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2
3 Internet Printing Protocol Working Group
4 INTERNET DRAFT
5 Expires 6 January 2001

Tom Hastings
Xerox
Ira McDonald
High North
6 July 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-03.txt>
12

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15
16 Status of this Memo

17
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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).
37 Comments should be submitted to the ipp@pwg.org mailing list.
38

39 This document proposes a mapping of IPP notifications over SNMP via
40 new service and job trap extensions defined for the Job Monitoring
41 MIB [RFC-2707]. This mapping may be used to deliver printer
42 notifications for any printer (not just IPP-capable ones) and also
43 job notifications for any job (not just ones submitted via IPP).
44

45 This document proposes (4) new object groups and (4) new SNMP traps
46 for addition to the Job Monitoring MIB [RFC 2707]. A working copy of
47 this proposal integrated into the original Job Monitoring MIB ASN.1
48 is at:
49 ftp://ftp.pwg.org/pub/pwg/ipp/new_NOT/jmp-trap-000706.mib
50

116
117
118 1. Introduction
119

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125 new service and job trap extensions defined for the Job Monitoring
126 MIB [RFC-2707]. This mapping may be used to deliver printer
127 notifications for any printer (not just IPP-capable ones) and also
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135

136 The IPP protocol [IPP-PRO] supports passive monitoring of IPP Printer
137 and Job objects, via client polling of IPP object attributes using
138 the 'Get-Printer-Attributes' and 'Get-Job-Attributes' operations.
139

140 This document proposes support for dynamic monitoring of IPP Printer
141 and Job objects via SNMP traps generated by the service provider
142 (server or device).
143

144
145 1.1. Terminology for Conformance
146

147 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
148 "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
149 document are to be interpreted per [RFC-2119].
150

151
152 2. SNMP Network Management Framework
153

154 See: Section 1.1 'SNMPv1', section 1.2 'SNMPv2', and section 1.3
155 'SNMPv3' of [RFC-2576].
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174 3. Managed Object Mapping
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177
178 3.1. SNMP Mapping for IPP Notifications
179

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181
182 3.1.1. SNMP Mapping for IPP Printer Events
183

184 IPP Printer event attribute	Job Monitoring MIB object mapping
185 -----	-----
186 version-number	[no mapping - not useful]
187 status-code	[implicit in each generated trap]
188 notify-sequence-number	[request-id in SNMP trap header]
189 notify-charset	[no mapping - strings are UTF-8]
190 notify-natural-language	[no mapping - no text bindings]
191 subscription-id	[no mapping]
192 notify-subscribed-event	jmServiceEventNotifyEvent
193 notify-printer-uri	jmServiceURI
194 printer-up-time	[sysUpTime in SNMP trap bindings]
195 printer-current-time	[hrSystemDate in Host Res MIB]
196 notify-user-data	[no mapping]
197 notify-text	[no mapping]
198 printer-state	jmServiceState
199 printer-state-reasons	jmServiceStateReasons
200 printer-is-accepting-jobs	[jmServiceStateReasons keyword]


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393
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398 4.  Managed Object Definitions
399
400
401
402 4.1.  Notification Definitions
403
404
405
406 4.1.1.  Service Basic Event - Trap
407
408 -- Service Basic Event Group (CONDITIONALLY MANDATORY)
409 --
410 -- Implementation of this group is conditionally mandatory;
411 -- mandatory for systems which send this Service traps via SNMP.
412
413 -- The jmServiceBasicEventGroup consists entirely of the
414 -- jmServiceBasicV2Event notification.
415
416 jmServiceBasicV1Enterprise OBJECT-IDENTITY
417     STATUS      current
418     DESCRIPTION
419         "The value of the enterprise-specific OID in an SNMPv1 trap
420         for a Service basic event sent by this managed system."
421     ::= { jobmonMIBNotifications 1 }
422
423 jmServiceBasicV2EventPrefix
424     OBJECT IDENTIFIER ::= { jmServiceBasicV1Enterprise 0 }
425
426 jmServiceBasicV2Event NOTIFICATION-TYPE
427     OBJECTS {
428         jmServiceEventNotifyEvent,
429         jmServiceState,
430         jmServiceStateReasons
431     }
432     STATUS      current
433     DESCRIPTION
434         "This SMIV2 trap corresponds to an IPP Printer basic event.
435
436         The value of 'jmServiceIndex' for
437         use with 'jmServiceTable' for this Service is conveyed in the
438         instance qualifier (OID suffix) of 'jmServiceState'.
439
440         This trap is sent when requested by a prior subscription.
441         The subscribed event type is in 'jmServiceEventNotifyEvent'.
442
443         Standard Printer event types defined in [IPP-NOT] are:
444         - 'printer-state-changed'
445         - 'printer-restarted'
446         - 'printer-shutdown'
447
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- 451
452 - 'printer-config-changed'
453 - 'printer-media-changed'
454 - 'printer-finishings-changed'
455 - 'printer-queue-order-changed'
456 - 'printer-full'
457 - 'printer-no-longer-full'
458 - 'printer-almost-idle'
459 - 'printer-not-almost-idle'

460
461 Standard Service event types generalized from [IPP-NOT] are:

