use with both generic
290 printer related information and services specific to SLP, IPP, and
291 LPR.
292

293
294 slpServicePrinter - auxiliary class for SLP registered printers
295 printerAbstract - abstract class for all printer classes
296 printerService - structural class for printers
297 printerServiceAuxClass - auxiliary class for printers
298 printerIPP - auxiliary class for IPP printers
299 printerLPR - auxiliary class for LPR printers
300

301 The following are some examples of how applications MAY choose to use
302 these classes when creating directory entries:
303

304 1) Use printerService for directory entries containing common printer
305 information.

306
307 2) Use both printerService and slpServicePrinter for directory
308 entries containing common printer information for SLP registered
309 printers.

310
311 3) Use printerService, printerLPR and printerIPP for directory
312 entries containing common printer information for printers that
313 support both LPR and IPP.

314
315 4) Use printerServiceAuxClass and object classes not defined by this
316 document for directory entries containing common printer information.
317 In this example, printerServiceAuxClass is used for extending other
318 structural classes defining printer information with common printer
319 information defined in this document.
320

321 Note that specifying the abstract object class printerAbstract is
322 OPTIONAL when using printerService or printerServiceAuxClass to
323 create directory entries per [RFC 2251].
324

325 Refer to section 4 for definition of attribute types referenced by
326 these object classes. We use names instead of OIDs in MUST and MAY
327 for clarity. Some attribute names described in [IPPMOD] have been
328 prefixed with 'printer-' as recommended in [SLPPRT] and [SLPLDAP].
329

330 For the object classes defined in this section, schema developers MAY
331 add to the list of MAY OIDs, but MUST NOT modify the list of MUST
332 OIDs and MUST NOT remove OIDs from the list of MAY OIDs. Schema
333 developers MAY derive additional classes from the abstract and
334 structural classes defined in this section. Note, an object class
335 definition SHOULD NOT be changed without having a new name and OID
336 assigned to it.
337

345 3.1. slpServicePrinter
346

347 This auxiliary class defines Service Location Protocol (SLP) specific
348 information. It MUST be used with a structural class such as
349 printerService. It MAY be used to create new or extend existing
350 directory entries with SLP 'service:printer' abstract service type
351 information as defined in [SLPPRT]. This object class is derived
352 from 'slpService', the parent class for all SLP services, defined in
353 [SLPLDAP].
354

```
355 ( <id-oc>.1  
356 NAME 'slpServicePrinter'  
357 DESC 'Service Location Protocol (SLP) information.'  
358 AUXILIARY  
359 SUP slpService  
360 )
```

361
362
363 3.2. printerAbstract
364

365 This abstract class defines printer information. It is a base class
366 for deriving other printer related classes, such as, but not limited
367 to, classes defined in this document. It defines a common set of
368 printer attributes that are not specific to any one type of service,
369 protocol or operating system.
370

```
371 ( <id-oc>.2  
372 NAME 'printerAbstract'  
373 DESC 'Printer related information.'  
374 ABSTRACT  
375 SUP top  
376 MAY ( printer-name $  
377 printer-natural-language-configured $  
378 printer-location $ printer-info $ printer-more-info $  
379 printer-make-and-model $  
380 printer-multiple-document-jobs-supported $  
381 printer-charset-configured $ printer-charset-supported $  
382 printer-generated-natural-language-supported $  
383 printer-document-format-supported $ printer-color-supported $  
384 printer-compression-supported $ printer-pages-per-minute $  
385 printer-pages-per-minute-color $  
386 printer-finishings-supported $ printer-number-up-supported $  
387 printer-sides-supported $ printer-media-supported $  
388 printer-media-local-supported $  
389 printer-resolution-supported $  
390 printer-print-quality-supported $  
391 printer-job-priority-supported $ printer-copies-supported $  
392 printer-job-k-octets-supported $ printer-current-operator $  
393
```



```
398            printer-service-person $  
399            printer-delivery-orientation-supported $  
400            printer-stacking-order-supported $  
401            printer-output-features-supported )  
402        )
```

403 404 405 3.3. printerService

406
407 This structural class defines printer information. It is derived
408 from class printerAbstract and thus inherits common printer
409 attributes. This class can be used with or without auxiliary classes
410 to define printer information. Auxiliary classes can be used to
411 extend the common printer information with protocol, service or
412 operating system specific information. Note that when extending
413 other structural classes with auxiliary classes, printerService MUST
414 NOT be used.

