

1 Subj: Mappings of Job Submission attributes to JMP objects/attributes  
 2 From: Tom Hastings  
 3 Date: 06/29/96  
 4 Verson: 0.2  
 5 File: ftp://ftp.external.hp.com/snmpmib/jobs-mib/protomap/protomap.doc .ps  
 6 Status: Collection of mappings produced by JMP members. Moved up IDPS two rows.  
 7

8 **1. Mapping Job Protocol parameters to JMP objects/attributes**

9 At the May 23 JMP meeting we agreed to the following action item:

10 . **ACTION ITEM (*responsible persons indicated below*):** Map the brainstorming  
 11 information objects/attributes to their assigned job submission protocol, so that we  
 12 can weed out information objects that do not have wide support in job submission  
 13 protocols.

14 There is a total of 69 objects/attributes from the above brainstorming. Several members  
 15 expressed concern over the large number of JMP objects/attributes. There was concern  
 16 expressed about the size of the Printer MIB; that it was too big and has two many  
 17 mandatory information objects. On the other hand, the IETF does not like having very  
 18 many OPTIONAL groups either. There was agreement that we need to reduce the  
 19 number of objects/attributes by at least half for JMP.  
 20

21 This file is the analysis of the mappings from various job submission protocols and the list  
 22 we brainstormed at the last JMP meeting, 5/23/96. Each job submission protocol was  
 23 assigned to a member of the JMP as follows:  
 24

Job Submission Protocol	file name	Responsible person
1. AppleTalk PAP	applepap.doc	Ron Bergman
2. IPDS	ipds.doc	Harry Lewis
3. ISO DPA	iso-dpa.doc	Tom Hastings
4. LPR/LPD - RFC 1179, PSIS extensions	lpr-lpd.doc	Ron Bergman
5. NDPS	ndps.doc	Craig Whittle
6. PJL	pjl.doc	Binnur Al-Kazily
7. PSERVER	pserver.doc	Craig Whittle
8. RPRINTER	rprinter.doc	Craig Whittle
9. SMB	smb.doc	Bob Setterbo
10. PostScript	ps.doc	Bob Setterbo
11. TIPS/NPAP	tipsi.doc	Don Wright

25 **2. Object/Attribute Categories**

26 We brainstormed information objects/attributes in the following categories for the JMP. No attempt was made to prune out  
 27 objects/attributes. No attempt was made to weed out duplicates. No attempt was made to quash bad ideas or to get agreement on any  
 28 of these.

29 The object/attributes are divided into the following categories:

- 30 1. Job Identification
- 31 2. Job Status
- 32 3. Job Parameters
- 33 4. Accounting

34 **3. The mappings**

35 The following table is the combination of the mappings from some common page description language to the attributes/objects that we  
 36 brainstormed at the last meeting.

37

<b>Job Identification</b>	<b>ISO DPA</b>	<b>Apple PAP</b>	<b>IPDS</b>	<b>LPR-LPD</b>	<b>NDPS</b>	<b>PJL</b>	<b>PSERVER</b>	<b>SMB</b>	<b>TIPSI</b>
1. Job id on client	job-client-id	Connection Identifier		Name of Data File	ndps-att-job-client-id	-	QMS Job Id Job Number	USHORT FID (File handle)	<i>JC-SJ:Job Name String</i>

Mappings from Job Submission Protocols to JMP objects/attributes

2. Job id on printer	job-identifier-on-printer	Define Group Boundary Group ID Triplet Format is platform dependent: MVS - 8 character EBCDIC job name VM - 8 character EBCDIC job name VSE - 8 character EBCDIC job name AIX - variable length ASCII file name.	ndps-att-job-identifier	See Job ID Info	QMS Job Id Job Number	-	<b>JC-SJ:Printer Assigned Job ID</b>
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Mappings from Job Submission Protocols to JMP objects/attributes

3. Job id on intermediate server(s) - focus on main scheduling server	job-identifier-on-client		Server and Platform dependent. Managed by Print Services Facility	Job Number / Queue Name	ndps-att-job-identifier-on-printer ndps-att-new-job-identifier	See Job ID Info		USHORT FID	-
4. Job type (print, fax, scan, etc.)	-		Specify Group Operations Command - 1. Print 2. Microfilm 3. etc.		ndps-att-job-	-		USHORT Mode (0 - text mode , 1- graphics mode)	-
5. Name of client node	-		-	Host Name	<in Printer Agent BIND operation>	-	Client Station Client Task		-

