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3 Internet Printing Protocol Working Group  
4 INTERNET DRAFT  
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8 August 2000

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9 Internet Printing Protocol (IPP):  
10 Notifications over SNMP via Job Monitoring MIB Traps  
11 <draft-ietf-ipp-not-over-snmp-04.txt>  
12

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14

15  
16 Status of this Memo

17  
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23

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31  
32  
33 Abstract

34  
35 This document is a submission to the Internet Printing Protocol  
36 Working Group of the Internet Engineering Task Force (IETF). This  
37 document is intended for eventual publication as an IETF  
38 Informational RFC. Comments should be submitted to the [ipp@pwg.org](mailto:ipp@pwg.org)  
39 mailing list.  
40

41 This document specifies an OPTIONAL mapping of IPP notifications over  
42 SNMP via new service and job trap extensions to the original Job  
43 Monitoring MIB [RFC-2707]. This mapping may be used to deliver  
44 printer notifications for any printer (not just IPP-capable ones) and  
45 also to deliver job notifications for any job (not just ones  
46 submitted via IPP).  
47

48 This document specifies (4) new object groups and (4) new SNMP traps  
49 for addition to the Job Monitoring MIB [RFC 2707]. A working copy of  
50 these extensions inserted in the original Job Monitoring MIB ASN.1 is  
51 at:

52  
53 [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_NOT/jmp-trap-000808.mib](ftp://ftp.pwg.org/pub/pwg/ipp/new_NOT/jmp-trap-000808.mib)  
54

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174 1. Introduction  
175

176 This document is a submission to the Internet Printing Protocol  
177 Working Group of the Internet Engineering Task Force (IETF).  
178 Comments should be submitted to the ipp@pwg.org mailing list.  
179

180 This document specifies an OPTIONAL mapping of IPP notifications over  
181 SNMP via new service and job trap extensions to the original Job  
182 Monitoring MIB [RFC-2707]. This mapping may be used to deliver  
183 printer notifications for any printer (not just IPP-capable ones) and  
184 also to deliver job notifications for any job (not just ones  
185 submitted via IPP).  
186

187 This document specifies (4) new object groups and (4) new SNMP traps  
188 for addition to the Job Monitoring MIB [RFC 2707]. A working copy of  
189 these extensions inserted in the original Job Monitoring MIB ASN.1 is  
190 at:  
191

192        ftp://ftp.pwg.org/pub/pwg/ipp/new\_NOT/jmp-trap-000808.mib  
193

194 The IPP protocol [IPP-PRO] supports passive monitoring of IPP Printer  
195 and Job objects, via client polling of IPP object attributes using  
196 the 'Get-Printer-Attributes' and 'Get-Job-Attributes' operations.  
197

198 This document specifies support for dynamic monitoring of IPP Printer  
199 and Job objects via SNMP traps generated by the service provider  
200 (server or device).  
201  
202  
203

204 2. Terminology  
205

206  
207  
208 2.1. Terminology for Conformance  
209

210 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",  
211 "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this  
212 document are to be interpreted per [RFC-2119].  
213  
214

215  
216 2.2. SNMP Network Management Framework  
217

218 See: Section 1.1 'SNMPv1', section 1.2 'SNMPv2', and section 1.3  
219 'SNMPv3' of [RFC-2576].  
220  
221  
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223

229  
230 3. Model and Operation  
231

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233  
234 3.1. SNMP Mapping for IPP Notifications  
235

236  
237  
238 3.1.1. SNMP Mapping for IPP Printer Events  
239

240 IPP Printer event attribute	Job Monitoring MIB object mapping
241 -----	-----
242 version-number	[no mapping - not useful]
243 status-code	[implicit in each generated trap]
244 notify-sequence-number	[request-id in SNMP trap header]
245 notify-charset	[no mapping - strings are UTF-8]
246 notify-natural-language	[no mapping - no text bindings]
247 subscription-id	[no mapping]
248 notify-subscribed-event	jmServiceEventNotifyTriggerEvent
249	jmServiceEventNotifyGroupEvent
250 notify-printer-uri	jmServiceURI
251 printer-up-time	[sysUpTime in SNMP trap bindings]
252 printer-current-time	[hrSystemDate in Host Res MIB]
253 notify-user-data	[no mapping]
254 notify-text	[no mapping]
255 printer-state	jmServiceState
256 printer-state-reasons	jmServiceStateReasons
257 printer-is-accepting-jobs	[jmServiceStateReasons keyword]

286 3.1.2. SNMP Mapping for IPP Job Events

287	IPP Job event attribute	Job Monitoring MIB object mapping
288	-----	-----
289	version-number	[no mapping - not useful]
290	status-code	[implicit in each generated trap]
291	notify-sequence-number	[request-id in SNMP trap header]
292	notify-charset	[no mapping - strings are UTF-8]
293	notify-natural-language	[no mapping - no text bindings]
294	subscription-id	[no mapping]
295	notify-subscribed-event	jmJobEventNotifyTriggerEvent
296		jmJobEventNotifyGroupEvent
297		jmServiceURI
298	notify-printer-uri	[via jmJobState OID instance]
299	job-id	[sysUpTime in SNMP trap bindings]
300	printer-up-time	[hrSystemDate in Host Res MIB]
301	printer-current-time	[no mapping]
302	notify-user-data	[no mapping]
303	notify-text	[no mapping]
304	job-state	jmJobState
305	job-state-reasons	jmJobEventJobStateReasons
306		[jmJobStateReasons1 plus zero or]
307		[more jobStateReasonsN in a string]
308		
309	[job-completed and job-purged - extra bindings]	
310	job-k-octets-processed	jmJobKOctetsProcessed
311	job-impressions-completed	jmJobImpressionsCompleted
312		
313	[job-progress - extra bindings]	
314	job-k-octets	jmJobKOctetsPerCopyRequested
315	job-impressions	jmJobImpressionsPerCopyRequested
316	job-copies	jmProgressJobCopiesRequested
317	job-collation-type	jmProgressJobCollationType
318	job-media-sheets-completed	jmProgressMediaSheetsCompleted
319	sheet-completed-copy-number	jmProgressSheetCompletedCopyNum
320	sheet-completed-document-number	jmProgressSheetCompletedDocNum
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341  
342 3.2. Subscription for IPP Notifications  
343

344 IPP Clients MAY subscribe for IPP Notifications delivered via SNMP by  
345 either of the following two standard methods:  
346  
347

348 3.2.1. Subscription via IPP  
349

350 IPP Job creation (Create-Job, Print-Job, Print-URI) and  
351 Create-Subscription operations MAY be used to create per-Printer or  
352 per-Job IPP Subscription objects and MAY specify:  
353

354 "notify-recipient-uri" = 'snmpnotify://hostname[.port]'  
355  
356 "notify-events" = <events of interest, e.g., 'job-completed'>  
357  
358 "notify-snmp-version" = <SNMP version and security model>  
359  
360 "notify-snmp-auth-data" = <authentication data, e.g., community>  
361  
362 "notify-snmp-operation" = <operation, e.g., SNMP Trap>  
363  
364 "notify-snmp-mtu-size" = <path max transmission unit, e.g., '4084'>  
365  
366

367 3.2.2. Subscription via SNMP  
368

369 The SNMP Notification MIB and SNMP Target MIB (both in [RFC-2573])  
370 MAY be used to create SNMP subscriptions.  
371

372 To create a subscription via SNMP, the IPP Client MAY use an SNMP  
373 Set-Request operation to create an appropriate row in the SNMP  
374 Notification MIB with the following variable-bindings:  
375

- 376 1) 'snmpNotifyTag'  
377     - tag of this notification - see 'snmpTargetAddrTagList' below
  - 378 2) 'snmpNotifyType'  
379     - deliver via SNMP Trap (unacknowledged) or Inform (acknowledged)
  - 380 3) 'snmpNotifyStorageType'  
381     - persistence (volatile, nonVolatile, permanent, readOnly)
- 382

383 Note: The SNMP Notification MIB uses persistence instead of the  
384 lease duration supported in IPP Subscription objects.  
385  
386

387 To complete a subscription via SNMP, the IPP Client MAY use an SNMP  
388 Set-Request operation to create an appropriate row in the SNMP Target  
389 MIB with the following variable-bindings:  
390  
391

- 397 1) 'snmpTargetAddrTDomain' and 'snmpTargetAddrTAddress'  
398    - notification target (client) transport protocol and address  
399      (corresponds to IPP 'notify-recipient-uri')
- 400 2) 'snmpTargetAddressTimeout' and 'snmpTargetAddrRetryCount'  
401    - retry timeout and limit (for acknowledged SNMP Inform only)
- 402 3) 'snmpTargetAddrTagList'  
403    - tags of notifications to be sent to this target (client)
- 404 4) 'snmpTargetAddrParamsEntry'  
405    - notification security and SNMP protocol version
- 406 5) 'snmpTargetAddrStorageType'  
407    - persistence (volatile, nonVolatile, permanent, readOnly)

408  
409 Note: The SNMP Target MIB uses persistence instead of the lease  
410 duration supported in IPP Subscription objects.

411  
412  
413 3.3. Relationship to other MIBs

414  
415  
416  
417 3.3.1. MIB-II (RFC 1213)

418  
419 All SNMPv1 Trap messages include 'time-stamp' which is the value of  
420 the 'sysUpTime' object from MIB-II [RFC-1213].

421  
422 All SNMPv2 trap bindings include the 'sysUpTime' object from MIB-II  
423 [RFC-1213].

424  
425  
426 3.3.2. Host Resources MIB (RFC 2790)

427  
428 The 'jmServiceTable' defined in this document MAY have a sparse  
429 mapping to the 'hrDeviceTable' (same indices) in Host Resources MIB  
430 [RFC-2790].

431  
432  
433 3.3.3. Printer MIB (RFC 1759)

434  
435 The 'jmServiceTable' defined in this document MAY have a sparse  
436 mapping to the 'hrDeviceTable' (same indices) in Host Resources MIB  
437 [RFC-2790], thus offering access to the Printer MIB via a  
438 'hrDeviceIndex' value.



