Comparison of Job Monitoring MIB implementations with the Job Monitoring MIB objects

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File: ftp://ftp.pwg.org/pub/snmpmib/jobs-mib/mono-map/os2-map.doc .ps

This file contains the mapping of the **OS/2 Warp Print Server and Intelligent Device Framework** to the Job Monitoring MIB objects and attributes. The OS/2 Warp Intelligent Device Framework enables printer companies to "plug in" support for intelligent device protocols below standard APIs that submit, monitor and manage print jobs in a device as well as monitor, configure and manage the device itself. The result is an integrated print solution that provides end-users, administrators and application developers with advanced print functionality in a consistent way regardless of a specific device protocol. For more information on the OS/2 Warp Intelligent Device Framework, please read file **ftp://ftp.pwg.org/pub/jmp/jobs-mib/os2warp-assessment.ps or .pdf or contact the author**. The OS/2 Warp Intelligent Device Framework is referred to as the "Framework" for the remainder of this document. Printer companies who "plug in" support for their intelligent device protocols are called "Service Providers" for the remainder of this document.

The primary objective is for OS/2 Warp to enable Service Providers to "plug in" support in the Framework for intelligent devices that implement the Job MIB. The secondary objective is to enable a third-party to produce a program that monitors jobs on an OS/2 Warp Print Server. With these objectives in mind, each object/attribute in the following tables has one of the following designations:

- **Supported** - The OS/2 Warp Print Server and/or Framework support the object/attribute.
- **Enabled** - No specific support for the object/attribute is required of OS/2 Warp. OS/2 Warp enables Service Providers to support this object/attribute through their "plug in" components for devices that support the Job MIB.
- **Extension** - The OS/2 Warp Team will consider extending the OS/2 Warp Print Server and/or the Framework to support this capability.
- **Not Supported** - Not supported by the OS/2 Warp Print Server nor the Framework.

1. List of objects for the Job Monitoring MIB

1.1 The MIB Instance Group

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

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

jmJobSetGroup (M)	DataType	Obj/attr name	Data type	Notes

jmJobSetGroup (M)	**DataType**	**Obj/attr name**	**Data type**	**Notes**
1. jmJobSetIndex - a running index of Job Set instances supported by this printer or server.	**Integer32 (1..2^31)**	**Enabled**		(1) A Service Provider will interface with the Job MIB in the device to index job sets in response to Framework requests for jobs in the device.

1.2 The General Group

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

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

jmGeneralGroup (G)	**DataType**	**Obj/attr name**	**Data type**	**Notes**
1. jmJobSetIndex - a running index of Job Set instances supported by this printer or server.	**Integer32 (1..2^31)**	**Enabled**		See note (1).
2. **jmGeneralJobCompletedPolicy** - the time in seconds that jobs are kept in the **jmJobTable** and the **jmCompletedTable** after processing	**Integer32 (0..2^31-1)**	**Extension**	**Integer32**	
3. **jmGeneralMaxNumberOfJobs** - the maximum number of job; (-1) means no limit.	**Integer32 (0..2^31-1)**	**Supported**	**Integer16**	The maximum number of jobs the printer can retain information about.
4. jmGeneralCurrentNumberOfJobs - the total number of jobs currently in the Job Table (pending and completed).	**Integer32 (0..2^31-1)**	**Extension**	**Integer32**	Currently, OS/2 supports a query for number of queued jobs and a a query for number of completed jobs.
5. jmGeneralQueuingAlgorithm - the current scheduling algorithm being used or **none** (no queuing is possible)**.**	**JMQueuingAlgorigthm**	**Extension**	**JMQueuing Algorithm**	