415
416 LDAP applications SHOULD use printer-uri as the naming attribute.
417 That is, when using printerService, printer-uri SHOULD be used as the
418 attribute type of the directory entry's relative distinguished name
419 (RDN). printer-uri uniquely identifies each of the printer services
420 for a given printer. Note that if the printer service changes
421 domains, printer-uri must be updated with the new domain name.

```
422  
423 ( <id-oc>.3  
424 NAME 'printerService'  
425 DESC 'Printer information.'  
426 STRUCTURAL  
427 SUP printerAbstract  
428 MAY ( printer-uri $ printer-xri-supported )  
429 )
```

430 431 432 3.4. printerServiceAuxClass

433
434 This auxiliary class defines printer information. It is derived from
435 class printerAbstract and thus inherits common printer attributes.
436 This class MUST be used with a structural class.

437
438 LDAP applications SHOULD use printer-uri as the naming attribute.
439 That is, when using printerServiceAuxClass, printer-uri SHOULD be
440 used as the attribute type of the directory entry's relative
441 distinguished name (RDN). printer-uri uniquely identifies each of
442 the printer services for a given printer. Note that if the printer
443 service changes domains, printer-uri must be updated with the new
444 domain name.

```
445  
446 ( <id-oc>.4  
447 NAME 'printerServiceAuxClass'  
448 DESC 'Printer information.'
```

```
454     AUXILIARY  
455     SUP   printerAbstract  
456     MAY   ( printer-uri $ printer-xri-supported )  
457     )
```

459
460 3.5. printerIPP
461

462 This auxiliary class defines Internet Printing Protocol (IPP)
463 information. It MUST be used with a structural class such as
464 printerService. It is used to extend structural classes with IPP
465 specific printer information.

```
466     ( <id-oc>.5  
467     NAME   'printerIPP'  
468     DESC   'Internet Printing Protocol (IPP) information.'  
469     AUXILIARY  
470     SUP   top  
471     MAY   ( printer-ipp-versions-supported $  
472           printer-multiple-document-jobs-supported )  
473     )  
474
```

475
476
477 3.6. printerLPR
478

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

```
482     ( <id-oc>.6  
483     NAME   'printerLPR'  
484     DESC   'LPR information.'  
485     AUXILIARY  
486     SUP   top  
487     MUST ( printer-name )  
488     MAY ( printer-aliases )  
489     )  
490
```

511
512 4. Definition of Attribute Types
513

514 The following attribute types are referenced by the object classes
515 defined in section 3.
516

517 The following table is a summary of the attribute names referenced by
518 this document and their corresponding names from [IPPMOD]. Some
519 attribute names described in [IPPMOD] have been prefixed with
520 'printer-' as recommended in [SLPLDAP], to address the flat namespace
521 for LDAP identifiers.
522

523 LDAP & SLP Printer Schema	523 IPP Model [IPPMOD]
524 -----	524 -----
525 printer-uri	
526 printer-xri-supported	
	527 [IPP printer-uri-supported]
	528 [IPP uri-authentication-supported]
	529 [IPP uri-security-supported]
530 printer-name	printer-name
531 printer-natural-language-configured	
	532 natural-language-configured
533 printer-location	printer-location
534 printer-info	printer-info
535 printer-more-info	printer-more-info
536 printer-make-and-model	printer-make-and-model
537 printer-ipp-versions-supported	ipp-versions-supported
538 printer-multiple-document-jobs-supported	
	539 multiple-document-jobs-supported
540 printer-charset-configured	charset-configured
541 printer-charset-supported	charset-supported
542 printer-generated-natural-language-supported	
	543 generated-natural-language-supported
544 printer-document-format-supported	
	545 document-format-supported
546 printer-color-supported	color-supported
547 printer-compression-supported	compression-supported
548 printer-pages-per-minute	pages-per-minute
549 printer-pages-per-minute-color	pages-per-minute-color
550 printer-finishings-supported	finishings-supported
551 printer-number-up-supported	number-up-supported
552 printer-sides-supported	sides-supported
553 printer-media-supported	media-supported
554 printer-media-local-supported	[site names from IPP media-supported]
555 printer-resolution-supported	printer-resolution-supported
556 printer-print-quality-supported	print-quality-supported
557 printer-job-priority-supported	job-priority-supported
558 printer-copies-supported	copies-supported
559 printer-job-k-octets-supported	job-k-octets-supported
560 printer-current-operator	

565
566 printer-service-person
567 printer-delivery-orientation-supported
568 printer-stacking-order-supported
569 printer-output-features-supported
570 printer-aliases

571
572 In the following definitions, we use matching rule names instead of
573 OIDs for clarity. Note that if the printer information is not known,
574 the attribute value is not set (for optional attributes). In the
575 following definitions, referenced matching rules are defined in
576 section 8 of [RFC 2252].