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4. General Information

4.1. Table 1 - Information about the Delivery Method

Document Method Conformance Requirement	Delivery Method Realization
-----	-----
1. What is the URL scheme name for the Delivery Method?	snmpnotify
2. Is the Delivery Method REQUIRED, RECOMMENDED or OPTIONAL for an IPP Printer to support?	OPTIONAL
3. What transport and delivery protocols does the Printer use to deliver the Event Notification Content, i.e., what is the entire network stack?	SNMP application layer over UDP transport layer over IP network layer over any datalink layer (or SNMP over any other transport stack)
4. Can several Event Notifications be combined into a Compound Event Notification?	No, impossible in SNMP (in an interoperable fashion)
5. Is the Delivery Method initiated by the Notification Recipient (pull), or by the Printer (push)?	By the Printer (push)
6. Is the Event Notification content Machine Consumable or Human Consumable?	Machine Consumable
7. What section in this document answers the following question? For a Machine Consumable Event Notification, what is the representation and encoding of values defined in section 0 of [ipp-ntfy] and the conformance requirements thereof? For a Human Consumable Event Notification, what is the representation and	Section 7 'SNMP ASN.1 for IPP Notifications'.

508 encoding of pieces of  
509 information defined in section  
510 9.2 of [ipp-ntfy] and the  
511 conformance requirements  
512 thereof?

513  
514 8. What are the latency and  
515 reliability of the transport  
516 and delivery protocol?

The latency is minimal in any network topology (all deployed transport mappings of SNMP are connectionless). The reliability is medium for SNMP Trap (unacknowledged) and high for SNMP Inform (acknowledged and optionally retried by the SNMP agent).

517  
518  
519  
520  
521  
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523  
524 9. What are the security aspects  
525 of the transport and delivery  
526 protocol, e.g., how it is  
527 handled in firewalls?

SNMPv1 and SNMPv2 support community-based security with very weak authentication. SNMPv3 (RFC 257x series) supports user-based security with strong authentication and MAY traverse firewalls (but usually does not).

528  
529  
530  
531  
532  
533 10. What are the content length  
534 restrictions?

SNMP messages MUST be encoded within the 'path MTU', i.e., the packet is NOT fragmented by the underlying network. In some IP networks, this results in a max payload of about 480 octets. See section 5.2.4 'notify-snmp-mtu-size'.

535  
536  
537  
538  
539  
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541  
542  
543 11. What are the additional  
544 values or pieces of  
545 information that a Printer  
546 sends in an Event Notification  
547 content and the conformance  
548 requirements thereof?

The 'job-completed' SNMP notification delivers 'job-k-octets-processed' as well as the base required 'job-impressions-completed' - and both are REQUIRED (for interoperability)

549  
550  
551 12. What are the additional  
552 Subscription Template and/or  
553 Subscription Description  
554 attributes and the conformance  
555 requirements thereof?

See section 5.1 'Table 2 - Subscription and Printer Attributes' - all of the additional subscription template attributes are REQUIRED (for interoperability)

565       13. What are the additional                             See section 5.1  
566            Printer Description attributes                 'Table 2 - Subscription  
567            and the conformance                             and Printer Attributes'  
568            requirements thereof?                           - all of the additional  
569   printer description  
570   attributes are REQUIRED  
571   (for interoperability).  
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621  
622 5. Subscription Template Attributes  
623

624  
625  
626 5.1. Table 2 - Subscription and Printer Attributes  
627

628 All systems that support this specification MUST implement the  
629 following REQUIRED attributes defined in this specification (on the  
630 Subscription object or the Printer object):  
631

Subscription Attribute	Subscription Attribute Type
Printer Attribute	Printer Attribute Type
-----	-----
notify-snmp-version	(type2 keyword)
notify-snmp-version-default	(type2 keyword)
notify-snmp-version-supported	(1setOf type2 keyword)
notify-snmp-auth-data	(octetString(MAX))
notify-snmp-auth-data-default	(octetString(MAX))
notify-snmp-auth-data-supported	(boolean)
notify-snmp-operation	(type2 keyword)
notify-snmp-operation-default	(type2 keyword)
notify-snmp-operation-supported	(1setOf type2 keyword)
notify-snmp-mtu-size	(integer(0:MAX))
notify-snmp-mtu-size-default	(integer(0:MAX))
notify-snmp-mtu-size-supported	(rangeOfInteger(0:MAX))

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650  
651 Note: The Printer attribute 'notify-snmp-auth-data-supported' has  
652 the irregular type 'boolean'.  
653

654  
655  
656 5.2. Additional Subscription Template Attributes  
657

658  
659  
660 5.2.1. notify-snmp-version (type2 keyword)  
661

662 REQUIRED - for IPP Printers to implement.  
663

664 This attribute specifies the SNMP protocol version and security model  
665 (e.g., community-based security in SNMPv1c IETF Standard [RFC-1157])  
666 to use for delivery of this IPP Notification.  
667

668 Note: SNMP protocol versions and SNMP security models are NOT  
669 mutually independent - therefore they are combined in this single  
670 attribute.  
671

676  
677 The following standard keyword values are defined:  
678

- 679 'snmpv1-community': The SNMPv1 protocol with community-based  
680 security model defined in IETF Standard [RFC-1157].
- 681 'snmpv1-party': The SNMPv1 protocol with party-based security  
682 model defined in IETF Historic [RFC-1352].
- 683 'snmpv2-party': The SNMPv2 protocol with party-based security  
684 model defined in IETF Historic [RFC-1446].
- 685 'snmpv2-community': The SNMPv2 protocol with community-based  
686 security model defined in IETF Experimental [RFC-1902].
- 687 'snmpv2-user': The SNMPv2 protocol with user-based security model  
688 defined in IETF Experimental [RFC-1910].
- 689 'snmpv3-user': The SNMPv3 protocol with user-based security model  
690 defined in IETF Draft Standard [RFC-2574].

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697  
698 5.2.1.1. notify-snmp-version-default  
699

700 REQUIRED - for IPP Printers to implement.  
701 notify-snmp-version-default (type2 keyword)  
702  
703 IPP Printer object attribute for IPP Notifications over SNMP.  
704  
705

706 5.2.1.2. notify-snmp-version-supported  
707

708 REQUIRED - for IPP Printers to implement.  
709 notify-snmp-version-supported (1setOf type2 keyword)  
710  
711 IPP Printer object attribute for IPP Notifications over SNMP.  
712  
713  
714

715 5.2.2. notify-snmp-auth-data (octetString(MAX))  
716

717 REQUIRED - for IPP Printers to implement.  
718  
719 This attribute specifies the SNMP protocol authentication data (e.g.,  
720 a community name in SNMPv1c IETF Standard [RFC-1157]) to use for  
721 delivery of this IPP Notification. This data MAY be opaque (not  
722 human-readable).  
723

724 Human-readable authentication data in this attribute (e.g., an  
725 SNMPv1c or SNMPv2c community name) MUST be encoded in the UTF-8  
726 [RFC-2279] transform of [ISO-10646] for interoperability.  
727

733  
734 5.2.2.1. notify-snmp-auth-data-default  
735

736 REQUIRED - for IPP Printers to implement.  
737 notify-snmp-auth-data-default (octetString(MAX))  
738

739 IPP Printer object attribute for IPP Notifications over SNMP.  
740

741  
742 5.2.2.2. notify-snmp-auth-data-supported  
743

744 REQUIRED - for IPP Printers to implement.  
745 notify-snmp-auth-data-supported (boolean)  
746

747 IPP Printer object attribute for IPP Notifications over SNMP.  
748

749 Note: The Printer attribute 'notify-snmp-auth-data-supported' has  
750 the irregular type 'boolean'.  
751

752  
753  
754 5.2.3. notify-snmp-operation (type2 keyword)  
755

756 REQUIRED - for IPP Printers to implement.  
757

758 This attribute specifies the SNMP operation (e.g, SNMP Trap in  
759 SNMPv1c IETF Standard [RFC-1157]) to use for delivery of this IPP  
760 Notification.  
761

762 The following standard keyword values are defined:  
763

764 'trap': An SNMP Trap PDU encoded in the version specified by  
765 "notify-snmp-version" above.

766 Note: SNMP Trap is an unconfirmed operation (i.e., the  
767 notification recipient MUST NOT reply with an acknowledgement) and  
768 MUST NOT be retried by the notification generator.  
769

770 'inform': An SNMP Inform PDU encoded in the version specified by  
771 "notify-snmp-version" above.

772 Note: SNMP Inform is a confirmed operation (i.e., the notification  
773 recipient MUST reply with an acknowledgement Inform-Response) and  
774 MAY be retried by the notification generator.  
775

776 'report': An SNMP Report PDU encoded in the version specified by  
777 "notify-snmp-version" above

778 Warning: The use of SNMP Report MAY not be interoperable.  
779  
780  
781  
782  
783

788  
789  
790 5.2.3.1. notify-snmp-operation-default

791  
792 REQUIRED - for IPP Printers to implement.  
793 notify-snmp-operation-default (type2 keyword)

794  
795 IPP Printer object attribute for IPP Notifications over SNMP.  
796

797  
798 5.2.3.2. notify-snmp-operation-supported

799  
800 REQUIRED - for IPP Printers to implement.  
801 notify-snmp-operation-supported (1setOf type2 keyword)

802  
803 IPP Printer object attribute for IPP Notifications over SNMP.  
804

805  
806  
807 5.2.4. notify-snmp-mtu-size (integer(0:MAX))

808  
809 REQUIRED - for IPP Printers to implement.

810  
811 This attribute specifies the SNMP path maximum transmission unit  
812 (MTU) size in octets to use for delivery of this IPP Notification.  
813 The SNMP path MTU is defined as the size of the complete SNMP message  
814 envelope, header, and body - but NOT of the underlying transport,  
815 network, and datalink headers - such that NO fragmentation is  
816 required for the SNMP message at ANY lower layer of the protocol  
817 stack OR on any segment of the bridged or routed delivery path  
818 (optimally).

819  
820 This attribute enhances the integrity and probability of SNMP  
821 delivery.

822  
823 This attribute may signal the need for algorithmic truncation of some  
824 string variable bindings in the SNMP notification which MAY not fit  
825 in very small path MTU sizes.

