

Printer Provider Proxy Prototype - Status

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Status



- Code
 - Translation code is complete, except perhaps for a few bugs
- Tests
 - Interactive tests to translate the management data for one printer or for one class of one printer
 - Batch test to translate all printers in the current set
 - "Analysis" of the batch test output to group results, property by property, across all printers
- Docs
 - Internal structure of the prototype
 - How to run tests
 - Comments in the code

What's in the Code?



- Python runtime programs
 - 16 modules
- Shell (bash) scripts to invoke tests
- ini files that generate runtime tables
 - printers, class properties, associations, MIB variables, SNMP tables, variable subscripts, variables required for a property, algorithms, paper sizes, property enum values
- Test data: MIB dumps from test printers
 - 3 Dell, 4 HP, 3 Konica, 1 Lexmark, 1 Oki, 1 Sharp, 5 Xerox
 - (Thank you, contributors)
- MOF text files, MIB RFC text files

Question: What's in a Name?



- Multiple properties containing something like "name"
 - Name
 - ElementName
 - Caption
 - Description
 - InstanceID
 - LocalizedDescription
- Varying requirements for uniqueness or friendliness
- What SNMP variables to map to these?

Question: What's in a Status?



- Same question: many status variables
 - PrimaryStatus, DetailedStatus, OperatingStatus, CommunicationStatus, OperationalStatus, AvailabilityStatus
 - PrinterStatus, HealthState
 - Deprecated: Status, LastErrorCode, ErrorDescription, ErrorCleared, Availability, StatusInfo
- Mostly derived from subunit status of components, hrDeviceStatus, hrPrinterStatus, hrPrinterDetectedErrorState
- For all of these, especially the printer-level roll-ups, we should state a policy
 - In code in the prototype AND in normative text in the profile
 - Else implementations will not be interoperable with clients

Sample Output 1 - Printer, p1



```
===== CIM_Printer key=SNMPRowId=1 rowid=1 =====
```

```
CIM_Printer.AdditionalAvailability          = ((null))
CIM_Printer.AllAlerts                      = ADDED: 9999 value of AllAlerts
CIM_Printer.Availability                   = ((deprecated))
CIM_Printer.AvailableJobSheets             = NYI paper types not evaluated
CIM_Printer.AvailableRequestedStates      = ((null))
CIM_Printer.Capabilities                   = ((deprecated))
CIM_Printer.CapabilityDescriptions        = ((deprecated))
CIM_Printer.Caption                        = Dell Laser Printer 5100cn (Net 6.26, Controller
    200408021635, Engine 00.07.01)
CIM_Printer.CharSetsSupported              = [3, 4, 4, 4, 4]
CIM_Printer.CommunicationStatus            = 2 (Communication OK)
CIM_Printer.ConsoleDisabled                = FALSE
CIM_Printer.ConsoleDisplayBufferText      = ['Ready/Standby', '']
CIM_Printer.ConsoleNaturalLanguage        = en
CIM_Printer.CreationClassName              = CIM_Printer
CIM_Printer.CriticalAlerts                = ADDED: 9998 value of CriticalAlerts
CIM_Printer.CurrentCapabilities            = ((deprecated))
CIM_Printer.CurrentCharSet                 = 3
CIM_Printer.CurrentLanguage                = ((deprecated))
CIM_Printer.CurrentMimeType                = ((deprecated))
CIM_Printer.CurrentNaturalLanguage        = en
CIM_Printer.CurrentOperator                = ADDED: value of CurrentOperator goes here
CIM_Printer.CurrentPaperType              = ((deprecated))
```

Sample Output 1 - Printer, p2



```
• CIM_Printer.DefaultCapabilities = ((deprecated))
• CIM_Printer.DefaultCopies = ((deprecated))
• CIM_Printer.DefaultLanguage = ((deprecated))
• CIM_Printer.DefaultMimeType = ((deprecated))
• CIM_Printer.DefaultNumberUp = ((deprecated))
• CIM_Printer.DefaultPaperType = na_letter_8.5x11in
• CIM_Printer.Description = Dell Laser Printer 5100cn (Net 6.26, Controller
200408021635, Engine 00.07.01)
• CIM_Printer.DetailedStatus = NYI Status rollups not evaluated
• CIM_Printer.DetectedErrorState = NYI Status rollups not evaluated
• CIM_Printer.DeviceID = DELL2A2001
• CIM_Printer.ElementName = ADDED: value of PrinterName goes here
• CIM_Printer.EnabledDefault = 2 (Enabled)
• CIM_Printer.EnabledState = 2 (Enabled)
• CIM_Printer.ErrorCleared = ((deprecated))
• CIM_Printer.ErrorDescription = ((deprecated))
• CIM_Printer.ErrorInformation = ((null))
• CIM_Printer.HealthState = NYI Status rollups not evaluated
• CIM_Printer.HorizontalResolution = ((deprecated))
• CIM_Printer.IdentifyingDescriptions = ((null))
• CIM_Printer.InstallDate = ((null))
• CIM_Printer.JobCountSinceLastReset = not supported
• CIM_Printer.LanguagesSupported = ['Print Language Auto Switch', 'PCL5', 'PCL6',
'PostScript']
• CIM_Printer.LastErrorCode = ((deprecated))
• CIM_Printer.LocationIndicator = 4 (Not Supported)
```