Mappings from Job Submission Protocols to JMP objects/attributes

6. Name of submitting end user	job-originator		-	User Identification (Control file)	ndps-job-originator	-		STRING IdentifierString[]	<i>JC-SJ:Host String</i>
7. Job owner	job-owner	Embedded in job by application	DGB Group ID		ndps-att-job-owner	-	Client ID	maybe IdentifierString	<i>JC-SJ:User String</i>
8. Name of source port/channel	-	DDP Source Socket	-	TCP port number	<in Printer Agent BIND operation>	-		-	-
9. Domain of name of source port/channel	-		-		<NDS context of originator>	-		-	-
10. Source port/channel type	-	AppleTalk PAP	-	lpd		-		-	<b>JC-SJ:Printer Assigned Data Channel</b>
11. Job name assigned by end-user	job-name		DGB Group ID		ndps-att-job-name	@PJL JOB NAME="job name"	Header File Name	-	-

Mappings from Job Submission Protocols to JMP objects/attributes

12. Submitting application name	-		-		ndps-document-comment	-		-	-
13. Document name(s)	document-name	Embedded in job by application	DGB Group ID	Title (Control File)	ndps-document-name	-	Directory Path	-	(Note 1)
14. Document file name(s)	document-file-name		Sometimes coded as DGB Job Name	Name of Source File (Control File)	ndps-document-file-name	-	Job File Name	-	(Note 1)
15. Time of job submission	submission-time		-		ndps-att-job-submission-time	-	Job Entry Time	SMB_DATE FileDate , SMB_TIME FileTime	-

Mappings from Job Submission Protocols to JMP objects/attributes

16. Job comment	job-comment		-		ndps-job-start-message ndps-job-end-message ndps-job-comment	@PJL COMMENTS remark	Job Description Text	-	JC-SJ:Additional Information String
17. Printer-specific id of printer	printer-name		* DGB Group Information Triplet		ndps-att-job-identifier	-		-	PCC-RPI: Printer ID
<b>Job Status</b>									
1. Job state (held, pending, executing, completed, etc.)	current-job-state	PostScript Status	-	** Implementation dependent	ndps-att-current-job-state	Status on EOJ == # Pages completed .		See UCHAR	JC-QQA:Queued or Active Job Status
2. Physical device(s) being used	printers-assigned		-		ndps-printers-assigned	-	Server Station Server Task Server ID	-	JC-QQA:Queued or Active Logical Unit

Mappings from Job Submission Protocols to JMP objects/attributes

<p>3. Job state reasons - additional information about the job state: reasons being held, additional executing information such as device(s) needs attention, additional completed information such as successful, warnings, or errors.</p>	<p>job-state-reasons</p>		<p>Robust set of NACKS correlated to specific commands in Job (see Spec).</p>		<p>ndps-att-job-state-reasons</p>	<p>See USTATU S Info:</p>		<p>-</p>	<p><b>JC-QQA:Queue d or Active Job Processing Position, JC-QQA:Queue d or Active Job Suspension Position</b></p>
<p>4. Percent complete</p>	<p>compute from octets-completed and total-job-octets</p>		<p>-</p>		<p>ndps-att-octet-complete</p>	<p>-</p>		<p>-</p>	<p>-</p>
<p>5. (Logical) Pages executed so far</p>	<p>pages-completed</p>		<p>IPDS page counters (requested via ARQ command).</p>		<p>ndps-att-pages-complete</p>	<p>-</p>		<p>-</p>	<p>-</p>



Mappings from Job Submission Protocols to JMP objects/attributes

6. Impressions (sides) executed so far	impressions-completed		-		ndps-att-impressions-completed	@PJL USTATUS PAGE = ON		-	-
7. Sheets executed so far	media-sheets-completed		-		ndps-att-media-sheets-completed	-		-	-
8. Processing time used so far	processing-time		-		ndps-att-processing-time	-		-	-
9. Time of day received by intermediate	-		-		ndps-att-job-submission-time	-		SMB_DATE FileDate , SMB_TIME FileTime	-
10. Time of day sent from intermediate	-		-			-		-	-
11. Time of day received by printer			-			-		-	-

Mappings from Job Submission Protocols to JMP objects/attributes

12. Time of day job started processing on printer	started-printing-time		-		ndsp-att-job-started-printing-time	-		-	<b>JCA-EOJ:Date/Time Job Started</b>
<b>Job Parameters</b>		<b>All PostScript Parameters used</b>				<b>@PJL SET</b>			
1. Number of copies requested	job-copies		-		ndps-att-copy-count	@PJL SET COPIES = { 1 ... 999 }	Number of Copies	-	-
2. Upper limit on processing time	job-abort-criteria=processing-time= <i>threshold</i>		-			-		-	-
3. Upper limit on number of pages	job-abort-criteria=page-completed= <i>threshold</i>		-			@PJL JOB START= <i>first page</i> END= <i>last page</i>		-	-

