PWG-DMTF Alliance Work

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PWG-DMTF Joint Mission

- "... to review and update the CIM model based on the updated Printer MIBv2, the PWG Semantic Model and web services protocols, as appropriate."
  - PWG / DMTF Work Register, V1.0, 2005/05/12

- "Based on..." implies no new invention
  - Bring PWG standard semantics to the CIM model

Who is PWG?

- The Printer Working Group (PWG), www.pwg.org
  - A program of the IEEE Industry Standard and Technology Organization (IEEE-ISTO)
- Varied membership
  - Manufacturers of printers, multi-function devices, print servers, and imaging devices
  - Developers of OSes, print management applications
- Chartered to make imaging devices and applications work together better
  - Develop standards for the electronic printing industry to improve interoperability

Some PWG Standards

- SNMP Printer MIB v2 (RFCs 3805, 1759)
- Internet Printing Protocol (RFCs 3995, 3996, 3997, 3998, 3510, plus ten previous RFCs), plus eight other standards
- Media Standardized Names
- PWG Semantic Model
- PWG Standardized Imaging System Counters & PWG Counter MIB
- Web-based Imaging Management Services
- PWG Printer Port Monitor MIB
- Et al.

PWG WIMS-CIM Working Group

- Existing PWG Web-based Imaging Management Services (WIMS) working group
  - Concerned with the management of imaging services and devices via the Web
- Formed WIMS-CIM working group within WIMS
  - Align the CIM printing model with established printer management models
    - SNMP Printer MIB, Internet Printing Protocol, PWG Semantic Model
    - Future: Imaging System Counters, Multi-Function Device model
  - Upgrade CIM printing classes
    - Future basis for web service based printer management

PWG WIMS-CIM WG Goals

- Update CIM printing model with PWG models
    - CIM schema includes classes for Printer (device), PrintService, PrintJob, PrintQueue

- Enhance management scope of Printer device model
    - Include many important printer attributes

- Ensure that every property in CIM printing-related classes is interoperable
    - Build prototype providers
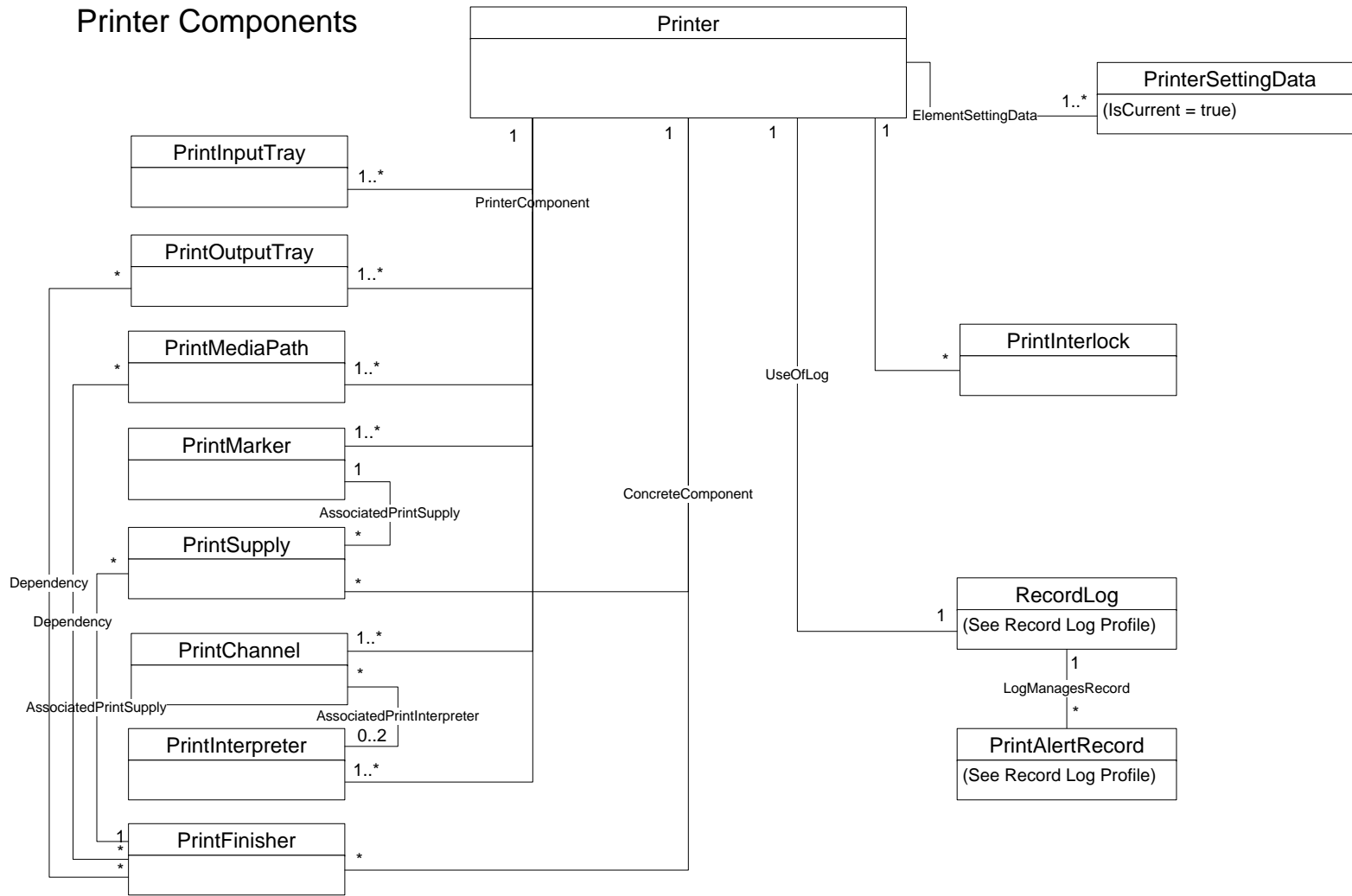
Improve Interoperability