1.3 The Queue Group

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

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

jmQueueGroup (Q)	DataType	Obj/attr name	Data type	Notes
1. **jmJobSetIndex** - a running index of Job Set instances supported by this printer or server.	**Integer32 (1..2^31)**	**Enabled**		See note (1).
2. **jmQueueIndex** - a running index of the jobs that have *not* finished processing.	**Integer32 (1..2^31-1)**	**Enabled**		(2) A Service Provider will interface with the Job MIB in the device to index the queue in response to Framework requests for jobs in the device.
3. **jmQueueJobIndex** - the job's identifier generated by the printer or server implementing this JM MIB	**Integer32 (0..2^31-1)**	**Enabled**		(3) A Service Provider will interface with the Job MIB in the device to index a job in response to Framework requests for a job in the device.
4. **jmQueueNumberOfInterveningJobs** - the number of jobs in front of this job	**Integer32 (0..2^31-1)**	**Supported by Server; Extension to Framework**	**Integer16**	Supports job position (1-n).
5. **jmJobPriority** - Job priority	**Integer32 (0..100)**	**Supported by Server; Extension to Framework**	**Integer32 (1-99)**	Valid values are 1-99 with 99 the highest priority.
6. **jmJobProcessAfterTime** - process-after-time	**GeneralizedTime**	**Extension**	**Integer32 Number of seconds since 1/1/70**	Service Provider translates GeneralizedTime to OS/2 value.
7. **jmJobMessageToOperator** - job-message-to-operator from submitting user or device	**OCTET STRING(SIZE(63)**	**Not Supported**		

1.4 The Completed Group

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

1. **jm<u>JobSet</u>Index -** a running index of Job <u>Set</u> instances supported by this printer or server.
2. **jmCompletedIndex** - a running index of the jobs that have finished processing.

jmCompletedGroup (C)	DataType	Obj/attr name	Data type	Notes
1. **jm<u>JobSet</u>Index** - a running index of Job <u>Set</u> instances supported by this printer or server.	**<u>Integer32</u> (1..2^31)**	**Enabled**		See note (1).
2. **jmCompletedIndex** - a running index of the jobs that have finished processing.	**<u>Integer32</u> (<u>1</u>..2^31)**	**Enabled**		(4) A Service Provider will interface with the Job MIB in the device to index the list of completed jobs in response to Framework requests to list completed jobs in the device.
3. **jmJob<u>Index</u>** - the job's identifier generated by the printer or server implementing this JM MIB	**Integer32 (<u>1</u>..)**	**Enabled**		(5) A Service Provider will interface with the Job MIB in the device to return information on completed jobs in response to Framework requests to list completed jobs in the device.

1.5 The Job Group

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

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

jmJobGroup - Identification **(I)**	**DataType**	**Obj/attr name**	**Data type**	**Notes**
1. jmJobSetIndex - a running index of Job Set instances supported by this printer or server.	**Integer32 (1..2^31)**	**Enabled**		See note (1).
2. **jmJobIndex** - the job's identifier generated by the server or printer implementing this JM MIB	**Integer32 (1..2^31-1)**	**Enabled**		See note (2).
3. **jmJobName** - Job name assigned by job ownerwhich is not necessarily unique.	**OCTET STRING(SIZE(63))**	**Supported by Server; Extension to Framework**	**A(48)**	Non-unicode string.
4. jmJobNameId - 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.	**OCTET STRING(SIZE(63))**	**TBD**	**TBD**	The content of this attribute requires further discussion.
5. jmJobNumberId - 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.	**Integer32 (0..2^31-1)**	**Supported**	**Integer32 (1..)**	-1 indicates submitter did not supply a job id. The Print Server maintains the association of the Server's job id with the Printer's job id. **Issue: why is -2 specified?**
6. **jmJobTypes** - Job types (print, fax, scan, etc.) - bit vector to get multiple values in a single object	**JMJobType - enum encoded as bits**	**Extension**	**JMJobType**	Currently, all jobs asserted to be of type "print".