Sample Output 1 - Printer, p3



```
CIM_Printer.MarkingTechnology          = ((deprecated))
CIM_Printer.MaxCopies                  = ((deprecated))
CIM_Printer.MaxNumberUp                = ((deprecated))
CIM_Printer.MaxQuiesceTime             = ((deprecated))
CIM_Printer.MaxSizeSupported           = ((deprecated))
CIM_Printer.MimeTypesSupported         = NYI
CIM_Printer.Name                       = DELL2A2001
CIM_Printer.NaturalLanguagesSupported  = ['en', 'fr', 'de', 'it', 'es']
CIM_Printer.OperatingStatus            = NYI Status rollups not evaluated
CIM_Printer.OperationalStatus          = NYI Status rollups not evaluated
CIM_Printer.OtherEnabledState          = ((null))
CIM_Printer.OtherIdentifyingInfo       = ((null))
CIM_Printer.PaperSizesSupported        = ((deprecated))
CIM_Printer.PaperTypesAvailable        = ['na_letter_8.5x11in', 'na_letter_8.5x11in',
    'na_letter_8.5x11in', 'iso_a4_210x297mm', 'iso_a4_210x297mm']
CIM_Printer.PowerManagementCapabilities = ((deprecated))
CIM_Printer.PowerManagementSupported   = ((deprecated))
CIM_Printer.PowerOnHours               = ((deprecated))
CIM_Printer.PrimaryStatus              = NYI Status rollups not evaluated
CIM_Printer.PrinterStatus              = NYI Status rollups not evaluated
CIM_Printer.RequestedState             = 12 (Not Applicable)
CIM_Printer.SerialNumber               = ADDED: value of SerialNumber goes here
CIM_Printer.ServicePerson              = ADDED: value of ServicePerson goes here
CIM_Printer.Status                     = ((deprecated))
CIM_Printer.StatusDescriptions         = ((null))
CIM_Printer.StatusInfo                 = ((null))
```


Sample Output 1 - Printer, p4



- `CIM_Printer.SystemCreationClassName` = `CIM_ComputerSystem`
- `CIM_Printer.SystemName` = `DELL2A2001`
- `CIM_Printer.TimeOfLastReset` = not supported
- `CIM_Printer.TimeOfLastStateChange` = not supported
- `CIM_Printer.TotalPowerOnHours` = ((deprecated))
- `CIM_Printer.TransitioningToState` = 5 (No Change)
- `CIM_Printer.VerticalResolution` = ((deprecated))

Many Printer properties have been deprecated

- Could not be implemented interoperably

Many have not been computed

- No consensus on algorithm
- Need policy

Sample Output 2 - InputTray, p1



```
===== CIM_PrintInputTray key=SNMPRowId=2 rowid=2 =====

CIM_PrintInputTray.AvailabilityStatus      = 3 (AvailableIdle)
CIM_PrintInputTray.CapacityUnit           = 8 (Sheets)
CIM_PrintInputTray.Caption                = Tray 1
CIM_PrintInputTray.CommunicationStatus    = 2 (Communication OK)
CIM_PrintInputTray.CriticalAlertsPresent  = FALSE
CIM_PrintInputTray.CurrentLevel           = 1
CIM_PrintInputTray.CurrentLevelBasis     = 4 (AtLeastOne)
CIM_PrintInputTray.Description            = Tray 1
CIM_PrintInputTray.DetailedStatus         = 1 (No Additional Information)
CIM_PrintInputTray.ElementName            = DELL2A2001 CIM_PrintInputTray 2
CIM_PrintInputTray.HealthState            = 5 (OK)
CIM_PrintInputTray.InstallDate            = ((null))
CIM_PrintInputTray.InstanceID             = Dell:RicksNoName:DELL2A2001:Dell Laser Printer
      5100cn:CIM_PrintInputTray:2
CIM_PrintInputTray.IsDefault              = FALSE
CIM_PrintInputTray.LocalizedDescription   = Tray 1
CIM_PrintInputTray.MaxCapacity            = 500
CIM_PrintInputTray.MaxCapacityBasis      = 3 (Actual)
CIM_PrintInputTray.MediaColor             = ((empty string))
CIM_PrintInputTray.MediaName              = ((empty string))
CIM_PrintInputTray.MediaSizeName          = na_letter_8.5x11in
CIM_PrintInputTray.MediaType              = stationery
CIM_PrintInputTray.MediaWeight            = 0
CIM_PrintInputTray.MediaWeightBasis      = 2 (Unknown)
```

