

1 Subj: Problems and Solutions to the **jmResourceTable** - Issue 43 *continued*

2 From: Tom Hastings

3 Date: 2/24/97, version 2

4 File: res-type.doc

5 This version of the **JMResourceTC** and **jmResourceTable** is the results of the 2/7/97
6 JMP meeting. The revision marks are with respect to the original V0.6 MIB, dated
7 1/23/97.

8 There are several problems with the **JmResourceTC** and **jmResourceTable**:

9 1. The text appears to say that the same resource is used for both the initial
10 requested value and then reset and used to reflect the actual. There are no
11 actual resources with such a specification, so the DESCRIPTION should be
12 clarified to indicate that requested and consumed require two separate
13 resources.

14 2. The **jmResourceName** object cannot be a union of a text string and an integer.
15 so we agreed to replace **jmResourceName** with two objects:
16 **jmResourceNameAsText** and **jmResourceNameAsType**.

17 However, the **jmResourceNameAsText** is really just a string value.

18 I suggest that we have two resource values, one as an integer and one as a text
19 string. We can even overload the integer to be an index when the value is an
20 index instead of an amount, such as **physicalDeviceIndex(11)** AND can be an
21 enum when the value is an enum, such as **documentFormat(10)**. Then we are
22 keeping the number of objects in the **jmResourceTable** constant:

<u>Current</u>	<u>Proposed</u>
<u>jmResourceIndex</u>	<u>same</u>
<u>jmResourceType</u>	<u>same</u>
<u>jmResourceName</u>	<u>jmResourceValueAsText</u>
<u>jmResourceUnits</u>	<u>same</u>
<u>jmResourceAmount</u>	<u>jmResourceValueAsInteger</u>

23
24 2. Clarify for each resource whether **jmResourceValueAsText** or
25 **jmResourceValueAsInteger** or both (**mediaConsumed**) are used. When
26 **jmResourceValueAsText** isn't used, the agent shall return a zero length
27 string. When the **jmResourceValueAsInteger** isn't used, the agent shall
28 return a (-1) signifying other as in the Printer MIB.

29 3. I've deleted **unknown(2)**, since an unknown resource wouldn't be put in the
30 table at all.

31 4. I've added **mediumRequested** and **mediaConsumed**.

- 32 5. I've added outputBin, colorantRequested, and colorantConsumed.
- 33 6. I've added (moved from jmJobTable): jobSourceChannel,
- 34 jobSubmissionTime, jobComment, jobTotalKOctets,
- 35 jobKOctetsCompleted, jobStartedProcessingTime, jobCompletionTime,
- 36 jobAccountName.
- 37 7. I've deleted faxPhoneNumber(12).
- 38 8. I've renamed existing resources as shown, as per Keith Carter's e-mail:
- 39

<u>Old</u>	<u>New</u>
<u>pagesSpooled(15)</u>	<u>impressionsSpooled(15)</u>
<u>pagesInterpreted(16)</u>	<u>impressionsInterpreted(16)</u>
<u>pagesSentToDevice(17)</u>	<u>impressioinsSentToDeviceCurrentCopy(17)</u>
<u>pagesCompleted(18)</u>	<u>impressionsCompletedCurrentCopy(18)</u>

40

41 This note attempts to clarify both of the above.

42 **-- textual-convention 1: JmResourceTypeTC**

43 **JmResourceTypeTC ::= TEXTUAL-CONVENTION**

44 STATUS current

45 DESCRIPTION

46 "The type of resource, e.g., medium, ink, staples,
 47 processing-time, color-impressions, etc. required to
 48 process the job before the job start processing OR
 49 ~~This value is updated while the job processes to~~
 50 indicate the amount of the resource that is being
 51 ~~consumed~~ used while the job is processing. If both a
 52 required and a consumed value is needed, two
 53 separate resource rows shall be used. ~~After the job~~
 54 ~~completes processing, this value indicates the total~~
 55 ~~usage of this resource made by the job.~~ The
 56 ~~accounting system will copy this value to a suitable~~
 57 ~~longer term storage.~~