826  
827 See: 'ifMtu' in the Interfaces group of IETF MIB-II [RFC-1213].  
828

829  
830 5.2.4.1. notify-snmp-mtu-size-default

831  
832 REQUIRED - for IPP Printers to implement.  
833 notify-snmp-mtu-size-default (integer(0:MAX))

834  
835 IPP Printer object attribute for IPP Notifications over SNMP.  
836

845  
846 5.2.4.2. notify-snmp-mtu-size-supported  
847

848 REQUIRED - for IPP Printers to implement.  
849 notify-snmp-mtu-size-supported (rangeOfInteger(0:MAX))  
850

851 IPP Printer object attribute for IPP Notifications over SNMP.  
852  
853

854 5.3. Additional Info about Subscription Template Attributes  
855  
856  
857

858 5.3.1. notify-recipient-uri (uri)  
859

860 This section describes the syntax of the value of this attribute for  
861 the 'snmpnotify' Delivery Method for IPP Notifications. The syntax  
862 for values of this attribute for other Delivery Methods for IPP  
863 Notifications is defined in each method's specification.  
864

865 In order to support the 'snmpnotify' Delivery Method, the Printer  
866 MUST support the following syntax for the 'snmpnotify' Delivery  
867 Method when the Printer uses SNMP to deliver IPP Notifications. The  
868 lines below use RFC 2396 syntax rules, terms, and ABNF productions:  
869

```
870 "snmpnotify://" hostport  
871 hostport      = host [ ":" port ]  
872 host          = hostname | IPv4address  
873 hostname      = *( domainlabel "." ) toplabel [ "." ]  
874 domainlabel   = alphanum | alphanum *( alphanum | "-" ) alphanum  
875 toplabel     = alpha | alpha *( alphanum | "-" ) alphanum  
876 IPv4address   = 1*digit "." 1*digit "." 1*digit "." 1*digit  
877 port         = *digit  
878  
879 alphanum     = alpha | digit  
880 alpha        = lowalpha | upalpha  
881  
882 lowalpha = "a" | "b" | "c" | "d" | "e" | "f" | "g" | "h" | "i" |  
883           "j" | "k" | "l" | "m" | "n" | "o" | "p" | "q" | "r" |  
884           "s" | "t" | "u" | "v" | "w" | "x" | "y" | "z"  
885 upalpha  = "A" | "B" | "C" | "D" | "E" | "F" | "G" | "H" | "I" |  
886           "J" | "K" | "L" | "M" | "N" | "O" | "P" | "Q" | "R" |  
887           "S" | "T" | "U" | "V" | "W" | "X" | "Y" | "Z"  
888 digit    = "0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" |  
889           "8" | "9"
```



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6. Event Notification Content

6.1. SNMP Message Envelope

6.1.1. SNMPv1 Message Envelope

The SNMPv1 [RFC-1157] message envelope for SNMPv1c (community-based security) contains the following:

6.1.1.1. version (INTEGER)

The SNMP protocol version (not the IPP version) for this message.

6.1.1.2. community (OCTET STRING)

The SNMP community name (read, write, or notify) for this message. Used for weak authentication.

6.1.2. SNMPv2 Message Envelope

The SNMPv2 [RFC-1905] message envelope for SNMPv2c (community-based security) [RFC-1901] contains the following:

6.1.2.1. version (INTEGER)

The SNMP protocol version (not the IPP version) for this message.

6.1.2.2. community (OCTET STRING)

The SNMP community name (read, write, or notify) for this message. Used for weak authentication.

6.1.3. SNMPv3 Message Envelope

The SNMPv2 [RFC-1905] message envelope for SNMPv3u (user-based security) [RFC-2574] contains the following:

956  
957  
958       6.1.3.1. msgVersion (INTEGER)  
959

960 The SNMP protocol version (not the IPP version) for this message.  
961

962  
963       6.1.3.2. msgGlobalData (HeaderData)  
964

965 Administrative parameters. The SNMP ASN.1 definition is as follows:  
966

```
967 HeaderData ::= SEQUENCE {  
968     msgID          INTEGER (0..2147483647),  
969     msgMaxSize    INTEGER (484..2147483647),  
970     msgFlags      OCTET STRING (SIZE(1)),  
971     msgSecurityModel INTEGER (1..2147483647)  
972 }
```

973  
974  
975       6.1.3.3. msgSecurityParameters (OCTET STRING)  
976

977 Security model-specific parameters.  
978

979 See: 'User-based Security Model (USM) for SNMPv3' [RFC-2574].  
980

981  
982       6.1.3.4. msgData (ScopedPduData)  
983

984 Scoped message body. The SNMP ASN.1 definition is as follows:  
985

```
986 ScopedPduData ::= CHOICE {  
987     plaintext      ScopedPDU,  
988     encryptedPDU  OCTET STRING -- encrypted scopedPDU value  
989 }
```

```
990  
991 ScopedPDU ::= SEQUENCE {  
992     contextEngineID OCTET STRING,  
993     contextName      OCTET STRING,  
994     data             ANY -- e.g., PDUs as defined in RFC 1905  
995 }
```

996  
997  
998  
999       6.2. SNMP Message Header

1000  
1001

1002  
1003       6.2.1. SNMPv1 Trap Message Header  
1004

1005 Note: The 'request-id' (SNMP sequence number) is NOT encoded in the  
1006 SNMPv1 Trap, whereas the SNMPv2 and SNMPv3 Trap/Inform requests DO  
1007

1012        have 'request-id' in their message header.  
1013

1014  
1015        6.2.1.1.    enterprise (OBJECT IDENTIFIER)  
1016

1017        The value of 'sysObjectID' (system type) in IETF MIB-II [RFC-1213]  
1018        for the system that generated this SNMPv1 Trap.  
1019

1020  
1021        6.2.1.2.    agent-addr (NetworkAddress)  
1022

1023        The network address of the SNMP agent that generated this SNMPv1  
1024        Trap.  
1025

1026  
1027        6.2.1.3.    generic-trap (INTEGER)  
1028

1029        The base type of this SNMPv1 Trap:    always 'enterpriseSpecific' in  
1030        IPP Notifications).  
1031

1032  
1033        6.2.1.4.    specific-trap (INTEGER)  
1034

1035        The specific type of this SNMPv1 Trap.  
1036

1037  
1038        6.2.1.5.    time-stamp (TimeTicks)  
1039

1040        The value of 'sysUpTime' in IETF MIB-II [RFC-1213] when this SNMPv1  
1041        Trap was generated.  
1042

1043  
1044  
1045        6.2.2.    SNMPv2 and SNMPv3 Trap/Inform Message Header  
1046

1047        Note:    The 'request-id' (SNMP sequence number) is NOT encoded in the  
1048        SNMPv1 Trap, whereas the SNMPv2 and SNMPv3 Trap/Inform requests DO  
1049        have 'request-id' in their message header.  
1050

1051  
1052        6.2.2.1.    request-id (Integer32)  
1053

1054        The receiver-specific sequence number for this SNMP message.  
1055

1056        See:    Section 5.4.2 'notify-sequence-number' in [IPP-NOT].  
1057

1058  
1059        6.2.2.2.    error-status (INTEGER)  
1060

1061        The error status associated with this SNMP message.  
1062  
1063

1068  
1069  
1070        6.2.2.3. error-index (INTEGER)

1071  
1072        Unused in SNMP Trap messages.

1073  
1074  
1075        6.3.    SNMP Message Body

1076  
1077  
1078  
1079        6.3.1.    SNMPv1 Trap Message Body

1080  
1081        The SNMPv1 Trap message body consists wholly of the specified  
1082        parameters

1083  
1084        See:    Section 7.1 'Notification Definitions'.    in the TRAP-TYPE  
1085        definition.

1086  
1087  
1088        6.3.2.    SNMPv2 and SNMPv3 Trap/Inform Message Body

1089  
1090        The SNMPv2 and SNMPv3 Trap/Inform message body consists of the  
1091        specified parameters in the NOTIFICATION-TYPE definition PRECEDED by  
1092        'sysUpTime' from IETF MIB-II [RFC-1213] and 'sysTrapOID'.

1093  
1094        See:    Section 7.1 'Notification Definitions'.

1095  
1096  
1097        6.3.2.1.    sysUpTime (TimeTicks)

1098  
1099        The value of 'sysUpTime' in IETF MIB-II [RFC-1213] when this SNMPv2  
1100        or SNMPv3 Trap/Inform was generated.

1101  
1102  
1103        6.3.2.2.    sysTrapOID (OBJECT IDENTIFIER)

1104  
1105        The specific type of this SNMPv2 or SNMPv3 Trap/Inform.    The value of  
1106        the assignment statement at the end of the NOTIFICATION-TYPE  
1107        definition.