jmJobGroup - Identification **(I)**	**DataType**	**Obj/attr name**	**Data type**	**Notes**
7. **jmJobOwner** - Job owner (User name of the user that originally submitted~~ding~~ print job)	**OCTET STRING(SIZE(63))**	**Supported by Server; Extension to Framework**	**A(21)**	Non-unicode string.
8. **jmJobDeviceNameRequested** - Device name (Device-specific name of device) requested by the submitting user.	**OCTET STRING(SIZE(63))**	**Not Supported**		For pooled printers, the Print Server selects an available printer on which to print each job in the print queue.
9. jmDeviceIndex - 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.	**Integer32 (0..2^31-1)**	**Enabled**		The Print Server tracks the device on which a job is printing but does not use the host resource index of the Printer MIB to identify the device.
10. **jmJobSourceChannel** - Source channel on which the job was submitted (index of channel row in the Printer MIB)	**PrtChannelIndex**	**Enabled**		The Print Server tracks the source channel (e.g. a port such as LPT1) on which a job is submitted but does not use the channel row index of the Printer MIB to identify the channel.
11. **jmJobSubmissionTime** - Date/Time of job submission by job owner	**DateAndTime**	**Supported by Server; Extension to Framework**	**Integer32 Number of seconds since 1/1/70**	Print Server generates for its jobs and printer generates for its jobs. (6) Service Provider translates DateAndTime to OS/2 value.
12. **jmJobComment** - Job comment	**OCTET STRING(SIZE(63))**	**Supported by Server; Extension to Framework**	**A(260)**	Non-unicode string.

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jmJobGroup - Parameters (J)	DataType	Obj/attr name	Data type	Notes
12. jmJobTotalKOctets - total K octets to be processed in the job - rounded up to next higher K	**Integer32 (0..2^31-1)**	**Extension**	**Integer32 (0..)**	Print Server and Framework support total in octets (Integer32)

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jmJobGroup - Status and Accounting (S)	DataType	Obj/attr name	Data type	Notes
13. **jmJobCurrentState** - Job state (**pending**, **processing**, **completed**, etc.)	**JMJobState**	**Completely Supported with Extensions**	**bit-vector16**	Service Provider maps JMJobState to corresponding bit(s) in OS/2.
14. **jmJobStateReasons** - Job state reasons - additional information about the job state: reasons being held, additional completed information such as successful, warnings, or errors.	**OCTET STRING(SIZE(0..63))-bit vector**	**Completely Supported with Extensions**	**bit-vector16**	Service Provider maps bit vector to corresponding bit(s) in OS/2.
15. **jmJobKOctetsCompleted** - K Octets completed - should be rounded down to lower K until completed.	**Integer32 (0..2^31-1)**	**Extension**	**Integer32**	
16. **jmJobStartedProcessingTime** - Date/Time of day job started processing on device	**DateAndTime**	**Extension**	**Integer32 Number of seconds since 1/1/70**	(6) Framework supports total processing time of a job in seconds.
17. **jmJobCompletionTime** - Date/Time of day job finished using the device	**DateAndTime**	**Extension**	**Integer32 Number of seconds since 1/1/70**	See note (6).
18. **jmJobAccountName** - Account Name	**OCTET STRING(SIZE(63))**	**Extension**	**OCTETSTRING(63)**	

1.6 The Resource Group

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

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

jmResourceGroup (R)	DataType	Obj/attr name	Data type	Notes
1. jmJobSetIndex - a running index of Job Set instances supported by this printer or server.	**Integer32**	**Enabled**		See note (1).
2. **jmJobIndex** - the job's current identifier generated by the server or printer implementing this JM MIB	**Integer32 (0..)**	**Enabled**		See note (5).
3. jmResourceIndex - a running index of the resources requested and/or used by the job.	**Integer32**	**Enabled**		(7) A Service Provider will interface with the Job MIB in the device to return information on the resources for a job in response to Framework requests to return the resources for jobs in the device.
4. **jmResourceType** - Resources required/used (table):	**JMResourceType**			
a) **documentName(3) -** Document name(s) (or file-names)	**OCTET STRING(63)**	**Supported by Server; Extension to Framework**	**A(48)**	
b) **jobCopiesRequested(4) -** Number of job copies requested	**Integer32 (0..2^31-1)**	**Supported by Server; Extension to Framework**	**Integer32 (1..)**	(8) Control sent to printer in job data.
c) **jobCopiesProduced(5) -** Number of job copies produced	**Integer32 (0..2^31-1)**	**Extension**	**Integer32**	
d) **documentCopiesRequested(6) -** Number of document copies requested	**Integer32 (0..2^31-1)**	**Not Supported**		(9) OS/2 Warp supports 1 document per job.