577
578 The following definitions reference syntax OIDs as defined in [RFC
579 2252], which are summarized below:

580 Syntax OID	Syntax Description
581 -----	-----
582 1.3.6.1.4.1.1466.115.121.1.7	Boolean
583 1.3.6.1.4.1.1466.115.121.1.15	Directory String (UTF-8 [RFC 2279])
584 1.3.6.1.4.1.1466.115.121.1.27	Integer

585
586
587
588 4.1. printer-uri

589
590 Note, that for SLP registered printers, the LDAP printer-uri
591 attribute should set to the value of the registered URL of the
592 printer.

593
594 (<id-at>.1
595 NAME 'printer-uri'
596 DESC 'The URI supported by this printer.'
597 EQUALITY caseIgnoreMatch
598 ORDERING caseIgnoreOrderingMatch
599 SUBSTR caseIgnoreSubstringMatch
600 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15
601 SINGLE-VALUE
602)

603
604
605 4.2. printer-xri-supported

606
607 A list of XRI (extended resource identifiers) supported by this
608 printer. Each value of this list consists of a URI (uniform resource
609 identifier) followed by optional authentication and security
610 metaparameters. The keywords for URI and their metaparameters are:

611 'uri' == IPP 'printer-uri-supported' value
612 'auth' == IPP 'uri-authentication-supported' value
613 'sec' == IPP 'uri-security-supported' value
614 Legal values of the 'auth' metaparameter include
615 'none' (no authentication for this URI)
616 'requesting-user-name' (from operation request)

621
622 'basic' (HTTP/1.1 Basic [RFC 2617])
623 'digest' (HTTP/1.1 Basic, [RFC 2617])
624 'certificate' (from certificate)
625 per IPP Model [3] (extensions MAY also be used). A missing 'auth'
626 metaparameter SHALL mean 'none'. Legal values of the 'sec'
627 metaparameter include
628 'none' (no security for this URI)
629 'ssl3' (Netscape SSL3)
630 'tls' (IETF TLS/1.0, [RFC 2246])
631 per IPP Model [3] (extensions MAY also be used). A missing 'sec'
632 metaparameter SHALL mean 'none'. Each metaparameter of a list member
633 is delimited by '<'. For example:
634 'uri=ipp://foo.com< auth=digest< sec=tls<'
635 'uri=lpr://bar.com< auth=none< sec=none<'
636 Registrations MAY consolidate values for metaparameters, as in the
637 following example:
638 'uri=ipp://foo.com< auth=basic,digest< sec=tls,ssl3<'

639
640 (<id-at>.2
641 NAME 'printer-xri-supported'
642 DESC 'The unordered list of XRI (extended resource identifiers)
643 supported by this printer. Each member of the list consists of
644 a URI (uniform resource identifier) followed by optional
645 authentication and security metaparameters.'
646 EQUALITY caseIgnoreMatch
647 ORDERING caseIgnoreOrderingMatch
648 SUBSTR caseIgnoreSubstringMatch
649 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15
650)

651
652
653 4.3. printer-name

654
655 The site-specific administrative name of this printer. This value of
656 this attribute SHOULD be in the language specified in
657 'printer-natural-language-configured' (although the printer's name
658 may be in any language). This name MAY be the last part of the
659 printer's URI or it MAY be completely unrelated. This name MAY
660 contain characters that are not allowed in a conventional URI (which
661 conforms to [RFC 2396]).