1108  
1109  
1110        6.4.    SNMP Trap/Inform Examples

1111        [To be supplied]

```

1121
1122 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1123
1124
1125
1126 7.  SNMP ASN.1 for IPP Notifications
1127
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1129
1130 7.1.  Notification Definitions
1131
1132
1133
1134 7.1.1.  Service Event Notify Group - Trap
1135
1136 -- Service Event Notify Group (CONDITIONALLY MANDATORY)
1137 --
1138 -- Implementation of this group is conditionally mandatory;
1139 -- mandatory for systems which send Service traps via SNMP.
1140
1141 -- The jmServiceEventNotifyGroup consists entirely of the
1142 -- jmServiceEventV2Notify notification.
1143
1144 jmServiceEventV1Enterprise OBJECT-IDENTITY
1145     STATUS      current
1146     DESCRIPTION
1147         "The value of the enterprise-specific OID in an SNMPv1 trap
1148         for a Service basic event sent by this managed system."
1149     ::= { jobmonMIBNotifications 1 }
1150
1151 jmServiceEventV2NotifyPrefix
1152     OBJECT IDENTIFIER ::= { jmServiceEventV1Enterprise 0 }
1153
1154 jmServiceEventV2Notify NOTIFICATION-TYPE
1155     OBJECTS {
1156         jmServiceEventNotifyTriggerEvent,
1157         jmServiceEventNotifyGroupEvent,
1158         jmServiceState,
1159         jmServiceStateReasons
1160     }
1161     STATUS      current
1162     DESCRIPTION
1163         "This SMIV2 trap corresponds to an IPP Printer basic event.
1164
1165         The value of 'jmServiceIndex' for
1166         use with 'jmServiceTable' for this Service is conveyed in the
1167         instance qualifier (OID suffix) of 'jmServiceState'.
1168
1169         This trap is sent when requested by a prior subscription.
1170         The specific event is in 'jmServiceEventNotifyTriggerEvent'.
1171         The group event is in 'jmServiceEventNotifyGroupEvent'.
1172
1173         Additional variable-bindings SHOULD be appended to this trap:
1174         - Systems with the Host Resources MIB (RFC 2790) SHOULD add
1175
1176 Hastings, McDonald      Expires 8 February 2001      [Page 21]

```

1180            'hrSystemDate'  
1181            (compare to IPP 'printer-current-time')

1182  
1183            Additional variable-bindings MAY be appended to this trap  
1184            for all printer-specific events:

1185            - Systems with the Host Resources MIB (RFC 2790) MAY add  
1186            'hrDeviceStatus'  
1187            (compare to IPP 'printer-state')  
1188            'hrPrinterStatus'  
1189            (compare to IPP 'printer-state') and  
1190            'hrPrinterDetectedErrorState'  
1191            (compare to IPP 'printer-state-reasons')

1192  
1193            Systems MAY add other variable-bindings from any MIB.

1194  
1195            See:        Standard events in 'jmServiceEventNotifyTriggerEvent';  
1196                        Section 5.3.2 'notify-events' in [IPP-NOT];  
1197                        Section 8.1 'notify-subscribed-event' in [IPP-NOT];  
1198                        Section 9 'Event Notification Content' in [IPP-NOT]."  
1199            ::= { jmServiceEventV2NotifyPrefix 1 }

1200  
1201  
1202  
1203 7.1.2. Job Event Notify Group - Trap

1204  
1205 -- Job Event Notify Group (CONDITIONALLY MANDATORY)  
1206 --  
1207 -- Implementation of this group is conditionally mandatory;  
1208 -- mandatory for systems which send this Job trap via SNMP.

1209  
1210 -- The jmJobEventNotifyGroup consists entirely of the  
1211 -- jmJobEventV2Notify notification.

1212  
1213 jmJobEventV1Enterprise OBJECT-IDENTITY  
1214        STATUS        current  
1215        DESCRIPTION  
1216            "The value of the enterprise-specific OID in an SNMPv1 trap  
1217            for a Job basic event sent by this managed system."  
1218        ::= { jobmonMIBNotifications 2 }

1219  
1220 jmJobEventV2NotifyPrefix  
1221        OBJECT IDENTIFIER ::= { jmJobEventV1Enterprise 0 }

1222  
1223 jmJobEventV2Notify NOTIFICATION-TYPE  
1224        OBJECTS {  
1225            jmJobEventNotifyTriggerEvent,  
1226            jmJobEventNotifyGroupEvent,  
1227            jmJobState,  
1228            jmJobEventJobStateReasons  
1229        }  
1230        STATUS        current

1236        DESCRIPTION  
1237            "This SMIV2 trap corresponds to an IPP Job basic event.  
1238  
1239            The values of 'jmGeneralJobSetIndex' and 'jmJobIndex' for  
1240            use with 'jmJobTable' for this Job are conveyed in the  
1241            instance qualifier (OID suffix) of 'jmJobState'.  
1242  
1243            This trap is sent when requested by a prior subscription.  
1244            The specific event is in 'jmJobEventNotifyTriggerEvent'.  
1245            The group event is in 'jmJobEventNotifyGroupEvent'.  
1246  
1247            Additional variable-bindings SHOULD be appended to this trap:  
1248            - Systems with the Host Resources MIB (RFC 2790) SHOULD add  
1249            'hrSystemDate'  
1250            (compare to IPP 'printer-current-time')  
1251  
1252            Systems MAY add other variable-bindings from any MIB.  
1253  
1254            See:        Standard events in 'jmJobEventNotifyTriggerEvent';  
1255                        Section 5.3.2 'notify-events' in [IPP-NOT];  
1256                        Section 8.1 'notify-subscribed-event' in [IPP-NOT];  
1257                        Section 9 'Event Notification Content' in [IPP-NOT]."  
1258 ::= { jmJobEventV2NotifyPrefix 1 }  
1259  
1260  
1261

1262 7.1.3. Job Completed Notify Group - Trap

1263  
1264 -- Job Completed Notify Group (CONDITIONALLY MANDATORY)  
1265 --  
1266 -- Implementation of this group is conditionally mandatory;  
1267 -- mandatory for systems which send this Job trap via SNMP.  
1268

1269 jmJobCompletedV1Enterprise OBJECT-IDENTITY  
1270        STATUS        current  
1271        DESCRIPTION  
1272            "The value of the enterprise-specific OID in an SNMPv1 trap  
1273            for a Job completed event sent by this managed system."  
1274 ::= { jobmonMIBNotifications 3 }  
1275

1276 jmJobCompletedV2NotifyPrefix  
1277        OBJECT IDENTIFIER ::= { jmJobCompletedV1Enterprise 0 }  
1278

1279 jmJobCompletedV2Notify NOTIFICATION-TYPE  
1280        OBJECTS {  
1281            jmJobState,  
1282            jmJobEventJobStateReasons,  
1283            jmJobKOctetsProcessed,  
1284            jmJobImpressionsCompleted  
1285        }  
1286        STATUS        current  
1287

1291            DESCRIPTION  
1292            "This SMIV2 trap corresponds to an IPP 'job-completed' event.  
1293  
1294            The values of 'jmGeneralJobSetIndex' and 'jmJobIndex' for  
1295            use with 'jmJobTable' for this Job are conveyed in the  
1296            instance qualifier (OID suffix) of 'jmJobState'.  
1297  
1298            This trap is sent when requested by a prior subscription.  
1299            The event type is 'job-completed'.  
1300  
1301            Additional variable-bindings SHOULD be appended to this trap:  
1302            - Systems with the Host Resources MIB (RFC 2790) SHOULD add  
1303            'hrSystemDate'  
1304            (compare to IPP 'printer-current-time')  
1305  
1306            Systems MAY add other variable-bindings from any MIB.  
1307  
1308            See:        Section 5.3.2 'notify-events' in [IPP-NOT];  
1309                        Section 8.1 'notify-subscribed-event' in [IPP-NOT];  
1310                        Section 9 'Event Notification Content' in [IPP-NOT]."  
1311            ::= { jmJobCompletedV2NotifyPrefix 1 }  
1312  
1313  
1314  
1315

1316 7.1.4. Job Progress Notify Group - Trap

1317 -- Job Progress Notify Group (CONDITIONALLY MANDATORY)  
1318 --  
1319 -- Implementation of this group is conditionally mandatory;  
1320 -- mandatory for systems which send this Job trap via SNMP.  
1321  
1322

1323 jmJobProgressV1Enterprise OBJECT-IDENTITY  
1324        STATUS        current  
1325        DESCRIPTION  
1326        "The value of the enterprise-specific OID in an SNMPv1 trap  
1327        for a Job progress event sent by this managed system."  
1328        ::= { jobmonMIBNotifications 4 }  
1329

1330 jmJobProgressV2NotifyPrefix  
1331        OBJECT IDENTIFIER ::= { jmJobProgressV1Enterprise 0 }  
1332

1333 jmJobProgressV2Notify NOTIFICATION-TYPE  
1334        OBJECTS {  
1335            jmJobKOctetsPerCopyRequested,  
1336            jmJobKOctetsProcessed,  
1337            jmJobImpressionsPerCopyRequested,  
1338            jmJobImpressionsCompleted,  
1339            jmProgressJobCopiesRequested,  
1340            jmProgressJobCollationType,  
1341            jmProgressMediaSheetsCompleted,  
1342            jmProgressSheetCompletedCopyNum,  
1343



1348            jmProgressSheetCompletedDocNum  
1349        }  
1350        STATUS            current  
1351        DESCRIPTION  
1352            "This SMIV2 trap corresponds to an IPP 'job-progress' event.  
1353  
1354            The values of 'jmGeneralJobSetIndex' and 'jmJobIndex' for  
1355            use with 'jmJobTable' for this Job are conveyed in the  
1356            instance qualifier (OID suffix) of 'jmJobKOctetsProcessed'.  
1357  
1358            This trap is sent when requested by a prior subscription.  
1359            The event type is 'job-progress'.  
1360  
1361            Additional variable-bindings SHOULD be appended to this trap:  
1362            - Systems with the Host Resources MIB (RFC 2790) SHOULD add  
1363            'hrSystemDate'  
1364            (compare to IPP 'printer-current-time')  
1365  
1366            Systems MAY add other variable-bindings from any MIB.  
1367  
1368            See:        Section 5.3.2 'notify-events' in [IPP-NOT];  
1369                        Section 8.1 'notify-subscribed-event' in [IPP-NOT];  
1370                        Section 9 'Event Notification Content' in [IPP-NOT]."  
1371 ::= { jmJobProgressV2NotifyPrefix 1 }  
1372  
1373  
1374

