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                                                        21 October 1999

Definition of printer: URLs for use with Service Location
<draft-ietf-svrloc-printer-scheme-04.txt>

Status of This Memo

Abstract

This document is a submission to the Service Location Working Group
of the Internet Engineering Task Force (IETF). Comments should be
submitted to the srvloc@srvloc.org mailing list.

This document defines the 'printer:' service type and the attributes
associated with it. This 'printer:' service template is designed to
be used in conjunction with the Service Location Protocol, Version 2
(SLPv2) [13], but may be used with any directory service which
supports attribute/value pair registration, such as Lightweight
Directory Access Protocol, Version 3 (LDAPv3, RFC 2251).

The 'printer:' service type is specified as an abstract service type.
It is expected that printers advertised with the 'printer:' service
type may be accessible by one or more protocols. IPP [3] and LPR [2]
are two examples of printing protocols that may be used to perform
the actual printing.

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1. Introduction

    Service Type templates are used to describe in a standard way those
    services which use the 'service:' URL. The template described in
    this document is an abstract type that includes concrete types such
    as the printing protocol defined in RFC 1179 [2], "Line Printer
    Daemon Protocol". The service type for this 'service:' URL is
    'printer:'.

    The 'printer:' service URL scheme supports consistent registration of
    printer services. The attributes described within this document are
    derived from previous specifications developed by the IETF IPP WG and
    IETF Printer MIB WG.

    The attributes specified are intended to facilitate both automatic
    and manual selection of services, not to provide service state,
    statistics, or notification. The target audience of service
    attributes consists of users, either software agents or end users.

2. Terminology

    The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
    "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
    document are to be interpreted as described in RFC 2119 [14].

3.   Template url-path Definition

     The 'printer:' type is an abstract service type. Because an abstract
     service type may contain one of many concrete types, the 'url-path'
     associated with a 'printer:' service URL may vary. IPP and LPR
     printers are presently supported by this 'printer:' template. Other
     printer protocols MAY be supported by extension templates or by
     future updates of this abstract 'printer:' template.

3.1. IPP

     An IPP Printer object is defined in "IPP/1.1 Model and Semantics"
     [3]. An IPP printer concrete URL is defined in "IPP/1.1 Encoding and
     Transport" [9].

     Examples of valid 'service:' URLs for IPP printers include:

     service:printer:ipp://server.sun.com/cgi-bin/public-printer
     service:printer:ipp://foo.sun.com/printers?public-printer

3.2. LPR

     An LPR accessible printer MAY include a queue name as the last part
     of the URL. If the queue name is absent, the print server is assumed
     to use a default print queue. The definition of an LPR printer
     concrete URL is specified in this document, in the 'printer:' service
     template.

     Examples of valid 'service:' URLs for LPR printers include:

     service:printer:lpr://server.sun.com
     service:printer:lpr://server.sun.com/public-printer

227

228
229   4.   Printer Service Template

230
231   The 'printer:' service template defined below conforms to the grammar
232   described in "Service Templates and service: Schemes". Please refer
233   to [4] for detailed explanation of the syntax.

234
235   Name of submitters: Pete St. Pierre <Pete.StPierre@eng.sun.com>
236   Scott Isaacson <sisaacson@novell.com>
237   Ira McDonald <imcdonal@sdsp.mc.xerox.com>

238
239   Language of service template: en (English)

240
241   Security Considerations:
242   By advertising the security methods associated with each supported
243   printer URL via the mandatory attributes 'printer-uri-supported'
244   'uri-authentication-supported', and 'uri-security-supported', the
245   the printer may expose information useful to attackers. Either SL
246   security or another security method SHOULD be used to authenticate
247   any service advertisements.

248
249   Template Text:
250   ------------------- template begins here --------------------
251   template-type = printer

252
253   template-version = 0.4

254
255   template-description =
256   The 'printer:' service template describes the attributes
257   supported by network printing devices. Devices may be
258   either directly connected to a network or managed by a
259   print server. The device or server understands one or
260   more network print protocols such as IPP or LPR.