- 462 - 'service-state-changed'
463 - 'service-restarted'
464 - 'service-shutdown'
465 - 'service-config-changed'
466 - 'service-media-changed'
467 - 'service-finishings-changed'
468 - 'service-queue-order-changed'
469 - 'service-full'
470 - 'service-no-longer-full'
471 - 'service-almost-idle'
472 - 'service-not-almost-idle'
473 - and (optionally) vendor extension event types

474
475 Additional variable-bindings SHOULD be appended to this trap:

- 476 - Systems with the Host Resources MIB (RFC 2790) SHOULD add
477 'hrSystemDate'
478 (compare to IPP 'printer-current-time')

479
480 Additional variable-bindings MAY be appended to this trap
481 for all printer-specific events:

- 482 - Systems with the Host Resources MIB (RFC 2790) MAY add
483 'hrDeviceStatus'
484 (compare to IPP 'printer-state')
485 'hrPrinterStatus'
486 (compare to IPP 'printer-state') and
487 'hrPrinterDetectedErrorState'
488 (compare to IPP 'printer-state-reasons')

489
490 Systems MAY add other variable-bindings from any MIB.

491
492 See: Section 5.3.2 'notify-events' in [IPP-NOT];
493 Section 8.1 'notify-subscribed-event' in [IPP-NOT];
494 Section 9 'Event Notification Content' in [IPP-NOT]."
495 ::= { jmServiceBasicV2EventPrefix 1 }

496
497
498

499 4.1.2. Job Basic Event - Trap

500
501 -- Job Basic Event Group (CONDITIONALLY MANDATORY)
502 --

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505
506 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
507
508 -- Implementation of this group is conditionally mandatory;
509 -- mandatory for systems which send this Job traps via SNMP.
510
511 -- The jmJobBasicEventGroup consists entirely of the
512 -- jmJobBasicV2Event notification.
513
514 jmJobBasicV1Enterprise OBJECT-IDENTITY
515     STATUS      current
516     DESCRIPTION
517         "The value of the enterprise-specific OID in an SNMPv1 trap
518         for a Job basic event sent by this managed system."
519     ::= { jobmonMIBNotifications 2 }
520
521 jmJobBasicV2EventPrefix
522     OBJECT IDENTIFIER ::= { jmJobBasicV1Enterprise 0 }
523
524 jmJobBasicV2Event NOTIFICATION-TYPE
525     OBJECTS {
526         jmJobEventNotifyEvent,
527         jmJobState,
528         jmJobEventJobStateReasons
529     }
530     STATUS      current
531     DESCRIPTION
532         "This SMIV2 trap corresponds to an IPP Job basic event.
533
534         The values of 'jmGeneralJobSetIndex' and 'jmJobIndex' for
535         use with 'jmJobTable' for this Job are conveyed in the
536         instance qualifier (OID suffix) of 'jmJobState'.
537
538         This trap is sent when requested by a prior subscription.
539         The subscribed event type is in 'jmJobEventNotifyEvent'.
540
541         Event types reported via 'jmJobBasicV2Event' include:
542         - 'job-state-changed'
543         - 'job-created'
544         - 'job-completed'
545         - 'job-purged'
546         - 'job-config-changed'
547         - and (optionally) vendor extension event types
548
549         Additional variable-bindings SHOULD be appended to this trap:
550         - Systems with the Host Resources MIB (RFC 2790) SHOULD add
551         'hrSystemDate'
552         (compare to IPP 'printer-current-time')
553
554         Systems MAY add other variable-bindings from any MIB.
555
556         See:      Section 5.3.2 'notify-events' in [IPP-NOT];
557                 Section 8.1 'notify-subscribed-event' in [IPP-NOT];
558                 Section 9 'Event Notification Content' in [IPP-NOT]."
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561
562 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
563
564 ::= { jmJobBasicV2EventPrefix 1 }
565
566
567
568 4.1.3. Job Completed Event - Trap
569
570 -- Job Completed Event Group (CONDITIONALLY MANDATORY)
571 --
572 -- Implementation of this group is conditionally mandatory;
573 -- mandatory for systems which send this Job traps via SNMP.
574
575 jmJobCompletedV1Enterprise OBJECT-IDENTITY
576     STATUS      current
577     DESCRIPTION
578         "The value of the enterprise-specific OID in an SNMPv1 trap
579         for a Job completed event sent by this managed system."
580     ::= { jobmonMIBNotifications 3 }
581
582 jmJobCompletedV2EventPrefix
583     OBJECT IDENTIFIER ::= { jmJobCompletedV1Enterprise 0 }
584
585 jmJobCompletedV2Event NOTIFICATION-TYPE
586     OBJECTS {
587         jmJobEventNotifyEvent,
588         jmJobState,
589         jmJobEventJobStateReasons,
590         jmJobKOctetsProcessed,
591         jmJobImpressionsCompleted
592     }
593     STATUS      current
594     DESCRIPTION
595         "This SMIV2 trap corresponds to an IPP 'job-completed' event.
596
597         The values of 'jmGeneralJobSetIndex' and 'jmJobIndex' for
598         use with 'jmJobTable' for this Job are conveyed in the
599         instance qualifier (OID suffix) of 'jmJobState'.
600
601         This trap is sent when requested by a prior subscription.
602         The subscribed event type is in 'jmJobEventNotifyEvent'.
603
604         Event types reported via 'jmJobCompletedV2Event' include:
605         - 'job-completed'
606         - 'job-purged'
607         - and (optionally) vendor extension event types
608
609         Additional variable-bindings SHOULD be appended to this trap:
610         - Systems with the Host Resources MIB (RFC 2790) SHOULD add
611           'hrSystemDate'
612           (compare to IPP 'printer-current-time')
613
614         Systems MAY add other variable-bindings from any MIB.
615
616 Hastings, McDonald                Expires 6 January 2001                [Page 11]