- Fix definitions of ambiguous properties
  - "Vertical" and "Horizontal" not defined for sheet-fed printers
  - Use measurements in feed direction and cross-feed direction

- Deprecate non-interoperable properties
  - "Current" media, language not defined for pipelines > 1 page
  - Define defaults instead

- Relocate some properties to correct parent class
  - CIM_Printer contains aspects of PrintService's logical printer
  - MaxCopies, DefaultCopies, MaxSizeSupported, etc., will be moved to CIM_PrintService

Add What Was Missing

- Then-current (<v2.16) CIM_Printer (and other) classes were pretty basic
  - CIM_Printer class has about 30 properties
  - PrinterMIB has about 140 properties
- Some categories of management information were entirely absent, including most information needed for *management*
  - Alerts
  - Input trays, output trays, input media
  - Media paths, markers
  - Toners, colorants, and other supplies
  - Communications channels and language interpreters
  - Counters
  - Local languages used for management
  - Console display

Model of Printer Device

Printer Components

Working Relationship

- All work to date submitted to Core Schema WG
- A great deal of education in both directions
- Many CRs, many ballots
- Result: successful collaboration
- Future work with Schema SC and Platform SC

Printer Device Almost Complete

- Re-modeling of Printer device almost complete

- Fifteen classes

- CRs already submitted: 35

  – Approved: 30

  – In flight: 0

  – Withdrawn: 5, due to changes in model

- Changes appear in schema versions 2.13 thru 2.19

- Current state in the wiki page
http://pwg-
wiki.wikispaces.com/DMTF+CIM+Core+Schema+Change+Requests

Remaining to be Done (near term)

- Printer alert messages
- Printer-related counters

Printer Alerts

- Add message codes and text to the Platform Alert Messages Registry, DSP8007

- Work with Physical Platform Profiles (PPP) WG of Platform SC

- Schedule?
  - Started
  - Done this CY

Defining Printer Alerts

- Take all currently defined printer-related alerts and cast them in CIM terms using the new model of Printer
- Several hundred types of printer device and finisher alerts, but many fall into the same categories
  - Need to compromise between specificity of messages and number of unique messages
  - Collapse into small set of messages with substitution arguments
  - Aim for dozens of messages rather than hundreds

Printer-Related Counters

- PWG specs define many counters for imaging systems, including printer devices, print services, etc.
  - Approx 100 different counters in specs
  - New Printer device model currently contains four
- Work with Schema SC
  - Small number of classes: approx 6 plus associations
  - Moderate number of properties: 50-100
- Schedule?
  - Done this CY