261
262   template-url-syntax =
263   url-path   = ippurl / lprurl
264   ippurl   = IPP URL as defined in [9]
265   lprurl   = "lpr://" hostport ["/" qname]
266   hostport   = host [":" port]
267   host   = hostname / hostnumber
268   hostname   = *(domainlavel ".") toplabel
269   domainlabel = alphanum /
270   alphanum * [alphanum / "-"] alphanum
271   toplabel   = alpha / alpha * [alphanum / "-"] alphanum
272   hostnumber = ipv4-number / ipv6-number
273   ipv4-number = 1*3digit 3*3("." 1*3digit)
274   ipv6-number = 32*hex
275   3digit   = digit digit digit
276   port   = 1*digit
277   alphanum   = alpha / digit

278

282
```
283                 alpha       = "a" / "b" / "c" / "d" / "e" / "f" / "g" /
284                               "h" / "i" / "j" / "k" / "l" / "m" / "n" /
285                               "o" / "p" / "q" / "r" / "s" / "t" / "u" /
286                               "v" / "w" / "x" / "y" / "z" /
287                               "A" / "B" / "C" / "D" / "E" / "F" / "G" /
288                               "H" / "I" / "J" / "K" / "L" / "M" / "N" /
289                               "O" / "P" / "Q" / "R" / "S" / "T" / "U" /
290                               "V" / "W" / "X" / "Y" / "Z"
291                 digit       = "0" / "1" / "2" / "3" / "4" / "5" / "6" /
292                               "7" / "8" / "9"
293
294         printer-uri-supported = STRING L
295             # REQUIRED for all registrations by conforming SLP SAs
296             # IPP 'printer-uri-supported'
297             # The ORDERED list of URI supported by this printer,
298             # correlated with 'uri-authentication-supported' values
299             # and correlated with 'uri-security-supported' values.
300             # Each list member is delimited by '>', for example:
301             #    'lpr://foo.com> ipp://bar.com'>
302
303         uri-authentication-supported = STRING L
304             # REQUIRED for all registrations by conforming SLP SAs
305             # IPP 'uri-authentication-supported'
306             # The ORDERED list of authentication supported for each URI
307             # specified in 'printer-uri-supported' for this printer.
308             # Each list member is delimited by '>', for example:
309             #    'basic> certificate>'
310             # (see example of 'printer-uri-supported' above).
311             # Legal values include
312             #    'none' (no authentication for this URI)
313             #    'requesting-user-name' (from operation request)
314             #    'basic' (HTTP/1.1 Basic, RFC 2617)
315             #    'digest' (HTTP/1.1 Basic, RFC 2617)
316             #    'certificate' (from certificate)
317             # per IPP Model [3] (extensions MAY also be used).
318             # URI that do not support authentication SHALL specify
319             # 'none'.
320
321         uri-security-supported = STRING L
322             # REQUIRED for all registrations by conforming SLP SAs
323             # IPP 'uri-security-supported'
324             # The ORDERED list of security supported for each URI
325             # specified in 'printer-uri-supported' for this printer.
326             # Each list member is delimited by '>', for example:
327             #    'none> tls>'
328             # (see example of 'printer-uri-supported' above).
329             # Legal values include
330             #    'none' (no security for this URI)
331             #    'ssl3' (Netscape SSL3)
332             #    'tls' (IETF TLS/1.0, RFC 2246)
333             # per IPP Model [3] (extensions MAY also be used).
```
334