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617
618 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
619
620
621     See:      Section 5.3.2 'notify-events' in [IPP-NOT];
622             Section 8.1 'notify-subscribed-event' in [IPP-NOT];
623             Section 9 'Event Notification Content' in [IPP-NOT].
624 ::= { jmJobCompletedV2EventPrefix 1 }
625
626
627
628 4.1.4.  Job Progress Event - Trap
629
630 -- Job Progress Event Group (CONDITIONALLY MANDATORY)
631 --
632 -- Implementation of this group is conditionally mandatory;
633 -- mandatory for systems which send this Job traps via SNMP.
634
635 jmJobProgressV1Enterprise OBJECT-IDENTITY
636     STATUS      current
637     DESCRIPTION
638         "The value of the enterprise-specific OID in an SNMPv1 trap
639         for a Job progress event sent by this managed system."
640 ::= { jobmonMIBNotifications 4 }
641
642 jmJobProgressV2EventPrefix
643     OBJECT IDENTIFIER ::= { jmJobProgressV1Enterprise 0 }
644
645 jmJobProgressV2Event NOTIFICATION-TYPE
646     OBJECTS {
647         jmJobKOctetsPerCopyRequested,
648         jmJobKOctetsProcessed,
649         jmJobImpressionsPerCopyRequested,
650         jmJobImpressionsCompleted,
651         jmProgressJobCopiesRequested,
652         jmProgressJobCollationType,
653         jmProgressMediaSheetsCompleted,
654         jmProgressSheetCompletedCopyNum,
655         jmProgressSheetCompletedDocNum
656     }
657     STATUS      current
658     DESCRIPTION
659         "This SMIV2 trap corresponds to an IPP 'job-progress' event.
660
661         The values of 'jmGeneralJobSetIndex' and 'jmJobIndex' for
662         use with 'jmJobTable' for this Job are conveyed in the
663         instance qualifier (OID suffix) of 'jmJobKOctetsProcessed'.
664
665         This trap is sent when requested by a prior subscription.
666         The event type is 'job-progress'.
667
668         Additional variable-bindings SHOULD be appended to this trap:
669         - Systems with the Host Resources MIB (RFC 2790) SHOULD add
670         'hrSystemDate'
671
672 Hastings, McDonald      Expires 6 January 2001      [Page 12]

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673
674 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
675
676         (compare to IPP 'printer-current-time')
677
678         Systems MAY add other variable-bindings from any MIB.
679
680         See:      Section 5.3.2 'notify-events' in [IPP-NOT];
681                  Section 8.1 'notify-subscribed-event' in [IPP-NOT];
682                  Section 9 'Event Notification Content' in [IPP-NOT].
683 ::= { jmJobProgressV2EventPrefix 1 }
684
685
686
687 4.2. Object Definitions
688
689
690
691 4.2.1. Service Group - Objects
692
693 -- The Service Group (CONDITIONALLY MANDATORY)
694 --
695 -- Implementation of this group is conditionally mandatory;
696 -- mandatory for systems which show Service state via SNMP.
697
698 -- The jmServiceGroup consists entirely of the jmServiceTable
699
700 jmService OBJECT IDENTIFIER ::= { jobmonMIBObjects 7 }
701
702 jmServiceTable OBJECT-TYPE
703     SYNTAX      SEQUENCE OF JmServiceEntry
704     MAX-ACCESS  not-accessible
705     STATUS      current
706     DESCRIPTION
707         "The jmServiceTable consists of basic service state and status
708         information for each service which offers one or more job
709         services on this managed system.
710
711         An entry SHALL exist in this table for each service, no matter
712         what the state of that service.  A service MAY support multiple
713         configured job sets and configured devices.
714
715         See:      'jmServiceJobSetsConfigured' and
716                  'jmServiceDevicesConfigured' bit-arrays in this MIB."
717 ::= { jmService 1 }
718
719
720 jmServiceEntry OBJECT-TYPE
721     SYNTAX      JmServiceEntry
722     MAX-ACCESS  not-accessible
723     STATUS      current
724     DESCRIPTION
725         "Basic service state and status information."
726     INDEX      { jmServiceIndex }
727
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729
730 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
731
732 ::= { jmServiceTable 1 }
733
734
735 JmServiceEntry ::= SEQUENCE {
736     jmServiceIndex      Integer32 (1..2147483647),
737     jmServiceName       JmUTF8StringTC (SIZE (0..63)),
738     jmServiceURI        JmUTF8StringTC (SIZE (0..63)),
739     jmServiceJobServiceTypes JmJobServiceTypesTC,
740     jmServiceJobSetsConfigured OCTET STRING (SIZE (0..255)),
741     jmServiceDevicesConfigured OCTET STRING (SIZE (0..255)),
742     jmServiceState      JmServiceStateTC,
743     jmServiceStateReasons SnmpAdminString (SIZE (0..255))
744 }
745
746 jmServiceIndex OBJECT-TYPE
747     SYNTAX      Integer32 (1..2147483647)
748     MAX-ACCESS  not-accessible
749     STATUS      current
750     DESCRIPTION
751         "The unique identifier for this service on this managed system.
752
753         See:      'jmServiceEventServiceIndex' object in this MIB."
754     ::= { jmServiceEntry 1 }
755
756 jmServiceName OBJECT-TYPE
757     SYNTAX      JmUTF8StringTC (SIZE(0..63))      -- 127 in IPP
758     MAX-ACCESS  read-only
759     STATUS      current
760     DESCRIPTION
761         "The human readable name of this managed service.
762
763         See:      'deviceNameRequested' job attribute in this MIB;
764                 'physicalDevice' job attribute in this MIB;
765                 Section 4.4.4 'printer-name' in [IPP-MOD]."
```