58

59 In the following definitions of the enums, each
 60 resource shall use the **jmResourceValueAsInteger** or
 61 the **jmResourceValueAsText** objects to indicate the
 62 value of the resource. A very few resources use
 63 both (**mediaConsumed**). If the
 64 **jmResourceValueAsInteger** object is not used, the
 65 agent shall return the value (-1) indicating other.
 66 If the **jmResourceValueAsText** object is not used, the
 67 agent shall return a zero-length string.

```

68 |
69 |         The standard resource types defined so far are:"
70 |         -- This is a type 2 enumeration.
71 |         SYNTAX      INTEGER {
-- jmResource      jmResour  jmReso  Description
-- Typeenum       ceValueN  urceVa
--                 ameAsTex  lueAsI
--                 t         nteger
--                 Datatype
other(1),      -- resource  n      A resource that is not in
--                 name                    the list and/or that has
--                                     not been registered with
--                                     IANA.
fileName(3),  -- filename  -1     The coded character set
--                                     file name of the
--                                     document.
--
--                                     A row with this resource
--                                     item may appear more than
--                                     once in the
--                                     jmResourceTable for a
--                                     job.
documentName( -- document  -1     The coded character set
4),          -- name                    name of the document. If
--                                     the document does not
--                                     have a name, the file
--                                     name containing the
--                                     document may be used as a
--                                     default.
--
--                                     A row with this resource
--                                     item may appear more than
--                                     once in the
--                                     jmResourceTable for a
--                                     job.
jobCopiesRequ -- " "         n      The number of copies of
ested(5),    --                                     the entire job that are
--                                     to be produce
--
--                                     A value of -2 means
--                                     unknown.
jobCopiesComp -- " "         n      The number of copies of
leted(6),   --                                     the entire job that the
--                                     entire job has completed
--                                     so far.
--
--                                     A value of (-2) means
--                                     unknown.
documentCopie -- " "         n      The total count of the
sRequested(7) --                                     number of document copies
,           --                                     requested. If there are
--                                     documents A, B, and C,
--                                     and document B is
--                                     specified to produce 4

```

	--			copies, the number of
	--			document copies requested
	--			is 6 for the job.
	--			
documentCopiesCompleted(8)	--	" "	<i>n</i>	The total count of the
,	--			number of document copies
	--			completed so far for the
	--			job as a whole. If there
	--			are documents A, B, and
	--			C, and document B is
	--			specified to produce 4
	--			copies, the number of
	--			document copies starts a
	--			0 and runs up to 6 for
	--			the job as the job
	--			processes.
	--			
sides(9),	--	" "	1 or 2	The number of sides that
	--			any document in this job
	--			will require or did use.
	--			
documentFormattersInterpreters(10),	--	" "	PrtInterpreterLangFamilyTC	The interpreter language
	--			family corresponding to
	--			the Printer MIB
	--			prtInterpreterLangFamily
	--			object, that this job
	--			requires and uses. A
	--			document or a job may use
	--			more than one PDL. As
	--			with all intensive
	--			resource items where
	--			multiple rows are
	--			allowed, there shall be
	--			only one distinct row for
	--			each distinct PDL; there
	--			shall be no duplicates.
	--			
	--			A row with this resource
	--			item may appear more than
	--			once in the
	--			jmResourceTable for a
	--			job, but the
	--			jmResourceValueAsTextName
	--			shall be different for
	--			each such row.
	--			
	--			This enumobject is a type
	--			2 enum.
	--			
	--			NOTE: This textual
	--			convention is imported
	--			from the draft Printer
	--			MIB, but is not in RFC
	--			1759.

	--			
	--			ISSUE: Should we define the documentFormat(10) TC in this module as well?
physicalDeviceIndex(11),	--	" "	<i>index</i>	The index of the physical device MIB instance requested/used. This value is an hrDeviceIndex value. See the Host Resource MIB.
	--			
	--			A row with this resource item may appear more than once in the jmResourceTable for a job, but the jmResourceValueAsTextName shall be different for each such row.
	--			
	--			If there is no physical device MIB instance for this job, this row shall not be present in the jmResourceTable .
physicalDeviceName(12)	--	<i>deviceName</i>	-1	The name of the physical device to which the job is assigned.
faxPhoneNumber(12),	--	OCTET	STRING(SIZE(0..255))	The FAX coded character set phone number(s) requested/used. NOTE the longer length since FAX numbers represented in two-octet coded character sets require more than 31 digits.
	--			A row with this resource item may appear more than once in the jmResourceTable for a job.
impressionsCompleted(1213),	--	" "	<i>n</i>	The number of impressions completed by this job. For a print job, an impression is the marking of the entire side of a sheet. Two-sided processing involves two impressions per sheet.
	--			
	--			The value of this attribute shall be 0 if

```

--
-- processing has not
-- started for this job.
--
--
--
--
-- sheetsCompleted(1314), -- " " n The number of medium
-- sheets that have been
-- completed whether those
-- sheets have been
-- processed on one side or
-- on both.
-- The value of this
-- attribute shall be 0 if
-- processing has not
-- started for this job.
--
-- mediumRequest -- name of -1 The name of the medium
-- ed(14), -- medium that are required by the
-- job.
--
-- A row with this resource
-- item may appear more than
-- once in the
-- jmResourceTable for a
-- job, but the
-- jmResourceValueAsText
-- shall be different for
-- each such row.
--
-- mediaConsumed -- name of n The name of the medium
-- (15), -- medium and the number of sheets
-- that have been consumed
-- whether those sheets have
-- been processed on one
-- side or on both.
--
-- A row with this resource
-- item may appear more than
-- once in the
-- jmResourceTable for a
-- job, but the
-- jmResourceValueAsText
-- shall be different for
-- each such row.
--
--
-- The value of this
-- attribute shall be 0 if
-- processing has not
-- started for this job.
--
--
--
-- impressionspa -- " " n The number of logical
-- gesSpooled(16 -- pages spooled to the
-- 15), -- server or device for the
-- job.
--
-- impressionspa -- " " n The number of logical
-- gesInterprete -- pages interpreted for the
-- d(1716), -- job.