1375 7.2. Object Definitions  
1376

1377  
1378  
1379 7.2.1. Service Group - Objects  
1380

1381 -- The Service Group (CONDITIONALLY MANDATORY)  
1382 --  
1383 -- Implementation of this group is conditionally mandatory;  
1384 -- mandatory for systems which show Service state via SNMP.  
1385  
1386 -- The jmServiceGroup consists entirely of the jmServiceTable  
1387  
1388 jmService OBJECT IDENTIFIER ::= { jobmonMIBObjects 7 }  
1389  
1390 jmServiceTable OBJECT-TYPE  
1391        SYNTAX            SEQUENCE OF JmServiceEntry  
1392        MAX-ACCESS        not-accessible  
1393        STATUS            current  
1394        DESCRIPTION  
1395            "The jmServiceTable consists of basic service state and status  
1396            information for each service which offers one or more job  
1397            services on this managed system.  
1398  
1399

```

1401
1402 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1403
1404
1405     An entry SHALL exist in this table for each service, no matter
1406     what the state of that service.  A service MAY support multiple
1407     configured job sets and configured devices.
1408
1409     See:      'jmServiceJobSetsConfigured' and
1410             'jmServiceDevicesConfigured' bit-arrays in this MIB."
1411 ::= { jmService 1 }
1412
1413
1414 jmServiceEntry OBJECT-TYPE
1415     SYNTAX      JmServiceEntry
1416     MAX-ACCESS  not-accessible
1417     STATUS      current
1418     DESCRIPTION
1419         "Basic service state and status information."
1420     INDEX      { jmServiceIndex }
1421 ::= { jmServiceTable 1 }
1422
1423
1424 JmServiceEntry ::= SEQUENCE {
1425     jmServiceIndex      Integer32 (1..2147483647),
1426     jmServiceName       JmUTF8StringTC (SIZE (0..63)),
1427     jmServiceURI        JmUTF8StringTC (SIZE (0..63)),
1428     jmServiceJobServiceTypes JmJobServiceTypesTC,
1429     jmServiceJobSetsConfigured OCTET STRING (SIZE (0..255)),
1430     jmServiceDevicesConfigured OCTET STRING (SIZE (0..255)),
1431     jmServiceState      JmServiceStateTC,
1432     jmServiceStateReasons SnmpAdminString (SIZE (0..255))
1433 }
1434
1435 jmServiceIndex OBJECT-TYPE
1436     SYNTAX      Integer32 (1..2147483647)
1437     MAX-ACCESS  not-accessible
1438     STATUS      current
1439     DESCRIPTION
1440         "The unique identifier for this service on this managed system.
1441
1442         See:      'jmServiceEventServiceIndex' object in this MIB."
1443 ::= { jmServiceEntry 1 }
1444
1445 jmServiceName OBJECT-TYPE
1446     SYNTAX      JmUTF8StringTC (SIZE(0..63))      -- 127 in IPP
1447     MAX-ACCESS  read-only
1448     STATUS      current
1449     DESCRIPTION
1450         "The human readable name of this managed service.
1451
1452         See:      'deviceNameRequested' job attribute in this MIB;
1453                 'physicalDevice' job attribute in this MIB;
1454                 Section 4.4.4 'printer-name' in [IPP-MOD]."
```

```

1457
1458 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1459
1460     DEFVAL      { 'H }          -- no service name
1461     ::= { jmServiceEntry 2 }
1462
1463 jmServiceURI OBJECT-TYPE
1464     SYNTAX      JmUTF8StringTC (SIZE(0..63))      -- 1023 in IPP
1465     MAX-ACCESS  read-only
1466     STATUS      current
1467     DESCRIPTION
1468         "A URI for this managed service (valid for job services).
1469
1470         See:      Section 4.3.3 'job-printer-uri' in [IPP-MOD];
1471                 Section 4.4.1 'printer-uri-supported' in [IPP-MOD]."
```

1472 DEFVAL { 'H } -- no service URI

1473 ::= { jmServiceEntry 3 }

1474

1475 jmServiceJobServiceTypes OBJECT-TYPE

1476 SYNTAX JmJobServiceTypesTC

1477 MAX-ACCESS read-only

1478 STATUS current

1479 DESCRIPTION

1480 "The types of job services supported by this managed service.

1481

1482 See: 'JmJobServiceTypesTC' textual convention in this MIB;

1483 'jobServiceTypes' job attribute in this MIB."

1484 DEFVAL { 0 } -- no job services

1485 ::= { jmServiceEntry 4 }

1486

1487 jmServiceJobSetsConfigured OBJECT-TYPE

1488 SYNTAX OCTET STRING (SIZE(0..255))

1489 MAX-ACCESS read-only

1490 STATUS current

1491 DESCRIPTION

1492 "A bit-array that specifies the job sets configured for this

1493 service, where each bit '2\*\*n' is set if 'jmGeneralJobSetIndex'

1494 is a configured job set. Uses network byte order (big-endian)

1495 rules - the high-order bit of the first octet corresponds to

1496 'jmGeneralJobSetIndex' of '0' (reserved) - the low-order bit of

1497 the first octet corresponds to 'jmGeneralJobSetIndex' of '7'.

1498 Supports values of 'jmGeneralJobSetIndex' from '1' to '2039'.

1499

1500 Compare to the BITS pseudotype defined in IETF SMIV2 (RFC 2578)

1501 which has the same bit ordering rules (big-endian).

1502

1503 See: 'queueNameRequested' job attribute in this MIB;

1504 'jmGeneralJobSetIndex' table index in this MIB."

1505 DEFVAL { 'H } -- no job sets configured

1506 ::= { jmServiceEntry 5 }

1507

1508 jmServiceDevicesConfigured OBJECT-TYPE

1509 SYNTAX OCTET STRING (SIZE(0..255))

1510 MAX-ACCESS read-only

1511

1512 Hastings, McDonald Expires 8 February 2001 [Page 27]

```

1513
1514 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1515
1516     STATUS      current
1517     DESCRIPTION
1518         "A bit-array that specifies the devices configured for this
1519         service, where each bit '2**n' is set if 'hrDeviceIndex'
1520         is a configured device.  Uses network byte order (big-endian)
1521         rules - the high-order bit of the first octet corresponds to
1522         'hrDeviceIndex' of '0' (reserved) - the low-order bit of
1523         the first octet corresponds to 'hrDeviceIndex' of '7'.
1524         Supports values of 'hrDeviceIndex' from '1' to '2039'.
1525
1526         Compare to the BITS pseudotype defined in IETF SMIV2 (RFC 2578)
1527         which has the same bit ordering rules (big-endian).
1528
1529         See:      'physicalDevice' job attribute in this MIB;
1530                 'hrDeviceIndex' in IETF Host MIB (RFC 2790)."
```

```

1531     DEFVAL      { 'H' }          -- no devices configured
1532     ::= { jmServiceEntry 6 }
1533
1534 jmServiceState OBJECT-TYPE
1535     SYNTAX      JmServiceStateTC
1536     MAX-ACCESS  read-only
1537     STATUS      current
1538     DESCRIPTION
1539         "The current state of this managed service.
1540
1541         See:      'jmServiceEventServiceState' object in this MIB;
1542                 'jmJobState' object in this MIB;
1543                 Section 4.4.11 'printer-state' in [IPP-MOD]."
```

```

1544     DEFVAL      { unknown }      -- unknown service state
1545     ::= { jmServiceEntry 7 }
1546
1547 jmServiceStateReasons OBJECT-TYPE
1548     SYNTAX      SnmpAdminString (SIZE (0..255)) -- multi-valued in IPP
1549     MAX-ACCESS  read-only
1550     STATUS      current
1551     DESCRIPTION
1552         "The service state reasons associated with this service state
1553         (as a comma-separated list) or the empty string (if none).
1554
1555         See:      'jmServiceEventServiceStateReasons' object in this MIB;
1556                 'jmJobStateReasons1' object in this MIB;
1557                 Section 4.4.12 'printer-state-reasons' in [IPP-MOD]."
```

```

1558     DEFVAL      { 'H' }          -- no service state reasons
1559     ::= { jmServiceEntry 8 }
1560
1561
1562
1563 7.2.2. Service Event Group - Objects
1564
1565 -- The Service Event Group (CONDITIONALLY MANDATORY)
1566 --
1567
1568 Hastings, McDonald      Expires 8 February 2001      [Page 28]
```

```

1569
1570 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1571
1572 -- Implementation of this group is conditionally mandatory;
1573 -- mandatory for systems which show Service events via SNMP.
1574
1575 -- The jmServiceEventGroup consists entirely of the jmServiceEventTable
1576
1577 jmServiceEvent OBJECT IDENTIFIER ::= { jobmonMIBObjects 8 }
1578
1579 jmServiceEventTable OBJECT-TYPE
1580     SYNTAX      SEQUENCE OF JmServiceEventEntry
1581     MAX-ACCESS  not-accessible
1582     STATUS      current
1583     DESCRIPTION
1584         "The jmServiceEventTable contains service event entries for the
1585         services which offer job services on this managed system."
1586     ::= { jmServiceEvent 1 }
1587
1588
1589 jmServiceEventEntry OBJECT-TYPE
1590     SYNTAX      JmServiceEventEntry
1591     MAX-ACCESS  not-accessible
1592     STATUS      current
1593     DESCRIPTION
1594         "Basic service event information."
1595     INDEX { jmServiceEventIndex }
1596     ::= { jmServiceEventTable 1 }
1597
1598
1599 JmServiceEventEntry ::= SEQUENCE {
1600     jmServiceEventIndex          Integer32 (1..2147483647),
1601     jmServiceEventNotifyTriggerEvent SnmpAdminString (SIZE (0..63)),
1602     jmServiceEventNotifyGroupEvent  SnmpAdminString (SIZE (0..63)),
1603     jmServiceEventNotifyTime        TimeTicks,
1604     jmServiceEventServiceIndex      Integer32 (1..2147483647),
1605     jmServiceEventServiceState      JmServiceStateTC,
1606     jmServiceEventServiceStateReasons SnmpAdminString (SIZE (0..255))
1607 }
1608
1609 jmServiceEventIndex OBJECT-TYPE
1610     SYNTAX      Integer32 (1..2147483647)
1611     MAX-ACCESS  not-accessible
1612     STATUS      current
1613     DESCRIPTION
1614         "The unique identifier for this event on this managed system."
1615     ::= { jmServiceEventEntry 1 }
1616
1617 jmServiceEventNotifyTriggerEvent OBJECT-TYPE
1618     SYNTAX      SnmpAdminString (SIZE (0..63))  -- 255 in [IPP-NOT]
1619     MAX-ACCESS  read-only
1620     STATUS      current
1621     DESCRIPTION
1622         "Specific event that created this row in 'jmServiceEventTable'."
1623
1624 Hastings, McDonald      Expires 8 February 2001      [Page 29]

```

1628            For example, 'printer-stopped' here and 'printer-state-changed'  
1629            in 'jmServiceEventNotifyGroupEvent'. Whereas a transition of  
1630            'jmServiceState' from 'idle' to 'processing' would report  
1631            'printer-state-changed' in both 'jmService...Event' objects.  
1632

1633            Standard Printer event types defined in [IPP-NOT] are:

- 1634            - 'printer-state-changed' (group event)
- 1635            - 'printer-restarted'
- 1636            - 'printer-shutdown'
- 1637            - 'printer-stopped'
- 1638            - 'printer-config-changed' (group event)
- 1639            - 'printer-media-changed'
- 1640            - 'printer-finishings-changed'
- 1641            - 'printer-queue-order-changed' (group event)

1642  
1643            Standard Service event types generalized from [IPP-NOT] are:

- 1644            - 'service-state-changed' (group event)
- 1645            - 'service-restarted'
- 1646            - 'service-shutdown'
- 1647            - 'service-stopped'
- 1648            - 'service-config-changed' (group event)
- 1649            - 'service-media-changed'
- 1650            - 'service-finishings-changed'
- 1651            - 'service-queue-order-changed' (group event)
- 1652            - and (optionally) vendor extension event types

1653  
1654            Conformance:        The natural language for keywords  
1655            in event type SHALL always be US English.