```

766     DEFVAL      { 'H' }      -- no service name
767     ::= { jmServiceEntry 2 }
768
```

```

769 jmServiceURI OBJECT-TYPE
770     SYNTAX      JmUTF8StringTC (SIZE(0..63))      -- 1023 in IPP
771     MAX-ACCESS  read-only
772     STATUS      current
773     DESCRIPTION
774         "A URI for this managed service (valid for job services).
775
776         See:      Section 4.3.3 'job-printer-uri' in [IPP-MOD];
777                 Section 4.4.1 'printer-uri-supported' in [IPP-MOD]."
```

```

778     DEFVAL      { 'H' }      -- no service URI
779     ::= { jmServiceEntry 3 }
780
```

```

781 jmServiceJobServiceTypes OBJECT-TYPE
782     SYNTAX      JmJobServiceTypesTC
783
```

```

785
786 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
787
788     MAX-ACCESS  read-only
789     STATUS      current
790     DESCRIPTION
791         "The types of job services supported by this managed service.
792
793         See:      'JmJobServiceTypesTC' textual convention in this MIB;
794                 'jobServiceTypes' job attribute in this MIB."
795     DEFVAL      { 0 }          -- no job services
796     ::= { jmServiceEntry 4 }
797
798 jmServiceJobSetsConfigured OBJECT-TYPE
799     SYNTAX      OCTET STRING (SIZE(0..255))
800     MAX-ACCESS  read-only
801     STATUS      current
802     DESCRIPTION
803         "A bit-array that specifies the job sets configured for this
804         service, where each bit '2**n' is set if 'jmGeneralJobSetIndex'
805         is a configured job set.  Uses network byte order (big-endian)
806         rules - the high-order bit of the first octet corresponds to
807         'jmGeneralJobSetIndex' of '0' (reserved) - the low-order bit of
808         the first octet corresponds to 'jmGeneralJobSetIndex' of '7'.
809         Supports values of 'jmGeneralJobSetIndex' from '1' to '2039'.
810
811         Compare to the BITS pseudotype defined in IETF SMIV2 (RFC 2578)
812         which has the same bit ordering rules (big-endian).
813
814         See:      'queueNameRequested' job attribute in this MIB;
815                 'jmGeneralJobSetIndex' table index in this MIB."
816     DEFVAL      { 'H' }          -- no job sets configured
817     ::= { jmServiceEntry 5 }
818
819 jmServiceDevicesConfigured OBJECT-TYPE
820     SYNTAX      OCTET STRING (SIZE(0..255))
821     MAX-ACCESS  read-only
822     STATUS      current
823     DESCRIPTION
824         "A bit-array that specifies the devices configured for this
825         service, where each bit '2**n' is set if 'hrDeviceIndex'
826         is a configured device.  Uses network byte order (big-endian)
827         rules - the high-order bit of the first octet corresponds to
828         'hrDeviceIndex' of '0' (reserved) - the low-order bit of
829         the first octet corresponds to 'hrDeviceIndex' of '7'.
830         Supports values of 'hrDeviceIndex' from '1' to '2039'.
831
832         Compare to the BITS pseudotype defined in IETF SMIV2 (RFC 2578)
833         which has the same bit ordering rules (big-endian).
834
835         See:      'physicalDevice' job attribute in this MIB;
836                 'hrDeviceIndex' in IETF Host MIB (RFC 2790)."
837     DEFVAL      { 'H' }          -- no devices configured
838     ::= { jmServiceEntry 6 }
839
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897
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899
900
901 jmServiceEventEntry OBJECT-TYPE
902     SYNTAX      JmServiceEventEntry
903     MAX-ACCESS  not-accessible
904     STATUS      current
905     DESCRIPTION
906         "Basic service event information."
907     INDEX { jmServiceEventIndex }
908     ::= { jmServiceEventTable 1 }
909
910
911 JmServiceEventEntry ::= SEQUENCE {
912     jmServiceEventIndex      Integer32 (1..2147483647),
913     jmServiceEventNotifyEvent SnmpAdminString (SIZE (0..63)),
914     jmServiceEventNotifyTime  TimeTicks,
915     jmServiceEventServiceIndex Integer32 (1..2147483647),
916     jmServiceEventServiceState JmServiceStateTC,
917     jmServiceEventServiceStateReasons SnmpAdminString (SIZE (0..255))
918 }
919
920 jmServiceEventIndex OBJECT-TYPE
921     SYNTAX      Integer32 (1..2147483647)
922     MAX-ACCESS  not-accessible
923     STATUS      current
924     DESCRIPTION
925         "The unique identifier for this event on this managed system."
926     ::= { jmServiceEventEntry 1 }
927
928 jmServiceEventNotifyEvent OBJECT-TYPE
929     SYNTAX      SnmpAdminString (SIZE (0..63))  -- 255 in [IPP-NOT]
930     MAX-ACCESS  read-only
931     STATUS      current
932     DESCRIPTION
933         "The event type that created this row in 'jmServiceEventTable'."
934
935         Standard Printer event types defined in [IPP-NOT] are:
