Job Monitoring MIB

Proposal for a new standards track project

Developed by Printer MIB participants

(Presented at 12/10/96 IETF

ftp://ftp.pwg.org/pub/pwg/jmp/slides/jmp-ietf.ppt)

and 4/8/97 IETF

ftp://ftp.pwg.org/pub/pwg/jmp/slides/jmpietf1.ppt

Tom Hastings, Xerox Corp.

Harry Lewis, IBM Corp.

1

Status

- Evolved the MIB
  - continued simplification - now only 13 objects
  - emphasis on client-server-printer configuration 3
- Based on 4 company private Job Monitoring MIBs
- Four Groups/Tables
  - **General** - 5 objects
  - **JobID** - 2 objects
  - **JobState** - 4 objects
  - **Attribute** - 2 objects, 50 attributes

2

Client-Server-Printer
(Configuration 3)

```
operator or
 end-user         end-user
 +-------+      +----------+
 |monitor|      |  client  |    ######## SNMP query
 +---+---*      +---*----+-+    **** non-SNMP query
     #    *         *     |     ---- job submission
     #     *        *     |
     #      *       *     |
     #       *====V====V==+
     #         |            |
     #         |   server   |
     #         |            |
     #       +----#-----+--+
     #    optional#        |
     #    ##########        |
     #    #                 |
 +==+=V===V=+==+           |
 |  | agent |  |           |
 |  +-------+  |           |
 |  PRINTER    <---------+
 |            | Print Job Delivery Channel
 |            |
 +=============+
```

Types of Application Programs

- End user monitoring of a single submitted job
  - has client job submission id of job; finds job index
- End user or Operator monitoring of active jobs in queue
  (job set); *ignores* **completed**/**canceled** jobs
  - reads entire table just selecting attributes of interest
  - End user looking for least busy printer - need fast startup
- Accounting or system utilization of **completed**/**canceled**
  jobs; *ignores active* jobs
  - program keeps shadow copy of **Attribute** table
  - copies data to persistent storage each poll cycle

General Table

Job Set Index	Job Set Name	Job Persistence	Attribute Persistence	Current Number Of Active Jobs	Smallet Active Job Index

- Job Set (Queue) index
  - fixed at 1 for simple printer implementations
  - allows multiple sets of jobs for servers
- Job Set (Queue) Name
- **P**ersistence of Job ID and State entries in seconds
- Persistence of Attribute table entries in seconds
- Current number of Active Jobs
- Smallest Job Index for any current active job

5

Job ID Table

Job Submission ID	Job Set Index	Job Index

- Allows monitoring program to find a specific job without getting whole table
- Job Submission ID is 32-octet string
  - intended to contain quasi unique job identifiers
  - various forms will be registered:
  - can contain server name, random number, MAC address, queue name and/or UUID formats
- Job Set Index - indicates which job set the job is in
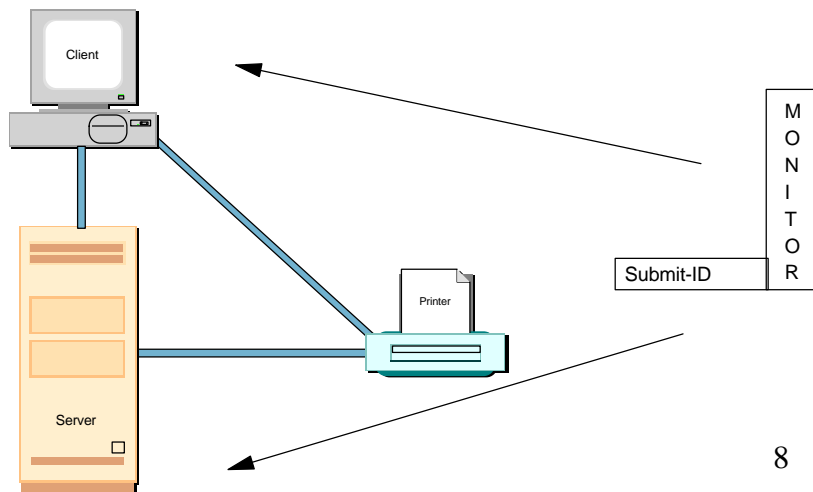- Job Index - is the job's index in the **Job State** and **Attribute** tables

6

Submission ID Formats

Format	Part-1	Part-2
0	Printer specified ID for jobs that arrive without	
1	8 digit random number	Last 22 bytes of job File Name
2	8 digit sequential number	Client MAC adress
3	8 digit sequential number	Last 22 bytes of client URL
4	Other new formats	

7

Submission/ Monitoring

Client

M
O
N
I
T
O
R

Submit-ID

Printer

Server

8

Job State Table

Job Set Index	Job Index	Job State	Octets Completed	Impressions Completed	Associated Value

- All values also appear in **Attribute** Table so accounting program can read just one table (and keep a shadow copy of it).

Job State	Associated Value
held	time of entry into held state
pending	queue position
processing	total number of octets
printing	total number of impressions
needsAttention	printer alert code (Printer MIB)
canceled	number of impressions completed
completed	output bin index (Printer MIB)

9

Attribute Table

Job Set Index	Job Index	Attribute Type Index	Attribute Instance Index	Value As Integer	Value As Octets

- *Attribute Type Index* - a set of 40-50 enums that identify attributes
  - conditionally mandatory
  - allows a broad range of implementations

- *Attribute Instance Index* - can have more than one attribute per job
  - some attributes are per document, so value is document number
  - each enum specifies whether value is an Integer or Octets

- **Value as Integer -** integer, counter, enum, or index

- **Value as Octets** - text or binary octets (ex - DateAndTime)

10

Attribute Table List

other	fileName	documentName
jobAccountName	jobComment	processingMessage
jobSourceChannelIndex	outputBinIndex	outputBinName
sides	documentFormatIndex	documentFormatEnum
physicalDeviceIndex	physicalDeviceName	jobCopiesRequested
jobCopiesCompleted	documentCopiesRequested	jobKOctetsTotal
jobKOctetsCompleted	impressionsSpooled	impressionsSentToDevice
impressionsInterpreted	impressionsRequested	impressionsCompleted
impressionsCompletedCurrentCopy	pagesRequested	pagesCompleted
pagesCompletedCurrentCopy	sheetsRequested	sheetsRequested
sheetsCompleted	sheetsCompletedCurrentCopy	mediumRequested
mediumConsumed	colorantRequestedIndex	colorantRequestedName
colorantConsumedIndex	colorantConsumedName	jobSubmissionDateAndTime
jobSubmissionTimeStamp	jobStartedProcessingDateAndTime	jobStartedProcessingTimeStamp
jobCompletedDateAndTime	jobCompletedTimeStamp	processingCPUTime

11

Advantages

- Direct access to printer assigned Job Index
- All state information is together in one table
- State table entry always contains most useful info for each job's current state
- Separates state info from attributes used for accounting - different persistence times possible as well
- Reduced size - only 13 objects
- Scales well: Number of attributes depends on implementation - conditionally mandatory
- Attributes can be directly addressed
- Attributes can be 1 per job, 1 per document or n per job

12

Additional Information Available

- PWG web site:
    http://www.pwg.org/
- Job Monitoring MIB: MIBs and papers in:
    ftp://ftp.pwg.org/pub/pwg/jmp/*/
- To subscribe, send mail to:
    majordomo@pwg.org
- in mail body (not subject):
    subscribe jmp
    end