Defining Printer Counters

- Sources: PWG Standardized Imaging System Counters, PWG Counter MIB
- Define 50-100 counters of various types
  - Impressions, media
  - Monochrome, color, blank
  - Processing, auxiliary, maintenance, waste
  - Times, jobs, alerts, bytes
  - Persistence
- Group into small number of classes, define model
- Define MOFs for classes
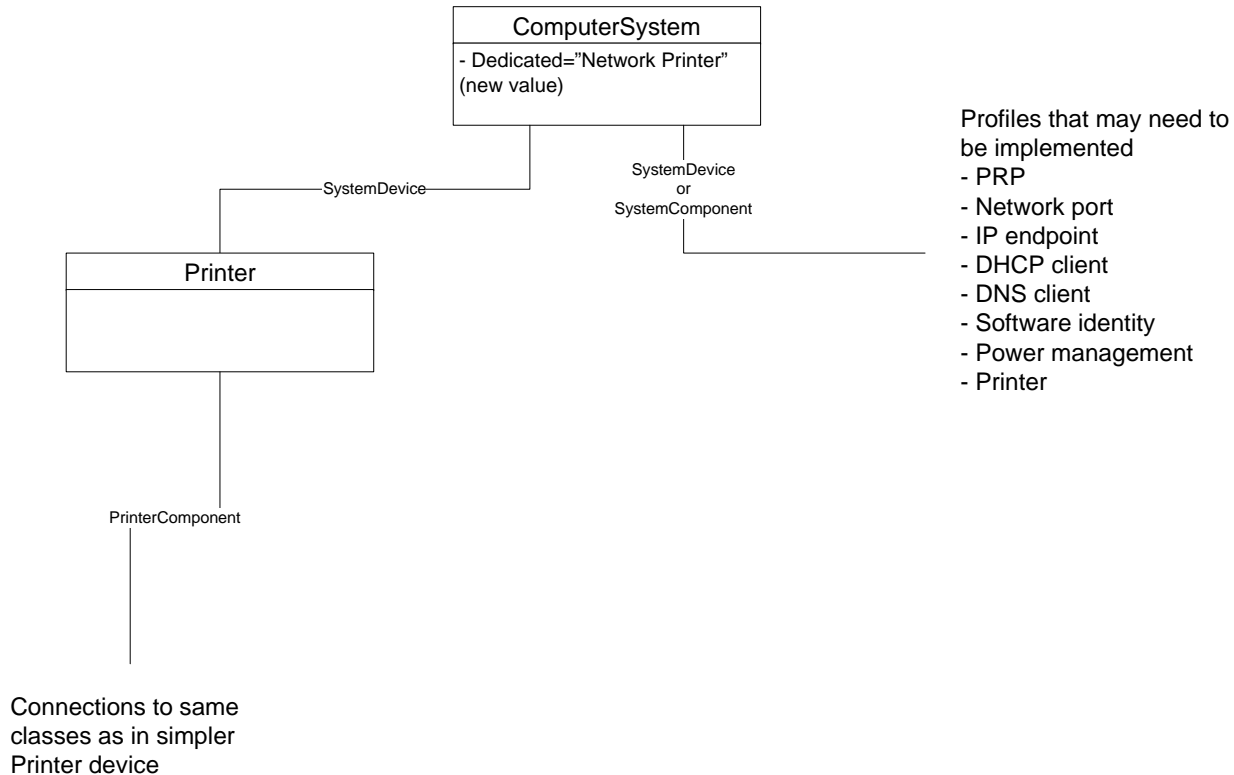
Future Challenges

- Network printer is ComputerSystem, not a LogicalDevice
  - 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
  - Incremental remodeling effort
    - Uses ComputerSystem (that includes an attached printer)

Model of Network Printer

Network Printer = Dedicated CIM_ComputerSystem with an included Printer

```
                    ┌─────────────────────────────┐
                    │        ComputerSystem        │
                    ├─────────────────────────────┤
                    │ - Dedicated="Network Printer"│
                    │ (new value)                  │
                    └─────────────────────────────┘
                      │                    │
          SystemDevice │              SystemDevice
                      │                    or
                      │              SystemComponent
  ┌──────────────────┐                    │
  │     Printer      │
  ├──────────────────┤
  │                  │
  └──────────────────┘
          │
          │
   PrinterComponent
          │
          │
```

Profiles that may need to be implemented
- PRP
- Network port
- IP endpoint
- DHCP client
- DNS client
- Software identity
- Power management
- Printer

Connections to same classes as in simpler Printer device

Future

- Next CY
  - Update the PrintService and PrintJob classes based on IPP and Semantic Model
  - Make notes for Profiles of Printer Device and Network Printer in the future

Questions?