

1 INTERNET-DRAFT

Ron Bergman
Dataproducts Corp.
January 23, 1998

2
3
4
5
6 Job Submission Protocol Mapping Recommendations
7 for the Job Monitoring MIB

8
9 <draft-bergman-printmib-job-protomap-01.txt>

10
11 Expires July 23, 1998

12
13
14
15 Status of this Memo

16
17 This document is an Internet-Draft. Internet-Drafts are working
18 documents of the Internet Engineering Task Force (IETF), its areas,
19 and its working groups. Note that other groups may also distribute
20 working documents as Internet-Drafts.

21
22 Internet-Drafts are draft documents valid for a maximum of six
23 months and may be updated, replaced, or obsoleted by other
24 documents at any time. It is inappropriate to use Internet-Drafts
25 as reference material or to cite them other than as "work in
26 progress".

27
28 To learn the current status of any Internet-Draft, please check the
29 "lid-abstracts.txt" listing contained in the Internet-Drafts Shadow
30 Directories on ftp.is.co.za (Africa), nic.nordu.net (Europe),
31 munnari.oz.au (Pacific Rim), ds.internic.net (US East Coast), or
32 ftp.isi.edu (US West Coast).

33
34 Abstract

35
36 This Internet-Draft defines the recommended mapping for many
37 currently popular Job submission protocols to objects and
38 attributes in the Job Monitoring MIB.
39

1 TABLE OF CONTENTS
2
3 1.0 INTRODUCTION..... 3
4 2.0 LINE PRINTER DAEMON (LPR/LPD) PROTOCOL..... 4
5 2.1 jmJobSubmissionId Mapped to LPR/LPD..... 4
6 2.2 jmJobIndex Mapped to LPR/LPD..... 5
7 2.3 Other MIB Objects Mapped to LPR/LPD..... 5
8 2.4 The Attribute Group Mapped to LPD..... 5
9 3.0 APPLE TALK PROTOCOL..... 6
10 3.1 jmJobSubmissionId Mapped to AppleTalk..... 6
11 3.2 Other AppleTalk Mappings..... 6
12 4.0 INTERNET PRINTING PROTOCOL (IPP)..... 6
13 4.1 jmJobSubmissionId Mapped to IPP..... 7
14 4.2 jmJobIndex Mapped to IPP..... 7
15 4.3 Other MIB Objects Mapped to IPP..... 7
16 4.4 The Attribute Group Mapped to IPP..... 8
17 5.0 INTELLIGENT PRINTER DATA STREAM (IPDS)..... 8
18 6.0 DOCUMENT PRINTING APPLICATION (DPA)..... 9
19 6.1 jmJobSubmissionId Mapped to DPA..... 9
20 6.2 jmJobIndex Mapped to DPA..... 9
21 6.3 Other MIB Objects Mapped to DPA..... 9
22 6.4 The Attribute Group Mapped to DPA..... 10
23 7.0 NOVELL DISTRIBUTED PRINT SERVICE (NDPS)..... 11
24 7.1 jmJobSubmissionId Mapped to NDPS..... 11
25 7.2 jmJobIndex Mapped to NDPS..... 11
26 7.3 Other MIB Objects Mapped to NDPS..... 11
27 7.4 The Attribute Group Mapped to NDPS..... 12
28 8.0 PRINTER JOB LANGUAGE (PJM)..... 13
29 8.1 jmJobSubmissionId Mapped to PJM..... 13
30 8.2 jmJobIndex Mapped to PJM..... 14
31 8.3 The Attribute Group Mapped to PJM..... 14
32 9.0 POSTSCRIPT..... 15
33 9.1 jmJobSubmissionId Mapped to PostScript..... 15
34 9.2 Other MIB Objects and Attributes Mapped to PostScript..... 15
35 10.0 NETWARE PSERVER..... 15
36 10.1 jmJobSubmissionId Mapped to PServer..... 15
37 10.2 jmJobIndex Mapped to PServer..... 16
38 10.3 The Attribute Group Mapped to PServer..... 16
39 11.0 NETWARE NPRINT or RPRINT..... 16
40 12.0 SERVER MESSAGE BLOCK (SMB) PROTOCOL..... 17
41 12.1 jmJobSubmissionId Mapped to SMB..... 17
42 12.2 jmJobIndex Mapped to SMB..... 17
43 12.3 Other MIB objects Mapped to SMB..... 17
44 13.0 TRANSPORT INDEPENDENT PRINTER/SYSTEM INTERFACE (TIP/SI)..... 18
45 13.1 jmJobSubmissionId Mapped to TIP/SI..... 18
46 13.2 jmJobIndex Mapped to TIP/SI..... 18
47 13.3 Other MIB Objects Mapped to TIP/SI..... 18
48 13.4 The Attribute Group Mapped to TIP/SI..... 18
49 14.0 REFERENCES..... 18
50 15.0 AUTHORS..... 19
51

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52

1.0 INTRODUCTION

The Job Monitoring MIB [JobMIB] is intended to be implemented in a device or server that supports any job submission protocol. However, the information available and the method of presentation varies significantly by job submission protocol. A common method of mapping job submission information to the Job Monitoring MIB is essential for interoperability of Job MIB agents and monitoring applications. This document defines recommended mappings for most popular job submission protocols to insure this compatibility.