Mappings from Job Submission Protocols to JMP objects/attributes

4. Media requested	page-medium-select?, default-medium? media-used?		OPC Media ID map		ndps-att-media-used	@PJL SET MEDIATYPE= @PJL SET PAPER= { LETTER   LEGAL   A4  ...  CUSTOM }	Job Number Form Name	-	<i>PVC- SPV:prtInput DefaultIndex</i>
5. Media path requested (one-sided, two-sided, LEF, SEF)	sides		LCC		ndsp-att-content-orientation ndps-att-plex	See SET DUPLEX		-	<i>PVC- SPV:prtMediaPathDefault Index</i>
6. PDLs requested	document-format		-	Available in Control File (application dependent)	ndps-att-document-format	@PJL SET PERSONALITY= { AUTO   PCL   POSTSCRIPT   ...}		-	<i>JC- SL:Logical Unit Number</i>
7. Job priority	job-priority		-		ndps-att-job-priority	-		-	<i>JC- SS:Requested Priority</i>

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8. Deadline time	deadline-time		-		ndps-att-job-deadline-time	-	Target Execution Time	-	-
9. Discard (expiration) time	discard-time		-		ndsp-att-job-discard-time	-		-	-
10. Color requested	-		-		ndps-job-finishing	@PJL SET RENDER MODE		-	-
11. Stapling requested	job-finishing		-		ndps-job-finishing	-		-	-
12. Finishing requested	job-finishing		SMM		ndps-job-finishing	-		-	-
13. Resolution requested	default-printer-resolution?		-		ndps-job-finishing	@PJL SET RESOLUTION= { 300   600 }		-	-
14. Fonts required/requested	default-font?, fonts-used?		LFC, AR, LFE			-		-	-
15. Forms required/requested	default-resources?, resources-used?		DGB Group ID			-		-	-

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16. Destination (including phone numbers for FAX, logical printers for printing)	printer-name-requested		LCC Media Destination			@PJL SET OUTBIN = { UPPER   LOWER   OPTION ALOUTP UTBIN1..62 }		-	-
17. Class requested (administrator-defined)	??		DGB Group ID			-		-	-
<b>Accounting</b>		<b>Not available per job</b>		<b>Not supported (no concept in lpd)</b>					
1. Accounting User Name	user-name		-		ndps-job-originator-	-		-	<b>JCA-EOJ: User String</b>
2. Account Name	accounting-information		-		ndps-att-accounting-information	-		-	<b>JCA-EOJ: Additional Information String</b>

Mappings from Job Submission Protocols to JMP objects/attributes

3. (Logical) pages completed	pages-completed		IPDS page counters (requested via ARQ command).		ndps-att-job-page-count	-		-	<b>JC-QJC: Counter Units</b>
4. Impressions completed	impressions-completed		-		ndps-att-job-impression-count	See Job Pages Info		-	<b>JC-QJC: Impressions</b>
5. Sheets completed	media-sheets-completed		-		ndps-att-job-media-sheet-count	-		-	<b>JC-QJC: Sheets</b>
6. Simplex sheets completed	compute: 2*media-sheets-completed - pages-completed		-			-		-	compute from impressions/sheets

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7. Duplex sheets completed	compute: pages- completed - media- sheets- completed		-			-		-	compute from impressions/s heets
8. Octets completed	octets- completed		-		ndps- att- octet- comple t e	-		-	<b>JC-QQA: Job Size</b>
9. Processing time completed	processing- time		-		ndps- att- processi ng-time	-		-	<b>JCA- EOJ:Processi ng Time</b> or <b>JC-QJC: Processing Time</b>
10. Consumable consumed	-		-			-		-	<b>JCA-EOJ</b> or <b>JC-QJC: (Multiple Objects)</b>
11. Media types consumed (paper trays selected)	-		-			-		-	<b>JCA-EOJ</b> or <b>JC-QJC: (Multiple Objects)</b>
12. Devices used	devices- assigned		-			-		-	<b>JCA-EOJ</b> or <b>JC-QJC: (Multiple Objects)</b>

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13. Finishing used	-		-			-		-	-
14. PDLs used	document-format for each document		-			-		-	<b>JCA-EOJ: Logical Unit</b>
15. Job Submission Channels used	-		-			-		-	-
16. Interfaces used	-		-			-		-	-
17. Human operator labor used	-		-			-		-	-
18. Setup time used	-		-			-		-	-
19. Wall clock time used executing the job	compute: completion-time - started-printing-time		-			-		-	<b>JCA-EOJ: Elapsed Time</b>
20. Fonts used	fonts-used		-			-		-	-
21. Phone charges	-		-			-		-	-
22. Wasted sheets	-		-			-		-	-
23. Number-up (N-up) used	compute: pages-completed / impressions-completed		-			-		-	compute from impressions/s heets



