

# List of Information Objects for the Job Monitoring MIB

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5 From: Tom Hastings  
6 Date: 01/09/97  
7 Version: 0.6  
8 File: ftp://ftp.pwg.org/pub/snmpmib/jobs-mib/jmp-list.doc .ps

9 Status: I've made the changes agreed to at the JMP meeting, 01/08/97 in Albuquerque: a number of  
10 object name changes, deletion of the jmJobDownstreamId, removal of the pairs of 32-bit object in favor of  
11 counting octets in K, and the addition of the jmJobNameId and jmJobNumberId client-assigned objects.  
12 The next step is to take these changes and turn it into a full fledged MIB.

13 I've made three changes that were suggested at the IETF meeting where I presented all the objects. So  
14 these changes are changes since version 0.4 that I posted after the 11/08/96 meeting: I combined  
15 **jmQueuing** and **jmQueuingAlgorithm** into a single **jmGeneralQueuingAlgorithm** enum that already  
16 includes the "none(3)" value, so we don't need the **jmQueuing** Boolean. I added the **jmDeviceIndex** so  
17 that a management application can determine the hrDeviceIndex for the associated Printer MIB instance  
18 that this job was submitted to or is to be printed on without having to scan the entire **jmResourcesTable**  
19 thereby resolving ISSUE 04. I removed the **jmJobSourceChannelInformation**, since it can now be  
20 obtained easily from the Printer MIB using the **jmDeviceIndex** object. In reviewing the minutes of the  
21 11/08/96 meeting in New Orleans, I see that I also failed to add the table of MIB instances (see point  
22 number 1 in the minutes under Scott's proposal). So the totals are the same: 36 mandatory objects and 7  
23 conditionally mandatory objects

24 The suggestion made at the IETF meeting to count jobs in K, instead of octets, would allow us to combine  
25 two 32-bit integer object into a single object. I have added this idea as an issue for the group to decide.  
26 See jmp-spec.doc.

27 This list summarizes the proposed objects for the Job Monitoring MIB as agreed to at the JMP meeting,  
28 11/08/96 in New Orleans and modified by suggestions at the IETF meeting. It can be used as a worksheet  
29 for further organizing the work. The version number of this list (jmp-list.\*) will track the version  
30 number of the specification (jmp-spec.\*). I've added the groups and tables as agreed at the 11/08/96  
31 meeting and copied in the data types. The number of protocols column is the sum of the number of  
32 protocols that use the object.

33 *NOTE - the descriptions of these objects in this list are not the specifications of these objects;*  
34 *these descriptions are only helpful short-hand descriptions. The full description is in the*  
35 *specification (see jmp-spec.\* files).*

## Proposed Specification of Information Objects for Job Monitoring MIB

### 36 1. Object totals

37 There is a one to one relationship between tables and groups as follows:

Group	Table	Description	No. of objects	Conformance
<b>jmJobSet</b>	<b>jmJobSetTable</b>	A table of indexes to each Job Set instance.	1	Mandatory
<b>jmGeneralGroup</b>	N/A	General attributes that apply to all jobs in the MIB instance.	5	Mandatory
<b>jmQueueGroup</b>	<b>jmQueueTable</b>	Ordered list of jobs that have <i>not</i> finished and job attributes that only matter until the job has finished processing. Mandatory only if queuing (or spooling).	7	Conditionally mandatory
<b>jmCompletedGroup</b>	<b>jmCompletedTable</b>	Ordered list of jobs that have finished processing.	3	Mandatory
<b>jmJobGroup</b>	<b>jmJobTable</b>	Per job objects.	19	Mandatory
<b>jmResourceGroup</b>	<b>jmResourceTable</b>	Resources requested and/or used by the job. Can have more than one per job.	7	Mandatory
<b>Mandatory Totals:</b>			35	
<b>Conditionally Mandatory Totals:</b>			7	
<b>Totals:</b>			42	

### 38 2. List of objects for the Job Monitoring MIB

39 The first column contains the MIB name followed by a descriptive name for the object that is applicable to  
 40 both MIB and MIF. Names for the MIB have a prefix of "jm" and mixed case with each word starting  
 41 with an upper case letter and no intervening spaces or hyphens. For the MIF the descriptive name will  
 42 have intervening spaces and *no* hyphens. We will keep the names in this file the same as the specification  
 43 file.

