



PWG Plenary Status for Printer Health Metrics Working Group

Austin, TX PWG F2F Meeting

WIMS CIM Update Project



- (If you've seen the intro before, skip ahead to slide 8.)
- Alliance partnership between PWG and DMTF (Distributed Management Task Force), dmtf.org
- DMTF is a large industry consortium
 - Home of CIM: Common Information Model (for management)
 - Many CIM and CIM-related standards
 - Also recently SMASH, DASH, WS-Management
 - Numerous working groups with specific areas of concentration
 - Server, Desktop & Mobile, Core Schema, Architecture, WBEM Interoperability & Protocols, etc.
 - Very sophisticated web sites

Goals



- Bring the CIM model of printing up to date with PWG models
 - CIM schema includes classes for Printer (device), PrintService, PrintJob, PrintQueue
 - Current classes missing many interesting attributes
 - CIM_Printer class has approx 30 properties; by comparison PrinterMIB has approx 140 properties
 - Current classes not clearly defined
 - CIM_Printer contains some aspects of PrintService's logical printer
- Ensure that every property in CIM printing-related classes is implementable interoperably
 - Build prototype providers

Participants



- Active participants
 - Dell: Rick Landau
 - High North: Ira McDonald
 - [InfoPrint](#): Harry Lewis
 - Lexmark: Jerry Thrasher
 - [Samsung](#): new rep?
 - Sharp: Craig Whittle (WIMS Co-Chair)
 - Bill Wagner (WIMS Chair)
 - Xerox: Peter Zehler

What's Missing



- Old CIM_Printer (and other) classes are pretty basic
- Some categories of management information entirely absent
 - Console displays and lights
 - Input trays, output trays, input media
 - Media paths, markers
 - Toners, colorants, and other supplies
 - Communications channels and language interpreters
 - Counters

Process to Change the Model



- In DMTF, submit Change Requests (CRs) to change CIM classes or define new classes
 - Concentrate on printer as device first, then service, job, queue
- Decide on changes, draft CRs, submit CRs to appropriate CIM Working Group
 - Anything printer-related is in the CIM Core Schema Working Group
- In WIMS-CIM, we
 - Selected a range of printers and use cases
 - Selected properties to move forward from Printer MIB
 - Developed a model of class inheritance and relationships, and changed it several times

Why CIM?



- WIMS group has put a stronger emphasis on CIM in recent past
- CIM is the management information model of the future
 - All major management vendors moving in this direction
 - **If something is not manageable in CIM, then, at some point, it won't be manageable at all**
 - For a long time
- CIM is the path to web services
 - WS-CIM is a standard mapping of the CIM Schema to XML for use by web services
 - WS-Management already published
 - Second generation "harmonization" of WS-Man and WSDM in the works

Change in Emphasis



- OLD NEWS: All CIM properties should now be considered potentially writable.
- Response: simplify the CIM printer-related classes
 - Read-only: for the near term, concentrate on monitoring
 - Proxy implementations in the near term are not likely to have SNMP write access, anyway
 - Use object methods to modify device behavior, contents of properties
 - Decide where to draw the line based on side effects and faults
 - If there are a number of possible faults when updating a property, then a method has better reporting capabilities

A Few Changes to the Model Recently



- Class structure moderately stable recently
 - Dropped two classes to simplify modeling
 - PrintConsoleLight
 - Not very functional relative to modern lights, e.g., no multicolor and only on/off/blink
 - Will investigate using CIM_IndicatorLED class in future
 - PrintAlertLog
 - Our proposed class added no semantic
 - Use the vanilla parent class CIM_RecordLog instead
- (Look at the latest Visio diagrams)

Changed in CIM CR Process



- New template
 - Processed by programs as part of the procedure that builds the CIM Schema every quarter
 - Requires **very** careful editing
 - Private tags in the HTML must be preserved
 - Colors crucial: red to delete, blue to add
 - One class per CR only
- New validation program
 - Not perfect, but getting better
 - Submitted many bug reports and suggestions
- When the process changed, we had to re-do EIGHT (!) CRs that we had already submitted

