```
1                          The job monitoring MIB
2
3
4   JOB-MONITORING-MIB DEFINITIONS ::= BEGIN
5
6   IMPORTS
7           MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
8           OBJECT-IDENTITY, TimeTicks,
9           Counter32, Integer32, UInteger32, experimental
10                FROM SNMPv2-SMI                          -- RFC 1442
11          DateAndTime, RowStatus, DisplayString
12                FROM SNMPv2-TC                           -- RFC 1443
13          MODULE-COMPLIANCE, OBJECT-GROUP
14                FROM SNMPv2-CONF                         -- RFC 1444
15          hrDeviceIndex, InternationalDisplayString
16                FROM HOST-RESOURCES-MIB                  -- RFC 1514
17          Ordinal16, Cardinal16, Ordinal32, Cardinal32, Cardinal64,
18          CodeIndexedStringIndex
19                FROM GENERAL-TC                          -- genltc.mib
20          PrtChannelType, PrtInterpreterLangFamily, MediaUnit,
21          CodedCharSet
22                FROM PRINTER-TC          -- prttc.mib (new) Printer MIB
23                                         -- textual-conventions
24          DPAJobState, DPAJobStateReasons, DPADeviceState, DPADocType,
25          DPADocState, DPADocOutput
26                FROM JOB-MONITORING-TC;                  -- jobmontc.mib
27
28    -- Upon publication as RFC, delete this comment and the line following
29    -- this comment and change the reference of { printmib 104 }
30    -- (below) to { mib-2 X }.
31    -- This will result in changing:
32    -- 1 3 6 1 3 54 jmJobMonMIB(104)    to:
33    -- 1 3 6 1 2  1 jmJobMonMIB(X)
34    -- This will make it easier to translate prototypes to
35    -- the standard namespace because the lengths of the OID's won't
36    -- change.
37     printmib OBJECT IDENTIFIER ::= { experimental 54 }
38
39  jmJobMonMIB MODULE-IDENTITY
40          LAST-UPDATED "9510251230Z"
41          ORGANIZATION "IETF/DMTF Printer Working Group (PWG)"
42          CONTACT-INFO
43          "       Thomas N. Hastings
44                  Xerox Corporation, MS ES-AE 242
45                  701 S. Aviation Blvd.
46                  El Segundo, CA 90245
47                  Phone:        1+ (310)333-6413
48                  FAX:          1+ (310)333-6342
49                  E-Mail:       hastings@cp10.es.xerox.com"
50          DESCRIPTION
51                  "File:     jobmon.doc, .psr, .ps, .txt, .mib
52                   Version:  0.7
53
54                  This MIB specifies job and document objects for
55                  monitoring print jobs, including accounting, of print
56                  jobs.  This MIB does not provide for management and
57                  control of print jobs, such as cancelling or modifying
58                  them.  If job control is desired, another MIB that
59                  augments this one should be developed.
60
```

```
                    The groups in this MIB are arranged so that an
                    additional MIB may be developed that supports monitoring
                    of multifunction jobs (print, scan, FAX, etc.),
                    including scan-only jobs.  Such a MIB is intended to
                    augment this MIB.  See the companion job monitoring
                    textual conventions module: JOB-MONITORING-TC for
                    the textual conventions and for an explanation of the
                    use of this MIB."
            ::= { printmib 104 }


-- Textual conventions for this MIB module

-- See JOB-MONITORING-TC module
-- (files:  jobmontc.doc, .psr, .ps, .txt)

-- NOTE - The term "Mandatory" in this MIB, as in all MIBs, means that
-- the object or group is mandatory, if an agent claims conformance to
-- this MIB.  Conversely, if an agent is not claiming conformance to
-- this MIB, an agent need not implement the mandatory (or conditionally
-- mandatory) objects or groups in this MIB.



--
--                  The Job Information Group (Mandatory)
--
-- The implementation of every object in this group is mandatory.
-- NOTE - SNMP conformance to a group merely means that each object
-- shall be responded to on a Get; returning actual values is optional.
--
-- The Job Information group consists entirely of the jmJobInfoTable.
--
-- The Job Information table provides general information about each job
-- that is independent of the type of job and device.

jmJobInfo  OBJECT IDENTIFIER ::= { jmJobMonMIB 7 }

jmJobInfoTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF JmJobInfoEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A table of general mandatory job information per (logical or
        physical) device.  Job information applies to the job as
        a whole or to all its documents.  The specifications for each
        object is taken directly from the ISO 10175 Document Printing
        Application (DPA) standard clause 9.2, Job Attributes."
    ::= { jmJobInfo 1}

jmJobInfoEntry OBJECT-TYPE
    SYNTAX     JmJobInfoEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "An entry exists in this table for each job in the device,
         no matter what the state of the job is.  Each device is
         represented as a separate device entry in the hostmib
         device table as a device of type 'printer', 'scanner', or
         'fax'.  The management station references each job using
```

```
121           the jmJobIdentifier assigned by this printer."
122       INDEX { hrDeviceIndex, jmJobIdentifier }
123       ::= { jmJobInfoTable 1 }
124
125   JmJobInfoEntry ::= SEQUENCE {
126       -- Note that object in this table are all mandatory.
127       -- The OptionalJobInfo and OptionalPrintJobInfo tables augment this
128       -- table with optional objects.
129       jmJobIdentifier             DisplayString,            -- mandatory
130       jmJobClientId               CodeIndexedStringIndex,   -- mandatory
131       jmJobName                   CodeIndexedStringIndex,   -- mandatory
132       jmJobOriginator             CodeIndexedStringIndex,   -- mandatory
133       jmJobOwner                  CodeIndexedStringIndex,   -- mandatory
134       jmJobSourceType             OBJECT IDENTIFIER,        -- mandatory
135       jmJobDestinationType        OBJECT IDENTIFIER,        -- mandatory
136       jmJobSourceChannelType      PrtChannelType,        -- mandatory
137       jmJobDestinationChannelType PrtChannelType,        -- mandatory
138       jmJobSubmittedCodedCharSet  CodedCharSet,             -- mandatory
139       jmJobUserName               CodeIndexedStringIndex,   -- mandatory
140       jmJobAccountingInformation  OCTET STRING,             -- mandatory
141       jmJobCurrentState           DPAJobState,              -- mandatory
142       jmJobStateReasons           DPAJobStateReasons,       -- mandatory
143       jmJobPreviousState          DPAJobState,              -- mandatory
144       jmJobNumberOfDocuments      Cardinal32                -- mandatory
145   }
146
147   jmJobIdentifier OBJECT-TYPE
148       SYNTAX     DisplayString             -- not localized
149       MAX-ACCESS read-only
150       STATUS     current
151       DESCRIPTION
152           "Job-identifier
153           This attribute provides the job-identifier for this job on the
154           server.  The server shall generate a job-identifier value that
155           is unique on that server, but need not be unique across the
156           distributed environment.
157
158           The value of the job-identifier attribute shall be returned by
159           the server as part of the PrintResult in the first Print
160           operation for the job (see 8.2.1).  The client shall pass its
161           value as part of the PrintArgument in subsequent Print
162           operations for the same job."
163       ::= { jmJobInfoEntry 1 }
164
165   jmJobClientId OBJECT-TYPE
166       SYNTAX     CodeIndexedStringIndex
167       MAX-ACCESS read-only
168       STATUS     current
169       DESCRIPTION
170           "Job-client-id
171           This attribute supplies a human-readable descriptor for the
172           job.  This descriptor may be printed by the server on auxiliary
173           sheets to help identify the user's printed output, and
174           discriminate between different jobs.
175
176           Use and treatment of this attribute is implementation and site
177           specific.
178
179           If the client specifies the value of the job attribute job-
180           client-id, no server shall change it.  If the client does not
```

```
181          specify the value of the job attribute job-client-id, the first
182          server shall set it to the value of the job attribute job-
183          identifier, so that no downstream server shall change it. These
184          rules ensure that if an implementation prints the value of the
185          job-client-id on an auxiliary sheet, it has a value that is
186          meaningful to the client originally submitting the job, no
187          matter how many servers the job passes through.
188
189          For example, client A submits a job to server B and does not
190          specify a value for the job attribute job-client-id.  Server B
191          assigns a job-identifier of 123 to the job, and forwards this
192          job to server C.  Server C assigns a job-identifier of 456 to
193          the job and forwards this job to printer D.  Printer D is not a
194          DPA server, but it has its own queue and assigns a job-id of
195          789 to the job. The following table shows the value of the
196          relevant job attributes in the two servers B and C:
197
198                      job-          job-           job-           job-
199                      client-id     identifier-    identifier     identifier-
200                                    on-client                     on-printer
201                      ---------     -----------    ----------     -----------
202          server B    123           unspecified    123            456
203          server C    123           123            456            789*
204
205          * If printer D did not assign a job-id to its jobs, then the
206          value of the job attribute job-identifier-on-printer for server
207          C would be unspecified."
208      ::= { jmJobInfoEntry 2 }
209
210  jmJobName OBJECT-TYPE
211      SYNTAX     CodeIndexedStringIndex
212      MAX-ACCESS read-only
213      STATUS     current
214      DESCRIPTION
215          "Job-name
216          This attribute supplies a human readable string for the print-
217          job. This string is used for naming the print-job in human-
218          readable 'free-form' fashion.
219
220          This attribute is intended for enabling a user or the user's
221          application to convey a job name that may be printed on a start
222          sheet, returned in a ListObjectAttributes result, or used in
223          notification or logging messages.
224
225          If this attribute is not specified, no job name is assumed, but
226          implementation specific defaults are allowed, such as the value
227          of the document-name attribute of the first document in the
228          job."
229      ::= { jmJobInfoEntry 3 }
230
231  jmJobOriginator OBJECT-TYPE
232      SYNTAX     CodeIndexedStringIndex
233      MAX-ACCESS read-only
234      STATUS     current
235      DESCRIPTION
236          "Job-originator
237          This attribute supplies the name of the human or programmatic
238          originator of the print-job.
239
240          If this attribute is not specified, no value for job originator
```

```
241          is assumed, but implementation specific defaults are allowed.
242
243          NOTE - This attribute may be different from job-owner (1) when
244          a program submits the print-job on behalf of a user or (2) when
245          an operator must resubmit a misprinted job on behalf of the
246          original job owner.  However, an operation to resubmit a print-
247          job is outside the scope of this part of ISO/IEC 10175."
248      ::= { jmJobInfoEntry 4 }
249
250  jmJobOwner OBJECT-TYPE
251      SYNTAX     CodeIndexedStringIndex
252      MAX-ACCESS read-only
253      STATUS     current
254      DESCRIPTION
255          "Job-owner
256          This attribute supplies the name of the human owner of the
257          print-job.
258
259          The value of job-owner will often be the same as job-
260          originator. The job-owner will be different from job-originator
261          when the job has been submitted by the originator on behalf of
262          the owner. This attribute is not to take the place of the
263          security parameters or the access-and-accounting attributes.
264          If this attribute is not specified, the value of user-name or
265          job-originator should be used for any circumstances which
266          require a value for job-owner."
267      ::= { jmJobInfoEntry 5 }
268
269  jmJobSourceType OBJECT-TYPE
270      -- This is a type 2 enum.
271      SYNTAX     OBJECT IDENTIFIER
272      MAX-ACCESS read-only
273      STATUS     current
274      DESCRIPTION
275          "Job-source-type (ISO DPA extension)
276          This attribute specifies the device type of the source of this
277          job.
278
279          The OBJECT IDENTIFIER values are defined in the host resources
280          MIB as device types.  For use as a
281          source type, the host resources MIB defines device type OIDs
282          for:
283
284              disk storage (local to the host)
285
286          and the following OIDs need to be defined and registered
287          with IANA for use with the host resources MIB:
288
289              local disk storage
290              network disk storage
291              document repository
292              scanner
293              fax"
294      ::= { jmJobInfoEntry 6 }
295
296  jmJobDestinationType OBJECT-TYPE
297      -- This is a type 2 enum.
298      SYNTAX     OBJECT IDENTIFIER
299      MAX-ACCESS read-only
300      STATUS     current
```

```
301       DESCRIPTION
302           "Job-destination-type (ISO DPA extension)
303           This attribute specifies the device type of the destination of
304           this job.
305
306           The OBJECT IDENTIFIER values are defined in the host resources
307           MIB as device types.  For use as a
308           destination type, the host resources MIB defines device type
309           OIDs for:
310
311               printer
312
313           and the following OIDs need to be defined and registered
314           with IANA for use with the host resources MIB:
315
316               local disk storage
317               network disk storage
318               document repository
319               fax
320               mechanical mail box
321               electronic mail box"
322       ::= { jmJobInfoEntry 7 }
323
324   jmJobSourceChannelType OBJECT-TYPE
325       SYNTAX     PrtChannelType
326       MAX-ACCESS read-only
327       STATUS     current
328       DESCRIPTION
329           "Job-source-channel-type (ISO DPA extensiion)
330           This attribute specifies the type of channel that is receiving
331           the job from the input device.  See RFC 1759 for values."
332       ::= { jmJobInfoEntry 8 }
333
334   jmJobDestinationChannelType OBJECT-TYPE
335       SYNTAX     PrtChannelType
336       MAX-ACCESS read-only
337       STATUS     current
338       DESCRIPTION
339           "Job-destination-channel-type (ISO DPA extensiion)
340           This attribute specifies the type of channel that is sending
341           the job to the output device.  See RFC 1759 for values."
342       ::= { jmJobInfoEntry 9 }
343
344   jmJobSubmittedCodedCharSet OBJECT-TYPE
345       SYNTAX     CodedCharSet
346       MAX-ACCESS read-only
347       STATUS     current
348       DESCRIPTION
349           "This object is the coded character set enum for the coded
350           character set that the submitting client used to encode the
351           attributes of type:  CodeIndexedStringIndex.  This object
352           permits a managment station to determine the exact coded
353           character set that the submitting client used, in case the code
354           conversion that the agent might perform is not sufficient to a
355           different coded character set."
356       ::= { jmJobInfoEntry 10 }
357
358   jmJobUserName OBJECT-TYPE
359       SYNTAX     CodeIndexedStringIndex
360       MAX-ACCESS read-only
```

```
361       STATUS     current
362       DESCRIPTION
363           "This attribute specifies the name of the user for accounting
364           purposes.  See jmJobOriginator and jmJobOwner for additional
365           user names for other purposes (and whose values may be
366           different).  An agent may return the same value for all three
367           attributes, if the printer or service does not support all
368           three concepts.
369
370           ISO DPA:   User-name
371           This attribute specifies the name of the user requesting access
372           to print [or other] service operations.  The usage of
373           this attribute may be mandatory, depending upon the local
374           security policy used."
375       ::= { jmJobInfoEntry 11 }
376
377   jmJobAccountingInformation OBJECT-TYPE
378       SYNTAX     OCTET STRING(SIZE(0..255))
379       MAX-ACCESS read-only
380       STATUS     current
381       DESCRIPTION
382           "Accounting-information
383           This attribute specifies information required by accounting
384           services (e.g. the account to be charged for any services
385           rendered).
386
387           Accounting information is intended to be interpreted by an
388           accounting system, and may be opaque to the print service."
389       ::= { jmJobInfoEntry 12 }
390
391   jmJobCurrentState OBJECT-TYPE
392       -- This is a type 2 enum.
393       SYNTAX     DPAJobState
394       MAX-ACCESS read-only
395       STATUS     current
396       DESCRIPTION
397           "Current-job-state
398           This attribute identifies the current state of the job
399           (pending, printing, held, etc.)
400
401           Print clients and DP-Servers shall be prepared to receive all
402           the standard job states.  DP-Servers are not required to
403           generate all job states, only those which are appropriate for
404           the particular implementation.
405
406           If a server implementation or policy is to start processing
407           documents before the last Print request (with a TRUE value for
408           the job-submission-complete parameter) and the value of the
409           job's job-scheduling attribute is not after-complete, the
410           server shall change the job's current-job-state from pre-
411           processing directly to the processing state when the server
412           begins processing any of the job's documents."
413       ::= { jmJobInfoEntry 13 }
414
415   jmJobStateReasons OBJECT-TYPE
416       SYNTAX     DPAJobStateReasons
417       MAX-ACCESS read-only
418       STATUS     current
419       DESCRIPTION
420           "This object is bit-encoded, so that multiple reasons can occur
```

```
421           at once.  Each bit corresponds to an ISO DPA OID for the same
422           reason.
423
424           ISO DPA:   Job-state-reasons
425           This attribute identifies the reason or reasons that the job is
426           in the held, terminating, retained, or completed state.  The
427           server shall indicate the particular reason(s) by setting the
428           value of the job-state-reasons attribute.  When the job is not
429           in any of these states, the server shall set the value of the
430           job-state-reasons attribute to the empty set."
431
432       ::= { jmJobInfoEntry 14 }
433
434   jmJobPreviousState OBJECT-TYPE
435       -- This is a type 2 enum.
436       SYNTAX     DPAJobState
437       MAX-ACCESS read-only
438       STATUS     current
439       DESCRIPTION
440           "This attribute identifies the state of the job (pending,
441           printing, held, etc.) before the last change of job state.
442
443           Standard values are defined in the specification for the
444           current-job-state [jmJobCurrentState] job-status attribute."
445       ::= { jmJobInfoEntry 15 }
446
447   jmJobNumberOfDocuments OBJECT-TYPE
448       SYNTAX     Cardinal32
449       MAX-ACCESS read-only
450       STATUS     current
451       DESCRIPTION
452           "Number-of-documents
453           This attribute indicates the number of documents in the job.
454           The number indicates how many Print operations that specified a
455           document (of any document-type have been submitted for
456           printing until job submission has been completed; at that point
457           this attribute shall then indicate the total number of
458           printable documents, fonts, and resource objects submitted by
459           the client in the job.  If the first Print operation does not
460           contain a first-document component (see 8.2.1), the value of
461           this attribute shall be 0.
462
463           The server shall count fonts and resource objects passed to the
464           server by means of Print operation invocations, as documents
465           for the purposes of this attribute."
466       ::= { jmJobInfoEntry 16 }
467
468
469
470
471   --
472   --                The Devices Assigned group (Mandatory)
473   --
474   -- The Devices Assigned group contains informations about the device(s)
475   -- that have been assigned to the job, when they are assigned.  The
476   -- complete state of the job includes the state(s) of such assigned
