



PWG Quarterly Apr 2007 WIMS CIM Update Project Status

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2007/04/24 V0.3



WIMS CIM Update Project

- (If you've seen the intro before, skip to slide 9.)
- 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.
 - Mainly conference calls, regular face-to-face meetings
 - Very sophisticated web sites

Goals

- Bring the CIM model of printing up to date with PWG models
 - CIM schema includes classes for Printer, 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
- Ensure that every property in CIM printing-related classes is implementable interoperably

Participants

- Active participants
 - Dell: Rick Landau
 - High North: Ira McDonald
 - IBM: Harry Lewis
 - Samsung: Walt Filbrich
 - Sharp: Craig Whittle
 - Bill Wagner (WIMS Chair)
 - Xerox: Peter Zehler

What's Missing

- Current 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
 - Toners, colorants, and other supplies
 - Communications channels and language interpreters
 - Counters

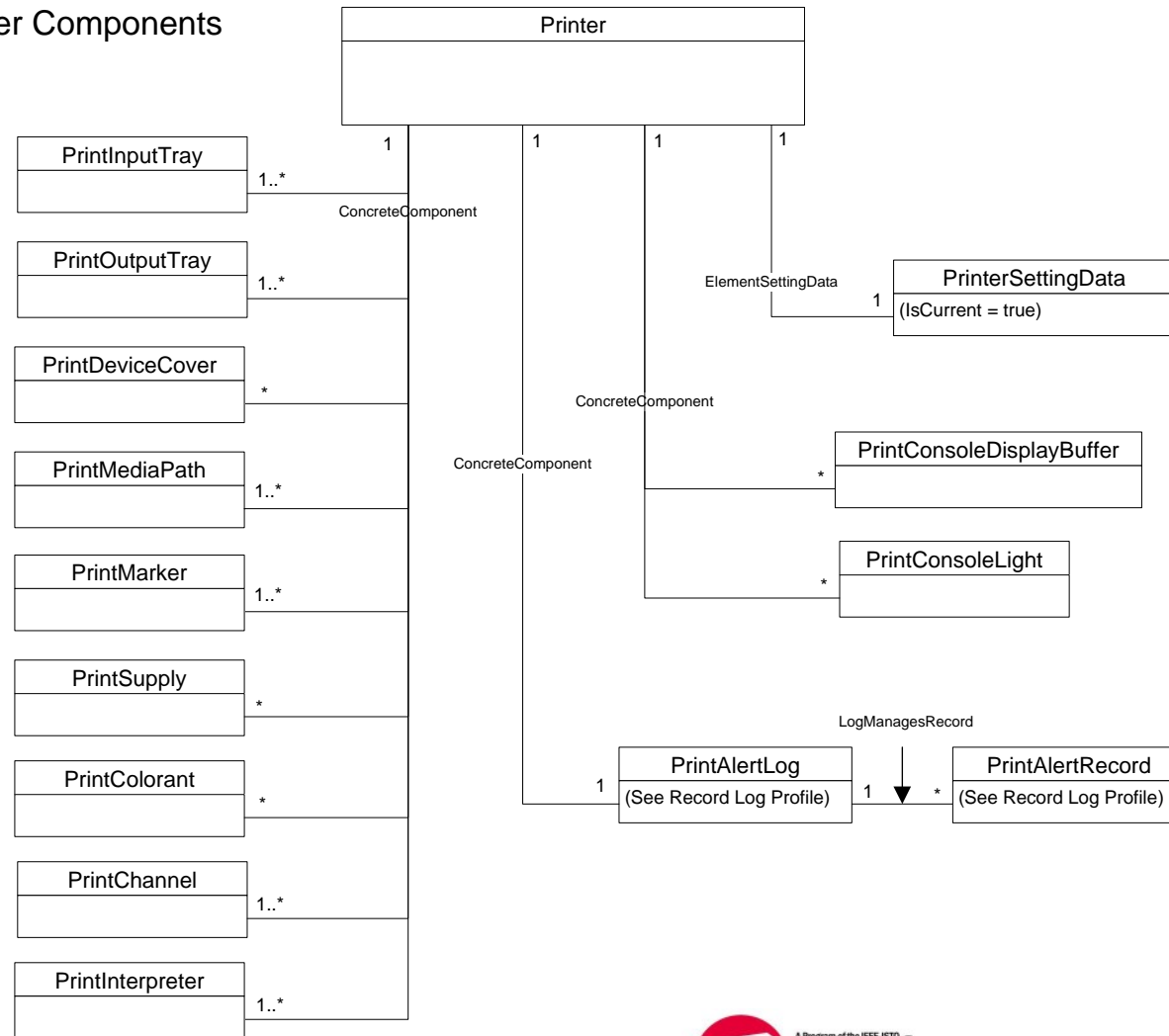
Process to Change the Model

- In DMTF, submit Change Requests (CRs) to change CIM classes or define new classes
 - Concentrate on printer as device first, then service, job, queue
 - Change in phases: cosmetic changes, corrections, major restructuring
- Decide on changes, draft CRs, submit CRs to appropriate CIM Working Group
 - Usually the CIM Core Schema Working Group
- In PWG,
 - Selected range of printers and use cases
 - Selected properties to move forward from Printer MIB
 - Developed model of class inheritance and relationships

