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WIMS CIM Update Project
Status

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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

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- 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

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Participants

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

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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, markers

    - Toners, colorants, and other supplies

    - Communications channels and language interpreters

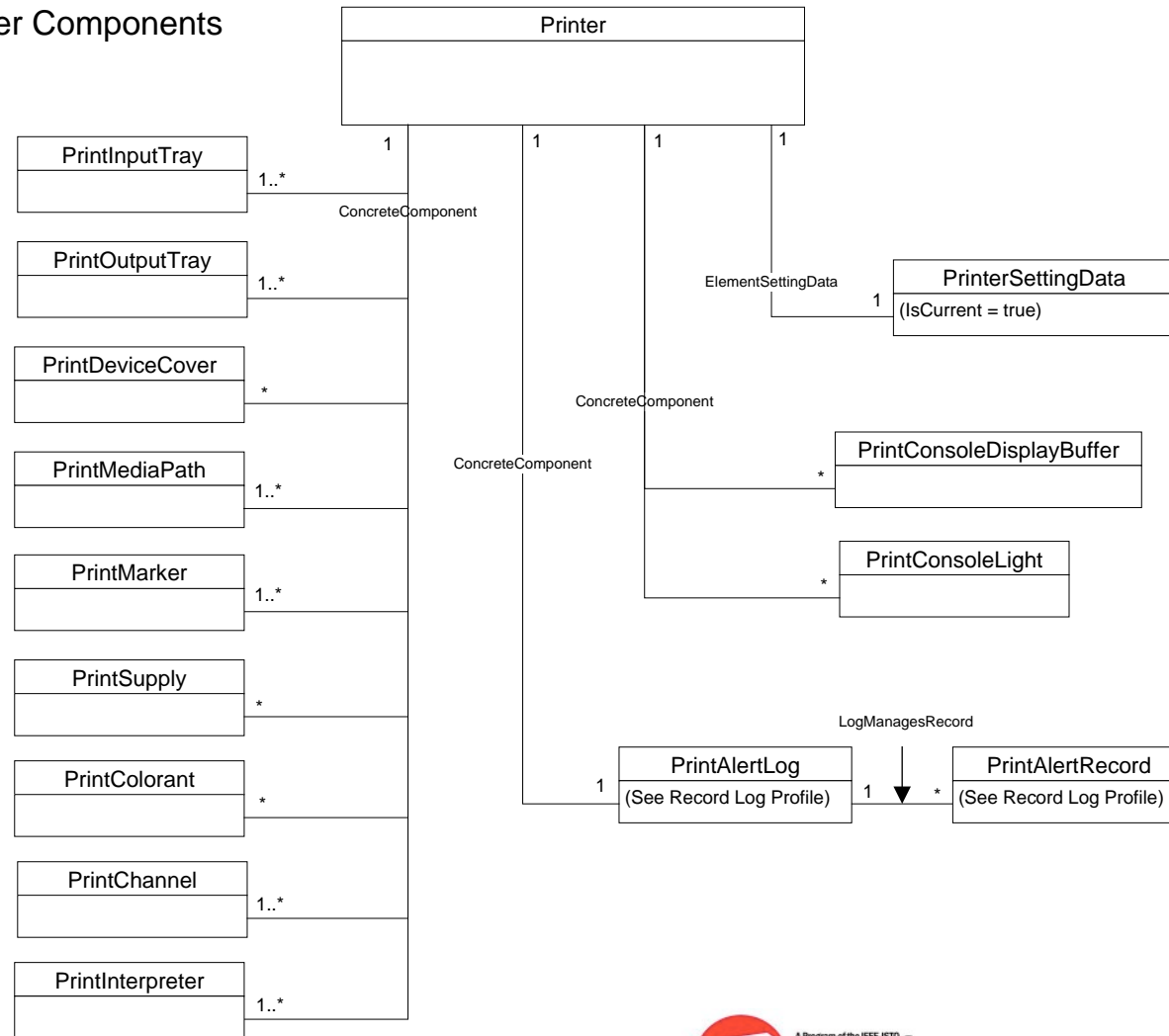   - Counters

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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

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Method

- 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

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Class Hierarchy of New Classes

Printer Components

Printer

PrintInputTray

1

1..*

ConcreteComponent

PrintOutputTray

1..*

PrintDeviceCover

*

PrintMediaPath

1..*

PrintMarker

1..*

PrintSupply

*

PrintColorant

*

PrintChannel

1..*

PrintInterpreter

1..*

1   1   1

ElementSettingData

PrinterSettingData
(IsCurrent = true)

1

ConcreteComponent

PrintConsoleDisplayBuffer

*

PrintConsoleLight

*

ConcreteComponent

LogManagesRecord

PrintAlertLog
(See Record Log Profile)

1

PrintAlertRecord
(See Record Log Profile)

1   *

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

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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,....

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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

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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

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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

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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

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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

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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

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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

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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

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Questions?

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