477   -- devices.
478   --
479   -- The implementation of every object in this group is mandatory.
480   -- NOTE - SNMP conformance to a group merely means that each object
```

```
481   -- shall be responded to on a Get; returning actual values is optional.
482   --
483   -- The Devices Assigned group consists entirely of the
484   -- jmDevicesAssignedTable.
485   --
486   -- The devices assigned table contains the hrDeviceIndex and the state
487   -- of each of the devices to which the service has assigned (parts
488   -- of) the job.  Implementations, such as physical printers, that only
489   -- assign a job to a single device need only implement one row of this
490   -- table.
491   --
492   -- NOTE - the names of these objects have been generalized from the DPA
493   -- attributes, so that they can apply to other devices in addition to
494   -- printers.  Some additional states will be added for such other
495   -- devices, such as scanning, dialing, etc.
496
497   jmDevicesAssigned  OBJECT IDENTIFIER ::= { jmJobMonMIB 8 }
498
499   jmDevicesAssignedTable OBJECT-TYPE
500       SYNTAX     SEQUENCE OF JmDevicesAssignedEntry
501       MAX-ACCESS not-accessible
502       STATUS     current
503       DESCRIPTION
504           "This table contains the hrDeviceIndex values and states of the
505           device(s) to which this job has been assigned.
506
507           NOTE: some (high-end) systems may assign a job to more than one
508           printer and print part of the job on each.  Therefore, the
509           printer state is represented as a table.  Systems that only
510           assign a job to a single printer, need only implement a single
511           row of this table.
512
513           NOTE - Multifunction devices/systems that scan and print, assign
514           a job to at least two devices: a scanner and a printer."
515       ::= { jmDevicesAssigned 1 }
516
517   jmDevicesAssignedEntry OBJECT-TYPE
518       SYNTAX     JmDevicesAssignedEntry
519       MAX-ACCESS not-accessible
520       STATUS     current
521       DESCRIPTION
522           "Entries may exist in the table for each device index whose
523           device type is 'printer' or 'scanner' and for each job."
524       INDEX { hrDeviceIndex, jmJobIdentifier, jmDevicesAssignedIndex }
525       ::= { jmDevicesAssignedTable 1 }
526
527   JmDevicesAssignedEntry ::= SEQUENCE {
528       jmDevicesAssignedIndex             Cardinal32,       -- mandatory
529       jmDeviceStateOfDevicesAssigned     DPADeviceState    -- mandatory
530   }
531   jmDevicesAssignedIndex OBJECT-TYPE
532       SYNTAX     Cardinal32
533       MAX-ACCESS not-accessible
534       STATUS     current
535       DESCRIPTION
536           "The hrDeviceIndex of one of the [physical] printers or scanners
537           to which the job has been assigned.  Since jobs need not be
538           persistent across power cycles of the device, these values are
539           not expected to remain stable across sucessive device power
540           cycles.  An index value of 0 indicates that the job has not
```

```
541          yet been assigned to a physical device.
542
543          The representation of the assigned printer(s) or scanner is an
544          index into the host resources device table, rather than being
545          the distinguished name of the physical printer as in the ISO DPA
546          printers-assigned attribute.
547
548              NOTE - The name of the physical printer [or scanner] is
549              contained in the host resources table for this device.
550
551          ISO DPA:   Printers-assigned
552          This attribute identifies the physical [devices] printer or
553          printers to which this job has been assigned, if any.
554
555          When the job is first submitted and the server has not yet
556          assigned any printers to the job, the SEQUENCE shall be empty.
557
558          If the server intends to use a single printer for the job, and
559          the server has assigned a printer to the job, the SEQUENCE shall
560          contain just that printer.
561
562          If a server has split the job into multiple pieces and assigned
563          each piece to a different printer, the SEQUENCE shall contain n
564          elements, one for each assigned printer. A job with multiple
565          job-result-sets is an example of a job that would be easy to
566          split into multiple pieces.
567
568          A SEQUENCE with no elements [row with no values] shall be
569          returned if this attribute is supported, but this job has not
570          yet been assigned to any physical printers [or other devices].
571
572          The number of elements in the SEQUENCE for this attribute shall
573          be the same as the number of elements in the SEQUENCE for the
574          associated job attribute printer-state-of-printers-assigned
575          [number of rows for the jmDeviceStateOfDevicesAssigned table].
576
577          In addition, the ith element of each of this associated
578          attributes shall be a value that pertains to the printer named
579          by the ith element of printers-assigned.
580
581          The printers-assigned value shall not be the same as the printer
582          requested by the user if the job's printer-name-requested
583          attribute specified a logical printer that supports one or more
584          different physical printers.  The printers-assigned value might
585          differ also if the job has been re-assigned by an operator to
586          ensure successful completion of the job, allowing the user to
587          find out where a job has been re-assigned (when necessary).
588
589          The value of the job's printers-assigned attribute shall remain
590          after the job has completed, so that users can determine the
591          physical printer(s) on which the job was printed."
592      ::= { jmDevicesAssignedEntry 1 }
593
594  jmDeviceStateOfDevicesAssigned OBJECT-TYPE
595      SYNTAX     DPADeviceState
596      MAX-ACCESS read-only
597      STATUS     current
598      DESCRIPTION
599          "For the MIB, the object applies to scanners, as well as
600          printers.  Changes of the values of this object shall create a
```

```
601           trap.
602
603           ISO DPA:   Printer-state-of-printers-assigned
604           This attribute identifies the current state of each assigned
605           [device] printer. This attribute gives the client access to
606           information within each assigned printer.  Because this
607           attribute contains a value that is updated within the printer,
608           the server may choose to update the value of this attribute only
609           when a client [or management station] queries its value.
610
611           See the [devices-assigned] printers-assigned attribute for the
612           correspondence between elements of this attribute and those of
613           [devices-assigned] printers-assigned."
614       ::= { jmDevicesAssignedEntry 2 }
615
616
617
618   --
619   --              Optional Job Information Group (Optional)
620   --
621   -- The Optional Job Information group is optional.
622   -- However, to claim conformance to this group, it is necessary to
623   -- implement every object in the group.
624   -- NOTE - SNMP conformance to a group merely means that each object
625   -- shall be responded to on a Get; returning actual values is optional.
626
627   -- The Optional Job Information group consists solely of the
628   -- jmOptionalJobInfoTable.
629
630   -- The Optional Job Information table provides additional general
631   -- information about each job that is independent of the type of job
632   -- and the type of device that was (1) submitted to or (2) assigned to
633   -- the (logical or physical) device specified by hrDeviceIndex.
634   --
635   jmOptionalJobInfo  OBJECT IDENTIFIER ::= { jmJobMonMIB 9 }
636
637   jmOptionalJobInfoTable OBJECT-TYPE
638       SYNTAX     SEQUENCE OF JmOptionalJobInfoEntry
639       MAX-ACCESS not-accessible
640       STATUS     current
641       DESCRIPTION
642           "A table of optional general job information per (logical or
643           physical) device that is independent of the type of device.
644           Job information applies to the job as
645           a whole or to all its documents.  The specifications for each
646           object is taken directly from the ISO 10175 Document Printing
647           Application (DPA) standard clause 9.2, Job Attributes."
648       ::= { jmOptionalJobInfo 1}
649
650   jmOptionalJobInfoEntry OBJECT-TYPE
651       SYNTAX     JmOptionalJobInfoEntry
652       MAX-ACCESS not-accessible
653       STATUS     current
654       DESCRIPTION
655           "An entry exists in this table for each job in the device,
656            no matter what the state of the job is.  Each device is
657            represented as a separate device entry in the hostmib
658            device table as a device of type 'printer', 'scanner', or
659            'fax'.  The management station references each job using
660            the jmJobIdentifier assigned by the server that accepted job
```

```
661           submission (by some other protocol).
662
663           This table augments the mandatory Job Information table in
664           this MIB."
665       AUGMENTS { jmJobInfoEntry }
666       ::= { jmOptionalJobInfoTable 1 }
667
668   JmOptionalJobInfoEntry ::= SEQUENCE {
669       -- Note that objects in this table are optional and are all
670       -- device-independent.
671       -- This OptionalJobInfo table augments the mandatory JobInfo table
672       -- with optional objects.
673       jmJobIdentifierOnClient        DisplayString,          -- optional
674       jmJobComment                   CodeIndexedStringIndex, -- optional
675       jmJobPriority                  INTEGER(1..100),        -- optional
676       jmJobEstimatedCompletionTime   DateAndTime,            -- optional
677       jmJobSubmissionTime            DateAndTime,            -- optional
678       jmJobInterveningJobs           Cardinal32,             -- optional
679       jmJobMessageFromAdministrator  CodeIndexedStringIndex, -- optional
680       jmJobErrorCount                Counter32,              -- optional
681       jmJobWarningCount              Counter32,              -- optional
682       jmJobProcessingTime            Counter32,              -- optional
683       jmJobCompletionTime            DateAndTime             -- optional
684   }
685
686   jmJobIdentifierOnClient OBJECT-TYPE
687       SYNTAX     DisplayString (SIZE(0..255))   -- not localized
688       MAX-ACCESS read-only
689       STATUS     current
690       DESCRIPTION
691           "Job-identifier-on-client
692           This attribute provides the job-identifier for this job to
693           uniquely identify the job on the client submitting the job, and
694           the value shall be assigned by that client.
695           The client shall supply the value of the job-identifier-on-
696           client attribute at the time that the client submits the job to
697           the server, if such client has its own job-identifier for the
698           job.
699
700           NOTE - This attribute is intended for jobs submitted from
701           legacy servers which have their own job-identifier for the job.
702           If a job passes through a chain of servers between the client
703           initiating the job and the output device, the value of the job
704           attribute job-identifier-on-client shall be the value of the
705           job's job-identifier on the immediate upstream server and the
706           value of the job attribute job-identifier-on-printer shall be
707           the value of the job's job-identifier on the immediate
708           downstream server or printer.
709
710           NOTE - A job has attributes for identifying itself on the
711           current server, on the immediate upstream server (where the job
712           came from), and on the immediate downstream server or printer
713           (where the job went). These attributes are job-identifier, job-
714           identifier-on-client, and job-identifier-on-printer,
715           respectively."
716       ::= { jmOptionalJobInfoEntry 1 }
717
718   jmJobComment OBJECT-TYPE
719       SYNTAX     CodeIndexedStringIndex
720       MAX-ACCESS read-only
```

```
721       STATUS     current
722       DESCRIPTION
723           "Job-comment
724           This attribute supplies an arbitrary human-readable text string
725           associated with the print-job.
726
727           This attribute is intended for enabling a user to convey a text
728           string that may be printed on a job start sheet, for example,
729           in an implementation-dependent manner."
730       ::= { jmOptionalJobInfoEntry 2 }
731
732   jmJobPriority OBJECT-TYPE
733       SYNTAX     INTEGER(1..100)
734       MAX-ACCESS read-only
735       STATUS     current
736       DESCRIPTION
737           "Job-priority
738           This attribute specifies a priority for scheduling the print-
739           job. It is used by servers that employ a priority-based
740           scheduling algorithm.
741
742           A higher value specifies a higher priority. The value 1 is
743           defined to indicate the lowest possible priority (a job which a
744           priority-based scheduling algorithm shall pass over in favour
745           of higher priority jobs). The value 100 is defined to indicate
746           the highest possible priority. Priority is expected to be
747           evenly or 'normally' distributed across this range. The mapping
748           of vendor-defined priority over this range is implementation-
749           specific. The omission of this attribute implies that the user
750           places no constraints concerning priority on the scheduling of
751           the print-job."
752       ::= { jmOptionalJobInfoEntry 3 }
753
754   jmJobEstimatedCompletionTime OBJECT-TYPE
755       SYNTAX     DateAndTime
756       MAX-ACCESS read-only
757       STATUS     current
758       DESCRIPTION
759           "Estimated-completion-time
760           This attribute indicates the estimated time by which this job
761           will be completed.
762
763           The time to complete one job is dependent on the time required
764           to complete all other jobs that the scheduling algorithm
765           determines must be printed before this job may be printed. The
766           time to complete each individual job may depend on when on-
767           request resources are available. The time to print each
768           individual job is dependent on the characteristics of the
769           document formats in which the individual documents of the job
770           are encoded and on the complexities and other characteristics
771           of  the documents themselves.
772
773           This attribute is highly implementation-dependent.  The
774           estimated-completion-time may be easy to calculate for some
775           combinations of document formats and scheduling algorithms. It
776           may be impossible to calculate for other combinations.  It is
777           recommended that, where possible, document creators provide
778           system hints to the print system (perhaps appropriately encoded
779           in document format headers) that help the print system
780           understand which features of the document formats the document
```

```
781          will be exercising."
782      ::= { jmOptionalJobInfoEntry 4 }
783
784  jmJobSubmissionTime OBJECT-TYPE
785      SYNTAX     DateAndTime
786      MAX-ACCESS read-only
787      STATUS     current
788      DESCRIPTION
789          "Submission-time
790          This attribute indicates the time at which the latest Print
791          request for this job was accepted by the server."
792      ::= { jmOptionalJobInfoEntry 5 }
793
794  jmJobInterveningJobs OBJECT-TYPE
795      SYNTAX     Cardinal32
796      MAX-ACCESS read-only
797      STATUS     current
798      DESCRIPTION
799          "Intervening-jobs
800          This attribute indicates the number of other jobs to be printed
801          before this job may be scheduled for printing.  The server
802          shall set the value of this attribute to 0 when the job begins
803          printing."
804      ::= { jmOptionalJobInfoEntry 6 }
805
806  jmJobMessageFromAdministrator OBJECT-TYPE
807      SYNTAX     CodeIndexedStringIndex
808      MAX-ACCESS read-only
809      STATUS     current
810      DESCRIPTION
811          "Job-message-from-administrator
812          This attribute provides a message from an operator, system
813          administrator or 'intelligent' process to indicate to the user
814          the reasons for modification or other management action taken
815          on a job."
816      ::= { jmOptionalJobInfoEntry 7 }
817
818  jmJobErrorCount OBJECT-TYPE
819      SYNTAX     Counter32
820      MAX-ACCESS read-only
821      STATUS     current
822      DESCRIPTION
823          "Error-count
824          This attribute provides the number of error events occurring
825          while processing the job."
826      ::= { jmOptionalJobInfoEntry 8 }
827
828  jmJobWarningCount OBJECT-TYPE
829      SYNTAX     Counter32
830      MAX-ACCESS read-only
831      STATUS     current
832      DESCRIPTION
833          "Warning-count
834          This attribute provides the number of warning events occurring
835          while processing the job."
836      ::= { jmOptionalJobInfoEntry 9 }
837
838  jmJobProcessingTime OBJECT-TYPE
839      SYNTAX     Counter32
840      MAX-ACCESS read-only
```

```
841         STATUS     current
842         DESCRIPTION
843             "Processing-time
844             This attribute indicates how long an individual job has been
845             processing [in seconds]."
846         ::= { jmOptionalJobInfoEntry 10 }
847
848     jmJobCompletionTime OBJECT-TYPE
849         SYNTAX     DateAndTime
850         MAX-ACCESS read-only
851         STATUS     current
852         DESCRIPTION
853             "Completion-time
854             This attribute indicates the time at which this job completed.
855             Providing this time is useful for jobs which are retained after
856             printing."
857         ::= { jmOptionalJobInfoEntry 11 }
858
859
860
861
862     --
863     --           Print Job Information Group (Conditionally Mandatory)
864     --
865     -- The Print Job Information group is Conditionally Mandatory,
866     -- i.e., is mandatory for agents that support (spooling) print systems,
867     -- as oppposed to printers.
868
869     -- The Print Job Information group consists solely of the
870     -- jmPrintJobInfoTable.
871
872     -- The Print Job Information table provides additional
873     -- information about each job that is printer-centric that was (1)
874     -- submitted to or (2) assigned to the (logical or physical) printer
875     -- specified by hrDeviceIndex.
876
877     jmPrintJobInfo  OBJECT IDENTIFIER ::= { jmJobMonMIB 10 }
878
879     jmPrintJobInfoTable OBJECT-TYPE
880         SYNTAX     SEQUENCE OF JmPrintJobInfoEntry
881         MAX-ACCESS not-accessible
882         STATUS     current
883         DESCRIPTION
884             "A table of printer-centric job information per
885             (logical or physical) printer.  Job information applies to the
886             job as a whole or to all its documents.  The specifications for
887             each object is taken directly from the ISO 10175 Document
888             Printing Application (DPA) standard clause 9.2, Job Attributes."
889         ::= { jmPrintJobInfo 1}
890
891     jmPrintJobInfoEntry OBJECT-TYPE
892         SYNTAX     JmPrintJobInfoEntry
893         MAX-ACCESS not-accessible
894         STATUS     current
895         DESCRIPTION
896             "An entry exists in this table for each job in the printer,
897              no matter what the state of the job is.  Each device is
898              represented as a separate device entry in the hostmib
899              device table as a device of type 'printer'.  The management
900              station references each job using the jmJobIdentifier assigned
```

```
901           by the server that accepted job submission (by some other
902           protocol).
903
904           This table augments the mandatory Job Information table in
905           this MIB."
906       AUGMENTS { jmJobInfoEntry }
907       ::= { jmPrintJobInfoTable 1 }
908
909   JmPrintJobInfoEntry ::= SEQUENCE {
910       -- Note that the printer-centric objects in this table are
911       -- conditionally mandatory, i.e., they are mandatory if an agent
912       -- supports a (spooling) print system, as opposed to a printer.
913       -- This PrintJobInfo table augments the mandatory JobInfo table.
914       jmJobNumberOfJobSets           Ordinal32,       -- cond. mandatory
915       jmJobCopies                    Ordinal32,       -- cond. mandatory
916       jmJobOutputBin                 Integer32,       -- cond. mandatory
917       jmJobPrintAfter                DateAndTime,     -- cond. mandatory
918       jmJobPrinterNameRequested      CodeIndexedStringIndex,
919                                                        -- cond. mandatory
920       jmJobStartedPrintingTime       DateAndTime,     -- cond. mandatory
921       jmJobCopiesCompleted           Counter32,       -- cond. mandatory
922       jmJobPagesCompleted            Counter32,       -- cond. mandatory
923       jmJobImpressionsCompleted      Counter32,       -- cond. mandatory
924       jmJobMediaSheetsCompleted      Counter32,       -- cond. mandatory