44 The **Data Type** column indicates the data type of the object. Enums are given distinct names that start  
 45 with a capital letter.

46 The **Conformance** column specifies the conformance:

**M** means **Mandatory** for conformance to this MIB specification

**CM** means **Conditional** Mandatory (for spooling systems, and systems with day and time clocks, etc.).

47 The **Cardinality** column contains:

**1** meaning there is only **one** of these objects per job, so that the object can be in a table that is indexed by **jmJobSet** and **hrJobIndex**.

**n** meaning that there may be **more than one** of these objects per job, so that that the object must be in another table that is indexed by **jmJobSet**, **hrJobIndex**, and a running instance index

## Proposed Specification of Information Objects for Job Monitoring MIB

48 The **Protocols** column in the number of job submission protocols that this object appears out of our survey  
49 of 9 job submission protocols. The 9 job submission protocols are: **ISO DPA, Apple PAP, IPDS,**  
50 **LPR/LPD, NDPS, PJL, PSERVER, SMB, and TIPSJ.**

# Proposed Specification of Information Objects for Job Monitoring MIB

## 51 2.1 The MIB Instance Group

52 The **JobSetGroup** consists of objects that are for *all* Job Set instances, not just a single instance. The  
53 **jmJobSetGroup** consists entirely of the **jmJobSetEntry** which is indexed by:

- 55 1. **jmJobSetIndex** - a running index of Job Set instances supported by this printer or server.

56

<b>jmJobSetGroup (M)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocols</b>
1. <b>jmJobSetIndex</b> - a running index of Job Set instances supported by this printer or server.	<b>Integer32(1..2<sup>31</sup>)</b>	<b>M</b>	<b>1</b>	

## 57 2.2 The General Group

58 The **jmGeneralGroup** consists of objects of a general nature that are *not* per-job. The **jmGeneralGroup**  
59 consists entirely of the **jmGeneralEntry** which is indexed by:

- 60 1. **jmJobSetIndex** - a running index of Job Set instances supported by this printer or server.

61

<b>jmGeneralGroup (G)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocols</b>
1. <b>jmJobSetIndex</b> - a running index of Job Set instances supported by this printer or server.	<b>Integer32(1..2<sup>15</sup>-1)</b>	<b>M</b>	<b>1</b>	
2. <b>jmGeneralJobCompletedPolicy</b> - the time in seconds that jobs are kept in the <b>jmJobTable</b> and the <b>jmCompletedTable</b> after processing.	<b>Integer32(0..2<sup>31</sup>-1)</b>	<b>M</b>	<b>1</b>	
3. <b>jmGeneralMaxNumberOfJobs</b> - the maximum number of job; (-1) means no limit.	<b>Integer32(0..2<sup>31</sup>-1)</b>	<b>M</b>	<b>1</b>	
4. <b>jmGeneralCurrentNumberOfJobs</b> - the total number of jobs currently in the Job Table (pending and completed).	<b>Integer32(0..2<sup>31</sup>-1)</b>	<b>M</b>	<b>1</b>	
5. <b>jmGeneralQueuingAlgorithm</b> - the current scheduling algorithm being used or <b>none</b> (no queuing is possible).	<b>JMQueuingAlgorithm</b>	<b>M</b>	<b>1</b>	

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63 **2.3 The Queue Group**

64 The **jmQueueGroup** is made up entirely of the **jmQueueTable** which is an ordered list of jobs that have  
 65 not completed processing. The **jmQueueGroup** consists of objects that are not needed after the job has  
 66 completed processing. The **jmQueueGroup** is conditionally mandatory and shall be implemented by a  
 67 server or print that performs queuing (or spooling). The **jmQueueGroup** shall *not* be implemented if the  
 68 value of **jmGeneralQueuingAlgorithm** is **none**. The **jmQueueTable** is indexed by:

- 69 1. **jmJobSetIndex** - a running index of Job Set instances supported by this printer or server.  
 70 2. **jmQueueIndex** - a running index of the jobs that have *not* finished processing.