All mappings are unidirectional from the job submission protocol to the MIB. It is assumed that support of the job submission protocol in the printer implies that the reverse information flow is presently defined and does not require interaction from the MIB. This mapping is not defined in this document as it should be obvious.

This document refers to system configurations that are defined in the Job Monitoring MIB [JobMIB]. For those readers that are familiar with the configuration descriptions, a short summary appears here. Please see the Job MIB document for further details.

Configuration 1: This is a simple peer-to-peer system which contains only a client and a printer. The Job MIB agent is resident in the printer.

Configuration 2: This system contains a client, server, and a printer. The Job MIB agent is resident in the server.

Configuration 3: This system, as in configuration 2, contains a client, server, and a printer. In this case the Job MIB agent is implemented within the printer.

The most important object to be mapped is jmJobSubmissionID, since this is a method for the user or client to determine the jmJobIndex for a submitted job. Therefore, jmJobSubmissionID is specified for all job submission protocols defined in this document. The remaining objects mapped include only those items that have the equivalent information presented to the printer by the job submission protocol.

While this document places a strong emphasis on jmJobSubmissionID mapping to obtain jmJobIndex, the preferred method is through the use of a bi-directional protocol that returns the value of jmJobIndex to the client, such as IPP. When a bi-directional protocol that returns jmJobIndex is in use, the jmJobSubmissionID object has no value to the client. When the jmJobIndex cannot be returned, the use of a client defined jmJobSubmissionID is preferred over an agent derived value. The client defined version allows for retrieval of jmJobIndex using a single SNMP Get operation, since jmJobSubmissionID is the index into the jmJobIDTable. An agent derived value will require a search through multiple entries in the jmJobIDTable.

1
2 The majority of the protocols mapped in this document are oriented
3 towards network job submission. However, the Job Monitoring MIB is also
4 intended to monitor print jobs received from other than network ports,
5 such as parallel and serial ports. Some of the job submission protocols
6 included that are used with non-networked ports are PJI, PostScript, and
7 TIP/SI. In addition, the Job Monitoring MIB can be used with print jobs
8 that are internally generated, such as self test pages. In this latter
9 case, no mapping is required since all job submission protocols are
10 bypassed.

11 12 13 2.0 LINE PRINTER DAEMON (LPR/LPD) PROTOCOL

14
15 The LPR/LPD printing protocol [LPD] is used with BSD UNIX systems in the
16 client-server-printer configuration. Usage of the Job Monitoring MIB
17 with LPR/LPD will most likely conform to Configuration 3, where the
18 monitor application or the server uses SNMP to obtain job information
19 from the printer. The client communicates with the UNIX server using
20 the existing LPD protocol to obtain job information.

21
22 The LPR/LPD protocol is also used in the Windows environment to
23 implement peer-to-peer printing, as shown in configuration 1. In this
24 case, SNMP is used by the client and/or the monitor application to
25 obtain the job information.

26
27 One of the major problems of LPR/LPD is the large number of vendor
28 unique extensions currently used with the protocol and the resulting
29 compatibility issues between available implementations. To avoid these
30 issues, this mapping of LPR/LPD is restricted to the protocol as defined
31 by RFC 1179.

32
33 The LPR/LPD protocol transfers print job data and control information in
34 separate files, known as the Data File and Control File, respectively.
35 Most of the information concerning the print job is contained in the
36 Control File. In many LPD implementations, the Control File is
37 transferred following the Data File. Thus much of the information
38 concerning the job may not be available until the completion of the data
39 transmission.

40 41 42 2.1 jmJobSubmissionID Mapped to LPR/LPD

43
44 The LPR/LPD Receive Data File command contains a parameter which defines
45 the name of the data file. This name field is structured as follows:

46
47 dfaXXX<host-name> or daXXXX<host-name>

48
49 Where XXX or XXXX is the numeric job number assigned by the LPR/LPD
50 client submitting the print job. The recommended mapping of this name
51 field to jmJobSubmissionID is:

1 octet 1: '9'
 2
 3 octets 2-40: Contains the <host-name> portion of the name field. If
 4 the <host-name> portion is less than 40 octets, the
 5 left-most character in the string shall appear in octet
 6 position 2. Any unused portion of this field shall be
 7 filled with spaces. Otherwise, only the last 39 bytes
 8 shall be included.
 9
 10 octets 41-48: '00000XXX' or '0000XXXX', where XXX or XXXX is the
 11 decimal (ASCII coded) representation of the LPR/LPD
 12 job number.
 13
 14

15 2.2 jmJobIndex Mapped to LPR/LPD

16
 17 The job index (jmJobIndex) is assigned by the SNMP job monitoring agent
 18 and is independent of the XXX (or XXXX) index assigned by the LPR/LPD
 19 client. This will allow the SNMP agent to track jobs received from
 20 multiple sources.
 21

22
 23 2.3 Other MIB Objects Mapped to LPR/LPD

MIB Object	LPR/LPD Parameter
jmJobKOctetsPerCopyRequested	Number of bytes as defined in the Data File
jmJobOwner	Control file command code = P (User Id)

24
 25
 26
 27
 28
 29
 30
 31
 32 2.4 The Attribute Group Mapped to LPD

33
 34 Other attributes that are applicable, but not defined in this section
 35 such as attributes that map to a vendor unique extension, may also be
 36 included.
 37