925       jmJobOctetsCompleted           Cardinal64,      -- cond. mandatory
926       jmJobTotalJobOctets            Cardinal64,      -- cond. mandatory
927       jmJobPageCount                 Cardinal32       -- cond. mandatory
928   }
929
930   jmJobNumberOfJobSets OBJECT-TYPE
931       SYNTAX     Ordinal32
932       MAX-ACCESS read-only
933       STATUS     current
934       DESCRIPTION
935           "number-of-job-sets
936           The hardcopy output of a print-job consists of one or more job
937           sets, each of which may be specified to be delivered to, or
938           held for, one particular recipient who is not necessarily the
939           job creator.  Each job set may be specified to contain one or
940           more job copies.  Each job copy shall contain one or more
941           copies of each of the documents specified by means of the Print
942           operations that compose the job."
943       ::= { jmPrintJobInfoEntry 1 }
944
945   jmJobCopies OBJECT-TYPE
946       SYNTAX     Ordinal32
947       MAX-ACCESS read-only
948       STATUS     current
949       DESCRIPTION
950           "job-copies
951           Total number of job copies in the job, i.e., number of job
952           copies summed across the job-result-sets.
953
954           NOTE - In ISO DPA, job-copies is a separate value for each job
955           result set, not the summation.  But it didnt seem worth the
956           effort to make job-copies a table."
957       ::= { jmPrintJobInfoEntry 2 }
958
959   jmJobOutputBin OBJECT-TYPE
960       SYNTAX     Integer32
```

```
961         MAX-ACCESS read-only
962         STATUS     current
963         DESCRIPTION
964             "output-bin
965             Special MIB definition:  specifies the index of the output
966             subunit table for the job.
967
968             NOTE - ISO DPA allows the output-bin to be specified
969             diferrently for each job result set in a job.  However, it
970             doesnt seem worth the effort to make output-bin a table, since
971             multiple job-result-sets is an unlikely feature to be supported
972             and/or used, especially with different output-bins."
973         ::= { jmPrintJobInfoEntry 3 }
974
975     jmJobPrintAfter OBJECT-TYPE
976         SYNTAX     DateAndTime
977         MAX-ACCESS read-only
978         STATUS     current
979         DESCRIPTION
980             "Job-print-after
981             This attribute specifies the calendar date and time of day
982             after which the print-job shall become a candidate to be
983             scheduled for printing.
984
985             If the value of this attribute is in the future, the server
986             shall set the value of the job's current-job-state to held and
987             add the job-print-after-specified value to the job's job-state-
988             reasons attribute and shall not schedule the print-job for
989             printing until the specified date and time has passed.  When
990             the specified date and time arrives, the server shall remove
991             the job-print-after-specified value from the job's job-state-
992             reason attribute and, if no other reasons remain, shall change
993             the job's current-job-state to pending so that the job becomes
994             a candidate for being scheduled on printer(s).
995
996             The server shall assign an empty value (see 9.1.2) to the job-
997             print-after attribute when no print after time has been
998             assigned, so that the job shall be a candidate for scheduling
999             immediately."
1000        ::= { jmPrintJobInfoEntry 4 }
1001
1002    jmJobPrinterNameRequested OBJECT-TYPE
1003        SYNTAX     CodeIndexedStringIndex
1004        MAX-ACCESS read-only
1005        STATUS     current
1006        DESCRIPTION
1007            "Printer-name-requested
1008            This attribute identifies the printer to be used for printing
1009            the job.  The client shall specify the value of this attribute
1010            with the first invocation of the Print operation for the print-
1011            job as the explicit printer-name component of the
1012            PrintArgument, rather than as an attribute (see 8.2.1.1).
1013
1014            NOTES
1015            1.  To cause a server to select a printer according to other
1016            attributes, the system administrator should define a logical
1017            printer that supports ALL of the physical printers supported by
1018            the server.
1019
1020            2.  For the server that supports only a single printer, the
```

```
1021          logical printer name may be the same as the server name, as
1022          long as they cannot be confused for each other in the name
1023          service directory.
1024
1025          3.  Initial-value-job objects should have the value of their
1026          printer-name-requested attribute specified as an empty value in
1027          order to indicate that no printer-name is defaulted."
1028      ::= { jmPrintJobInfoEntry 5 }
1029
1030  jmJobStartedPrintingTime OBJECT-TYPE
1031      SYNTAX     DateAndTime
1032      MAX-ACCESS read-only
1033      STATUS     current
1034      DESCRIPTION
1035          "Started-printing-time
1036          This attribute indicates the time at which this job started
1037          printing."
1038      ::= { jmPrintJobInfoEntry 6 }
1039
1040  jmJobCopiesCompleted OBJECT-TYPE
1041      SYNTAX     Counter32
1042      MAX-ACCESS read-only
1043      STATUS     current
1044      DESCRIPTION
1045          "Job-copies-completed
1046          This attribute indicates the number of job-copies of the job
1047          that the printer(s) have completed printing.  The server shall
1048          not reset its value during the processing of multiple print-job
1049          results that are part of the same job (see the results-profile
1050          job attribute).  Since this attribute is intended to measure
1051          the progress of a job, the value shall include repeated job-
1052          copies due to multiple print-job results for the same job.
1053          The accuracy of this value is implementation-dependent. It is
1054          expected that the value reported is never greater than the
1055          actual value.  This attribute may not be supported for all
1056          printers and all page description languages.
1057
1058          The value of this attribute shall be 0 if printing has not
1059          started for this job."
1060      ::= { jmPrintJobInfoEntry 7 }
1061
1062  jmJobPagesCompleted OBJECT-TYPE
1063      SYNTAX     Counter32
1064      MAX-ACCESS read-only
1065      STATUS     current
1066      DESCRIPTION
1067          "Pages-completed
1068          This attribute indicates the number of pages of the job that
1069          the printer(s) have completed printing.
1070
1071          NOTE - The number of source pages, impressions and sheets of
1072          media may differ.  The following examples illustrate how they
1073          may differ when attributes, rather than the document contents,
1074          control the printing. If number-up is 0 or 1, there is one
1075          source page per impression, and if number-up is 2, there are
1076          two source pages per impression.  If sides is 1, there is one
1077          impression per sheet of media, but if sides is 2, there are two
1078          impressions per sheet of media. By inference, if number-up is 4
1079          and sides is 2, there are 4 source pages per impression and 8
1080          source pages per sheet of media.
```

```
1081
1082            The server shall not reset its value during the processing of
1083            multiple copies of documents or the job.  Since this attribute
1084            is intended to measure the progress of a job, the value shall
1085            include repeated pages due to multiple copies.  When the job
1086            completes, this attribute should contain the value of the total
1087            number of source pages that the printer processed for the
1088            print-job.
1089
1090            The accuracy of this value is implementation-dependent. It is
1091            expected that the value reported is never greater than the
1092            actual value.  This attribute may not be supported for all
1093            printers and all page description languages.
1094
1095            The value of this attribute shall be 0 if printing has not
1096            started for this job. "
1097        ::= { jmPrintJobInfoEntry 8 }
1098
1099    jmJobImpressionsCompleted OBJECT-TYPE
1100        SYNTAX     Counter32
1101        MAX-ACCESS read-only
1102        STATUS     current
1103        DESCRIPTION
1104            "Impressions-completed
1105            This attribute indicates the number of impressions that the
1106            printer engine(s) have placed on the media for the job. See the
1107            note in the pages-completed attribute for the relationship of
1108            the pages-completed, impressions-completed and media-sheets-
1109            completed attributes.
1110
1111            The server shall not reset its value during the processing of
1112            multiple copies of documents or the job.  Since this attribute
1113            is intended to measure the progress of a job, the value shall
1114            include repeated pages due to multiple copies. When the job
1115            completes, this attribute should contain the value of the total
1116            number of impressions that the printer made for the print-job.
1117            The accuracy of this value is implementation-dependent. It is
1118            expected that the value reported is never greater than the
1119            actual value.  This attribute may not be supported for all
1120            printers and all page description languages.
1121
1122            The value of this attribute shall be 0 if printing has not
1123            started for this job."
1124        ::= { jmPrintJobInfoEntry 9 }
1125
1126    jmJobMediaSheetsCompleted OBJECT-TYPE
1127        SYNTAX     Counter32
1128        MAX-ACCESS read-only
1129        STATUS     current
1130        DESCRIPTION
1131            "Media-sheets-completed
1132            This attribute indicates the number of sheets of media that the
1133            printer(s) have completed printing for the job. See the note in
1134            the pages-completed attribute for the relationship of the
1135            pages-completed, impressions-completed and media-sheets-
1136            completed attributes.
1137
1138            The server shall not reset its value during the processing of
1139            multiple copies of documents or the job.  Since this attribute
1140            is intended to measure the progress of a job, the value shall
```

```
1141          include repeated pages due to multiple copies. When the job
1142          completes, this attribute should contain the value of the total
1143          number of sheets of media used for the print-job.
1144
1145          The accuracy of this value is implementation-dependent. It is
1146          expected that the value reported is never greater than the
1147          actual value.  This attribute may not be supported for all
1148          printers and all page description languages.
1149
1150          The value of this attribute shall be 0 if printing has not
1151          started for this job."
1152      ::= { jmPrintJobInfoEntry 10 }
1153
1154  jmJobOctetsCompleted OBJECT-TYPE
1155      SYNTAX     Cardinal64
1156      MAX-ACCESS read-only
1157      STATUS     current
1158      DESCRIPTION
1159          "Octets-completed
1160          This attribute indicates the number of octets of the job that
1161          the printer(s) have completed printing.  The server shall not
1162          reset its value during the processing of multiple copies of
1163          documents or the job.  Since this attribute is intended to
1164          measure the progress of a job, the value shall include repeated
1165          pages due to multiple copies.
1166
1167          The accuracy of this value is implementation-dependent. It may
1168          be approximated by the number of octets conveyed to the
1169          printer. This attribute may not be supported for all printers
1170          and all page description languages.
1171          The value of this attribute shall be 0 if printing has not
1172          started for this job."
1173      ::= { jmPrintJobInfoEntry 11 }
1174
1175  jmJobTotalJobOctets OBJECT-TYPE
1176      SYNTAX     Cardinal64
1177      MAX-ACCESS read-only
1178      STATUS     current
1179      DESCRIPTION
1180          "Total-job-octets
1181          This attribute indicates the size of the job in octets,
1182          including document and job copies.
1183
1184          The server may update the value of this attribute after each
1185          document has been transferred to the server or the server may
1186          provide this value after all documents have been transferred to
1187          the server, depending on implementation.  In other words, while
1188          the job is in the pre-processing state and when the job is in
1189          the held state with the job-state-reasons containing a
1190          document-needed value, the value of the total-job-octets job
1191          status attribute depends on implementation and may not
1192          correctly reflect the size of the job.
1193
1194          In computing this value, the server shall include the
1195          multiplicative factors contributed by the (1) copy-count
1196          document attribute, (2) the results-profile.job-copies job
1197          attribute element and (3) multiple values of the results-
1198          profile job attribute, independent of whether the printer can
1199          process multiple copies of the job or document without making
1200          multiple passes over the job or document data and independent
```

```
1201          of the value of the output document attribute (page-collate vs.
1202          no-page-collate).  Thus the server computation is independent
1203          of the printer implementation and shall be:
1204
1205          a)  Document contribution:  Multiply each copy-count by the
1206          size of the document in octets.
1207
1208          b)  Add each document contribution together
1209
1210          c)  Job result contribution:  Multiply the job size by the
1211          number job-copies in the result set.
1212
1213          d)  Add each job result contribution together
1214
1215          e)  Multiply the value by the number of values in the job's
1216          result-profile attribute."
1217      ::= { jmPrintJobInfoEntry 12 }
1218
1219   jmJobPageCount OBJECT-TYPE
1220       SYNTAX     Cardinal32
1221       MAX-ACCESS read-only
1222       STATUS     current
1223       DESCRIPTION
1224           "Job-page-count
1225           This attribute contains the number of source pages in the job
1226           that the server expects to image. The server shall compute this
1227           value by the following procedure:
1228
1229           a)  For each document in the job object, multiply the value
1230           of document's page-count attribute by the value of its copy-
1231           count attribute and call the result document-set-page-count.
1232
1233           b)  Add up all the document-set-page-counts from the previous
1234           step and call this sum the job-copy-page-count.
1235
1236           c)  For each job-result-set, multiply the value of job-copy-
1237           page-count from the previous step by the value of job-copies
1238           element of the job-result-set and call the result job-result-
1239           set-page-count.
1240
1241           d)  Add up all the job-result-set-page-counts from the
1242           previous step and set this sum into the job-page-count
1243           attribute.
1244
1245           The value of this attribute is a measure of the amount of
1246           computation involved.
1247
1248           The accuracy of this value is dependent on the accuracy of the
1249           page-count attribute in each document.  If some documents have
1250           a page-count value of 0, the server may set the value of this
1251           attribute to 0 and not use it for scheduling."
1252       ::= { jmPrintJobInfoEntry 13 }
1253
1254
1255
1256
1257   --
1258   --                      Media Consumed Group (Optional)
1259   --
1260   -- The objects in this group are optional.
```

```
1261   -- However, to claim conformance to this group, it is necessary to
1262   -- implement every object in the group.
1263   -- NOTE - SNMP conformance to a group merely means that each object
1264   -- shall be responded to on a Get; returning actual values is optional.
1265   --
1266   -- The Media Consumed group consists entirely of the
1267   --  jmMediaConsumedTable.
1268
1269   -- The media consumed table contains the media used by this (print) job
1270   -- and the number of sheets consumed for each of these media summed
1271   -- over all the documents in the job.
1272
1273   -- An agent may fill in the MediaConsumedTable when the job is accepted
1274   -- for printing by the server using the ISO DPA media-used document
1275   -- attribute values summed over the entire job.  In this case, the value
1276   -- of the MediaConsumedSheetCount shall be 0.  Then the system operator
1277   -- is able to determine the media needs of the job while the job is
1278   -- waiting to be printed.  If the job needs media that are not ready in
1279   -- the printer(s), the job will be in the held state with the
1280   -- JobStateReasons set to (at least) the resources-needed value.  In
1281   -- such cases, the MediaConsumed table can help the system operator sort
1282   -- out the conflicting demands for media.
1283
1284   jmMediaConsumed  OBJECT IDENTIFIER ::= { jmJobMonMIB 11 }
1285
1286   jmMediaConsumedTable OBJECT-TYPE
1287       SYNTAX     SEQUENCE OF JmMediaConsumedEntry
1288       MAX-ACCESS not-accessible
1289       STATUS     current
1290       DESCRIPTION
1291           "This table contains pairs of media indexes and the number of
1292           sheets of that media consumed by this job."
1293       ::= { jmMediaConsumed 1 }
1294
1295   jmMediaConsumedEntry OBJECT-TYPE
1296       SYNTAX     JmMediaConsumedEntry
1297       MAX-ACCESS not-accessible
1298       STATUS     current
1299       DESCRIPTION
1300           "Entries may exist in the table for each device index whose
1301           device type is `printer' and for each job."
1302       INDEX { hrDeviceIndex, jmJobIdentifier, jmMediaConsumedIndex }
1303       ::= { jmMediaConsumedTable 1 }
1304
1305   JmMediaConsumedEntry ::= SEQUENCE {
1306       jmMediaConsumedIndex         Ordinal16,       -- optional
1307       jmMediaConsumedTypeIndex     Ordinal16,       -- optional
1308       jmMediaConsumedSheetCount    Counter32                -- optional
1309   }
1310
1311   jmMediaConsumedIndex OBJECT-TYPE
1312       SYNTAX     Ordinal16
1313       MAX-ACCESS not-accessible
1314       STATUS     current
1315       DESCRIPTION
1316           "A unique value used by the device to identify this medium
1317           entry in this job.  Since jobs need not be persistent across
1318           power cycles of the device, these values are not expected
1319           to remain stable across sucessive device power cycles."
1320       ::= { jmMediaConsumedEntry 1 }
```

```
1321
1322    jmMediaConsumedTypeIndex OBJECT-TYPE
1323        SYNTAX     Ordinal16
1324        MAX-ACCESS read-only
1325        STATUS     current
1326        DESCRIPTION
1327            "This attribute indicates the medium type (index into the
1328            MediaSupportedTable) that have been consumed by the printer(s)
1329            for this print job."
1330        ::= { jmMediaConsumedEntry 2 }
1331
1332    jmMediaConsumedSheetCount OBJECT-TYPE
1333        SYNTAX     Counter32
1334        MAX-ACCESS read-only
1335        STATUS     current
1336        DESCRIPTION
1337            "This attribute indicates the number of sheets of the medium
1338            that have been consumed by the printer(s) for this print job.
1339            A value of 0 may be set when the job is accepted for printing to
1340            indicate that the job expects to use media of this type."
1341        ::= { jmMediaConsumedEntry 3 }
1342
1343
1344
1345    --
1346    --              Color Impressions Consumed Group (Optional)
1347    --
1348    -- The objects in this group are optional.
1349    -- However, to claim conformance to this group, it is necessary to
1350    -- implement every object in the group.
1351    -- NOTE - SNMP conformance to a group merely means that each object
1352    -- shall be responded to on a Get; returning actual values is optional.
1353    --
1354    -- The Color Impressions Consumed group consists entirely of the
1355    -- jmColorImpressionsConsumedTable.
1356
1357    -- The Color Impressions Consumed table contains the colorant used by
1358    -- this job and the number of impressions produced for each colorant
1359    -- summed over all the documents in the job.
1360
1361    jmColorImpressionsConsumed  OBJECT IDENTIFIER ::= { jmJobMonMIB 12 }
1362
1363    jmColorImpressionsConsumedTable OBJECT-TYPE
1364        SYNTAX     SEQUENCE OF JmColorImpressionsConsumedEntry
1365        MAX-ACCESS not-accessible
1366        STATUS     current
1367        DESCRIPTION
1368            "This table contains pairs of colorant indexes and the number
1369            of impressions of that colorant consumed by this job."
1370        ::= { jmColorImpressionsConsumed 1 }