662
663 (<id-at>.3
664 NAME 'printer-name'
665 DESC 'The site-specific administrative name of this printer, more
666 end-user friendly than a URI.'
667 EQUALITY caseIgnoreMatch
668 ORDERING caseIgnoreOrderingMatch
669 SUBSTR caseIgnoreSubstringMatch
670 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
671 SINGLE-VALUE
672)

679
680 4.4. printer-natural-language-configured

681 (<id-at>.4
682 NAME 'printer-natural-language-configured'
683 DESC 'The configured language in which error and status messages will
684 be generated (by default) by this printer. Also, a possible
685 language for printer string attributes set by operator, system
686 administrator, or manufacturer. Also, the (declared) language
687 of the "printer-name", "printer-location", "printer-info", and
688 "printer-make-and-model" attributes of this printer. For
689 example: "en-us" (US English) or "fr-fr" (French in France)
690 Legal values of language tags conform to [RFC 1766] "Tags for
691 the Identification of Languages".'
692 EQUALITY caseIgnoreMatch
693 ORDERING caseIgnoreOrderingMatch
694 SUBSTR caseIgnoreSubstringMatch
695 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
696 SINGLE-VALUE
697)
698
699
700

701 4.5. printer-location

702 (<id-at>.5
703 NAME 'printer-location'
704 DESC 'Identifies the location of the printer. This could include
705 things like: "in Room 123A", "second floor of building XYZ".'
706 EQUALITY caseIgnoreMatch
707 ORDERING caseIgnoreOrderingMatch
708 SUBSTR caseIgnoreSubstringMatch
709 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
710 SINGLE-VALUE
711)
712
713
714

715 4.6. printer-info

716 (<id-at>.6
717 NAME 'printer-info'
718 DESC 'Identifies the descriptive information about this printer.
719 This could include things like: "This printer can be used for
720 printing color transparencies for HR presentations", or "Out
721 of courtesy for others, please print only small (1-5 page) jobs
722 at this printer", or even "This printer is going away on July
723 1, 1997, please find a new printer".'
724 EQUALITY caseIgnoreMatch
725 ORDERING caseIgnoreOrderingMatch
726 SUBSTR caseIgnoreSubstringMatch
727 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
728
729

734 SINGLE-VALUE
735)

736
737

738 4.7. printer-more-info

739
740

741 (<id-at>.7
742 NAME 'printer-more-info'
743 DESC 'A URI used to obtain more information about this specific
744 printer. For example, this could be an HTTP type URI
745 referencing an HTML page accessible to a Web Browser. The
746 information obtained from this URI is intended for end user
 consumption.'

747 EQUALITY caseIgnoreMatch
748 ORDERING caseIgnoreOrderingMatch
749 SUBSTR caseIgnoreSubstringMatch
750 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15
751 SINGLE-VALUE
752)

753
754

755 4.8. printer-make-and-model

756
757

758 (<id-at>.8
759 NAME 'printer-make-and-model'
760 DESC 'Identifies the make and model of the device. The device
761 manufacturer may initially populate this attribute.'

762 EQUALITY caseIgnoreMatch
763 ORDERING caseIgnoreOrderingMatch
764 SUBSTR caseIgnoreSubstringMatch
765 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
766 SINGLE-VALUE
767)

768
769

769 4.9. printer-ipp-versions-supported

770
771

772 (<id-at>.9
773 NAME 'printer-ipp-versions-supported'
774 DESC 'Identifies the IPP protocol version(s) that this printer
775 supports, including major and minor versions, i.e., the version
776 numbers for which this Printer implementation meets the
 conformance requirements.'

777 EQUALITY caseIgnoreMatch
778 ORDERING caseIgnoreOrderingMatch
779 SUBSTR caseIgnoreSubstringMatch
780 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
781)

782
783

784
785

792 4.10. printer-multiple-document-jobs-supported
793

```
794 ( <id-at>.10  
795 NAME 'printer-multiple-document-jobs-supported'  
796 DESC 'Indicates whether or not the printer supports more than one  
797 document per job, i.e., more than one Send-Document or  
798 Send-Data operation with document data.'  
799 EQUALITY booleanMatch  
800 SYNTAX 1.3.6.1.4.1.1466.115.121.1.7  
801 SINGLE-VALUE  
802 )
```