```

impressionsPagesSentToDevice(1817),	--	" "	n	The number of logical pages sent to the device for the job.
impressionsPagesCompletedCurrentCopy(1918),	--	" "	n	The number of logical pages completed for the job.
	--			The value of this attribute shall be 0 if processing has not started for this job.
pagesCompletedCurrentCopy(2019),	--	" "	n	The number of logical pages completed for the current copy of the document. This value is reset to 0 for each document and for each document copy.
processingCPUTime(2120),	--	" "	n	The amount of time that the job has been processing in seconds.
	--			The value of this attribute shall be 0 if processing has not started for this job.
processingMessage(2221),	--	<i>the message</i>	1	A coded character set message that is generated during the processing of the job as a simple form of processing log to show progress and any problems.
	--			A row with this resource item may appear more than once in the jmResourceTable for a job.
outputBin(23)	--	<i>name of output bin</i>	-1	The name of the output bin to which all or part of the job is placed in.
	--			A row with this resource item may appear more than once in the jmResourceTable for a job, but the jmResourceValueAsText shall be different for each such row.
colorantReque	--	<i>name of</i>	-1	The name of the colorant

```

sted          -- colorant          requested.

A row with this resource
item may appear more than
once in the
jmResourceTable for a
job, but the
jmResourceValueAsText
shall be different for
each such row.

colorantConsumed(24) -- name of colorant n
                    -- colorant
                    --
                    -- A row with this resource
                    -- item may appear more than
                    -- once in the
                    -- jmResourceTable for a
                    -- job, but the
                    -- jmResourceValueAsText
                    -- shall be different for
                    -- each such row.

jobSourceChannelIndex(25) -- " " index
jobSubmissionTime(26)    -- " " DateAn
                        OR
                        TimeTicks
jobStartedPrintingTime(27) -- " " DateAn
                        OR
                        TimeTicks
jobCompletedTime(28)     -- " " DateAn
                        OR
                        TimeTicks
jobComment(29)           -- comment -1
jobTotalKOctets(30)      -- " " n
jobKOctetsCompleted(31) -- " " n
jobAccountName(32)       -- account name -1
}

```

72


```

73 -- textual-convention 2: JmResourceUnitsTC
74 JmResourceUnitsTC ::= TEXTUAL-CONVENTION
75     STATUS      current
76     DESCRIPTION
77         "The units in which this resource is measured, e.g.,
78         sheets, feet, meters, micrometers,
79         tenThousandthsOfInches, seconds, count, etc. The
80         value of the jmResourceAmount object shall be in
81         these units.
82
83         Start with the Printer MIB units:"
84     -- This is a type 2 enumeration.
85     SYNTAX      INTEGER {
            other(1)                -- other, i.e., not one of the
                                   following:
            tenThousandthsOfInches(3), -- .0001
            micrometers(4),
            characters(5),
            lines(6),
            impressions(7),
            sheets(8),
            dotRow(9),
            hours(11),
            thousandthsOfOunces(12),
            tenthsOfGrams(13),
            hundredthsOfFluidOunces(14),
            tenthsOfMilliliters(15)
            feet(16),
            meters(17),
            seconds(18),
            -- not in Printer MIB:
            counter(19),             -- Counter32(0..2147483647)
            integer(20),            -- Integer32(0..2^31)
            index(21),              -- Index into another table
            intensive(22),          -- Intensive resource, the
                                   -- jmResourceValueAsInteger shall
                                   -- be -1 (other).
            dateAndTime(23),        -- Date and time as defined in
                                   -- SMIV2 (RFC 1902).
            timeTicks(24)          -- Time ticks - same units as
                                   -- sysUptTime in the host
                                   -- resources MIB.
        }
86