MIB attribute	LPR/LPD information	Data type
jobName	Name of the data file (note 1)	Octet String
queueNameRequested	Queue name from the Data File	Octet String
fileName	Source File Name (notes 2, 3)	Octet String
documentName	Document title (notes 2, 4)	Octet String

38
 39
 40
 41
 42
 43
 44
 45 Notes:

- 46 -----
 47 1. See section 2.1 (jmJobSubmissionID).
 48 2. The information is optional in the Control File. The attribute
 49 should be included if present in the Control File.
 50 3. Control file command code = N.
 51 4. Control file command code = J.
 52

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51

3.0 APPLE TALK PROTOCOL

AppleTalk was originally developed as a peer-to-peer network protocol, as described in configuration 1, for use with Apple Macintosh computers. Today, print spoolers are also available for use with Macintosh computer networks that conform to configurations 2/3. In addition, printing with the AppleTalk protocol is supported from both Windows NT servers and Novell servers also per configurations 2/3.

The AppleTalk protocol provides very little information that can be used with the Job Monitoring MIB. The Macintosh print drivers are able to provide information concerning the user and document name but imbed this information in the PDL, which is typically PostScript. The preferred jmJobSubmissionID is constructed from the information in the PostScript file, as defined in section 9.0.

3.1 jmJobSubmissionID Mapped to AppleTalk

An alternative jmJobSubmissionID may be constructed from the Connection Identifier contained in the AppleTalk Printer Access Protocol (PAP) header. Since the Connection Id is not readily available in any of the defined AppleTalk implementations, this approach may be of little utility.

octet 1: 'A'

octets 2-40: Contains the AppleTalk printer name, with the first character of the name in octet 2. AppleTalk printer names are a maximum of 31 characters. Any unused portion of this field shall be filled with spaces.

octets 41-48: '00000XXX', where 'XXX' is the decimal (ASCII coded) representation of the Connection Id.

3.2 Other AppleTalk Mappings

No other Job MIB objects or parameters can be derived from information available in the AppleTalk headers

4.0 INTERNET PRINTING PROTOCOL (IPP)

The Internet Printing Protocol [IPP] supports printing using any one of the three possible configurations. For configuration 2, the mapping defined herein is performed on an agent within the server. Otherwise, the mapping is performed on an agent within the printer.

1 4.1 jmJobSubmissionID Mapped to IPP
2

3 IPP contains a rich set of parameters which allow several methods of
4 creating the jmJobSubmissionID object. To prevent interoperability
5 problems, the preferred method is to use the IPP job-uri attribute as
6 follows:

7
8 octet 1: '4'

9
10 octets 2-40: Contains the IPP job-uri job description attribute
11 generated by the printer. (The job-uri is returned to
12 the client by IPP.) If the job-uri is less than 40
13 octets, the left-most character in the string shall
14 appear in octet position 2. Any unused portion of this
15 field shall be filled with spaces. Otherwise, only the
16 last 39 bytes shall be included.

17
18 octets 41-48: Contains the decimal (ASCII coded) representation of
19 the job-id job description attribute. Leading zeros
20 shall be inserted to fill the entire 8 octet field.
21

22
23 4.2 jmJobIndex Mapped to IPP
24

25 The job index (jmJobIndex) assigned by the SNMP job monitoring agent is
26 returned to the client by IPP as the job-id job description attribute.
27 (Since IPP does not require consecutively generated job-ids, the agent
28 may receive jobs from multiple clients and can assign jmJobIndex in an
29 ascending sequence independent of the submitting job client.) The IPP
30 job-id must be restricted to the range of 1 to 99,999,999 (decimal) to
31 allow the value to be properly represented in jmJobSubmissionID.
32

33
34 4.3 Other MIB Objects Mapped to IPP
35

MIB Object	IPP Job attribute
jmJobState	job-state
jmJobStateReasons1	job-state-reasons (note 1)
jmNumberOfInterveningJobs	number-of-intervening-jobs
jmJobKOctetsPerCopyRequested	job-k-octets
jmJobKOctetsProcessed	job-k-octets-processed
jmJobImpressionsPerCopyRequested	job-impressions
jmJobImpressionsCompleted	job-impressions-completed
jmJobOwner	job-originating-user-name

36
37
38
39
40
41
42
43
44
45
46
47 Notes:
48 -----

49 1. jmJobStateReasons1 is a bit map described in one object and three
50 attributes. The IPP condition may change one or more of the bits
51 in one or more of these Job MIB items.
52

1
2 4.4 The Attribute Group Mapped to IPP
3

4 The following mappings are required if the listed IPP job template
5 attribute is provided.

6 MIB attribute	7 IPP job attribute	8 Data type
9 jobStateReasonsN	job-state-reasons (note 3)	Integer
10 jobCodedCharSet	attributes-charset (note 1)	Octet String
11 jobNaturalLanguageTag	attributes-natural-language	Octet String
12 jobURI	job-uri	Octet String
13 jobName	job-name	Octet String
14 physicalDevice	output-device-assigned	Octet String
15 numberOfDocuments	number-of-documents	Integer
16 jobPriority	job-priority	Integer
17 jobHoldUntil	job-hold-until	Octet String
18 sides	sides (note 2)	Integer
19 finishing	finishings	Integer
20 printQualityRequested	print-quality	Integer
21 printerResolutionRequested	printer-resolution	Integer
22 jobCopiesRequested	copies (note 4)	Integer
23 documentCopiesRequested	copies (note 4)	Integer
24 jobCollationType	multiple-document-handling	Integer
25 sheetsRequested	job-media-sheets	Integer
26 sheetsCompleted	job-media-sheets-completed	Integer
27 mediumRequested	media	Octet String
28 jobSubmissionTime	time-at-submission	Integer
29 jobStartedProcessingTime	time-at-processing	Integer
30 jobCompletionTime	time-at-completed	Integer