71

<b>jmQueueGroup (Q)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocol</b>
1. <b>jmJobSetIndex</b> - a running index of Job Set instances supported by this printer or server.	<b>Integer32(1..2^15)</b>	<b>CM</b>	<b>1</b>	
2. <b>jmQueueIndex</b> - a running index of the jobs that have <i>not</i> finished processing.	<b>Integer32(1..2^31-1)</b>	<b>CM</b>	<b>1</b>	
3. <b>jmQueueIndex</b> - the job's identifier generated by the printer or server implementing this JM MIB	<b>Integer32(0..2^31-1)</b>	<b>CM</b>	<b>1</b>	<b>6</b>
4. <b>jmQueueNumberOfInterveningJobs</b> - the number of jobs in front of this job	<b>Integer32(0..2^31-1)</b>	<b>CM</b>	<b>1</b>	<b>1</b>
5. <b>jmJobPriority</b> - Job priority	<b>Integer32(0..100)</b>	<b>CM</b>	<b>1</b>	<b>3</b>
6. <b>jmJobProcessAfterTime</b> - process-after-time	<b>GeneralizedTime</b>	<b>CM</b>	<b>1</b>	<b>1</b>
7. <b>jmJobMessageToOperator</b> - job-message-to-operator from submitting user or device	<b>OCTET STRING (SIZE((63))</b>	<b>CM</b>	<b>1</b>	<b>1</b>

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## Proposed Specification of Information Objects for Job Monitoring MIB

### 73 2.4 The Completed Group

74 The **jmCompletedGroup** consists entirely of the **jmCompletedTable** which is an ordered list of the job  
75 that have completed processing. The **jmCompletedTable** is indexed by:

76 1. **jmJobSetIndex** - a running index of Job Set instances supported by this printer or server.

77 2. **jmCompletedIndex** - a running index of the jobs that have finished processing.

78

<b>jmCompletedGroup (C)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocols</b>
1. <b>jmJobSetIndex</b> - a running index of Job Set instances supported by this printer or server.	<b>Integer32(1..2^15-1)</b>	<b>M</b>	<b>1</b>	
2. <b>jmCompletedIndex</b> - a running index of the jobs that have finished processing.	<b>Integer32(1..2^31-1)</b>	<b>M</b>	<b>1</b>	
3. <b>jmJobIndex</b> - the job's identifier generated by the printer or server implementing this JM MIB	<b>Integer32(1..)</b>	<b>M</b>	<b>1</b>	<b>6</b>

## Proposed Specification of Information Objects for Job Monitoring MIB

### 79 2.5 The Job Group

80 The **jmJobGroup** consists of (1) job identification, (2) job parameters, and (3) job status and accounting  
 81 objects that have a *single* value per job. The **jmJobGroup** consists entirely of the **jmJobTable** which is  
 82 indexed by:

- 83 1. **jmJobSetIndex** - an instance index to distinguish separate sets of tables when a server  
 84 supports more than one printer.
- 85 2. **jmJobIndex** - the job identifier that was generated by the server or printer that accepted the  
 86 job.

87

<b>jmJobGroup - Identification (I)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocols</b>
1. <b>jmJobSetIndex</b> - a running index of Job Set instances supported by this printer or server.	<b>Integer32(1..2^15-1)</b>	<b>M</b>	<b>1</b>	
2. <b>jmJobIndex</b> - the job's identifier generated by the server or printer implementing this JM MIB	<b>Integer32(1..2^31-1)</b>	<b>M</b>	<b>1</b>	<b>6</b>
3. <b>jmJobName</b> - Job name assigned by job owner which is not necessarily unique.	<b>OCTET STRING (SIZE(63))</b>	<b>M</b>	<b>1</b>	<b>5</b>
4. <b>jmJobNameId</b> - the job's identifier name generated by the job submitting software using the job submission protocol. This name can be anything that helps identify the job to the job submitter, including the name of the queue from which the job was submitted.	<b>OCTET STRING (SIZE(63))</b>	<b>M</b>	<b>1</b>	<b>7</b>
5. <b>jmJobNumberId</b> - the job's identifier number generated by the job submitting software using the job submission protocol. A (-2) value shall indicate that the submitter did not supply a job identifier number.	<b>Integer32(0..2^31-1)</b>	<b>M</b>	<b>1</b>	
6. <b>jmJobTypes</b> - Job types (print, fax, scan, etc.) - bit vector to get multiple values in a single object	<b>JMJobType - enum encoded as bits</b>	<b>M</b>	<b>1</b>	<b>3</b>
7. <b>jmJobOwner</b> - Job owner (User name of the user that originally submitted print job)	<b>OCTET STRING (SIZE(63))</b>	<b>M</b>	<b>1</b>	<b>7</b>
8. <b>jmJobDeviceNameRequested</b> - Device name (Device-specific name of device) requested by the submitting user.	<b>OCTET STRING (SIZE((63))</b>	<b>M</b>	<b>1</b>	<b>4</b>