```

```

-- The Resource Group
--
-- The jmResourceGroup consists of requested and/or consumed used
-- resources objects for each job. Instead of allocating distinct
-- objects for each resource, each resource item is represented as a
-- separate row in the jmResourceTable. Each column in the row
-- describes the resource, such as its type represented as an enums,
-- its name, the units of measure, and the amount. Resources are
-- allocated to the jmResourceTable (instead of distinct objects in
-- the jmJobTable) that monitoring applications programs are unlikely
-- to need to access multiple times, since they would have to scan
-- the entire jmResourceTable to find a particular object.
--
-- Most resource items shall have only one row per job. However, a
-- few resource items can have multiple values per job or even per
-- document, where each value is a separate row in the
-- jmResourceTable. Unless indicated otherwise, an agent shall
-- ensure that each resource item occurs only once in the
-- jmResourceTable. Resource items that may appear multiple times in
-- the jmResourceTable are indicated in their specification in the
-- JmResourceTypeTC (see page 1). However, such resource items shall
-- not contain duplicates for "intensive" (as opposed to "extensive")
-- resources. For example, each docdocumentFormat(11) interpreter
-- shall appear in the jmResourceTable only once for a job since the
-- interpreter language is an intensive resource item, even though
-- the job has a number of documents that all use the same PDL. As
-- another example of an intensive resource that can have multiple
-- entries, if a document or job uses multiple types of media, there
-- shall be only one row in the jmResourceTable for each media type,
-- not one row for each document that uses that medium type. On the
-- other hand, if a job contains two documents of the same name,
-- there can be separate rows for the documentName(4) resource item
-- with the same name, since a document name is an extensive resource
-- item.
--
-- 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 device.
--
-- 2) jmJobIndex - the job identifier that was generated by the
-- server or device that accepted the job.
--
-- 3) jmResourceType - the enum that indicates the type of resource.
-- See JmResourceTypeTC on page 1.
--
-- 4) jmResourceIndex - a running index of resources for each job.
-- For those resources that are per document, the index is the
-- document number, starting with 1 for the job.
--
-- The jmResourceTable following table is a per job table with an

```

```

-- extra index for each resource that a job can require and consume.
-- The jmResourceType object shall contain an enum type that
-- indicates the type of resource. Some resource types are used both
-- for requested and consumedused values, while others have distinct
-- types for requested versus consumedused. The agent is able to
-- discover the resources required either from the job submission
-- protocol itself or from the document PDL. As the documents are
-- interpreted, the interpreter may discover additional resources
-- that are required and so adds additional rows to this table. As
-- the resources are actually consumedused, the usage counter
-- contained in the jmResourceValueAtInteger object is incremented
-- according to the units indicated by the jmResourceUnits object.
--
-- Some resources are mandatory for conformance, and the rest are
-- optional. The mandatory resources are:
--
-- interpreters(10)
-- sheetsCompleted(14)
-- processingTime(20)

```

Issue 1 - Is ~~Are interpreters(10), sheetsCompleted(14), processingTime(20)~~ the right resource item(s) to require agents to implement?

~~Is Are interpreters(10), sheetsCompleted(14), processingTime(20)~~ the right resource items to require agents to implement?

Implementation of every object in this group is mandatory. See Section **Error! Reference source not found.** entitled "**Error! Reference source not found.**" on page **Error! Bookmark not defined..**

```

88
89 jmResource OBJECT IDENTIFIER ::= { jobmonmib 9 }
90
91 jmResourceTable OBJECT-TYPE
92     SYNTAX SEQUENCE OF JmResourceEntry
93     MAX-ACCESS not-accessible
94     STATUS current
95     DESCRIPTION
96     "A table of resources required and/or consumedused
97     for each job in each job set."
98     ::= { jmResource 1 }
99
100 jmResourceEntry OBJECT-TYPE
101     SYNTAX JmResourceEntry
102     MAX-ACCESS not-accessible
103     STATUS current
104     DESCRIPTION
105     "Zero or more entriesAn entry exists in this table
106     for each job in each job set. Each job shall appear
107     in one and only one job set."
108     INDEX { jmJobSetIndex, jmJobIndex, jmResourceType,
109     jmResourceIndex }
110     ::= { jmResourceTable 1 }
111