1371
1372    jmColorImpressionsConsumedEntry OBJECT-TYPE
1373        SYNTAX     JmColorImpressionsConsumedEntry
1374        MAX-ACCESS not-accessible
1375        STATUS     current
1376        DESCRIPTION
1377            "Entries may exist in the table for each device index whose
1378            device type is 'printer' and for each job."
1379        INDEX { hrDeviceIndex, jmJobIdentifier,
1380                jmColorImpressionsConsumedIndex }
```

```
1381        ::= { jmColorImpressionsConsumedTable 1 }
1382
1383    JmColorImpressionsConsumedEntry ::= SEQUENCE {
1384        jmColorImpressionsConsumedIndex              Ordinal16, -- optional
1385        jmColorImpressionsConsumedTypeIndex          Ordinal16, -- optional
1386        jmColorImpressionsConsumedImpressionCount    Counter32  -- optional
1387    }
1388
1389    jmColorImpressionsConsumedIndex OBJECT-TYPE
1390        SYNTAX     Ordinal16
1391        MAX-ACCESS not-accessible
1392        STATUS     current
1393        DESCRIPTION
1394            "A unique value used by the printer to identify this colorant
1395            entry for this job.  Since jobs need not be persistent across
1396            power cycles of the printer, these values are not expected
1397            to remain stable across sucessive printer power cycles."
1398        ::= { jmColorImpressionsConsumedEntry 1 }
1399
1400    jmColorImpressionsConsumedTypeIndex OBJECT-TYPE
1401        SYNTAX     Ordinal16
1402        MAX-ACCESS read-only
1403        STATUS     current
1404        DESCRIPTION
1405            "This attribute indicates one of the colorant type (index into
1406            the prtColorantsTable) that have been consumed by the printer(s)
1407            for this print job."
1408        ::= { jmColorImpressionsConsumedEntry 2 }
1409
1410    jmColorImpressionsConsumedImpressionCount OBJECT-TYPE
1411        SYNTAX     Counter32
1412        MAX-ACCESS read-only
1413        STATUS     current
1414        DESCRIPTION
1415            "This attribute indicates the number of impressions that have
1416            been consumed by the printer(s) for this print job and this
1417            colorant."
1418        ::= { jmColorImpressionsConsumedEntry 3 }
1419
1420
1421
1422    --
1423    --               The Document Information Group (Mandatory)
1424    --
1425    -- The implementation of every object in this group is mandatory.
1426    -- NOTE - SNMP conformance to a group merely means that each object
1427    -- shall be responded to on a Get; returning actual values is optional.
1428    --
1429    -- The Document Information group consists entirely of the
1430    -- jmDocInfoTable.
1431    --
1432    -- The Document Information table provides information about each
1433    -- document in each job that is contained in the printer.  Each document
1434    -- entry is accessed using the job identifier and the document sequence
1435    -- number which the printer assigns starting at 1 for each job.
1436
1437    jmDocInfo  OBJECT IDENTIFIER ::= { jmJobMonMIB 13 }
1438
1439    jmDocInfoTable OBJECT-TYPE
1440        SYNTAX     SEQUENCE OF XdocInfoEntry
```

```
1441        MAX-ACCESS not-accessible
1442        STATUS     current
1443        DESCRIPTION
1444            "A table of mandatory document information which is per document
1445            which in turn is per job and which in turn is per (logical or
1446            physical) printer.  Document information applies to an
1447            individual document contained in a job.  The specifications for
1448            each object is taken directly from the ISO 10175 Document
1449            Printing Application (DPA) standard clause 9.3, Document
1450            Attributes."
1451        ::= { jmDocInfo 1}
1452
1453    jmDocInfoEntry OBJECT-TYPE
1454        SYNTAX     XdocInfoEntry
1455        MAX-ACCESS not-accessible
1456        STATUS     current
1457        DESCRIPTION
1458            "An entry exists in this table for each document in each job,
1459             no matter what the state of the job is.  Each printer is
1460             represented as a separate device entry in the hostmib
1461             device table as a device of type 'printer'.  The management
1462             station references each job using the jmJobIdentifier
1463             assigned by the server that accepted job submission (by some
1464             other protocol)."
1465        INDEX { hrDeviceIndex, jmJobIdentifier, jmDocSequenceNumber }
1466        ::= { jmDocInfoTable 1 }
1467
1468    XdocInfoEntry ::= SEQUENCE {
1469        jmDocSequenceNumber  Ordinal32,                    -- mandatory
1470        jmDocName            CodeIndexedStringIndex,       -- mandatory
1471        jmDocFileName        CodeIndexedStringIndex,       -- mandatory
1472        jmDocType            DPADocType,                   -- mandatory
1473        jmDocFormat          PrtInterpreterLangFamily,     -- mandatory
1474        jmDocFormatVariants  CodeIndexedStringIndex,       -- mandatory
1475        jmDocFormatVersion   CodeIndexedStringIndex,       -- mandatory
1476        jmDocOctetCount      Cardinal64,                   -- mandatory
1477        jmDocState           DPADocState                   -- mandatory
1478    }
1479
1480    jmDocSequenceNumber OBJECT-TYPE
1481        SYNTAX     Ordinal32
1482        MAX-ACCESS read-only
1483        STATUS     current
1484        DESCRIPTION
1485            "For the MIB, a row shall not exist in this table if the job
1486            does not (yet) have any documents.  A 32-bit index is required,
1487            since the ISO DPA has a 2**31-1 maximum-value integer for the
1488            document-sequence-number attribute.
1489
1490            ISO DPA:   Document-sequence-number
1491            This attribute specifies the number of this document in
1492            relation to the set of documents in this job. The first
1493            document in the job is numbered 1.
1494
1495            The document-sequence-number is not passed as an input
1496            attribute in the print operation.  Documents are assumed to be
1497            submitted in order (i.e., document number 1 followed by
1498            document number 2, etc.).
1499
1500            A server shall return a value of 0 for this attribute if the
```

```
1501            first Print operation has not submitted a document (e.g., the
1502            first-document element is omitted in the create-job element of
1503            the Print operation).
1504
1505            If a document is cancelled in a multi-document job, the
1506            document-sequence numbers of the other documents shall not
1507            change."
1508        ::= { jmDocInfoEntry 1 }
1509
1510    jmDocName OBJECT-TYPE
1511        SYNTAX     CodeIndexedStringIndex
1512        MAX-ACCESS read-only
1513        STATUS     current
1514        DESCRIPTION
1515            "For the MIB, the single jmDocName object is both the document
1516            name for scan-to-file and the document name for file-to-print.
1517
1518            ISO DPA:   Document-name
1519            This attribute supplies a human readable string for the
1520            document. This string is used for naming the document in a
1521            human-readable 'free-form' fashion.
1522
1523            This attribute is intended for enabling a user or the user's
1524            application to convey a document name that may be printed on a
1525            start sheet, returned in a ListObjectAttributes result, or used
1526            in notification or logging messages.
1527
1528            If this attribute is not specified, no document name is
1529            assumed, but implementation specific defaults are allowed, such
1530            as the simple-name part of the value of the document-file-name
1531            attribute.  It is suggested, however, that the server not
1532            supply additional text for this attribute when printing its
1533            value (e.g. on a start sheet).  This string only has meaning to
1534            the clients and can therefore take several forms, e.g. the name
1535            of a mail folder, name of a revisable document, the file
1536            specification minus the file path, the title of a document,
1537            etc."
1538        ::= { jmDocInfoEntry 2 }
1539
1540    jmDocFileName OBJECT-TYPE
1541        SYNTAX     CodeIndexedStringIndex
1542        MAX-ACCESS read-only
1543        STATUS     current
1544        DESCRIPTION
1545            "For the MIB, the single jmDocFileName object is both the
1546            document file name for scan-to-file and the document name for
1547            file-to-print.  If this attribute is specified for a
1548            scan-to-print job, the result of the scan is also copied to the
1549            file specified by jmDocFileName as a side-effect of the
1550            scan-to-print operation.
1551
1552            ISO DPA:   Document-file-name
1553            This attribute specifies the file name of the document, if the
1554            document came from a file.
1555
1556            The file name may include the full path to the file, in which
1557            case the name-syntax element of the DistinguishedNameString
1558            data type shall specify the syntax of the file name.  If the
1559            document did not come from a file, the client should not
1560            specify this attribute."
```

```
1561        ::= { jmDocInfoEntry 3 }
1562
1563    jmDocType OBJECT-TYPE
1564        SYNTAX     DPADocType
1565        MAX-ACCESS read-only
1566        STATUS     current
1567        DESCRIPTION
1568            "Document-type
1569            This attribute indicates that the document being passed by the
1570            current Print abstract-operation is either a printable
1571            document, a font, or a resource.
1572
1573            How resources are managed during the printing process is
1574            necessarily dependent on the characteristics of the server and
1575            printer implementations. These methods are considered
1576            implementation-specific, and shall not be dictated by ISO/IEC
1577            10175.  In particular, ISO/IEC 10175 does not require that
1578            resources be passed in advance of the documents that use them;
1579            i.e., resources may be passed to the server in any order within
1580            the job, subject only to the requirement that the resources be
1581            present at the server before processing begins on the documents
1582            that use them."
1583        ::= { jmDocInfoEntry 4 }
1584
1585    jmDocFormat OBJECT-TYPE
1586        SYNTAX     PrtInterpreterLangFamily
1587        MAX-ACCESS read-only
1588        STATUS     current
1589        DESCRIPTION
1590            "The interpreter language family enum value registered by IANA
1591            is used according to RFC 1759 (see prtInterpreterLangFamily in
1592            RFC 1759).  For the job monitoring MIB, an index into the
1593            prtInterpretersTable is not used, since the exact format of the
1594            document need not conform exactly to one of the printer's
1595            intepreters and, furthermore, the device need not even be a
1596            printer (so that RFC 1759 need not be used for non-printers).
1597
1598            For scan-to-file jobs, the jmDocFormat object specifies the
1599            document format desired as a result of the scan.
1600
1601            ISO DPA:   Document-format
1602            This attribute identifies the overall print document format
1603            used for the document.  It consists of three elements, a
1604            document-format, a document-format-variants and a document-
1605            format-version. The latter two elements are optional.
1606            The document-format element identifies a particular family of
1607            document formats, of which there may exist several versions or
1608            variants.  The document-format-variants and document-format-
1609            version elements identify a specific instance of a document
1610            format. The variant refers to a particular functional subset of
1611            a format. For example, the format PostScript has variants of
1612            level 1 and level 2, and the format PCL has several variants,
1613            including PCL4 and PCL5.  The version distinguishes among
1614            successive releases of the same basic format and variant. For
1615            example, successive versions of Xerox Interpress include
1616            versions 2.0, 2.1, 3.0, 3.1, etc."
1617        ::= { jmDocInfoEntry 5 }
1618
1619    jmDocFormatVariants OBJECT-TYPE
1620        SYNTAX     CodeIndexedStringIndex
```

```
1621        MAX-ACCESS read-only
1622        STATUS     current
1623        DESCRIPTION
1624            "For scan-to-file jobs, the jmDocFormatVariants object
1625            specifies the document format variant desired as a result of the
1626            scan.
1627
1628            ISO DPA:   Document-format-variants
1629            The document-format-variants and document-format-version
1630            elements identify a specific instance of a document format. The
1631            variant refers to a particular functional subset of a format.
1632            For example, the format PostScript has variants of level 1 and
1633            level 2, and the format PCL has several variants, including
1634            PCL4 and PCL5.
1635
1636            The document-format-variants element consiststs of a single
1637            text string.  If it is necessary to identify more than one
1638            variant, the respective variant values shall all be contained
1639            in the document-format-variants element, separated from one
1640            another by commas.
1641
1642            If the client omits the document-format-variants or document-
1643            format-version elements, the server may supply a format-
1644            specific default which will restrict the outcome of the rules
1645            described in the next paragraph. This rule shall not cause a
1646            job to fail in validation if it would have succeeded with the
1647            rules of the next paragraph.
1648
1649            If the client omits the document-format-variants element, the
1650            server shall print the document if the requested printer's
1651            document-formats-supported attribute contains a DocFormat which
1652            differs from the specified document-format only in the value of
1653            its document-format-variants.  If the document-format-variants
1654            is omitted from the printer document-formats-supported
1655            attribute, the printer shall accept documents with any variant
1656            of the specified format. Similar rules apply if the document-
1657            format-version element is omitted.
1658
1659            If the client omits the document-format-variants or document-
1660            format-version elements, the server may supply a format-
1661            specific default. Such a default shall be one that could have
1662            matched a document-format according to the rules of the
1663            preceding paragraph.
1664
1665            Proprietary values for the document-format, document-format-
1666            variants, and document-format-version elements are assigned by
1667            the owners of those formats.  Annex F contains a set of
1668            document-formats and variants for various commercially
1669            available formats and variants that are currently in common
1670            use."
1671        ::= { jmDocInfoEntry 6 }
1672
1673    jmDocFormatVersion OBJECT-TYPE
1674        SYNTAX     CodeIndexedStringIndex
1675        MAX-ACCESS read-only
1676        STATUS     current
1677        DESCRIPTION
1678            "For scan-to-file jobs, the jmDocFormatVersion object specifies
1679            the document format version desired as a result of the scan.
1680
```

```
1681            ISO DPA:   Document-format-version
1682            The version distinguishes among successive releases of the same
1683            basic format and variant. For example, successive versions of
1684            Xerox Interpress include versions 2.0, 2.1, 3.0, 3.1, etc."
1685        ::= { jmDocInfoEntry 7 }
1686
1687    jmDocOctetCount OBJECT-TYPE
1688        SYNTAX     Cardinal64
1689        MAX-ACCESS read-only
1690        STATUS     current
1691        DESCRIPTION
1692            "For the MIB, the value of the jmDocOctetCount is used for both
1693            scan-to-file and file-to-print jobs.  In the case of
1694            scan-to-file jobs, the value starts at 0 and counts the number
1695            of octets scanned.
1696
1697            ISO DPA:   Octet-count
1698            This attribute specifies the size of the document in octets."
1699        ::= { jmDocInfoEntry 8 }
1700
1701    jmDocState OBJECT-TYPE
1702        SYNTAX     DPADocState
1703        MAX-ACCESS read-only
1704        STATUS     current
1705        DESCRIPTION
1706            "For the MIB,   If the document is being
1707            scanned and printed in the same (level 1) job, the jmDocState
1708            object represents the state of the document being printed, since
1709            level 1 scan-to-print jobs must scan directly to the printer
1710
1711            ISO DPA:   Document-state
1712            This attribute identifies the current state of the document
1713            [whether being scanned or printed.]."
1714        ::= { jmDocInfoEntry 9 }
1715
1716
1717
1718
1719    --
1720    --          Print Document Information Group (Conditionally Mandatory)
1721    --
1722    -- The Print Document Information group is Conditionally
1723    -- Mandatory, i.e., it is mandatory for an agent that supports a
1724    -- (spooling) print system, as opposed to a printer.
1725    --
1726    -- The Print Document Information group consists entirely of
1727    -- the jmPrintDocInfoTable.
1728
1729    -- The Print Document Information table provides additional
1730    -- (print-centric) information about each document that was (1)
1731    -- submitted to or (2) assigned to the (logical or physical) printer
1732    -- specified by hrDeviceIndex.
1733
1734    jmPrintDocInfo  OBJECT IDENTIFIER ::= { jmJobMonMIB 14 }
1735
1736    jmPrintDocInfoTable OBJECT-TYPE
1737        SYNTAX     SEQUENCE OF JmPrintDocInfoEntry
1738        MAX-ACCESS not-accessible
1739        STATUS     current
1740        DESCRIPTION
```

```
1741          "A table of print-centric document information which
1742          is per document which in turn is per job and which in turn is
1743          per (logical or physical) printer.  Document information applies
1744          to an individual document contained in the job.  The
1745          specifications for each object is taken directly from the ISO
1746          10175 Document Printing Application (DPA) standard clause 9.3,
1747          Document Attributes and is print-centric."
1748      ::= { jmPrintDocInfo 1}
1749
1750  jmPrintDocInfoEntry OBJECT-TYPE
1751      SYNTAX     JmPrintDocInfoEntry
1752      MAX-ACCESS not-accessible
1753      STATUS     current
1754      DESCRIPTION
1755          "An entry exists in this table for each job in the device,
1756           no matter what the state of the job is.  Each printer is
1757           represented as a separate device entry in the hostmib
1758           device table as a device of type 'printer'.  The management
1759           station references each job using the jmJobIdentifier
1760           assigned by the server that accepted job submission (by some
1761           other protocol).  The management station accesses each
1762           document in the job using the jmDocSequenceNumber from the
1763           DocInfoTable.
1764
1765           This table augments the mandatory Document Information table in
1766           this MIB."
1767      AUGMENTS { jmDocInfoEntry }
1768      ::= { jmPrintDocInfoTable 1 }
1769
1770  JmPrintDocInfoEntry ::= SEQUENCE {
1771      -- Note that objects in this table are print-centric and
1772      -- Conditionally Mandatory, i.e., are mandatory for an agent that
1773      -- supports a (spooling) print system, as opposed to a printer.
1774      -- This PrintDocInfo table augments the mandatory DocInfo table.
1775      jmDocDefaultMediumIndex     Cardinal16,         -- cond. mandatory
1776      jmDocDefaultInputTrayIndex  Cardinal16,         -- cond. mandatory
1777      jmDocOutput                 DPADocOutput,       -- cond. mandatory
1778      jmDocSides                  INTEGER(1..2),      -- cond. mandatory
1779      jmDocCopyCount              Cardinal32,         -- cond. mandatory
1780      jmDocCopiesCompleted        Counter32           -- cond. mandatory
1781  }
1782
1783  jmDocDefaultMediumIndex OBJECT-TYPE
1784      SYNTAX     Cardinal16
1785      MAX-ACCESS read-only
1786      STATUS     current
1787      DESCRIPTION
1788          "The value of this object is the index of the medium in the
1789          jmMediaSupportedTable that is the default medium for this
1790          document.  An index value of 0 indicates that neither the
1791          submitting client, the print server, nor the printer has
1792          specified a default medium for this document.
1793
1794          ISO DPA:   Default-medium
1795          This attribute identifies a medium that the server shall use as
1796          the medium default for the pages of the document that require a
1797          specification.
1798
1799          Standard values are defined in the specification of the medium-
1800          identifier medium attribute.
```