936         - 'printer-state-changed'
937         - 'printer-restarted'
938         - 'printer-shutdown'
939         - 'printer-config-changed'
940         - 'printer-media-changed'
941         - 'printer-finishings-changed'
942         - 'printer-queue-order-changed'
943         - 'printer-full'
944         - 'printer-no-longer-full'
945         - 'printer-almost-idle'
946         - 'printer-not-almost-idle'
947
948         Standard Service event types generalized from [IPP-NOT] are:
949         - 'service-state-changed'
950         - 'service-restarted'
951
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953
954 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
955
956     - 'service-shutdown'
957     - 'service-config-changed'
958     - 'service-media-changed'
959     - 'service-finishing-changed'
960     - 'service-queue-order-changed'
961     - 'service-full'
962     - 'service-no-longer-full'
963     - 'service-almost-idle'
964     - 'service-not-almost-idle'
965
966     Conformance:      The natural language for keywords
967     in subscribed event type SHALL always be US English.
968
969     Conformance:      This subscribed event type SHALL be valid
970     and reported in ALL Job Monitoring MIB notifications.
971
972     See:      Section 8.1 'notify-subscribed-event' in [IPP-NOT].
973     DEFVAL      { 'H' }      -- no notify subscribed event
974     ::= { jmServiceEventEntry 2 }
975
976 jmServiceEventNotifyTime OBJECT-TYPE
977     SYNTAX      TimeTicks
978     MAX-ACCESS  read-only
979     STATUS      current
980     DESCRIPTION
981         "The time of this service event."
982
983     Usage:      Conforming management agents, which MUST implement the
984     IETF MIB-II (RFC 1213), SHALL set 'jmServiceEventNotifyTime' to
985     'sysUpTime' when a service event row is created.
986
987     See:      'sysUpTime' in IETF MIB-II (RFC 1213);
988             Section 5.4.4 'notify-printer-up-time' in [IPP-NOT];
989             Section 4.4.29 'printer-up-time' in [IPP-MOD].
990     ::= { jmServiceEventEntry 3 }
991
992 jmServiceEventServiceIndex OBJECT-TYPE
993     SYNTAX      Integer32 (1..2147483647)
994     MAX-ACCESS  read-only
995     STATUS      current
996     DESCRIPTION
997         "The unique identifier for this service on this managed system."
998
999     See:      'jmServiceIndex' object in this MIB."
1000     ::= { jmServiceEventEntry 4 }
1001
1002 jmServiceEventServiceState OBJECT-TYPE
1003     SYNTAX      JmServiceStateTC
1004     MAX-ACCESS  read-only
1005     STATUS      current
1006     DESCRIPTION
1007
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1009
1010 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
1011
1012     "The state of this managed service at the time of this event.
1013
1014     See:      'jmServiceState' object in this MIB;
1015             'jmJobState' object in this MIB;
1016             Section 4.4.11 'printer-state' in [IPP-MOD]."
1017     DEFVAL    { unknown }          -- unknown service state
1018     ::= { jmServiceEventEntry 5 }
1019
1020 jmServiceEventServiceStateReasons OBJECT-TYPE
1021     SYNTAX      SnmpAdminString (SIZE (0..255)) -- multi-valued in IPP
1022     MAX-ACCESS  read-only
1023     STATUS      current
1024     DESCRIPTION
1025         "The service state reasons associated with this service state
1026         (as a comma-separated list) or the empty string (if none).
1027
1028     See:      'jmServiceStateReasons' object in this MIB;
1029             'jmJobStateReasons1' object in this MIB;
1030             Section 4.4.12 'printer-state-reasons' in [IPP-MOD]."
1031     DEFVAL    { 'H' }              -- no service state reasons
1032     ::= { jmServiceEventEntry 6 }
1033
1034
1035
1036 4.2.3. Job Event Group - Objects
1037
1038 -- The Job Event Group (CONDITIONALLY MANDATORY)
1039 --
1040 -- Implementation of this group is conditionally mandatory;
1041 -- mandatory for systems which show Job events via SNMP.
1042
1043 -- The jmJobEventGroup consists entirely of the jmJobEventTable
1044
1045 jmJobEvent OBJECT IDENTIFIER ::= { jobmonMIBObjects 9 }
1046
1047 jmJobEventTable OBJECT-TYPE
1048     SYNTAX      SEQUENCE OF JmJobEventEntry
1049     MAX-ACCESS  not-accessible
1050     STATUS      current
1051     DESCRIPTION
1052         "The jmJobEventTable contains job event entries for the
1053         jobs present on this managed system."
1054     ::= { jmJobEvent 1 }
1055
1056
1057 jmJobEventEntry OBJECT-TYPE
1058     SYNTAX      JmJobEventEntry
1059     MAX-ACCESS  not-accessible
1060     STATUS      current
1061     DESCRIPTION
1062         "Basic job event information."
1063
1064 Hastings, McDonald           Expires 6 January 2001           [Page 19]