31
32 Notes:
33 -----

- 34 1. jobCodedCharSet is an enum from the IANA registry which is also
35 used in the Printer MIB. The IPP attributes-charset is the name
36 (MIME preferred name) of the character set.
- 37 2. The Job MIB sides attribute uses the integer values "1" and "2".
38 The IPP sides attribute uses three keywords.
- 39 3. jobStateReasonsN is a bit map described in one object and three
40 attributes. The IPP condition may change one or more of the bits
41 in one or more of these Job MIB items.
- 42 4. The IPP "copies" attribute maps to the Job MIB:
43 (1) jobCopiesRequested when the job has only one document OR
44 IPP "multiple-document-handling" is 'single-valued'
45 (2) documentCopiesRequested, in which case the MIB value is the
46 total number of document copies that the job will produce as a
47 whole.

48
49
50 5.0 INTELLIGENT PRINTER DATA STREAM (IPDS)
51
52

1 6.0 DOCUMENT PRINTING APPLICATION (DPA)
2

3 The ISO 10175 Document Printing Application (DPA) [DPA] supports
4 printing using any one of the three possible configurations. For
5 configuration 2, the mapping defined herein is performed on a server.
6 Otherwise, the mapping is performed on an agent within the printer.
7

8
9 6.1 jmJobSubmissionID Mapped to DPA

10 DPA contains a rich set of parameters which allow several methods of
11 creating the jmJobSubmissionID object. To prevent interoperability
12 problems, the preferred method is to use the DPA job-originating-user
13 attribute as follows:
14

15 octet 1: '0'

16
17 octets 2-40: Contains the DPA job-owner attribute
18 supplied by the submitter. If the job-owner
19 is less than 40 octets, the left-most character in the
20 string shall appear in octet position 2. Any unused
21 portion of this field shall be filled with spaces.
22 Otherwise, only the last 39 bytes shall be included.
23

24 octets 41-48: Contains an 8-digit sequential decimal number.
25
26

27
28 6.2 jmJobIndex Mapped to DPA
29

30 The job index (jmJobIndex) assigned by the SNMP job monitoring agent is
31 returned to the client by DPA as a decimal digit string as the value of
32 the DPA job-identifier attribute. (Since DPA does not require
33 consecutively generated job-identifiers, the agent may receive jobs from
34 multiple clients and can assign the jmJobIndex in an ascending sequence
35 independent of the submitting job client.) The DPA job-identifier must
36 be restricted to the range of 1 to 99,999,999 (decimal) to allow the
37 value to be properly represented in jmJobSubmissionID.
38
39

40 6.3 Other MIB Objects Mapped to DPA
41

MIB Object	DPA Job attribute
jmJobState	job-state
jmJobStateReasons1	job-state-reasons (note 2)
jmNumberOfInterveningJobs	intervening-jobs
jmJobKOctetsPerCopyRequested	total-job-octets (notes 1, 3)
jmJobKOctetsProcessed	job-octets-completed (note 1)
jmJobImpressionsPerCopyRequested	job-impression-count (note 3)
jmJobImpressionsCompleted	impressions-completed
jmJobOwner	job-owner

52

1 Notes:

- 2 -----
- 3 1. jmJobKOctetsPerCopyRequested and jmJobKOctetsProcessed is in K
 - 4 octets while the DPA job-total-octets and job-octets-completed is
 - 5 in octets and is 63-bits of significance.
 - 6 2. jobStateReasonsN is a bit map described in one object and three
 - 7 attributes. The DPA condition may change one or more of the bits
 - 8 in one or more of these Job MIB items. Also the DPA
 - 9 job-state-reasons is a multi-valued attribute with each value being
 - 10 an OBJECT IDENTIFIER (OID).
 - 11 3. DPA octets include the multiplication factor due to job and
 - 12 document copies, while the MIB values do not.

13
14
15 6.4 The Attribute Group Mapped to DPA

16
17 The following mappings are required if the listed DPA job attribute is

18 provided.