803
804
805 4.11. printer-charset-configured
806

```
807 ( <id-at>.11  
808 NAME 'printer-charset-configured'  
809 DESC 'The configured charset in which error and status messages will  
810 be generated (by default) by this printer. Also, a possible  
811 charset for printer string attributes set by operator, system  
812 administrator, or manufacturer. For example: "utf-8" (ISO  
813 10646/Unicode) or "iso-8859-1" (Latin1). Legal values are  
814 defined by the IANA Registry of Coded Character Sets and the  
815 "(preferred MIME name)" SHALL be used as the tag. For  
816 coherence with IPP Model, charset tags in this attribute SHALL  
817 be lowercase normalized. This attribute SHOULD be static (time  
818 of registration) and SHOULD NOT be dynamically refreshed  
819 (subsequently).'
```

```
820 EQUALITY caseIgnoreMatch  
821 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}  
822 SINGLE-VALUE  
823 )
```

824
825
826 4.12. printer-charset-supported
827

```
828 ( <id-at>.12  
829 NAME 'printer-charset-supported'  
830 DESC 'Identifies the set of charsets supported for attribute type  
831 values of type Directory String for this directory entry. For  
832 example: "utf-8" (ISO 10646/Unicode) or "iso-8859-1" (Latin1).  
833 Legal values are defined by the IANA Registry of Coded  
834 Character Sets and the preferred MIME name.'  
835 EQUALITY caseIgnoreMatch  
836 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}  
837 )
```


846
847
848 4.13. printer-generated-natural-language-supported
849

850 (<id-at>.13
851 NAME 'printer-generated-natural-language-supported'
852 DESC 'Identifies the natural language(s) supported for this directory
853 entry. For example: "en-us" (US English) or "fr-fr" (French in
854 France). Legal values conform to [RFC 1766], Tags for the
855 Identification of Languages.'
856 EQUALITY caseIgnoreMatch
857 ORDERING caseIgnoreOrderingMatch
858 SUBSTR caseIgnoreSubstringMatch
859 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{63}
860)

861
862
863 4.14. printer-document-format-supported
864

865 (<id-at>.14
866 NAME 'printer-document-format-supported'
867 DESC 'The possible document formats in which data may be interpreted
868 and printed by this printer. Legal values are MIME types come
869 from the IANA Registry of Internet Media Types.'
870 EQUALITY caseIgnoreMatch
871 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
872)

873
874
875 4.15. printer-color-supported
876

877 (<id-at>.15
878 NAME 'printer-color-supported'
879 DESC 'Indicates whether this printer is capable of any type of color
880 printing at all, including highlight color.'
881 EQUALITY booleanMatch
882 SYNTAX 1.3.6.1.4.1.1466.115.121.1.7
883 SINGLE-VALUE
884)

885
886
887 4.16. printer-compression-supported
888

889 (<id-at>.16
890 NAME 'printer-compression-supported'
891 DESC 'Compression algorithms supported by this printer. For example:
892 "deflate, gzip". Legal values include; "none", "deflate"
893 (public domain ZIP), "gzip" (GNU ZIP), "compress" (UNIX).'
894 EQUALITY caseIgnoreMatch
895 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}
896)

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4.17. printer-pages-per-minute

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

4.18. printer-pages-per-minute-color

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

4.19. printer-finishings-supported

```
( <id-at>.19
  NAME 'printer-finishings-supported'
  DESC 'The possible finishing operations supported by this printer.
        Legal values include; "none", "staple", "punch", "cover",
        "bind", "saddle-stitch", "edge-stitch", "staple-top-left",
        "staple-bottom-left", "staple-top-right",
        "staple-bottom-right", "edge-stitch-left", "edge-stitch-top",
        "edge-stitch-right", "edge-stitch-bottom", "staple-dual-left",
        "staple-dual-top", "staple-dual-right", "staple-dual-bottom".'
  EQUALITY caseIgnoreMatch
  SUBSTR caseIgnoreSubstringMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}
)
```

958
959
960 4.20. printer-number-up-supported

961 (<id-at>.20
962 NAME 'printer-number-up-supported'
963 DESC 'The possible numbers of print-stream pages to impose upon a
964 single side of an instance of a selected medium. Legal values
965 include; 1, 2, and 4. Implementations may support other
966 values.'
967 EQUALITY integerMatch
968 ORDERING integerOrderingMatch
969 SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
970)
971

972
973
974 4.21. printer-sides-supported

975 (<id-at>.21
976 NAME 'printer-sides-supported'
977 DESC 'The number of impression sides (one or two) and the two-sided
978 impression rotations supported by this printer. Legal values
979 include; "one-sided", "two-sided-long-edge",
980 "two-sided-short-edge".'
981 EQUALITY caseIgnoreMatch
982 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
983)
984