Sample Output 2 - InputTray, p2



```
CIM_PrintInputTray.Name                = DELL2A2001 CIM_PrintInputTray 2
CIM_PrintInputTray.NonCriticalAlertsPresent = FALSE
CIM_PrintInputTray.OperatingStatus      = 0 (Unknown)
CIM_PrintInputTray.OperationalStatus     = ((null))
CIM_PrintInputTray.OtherAvailabilityStatus = ((null))
CIM_PrintInputTray.OtherCapacityUnit     = ((null))
CIM_PrintInputTray.OtherTypeDescription  = ((null))
CIM_PrintInputTray.PrimaryStatus         = 1 (OK)
CIM_PrintInputTray.SNMPRowId             = 2
CIM_PrintInputTray.Status                 = ((deprecated))
CIM_PrintInputTray.StatusDescriptions    = ((null))
CIM_PrintInputTray.Type                   = 3 (SheetFeedAutoRemovableTray)
```

Sample Output 3 - AlertRecord



```
===== CIM_PrintAlertRecord key=SNMPRowId=1 rowid=1 =====
```

```
CIM_PrintAlertRecord.Caption           = Out of Paper.
CIM_PrintAlertRecord.CodeName          = NYI: replace this with the IANA registered code name
CIM_PrintAlertRecord.ComponentClassName = CIM_PrintInputTray
CIM_PrintAlertRecord.ComponentElementName = DELL2A2001 CIM_PrintInputTray 5
CIM_PrintAlertRecord.CreationTimeStamp = 2009-04-18T06:27:20 0:00:00:06.82 ago
CIM_PrintAlertRecord.Description      = Out of Paper.
CIM_PrintAlertRecord.ElementName      = DELL2A2001 CIM_PrintAlertRecord 1
CIM_PrintAlertRecord.InstanceID       = Dell:RicksNoName:DELL2A2001:Dell Laser Printer
    5100cn:CIM_PrintAlertRecord:1
CIM_PrintAlertRecord.Locale           = ((deprecated))
CIM_PrintAlertRecord.LocalizedDescription = Out of Paper.
CIM_PrintAlertRecord.LogInstanceID    = Dell:RicksNoName:DELL2A2001:Dell Laser Printer
    5100cn:CIM_RecordLog:999
CIM_PrintAlertRecord.LogName          = prtAlertTable
CIM_PrintAlertRecord.Message          = NYI Message Registry not defined
CIM_PrintAlertRecord.MessageArguments = NYI Message Registry not defined
CIM_PrintAlertRecord.MessageID        = NYI Message Registry not defined
CIM_PrintAlertRecord.OtherCodeName    = ((null))
CIM_PrintAlertRecord.OtherSeverityLevel = ((null))
CIM_PrintAlertRecord.OwningEntity     = NYI Message Registry not defined
CIM_PrintAlertRecord.RecordData       = ;1;0;3;8;5;0;808;288964133;
CIM_PrintAlertRecord.RecordFormat     = ;uint32 prtAlertIndex;uint32 prtAlertSeverityLevel;uint32
    prtAlertTrainingLevel;uint32 prtAlertGroup;uint32 prtAlertGroupIndex;uint32 prtAlertLocation;uint32
    prtAlertCode;uint32 prtAlertTime;
CIM_PrintAlertRecord.RecordID         = 0
CIM_PrintAlertRecord.SeverityLevel    = 1 (Other)
```