jmResourceGroup (R)	DataType	Obj/attr name	Data type	Notes
e) **documentCopiesProduced(7) -** Number of document copies produced	**Integer32 (0..2^31-1)**	**Not Supported**		See note (9).
f) **sides(8) -** Number of sides requested/used (one-sided, two-sided)	**Integer32 (1..2)**	**Supported by Server**	**Integer32**	See note (8).
g) **interpreters(9) -** PDLs requested/used	**PrtInterpreterFamily**	**Supported**	**Integer16**	Service Provider maps PrtInterpreterFamily to OS/2 value.
h) **physicalDevices(10) -** physical devices requested/used	**hrDeviceIndex**	**Enabled**		The Print Server tracks the device on which a job is printing but does not use the host resource index of the Printer MIB to identify the device.
i) **faxPhoneNumber(10) -** FAX phone number requested/used	**OCTET STRING(255)**	**Extension**		A fax printer driver can pass this value to the fax device. The fax device can then store this attribute in its Job MIB. A fax Service Provider can then return this attribute.
j) **impressionsCompleted (11) -** Impressions (sides) completed	**Counter32(0..2^31-1)**	**Supported**	**Integer32**	
k) **sheetsCompleted(12) -** Sheets completed for the job.	**Counter32(0..2^31-1)**	**Supported**	**Integer32**	
l) pagesSpooled(13) - logical pages spooled for the job.	**Counter32(0..2^31-1)**	**Supported by Server**	**Integer32**	(10) Supports physical pages - not logical pages.
m) pagesInterpreted(14) - logical pages intepreted for the job.	**Counter32(0..2^31-1)**	**Extension**	**Integer32**	See note (10).
n) pagesSentToDevice(15) - logical pages sent to the device for the job.	**Counter32(0..2^31-1)**	**Supported by Server**	**Integer32**	See note (10).

jmResourceGroup (R)	DataType	Obj/attr name	Data type	Notes
o) **pagesCompleted(16) -** logical pages completed for the job.	**Counter32(0..2^31-1)**	**Extension**	**Integer32**	See note (10).
p) **pagesCompletedCurrentCopy(17) -** logical pages completed on the current copy.	**Integer32 (0..2^31-1)**	**Extension**	**Integer32**	See note (10).
q) **processingTime(18) -** Processing time so far in seconds.	**Integer32 (0..2^31-1)**	**Supported**	**Integer32**	Processing time in seconds not counting operator intervention time.
r) **processingMessage(19) -** Processing Messages	**OCTET STRING(63)**	**Supported by Server; Extension to Framework**	**A(n)**	Non-unicode string.
5. **jmResourceName** - resource required/usage name	**OCTET STRING(63) or Integer32**	**Enabled**		A Service Provider will interface with the Job MIB in the device to return the name of a resource for a job in response to Framework requests to return the resources for jobs in the device.
6. jmResourceUnits - resource required/used usage-unit	**JMResourceUnits**	**Enabled**		A Service Provider will interface with the Job MIB in the device to return the units of a resource for a job in response to Framework requests to return the resources for jobs in the device.

jmResourceGroup (R)	DataType	Obj/attr name	Data type	Notes
7. jmResourceAmount - resource amount requested/used; -2 - unknown	**Integer32**	**Enabled**		A Service Provider will interface with the Job MIB in the device to return the amount of a resource for a job in response to Framework requests to return the resources for jobs in the device.

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