## 39 4. Additional Information about some of the Job Protocols

40 Some of the entries in the above table refer to extra information below.

### 41 4.1 IPDS

42 Manage IPDS dialog controls the IPDS session which contains the jobs and documents.

43 Jobs and documents are distinguished via Nested Groups

44 Robust accounting information is available from the PSFs but IPDS itself is logical page  
45 oriented.

46 Fonts are tightly managed by PSF on a per page basis. Therefore, PSF handles font  
47 accounting (per job).

48 \* - Not in v5.0 spec

#### 49 4.1.1 Job id on Printer

50 Define Group Boundary Group ID Triplet

51 Format is platform dependent:

52 MVS - 8 character EBCDIC job name

53 VM - 8 character EBCDIC job name

54 VSE - 8 character EBCDIC job name

55 AIX - variable length ASCII file name.

56 OS/2 - variable length ASCII file name.

57 OS/400 - 10 character job name.

### 58 4.2 PJL

#### 59 4.2.1 JOB ID Info:

- 60 • If unsolicited job status is enabled when the printer begins processing the PJL  
61 job, the printer responds to the PJL JOB command with @PJL USTATUS  
62 JOB START response. The printer response includes a job ID number that is  
63 associated with the job name supplied in the JOB command.

64 // printer receives the PJL JOB command

65 @PJL JOB NAME = "job name"

66 // If unsolicited job status is enabled, printer would generate an ID number and respond with:

67 @PJL USTATUS JOB<CR><LF>

68 START<CR><LF>

69 NAME=" job name "<CR><LF>

70 ID=346<CR><LF>

71 <FF>

#### 72 4.2.2 JOB Page Info:

- 73 • When the job is completely finished, the printer sends a END of job command:

74 // If unsolicited job status is enabled, printer would respond at the end of a job:

75 @PJL USTATUS JOB<CR><LF>

## Mappings from Job Submission Protocols to JMP objects/attributes

```
76         END<CR><LF>
77         NAME=" job name" <CR><LF>           // from the EOJ command
78         PAGES=page count <CR><LF>
79         <FF>
```

### 80 4.2.3 SET DUPLEX

```
81 @PJM SET DUPLEX={ON | OFF}
82 @PJM SET MANUALFEED={ ON | OFF }
83 @PJM SET ORIENTATION={PORTRAIT | LANDSCAPE }
```

### 84 4.2.4 @PJM SET BINDING={ LONGEDGE | SHORTEGE }USTATUS

- 85 • @PJM USTATUS PAGE=ON command is used to notify the application that a  
86 particular page finished printing. The number of pages incremented by one for  
87 each simplex page, and by two for each duplex page.

```
88 @PJM USTATUS PAGE <CR><LF>
89 1<CR><LF>
90 ID=#<CR><LF>
91 <FF>
92 @PJM USTATUS PAGE <CR><LF>
93 2<CR><LF>
94 ID=#<CR><LF>
95 <FF>
96
```

### 97 4.2.5 USTATUS Info:

```
98 @PJM USTATUS JOB=ON - When EOJ, it returns a RESULT field:
99   OK : Last page of the job was printed
100   USER_CANCELLED: control panel
101   HOST_CANCELLED : host system
102   RESOURCE_CANCELLED : resource wasn't available (ex. media not loaded).
```

## 103 4.3 SMP

### 104 4.3.1 UCHAR

105 UCHAR Status -

```
106 01 = held or stopped
107 02 = printing
108 03 = awaiting print
109 04 = in intercept
110 05 = file had error
111 06 = printer error
```

## 112 4.4 TIPSJ

113

114 Note: IEEE P1284.1 does not name each object or attribute. Rather, blocks of  
115 data containing multiple related objects are returned as a result of a single

## Mappings from Job Submission Protocols to JMP objects/attributes

116 query. As such, I have included the *Command Name:Textual Description* for  
117 each of the supported objects/attributes that are set by the home and **Response**  
118 **Name: Textual Description** for responses back from the printer which contain  
119 the object/attribute.

120

121 Note #1: TIPSII has a two level job/document structure which is partitioned as  
122 follows:

123

SESSION 1

124

Job 1

125

Job 2

126

Job 3

127

END SESSION 1

128

SESSION 2

129

Job 1

130

END SESSION 2

131

Rather than try to included that information and confuse the structure of the chart I  
132 have simply noted this difference in terminology and left the “document”  
133 objects blank.

134