- Doing major surgery on CIM_Printer (the print device)
 - Will add 11 classes analogous to prtXxx tables
 - InputTray, OutputTray, DeviceCover, MediaPath, Marker, Supply, Colorant, Channel, Interpreter, ConsoleLight, ConsoleDisplayBuffer
 - Actual class names have "CIM_Print" prefix
 - Plus three special classes: AlertLog, AlertRecord, PrinterSettingData
 - Also add properties to the CIM_Printer base class
 - Total approx 120 new properties from PrinterMIB and Semantic Model
- Many CRs to write
 - Custom machine translation from MIB to MOF format, does 90% of the work (thanks, Ira)
 - Add Status and Key properties by hand editing
 - Run through MOF lint and pretty printer
 - Create a DMTF CR to add the class

Class Hierarchy of New Classes

Printer Components



Why CIM?

- WIMS group has put a stronger emphasis on CIM in recent past
- This is the management information model of the future
 - If something is not manageable in CIM, at some point, it won't be manageable at all
 - For a long time
- This 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

- Received considerable push-back from CIM Core WG about writable properties
 - Especially the writable-if-the-device-cannot-sense-reliably ones
- Response: simplify the CIM printer-related classes
 - Read-only: for the near term, concentrate on monitoring
 - Use object methods to modify device behavior, contents of properties
 - Proxy implementations in the near term are not likely to have SNMP write access, anyway
 - Remove priority B properties, especially if they are writable
 - E.g., OutputTray.StackingOrder, OffsetStacking
 - Prioritize order of class submissions to work on "most important" classes early
 - Approximately: outputs, inputs, supplies, covers, alerts, markers,....

Status Properties In and Out

- CIM has four new scalar generic status properties
 - PrimaryStatus, Detailed..., Operating..., Communication...
- Step 1: Add these properties
 - Our classes do not inherit from the branch of the class hierarchy where these properties are defined
- Step 2: Promote these properties to the right place
 - Largely because of our complaints, the properties were promoted to a high level in the class hierarchy
- Step 3: Remove these properties
 - Since the status properties are now present in our branch of the hierarchy, they are redundantly defined in our classes
- Step 4: Try to merge with some of these properties
 - If the semantics are same, or close, or can be made close enough
 - Confer with author of new CIM generic status properties

Stop the Presses!

- Changes worked out, we think, with Core leadership
 - XxxStatus
 - Retain most of the status properties derived from SubunitStatus in the MIB
 - Add one value to the CIM OperatingStatus property and use that instead of StatusTransitioning.
 - Id, which was the row Index in the MIB
 - Change name to SNMPRowId to show clearly the legacy origin
 - Needed to correlate SNMP and CIM views of status and events for near-term proxy implementations of CIM providers
 - XxxBasis
 - MaxCapacity and RemainingCapacity combine the real value, if it exists, with out-of-band values: Other, Unknown, At Least One
 - Add a new, parallel property, e.g., MaxCapacityBasis, to show out-of-band cases
 - Make XxxCapacity nice, plain, nonnegative integers
 - All these will be true of *many* subunit classes

Future Challenges

- A network printer is a ComputerSystem, not a LogicalDevice
 - Obviously correct, but a major remodeling effort
 - The current model of CIM_Printer is a personal printer attached to a host computer
 - Network printer is more complex: computer system, interfaces, protocol services, profiles,
 - We do not want to replace the fundamental model at this time
 - Add important manageable elements first
 - Define network printer for CIM later

Current State

- All Phase 1 (editorial, cosmetic) CRs approved, are included in CIM Schema 2.14, published 2006/12/04
- Submitted the first of approx. fifteen CRs: add new class CIM_PrintOutputTray
 - Our "pipe cleaner"
 - Several ballots, long discussions with CIM experts
 - Restructured class hierarchy, writable properties, and status properties
 - Almost done
- Working on machine translations and CRs for the next several

Future

- This year, finish the printer device classes
 - Easy, we hope, once we get the hang of it
 - Maybe add some management functions for the lost writable properties
- Next year: update the PrintService and PrintJob classes
 - Based on IPP and Semantic Model

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

Documents

- FTP area in <ftp://ftp.pwg.org/pub/pwg/wims/wd> and .../wims/cim
 - Previous CRs
 - Current property lists, proposed class structure
- URLs to key docs
 - ftp://ftp.pwg.org/pub/pwg/wims/wd/CIMCoreCR_PrintOutputTray_096.htm
 - 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_v09_20070208.xls
 - ftp://ftp.pwg.org/pub/pwg/wims/cim/Visio-Printer_05.pdf

Look at Documents

- What would people like to see?
 - Latest CR (not the ultra-long one)
 - Printer MIB and CIM_Printer MOF, with color syntax highlighting
 - Current proposed class structure (pictures)
 - Ordering of classes we plan to submit
 - CIM "Flat classes" tool for browsing CIM schema
 - Spreadsheet of Printer MIB properties to be added to CIM
 - Spreadsheet of proposed class grouping of properties

Questions?