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336
337    Internet Draft          'printer:' Service Template         21 October 1999
338
339                   # URI that do not support security SHALL specify
340                   # 'none'.
341
342            printer-name = STRING
343                   # REQUIRED for all registrations by conforming SLP SAs
344                   # IPP 'printer-name'
345                   # The site-specific administrative name of this printer,
346                   # in the language in 'natural-language-configured'.
347                   # This name MAY be the last part of the printer's URI or it
348                   # MAY be completely unrelated.
349                   # This name MAY contain characters that are not allowed in a
350                   # conventional URI (which conforms to RFC 2396).
351                   # If this printer information is not known to the SLP SA,
352                   # then this attribute SHALL be set to 'unknown'.
353                   # This attribute SHOULD be static (time of registration)
354                   # and SHOULD NOT be dynamically refreshed (subsequently).
355
356            printer-location = STRING O
357                   unknown
358                   # IPP 'printer-location'
359                   # The physical location of this printer,
360                   # in the language in 'natural-language-configured'.
361                   # A free form description of this printer's physical
362                   # location, for example:
363                   #   '2nd floor, near the fire escape'
364                   # If this printer information is not known to the SLP SA,
365                   # then this attribute SHALL be set to 'unknown'.
366
367            printer-info = STRING O
368                   unknown
369                   # IPP 'printer-info'
370                   # Additional descriptive information on this printer,
371                   # in the language in 'natural-language-configured'.
372                   # A free form string that may contain any site-specific
373                   # descriptive information about this printer.
374                   # If this printer information is not known to the SLP SA,
375                   # then this attribute SHALL be set to 'unknown'.
376
377            printer-more-info = STRING L O
378                   unknown
379                   # IPP 'printer-more-info'
380                   # A URI used to obtain more information about this specific
381                   # printer.  For example, this could be an 'http:' URI
382                   # referencing an HTML page accessible to a Web Browser.
383                   # The information obtained from this URI is intended for
384                   # end user consumption.
385                   # If this printer information is not known to the SLP SA,
386                   # then this attribute SHALL be set to 'unknown'.
387
388            printer-make-and-model = STRING O
389                   unknown
390
391    St. Pierre, Isaacson, McDonald     Expires 21 April 2000        [Page 7]
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```
395                # IPP 'printer-make-and-model'
396                # The manufacturer, make, and model of this printer,
397                # a simple text string defined by the manufacturer,
398                # in the language in 'natural-language-configured'.
399                # If this printer information is not known to the SLP SA,
400                # then this attribute SHALL be set to 'unknown'.
401
402        ipp-versions-supported = STRING L M O
403            none
404            # IPP 'ipp-versions-supported'
405            # The unordered list of 'major.minor' IPP versions
406            # supported by this printer or 'none'.
407            # For example:
408            #    '1.0, 1.1'
409            # Legal values include 'none', '1.0', and '1.1',
410            # per IPP Model [3] (extensions MAY also be used).
411            # If this printer information is not known to the SLP SA,
412            # then this attribute SHALL be set to 'none'.
413
414        multiple-document-jobs-supported = STRING L O
415            unknown
416            # IPP 'multiple-document-jobs-supported'
417            # Indicates whether this printer supports more than one
418            # document per job.
419            # This template attribute is an extended boolean.
420            # If this printer information is not known to the SLP SA,
421            # then this attribute SHALL be set to 'unknown'.
422            unknown, true, false
423
424        charset-configured = STRING L O
425            utf-8
426            # IPP 'charset-configured'
427            # The configured charset in which error and status messages
428            # will be generated (by default) by this printer.
429            # Also, a possible charset for printer string attributes
430            # set by operator, system administrator, or manufacturer.
431            # For example:
432            #    'utf-8' (ISO 10646/Unicode) or 'iso-8859-1' (Latin1)
433            # Legal values of charset tags (names/aliases) come from
434            # the IANA Registry of Coded Character Sets [6] and
435            # the '(preferred MIME name)' SHALL be used as the tag.
436            # For coherence with IPP Model [3], charset tags in this
437            # attribute SHALL be lowercase normalized.
438            # This attribute SHOULD be static (time of registration)
439            # and SHOULD NOT be dynamically refreshed (subsequently).
440
441        charset-supported = STRING L M O
442            utf-8
443            # IPP 'charset-supported'
444            # The possible charsets in which error and status messages
445            # may be generated (if requested) by this printer.
446
```

```
                    # Also, the possible charsets for printer string attributes
                    # set by operator, system administrator, or manufacturer.
                    # For example:
                    #   'utf-8' (ISO 10646/Unicode) or 'iso-8859-1' (Latin1)
                    # Legal values of charset tags (names/aliases) come from
                    # the IANA Registry of Coded Character Sets [6] and
                    # the '(preferred MIME name)' SHALL be used as the tag.
                    # This attribute SHALL include the value 'utf-8', per
                    # RFC 2277, 'IETF Policy on Charsets and Languages' [12].
                    # For coherence with IPP Model [3], charset tags in this
                    # attribute SHALL be lowercase normalized.