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1065
1066 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
1067
1068     INDEX { jmJobEventIndex }
1069     ::= { jmJobEventTable 1 }
1070
1071
1072 JmJobEventEntry ::= SEQUENCE {
1073     jmJobEventIndex          Integer32 (1..2147483647),
1074     jmJobEventNotifyEvent   SnmpAdminString (SIZE (0..63)),
1075     jmJobEventNotifyTime    TimeTicks,
1076     jmJobEventJobSetIndex   Integer32 (1..32767),
1077     jmJobEventJobIndex      Integer32 (1..2147483647),
1078     jmJobEventJobState      JmJobStateTC,
1079     jmJobEventJobStateReasons OCTET STRING (SIZE (4..16))
1080 }
1081
1082 jmJobEventIndex OBJECT-TYPE
1083     SYNTAX      Integer32 (1..2147483647)
1084     MAX-ACCESS  not-accessible
1085     STATUS      current
1086     DESCRIPTION
1087         "The unique identifier for this event on this managed system."
1088     ::= { jmJobEventEntry 1 }
1089
1090 jmJobEventNotifyEvent OBJECT-TYPE
1091     SYNTAX      SnmpAdminString (SIZE (0..63))  -- 255 in [IPP-NOT]
1092     MAX-ACCESS  read-only
1093     STATUS      current
1094     DESCRIPTION
1095         "The event type that created this row in 'jmJobEventTable'."
1096
1097         Standard Job event types defined in [IPP-NOT] are:
1098         - 'job-state-changed'
1099         - 'job-created'
1100         - 'job-completed'
1101         - 'job-purged'
1102         - 'job-config-changed'
1103         - 'job-progress'
1104
1105         Conformance:   The natural language for keywords
1106         in subscribed event type SHALL always be US English.
1107
1108         Conformance:   This subscribed event type SHALL be valid
1109         and reported in ALL Job Monitoring MIB notifications.
1110
1111         See:           Section 8.1 'notify-subscribed-event' in [IPP-NOT].
1112     DEFVAL      { 'H' }          -- no notify subscribed event
1113     ::= { jmJobEventEntry 2 }
1114
1115 jmJobEventNotifyTime OBJECT-TYPE
1116     SYNTAX      TimeTicks
1117     MAX-ACCESS  read-only
1118     STATUS      current
1119
1120 Hastings, McDonald          Expires 6 January 2001          [Page 20]

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1121
1122 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
1123
1124     DESCRIPTION
1125         "The time of this job event.
1126
1127         Usage:  Conforming management agents, which MUST implement the
1128         IETF MIB-II (RFC 1213), SHALL set 'jmJobEventNotifyTime' to
1129         'sysUpTime' when a job event row is created.
1130
1131         See:    'sysUpTime' in IETF MIB-II (RFC 1213);
1132                Section 5.4.4 'notify-printer-up-time' in [IPP-NOT];
1133                Section 4.4.29 'printer-up-time' in [IPP-MOD]."
1134     ::= { jmJobEventEntry 3 }
1135
1136 jmJobEventJobSetIndex OBJECT-TYPE
1137     SYNTAX      Integer32 (1..32767)
1138     MAX-ACCESS  read-only
1139     STATUS      current
1140     DESCRIPTION
1141         "The unique identifier for this job set on this managed system.
1142
1143         See:    'jmGeneralJobSetIndex' object in this MIB."
1144     ::= { jmJobEventEntry 4 }
1145
1146 jmJobEventJobIndex OBJECT-TYPE
1147     SYNTAX      Integer32 (1..2147483647)
1148     MAX-ACCESS  read-only
1149     STATUS      current
1150     DESCRIPTION
1151         "The unique identifier for this job on this managed system,
1152         when prefixed with 'jmJobEventJobSetIndex'.
1153
1154         See:    'jmJobIndex' object in this MIB."
1155     ::= { jmJobEventEntry 5 }
1156
1157 jmJobEventJobState OBJECT-TYPE
1158     SYNTAX      JmJobStateTC
1159     MAX-ACCESS  read-only
1160     STATUS      current
1161     DESCRIPTION
1162         "The state of this managed job at the time of this event.
1163
1164         See:    'jmJobState' in this MIB;
1165                Section 4.3.7 'job-state' in [IPP-MOD]."
1166     DEFVAL     { unknown }          -- unknown job state
1167     ::= { jmJobEventEntry 6 }
1168
1169 jmJobEventJobStateReasons OBJECT-TYPE
1170     SYNTAX      OCTET STRING (SIZE (4..16)) -- multi-valued in IPP
1171     MAX-ACCESS  read-only
1172     STATUS      current
1173     DESCRIPTION
1174         "The job state reasons associated with this job state
1175
1176 Hastings, McDonald           Expires 6 January 2001           [Page 21]