985
986
987 4.22. printer-media-supported

988 (<id-at>.22
989 NAME 'printer-media-supported'
990 DESC 'The standard names/types/sizes (and optional color suffixes) of
991 the media supported by this printer. For example: "iso-a4",
992 "envelope", or "na-letter-white". Legal values conform to ISO
993 10175, Document Printing Application (DPA), and any IANA
994 registered extensions.'
995 EQUALITY caseIgnoreMatch
996 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}
997)
998

999
1000
1001 4.23. printer-media-local-supported

1002 (<id-at>.23
1003 NAME 'printer-media-local-supported'
1004 DESC 'Site-specific names of media supported by this printer, in the
1005 language in "printer-natural-language-configured".
1006 For example: "purchasing-form" (site-specific name) as opposed
1007 to (in "printer-media-supported"): "na-letter" (standard
1008 to (in "printer-media-supported")):
1009

1014 keyword from ISO 10175).'
1015 EQUALITY caseIgnoreMatch
1016 SUBSTR caseIgnoreSubstringMatch
1017 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}
1018)

1020
1021 4.24. printer-resolution-supported

1022 (<id-at>.24
1023 NAME 'printer-resolution-supported'
1024 DESC 'List of resolutions supported for printing documents by this
1025 printer. Each resolution value is a string with 3 fields:
1026 1) Cross feed direction resolution (positive integer), 2) Feed
1027 direction resolution (positive integer), 3) Resolution unit.
1028 Legal values are "dpi" (dots per inch) and "dpcm" (dots per
1029 centimeter). Each resolution field is delimited by ">". For
1030 example: "300> 300> dpi>".'
1031 EQUALITY caseIgnoreMatch
1032 SUBSTR caseIgnoreSubstringMatch
1033 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{255}
1034)
1035
1036
1037

1038 4.25. printer-print-quality-supported

1039 (<id-at>.25
1040 NAME 'printer-print-quality-supported'
1041 DESC 'List of print qualities supported for printing documents on
1042 this printer. For example: "draft, normal". Legal values
1043 include; "unknown", "draft", "normal", "high".'
1044 EQUALITY caseIgnoreMatch
1045 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
1046)
1047
1048
1049

1050 4.26. printer-job-priority-supported

1051 (<id-at>.26
1052 NAME 'printer-job-priority-supported'
1053 DESC 'Indicates the number of job priority levels supported. An IPP
1054 conformant printer which supports job priority must always
1055 support a full range of priorities from "1" to "100" (to ensure
1056 consistent behavior), therefore this attribute describes the
1057 "granularity". Legal values of this attribute are from "1" to
1058 "100".'
1059 EQUALITY integerMatch
1060 ORDERING integerOrderingMatch
1061 SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
1062 SINGLE-VALUE
1063)
1064
1065

1070
1071
1072 4.27. printer-copies-supported
1073

1074 (<id-at>.27
1075 NAME 'printer-copies-supported'
1076 DESC 'The maximum number of copies of a document that may be printed
1077 as a single job. A value of "0" indicates no maximum limit. A
1078 value of "-1" indicates unknown.'
1079 EQUALITY integerMatch
1080 ORDERING integerOrderingMatch
1081 SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
1082 SINGLE-VALUE
1083)
1084

1085
1086 4.28. printer-job-k-octets-supported
1087

1088 (<id-at>.28
1089 NAME 'printer-job-k-octets-supported'
1090 DESC 'The maximum size in kilobytes (1,024 octets actually) incoming
1091 print job that this printer will accept. A value of "0"
1092 indicates no maximum limit. A value of "-1" indicates
1093 unknown.'
1094 EQUALITY integerMatch
1095 ORDERING integerOrderingMatch
1096 SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
1097 SINGLE-VALUE
1098)
1099

1100
1101 4.29. printer-current-operator
1102

1103 (<id-at>.29
1104 NAME 'printer-current-operator'
1105 DESC 'The name of the current human operator responsible for
1106 operating this printer. It is suggested that this string
1107 include information that would enable other humans to reach the
1108 operator, such as a phone number.'
1109 EQUALITY caseIgnoreMatch
1110 ORDERING caseIgnoreOrderingMatch
1111 SUBSTR caseIgnoreSubstringMatch
1112 SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
1113 SINGLE-VALUE
1114)
1115