             natural-language-configured = STRING L
                    # REQUIRED for all registrations by conforming SLP SAs
                    # IPP 'natural-language-configured'
                    # The configured language in which error and status messages
                    # will be generated (by default) by this printer.
                    # Also, a possible language for printer string attributes
                    # set by operator, system administrator, or manufacturer.
                    # Also, the (declared) language of the 'printer-name',
                    # 'printer-location', 'printer-info', and
                    # 'printer-make-and-model' attributes of this printer.
                    # For example:
                    #   'en-us' (US English) or 'fr-fr' (French in France)
                    # Legal values of language tags conform to RFC 1766
                    # 'Tags for the Identification of Languages' [5].
                    # For coherence with IPP Model [3], language tags in this
                    # attribute SHALL be lowercase normalized.
                    # This attribute SHOULD be static (time of registration)
                    # and SHOULD NOT be dynamically refreshed (subsequently).

             natural-language-supported = STRING L M
                    # REQUIRED for all registrations by conforming SLP SAs
                    # IPP 'generated-natural-language-supported'
                    # The possible languages in which error and status messages
                    # may be generated (if requested) by this printer.
                    # Also, the possible languages for printer string attributes
                    # set by operator, system administrator, or manufacturer.
                    # For example:
                    #   'en-us' (US English) or 'fr-fr' (French in France)
                    # Legal values of language tags conform to RFC 1766
                    # 'Tags for the Identification of Languages' [5].
                    # For coherence with IPP Model [3], language tags in this
                    # attribute SHALL be lowercase normalized.

             document-format-supported = STRING L M
                    # REQUIRED for all registrations by conforming SLP SAs
                    # IPP 'document-format-supported'
                    # The possible document formats in which data may be
                    # interpreted and printed by this printer.
                    # Legal values of document formats (MIME types) come from
```

507   # the IANA Registry of Internet Media Types [11].
508   # If this printer information is not known to the SLP SA,
509   # then this attribute SHALL be set to 'unknown'.
510
511   color-supported = STRING L O
512   unknown
513   # IPP 'color-supported'
514   # Indicates whether this printer is capable of any type of
515   # color printing at all, including highlight color.
516   # This template attribute is an extended boolean.
517   # If this printer information is not known to the SLP SA,
518   # then this attribute SHALL be set to 'unknown'.
519   unknown, true, false
520
521   compression-supported = STRING L M
522   # REQUIRED for all registrations by conforming SLP SAs
523   # IPP 'compression-supported'
524   # The unordered list of compression algorithms supported
525   # by this printer.
526   # For example:
527   #   'deflate, gzip'
528   # Legal values include
529   #   'none'
530   #   'deflate' (public domain ZIP)
531   #   'gzip' (GNU ZIP)
532   #   'compress' (UNIX)
533   # per IPP Model [3] (extensions MAY also be used).
534   # If this printer information is not known to the SLP SA,
535   # then this attribute SHALL be set to 'none'.
536
537   pages-per-minute = INTEGER O
538   -1
539   # IPP 'pages-per-minute'
540   # The nominal number of pages per minute which may be
541   # output by this printer (e.g., simplex, black-and-white).
542   # This attribute is informative, NOT a service guarantee.
543   # Typically, it is the value used in marketing literature
544   # to describe this printer.
545   # A value of '-1' indicates unknown.
546   # If this printer information is not known to the SLP SA,
547   # then this attribute SHALL be set to '-1'.
548
549   pages-per-minute-color = INTEGER O
550   -1
551   # IPP 'pages-per-minute-color'
552   # The nominal number of color pages per minute which may be
553   # output by this printer (e.g., simplex, color).
554   # This attribute is informative, NOT a service guarantee.
555   # Typically, it is the value used in marketing literature
556   # to describe this printer.
557   # A value of '-1' indicates unknown.
558

```
                # If this printer information is not known to the SLP SA,
                # then this attribute SHALL be set to '-1'.