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1177
1178 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
1179
1180     represented as one to four concatenated 32-bit integers
1181     in network byte order (big-endian).
1182
1183     Usage:  Conforming management stations SHALL always report the
1184     value of the object 'jmJobStateReasons1' in the first four
1185     octets of 'jmJobEventJobStateReasons' and SHOULD report values
1186     of the attributes 'jobStateReasons2', 'jobStateReasons3', and
1187     'jobStateReasons4' in subsequent octets.
1188
1189     See:    'jmJobStateReasons1' in this MIB;
1190           Section 4.3.8 'job-state-reasons' in [IPP-MOD].
1191     DEFVAL    { '00000000'H }          -- no job state reasons
1192     ::= { jmJobEventEntry 7 }
1193
1194
1195
1196 4.2.4.  Job Progress Group - Objects
1197
1198 -- The Job Progress Group (CONDITIONALLY MANDATORY)
1199 --
1200 -- Implementation of this group is conditionally mandatory;
1201 -- mandatory for systems which send Job progress traps via SNMP.
1202
1203 -- The jmProgressGroup consists entirely of leaf objects for traps
1204
1205 jmProgress OBJECT IDENTIFIER ::= { jobmonMIBObjects 10 }
1206
1207 jmProgressJobCopiesRequested OBJECT-TYPE
1208     SYNTAX      Integer32 (-2..2147483647)
1209     MAX-ACCESS  read-only
1210     STATUS      current
1211     DESCRIPTION
1212         "The number of copies of this job requested by the client.
1213
1214         See:    'jobCopiesRequested' attribute in this MIB."
1215     DEFVAL      { -2 }                -- unknown job copies
1216     ::= { jmProgress 1 }
1217
1218 jmProgressJobCollationType OBJECT-TYPE
1219     SYNTAX      JmJobCollationTypeTC
1220     MAX-ACCESS  read-only
1221     STATUS      current
1222     DESCRIPTION
1223         "The number of copies of this job requested by the client.
1224
1225         See:    'jobCollationType' attribute in this MIB;
1226               'job-collation-type' in [IPP-PROG];
1227               Section 9 'Event Notification Content' in [IPP-NOT].
1228     DEFVAL      { unknown }          -- unknown job collation type
1229     ::= { jmProgress 2 }
1230
1231
1232