If the page-media-select attribute is specified (either by the client or by a server default, i.e., the page-media-select attribute of the initial-value-job object specified by the logical or physical printer), then the server shall use the page-media-select value to override the default-medium specification on a page by page basis.

The default-medium attribute may contain a value of id-val-generic-none (see 9.1.2) indicating that the server shall not use a default medium. Instead, the server shall rely on lower precedence document attributes (such as default-input-tray) for the media specification.

If the document data, itself, specifies media, such specification shall override the default-medium attribute on a page by page basis. If the document data specifies media which are not also values of media-used, then a printer may receive a document which requires media that are not ready. In such a case, an implementation may either abort the document or try printing the document on some alternative medium, such as the default medium.

A client has numerous ways to specify the media to be used when printing a document and different document pages can be specified in different ways. The client can specify the media in the document contents or with attributes. Some attributes override the document contents, and other attributes may be overridden by the document contents. In addition, the client can specify the media by name or by the input-tray containing it.

Before printing each page of a document, the server determines the medium or input-tray for that page by finding the first condition in the list of numbered steps below that is satisfied. For this discussion, either the medium or the input-tray is sufficient information:

a) If page-media-select has a medium value for the current page, use that medium, regardless of document contents and other attributes.

b) If input-tray-select has a value, use that tray.

c) If the document contents specify a medium, and that medium is the same as the value of one of the original-medium elements in the media-substitution attribute, then use the corresponding substitution-medium in the media-substitution attribute.

d) If the document contents specify a medium, use that medium.

e) If the document contents specify an input-tray, use that input-tray.