19 MIB attribute	20 DPA job attribute	21 IPP Data type
22 jobStateReasonsN	23 job-state-reasons (note 2)	Integer
24 jobCodedCharSet	(note 1)	Octet String
25 jobAccountName	accounting-information	Octet String
26 jobName	job-name	Octet String
27 deviceNameRequested	printer-name-requested	Octet String
28 physicalDevice	printers-assigned	Octet String
29 numberOfDocuments	number-of-documents	Integer
30 fileName	file-name	Octet String
31 documentName	document-name	Octet String
32 jobComment	job-comment	Octet String
33 documentFormat	document-format	Octet String
34 jobPriority	job-priority	Integer
35 jobProcessAfterDateAndTime	job-print-after	Octet String
36 outputBin	results-profile.output-bin	Octet String
37 sides	sides (note 3)	Integer
38 finishing	job-finishing, finishing	Integer
39 printQualityRequested	print-quality	Integer
40 printerResolutionRequested	default-printer-resolution	Integer
41 jobCopiesRequested	(note 4)	
42 jobCopiesCompleted	results-profile.job-copies	Integer
43 documentCopiesRequested	job-copies-completed	Integer
44 documentCopiesCompleted	copy-count (note 5)	Integer
45 sheetsRequested	copies-completed (note 6)	Integer
46 sheetsCompleted	job-media-sheet-count	Integer
47 pagesRequested	job-media-sheets-completed	Integer
48 pagesCompleted	job-page-count	Integer
49 mediumRequested	pages-completed	Integer
50	page-media-select,	Octet String
51 jobSubmissionTime	default-medium	
52 jobStartedProcessingTime	submission-time (note 7)	Octet String
	started-printing-time (note 7)	Octet String

1 jobCompletionTime | completion-time (note 7) | Octet String

2
3 Notes:
4 -----

- 5 1. Every DPA attribute is tagged indicating the coded character set
- 6 to be used for that attribute.
- 7 2. jobStateReasonsN is a bit map described in one object and three
- 8 attributes. The DPA condition may change one or more of the bits
- 9 in one or more of these Job MIB items. Also the DPA
- 10 job-state-reasons is a multi-valued attribute with each value being
- 11 an OBJECT IDENTIFIER (OID).
- 12 3. The Job MIB sides attribute is an integer '1' or '2' while the DPA
- 13 sides attribute has one of six OID values that includes plex.
- 14 4. printerResolutionRequested has x and y resolution and is intended
- 15 to override the resolution instruction in the document, if any,
- 16 while the DPA default-printer-resolution is the same in x and y and
- 17 only takes effect if the document does not contain a resolution
- 18 instruction
- 19 5. The DPA "copy-count" attribute is a per-document attribute, so the
- 20 MIB value is the sum of the documents' "copy-count" values times
- 21 the job's "results-profile.job-copies" value.
- 22 6. The DPA "copies-completed" attribute is a per-document attribute,
- 23 so the MIB value is the sum of the documents' "copies-completed"
- 24 values times the job's "results-profile.job-copies" value.
- 25 7. The DPA GeneralizedTime data type is defined by ISO 8824
- 26 (ISO-8824) while the MIB DateAndTime is defined by SNMPv2-TC.
- 27

28 7.0 NOVELL DISTRIBUTED PRINT SERVICE (NDPS)

29
30 Novell Distributed Print Services is a DPA based job submission protocol
31 that conforms to configuration 3.

32 33 34 7.1 jmJobSubmissionID Mapped to NDPS

35
36 NDPS supports the generation of a properly formatted jmJobSubmissionID
37 for use in the Job MIB, via the attribute ndps-att-job-identifier.

38
39 ISSUE: Is this the proper NDPS attribute or should the attribute ndps-
40 att-identifier-on-client or ndps-att-new-job-identifier to be used?

41 42 43 7.2 jmJobIndex Mapped to NDPS

44
45 NDPS defines the attribute ndps-att-job-identifier-on-printer that can
46 be used to return the value of jmJobIndex to the NDPS client.

47 48 49 7.3 Other MIB Objects Mapped to NDPS

50

MIB Object	NDPS Parameter
jmJobState	ndps-att-current-job-state (note 1)
jmJobStateReasons1	ndps-att-job-state-reasons (note 2)
jmNumberOfInterveningJobs	ndps-att-intervening-jobs
jmJobKOctetsPerCopyRequested	ndps-att-total-job-octets (notes 3, 4)
jmJobKOctetsProcessed	ndps-att-octets-completed (note 3)
jmJobImpressionsPerCopyRequested	ndps-att-job-impressions-count
jmJobImpressionsCompleted	ndps-att-impressions-completed
jmJobOwner	ndps-att-job-owner (note 5)

Notes:

1. Some of the NDPS job states must be represented by both a jmJobState and a jmJobStateReasons1 object or a jobStateReasonsN attribute.
2. The NDPS job state reasons may be mapped to either the object jmJobStateReasons1 or the attribute jobStateReasonsN.
3. jmJobKOctetsPerCopyRequested and jmJobKOctetsProcessed is in K octets while the NDPS ndps-att-job-total-octets and ndps-att-job-octets-completed is in octets and is 63-bits of significance.
4. NDPS octets include the multiplication factor due to job and document copies, while the MIB values do not.
5. The Job MIB object must be multiplied by the attribute jobCopiesRequested to obtain the NDPS attribute value, if multiple copies have been requested.

7.4 The Attribute Group Mapped to NDPS

The following mappings are required if the listed PJI attribute or command option is provided.