## Proposed Specification of Information Objects for Job Monitoring MIB

<b>jmJobGroup - Identification (I)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocols</b>
9. <b>jmDeviceIndex</b> - the host resources index of the corresponding Printer MIB that the job was submitted to or has been assigned to be printed on by the server. 0 indicates if the server has not assigned a printer to the job.	<b>Integer32(0..2^31-1)</b>	<b>M</b>	<b>1</b>	
10. <b>jmJobSourceChannel</b> - Source channel on which the job was submitted (index of channel row in the Printer MIB)	<b>PrtChannelIndex</b>	<b>M</b>	<b>1</b>	<b>3</b>
11. <b>jmJobSubmissionTime</b> - Date/Time of job submission by job owner	<b>DateAndTime</b>	<b>CM</b>	<b>1</b>	<b>4</b>
12. <b>jmJobComment</b> - Job comment	<b>OCTET STRING (SIZE(63))</b>	<b>M</b>	<b>1</b>	<b>5</b>

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<b>jmJobGroup - Parameters (J)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocol</b>
12. <b>jmJobTotalKOctets</b> - total K octets to be processed in the job - rounded up to next higher K	<b>Integer32(0..2^31-1)</b>	<b>M</b>	<b>1</b>	<b>1</b>

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<b>jmJobGroup - Status and Accounting (S)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocols</b>
13. <b>jmJobCurrentState</b> - Job state ( <b>pending, processing, completed</b> , etc.)	<b>JMJobState</b>	<b>M</b>	<b>1</b>	<b>7</b>
14. <b>jmJobStateReasons</b> - Job state reasons - additional information about the job state: reasons being held, additional completed information such as successful, warnings, or errors.	<b>OCTET STRING (SIZE(0..63)) -bit vector</b>	<b>M</b>	<b>1</b>	<b>5</b>
15. <b>jmJobKOctetsCompleted</b> - K Octets completed - should be rounded down to lower K until completed.	<b>Integer32(0..2^31-1)</b>	<b>M</b>	<b>1</b>	<b>3</b>
16. <b>jmJobStartedProcessingTime</b> - Date/Time of day job started processing on device	<b>DateAndTime</b>	<b>CM</b>	<b>1</b>	<b>3</b>
17. <b>jmJobCompletionTime</b> - Date/Time of day job finished using the device	<b>DateAndTime</b>	<b>CM</b>	<b>1</b>	<b>1</b>



## Proposed Specification of Information Objects for Job Monitoring MIB

<b>jmJobGroup - Status and Accounting (S)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocols</b>
18. <b>jmJobAccountName</b> - Account Name	<b>OCTET STRING (SIZE(63))</b>	<b>M</b>	<b>1</b>	<b>3</b>

## Proposed Specification of Information Objects for Job Monitoring MIB

### 90 2.6 The Resource Group

91 The **jmResourceGroup** consists of requested and used resources objects that can have multiple values per  
 92 job. The **jmResourceGroup** consists entirely of the **jmResourceTable** which is indexed by:

- 93 1. **jmJobSetIndex** - an instance index to distinguish separate sets of tables when a server  
 94 supports more than one printer.
- 95 2. **jmJobIndex** - the job identifier that was generated by the server or printer that accepted the  
 96 job.
- 97 3. **jmResourceIndex** - a running index of resources for each job
- 98