1116
1117 4.30. printer-service-person
1118

1119 (<id-at>.30
1120 NAME 'printer-service-person'
1121

```

1123
1124 Internet Draft      LDAP Schema for Printer Services      04 August 2000
1125
1126     DESC 'The name of the current human service person responsible for
1127           servicing this printer.  It is suggested that this string
1128           include information that would enable other humans to reach the
1129           service person, such as a phone number.'
```

```

1130     EQUALITY caseIgnoreMatch
1131     ORDERING caseIgnoreOrderingMatch
1132     SUBSTR caseIgnoreSubstringMatch
1133     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
1134     SINGLE-VALUE
1135 )
1136
1137
1138 4.31. printer-delivery-orientation-supported
1139
1140     ( <id-at>.31
1141     NAME 'printer-delivery-orientation-supported'
1142     DESC 'The possible delivery orientations of pages as they are printed
1143           and ejected from this printer.  Legal values include;
1144           "unknown", "face-up", and "face-down".'
```

```

1145     EQUALITY caseIgnoreMatch
1146     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
1147     )
1148
1149
1150 4.32. printer-stacking-order-supported
1151
1152     ( <id-at>.32
1153     NAME 'printer-stacking-order-supported'
1154     DESC 'The possible stacking order of pages as they are printed and
1155           ejected from this printer.  Legal values include; "unknown",
1156           "first-to-last", "last-to-first".'
```

```

1157     EQUALITY caseIgnoreMatch
1158     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
1159     )
1160
1161
1162 4.33. printer-output-features-supported
1163
1164     ( <id-at>.33
1165     NAME 'printer-output-features-supported'
1166     DESC 'The possible output features supported by this printer.  Legal
1167           values include; "unknown", "bursting", "decollating",
1168           "page-collating", "offset-stacking".'
```

```

1169     EQUALITY caseIgnoreMatch
1170     SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
1171     )
1172
1173
1174
1175
1176
1177
1178 Fleming, Jones, Lewis, McDonald      Expires 04 February 2001      [Page 21]
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4.34. printer-aliases

```
( <id-at>.34
  NAME 'printer-aliases'
  DESC 'Site-specific administrative names of this printer in addition
       the printer name specified for printer-name.'
  EQUALITY caseIgnoreMatch
  ORDERING caseIgnoreOrderingMatch
  SUBSTR caseIgnoreSubstringMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.15{127}
)
```

1239
1240 5. Definition of Syntaxes

1241 No new syntaxes are defined by this document.
1242
1243

1244
1245 6. IANA Considerations

1246 There are no IANA registration considerations defined by this
1247 document.
1248
1249

1250
1251 7. Internationalization Considerations

1252
1253 All text string attribute values in objects of the printerService
1254 class MUST be encoded in UTF-8 [RFC 2279] characters, as required by
1255 the syntax 'Directory String' [RFC 2252]. Also, a language tag for
1256 all of the text string attributes in objects of the printerService
1257 class SHOULD be supplied in 'printer-natural-language-configured'.
1258 Therefore, all objects of the printerService class conform to "IETF
1259 Policy on Character Sets and Languages" [RFC 2277].
1260
1261

1262
1263 8. Security Considerations

1264 As with any LDAP schema, it is important to protect specific entries
1265 and attributes with the appropriate access control. It is
1266 particularly important that only administrators can modify entries
1267 defined in this schema. For additional considerations of deploying
1268 printers in an IPP environment the reader is referred to section 8 of
1269 [IPPMOD].
1270

1271 By advertising the security methods for each supported printer URL
1272 the printer may expose information useful to attackers. Suitable
1273 security methods SHOULD be used to authenticate any service
1274 advertisements.
1275

1276 Obtaining a reference to an object and storing it in the directory
1277 may make a handle to the object available to a wider audience. This
1278 may have security implications.
1279

1280
1281
1282
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1336
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1338
1339 10. Acknowledgments

1340 This document is a submission to the IPP Working group.

1341
1342 Thanks to Kimberly Reger (IBM), Robert Moore (IBM) and Lee Rafalow
1343 (IBM) for their review comments and help in preparing this document.

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