1656  
1657            See:            'jmServiceEventNotifyGroupEvent' in this MIB;  
1658                            Section 8.1 'notify-subscribed-event' in [IPP-NOT]."  
1659            DEFVAL        { 'H' }                            -- no notify event  
1660            ::= { jmServiceEventEntry 2 }

1661  
1662            jmServiceEventNotifyGroupEvent OBJECT-TYPE

1663            SYNTAX        SnmpAdminString (SIZE (0..63))    -- 255 in [IPP-NOT]  
1664            MAX-ACCESS    read-only  
1665            STATUS        current  
1666            DESCRIPTION

1667            "Group event that created this row in 'jmServiceEventTable'.  
1668            For example, 'printer-state-changed' here and 'printer-stopped'  
1669            in 'jmServiceEventNotifyTriggerEvent'. Whereas a transition of  
1670            'jmServiceState' from 'idle' to 'processing' would report  
1671            'printer-state-changed' in both 'jmService...Event' objects.  
1672

1673            Conformance:        The natural language for keywords  
1674            in event type SHALL always be US English.

1675  
1676            See:            Standard events in 'jmServiceEventNotifyTriggerEvent';  
1677                            Section 8.1 'notify-subscribed-event' in [IPP-NOT]."  
1678            DEFVAL        { 'H' }                            -- no notify event  
1679

```

1681
1682 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1683
1684 ::= { jmServiceEventEntry 3 }
1685
1686 jmServiceEventNotifyTime OBJECT-TYPE
1687     SYNTAX      TimeTicks
1688     MAX-ACCESS  read-only
1689     STATUS      current
1690     DESCRIPTION
1691         "The time of this service event.
1692
1693         Usage:  Conforming management agents, which MUST implement the
1694         IETF MIB-II (RFC 1213), SHALL set 'jmServiceEventNotifyTime' to
1695         'sysUpTime' when a service event row is created.
1696
1697         See:    'sysUpTime' in IETF MIB-II (RFC 1213);
1698                Section 5.4.4 'notify-printer-up-time' in [IPP-NOT];
1699                Section 4.4.29 'printer-up-time' in [IPP-MOD]."
```

```

1700 ::= { jmServiceEventEntry 4 }
1701
1702 jmServiceEventServiceIndex OBJECT-TYPE
1703     SYNTAX      Integer32 (1..2147483647)
1704     MAX-ACCESS  read-only
1705     STATUS      current
1706     DESCRIPTION
1707         "The unique identifier for this service on this managed system.
1708
1709         See:    'jmServiceIndex' object in this MIB."
1710 ::= { jmServiceEventEntry 5 }
1711
1712 jmServiceEventServiceState OBJECT-TYPE
1713     SYNTAX      JmServiceStateTC
1714     MAX-ACCESS  read-only
1715     STATUS      current
1716     DESCRIPTION
1717         "The state of this managed service at the time of this event.
1718
1719         See:    'jmServiceState' object in this MIB;
1720                'jmJobState' object in this MIB;
1721                Section 4.4.11 'printer-state' in [IPP-MOD]."
```

```

1722     DEFVAL     { unknown }          -- unknown service state
1723 ::= { jmServiceEventEntry 6 }
1724
1725 jmServiceEventServiceStateReasons OBJECT-TYPE
1726     SYNTAX      SnmpAdminString (SIZE (0..255)) -- multi-valued in IPP
1727     MAX-ACCESS  read-only
1728     STATUS      current
1729     DESCRIPTION
1730         "The service state reasons associated with this service state
1731         (as a comma-separated list) or the empty string (if none).
1732
1733         See:    'jmServiceStateReasons' object in this MIB;
1734                'jmJobStateReasons1' object in this MIB;
1735
1736 Hastings, McDonald      Expires 8 February 2001      [Page 31]
```

```

1737
1738 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1739
1740             Section 4.4.12 'printer-state-reasons' in [IPP-MOD].
1741     DEFVAL      { 'H' }      -- no service state reasons
1742     ::= { jmServiceEventEntry 7 }
1743
1744
1745
1746 7.2.3. Job Event Group - Objects
1747
1748 -- The Job Event Group (CONDITIONALLY MANDATORY)
1749 --
1750 -- Implementation of this group is conditionally mandatory;
1751 -- mandatory for systems which show Job events via SNMP.
1752
1753 -- The jmJobEventGroup consists entirely of the jmJobEventTable
1754
1755 jmJobEvent OBJECT IDENTIFIER ::= { jobmonMIBObjects 9 }
1756
1757 jmJobEventTable OBJECT-TYPE
1758     SYNTAX      SEQUENCE OF JmJobEventEntry
1759     MAX-ACCESS  not-accessible
1760     STATUS      current
1761     DESCRIPTION
1762         "The jmJobEventTable contains job event entries for the
1763         jobs present on this managed system."
1764     ::= { jmJobEvent 1 }
1765
1766
1767 jmJobEventEntry OBJECT-TYPE
1768     SYNTAX      JmJobEventEntry
1769     MAX-ACCESS  not-accessible
1770     STATUS      current
1771     DESCRIPTION
1772         "Basic job event information."
1773     INDEX      { jmJobEventIndex }
1774     ::= { jmJobEventTable 1 }
1775
1776
1777 JmJobEventEntry ::= SEQUENCE {
1778     jmJobEventIndex      Integer32 (1..2147483647),
1779     jmJobEventNotifyTriggerEvent SnmpAdminString (SIZE (0..63)),
1780     jmJobEventNotifyGroupEvent  SnmpAdminString (SIZE (0..63)),
1781     jmJobEventNotifyTime      TimeTicks,
1782     jmJobEventJobSetIndex     Integer32 (1..32767),
1783     jmJobEventJobIndex        Integer32 (1..2147483647),
1784     jmJobEventJobState        JmJobStateTC,
1785     jmJobEventJobStateReasons OCTET STRING (SIZE (4..16))
1786 }
1787
1788 jmJobEventIndex OBJECT-TYPE
1789     SYNTAX      Integer32 (1..2147483647)
1790     MAX-ACCESS  not-accessible
1791
1792
1793 Hastings, McDonald      Expires 8 February 2001      [Page 32]

```



1796        STATUS            current  
1797        DESCRIPTION  
1798            "The unique identifier for this event on this managed system."  
1799        ::= { jmJobEventEntry 1 }  
1800

1801 jmJobEventNotifyTriggerEvent OBJECT-TYPE  
1802        SYNTAX            SnmpAdminString (SIZE (0..63))    -- 255 in [IPP-NOT]  
1803        MAX-ACCESS        read-only  
1804        STATUS            current  
1805        DESCRIPTION

1806            "Specific event that created this row in 'jmJobEventTable'.  
1807            For example, 'job-stopped' here and 'job-state-changed'  
1808            in 'jmJobEventNotifyGroupEvent'. Whereas a transition of  
1809            'jmJobState' from 'pending' to 'processing' would report  
1810            'job-state-changed' in both 'jmJob...Event' objects.  
1811

1812        Standard Job event types defined in [IPP-NOT] are:

- 1813        - 'job-state-changed' (group event)
- 1814        - 'job-created'
- 1815        - 'job-completed'
- 1816        - 'job-stopped'
- 1817        - 'job-config-changed' (group event)
- 1818        - 'job-progress' (group event)
- 1819        - and (optionally) vendor extension event types

1820  
1821        Conformance:        The natural language for keywords  
1822        in event type SHALL always be US English.

1823  
1824        See:            'jmJobEventNotifyGroupEvent' in this MIB;  
1825            Section 8.1 'notify-subscribed-event' in [IPP-NOT]."

1826        DEFVAL            { 'H' }                            -- no notify event  
1827        ::= { jmJobEventEntry 2 }  
1828

1829 jmJobEventNotifyGroupEvent OBJECT-TYPE  
1830        SYNTAX            SnmpAdminString (SIZE (0..63))    -- 255 in [IPP-NOT]  
1831        MAX-ACCESS        read-only  
1832        STATUS            current  
1833        DESCRIPTION

1834            "Group event that created this row in 'jmJobEventTable'.  
1835            For example, 'job-state-changed' here and 'job-stopped'  
1836            in 'jmJobEventNotifyTriggerEvent'. Whereas a transition of  
1837            'jmJobState' from 'pending' to 'processing' would report  
1838            'job-state-changed' in both 'jmJob...Event' objects.  
1839

1840        Conformance:        The natural language for keywords  
1841        in event type SHALL always be US English.

1842  
1843        See:            'jmJobEventNotifyGroupEvent' in this MIB;  
1844            Section 8.1 'notify-subscribed-event' in [IPP-NOT]."