f) If the default-medium has a value, and the document format interpreter allows its use, and that medium is the same as the value of one of the original-medium elements in media-substitution attribute, then use the corresponding substitution-medium in the media-substitution attribute.

```
1861          g)  If the default-medium has a value and the document format
1862          interpreter allows its use, use the default-medium.
1863
1864          h)  If the default-input-tray has a value and the document
1865          format interpreter allows its use, use the default-input-tray.
1866
1867          i)  Use the medium or input-tray selected by the document
1868          format processor in the printer. This selection is
1869          implementation-dependent."
1870      ::= { jmPrintDocInfoEntry 1 }
1871
1872  jmDocDefaultInputTrayIndex OBJECT-TYPE
1873      SYNTAX     Cardinal16
1874      MAX-ACCESS read-only
1875      STATUS     current
1876      DESCRIPTION
1877          "The value of this object is the index of the input sub-unit in
1878          the prtInputTable in the printer MIB that is the default input
1879          tray for this document.  An index value of 0 indicates that
1880          neither the submitting client, the print server, nor printer
1881          has specified a default input tray for this document.
1882
1883          ISO DPA:   Default-input-tray
1884          This attribute identifies an input-tray that the server shall
1885          use as the input-tray default for the pages of the document
1886          that require a specification.
1887
1888          The correspondence between the simple-name of an input-tray
1889          (alphanumeric or numeric) and the actual tray in the printer is
1890          printer-dependent, and a tray named by such a simple-name may
1891          also have an OBJECT IDENTIFER that names it as well.
1892
1893          A server may try to convert a simple-name received from a
1894          client to one of the server's OIDs, depending on
1895          implementation. However, a server shall always return an input-
1896          tray as an OID to the client if the server identifies the
1897          input-tray using an OID.
1898
1899          Examples: The simple-name strings: envelope, top, 2, or 02, or
1900          the OID value: id-val-input-tray-top.
1901
1902          If the default-medium attribute is specified (either by the
1903          client or by a server default, i.e., the default-medium
1904          attribute of the initial-value-job object specified by the
1905          logical or physical printer), then the server shall use the
1906          default-medium value and shall ignore the default-input-tray
1907          attribute, if specified.  If the page-media-select attribute is
1908          specified (either by the client or by a server default, i.e.,
1909          the page-media-select attribute of the initial-value-job object
1910          specified by the logical or physical printer), then the server
1911          shall use the page-media-select value to override the default-
1912          input-tray specification on a page by page basis.
1913
1914          If the document data, itself, specifies media or input trays,
1915          such specification shall override the default-input-tray
1916          attribute on a page by page basis.  If the document data
1917          specifies media or input-trays which are not also values of
1918          media-used or input-trays-used, respectively, then a printer
1919          may receive a document which requires media or input-trays
1920          which are not ready. In such a case, an implementation may
```

```
1921          either abort the document or try printing the document using
1922          some alternative input-tray, such as the default input-tray.
1923
1924          The following standard values are defined:
1925
1926          top             The top input tray in the printer.  (id-
1927                          val-input-tray-top)
1928
1929          middle          The middle input tray in the printer.  (id-
1930                          val-input-tray-middle)
1931
1932          bottom          The bottom input tray in the printer.  (id-
1933                          val-input-tray-bottom)
1934
1935          envelope        The envelope input tray in the printer.
1936                          (id-val-input-tray-envelope)
1937
1938          manual          The manual feed input tray in the printer.
1939                          (id-val-input-tray-manual)
1940
1941          large-capacity  The large capacity input tray in the
1942                          printer.  (id-val-input-tray-large-
1943                          capacity)
1944
1945          main            The main input tray  (id-val-input-tray-
1946                          main)
1947
1948          side            The side input tray  (id-val-input-tray-
1949                          side)"
1950      ::= { jmPrintDocInfoEntry 2 }
1951
1952  jmDocOutput OBJECT-TYPE
1953      SYNTAX     DPADocOutput
1954      MAX-ACCESS read-only
1955      STATUS     current
1956      DESCRIPTION
1957          "This object is bit coded, so that multiple document output
1958          requests may be made for the document.  Each bit corresponds to
1959          one of the ISO DPA output OIDs.
1960
1961          ISO DPA:   Output
1962          This attribute identifies the output processing for the media
1963          on which the document is to be printed."
1964      ::= { jmPrintDocInfoEntry 3 }
1965
1966  jmDocSides OBJECT-TYPE
1967      SYNTAX     INTEGER(1..2)
1968      MAX-ACCESS read-only
1969      STATUS     current
1970      DESCRIPTION
1971          "NOTE - The jmDocSides attribute is for print jobs.  A
1972          scanner-specific object, jmDocScanSides is needed to be added,
1973          so that input and output sides can be specified independently.
1974
1975          ISO DPA:   Sides
1976          This attribute specifies the number of printable surfaces of
1977          the medium to be imaged."
1978      ::= { jmPrintDocInfoEntry 4 }
1979
1980  jmDocCopyCount OBJECT-TYPE
```

```
1981        SYNTAX     Cardinal32
1982        MAX-ACCESS read-only
1983        STATUS     current
1984        DESCRIPTION
1985            "Copy-count
1986            This attribute specifies the number of copies of the documents,
1987            or of the selected pages of the document, to be printed.
1988            A value of 1 for copy-count shall generate a single human
1989            perceptible copy of the electronic document.  If a value of 0
1990            is supplied, the job may be processed normally, but no print
1991            output shall be produced or the server shall return an
1992            unsupported-attribute-value AttributeError."
1993        ::= { jmPrintDocInfoEntry 5 }
1994
1995    jmDocCopiesCompleted OBJECT-TYPE
1996        SYNTAX     Counter32
1997        MAX-ACCESS read-only
1998        STATUS     current
1999        DESCRIPTION
2000            "Copies-completed
2001            This attribute indicates the number of complete copies of this
2002            document that have been printed.
2003
2004            Some printers print multiple copies of each individual page of
2005            a document, completing the printing of all copies at the same
2006            time, printing as many of these pages as necessary to satisfy
2007            the copy count. The value of copies-completed is 0 if printing
2008            has not started for this document."
2009        ::= { jmPrintDocInfoEntry 6 }
2010
2011
2012
2013
2014    --
2015    --                    The Media Supported Group (Optional)
2016    --
2017    -- The Media Supported group is optional.
2018    -- However, to claim conformance to this group, it is necessary to
2019    -- implement every object in the group.
2020    -- NOTE - SNMP conformance to a group merely means that each object
2021    -- shall be responded to on a Get; returning actual values is optional.
2022
2023    -- The Media Supported group consists solely of the
2024    -- jmMediaSupportedTable.
2025
2026    -- The media supported table contains the media supported by this
2027    -- printer, whether installed in the input tray(s) (i.e., ready) or not.
2028    -- Operator intervention is required in order to use a supported medium
2029    -- that is not ready.
2030
2031    -- Representing the supported media (which is the system Administrator's
2032    -- policy), as opposed to what is ready, is a deviation from the
2033    -- strategy agreed to by the IETF Printer MIB working group in
2034    -- developing RFC 1759.  Representing MediaSupported is moving away from
2035    -- representing just the output device and moving towards representing
2036    -- the service.
2037
2038    -- The objects in this table are read-write, so that implementations may
2039    -- require that the system adminstrator set the values using SNMP.
2040    -- Other implementations may determine the supported media by querying
```

```
2041   -- the server or service, in which case the objects in this table will
2042   -- be read-only.
2043   --
2044   -- NOTE - If SNMPv1 is being used, the security capabilities are so weak
2045   -- as to make it unwise to implement the MediaTable as read-write.
2046   -- The objects in this group are optional.
2047   -- However, to claim conformance to this group,
2048   -- it is necessary to implement every object in the group.
2049   -- NOTE - SNMP conformance to a group merely means that each object
2050   -- shall be responded to on a Get; returning actual values is optional.
2051
2052   jmMediaSupported  OBJECT IDENTIFIER ::= { jmJobMonMIB 15 }
2053
2054   jmMediaSupportedTable OBJECT-TYPE
2055       SYNTAX     SEQUENCE OF JmMediaSupportedEntry
2056       MAX-ACCESS not-accessible
2057       STATUS     current
2058       DESCRIPTION
2059           "A table of supported media for this printer."
2060   ::= { jmMediaSupported 1 }
2061
2062   jmMediaSupportedEntry OBJECT-TYPE
2063       SYNTAX     JmMediaSupportedEntry
2064       MAX-ACCESS not-accessible
2065       STATUS     current
2066       DESCRIPTION
2067           "An entry exists in this table for each medium that the
2068           system administrator has established as the policy for
2069           support by this pritner.  Each entry containsA description
2070           of a medium that is supported by this printer.
2071           Entries may exist in the table for each device index whose
2072           device type is 'printer'"
2073       INDEX { hrDeviceIndex, jmMediaSupportedIndex }
2074   ::= { jmMediaSupportedTable 1}
2075
2076   JmMediaSupportedEntry ::= SEQUENCE {
2077       jmMediaSupportedIndex        Ordinal16,                 -- optional
2078       jmMediaSupportedRowStatus    RowStatus,                 -- optional
2079       jmMediaSupportedASCIIName    DisplayString,             -- optional
2080       jmMediaSupportedName         InternationalDisplayString,-- optional
2081       jmMediaSupportedDescription  InternationalDisplayString,-- optional
2082       jmMediaSupportedSizeUnit     MediaUnit,                 -- optional
2083       jmMediaSupportedXDim         Cardinal32,                -- optional
2084       jmMediaSupportedYDim         Cardinal32,                -- optional
2085       jmMediaSupportedType         InternationalDisplayString,-- optional
2086       jmMediaSupportedWeight       Cardinal32,                -- optional
2087       jmMediaSupportedColor        InternationalDisplayString -- optional
2088   }
2089
2090   jmMediaSupportedIndex OBJECT-TYPE
2091       SYNTAX     Ordinal16
2092       MAX-ACCESS not-accessible
2093       STATUS     current
2094       DESCRIPTION
2095           "A unique value used by the printer to identify this
2096           medium entry.  Since media supported entries may or may not
2097           be persistent across power cycles of the printer, depending
2098           on implementation, these values may or may not remain stable
2099           across sucessive printer power cycles.  However, printers with
2100           disks shall keep the media supported as persistent."
```

```
2101        ::= { jmMediaSupportedEntry 1 }
2102
2103    jmMediaSupportedRowStatus OBJECT-TYPE
2104        SYNTAX     RowStatus
2105        MAX-ACCESS read-write
2106        STATUS     current
2107        DESCRIPTION
2108            "This object manages the row status of this conceptual row in
2109            the 'jmMediaSupportedTable'."
2110        ::= { jmMediaSupportedEntry 2 }
2111
2112    jmMediaSupportedASCIIName OBJECT-TYPE
2113        SYNTAX     DisplayString                  -- not localizable
2114        MAX-ACCESS read-write
2115        STATUS     current
2116        DESCRIPTION
2117            "The unlocalized human-readable name in ASCII of this medium.
2118
2119            For the MIB, instead of using enums, use the ISO DPA
2120            medium descriptive name of the medium.  Then the system
2121            administrator can add additional media to this supported
2122            table.  Also using text string values follows the precedant
2123            in RFC 1759 for prtInputMediaName which uses string values
2124            and lists the ISO DPA descriptive names in its Appendix C.
2125
2126            This object is supplied since it corresponds directly to the
2127            ISO DPA medium-name attribute which are NameOrOid.  The ISO DPA
2128            standard media are identified as ISO DPA OIDs.  Then a printer
2129            does not need to search through the localization table to find a
2130            match.
2131
2132            ISO DPA:   Name
2133            This attribute identifies the medium.  Examples are: iso-a4-
2134            white, a."
2135        ::= { jmMediaSupportedEntry 3 }
2136
2137    jmMediaSupportedName OBJECT-TYPE
2138        SYNTAX     InternationalDisplayString (SIZE(0..255)) -- localized
2139        MAX-ACCESS read-write
2140        STATUS     current
2141        DESCRIPTION
2142            "The localized human-readable name of this medium.
2143
2144            For the MIB, instead of using enums, use the ISO DPA
2145            medium descriptive name of the medium.  Then the system
2146            administrator can add additional media to this supported
2147            table.  Also using text string values follows the precedant
2148            in RFC 1759 for prtInputMediaName which uses string values
2149            and lists the ISO DPA descriptive names in its Appendix C.
2150            However, go beyond the Printer MIB and make this object
2151            localizable, so that it is more meaningful to end-users and
2152            system operators.  RFC 1759 says that prtInputMediaName is not
2153            processed by the printer.  If the printer does process
2154            prtInputMediaName, the printer can avoid seaching for a
2155            localization that the printer understands by using the
2156            jmMediaSupportedASCIIName directly, instead.
2157
2158            Since the type is InternationDisplayString, the value shall be
2159            localized according to the value of
2160            jmGenCurrentLocalizationIndex.
```

```
2161
2162            Examples: iso-a4-yellow, iso-a4-jeune."
2163        ::= { jmMediaSupportedEntry 4 }
2164
2165    jmMediaSupportedDescription OBJECT-TYPE
2166        SYNTAX     InternationalDisplayString (SIZE(0..255)) -- localized
2167        MAX-ACCESS read-write
2168        STATUS     current
2169        DESCRIPTION
2170            "The localized human-readable description of this medium.
2171            Since the type is InternationDisplayString, the value shall be
2172            localized according to the value of
2173            jmGenCurrentLocalizationIndex."
2174        ::= { jmMediaSupportedEntry 5 }
2175
2176    jmMediaSupportedSizeUnit OBJECT-TYPE
2177        SYNTAX     MediaUnit
2178        MAX-ACCESS read-only
2179        STATUS     current
2180        DESCRIPTION
2181            "The units of measure of media size for use in calculating and
2182            relaying dimensional values for all media in the
2183            jmMediaSupportedTable.
2184
2185            NOTE - The MediaUnit textual-convention is an enum imported
2186            from RFC 1759 that specifies either: micrometers or .0001
2187            inches."
2188        ::= { jmMediaSupportedEntry 6 }
2189
2190    jmMediaSupportedXDim OBJECT-TYPE
2191        SYNTAX     Cardinal32
2192        MAX-ACCESS read-write
2193        STATUS     current
2194        DESCRIPTION
2195            "X-dimension
2196            The attribute indicates the x-dimension of the medium as
2197            measured in the Reference Coordinate System (see DPA
2198            6.5.4) and expressed in jmMediaSupportedSizeUnit's."
2199        ::= { jmMediaSupportedEntry 7 }
2200
2201    jmMediaSupportedYDim OBJECT-TYPE
2202        SYNTAX     Cardinal32
2203        MAX-ACCESS read-write
2204        STATUS     current
2205        DESCRIPTION
2206            "Y-dimension
2207            The attribute indicates the y-dimension of the medium as
2208            measured in the Reference Coordinate System (see DPA
2209            6.5.4) and expressed in jmMediaSupportedSizeUnit's."
2210        ::= { jmMediaSupportedEntry 8 }
2211
2212    jmMediaSupportedType OBJECT-TYPE
2213        SYNTAX     InternationalDisplayString           -- localized
2214        MAX-ACCESS read-write
2215        STATUS     current
2216        DESCRIPTION
2217            "For the MIB: Instead of assigning enums, use the ISO DPA
2218            descriptive name text string of the medium-type as the value.
2219            Then the system administrator can add additional media types.
2220            Also using standard text string values follows the precedant in
```

```
2221          RFC 1759 for prtInputMediaType which uses the same standard text
2222          string values.  However, go beyond the Printer MIB and make
2223          this object localizable, so that it is more meaningful to
2224          end-users and system operators.  RFC 1759 says that
2225          prtInputMediaType need not be processed by the printer.  If the
2226          printer does, there should be a localization in this table that
2227          has the same values as the prtInputMediaType object in the
2228          printer MIB.
2229
2230          Since the type is InternationDisplayString, the value shall be
2231          localized according to the value of
2232          jmGenCurrentLocalizationIndex.
2233
2234          ISO DPA:   Medium-type
2235          This attribute identifies the type of this medium. (e.g.
2236          stationery, envelope, transparency, etc.)
2237
2238          The following standard [text string] values are defined [for
2239          English localizations]:
2240
2241          stationery     Separately cut sheets of an opaque material
2242                         (id-val-medium-type-stationery)
2243
2244          transparency   Separately cut sheets of a transparent
2245                         material  (id-val-medium-type-transparency)
2246
2247          envelope       Envelopes that can be used for conventional
2248                         mailing purposes  (id-val-medium-type-envelope)
2249
2250          envelope-      Envelopes that are not preprinted and have no
2251          plain          windows  (id-val-medium-type-envelope-plain)
2252
2253          envelope-      Envelopes that have windows for addressing
2254          window         purposes  (id-val-medium-type-envelope-window)
2255
2256          continuous-    Continuously connected sheets of an opaque
2257          long           material connected along the long edge  (id-
2258                         val-medium-type-continuous-long)
2259
2260          continuous-    Continuously connected sheets of an opaque
2261          short          material connected along the short edge  (id-
2262                         val-medium-type-continuous-short)
2263
2264          tab-stock      Media with tabs  (id-val-medium-type-tab)
2265
2266          multi-part-    Form medium composed of multiple layers not
2267          form           pre-attached to one another;  each sheet may
2268                         be drawn separately from an input source  (id-
2269                         val-medium-multi-part-form)
2270
2271          labels         Label-stock  (id-val-medium-labels)
2272
2273          multi-layer    Form medium composed of multiple layers which
2274                         are pre-attached to one another, e.g. for use
2275                         with impact printers  (id-val-medium-type-
2276                         multi-layer)."
2277      ::= { jmMediaSupportedEntry 9 }
2278
2279  jmMediaSupportedWeight OBJECT-TYPE
2280      SYNTAX     Cardinal32
```

```
2281        MAX-ACCESS read-write
2282        STATUS     current
2283        DESCRIPTION
2284            "Weight
2285            This attribute indicates the weight of this medium in grams per
2286            square metre."
2287        ::= { jmMediaSupportedEntry 10 }
2288
2289    jmMediaSupportedColor OBJECT-TYPE
2290        SYNTAX     InternationalDisplayString         -- localized
2291        MAX-ACCESS read-write
2292        STATUS     current
2293        DESCRIPTION
2294            "For the MIB: Instead of assigning enums, use the ISO DPA
2295            descriptive name text string of the medium-color as the value.
2296            Then the system administrator can add additional media colors.
2297            Also using standard text string values follows the precedant in
2298            RFC 1759 for prtInputMediaColor which uses the same standard
2299            text string values.  However, go beyond the Printer MIB and make
2300            this object localizable, so that it is more meaningful to
2301            end-users and system operators.  RFC 1759 says that
2302            prtInputMediaColor need not be processed by the printer.  If the
2303            printer does, there should be a localization in this table that
2304            has the same values as the prtInputMediaColor object in the
2305            printer MIB.
2306
2307            Since the type is InternationDisplayString, the value shall be
2308            localized according to the value of
2309            jmGenCurrentLocalizationIndex.
2310
2311            ISO DPA:   Color
2312            This attribute indicates the colour of this medium.
2313
2314            The following standard [text string] values are defined [for
2315            English localizations]:
2316
2317            white          White colour  (id-val-medium-colour-white)
2318
2319            pink           Pink colour  (id-val-medium-colour-pink)
2320
2321            yellow         Yellow colour  (id-val-medium-colour-yellow)
2322
2323            buff           Buff colour  (id-val-medium-colour-buff)
2324
2325            goldenrod      Goldenrod colour  (id-val-medium-colour-
2326                           goldenrod)
2327
2328            blue           Blue colour  (id-val-medium-colour-blue)
2329
2330            green          Green colour  (id-val-medium-colour-green)
2331
2332            transparent    Transparent (no colour)  (id-val-medium-colour-
2333            -untinted      transparent-untinted)"
2334        ::= { jmMediaSupportedEntry 11 }
2335
2336
2337
2338    --
2339    --                      Job Alert Group (Mandatory)
2340    --
```

```
2341   --  This group describes notifications (SNMP trap messages) to be
2342   --  generated for state changes in Job and Document objects being
2343   --  processed by the printing system.
2344   --
2345   --  Implementation of every object in this group is mandatory.
2346   --
2347
2348   jmJobAlert  OBJECT IDENTIFIER ::= { jmJobMonMIB 16 }
2349
2350   jmJobAlertReason OBJECT-TYPE
2351       SYNTAX     UInteger32
2352       MAX-ACCESS not-accessible
2353       STATUS     current
2354       DESCRIPTION
2355           "This object has an instantaneous value when a
2356           jmJobV2StateAlert notification is raised, which is sent in
2357           the variable bindings of any generated SNMPv2-Trap PDUs.  It
2358           is used to inform the recipient of the trap what caused it to
2359           be sent.
2360
2361           This value is a mask whose bits have the following meanings:
2362
2363           Bit Number      Meaning
2364           0 (0x01)        the job's jmJobCurrentState attribute changed.
2365           1 (0x02)        the job's jmJobPriority attribute changed.
2366           2 (0x04)        the job's jmJobStateReasons attribute changed.
2367           3 (0x08)        the job's jmMessageFromAdministrator attribute
2368                               changed.
2369           4 (0x10)        the job's jmDevicesAssigned attribute
2370                               changed.
2371           5 (0x20)        the job's jmDeviceStateOfDevicesAssigned
2372                               attribute changed.
2373
2374           All other bits in the mask are currently undefined."
2375       ::= { jmJobAlert 1 }
2376
2377   jmJobAlertTime OBJECT-TYPE
2378       SYNTAX     TimeTicks
2379       MAX-ACCESS read-only
2380       STATUS     current
2381       DESCRIPTION
2382           "The value of sysUpTime at the time that this alert was
2383            generated.
2384
2385            NOTE - this is a best efforts basis.  If the host upon which
2386            the agent is running does not provide a means to get the up
2387            time in ticks, then the agent may return a value that is not
2388            meaningful."
2389       ::= { jmJobAlert 2 }
2390
2391   jmJobV1Alert OBJECT-IDENTITY
2392       STATUS     current
2393       DESCRIPTION
2394           "The value of the enterprise-specific OID in an SNMPv1 trap sent
2395           signalling a job status change event."
2396       ::= { jmJobAlert 3 }
2397
2398   jmJobV2AlertPrefix OBJECT IDENTIFIER ::= { jmJobV1Alert 0 }
2399
2400   jmJobV2StateAlert NOTIFICATION-TYPE
```

```
2401        OBJECTS { jmJobAlertReason, hrDeviceIndex, jmJobIdentifier,
2402                  jmJobPriority, jmJobSourceType, jmJobDestinationType,
2403                  jmJobCurrentState, jmJobPreviousState,
2404                  jmJobStateReasons, jmJobAlertTime }
2405        STATUS  current
2406        DESCRIPTION
2407            "This trap is sent whenever the state of a job changes.  The
2408            'state of a job' is comprised by the aggregate values of the
2409            jmJobCurrentState, jmJobStateReasons, jmJobPriority,
2410            jmJobMessageFromAdministrator and
2411            jmJobDeviceStateOfDevicesAssigned
2412            fields of the job's jmJobTable entry:  This notification is
2413            sent whenever any of these values changes.
2414
2415            NOTE - the hrDeviceIndex is included for convenience, even
2416            though the Printer MIB (RFC 1759) doesn't include hrDeviceIndex
2417            in its traps.  Then the management station doesn't have to parse
2418            the received OIDs on a trap in order to discover which device
2419            traped.
2420
2421            NOTE - the addition of an entire row corresponds to the
2422            acceptance of another job by the server.  The state of the job
2423            changes from unknown to a specific value (usually pending).
2424            Therefore, the agent shall generate a trap when a job is
2425            accepted (so that the management station can display the newly
2426            arrived job in a timely fashion).
2427
2428            Similarly when the server removes a job because the job as been
2429            in the completed state for a sufficient time or the job has been
2430            deleted by a Delete operationm, the SNMP agent shall reflect
2431            that removal by removing the row from the job tables, and shall
2432            generate a trap (since the state of the job has changed to
2433            non-existent).
2434
2435            The IETF Printer MIB maintains a table which serves as a sort
2436            of 'audit-trail' of recent alerts.  There is no need for such
2437            a table here, since the jmJobTable will serve virtually the
2438            same purpose.
2439
2440            As with all SNMP notifications, critical applications cannot
2441            completely rely upon delivery:  some amount of polling is
2442            recommended.
2443
2444            The variable-bindings of this trap have been chosen to give as
2445            much description of the new Job state as possible while keeping
2446            trap messages reasonably concise (generally a few hundred octets
2447            at most).  The most common reasons for sending this notification
2448            are expected to be that the job's jmJobCurrentState or
2449            jmJobStateReasons (or both) have changed--both values, and the
2450            jmJobPreviousState are included in the variable-bindings.  If
2451            other information is required, the jmJobIdentifier value and
2452            hrDeviceIndex are provided;  this can be used to obtain the
2453            full job table entry.
2454
2455            This notification has the following special semantics:
2456
2457                o  If the job's jmJobClientID field is not empty,
2458                   its value will also be appended to trap object ID.
2459
2460            This trap OID qualifier allows job-submission and monitoring
```

```
2461          applications to limit the alerts they receive to ones generated
2462          by jobs which they have submitted (by making the appropriate
2463          entries in the SNMPv2-PARTY-MIB tables)."
2464      ::= { jmJobV2AlertPrefix 1 }
2465
2466  -- Note that the SNMPv2 to SNMPv1 translation rules dictate that the
2467  -- preceding structure will result in SNMPv1 traps of the following
2468  -- form:
2469  --
2470  -- jmJobAlert TRAP-TYPE
2471  --     ENTERPRISE jobV1Alert
2472  --     VARIABLE { hrDeviceIndex, jmJobAlertReason, jmJobIdentifier,
2473  --            jmJobPriority, jmJobSourceType, jmJobDestinationType,
2474  --            jmJobCurrentState, jmJobPreviousState,
2475  --            jmJobStateReasons }
2476  --     DESCRIPTION
2477  --         "This trap is sent whenever a job changes state."
2478  --     ::= 1
2479
2480  jmDocV1Alert OBJECT-IDENTITY
2481      STATUS     current
2482      DESCRIPTION
2483          "The value of the enterprise-specific OID in an SNMPv1 trap sent
2484          signalling a critical event in the jmDocAlertTable."
2485      ::= { jmJobAlert 4 }
2486
2487
2488  jmV2DocStateAlert NOTIFICATION-TYPE
2489      OBJECTS { hrDeviceIndex, jmJobIdentifier, jmDocSequenceNumber,
2490                jmJobSourceType, jmJobDestinationType,
2491                jmDocState }
2492      STATUS current
2493      DESCRIPTION
2494          "This trap is sent whenever the state of one of the documents in
2495          a job changes.  The state of a single document is represented in
2496          the jmJobDocumentTable column jmDocumentState.
2497
2498          The document's job's jmJobIdentifier and jmDocumentSequence
2499          are include in the trap's variable bindings;  these can be used
2500          to reference the document's jmDocumentTable entry.  The new
2501          jmDocumentState value is also included in the bindings.
2502
2503          NOTE - the addition of an entire row corresponds to the
2504          acceptance of another document (in a job) by the server.  The
2505          state of the document changes from unknown to a specific value
2506          (usually transfer pending).  Therefore, the agent generates a
2507          trap when a document (within a job) is accepted (so that
2508          the management station can display the newly arrived document in
2509          a timely fashion)."
2510      ::= { jmJobV2AlertPrefix 2 }
2511
2512  -- Note that the SNMPv2 to SNMPv1 translation rules dictate that the
2513  -- preceding structure will result in SNMPv1 traps of the following
2514  -- form:
2515  --
2516  -- jmDocAlert TRAP-TYPE
2517  --     ENTERPRISE jobV1Alert
2518  --     VARIABLE { hrDeviceIndex, jmJobIdentifier, jmDocSequenceNumber,
2519  --                jmJobSourceType, jmJobDestinationType,
2520  --                jmDocState }
```

```
2521   --     DESCRIPTION
2522   --         "This trap is sent whenever a document (in a job) changes
2523   --         state."
2524   --     ::= 1
2525
2526
2527
2528   -- Conformance Information
2529
2530   jmJobMonMIBConformance OBJECT IDENTIFIER ::= { jmJobMonMIB 2 }
2531
2532   -- compliance statements
2533   jmJobMonMIBCoreComp MODULE-COMPLIANCE
2534       STATUS current
2535       DESCRIPTION
2536           "The mandatory compliance statement for the agents that
2537           implement the job information MIB, i.e., all the mandatory
2538           groups."
2539       MODULE -- this module
2540       MANDATORY-GROUPS { jmJobInfoGroup,
2541                          jmDevicesAssignedGroup,
2542                          jmDocInfoGroup,
2543                          jmJobAlertGroup }
2544
2545       -- The jmPrintJobGroup and jmPrintDocGroup are conditionally
2546       -- mandatory, i.e., are mandatory for an agent that supports a
2547       -- (spooling) print system, as opposed to a printer.
2548       -- The jmOptionalJobInfoGroup, jmPrintJobInfoGroup,
2549       -- jmMediaConsumedGroup, jmColorImpressionsConsumedGroup,
2550       -- jmPrintDocInfoGroup, and jmMediaSupportedGroup
2551       -- are completely optional.
2552       ::= { jmJobMonMIBConformance 6 }
2553
2554
2555   jmJobMonMIBOptionalJobInfoComp MODULE-COMPLIANCE
2556       STATUS current
2557       DESCRIPTION
2558           "The compliance statement for the agents that implement the
2559           optional Optional Job Information group."
2560       MODULE -- this module
2561       MANDATORY-GROUPS { jmOptionalJobInfoGroup }
2562       ::= { jmJobMonMIBConformance 9 }
2563
2564   jmJobMonMIBPrintJobInfoComp MODULE-COMPLIANCE
2565       STATUS current
2566       DESCRIPTION
2567           "The compliance statement for the agents that implement the
2568           conditionally mandatory Print Job and Print Document groups.
2569
2570           The Print Job group and Print Document group are conditionally
2571           mandatory groups, i.e., are mandatory for agents that manage
2572           (spooling) print systems, as opposed to  printers."
2573       MODULE -- this module
2574       MANDATORY-GROUPS { jmPrintJobGroup,
2575                          jmPrintDocGroup }
2576       ::= { jmJobMonMIBConformance 10 }
2577
2578   jmJobMonMIBMediaConsumedComp MODULE-COMPLIANCE
2579       STATUS current
2580       DESCRIPTION
```

```
2581            "The compliance statement for the agents that implement the
2582            optional Media Consumed group."
2583        MODULE -- this module
2584        MANDATORY-GROUPS { jmMediaConsumedGroup }
2585        ::= { jmJobMonMIBConformance 11 }
2586
2587    jmJobMonMIBColorImpressionsConsumedComp MODULE-COMPLIANCE
2588        STATUS current
2589        DESCRIPTION
2590            "The compliance statement for the agents that implement the
2591            optional Color Impressions Consumed group."
2592        MODULE -- this module
2593        MANDATORY-GROUPS { jmColorImpressionsConsumedGroup }
2594        ::= { jmJobMonMIBConformance 12 }
2595
2596    jmJobMonMIBMediaSupportedComp MODULE-COMPLIANCE
2597        STATUS current
2598        DESCRIPTION
2599            "The compliance statement for the agents that implement the
2600            optional Media Supported group."
2601        MODULE -- this module
2602        MANDATORY-GROUPS { jmMediaSupportedGroup }
2603
2604            OBJECT          jmMediaSupportedRowStatus
2605            SYNTAX      INTEGER { active(1) }
2606            MIN-ACCESS      read-only
2607            DESCRIPTION
2608                "It is conformant to implement this object as read-only."
2609
2610            OBJECT          jmMediaSupportedASCIIName
2611            MIN-ACCESS      read-only
2612            DESCRIPTION
2613                "It is conformant to implement this object as read-only."
2614
2615            OBJECT          jmMediaSupportedName
2616            MIN-ACCESS      read-only
2617            DESCRIPTION
2618                "It is conformant to implement this object as read-only."
2619
2620            OBJECT          jmMediaSupportedDescription
2621            MIN-ACCESS      read-only
2622            DESCRIPTION
2623                "It is conformant to implement this object as read-only."
2624
2625            OBJECT          jmMediaSupportedSizeUnit
2626            MIN-ACCESS      read-only
2627            DESCRIPTION
2628                "It is conformant to implement this object as read-only."
2629
2630            OBJECT          jmMediaSupportedXDim
2631            MIN-ACCESS      read-only
2632            DESCRIPTION
2633                "It is conformant to implement this object as read-only."
2634
2635            OBJECT          jmMediaSupportedYDim
2636            MIN-ACCESS      read-only
2637            DESCRIPTION
2638                "It is conformant to implement this object as read-only."
2639
2640            OBJECT          jmMediaSupportedType
```

```
2641            MIN-ACCESS      read-only
2642            DESCRIPTION
2643                "It is conformant to implement this object as read-only."
2644
2645            OBJECT          jmMediaSupportedWeight
2646            MIN-ACCESS      read-only
2647            DESCRIPTION
2648                "It is conformant to implement this object as read-only."
2649
2650            OBJECT          jmMediaSupportedColor
2651            MIN-ACCESS      read-only
2652            DESCRIPTION
2653                "It is conformant to implement this object as read-only."
2654        ::= { jmJobMonMIBConformance 15 }
2655
2656
2657
2658    jmJobMonMIBGroups  OBJECT IDENTIFIER ::= { jmJobMonMIBConformance 2 }
2659
2660    jmJobInfoGroup OBJECT-GROUP                                 -- mandatory
2661        OBJECTS {    jmJobIdentifier,
2662                     jmJobClientId,
2663                     jmJobName,
2664                     jmJobOriginator,
2665                     jmJobOwner,
2666                     jmJobSourceType,
2667                     jmJobDestinationType,
2668                     jmJobSourceChannelType,
2669                     jmJobDestinationChannelType,
2670                     jmJobSubmittedCodedCharSet,
2671                     jmJobNumberOfJobSets,
2672                     jmJobCopies,
2673                     jmJobUserName,
2674                     jmJobAccountingInformation,
2675                     jmJobCurrentState,
2676                     jmJobStateReasons,
2677                     jmJobPreviousState,
2678                     jmJobNumberOfDocuments
2679     }
2680        STATUS    current
2681        DESCRIPTION
2682            "The job information group."
2683        ::= { jmJobMonMIBGroups 7 }
2684
2685
2686    jmDevicesAssignedGroup OBJECT-GROUP                          -- mandatory
2687        OBJECTS {    jmDevicesAssignedIndex,
2688                     jmDeviceStateOfDevicesAssigned }
2689        STATUS    current
2690        DESCRIPTION
2691            "The Devices Assigned group."
2692        ::= { jmJobMonMIBGroups 8 }
2693
2694    jmOptionalJobInfoGroup OBJECT-GROUP                         -- optional
2695        OBJECTS {    jmJobIdentifierOnClient,
2696                     jmJobComment,
2697                     jmJobPriority,
2698                     jmJobEstimatedCompletionTime,
2699                     jmJobSubmissionTime,
2700                     jmJobInterveningJobs,
```

```
2701                    jmJobMessageFromAdministrator,
2702                    jmJobErrorCount,
2703                    jmJobWarningCount,
2704                    jmJobProcessingTime,
2705                    jmJobCompletionTime }
2706        STATUS    current
2707        DESCRIPTION
2708            "The optional job information group that is device-independent."
2709        ::= { jmJobMonMIBGroups 9 }
2710
2711    jmPrintJobInfoGroup OBJECT-GROUP        -- conditionally mandatory,
2712                            -- i.e., mandatory if supporting a (spooling)
2713                            -- print service, as opposed to a printer.
2714        OBJECTS {    jmJobNumberOfJobSets,
2715                     jmJobCopies,
2716                     jmJobOutputBin,
2717                     jmJobPrintAfter,
2718                     jmJobPrinterNameRequested,
2719                     jmJobStartedPrintingTime,
2720                     jmJobCopiesCompleted,
2721                     jmJobPagesCompleted,
2722                     jmJobImpressionsCompleted,
2723                     jmJobMediaSheetsCompleted,
2724                     jmJobOctetsCompleted,
2725                     jmJobTotalJobOctets,
2726                     jmJobPageCount }
2727        STATUS    current
2728        DESCRIPTION
2729            "The print job information group that is
2730            printer-centric and is conditionally mandatory, i.e., is
2731            mandatory for an agent that supports a (spooling) print system,
2732            as opposed to a printer."
2733        ::= { jmJobMonMIBGroups 10 }
2734
2735    jmMediaConsumedGroup OBJECT-GROUP                       -- optional
2736        OBJECTS {    jmMediaConsumedIndex,
2737                     jmMediaConsumedTypeIndex,
2738                     jmMediaConsumedSheetCount }
2739        STATUS    current
2740        DESCRIPTION
2741            "The optional media consumed group."
2742        ::= { jmJobMonMIBGroups 11 }
2743
2744    jmColorImpressionsConsumedGroup OBJECT-GROUP            -- optional
2745        OBJECTS {    jmColorImpressionsConsumedIndex,
2746                     jmColorImpressionsConsumedTypeIndex,
2747                     jmColorImpressionsConsumedImpressionCount }
2748        STATUS    current
2749        DESCRIPTION
2750            "The optional color impressions consumed group."
2751        ::= { jmJobMonMIBGroups 12 }
2752
2753    jmDocInfoGroup OBJECT-GROUP                             -- mandatory
2754        OBJECTS {    jmDocSequenceNumber,
2755                     jmDocName,
2756                     jmDocFileName,
2757                     jmDocType,
2758                     jmDocFormat,
2759                     jmDocFormatVariants,
2760                     jmDocFormatVersion,
```

```
                    jmDocOctetCount,
                    jmDocState }
        STATUS    current
        DESCRIPTION
            "The document information group."
        ::= { jmJobMonMIBGroups 13 }

    jmPrintDocInfoGroup OBJECT-GROUP    -- conditionally mandatory
        OBJECTS {    jmDocDefaultMediumIndex,
                    jmDocDefaultInputTrayIndex,
                    jmDocOutput,
                    jmDocSides,
                    jmDocCopyCount,
                    jmDocCopiesCompleted }
        STATUS    current
        DESCRIPTION
            "The print document information group that is
            print-centric and is conditionally mandatory, i.e., is
            mandatory for an agent that supports a (spooling) print system,
            as opposed to a printer."
        ::= { jmJobMonMIBGroups 14 }

    jmMediaSupportedGroup OBJECT-GROUP                    -- optional
        OBJECTS {    jmMediaSupportedIndex,
                    jmMediaSupportedRowStatus,
                    jmMediaSupportedASCIIName,
                    jmMediaSupportedName,
                    jmMediaSupportedDescription,
                    jmMediaSupportedSizeUnit,
                    jmMediaSupportedXDim,
                    jmMediaSupportedYDim,
                    jmMediaSupportedType,
                    jmMediaSupportedWeight,
                    jmMediaSupportedColor }
        STATUS    current
        DESCRIPTION
            "The media supported group."
        ::= { jmJobMonMIBGroups 15 }

    jmJobAlertGroup OBJECT-GROUP                          -- mandatory
        OBJECTS {    jmJobAlertReason }
        STATUS    current
        DESCRIPTION
            "The job/document alert group."
        ::= { jmJobMonMIBGroups 16 }

    END
```