MIB attribute	NDPS parameter	Data type
jobAccountName	ndps-att-job-owner	Octet String
jobName	ndps-att-job-name	Octet String
jobOriginatingHost	ndps-att-job-originator	Octet String
deviceNameRequested	ndps-att-printer-name-- requested	Octet String
numberOfDocuments	ndps-att-number-of-documents	Integer
fileName	ndps-att-document-file-name	Octet String
documentName	ndps-att-document-name	Octet String
jobComment	ndps-att-job-comment	Octet String
documentFormatIndex	ndps-att-prtInterpreterIndex	Integer
documentFormat	ndps-att-document-format	Integer
jobPriority	ndps-att-job-priority	Integer
jobProcessAfterDateAndTime	ndps-att-job-print-after	Octet String
outputBin	ndps-att-results-profile (note 1)	Integer

1	sides	ndps-att-sides (note 2)	Integer
2	finishing	ndps-att-job-finishing	Integer
3	printQualityRequested	ndps-att-print-quality	Integer
4	printerResolutionRequested	ndps-att-default-printer-- resolution (note 3)	Integer
5	printerResolutionUsed	ndps-att-default-resolutions-- used	Integer
6	jobCopiesRequested	ndps-att-results-profile (note 4)	Integer
7	jobCopiesCompleted	ndps-att-job-copies-completed	Integer
8	documentCopiesRequested	ndps-att-copy-count	Integer
9	documentCopiesCompleted	ndps-att-copies-completed (note 3)	Integer
10	sheetsRequested	ndps-att-job-media-- sheet-count	Integer
11	sheetsCompleted	ndps-att-media-sheets-- completed	Integer
12	mediumConsumed	ndps-att-media-used	Integer
13	jobSubmissionToServerTime	ndps-att-submission-time	Octet String
14	jobSubmissionTime	ndps-att-started-printing-time	Octet String
15	jobCompletionTime	ndps-att-completion-time	Octet String

22 Notes:

- 23 -----
- 24 1. The output-bin field in ndps-att-results-profile is to be used.
 - 25 2. The Job MIB sides attribute is an integer '1' or '2' while the NDPS
 - 26 sides attribute has one of six OID values that includes plex.
 - 27 3. printerResolutionRequested has x and y resolution and is intended
 - 28 to override the resolution instruction in the document, if any,
 - 29 while the ndps-att-default-printer-resolution is the same in x and
 - 30 y and only takes effect if the document does not contain a
 - 31 resolution instruction
 - 32 4. The job-copies field in ndps-att-results-profile is to be used.

35 8.0 PRINTER JOB LANGUAGE (PJL)

36
37 PJL [PJL] has been developed by Hewlett-Packard to provide job control
38 information to the printer and status information to applications,
39 independent of the PDL.

42 8.1 jmJobSubmissionID Mapped to PJL

43
44 PJL has defined the SUBMISSIONID option for the JOB command which
45 indicates a properly formatted jmJobSubmissionID for use in the Job MIB.
46 The PJL JOB command is presented at the start of a print job with
47 options that apply only the attached job. The syntax for this command
48 option is:

49 @PJL JOB SUBMISSIONID = "id string"

51

1 Driver software that implements this PJL command option must provide the
 2 "id string" in one of the client version formats specified in the Job
 3 MIB for jmJobSubmissionID.

4
 5 For drivers that are not able to create the SUBMISSIONID option, it is
 6 recommended that jmJobSubmissionID format 0 be created by the agent
 7 using the PJL attribute DocOwner or DocOwnerId.

8
 9 octet 1: '0'

10
 11 octets 2-40: Contains the string associated with DocOwner or
 12 DocOwnerId. If the string is less than 40 octets, the
 13 left-most character in the string shall appear in octet
 14 position 2. Otherwise, only the last 39 bytes shall be
 15 included. Any unused portion of this field shall be
 16 filled with spaces. If DocOwner or DocOwnerId cannot be
 17 obtained, this field shall be blank.

18
 19 octets 41-48: Contains the value of jmJobIndex associated with the
 20 job. Leading zeros shall be inserted to fill the
 21 entire 8 octet field.

22
 23
 24 8.2 jmJobIndex Mapped to PJL

25
 26 PJL does not provide a value that can be mapped to jmJobIndex.

27
 28
 29 8.3 Other MIB Objects Mapped to PJL

30
 31 MIB Object | PJL Job attribute
 32 -----+-----
 33 jobOwner | DocOwner or DocOwnerId attribute

34
 35
 36 8.4 The Attribute Group Mapped to PJL

37
 38 The following mappings are required if the listed PJL attribute or
 39 command option is provided.

40
 41 MIB attribute | PJL attribute or command option | Data type
 42 -----+-----+-----
 43 serverAssignedJobName | DocName attribute or the command | Octet String
 44 | @PJL JOB Name = "string" | Octet String
 45 submittingServerName | SrcServerName attribute | Octet String
 46 jobOriginatingHost | SrcPort attribute | Octet String
 47 queueNameRequested | SrcQ attribute | Octet String
 48 fileName | JobFName attribute | Octet String
 49 jobComment | JobDesc attribute | Octet String
 50 jobSubmissionTime | TimeSubmit attribute | Octet String

51
 52

1 9.0 POSTSCRIPT

2

3 The PostScript PDL permits comment fields which can be used by
4 application drivers to include job information. Although there are no
5 restrictions or requirements as to what information may be included,
6 many drivers include job owner and/or document name.

7

8

9 9.1 jmJobSubmissionID Mapped to PostScript

10

11 The use of a standard format job submission id comment string will allow
12 interoperability of printers and drivers from multiple vendors. The
13 following comment string format is recommended for use with PostScript
14 level 1 and level 2 data streams.