         finishings-supported = STRING L M O
             none
             # IPP 'finishings-supported'
             # The possible finishing operations supported by this
             # printer.
             # Legal values of finishings are defined in IPP Model [3].
             # If this printer information is not known to the SLP SA,
             # then this attribute SHALL be set to 'none'.
             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

         number-up-supported = INTEGER M O
             1
             # IPP 'number-up-supported'
             # The possible numbers of print-stream pages to impose
             # upon a single side of an instance of a selected
             # medium.
             # Legal values of this attribute include 1, 2, and 4 [3].
             # Implementations may support other values.
             # If this printer information is not known to the SLP SA,
             # then this attribute SHALL be set to '1'.

         sides-supported = STRING L M O
             one-sided
             # IPP 'sides-supported'
             # (Compare with Salutation 'duplex-mode')
             # The number of impression sides (one or two) and the
             # two-sided impression rotations supported by this printer.
             # Salutation 'simplex' == IPP 'one-sided'
             # Salutation 'duplex' == IPP 'two-sided-long-edge'
             # Salutation 'tumble' == IPP 'two-sided-short-edge'
             # If this printer information is not known to the SLP SA,
             # then this attribute SHALL be set to 'one-sided'.
             one-sided, two-sided-long-edge, two-sided-short-edge

         media-supported = STRING L M O
             unknown
             # IPP 'media-supported' - only the standard keyword values
             # The standard names/types/sizes (and optional color
             # suffixes) of the media supported by this printer.
             # The values specified are NOT localized according to the
             # value of 'natural-language-configured', but are in a
```

```
                 # fixed language of 'en-us' (US English).  For example:
                 #   'iso-a4' or 'envelope' or 'na-letter-white'
                 # Legal values of this attribute conform to ISO 10175
                 # 'Document Printing Application (DPA)' [10] and
                 # any IANA registered extensions, per IPP Model [3].
                 # If this printer information is not known to the SLP SA,
                 # then this attribute SHALL be set to 'unknown'.

        media-local-supported = STRING M O
             unknown
             # IPP 'media-supported' - only site-specific name values
             # Site-specific names of media supported by this printer,
             # in the language in 'natural-language-configured'.
             # For example:
             #   'purchasing-form' (site-specific name)
             # as opposed to (in 'media-supported' above):
             #   'na-letter' (standard keyword from ISO 10175 [10]).
             # If this printer information is not known to the SLP SA,
             # then this attribute SHALL be set to 'unknown'.

        printer-resolution-supported = STRING L M O
             unknown
             # IPP 'printer-resolution-supported'
             # (Compare with 'printer-uri-supported' in this template)
             # The unordered list of resolutions supported for printing
             # documents by this printer.
             # Each resolution supported is a string with 3 fields:
             # 1) Crossfeed direction resolution (positive integer)
             # 2) Feed direction resolution (positive integer)
             # 3) Resolution unit (enumerated value - see below)
             # Each resolution field is delimited by '>', for example:
             #   '300> 300> dpi>, 600> 600> dpi>'
             # Legal values of resolution unit are
             #   'dpi' (dots per inch)
             #   'dpcm' (dots per centimeter)
             # per IPP Model [3] (extensions SHOULD NOT be used).
             # This attribute is derived from the Printer MIB [7].
             # If this printer information is not known to the SLP SA,
             # then this attribute SHALL be set to 'unknown'.

        print-quality-supported = STRING L M O
             unknown
             # IPP 'print-quality-supported'
             # The unordered list of print qualities supported for
             # printing documents on this printer.
             # For example:
             #   'draft, normal'
             # Legal values are defined in IPP Model [3].
             # If this printer information is not known to the SLP SA,
             # then this attribute SHALL be set to 'unknown'.
             unknown, draft, normal, high
```

```
        job-priority-supported = INTEGER O
            1
            # IPP 'job-priority-supported'
            # (Compare with Salutation 'priority-levels-supported')
            # Indicates the number of job priority levels supported.
            # An IPP conformant printer which supports job priority
            # must always support a full range of priorities from
            # '1' to '100' (to ensure consistent behavior), therefore
            # this template attribute describes the 'granularity'.
            # Legal values of this attribute are from '1' to '100'.
            # If this printer information is not known to the SLP SA,
            # then this attribute SHALL be set to '1'.