Change History

The following changes were made from version 0.6, dated 15-Sep-1995 to make version 0.7, dated 18-Oct-1995:

1. Divided the textual conventions and the MIB into separate files: jobmontc.doc, .psr, .ps, .txt and jobmon.doc, .psr, .ps, .txt, .mib, respectively.

2. Moved the following objects out of the mandatory JobInfoGroup to a new OptionalPrintJobGroup, so that the JobInfoGroup contains no printer-centric attributes:

    JobNumberOfJobSets
    JobCopies.

3. Moved the following objects from the mandatory JobInfoGroup to the optional OptionalJobInfoGroup, because they are not required for DPA level 2 conformance:

    JobIdentifierOnClient

4. Added JobDestinationChannelType object to the mandatory JobInfoGroup and changed the name of JobChannelType to JobSourceChannelType, so that we can express both the source and destination type for a single multifunction job.

5. Added local disk storage, network disk storage, and document repository to the list of OIDs that need to be defined and registerd with IANA for use with the host resources MIB.

6. Created the DevicesAssignedGroup and moved the DevicesAssignedTable into it, so that we are following the SMI V2 rule of one table per group.

7. Clarified that the DevicesAssigned objects apply to scanners as well as printers.

8. Moved the following print-centric objects from the optional OptionalJobInfo group/table to the new optional print-centric PrintJobInfo group/table:

    jmJobOutputBin
    jmJobPrintAfter
    jmJobPrinterNameRequested
    jmJobStartedPrintingTime
    jmJobCopiesCompleted
    jmJobPagesCompleted
    jmJobImpressionsCompleted
    jmJobMediaSheetsCompleted
    jmJobOctetsCompleted
    jmJobTotalJobOctets
    jmJobPageCount

9. Changed the type of jmJobOutputBin from Integer32 to Cardinal16, since the number of output bins is likely to be a small number.

10. Changed the name of the data type from CodedStringIndex to CodeIndexedStringIndex. See General MIB.

11. Added the word Index to the end of the jmMediaConsumedType and jmColorImpressionsConsumedType objects to make: jmMediaConsumedTypeIndex and jmColorImpressionsConsumedTypeIndex objects, in order to follow the rule that an index object ends with the word Index so that it is clearer what is an index and what is data.