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1233
1234 Internet Draft      IPP Notify - Job Monitoring MIB Traps      6 July 2000
1235
1236
1237 jmProgressMediaSheetsCompleted OBJECT-TYPE
1238     SYNTAX      Integer32 (-2..2147483647)
1239     MAX-ACCESS  read-only
1240     STATUS      current
1241     DESCRIPTION
1242         "The number of media sheets completed for this job.
1243
1244         See:      'sheetsCompleted' attribute in this MIB;
1245                 Section 4.3.18.3 'job-media-sheets-completed'
1246                 in [IPP-MOD];
1247                 Section 9 'Event Notification Content' in [IPP-NOT]."

```

1292
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1294 5. IANA Considerations

1295
1296 None.

1297
1298

1299 6. Internationalization Considerations

1300
1301 The 'jmServiceStateReasons', 'jmServiceEventServiceStateReasons',
1302 'jmServiceEventNotifyEvent', and 'jmJobEventNotifyEvent', text string
1303 objects defined in this document are of type 'SnmpAdminString' (UTF-8
1304 stream-encoded ISO 10646/Unicode text) defined in the SNMPv3
1305 Framework MIB [RFC-2571]. The natural language of these objects is
1306 US English (they contain keywords).

1307
1308
1309

1310 7. Security Considerations

1311
1312 This IPP Notifications over SNMP mapping defines only 'read-only'
1313 objects. It is suitable for use with any version of SNMP, as no
1314 update security is required (because no configuration updates are
1315 supported).

1316
1317 No sensitive information is available via IPP Notifications over
1318 SNMP.

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1405
1406 9. Change Log

1407
1408 Changes in reverse chronological order (most recent first).

1409
1410 <draft-ietf-ipp-not-over-snmp-03.txt> - 6 July 2000

- 1411 1) Added 'SnmpAdminString' to IMPORTS clause for new objects.
- 1412 2) Corrected OID in MODULE-IDENTITY to use forward reference to
1413 definition of 'pwg' from 'enterprises' and 'mibs' from 'pwg'.
- 1414 3) Added 'JmServiceStateTC' textual convention.
- 1415 4) Added 'jmMirrorAttr' and 'jmSystem' object identifiers reserved
1416 for future extensions.
- 1417 5) Major rewrite, per email discussion on IETF IPP WG list, to
1418 specify four new small (traditional) SNMP traps for:
1419 'jmServiceBasicV2Event' (generalized from IPP Printer event),
1420 'jmJobBasicV2Event' (corresponds IPP Job event),
1421 'jmJobCompletedV2Event' (corresponds IPP Job completed event),
1422 'jmJobProgressV2Event' (corresponds IPP Job progress event).
- 1423 6) Major rewrite, per email discussion on IETF IPP WG list, to
1424 specify four new SNMP object groups: 'jmServiceTable' (name,
1425 URI, state, etc. - from IPP Printer), 'jmServiceEventTable'
1426 (records IPP Printer events for polling), 'jmJobEventTable'
1427 (records IPP Job events for polling), 'jmJobProgressGroup' (leaf
1428 objects for IPP Job progress event).
- 1429 7) Revised section 3.1 'SNMP Mapping for IPP Printer Events' and
1430 section 3.2 'SNMP Mapping for IPP Job Events', to agree with
1431 above.
- 1432 8) Deleted obsolete section 3.3 'Rules for Encoding Notifications',
1433 as event bindings now always fit over all SNMP transport
1434 protocols.

1435
1436 <draft-ietf-ipp-not-over-snmp-02.txt> - 19 March 2000

- 1437 1) Renamed Printer Event notification group to Device Basic Event
1438 and 'jmPrinterEventV2Event' notification to
1439 'jmDeviceBasicV2Event', to better align with IPP and to support
1440 non-printing jobs.
- 1441 2) Revised 'jmDeviceBasicV2Event' notification to remove
1442 'hrDeviceStatus', 'hrPrinterStatus',
1443 'hrPrinterDetectedErrorState' from mandatory trap bindings
1444 because they were redundant, per request of Ron Bergman.
- 1445 3) Renamed Job Event notification group to Job Basic Event and
1446 'jmJobEventV2Event' notification to 'jmJobBasicV2Event', to
1447 better align with IPP and to support variant job events.
- 1448 4) Defined new Job Completed Event notification group and defined
1449 new Job Progress Event notification group, to better align with
1450 IPP and to support variant job events.
- 1451 5) Renamed Event object group to Event Binding,
1452 'jmEventPrinterState' to 'jmEventDeviceState',
1453 'jmEventPrinterStateReasons' to 'jmEventDeviceStateReasons',
1454 'jmEventPrinterIsAcceptingJobs' to

- 1460 'jmEventDeviceIsAcceptingJobs', to support non-printing jobs.
1461 6) Revised Event Binding object group, adding explicit objects
1462 'jmEventDeviceURI', 'jmEventDeviceName', 'jmEventJobSetIndex',
1463 'jmEventJobIndex', 'jmEventJobName', 'jmEventJobState',
1464 'jmEventJobStateReasons', 'jmEventJobKOctets',
1465 'jmEventJobKOctetsProcessed', 'jmEventJobImpressions',
1466 'jmEventJobImpressionsCompleted', 'jmEventJobMediaSheets',
1467 'jmEventJobMediaSheetsCompleted',
1468 'jmEventJobImpressionsCompletedCC', 'jmEventJobCollationType',
1469 'jmEventJobSheetCompletedCopyNum',
1470 'jmEventJobSheetCompletedDocNum', per request of Ron Bergman.
1471 7) Revised SYNTAX of 'jmEventTriggerEvent' object from from
1472 'JmUTF8StringTC' (string) to IPP-aligned enumeration, per request
1473 of Ron Bergman.
1474 8) Removed all references to Printer MIB v2, as they were of limited
1475 value, per request of Ron Bergman.
1476 9) Revised 'SNMP Mapping for IPP Printer Events' section for renamed
1477 event binding objects, per request of Ron Bergman.
1478 10) Revised 'Rules for Encoding Notifications' section to truncate
1479 additional string bindings, per request of Ron Bergman.
1480 11) Revised 'Registration via IPP' section, to change scheme name
1481 from 'ipp-snmp:' to 'snmpnotify:', per request of Ron Bergman.
1482

- 1483 <draft-ietf-ipp-not-over-snmp-01.txt> - 1 December 1999
1484 1) Deleted 'JmTriggerEventTC' textual convention (see below).
1485 2) Revised SYNTAX of 'jmEventTriggerEvent' object from
1486 'JmTriggerEventTC' (enumeration) to 'JmUTF8StringTC' (string), to
1487 support use of IPP standard keywords.
1488 3) Added 'jmEventPrinterState', 'jmEventPrinterStateReasons', and
1489 'jmEventPrinterIsAcceptingJobs' objects for consistency w/
1490 [IPP-NOT] and to reduce ambiguity about printer states inherent
1491 in RFC 1759.
1492 4) Revised DESCRIPTION of 'jmPrinterEventV2Event' notification to
1493 add SHOULD (recommendation) for 'jmEventPrinterState',
1494 'jmEventPrinterStateReasons', and 'jmEventPrinterIsAcceptingJobs'
1495 objects.
1496 5) Revised 'SNMP Mapping for IPP Printer Events' section to add
1497 direct mapping of IPP notification attributes to
1498 'jmEventPrinterState', 'jmEventPrinterStateReasons', and
1499 'jmEventPrinterIsAcceptingJobs' objects.
1500 6) Revised 'Rules for Encoding Notifications' section to add
1501 'jmEventPrinterState' and 'jmEventPrinterStateReasons'.
1502 7) Revised 'IANA Considerations' section to specify there are none -
1503 no enumerated or keyword textual conventions are now defined in
1504 this document.
1505 8) Revised 'Internationalization Considerations' section to specify
1506 that US English keywords are used in 'jmEventTriggerEvent',
1507 'jmEventPrinterState', and 'jmEventPrinterStateReasons' objects
1508 and thus no explicit natural language tagging is required.
1509

1510 <draft-ietf-ipp-not-over-snmp-00.txt> - 10 October 1999

1513
1514 Internet Draft IPP Notify - Job Monitoring MIB Traps 6 July 2000
1515

1516 1) Initial version.
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1595

1596
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1598

1599 Tom Hastings
1600 Xerox Corporation
1601 701 S Aviation Blvd, MS 834-03E
1602 El Segundo, CA 90245
1603
1604 Phone: +1 310-333-6413
1605 Email: hastings@cpl0.es.xerox.com
1606

1607
1608 Ira McDonald
1609 High North Inc
1610 221 Ridge Ave
1611 Grand Marais, MI 49839
1612
1613 Phone: +1 906-494-2434 or +1 906-494-2697
1614 Email: imcdonald@sharplabs.com
1615 Email: imcdonal@sdsp.mc.xerox.com
1616

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