Add Properties to Base Printer



- Add properties to the CIM_Printer base class
 - ConsoleDisplayBuffer becomes a string array in Printer
 - Other leftovers from Printer MIB that we think are useful
 - ConfigChanged, AlertCriticalEvents, AlertAllEvents
 - PrinterName, SerialNumber
 - CurrentOperator, ServicePerson
 - ConsoleDisable, ConsoleLocalization
 - Evaluate adding several properties from PortMon MIB to CIM_Printer or CIM_PrintChannel
 - No new properties that are not already in a standard
- Total, in all classes, approx 120 new properties from PrinterMIB and Semantic Model

How to Model a Network Printer



- Insight: A network printer is a networked computer system with a printer attached to it
- Advantages
 - Use all the standard machinery in CIM that describes networked computer systems
 - Many related classes
 - Existing profiles that describe required relationships, not our problem
 - Don't have to invent any new model of network device
 - Don't have to change anything in the (new) Printer device model
 - [CIM Core WG agrees with this model](#)
- Disadvantages
 - None (that we have discovered yet)

Done with the Bulk of Editing



- Twenty-five CRs already submitted
- Followed the new plan:
 - Started with machine translation output
 - Examine every description carefully, edit > 50% of them
 - Change representation of many properties
 - Factor common properties out, move into parent classes
- Much more work that we anticipated

Remaining to be Done



- Add properties to CIM_Printer
- Minor technical corrections to four early classes
 - PrintOutputTray, PrintInputTray, PrintFinisher, PrintSupply

Current State



- (Current state updated in the wiki)
- All Phase 1 (editorial, cosmetic) CRs approved, are included in CIM Schema 2.14, published 2006/12/04
- New classes CIM_PrintOutputTray and CIM_InputTray adopted and in v2.16

Current State (cont'd)



- Now have a leadership position in CIM Core WG
 - Should make process slightly easier
- Eleven more classes adopted for v2.17
 - CIM_PrinterElement, CIM_PrintMarker, CIM_PrintSupply, CIM_AssociatedPrintSupply
 - CIM_MediaPath, CIM_PrintFinisher
 - CIM_PrintChannel, CIM_PrintInterpreter, CIM_AssociatedPrintInterpreter, CIM_PrinterComponent
 - CIM_PrintAlertRecord
- One more class adopted for v2.18
 - CIM_PrintInterlock

Future



- Next quarter, finish the printer device classes
 - Easy, we hope. We seem to have got the hang of it.
- Next year:
 - Add statistics class(es) for counters derived from the Counter MIB and abstract spec
 - Update the PrintService and PrintJob classes based on IPP and Semantic Model
 - Make notes for whoever is going to write a Printer Profile in the future

Prototype Implementation



- Build a prototype implementation of a CIM Provider that embodies the new Printer device classes (Rick, Dell)
 - Proxy to SNMP printers
 - Proof point for implementability of new classes and properties
 - Possible testbed for interoperability
- Two instances of "implementation experience" are required for DMTF to promote classes from experimental status to final status
 - Who else is going to volunteer?
- Also, who would like to write a web service (WS-Management) client

Documents



- FTP area in <ftp://ftp.pwg.org/pub/pwg/wims/cim> and .../wims/wd
 - All current and previous CRs
 - Current property lists, proposed class structure
- URLs to key docs
 - ftp://ftp.pwg.org/pub/pwg/wims/cim/PrinterMibObjectsToAdd_conclusions_20060921_F.xls
 - ftp://ftp.pwg.org/pub/pwg/wims/cim/PrinterMibObjectsToAdd_conclusions_20060921_F_Rationale.pdf
 - ftp://ftp.pwg.org/pub/pwg/wims/cim/td_PrintClassGroupings_v10_20070208.xls
 - ftp://ftp.pwg.org/pub/pwg/wims/cim/Visio-Printer_14.pdf
 - <http://pwg-wiki.wikispaces.com/DMTF+CIM+Core+Schema+Change+Requests>

Look at Documents



- What would people like to see?