15

```
16     %%JMPJobSubmissionId:(id-string)
```

17

18 where "id string" can be any jmJobSubmissionID format reserved for
19 clients.

20

21 9.2 Other MIB Objects and Attributes Mapped to PostScript

22

23 No Other mappings from PostScript comment strings are recommended, but
24 many Job MIB objects and attributes can be defined using vendor unique
25 comment strings.

26

27

28

29 10.0 NETWARE PSERVER

30

31 The NetWare PServer job submission protocol is implemented in a client-
32 server-printer system on the server to printer link as defined in
33 configuration 3.

34

35

36 10.1 jmJobSubmissionID Mapped to PServer

37

```
38     octet 1:    'B'
```

39

40

```
41     octets 2-40: Contains the Directory Path Name of the agent as  
42                   recorded by the Novell File Server in the queue  
43                   directory. If the string is less than 40 octets, the  
44                   left-most character in the string shall appear in octet  
45                   position 2. Otherwise, only the last 39 bytes shall be  
46                   included. Any unused portion of this field shall be  
47                   filled with spaces.
```

48

```
49     octets 41-48: '000XXXXX' The decimal (ASCII coded) representation of  
50                   the Job Number as per the NetWare File Server Queue  
51                   Management Services.
```

52

1
2 10.2 jmJobIndex Mapped to PServer
3

4 The job index (jmJobIndex) is assigned by the SNMP job monitoring agent
5 and is independent of the Job Number assigned by the NetWare File Server
6 Queue Management Services. This will allow the SNMP agent to track jobs
7 received from multiple sources.
8
9

10 10.3 Other MIB Objects Mapped to PjL

MIB Object	PServer Job attribute	
jobOwner	Client Id Number	Octet String

16
17 10.4 The Attribute Group Mapped to PServer

18
19 The following mappings are required if the listed PServer parameter is
20 provided in the Novell File Server queue directory.
21

MIB attribute	PServer parameter	Data type
serverAssignedJobName	Job File Name	Octet String
queueNameRequested	Queue Id	Integer
physicalDevice	Server Id Number	Integer
jobComment	Job Description	Octet String
jobPriority	(note 1)	Integer
jobProcessAfterDateAndTime	Target Execution Time	Octet String
jobCopiesRequested	Number of Copies	Integer
mediumRequested	Form Name	Octet String
jobSubmissionToServerTime	Job Entry Time	Octet String

33
34 Notes:

- 35 -----
36 1. The job priority is determined by the priority assigned to the queue
37 that contains the job. Each queue can be assigned a unique priority
38 and the priority of the job is inherited from the queue.
39
40

41 11.0 NETWARE NPrinter or RPrinter

42
43 The NetWare NPrinter/RPrinter protocol was designed to transfer print
44 data from a Novell File Server to a printer attached directly to a local
45 port (e.g. parallel or serial) on a PC. NPrinter/RPrinter is an
46 extremely lightweight printing protocol. Consequently, no information
47 required by the Job Monitoring MIB is provided and a meaningful
48 jmJobSubmissionID cannot be generated.
49

50 It is recommended that an additional job submission layer, such as PjL
51 or another vendor private protocol, be included on top of
52 NPrinter/RPrinter to provide the required information. The mapping

1 should then be performed according to the recommendations of the higher
 2 layer submission protocol.

3
 4
 5 12.0 SERVER MESSAGE BLOCK (SMB) PROTOCOL
 6

7 The Server Message Block protocol is used with several PC Network
 8 operating systems, such as Microsoft Windows for Workgroups, IBM LAN
 9 Server, and Artisoft Lantastic. SMB systems supporting the Job
 10 Monitoring MIB will conform to either configuration 1 or 3.

11
 12
 13 12.1 jmJobSubmissionID Mapped to SMB
 14

15 octet 1: 'C'
 16
 17 octets 2-40: Contains a decimal (ASCII coded) representation of the
 18 16 bit SMB Tree Id field, which uniquely identifies the
 19 connection that submitted the job to the printer. The
 20 most significant digit of the numeric string shall be
 21 placed in octet position 2. All unused portions of this
 22 field shall be filled with spaces. The SMB Tree Id has
 23 a maximum value of 65,535.
 24

25 octets 41-48: Contains a decimal (ASCII coded) representation of the
 26 File Handle returned from the printer agent to the
 27 client in response to a Create Print File command.
 28 Leading zeros shall be inserted to fill the entire 8
 29 octet field.
 30
 31

32 12.2 jmJobIndex Mapped to SMB
 33

34 It is strongly recommended that the File Handle returned from the
 35 printer agent be identical to jmJobIndex. If these items are identical,
 36 there is no need for the client application to perform a search on
 37 jmJobSubmissionID. To be compatible with the 16 bit field allocated to
 38 this value by SMB, the maximum jmJobIndex is 65,535.
 39
 40

41 12.3 Other MIB objects Mapped to SMB
 42

MIB Object	SMB Parameter
jmJobOwner	SMB User Id field (note 1)

43
 44
 45
 46
 47 Notes:
 48 -----

49 1. A decimal (ASCII coded) representation of the SMB User Id numeric
 50 shall be presented as jmJobOwner.
 51
 52

1 13.0 TRANSPORT INDEPENDENT PRINTER/SYSTEM INTERFACE (TIP/SI)

2
3 The TIP/SI protocol, although currently specified as a part of the IEEE
4 1284 parallel port standards [TIP/SI], was originally developed as a
5 network protocol. TIP/SI thus has the potential of being integrated
6 into any network or non-network configuration.