1845        DEFVAL            { 'H' }                            -- no notify event  
1846        ::= { jmJobEventEntry 3 }  
1847

```

1849
1850 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1851
1852
1853 jmJobEventNotifyTime OBJECT-TYPE
1854     SYNTAX      TimeTicks
1855     MAX-ACCESS  read-only
1856     STATUS      current
1857     DESCRIPTION
1858         "The time of this job event.
1859
1860         Usage:  Conforming management agents, which MUST implement the
1861         IETF MIB-II (RFC 1213), SHALL set 'jmJobEventNotifyTime' to
1862         'sysUpTime' when a job event row is created.
1863
1864         See:    'sysUpTime' in IETF MIB-II (RFC 1213);
1865                 Section 5.4.4 'notify-printer-up-time' in [IPP-NOT];
1866                 Section 4.4.29 'printer-up-time' in [IPP-MOD]."
```

```

1867 ::= { jmJobEventEntry 4 }
1868
1869 jmJobEventJobSetIndex OBJECT-TYPE
1870     SYNTAX      Integer32 (1..32767)
1871     MAX-ACCESS  read-only
1872     STATUS      current
1873     DESCRIPTION
1874         "The unique identifier for this job set on this managed system.
1875
1876         See:    'jmGeneralJobSetIndex' object in this MIB."
1877 ::= { jmJobEventEntry 5 }
1878
1879 jmJobEventJobIndex OBJECT-TYPE
1880     SYNTAX      Integer32 (1..2147483647)
1881     MAX-ACCESS  read-only
1882     STATUS      current
1883     DESCRIPTION
1884         "The unique identifier for this job on this managed system,
1885         when prefixed with 'jmJobEventJobSetIndex'.
1886
1887         See:    'jmJobIndex' object in this MIB."
1888 ::= { jmJobEventEntry 6 }
1889
1890 jmJobEventJobState OBJECT-TYPE
1891     SYNTAX      JmJobStateTC
1892     MAX-ACCESS  read-only
1893     STATUS      current
1894     DESCRIPTION
1895         "The state of this managed job at the time of this event.
1896
1897         See:    'jmJobState' in this MIB;
1898                 Section 4.3.7 'job-state' in [IPP-MOD]."
```

```

1899     DEFVAL      { unknown }          -- unknown job state
1900 ::= { jmJobEventEntry 7 }
1901
1902 jmJobEventJobStateReasons OBJECT-TYPE
1903
1904 Hastings, McDonald      Expires 8 February 2001      [Page 34]
```

1908        SYNTAX            OCTET STRING (SIZE (4..16)) -- multi-valued in IPP  
1909        MAX-ACCESS    read-only  
1910        STATUS            current  
1911        DESCRIPTION  
1912            "The job state reasons associated with this job state  
1913            represented as one to four concatenated 32-bit integers  
1914            in network byte order (big-endian).  
1915  
1916            Usage:    Conforming management stations SHALL always report the  
1917            value of the object 'jmJobStateReasons1' in the first four  
1918            octets of 'jmJobEventJobStateReasons' and SHOULD report values  
1919            of the attributes 'jobStateReasons2', 'jobStateReasons3', and  
1920            'jobStateReasons4' in subsequent octets.  
1921  
1922            See:        'jmJobStateReasons1' in this MIB;  
1923                        Section 4.3.8 'job-state-reasons' in [IPP-MOD]."  
1924        DEFVAL            { '00000000'H }            -- no job state reasons  
1925        ::= { jmJobEventEntry 8 }

1926  
1927  
1928  
1929 7.2.4. Job Progress Group - Objects  
1930

1931 -- The Job Progress Group (CONDITIONALLY MANDATORY)  
1932 --  
1933 -- Implementation of this group is conditionally mandatory;  
1934 -- mandatory for systems which send Job progress traps via SNMP.  
1935  
1936 -- The jmProgressGroup consists entirely of leaf objects for traps

1937  
1938 jmProgress OBJECT IDENTIFIER ::= { jobmonMIBObjects 10 }

1939  
1940 jmProgressJobCopiesRequested OBJECT-TYPE

1941        SYNTAX            Integer32 (-2..2147483647)  
1942        MAX-ACCESS    read-only  
1943        STATUS            current  
1944        DESCRIPTION  
1945            "The number of copies of this job requested by the client.  
1946  
1947            See:        'jobCopiesRequested' attribute in this MIB."  
1948        DEFVAL            { -2 }            -- unknown job copies  
1949        ::= { jmProgress 1 }

1950  
1951 jmProgressJobCollationType OBJECT-TYPE

1952        SYNTAX            JmJobCollationTypeTC  
1953        MAX-ACCESS    read-only  
1954        STATUS            current  
1955        DESCRIPTION  
1956            "The number of copies of this job requested by the client.  
1957  
1958            See:        'jobCollationType' attribute in this MIB;

```

1961
1962 Internet Draft      IPP Notify via Job Mon MIB Traps      8 August 2000
1963
1964         'job-collation-type' in [IPP-PROG];
1965         Section 9 'Event Notification Content' in [IPP-NOT].
1966     DEFVAL      { unknown }          -- unknown job collation type
1967     ::= { jmProgress 2 }
1968
1969 jmProgressMediaSheetsCompleted OBJECT-TYPE
1970     SYNTAX      Integer32 (-2..2147483647)
1971     MAX-ACCESS  read-only
1972     STATUS      current
1973     DESCRIPTION
1974         "The number of media sheets completed for this job.
1975
1976         See:      'sheetsCompleted' attribute in this MIB;
1977         Section 4.3.18.3 'job-media-sheets-completed'
1978         in [IPP-MOD];
1979         Section 9 'Event Notification Content' in [IPP-NOT].
1980     DEFVAL      { -2 }          -- unknown job progress
1981     ::= { jmProgress 3 }
1982
1983 jmProgressSheetCompletedCopyNum OBJECT-TYPE
1984     SYNTAX      Integer32 (-2..2147483647)
1985     MAX-ACCESS  read-only
1986     STATUS      current
1987     DESCRIPTION
1988         "The number of the job copy currently being stacked for the
1989         current document or zero (if none) or '-2' (unknown).
1990
1991         See:      'sheetCompletedCopyNumber' attribute in this MIB;
1992         'sheet-completed-copy-number' in [IPP-PROG];
1993         Section 9 'Event Notification Content' in [IPP-NOT].
1994     DEFVAL      { -2 }          -- unknown sheet complete copy
1995     ::= { jmProgress 4 }
1996
1997 jmProgressSheetCompletedDocNum OBJECT-TYPE
1998     SYNTAX      Integer32 (-2..2147483647)
1999     MAX-ACCESS  read-only
2000     STATUS      current
2001     DESCRIPTION
2002         "The number of the job document currently being stacked for the
2003         current job or zero (if none) or '-2' (unknown).
2004
2005         See:      'sheetCompletedDocumentNumber' attribute in this MIB;
2006         'sheet-completed-document-number' in [IPP-PROG];
2007         Section 9 'Event Notification Content' in [IPP-NOT].
2008     DEFVAL      { -2 }          -- unknown sheet complete doc
2009     ::= { jmProgress 5 }
2010
2011
2012
2013
2014
2015
2016 Hastings, McDonald      Expires 8 February 2001      [Page 36]

```

2021  
2022 8. Conformance

2023  
2024 See DESCRIPTION clauses of objects and notifications defined in section  
2025 7 'SNMP ASN.1 for IPP Notifications'.  
2026

2027  
2028 9. IANA Considerations

2029  
2030 None.  
2031

2032  
2033 10. Internationalization Considerations

2034  
2035 The 'jmServiceStateReasons', 'jmServiceEventServiceStateReasons',  
2036 'jmServiceEventNotify[Trigger|Group]Event', and  
2037 'jmJobEventNotify[Trigger|Group]Event' text string objects defined in  
2038 this document have a syntax (datatype) of 'SnmpAdminString' (UTF-8  
2039 stream-encoded ISO 10646/Unicode text) defined in the SNMPv3  
2040 Framework MIB [RFC-2571]. The natural language of these objects is  
2041 US English (they contain keywords which are protocol elements).  
2042

2043  
2044  
2045 11. Security Considerations

2046  
2047 This IPP Notifications over SNMP mapping defines only 'read-only'  
2048 objects. It is suitable for use with any version of SNMP, as no  
2049 update security is required (because no configuration updates are  
2050 supported).  
2051

2052 No sensitive information is available via IPP Notifications over  
2053 SNMP.  
2054

2077  
2078 12. References  
2079

2080 [IPP-MOD] R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell.  
2081 IPP/1.1 Model and Semantics, <draft-ietf-ipp-model-v11-07.txt>  
2082 (work-in-progress), May 2000.  
2083  
2084 [IPP-NOT] S. Isaacson, J. Martin, R. deBry, T. Hastings, M. Shepherd,  
2085 R. Bergman. IPP Event Notification Specification,  
2086 <draft-ietf-ipp-not-spec-04.txt> (work-in-progress), July 2000.  
2087  
2088 [IPP-PROG] T. Hastings, R. Bergman, H. Lewis. Proposed Job Progress  
2089 Attributes for IPP, <draft-ietf-ipp-job-prog-00.txt>  
2090 (work-in-progress), July 2000.  
2091  
2092 [RFC-1157] J.D. Case, M. Fedor, M.L. Schoffstall, C. Davin. Simple  
2093 Network Management Protocol, RFC 1157, May 1990.  
2094  
2095 [RFC-1213] K. McCloghrie, M. Rose. MIB-II, RFC 1213, March 1991.  
2096  
2097 [RFC-1215] M. Rose. Convention for Defining Traps for SNMPv1, RFC  
2098 1215, March 1991.  
2099  
2100 [RFC-1759] R. Smith, F. Wright, T. Hastings, S. Zilles,  
2101 J. Gyllenskog. Printer MIB, RFC 1759, March 1995.  
2102  
2103 [RFC-1901] J. Case, K. McCloghrie, M. Rose, S. Waldbusser.  
2104 Introduction to Community-based SNMPv2, RFC 1901, January 1996.  
2105  
2106 [RFC-1905] J. Case, K. McCloghrie, M. Rose, S. Waldbusser. Protocol  
2107 Operations for SNMPv2, RFC 1905, January 1996.  
2108  
2109 [RFC-2396] T. Berners-Lee, R. Fielding, L. Masinter. Uniform  
2110 Resource Identifiers (URI): Generic Syntax, RFC 2396, August 1998.  
2111  
2112 [RFC-2571] D. Harrington, R. Presuhn, B. Wijnen. Architecture for  
2113 SNMP Management Frameworks, RFC 2571, April 1999.  
2114  
2115 [RFC-2573] D. Levi, P. Meyer, B. Stewart. SNMP Applications, RFC  
2116 2573, April 1999.  
2117  
2118 [RFC-2574] U. Blumenthal, B. Wijnen. User-based Security Model (USM)  
2119 for SNMPv3, RFC 2574, April 1999.  
2120  
2121 [RFC-2575] B. Wijnen, R. Presuhn, K. McCloghrie. View-based Access  
2122 Control Model (VACM) for SNMPv3, RFC 2575, April 1999.  
2123  
2124 [RFC-2576] R. Frye, D. Levi, S. Routhier, B. Wijnen. Coexistence  
2125 between Version 1, Version 2, and Version 3 of the Internet-standard  
2126 Network Management Framework, RFC 2576, March 2000.  
2127