        copies-supported = INTEGER O
            -1
            # IPP 'copies-supported'
            # The maximum number of copies of a document
            # that may be printed as a single job.
            # A value of '0' indicates no maximum limit.
            # A value of '-1' indicates unknown.
            # If this printer information is not known to the SLP SA,
            # then this attribute SHALL be set to '-1'.

        job-k-octets-supported = INTEGER O
            -1
            # IPP 'job-k-octets-supported'
            # The maximum size in kilobytes (1,024 octets actually)
            # incoming print job that this printer will accept.
            # A value of '0' indicates no maximum limit.
            # A value of '-1' indicates unknown.
            # If this printer information is not known to the SLP SA,
            # then this attribute SHALL be set to '-1'.

        printer-current-operator = STRING M O
            unknown
            # Printer MIB 'prtGeneralCurrentOperator'
            # The name of the current human operator responsible for
            # operating this printer.  It is suggested that this string
            # include information that would enable other humans to
            # reach the operator, such as a phone number.
            # If this printer information is not known to the SLP SA,
            # then this attribute SHALL be set to 'unknown'.
            # This attribute SHOULD be static (time of registration)
            # and SHOULD NOT be dynamically refreshed (subsequently).

        printer-service-person = STRING M O
            unknown
            # Printer MIB 'prtGeneralServicePerson'
            # The name of the current service person responsible for
            # servicing this printer.  It is suggested that this string
```

```
                # include information that would enable other humans to
                # reach the service person, such as a phone number.
                # If this printer information is not known to the SLP SA,
                # then this attribute SHALL be set to 'unknown'.
                # This attribute SHOULD be static (time of registration)
                # and SHOULD NOT be dynamically refreshed (subsequently).

        delivery-orientation-supported = STRING L O
            unknown
            # Printer MIB 'prtOutputPageDeliveryOrientation'
            # The possible delivery orientations of pages as they are
            # printed and ejected from this printer.
            # If this printer information is not known to the SLP SA,
            # then this attribute SHALL be set to 'unknown'.
            unknown, face-up, face-down

        stacking-order-supported = STRING L M O
            unknown
            # Printer MIB 'prtOutputStackingOrder'
            # (Compare with Salutation 'paper-output')
            # The possible stacking order of pages as they are printed
            # and ejected from this printer.
            # If this printer information is not known to the SLP SA,
            # then this attribute SHALL be set to 'unknown'.
            unknown, first-to-last, last-to-first

        output-features-supported = STRING L M O
            unknown
            # Printer MIB 'prtOutputFeaturesGroup'
            # (Compare with Salutation 'paper-output')
            # The possible output features supported by this printer.
            # 'bursting' == Printer MIB 'prtOutputBursting'
            # 'decollating' == Printer MIB 'prtOutputDecollating'
            # 'page-collating' == Printer MIB 'prtOutputPageCollated'
            # 'offset-stacking' == Printer MIB 'prtOutputOffestStacking'
            # If this printer information is not known to the SLP SA,
            # then this attribute SHALL be set to 'unknown'.
            unknown, bursting, decollating, page-collating,
            offset-stacking