12. Moved the following print-centric objects from the mandatory jmDocInfoTable to the optional jmPrintDocInfoTable:

2881 jmDocSides
2882 jmDocCopyCount
2883 jmDocCopiesCompleted
2884
2885 13. Extended the semantics of the following objects so that they control
2886 input scanning as well, specifying the results of the scan and
2887 specifying the source of printing at the same time:
2888
2889 jmDocName
2890 jmDocFileName
2891 jmDocFormat
2892 jmDocFormatVariants
2893 jmDocFormatVersion
2894 jmDocOctetCount
2895 jmDocState
2896
2897 14. Changed the name of the optional Optional Document Information
2898 group/table to Optional Print Document Information group/table, since
2899 all the objects are print-centric:
2900
2901 jmDocDefaultMediumIndex
2902 jmDocDefaultInputTrayIndex
2903 jmDocOutput
2904 jmDocSides
2905 jmDocCopyCount
2906 jmDocCopiesCompleted
2907
2908 15. Added the word Index to the end of the jmDocDefaultMedium and
2909 jmDocDefaultInputTray objects to make jmDocDefaultMediumIndex and
2910 jmDocDefaultInputTrayIndex, in order to follow the rule that an index
2911 object ends with the word Index so that it is clearer what is an index
2912 and what is data.
2913
2914 16. Changed the types of the jmDocDefaultMediumIndex and
2915 jmDocDefaultInputTrayIndex objects from Integer32 to Cardinal16, since
2916 32K seems sufficient number of media and input trays. Also clarified
2917 that an index value of 0 means no default specified.
2918
2919 17. Clarified that when developing a scan job monitoring MIB, a new
2920 sides attribute needs to be added for scanning, so that the number of
2921 sides for scanning can be specified independently from printing.
2922
2923 180. Moved the MediaSupportedTable to its own group: the optional
2924 MediaSupportedGroup to follow the SMI guideline that each table be in a
2925 separate group.
2926
2927 19. Changed the data type of the jmMediaSupportedIndex from Integer32 to
2928 Ordinal16, since 32K media seems sufficient.
2929
2930 20. Change the type of the jmMediaSupportedASCIIName from ASCIIstring to
2931 DisplayString, so as to use an already defined SMI textual-convention,
2932 instead of inventing a new textual-convention (with the identical
2933 semantics).
2934
2935 21. Changed the types of jmMediaSupportedType and jmMediaSupportedColor
2936 from ASCIISring to InternationDisplayString, so that they could be
2937 localized, even though the corresponding objects in the Printer MIB
2938 aren't localizable. Do the right thing for users of the management
2939 station.
2940

22. Changed the order of the bound variables on a trap, so that the jmJobAlertReason is first, since it is the most significant object. Then the indexes are grouped together next as well.

23. Added the word Core to jmJobMonMIBCOmpliance name to follow SMI conventions and allow for additional compliance macros to be added in the future.

24. Updated the conformance macros to support the creation of the new groups, so that each table is in a separate group. The following groups/tables are mandatory:

    jmJobInfoGroup
    jmDevicesAssignedGroup
    jmDocInfoGroup
    jmJobAlertGroup

25. Added all the MediaSupported (which are read-write) objects to the list that can be implemented a read-only for conformance.

26. Changed all references to ASCIIString (currently defined in General TC) to DisplayString, since they have identical semantics (255-byte NVT ASCII string) and we should use SMI textual-conventions whenever possible..

27. Changed the group compliance OID arcs from 1-10 to 6-16 to match the group assignments.

28. Clarified that the MediaConsumedTable can be used to hold the ISO DPA media-used document attribute values that indicate the media that the document will be using (the MediaConsumedSheetCount would have a 0 value). Being in the MediaConsumedTable means that the values are for the job as a whole, not for each document (else we have a separate table with four indexes). So the MediaConsumedTable can be useful to the system operator while jobs are in the pending state; the system operator can see which media the jobs need when the jobs are in the held state with job-state-reasons being resources-needed.

29. Added 255-octet size constraints to DisplayString and InternationalDisplayString, since neither SMI, nor hr ASN.1 does, even though the agreed semantics is a 255-octet limit.

30. Changed the name of the OptionalPrintJob and OptionalPrintDoc groups/tables to PrintJob and PrintDoc, and changed them to conditionally mandatory, i.e., mandatory if the agent is supporting a (spooling) print system, as opposed to a printer.

31. Changed the type of DocSequenceNumber index from Ordinal16 to Ordinal32, since it can be a 32-bit number in DPA.

32. Changed the jmDevicesAssignedIndex from Cardinal16 to Cardinal32, since the device index is a 32-bit number in the host resources MIB.

33. Added compliance statements for all optional and conditionally mandatory groups.

The following changes were made from version 0.5, dated 11-Sep-1995 to make version 0.6, dated 20-Sep-1995 (the first 9 changes are as a result of the review at the 18-Sept IETF/DMTF PWG meeting:

1. Clarified that the mandatory objects are for a printer and the optional attributes are for print spooling systems.

2. Indicated that the job information retained by the agent after a job completes is intended for use by: management stations used by system operators, a remote console capability, end-user monitoring, system accounting, and system usage programs.

3. Clarified the requirement that the job monitoring MIB is intended to be used with print systems that do not implement ISO DPA, as well as with ones that do.

4. Added the goal that the current proposal is for print jobs, but that the MIB should be designed so that a future MIB could augment this job monitoring MIB for monitoring scan and FAX jobs.

5. Indicated that this job monitoring MIB must be designed to be used with SNMPv1 and SNMPv2, including the different security mechanisms provided.

6. Clarified that if job control functions (cancel job, etc.) are to be provided, they should be provided by a separate job control MIB, that would be a companion MIB to this job monitoring MIB.

7. Removed the idea that the agent keeps a client job id to server job id map, since such complication in an agent is against SNMP philosophy of keeping agents simple (and putting the smarts into management stations).

8. Clarified the goal about legacy protocols.

9. Added goal of supplying only objects that are of interest to the system operator and system administrator, as opposed to the end user, since that is the focus of job managment MIBs.

10. Clarified that this MIB is only for job monitoring and that another MIB should be developed if and when job management (or job control) is wanted, if ever. Reason: job control is controversial. However, having a separate MIB that augments the job monitoring MIB seems a simple way to make everyone happy and removes the battle completely from the job monitoring MIB efforts.

11. Added the thinking about the job model for multifunction jobs as having simple and complex jobs; complex jobs contain other jobs when multiple destination types (or source types) are needed. Simple jobs (such as scan-to-file and file-to-print) can be either created by the server from a simple job request (scan-to-print) transparently. Also the ISO DPA protocol can be extended to allow high-end clients to be able to create complex jobs directly that contain other simple and complex jobs.

12. Added the concept of CodedStrings that allow servers to store strings from submitting clients as they are and lets management stations request the string in any of a number of coded representations, if the

agent supports code conversion. (Name later changed to CodeIndexedStringIndex and CodeIndexedString).

13. Added more coded characters sets that can be implemented for representing CodeIndexedStrings (other ISO 8859-n, JIS 6226, and Shift JIS) and relaxed the requirement that all four ISO DPA standard sets (ASCII, T61String, ISOLatin1, and Unicode) must be implemented. Now only ASCII, and ISO Latin1 is required, with others optional. This relaxation is more in line with current localization practice on POSIX compliance platforms and follows ISO DPA implementation direction which needs reflection in ISO DPA as well.

14. Added the description that minimal implementation only requires resopnding to 29 accessible objects (and that even those values need not have meaningful data, though it is recommended that they do).

15. Added DPAJobStateReasons and DPADocOutput textual conventions.

16. Changed the names of the textual conventions module from Job-monitoring-TC to JOB-MONITORING-TC and the MIB from Job-monitoring-MIB to JOB-MONITORING-MIB to follow JMSMI conventions.

17. Moved the general textual conventions from the job monitoring TC to the General TC: Ordinal32, Cardinal32, Cardinal64, CodedStringIndex.

18. Added jmJobSubmittedCodedCharSet to the mandatory JobInfo group/table so that a management station can find out the coded character set that was most likely used for submtting the attributes when the job was submitted.

19. Deleted DeviceAssignedName from DevicesAssignedTable, since the hr MIB has the device name.

20. Changed the jmMediaConsumedIndex, jmMediaConsumedTypeIndex, jmColorImpressionsConsumedIndex and jmColorImpressionsConsumedTypeIndex from Integer32 to Ordinal16, since 32K seems enough media, media type, colors and color types.

21. Added MediaSupportedRowStatus, MediaSupportedASCIIName, and MediaSupportedDescription to the optional MediaSupportedTable.

22. Added jmJobAlertTime to the mandatory job alerts group. The time, as in SNMP, is on a best efforts basis.

23. Updated the conformance to agree with the above.

The following changes were made from version 0.4, dated 1-Sep-1995 to make version 0.5, dated 11-Sep-1995:

1. Changed terminology from "client" to "management station" and "server" to "SNMP agent" (or sometimes just "agent") agree with IETF SNMP practice. Kept "client" and "server" for the descriptions copied from ISO DPA.

2. Moved the accounting objects: user-name and accounting-information from the optional job information group to the mandatory, since they are needed for accounting. Clarified that user-name is for accounting.

3. Changed the name of the jmGeneral group to jmJobGeneral group to distinguish this group from the General group in the base MIB.

4. Added previous-job-state to the Mandatory group and the trap list. Then management stations can more rapidly decide whether to query the MIB on a trap.

5. Fixed the comment about the size being about 512 bytes (546 bytes = 576-30).

6. Changed the table name from PrintersAssigned to DevicesAssigned, so that other multifunction devices can be put into the same table. Also jmPrinterAssignedName and jmPrinterStateOfPrintersAssigned to jm DeviceAssignedName and jmDeviceStateOfDevicesAssigned.

7. Made MediaConsumed and ColorImpressionsConsumed tables into separate optional groups so can be implemented without the other (big) OptionalJobInfo group.

8. Changed PositiveInteger textual-convention to Ordinal32, to use SMI, but only use range to 2**31-1 (31 bits).

9. Changed jobs MIB Cardinal textual-convention to Cardinal32 for consistency with SMI.

10. Changed the data type of JobSourceType and JobDestinationType from enum to OID, so that the OIDs from the host resources MIB could be used to identify device types.

11. Added comments about device-type OIDs being used from the host resources MIB: printer, (local) disk storage and new OIDs being defined for use with the host-resources extension MIB for the following devices: scanner, fax, network disk storage (same as document repository?), mechanical mail box, and electronic mail box.

12. Moved text that shows syntactic difference between this MIB and ISO DPA from the end of each specification to the beginning.

13. Changed the MS-WORD single quote to ASCII single quote.

14. Changed the way media size in the MediaSupported table is specified to use the MediaSize textual-convention from RFC 1759 and to have a read-only MediaSizeUnit object that specifies whether the media units are in .0001 inches or micrometers, instead of having objects that have both sets of units. Management stations can perform the conversion between the two systems of units depending on management station's user localization.

15. Added DeviceStateOfDevicesAssigned bit to JobAlertReason, so that a trap is generated whenever the state of a device assigned to a job changes state, since the complete state of a job includes the state of the device when the job is in processing or printing state. In the future, add a few more states for other devices, such as scanners and dial-up devices.

16. Added hrDeviceIndex to the V2JobStateAlert and V2DocStateAlert NOTIFICATION-TYPE objects, so that management stations can more easily determine which device generated the trap.

17. Added jmJobV1Alert and jmDocV1Alert TRAP-TYPE objects to cause SNMPv1 traps.

18. Added comments about jobV1Trap and docV1Trap objects, so can see the mapping from SNMPv2 to SNMPv1 traps, like in RFC 1759.

19. Added a Mandatory AlertTime object that is sysUpTime when the alert was generated (like RFC 1759 has, except it is mandatory in the job monitoring MIB and optional in RFC 1759).

20. Changed the way that DPAText is handled, so that the management station no longer sets the coded character set to be used by the agent, thus solving the contention problem for the jobs MIB where there is likely to be a number of management stations (document monitors) accessing the same MIB. All the DPAText objects are changed to be CodeStringIndex which is an index a large string table. The second index into that table is the coded character set enum requested by the management station.

The agent shall support at least one coded character set from the list of DPA coded character sets (ASCII, ISOLatin1, T61String, or Unicode) and can support any others, either with code conversion or by storing the actual data. This mechanism is a general one and will be moved to the General group in the general MIB, so that other MIBs can use it.

21. Created a textual-conventions module for the job monitoring MIB, so that only the textual-conventions module need be updated to add new (type 2 and type 3) enum values; the actual job monitoring MIB need not be republished. Type 1 enum textual conventions remain in the jobs monitoring MIB.

The following changes were made from version 0.3, dated 26-Aug-1995 to make version 0.4, dated 5-Sep-1995:

1. Changed the title to "job monitoring MIB" to reflect that this proposal is to be a new MIB, not an extension to the Printer MIB. Then the job MIB can be used with other types of devices, such as scanners and faxes.

2. Changed the DPAText textual-convention so that it is a single object of type OCTET STRING containing one of the four DPA standard character sets. Also changed to use a type 2 enum with four values that are specific to this MIB, instead of the four values registered with IANA (since T61String and UCS-2 level 2 are not registered with IANA).

3. Added a mandatory General group that contains: a GeneralCurrentLocalization object, indices into the host resources software installed and software running tables.

4. Added DPA Printers-assigned to the MIB, since systems implementing logical printers need to be able to indicate which physical printer(s) the job is assigned to so that the management station can find the printer state that is really an augmentation of the state of the job. Since some print systems can assign a print job to multiple devices, the printers-assigned is represented as a table. The mandatory printers-state-of-printers-assigned attribute was also put into this PrintersAssigned table so the entire table is mandatory.

5. Changed octets-completed and total-job-octets from mandatory to optional as sugggested at the MFPA WG meeting, August 28-29 in Bellevue WA.

6. Deleted submitting-product-name, and submitting product instance qualifier which had been taken from the DMTF printer finisher MIF work, not from DPA. Discussions with Harry Lewis, DMTF printer finisher WG chair, the LMO product name is really a name for a set of jobs. However, if we use the formulation agreed to at the MFPA WG meeting, Aug 28-29, that jobs can contain other jobs, then such a container job is the same as an LMO product. So the job-name attribute can be used on a job that contains other jobs in order to get the functionality needed by LMO of a product name.

7. Changed GeneralizedTime (from ASN.1 standard) to DateAndTime (from SNMPv2 textual-conventions).

8. Clarified the goal that the windows and other PC environments managing low-end devices is a strong goal.

9. Clarified the goal that the MIB is intended to be used with systems that control multiple devies, as well as to be used with a single device. Introduced the concept of a logical device and a physical device for such systems.

10. Clarified that the job monitoring MIB is intended for other devices as well as and/or instead of printers. So that RFC 1759 is not a requirement, if there are no printers.

jm11. Changed each object in a table to start with a word or words that indicate the table (not necessarily the group). Eg. jmJobName. If the DPA attribute already started with job-, don't add another Job, but add Job if the DPA attribute did not start with job-. Same for the document table attributes starting with Doc.

12. Changed Cardinal64 to use the SNMPv2 SMI Counter64 textual-convention.

13. Added a PrtChannelType textual-convention that should be moved to RFC 1759. A comment to the IETF PWG will be made to do so when RFC 1759 is promoted from draft proposed to draft status.

14. Clarified that scanners will be indicated using an OID in the hrDeviceType. That OID will be registered with IANA.

15. Split out the optional job and document tables as separate tables that AUGMENT the mandatory job and document tables. Follows communication MIB here (though a second get is required to get an optional table, instead of RFC 1759 practice of putting optional objects into the same table (that can be gotten in a single get).

16. Added the PrintersAssigned table to hold the printer indices and the printer states of printer(s) assigned to print a job, to align with ISO DPA where high end systems can print a job on more than one printer.

17. Made MediaConsumed and ColorImpressionsConsumed tables in the optional job info group.

18. Changed the Media Supported table from mandatory to optional and made read-write, with MIN-ACCESS read-only, especially with SNMPv1

security.

19. Added type 2 enum indications to all enums.

20. Made textual-conventions for the 3 enums taken directly from ISO DPA: printer-state (used for printer-states-of-printers-assigned), document-type, and document-state. Indicated the offset from the DPA OID final arc (+2 or +3) to the MIB enum as comments on all three.

21. Added the alerts group to the job monitoring MIB.

Changes from version 0.2 (7-Aug-1995) to version 0.3 (11-Aug-1995):

1. Converted job-ext.doc to MIB format

2. Added document-sequence-number and made it Mandatory, since a document could be deleted in the middle of a multi-document job and the document-sequence-numbers of the following documents shall not change. So the document-sequence-number cannot be inferred from the position of the document in the job.

[End of the job monitoring MIB specification]