7
8 13.1 jmJobSubmissionID Mapped to TIP/SI

9
10 octet 1: 'D'
11
12 octets 2-40: Contains the Job Name from the Job Control-Start Job
13 (JC-SJ) command. If the Job Name portion is less than
14 40 octets, the left-most character in the string shall
15 appear in octet position 2. Any unused portion of this
16 field shall be filled with spaces. Otherwise, only the
17 last 39 bytes shall be included.
18
19
20 octets 41-48: Contains a decimal (ASCII coded) representation of the
21 jmJobIndex assigned by the agent. Leading zeros shall
22 be inserted to fill the entire 8 octet field.

23
24 13.2 jmJobIndex Mapped to TIP/SI

25
26 jmJobIndex is returned to the client as the Printer Assigned Job Id in a
27 Job Control-Start Job (JC-SJ) response packet. To be compatible with
28 the 16 bit field allocated to this value by TIP/SI, the maximum
29 jmJobIndex is 65,535.

30
31
32 13.3 Other MIB Objects Mapped to TIP/SI

33

MIB Object	TIP/SI Parameter
jmJobOwner	User string

34
35
36
37
38
39 13.4 The Attribute Group Mapped to TIP/SI

40

MIB attribute	TIP/SI information	Data type
jobName	Job Name string	Octet String
jobComment	Additional Information string	Octet String

41
42
43
44
45
46
47 14.0 REFERENCES

48
49 [DPA] ISO/IEC 10175-1:1996(E), "Information technology - Text and
50 office systems - Document Printing Application (DPA) - Part 1: Abstract
51 service definition and procedures", JTCl/SC18.

52

1 [IPP] The Internet Printing Protocol RFC XXXX, Model RFC XXXX
2
3 [ISO-8824] ISO/IEC 8824:1990, "Information technology - Open Systems
4 Interconnection - Specification of Abstract Syntax Notation (ASN.1)".
5
6 [JobMIB] The Job Monitoring MIB, work in progress, <draft-ietf-
7 printmib-job-monitoring-07.txt>, to be published as an Informational RFC
8 as a Printer Working Group (PWG) standard.
9
10 [LPD] Line Printer Daemon Protocol, RFC 1179, IETF informational
11 document.
12
13 [PJL] Printer Job Language Technical Reference Manual, Hewlett-Packard
14 part number 5021-0328.
15
16 [PrtMIB] The Printer MIB, RFC 1759, IETF standards track document.
17
18 [TIP/SI] IEEE Standard 1284.1, Transport Independent Printer/System
19 Interface.
20
21

22 15.0 AUTHORS

23
24 This document was created with significant contributions from the
25 following individuals.
26

27 Ron Bergman (Editor)
28 Dataproducts Corp.
29 1757 Tapo Canyon Road
30 Simi Valley, CA 93063-3394
31

32 Phone: 805-578-4421
33 Fax: 805-578-4001
34 Email: rbergman@dpc.com
35

36
37 Tom Hastings
38 Xerox Corporation, ESAE-231
39 701 S. Aviation Blvd.
40 El Segundo, CA 90245
41

42 Phone: 310-333-6413
43 Fax: 310-333-5514
44 EMail: hastings@cpl0.es.xerox.com
45

46
47 Scott A. Isaacson
48 Novell, Inc.
49 122 E 1700 S
50 Provo, UT 84606
51
52 Phone: 801-861-7366

1 Fax: 801-861-4025
2 EMail: scott_isaacson@novell.com
3
4

5 Harry Lewis
6 IBM Corporation
7 6300 Diagonal Hwy
8 Boulder, CO 80301
9

10 Phone: (303) 924-5337
11 Fax: (303) 924-4662
12 Email: harryl@us.ibm.com
13
14

15 Bob Pentecost
16 Hewlett-Packard Corporation
17 11311 Chinden Boulevard
18 Boise, ID 83714
19

20 Phone: (208) 396-3312
21 Fax: (208) 396-4122
22 Email: bpenteco@boi.hp.com
23
24

25 Send comments to the printmib WG using the Job Monitoring Project
26 (JMP) Mailing List: jmp@pwg.org
27

28 For further information, access the PWG web page under "JMP":
29 <http://www.pwg.org/>
30
31

32 Other Participants:
33

34 Chuck Adams - Tektronix
35 Keith Carter - IBM Corporation
36 Angelo Caruso - Xerox
37 Jeff Copeland - QMS
38 Andy Davidson - Tektronix
39 Mabry Dozier - QMS
40 Lee Ferrel - Canon
41 David Kellerman - Northlake Software
42 Rick Landau - Digital
43 Jay Martin - Underscore
44 Ira McDonald - Xerox
45 Stuart Rowley - Kyocera
46 Bob Setterbo - Adobe
47 Gail Songer - EFI
48 Mike Timperman - Lexmark
49 William Wagner - DPI/Osicom
50 Chris Wellens - Interworking Labs
51 Rob Whittle - Novell
52 Don Wright - Lexmark

1 Lloyd Young - Lexmark
2