    ------------------- template ends here ---------------------
```

5.   Summary of Required Attributes

     Attributes are associated with 'service:' URLs in order to provide a
     dynamic search capability to service location clients, not to burden
     servers implementations during registrations.

     A small subset (8) of the attributes defined in 'printer:' are
     REQUIRED in all compliant service registrations by SLP SAs:

     SLP Required Attribute   IPP Generic Directory Schema
     ----------------------   ----------------------------
     printer-uri-supported   r
     uri-authentication-supported   r
     uri-security-supported   r
     printer-name   r
     natural-language-configured   m (SLP enhancement)
     natural-language-supported   o (SLP enhancement)
     document-format-supported   r
     compression-supported   r

     r   RECOMMENDED - Appendix E 'Generic Directory Schema' IPP Model [3]
         REQUIRED - SLP 'printer:' template
     o   OPTIONAL - Appendix E 'Generic Directory Schema' IPP Model [3]
         REQUIRED - SLP 'printer:' template
     m   Missing - Appendix E 'Generic Directory Schema' IPP Model [3]
         REQUIRED - SLP 'printer:' template

6. Summary of Optional Attributes

    Many of the attributes defined in 'printer:' are OPTIONAL in all
    compliant service registrations by SLP SAs:

    SLP Optional Attribute   IPP Generic Directory Schema
    ---------------------   ----------------------------
    printer-location   r
    printer-info   o
    printer-more-info   o
    printer-make-and-model   r
    ipp-versions-supported   r
    multiple-document-jobs-supported   o
    charset-configured   m (SLP enhancement)
    charset-supported   o
    color-supported   r
    finishings-supported   r
    number-up-supported   o
    sides-supported   r
    media-supported   r
    media-local-supported   m (part of 'media-supported')
    pages-per-minute   o
    pages-per-minute-color   o
    printer-resolution-supported   o
    print-quality-supported   o
    job-priority-supported   m (SLP enhancement)
    copies-supported   m (SLP enhancement)
    job-k-octets-supported   m (SLP enhancement)
    printer-current-operator   m (from Printer MIB)
    printer-service-person   m (from Printer MIB)
    delivery-orientation-supported   m (from Printer MIB)
    stacking-order-supported   m (from Printer MIB)
    output-features-supported   m (from Printer MIB)

    r   RECOMMENDED - Appendix E 'Generic Directory Schema' IPP Model [3]
        OPTIONAL - SLP 'printer:' template (with specified default)
    o   OPTIONAL - Appendix E 'Generic Directory Schema' IPP Model [3]
        OPTIONAL - SLP 'printer:' template (with specified default)
    m   Missing - Appendix E 'Generic Directory Schema' IPP Model [3]
        OPTIONAL - SLP 'printer:' template (with specified default)

898
899
900
901   7. Summary of Attribute Origins
902
903   The following table summarizes the origins of all of the attributes
904   in the 'printer:' service template (except 'template-xxx' generic
905   attributes defined in "Service Templates and service: Schemes" [4]
906   and required for all 'service:' templates).
907

Attribute Name	IPP[3]	Printer MIB[7]
printer-uri-supported	X	
uri-authentication-supported	X	
uri-security-supported	X	
printer-name	X	
printer-location	X	
printer-info	X	
printer-more-info	X	
printer-make-and-model	X	
ipp-versions-supported	X	
multiple-document-jobs-supported	X	
charset-configured	X	
charset-supported	X	
natural-language-configured	X	
natural-language-supported	X	
document-format-supported	X	
color-supported	X	
compression-supported	X	
pages-per-minute	X	
pages-per-minute-color	X	
finishings-supported	X	
number-up-supported	X	
sides-supported	X	
media-supported	X	
media-local-supported	X	
printer-resolution-supported	X	
print-quality-supported	X	
job-priority-supported	X	
copies-supported	X	
job-k-octets-supported	X	
printer-current-operator		X
printer-service-person		X
delivery-orientation-supported		X
stacking-order-supported		X
output-features-supported		X

8.   IANA Considerations

   Registration of this 'printer:' service template will follow the
   procedures defined in section 4 'A Procedure for Standardizing New
   Service Types' and section 5 'IANA Considerations' of "Service
   Templates and service: Schemes" [4].

9.   Internationalization Considerations

   All attribute values in registrations using this 'printer:' service
   template MUST be encoded in UTF-8 characters, as required by "Service
   Location Protocol, Version 2" [13]. Thus, all registrations using
   this 'printer:' service template conform to "IETF Policy on Character
   Sets and Languages" [12].

10. Security Considerations

   When used with SLPv2, this 'printer:' service template inherits all
   of the security issues described in section 17 'Security
   Considerations' of "Service Location Protocol, Version 2" [13].

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   'Generic Directory Schema' in IPP/1.1 Model [3] (recommended and
   optional attributes for registering IPP printers) was the primary
   input to this version of the 'printer:' service template.

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