2129  
2130 Internet Draft           IPP Notify via Job Mon MIB Traps           8 August 2000  
2131  
2132  
2133       [RFC-2707] R. Bergman, T. Hastings, S. Isaacson, H. Lewis. Job  
2134       Monitoring MIB v1.0, RFC 2707, November 1999  
2135  
2136       [RFC-2790] P. Grillo, S. Waldbusser. Host Resources MIB, RFC 2790,  
2137       March 2000.  
2138  
2139  
2140  
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2142  
2143  
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2184 Hastings, McDonald                           Expires 8 February 2001                           [Page 39]

2190 13. Change Log

2191  
2192 [This section will be deleted before publication as an RFC]  
2193

2194 Changes in reverse chronological order (most recent first).  
2195

2196 <draft-ietf-ipp-not-over-snmplib-04.txt> - 8 August 2000

- 2197 1) Deleted 'printer-full', 'printer-no-longer-full',  
2198 'printer-almost-idle', and 'printer-not-almost-idle' event types,  
2199 and added 'printer-stopped' in 'jmServiceEventNotifyTriggerEvent',  
2200 for alignment with revised [IPP-NOT];
- 2201 2) Deleted 'job-purged' event type and added 'job-stopped' in  
2202 'jmJobEventNotifyTriggerEvent', for alignment with revised  
2203 [IPP-NOT];
- 2204 3) Renamed 'jmServiceEventNotifyEvent' object to  
2205 'jmServiceEventNotifyTriggerEvent' (most specific event) and added  
2206 'jmServiceEventNotifyGroupEvent' (most general event), for higher  
2207 fidelity mapping to IPP 'notify-subscribed-event';
- 2208 4) Renamed 'jmJobEventNotifyEvent' object to  
2209 'jmJobEventNotifyTriggerEvent' (most specific event) and added  
2210 'jmJobEventNotifyGroupEvent' (most general event), for higher  
2211 fidelity mapping to IPP 'notify-subscribed-event';
- 2212 5) Renamed all NOTIFICATION-TYPES (traps) for clarity, changing  
2213 'jmServiceBasicV2Event' to 'jmServiceEventV2Notify',  
2214 'jmJobBasicV2Event' to 'jmJobEventV2Notify',  
2215 'jmJobCompletedV2Event' to 'jmJobCompletedV2Notify', and  
2216 'jmJobProgressV2Event' to 'jmJobProgressV2Notify'.  
2217

2218 <draft-ietf-ipp-not-over-snmplib-03.txt> - 6 July 2000

- 2219 1) Added 'SnmplibAdminString' to IMPORTS clause for new objects.
- 2220 2) Corrected OID in MODULE-IDENTITY to use forward reference to  
2221 definition of 'pwg' from 'enterprises' and 'mibs' from 'pwg'.  
2222
- 2223 3) Added 'JmServiceStateTC' textual convention.
- 2224 4) Added 'jmMirrorAttr' and 'jmSystem' object identifiers reserved  
2225 for future extensions.
- 2226 5) Major rewrite, per email discussion on IETF IPP WG list, to  
2227 specify four new small (traditional) SNMP traps for:  
2228 'jmServiceBasicV2Event' (generalized from IPP Printer event),  
2229 'jmJobBasicV2Event' (corresponds IPP Job event),  
2230 'jmJobCompletedV2Event' (corresponds IPP Job completed event),  
2231 'jmJobProgressV2Event' (corresponds IPP Job progress event).
- 2232 6) Major rewrite, per email discussion on IETF IPP WG list, to  
2233 specify four new SNMP object groups: 'jmServiceTable' (name, URI,  
2234 state, etc. - from IPP Printer), 'jmServiceEventTable' (records  
2235 IPP Printer events for polling), 'jmJobEventTable' (records IPP Job  
2236 events for polling), 'jmJobProgressGroup' (leaf objects for IPP Job  
2237 progress event).
- 2238 7) Revised section 3.1 'SNMP Mapping for IPP Printer Events' and  
2239 section 3.2 'SNMP Mapping for IPP Job Events', to agree with above.



2244        8) Deleted obsolete section 3.3 'Rules for Encoding Notifications',  
2245        as event bindings now always fit over all SNMP transport protocols.  
2246

2247 <draft-ietf-ipp-not-over-snmp-02.txt> - 19 March 2000

- 2248 1) Renamed Printer Event notification group to Device Basic Event  
2249     and 'jmPrinterEventV2Event' notification to 'jmDeviceBasicV2Event',  
2250     to better align with IPP and to support non-printing jobs.
- 2251 2) Revised 'jmDeviceBasicV2Event' notification to remove  
2252     'hrDeviceStatus', 'hrPrinterStatus', 'hrPrinterDetectedErrorState'  
2253     from mandatory trap bindings because they were redundant, per  
2254     request of Ron Bergman.
- 2255 3) Renamed Job Event notification group to Job Basic Event and  
2256     'jmJobEventV2Event' notification to 'jmJobBasicV2Event', to better  
2257     align with IPP and to support variant job events.
- 2258 4) Defined new Job Completed Event notification group and defined  
2259     new Job Progress Event notification group, to better align with IPP  
2260     and to support variant job events.
- 2261 5) Renamed Event object group to Event Binding,  
2262     'jmEventPrinterState' to 'jmEventDeviceState',  
2263     'jmEventPrinterStateReasons' to 'jmEventDeviceStateReasons',  
2264     'jmEventPrinterIsAcceptingJobs' to 'jmEventDeviceIsAcceptingJobs',  
2265     to support non-printing jobs.
- 2266 6) Revised Event Binding object group, adding explicit objects  
2267     'jmEventDeviceURI', 'jmEventDeviceName', 'jmEventJobSetIndex',  
2268     'jmEventJobIndex', 'jmEventJobName', 'jmEventJobState',  
2269     'jmEventJobStateReasons', 'jmEventJobKOctets',  
2270     'jmEventJobKOctetsProcessed', 'jmEventJobImpressions',  
2271     'jmEventJobImpressionsCompleted', 'jmEventJobMediaSheets',  
2272     'jmEventJobMediaSheetsCompleted',  
2273     'jmEventJobImpressionsCompletedCC', 'jmEventJobCollationType',  
2274     'jmEventJobSheetCompletedCopyNum',  
2275     'jmEventJobSheetCompletedDocNum', per request of Ron Bergman.
- 2276 7) Revised SYNTAX of 'jmEventTriggerEvent' object from from  
2277     'JmUTF8StringTC' (string) to IPP-aligned enumeration, per request  
2278     of Ron Bergman.
- 2279 8) Removed all references to Printer MIB v2, as they were of limited  
2280     value, per request of Ron Bergman.
- 2281 9) Revised 'SNMP Mapping for IPP Printer Events' section for renamed  
2282     event binding objects, per request of Ron Bergman.
- 2283 10) Revised 'Rules for Encoding Notifications' section to truncate  
2284     additional string bindings, per request of Ron Bergman.
- 2285 11) Revised 'Registration via IPP' section, to change scheme name  
2286     from 'ipp-snmp:' to 'snmpnotify:', per request of Ron Bergman.

2287  
2288 <draft-ietf-ipp-not-over-snmp-01.txt> - 1 December 1999

- 2289 1) Deleted 'JmTriggerEventTC' textual convention (see below).
- 2290 2) Revised SYNTAX of 'jmEventTriggerEvent' object from  
2291     'JmTriggerEventTC' (enumeration) to 'JmUTF8StringTC' (string), to  
2292     support use of IPP standard keywords.
- 2293 3) Added 'jmEventPrinterState', 'jmEventPrinterStateReasons', and  
2294     'jmEventPrinterIsAcceptingJobs' objects for consistency w/  
2295

- 2300       [IPP-NOT] and to reduce ambiguity about printer states inherent in  
2301       RFC 1759.
- 2302       4) Revised DESCRIPTION of 'jmPrinterEventV2Event' notification to
  - 2303       add SHOULD (recommendation) for 'jmEventPrinterState',
  - 2304       'jmEventPrinterStateReasons', and 'jmEventPrinterIsAcceptingJobs'
  - 2305       objects.
  - 2306       5) Revised 'SNMP Mapping for IPP Printer Events' section to add
  - 2307       direct mapping of IPP notification attributes to
  - 2308       'jmEventPrinterState', 'jmEventPrinterStateReasons', and
  - 2309       'jmEventPrinterIsAcceptingJobs' objects.
  - 2310       6) Revised 'Rules for Encoding Notifications' section to add
  - 2311       'jmEventPrinterState' and 'jmEventPrinterStateReasons'.
  - 2312       7) Revised 'IANA Considerations' section to specify there are none -
  - 2313       no enumerated or keyword textual conventions are now defined in
  - 2314       this document.
  - 2315       8) Revised 'Internationalization Considerations' section to specify
  - 2316       that US English keywords are used in 'jmEventTriggerEvent',
  - 2317       'jmEventPrinterState', and 'jmEventPrinterStateReasons' objects and
  - 2318       thus no explicit natural language tagging is required.

2319  
2320 <draft-ietf-ipp-not-over-snmp-00.txt> - 10 October 1999

- 2321       1) Initial version.

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