<b>jmResourceGroup (R)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocol</b>
1. <b>jmJobSetIndex</b> - a running index of Job Set instances supported by this printer or server.	<b>Integer32</b>	<b>M</b>	<b>1</b>	
2. <b>jmJobIndex</b> - the job's current identifier generated by the server or printer implementing this JM MIB	<b>Integer32(0..)</b>	<b>M</b>	<b>1</b>	<b>6</b>
3. <b>jmResourceIndex</b> - a running index of the resources requested and/or used by the job.	<b>Integer32</b>	<b>M</b>	<b>1</b>	
4. <b>jmResourceType</b> - Resources required/used (table):	<b>JMResourceType</b>	<b>M</b>	<b>n</b>	
a) <b>documentName(3)</b> - Document name(s) (or file-names)	<b>OCTET STRING (63)</b>	<b>CM</b>	<b>n</b>	<b>7</b>
b) <b>jobCopiesRequested(4)</b> - Number of job copies requested	<b>Integer32(0..2^31-1)</b>	<b>CM</b>	<b>1</b>	<b>4</b>
c) <b>jobCopiesProduced(5)</b> - Number of job copies produced	<b>Integer32(0..2^31-1)</b>	<b>CM</b>	<b>1</b>	<b>1</b>
d) <b>documentCopiesRequested(6)</b> - Number of document copies requested	<b>Integer32(0..2^31-1)</b>	<b>CM</b>	<b>1</b>	<b>4</b>
e) <b>documentCopiesProduced(7)</b> - Number of document copies produced	<b>Integer32(0..2^31-1)</b>	<b>CM</b>	<b>1</b>	<b>1</b>
f) <b>sides(8)</b> - Number of sides requested/used (one-sided, two-sided)	<b>Integer32(1..2)</b>	<b>CM</b>	<b>1</b>	<b>5</b>
g) <b>interpreters(9)</b> - PDLs requested/used	<b>PrtInterpreterFamily</b>	<b>M</b>	<b>n</b>	<b>5</b>
h) <b>physicalDevices(10)</b> - physical devices requested/used	<b>hrDeviceIndex</b>	<b>CM</b>	<b>n</b>	<b>6</b>
i) <b>faxPhoneNumber(10)</b> - FAX phone number requested/used	<b>OCTET STRING (255)</b>	<b>CM</b>	<b>n</b>	

**Proposed Specification of Information Objects for Job Monitoring MIB**

<b>jmResourceGroup (R)</b>	<b>Data Type</b>	<b>Conformance</b>	<b>Cardinality</b>	<b>Protocol</b>
j) <b>impressionsCompleted(11)</b> - Impressions (sides) completed	<b>Counter32(0..2<sup>31</sup>-1)</b>	<b>CM</b>	<b>1</b>	<b>3</b>
k) <b>sheetsCompleted(12)</b> - Sheets completed for the job.	<b>Counter32(0..2<sup>31</sup>-1)</b>	<b>M</b>	<b>1</b>	<b>2</b>
l) <b>pagesSpooled(13)</b> - logical pages spooled for the job.	<b>Counter32(0..2<sup>31</sup>-1)</b>	<b>CM</b>	<b>1</b>	
m) <b>pagesInterpreted(14)</b> - logical pages interpreted for the job.	<b>Counter32(0..2<sup>31</sup>-1)</b>	<b>CM</b>	<b>1</b>	
n) <b>pagesSentToDevice(15)</b> - logical pages sent to the device for the job.	<b>Counter32(0..2<sup>31</sup>-1)</b>	<b>CM</b>	<b>1</b>	
o) <b>pagesCompleted(16)</b> - logical pages completed for the job.	<b>Counter32(0..2<sup>31</sup>-1)</b>	<b>CM</b>	<b>1</b>	
p) <b>pagesCompletedCurrentCopy(17)</b> - logical pages completed on the current copy.	<b>Integer32(0..2<sup>31</sup>-1)</b>	<b>CM</b>	<b>1</b>	
q) <b>processingTime(18)</b> - Processing time so far	<b>Integer32(0..2<sup>31</sup>-1)</b>	<b>M</b>	<b>1</b>	<b>2</b>
r) <b>processingMessage(19)</b> - Processing Messages	<b>OCTET STRING (63)</b>	<b>CM</b>	<b>n</b>	
5. <b>jmResourceName</b> - resource required/usage name	<b>OCTET STRING (63)</b> or <b>Integer32</b>	<b>M</b>	<b>n</b>	
6. <b>jmResourceUnits</b> - resource required/used usage-unit	<b>JMResourceUnits</b>	<b>M</b>	<b>n</b>	
7. <b>jmResourceAmount</b> - resource amount requested/used; -2 - unknown	<b>Integer32</b>	<b>M</b>	<b>n</b>	