```

```

112 JmResourceEntry ::= SEQUENCE {
      jmResourceIndex      Integer32(0..32767),
      jmResourceType       JmResourceTypeTC,
      jmResourceName       OCTET STRING(SIZE(0..63))
      or
      Integer32(0..2147483647)
      or
      Counter32(0..2147483647),
      jmResourceUnits      JmResourceUnitsTC,
      jmResourceValuesAs Integer32(0..2147483647)
      tIntegerAmount
      jmResourceValueAs OCTET STRING(SIZE(0..63))
      Text
113 }
114
115 jmResourceIndex OBJECT-TYPE
116 SYNTAX          Integer32(0..32767)
117 MAX-ACCESS      not-accessible
118 STATUS          current
119 DESCRIPTION
120     "A running index of the resources requested and/or
121     consumed used by the job identified by jmJobIndex in
122     the job set identified by jmJobSetIndex."
123     ::= { jmResourceEntry 1 }
124
125 jmResourceType OBJECT-TYPE
126 SYNTAX          JmResourceTypeTC    -- See page 1
127 MAX-ACCESS      read-only
128 STATUS          current
129 DESCRIPTION
130     "The type of resource, e.g., medium, ink, staples,
131     processing time, color impressions, etc. required to
132     process the job before the job start processing
133     and/or consumed by the job as the job is processed.
134     Examples include jobCopiesRequested,
135     documentCopiesRequested, jobCopiesCompleted,
136     documentCopiesCompleted, fileName, and documentName.
137     See the JmResourceTypeTC textual convention on page
138     1.This value is updated while the job processes to
139     indicate the amount of the resource that is being
140     used while the job is processing. After the job
141     completes processing, this value indicates the total
142     usage of this resource made by the job. The
143     accounting system will copy this value to a suitable
144     longer term storage.
145
146     This valueobject is a type 2 enum."
147     ::= { jmResourceEntry 2 }
148
149 jmResourceUnits OBJECT-TYPE
150 SYNTAX          JmResourceUnitsTC    -- See page 9
151 MAX-ACCESS      read-only
152 STATUS          current
153 DESCRIPTION

```

154 "The units in which this resource is measured, e.g.,
155 sheets, feet, meters, micrometers,
156 tenThousandthsOfInches, seconds, count, etc. The
157 value of the **jmResourceAmount** object shall be in
158 these units.

159
160 This object is a type 2 enum."
161 ::= { jmResourceEntry 34 }

162
163 ~~**jmResourceValueAsIntegerAmount**~~ OBJECT-TYPE

164 SYNTAX **Integer32(0..2147483647)**

165 MAX-ACCESS read-only

166 STATUS current

167 DESCRIPTION

168 "The ~~valueamount~~ of the resource requested or
169 ~~consumedused~~ so far in the units specified by the
170 **jmResourceUnits** " object. This value may be a
171 integer, a counter, an index, or an enum, depending
172 on the **jmResourceType**. After the job completes
173 processing for those resources that indicate
174 consumption, this value indicates the total usage of
175 this resource made by the job.

176
177 A monitoring application is able to copy this value
178 to a suitable longer term storage for later
179 processing as part of an accounting system.

180
181 Since resources can be added to this table while the
182 job is waiting to be processed or being processed,
183 which can be a long time before any of the resources
184 are actually used, the agent shall set the value of
185 the ~~**jmResourceValueAsIntegerAmount**~~ object to 0 for
186 resources that the job has not yet ~~consumedused~~.

187
188 Resource items for which the concept of an amount is
189 meaningless, such as **fileName, interpreters, and**
190 **physicalDevices, or ~~faxPhoneNumber~~**, shall return a
191 value of (-1) to indicate other for
192 ~~**jmResourceValueAsIntegerAmount**~~ as indicated in the
193 **JmResourceTypeTC** textual convention description."

194 ::= { jmResourceEntry 45 }

195
196 ~~**jmResourceValueNameAsText**~~ OBJECT-TYPE

197 SYNTAX **OCTET STRING(SIZE(0..63))**

198 _____ **or**

199 _____ **Integer32(0..2147483647)**

200 _____ **or**

201 _____ **Counter32(0..2147483647)**

202 MAX-ACCESS read-only

203 STATUS current

204 DESCRIPTION

205 "The coded character set ~~valuenam~~e of the resource.
206 There are variable resource names that identify the
207 resource, e.g., iso-a4-white, red-ink, number 2

208 staples, or the string value, such as the document
209 name, or device name, etc., as specified in the
210 **JmResourceTypeTC** textual convention on page 1., or
211 an index of a row in a table. The data type of
212 **jmResourceName** is determined by the value of
213 **jmResourceType**."
214 ::= { jmResourceEntry 53 }
215
216