Sample Output 4 - Supply, p1



```
===== CIM_PrintSupply key=SNMPRowId=1 rowid=1 =====

CIM_PrintSupply.Caption                = Cyan Toner
CIM_PrintSupply.Classification          = 3 (SupplyThatIsConsumed)
CIM_PrintSupply.ColorantName            = cyan
CIM_PrintSupply.ColorantRole            = 3 (Process)
CIM_PrintSupply.ColorantTonality        = 256
CIM_PrintSupply.CommunicationStatus      = 1 (Not Available)
CIM_PrintSupply.Description             = Cyan Toner
CIM_PrintSupply.DetailedStatus          = 1 (No Additional Information)
CIM_PrintSupply.ElementName             = DELL2A2001 CIM_PrintSupply 1
CIM_PrintSupply.HealthState             = 25 (Critical failure)
CIM_PrintSupply.InstallDate             = not yet specified
CIM_PrintSupply.InstanceID              = Dell:RicksNoName:DELL2A2001:Dell Laser Printer
    5100cn:CIM_PrintSupply:1
CIM_PrintSupply.LocalizedDescription     = Cyan Toner
CIM_PrintSupply.MaxCapacity             = 100
CIM_PrintSupply.MaxCapacityBasis        = 3 (Actual)
CIM_PrintSupply.Name                    = DELL2A2001 CIM_PrintSupply 1
CIM_PrintSupply.OperatingStatus          = 1 (Not Available)
CIM_PrintSupply.OperationalStatus        = ((null))
CIM_PrintSupply.OtherClassification     = ((null))
CIM_PrintSupply.OtherColorantName        = ((null))
CIM_PrintSupply.OtherColorantRole       = ((null))
CIM_PrintSupply.OtherSupplyUnit          = ((null))
CIM_PrintSupply.OtherTypeDescription     = ((null))
```

Sample Output 4 - Supply, p2



```
CIM_PrintSupply.PrimaryStatus          = 0 (Unknown)
CIM_PrintSupply.RemainingCapacity      = 80
CIM_PrintSupply.RemainingCapacityBasis = 3 (Actual)
CIM_PrintSupply.SNMPSRowId            = 1
CIM_PrintSupply.Status                 = ((deprecated))
CIM_PrintSupply.StatusDescriptions     = ((null))
CIM_PrintSupply.SupplyUnit             = 13 (TenthsOfGrams)
CIM_PrintSupply.Type                   = 3 (Toner)
```

Sample Output 5 - AssociatedPrintInterpreter



```
=====  
CIM_AssociatedPrintInterpreter key=['CIM_PrintChannel', 'CIM_PrintInterpreter'] rowid=['1', '1']  
=====
```

```
CIM_AssociatedPrintInterpreter.Antecedent      = Dell:RicksNoName:DELL2A2001:Dell Laser Printer  
  5100cn:CIM_PrintInterpreter:1  
CIM_AssociatedPrintInterpreter.DefaultType    = 3 (JobControlLanguage)  
CIM_AssociatedPrintInterpreter.Dependent      = Dell:RicksNoName:DELL2A2001:Dell Laser Printer  
  5100cn:CIM_PrintChannel:1  
CIM_AssociatedPrintInterpreter.OtherDefaultTypeDescription = ((null))
```

. . .

```
=====  
CIM_AssociatedPrintInterpreter key=['CIM_PrintChannel', 'CIM_PrintInterpreter'] rowid=['1', '1']  
=====
```

```
CIM_AssociatedPrintInterpreter.Antecedent      = Dell:RicksNoName:DELL2A2001:Dell Laser Printer  
  5100cn:CIM_PrintInterpreter:1  
CIM_AssociatedPrintInterpreter.DefaultType    = 4 (PageDescriptionLanguage)  
CIM_AssociatedPrintInterpreter.Dependent      = Dell:RicksNoName:DELL2A2001:Dell Laser Printer  
  5100cn:CIM_PrintChannel:1  
CIM_AssociatedPrintInterpreter.OtherDefaultTypeDescription = ((null))
```

Sample Output 6 - ElFako_Colorant



```
. . .

===== ElFako_Supply key=SNMPRowId=4 rowid=4 =====

ElFako_Supply.PROPprtMarkerSuppliesColorantIndex = 4
ElFako_Supply.PROPprtMarkerSuppliesIndex        = 4
ElFako_Supply.PROPprtMarkerSuppliesMarkerIndex  = 1

===== ElFako_Supply key=SNMPRowId=5 rowid=5 =====

ElFako_Supply.PROPprtMarkerSuppliesColorantIndex = 0
ElFako_Supply.PROPprtMarkerSuppliesIndex        = 5
ElFako_Supply.PROPprtMarkerSuppliesMarkerIndex  = 1

. . .

===== ElFako_Colorant key=SNMPRowId=4 rowid=4 =====

ElFako_Colorant.PROPprtMarkerColorantIndex      = 4
ElFako_Colorant.PROPprtMarkerColorantMarkerIndex = 1
ElFako_Colorant.PROPprtMarkerColorantRole       = 3
ElFako_Colorant.PROPprtMarkerColorantTonality   = 256
ElFako_Colorant.PROPprtMarkerColorantValue      = black
```


Sample Analysis 1 - Printer.Name



```
===== Searching for Printer\.Name
```

```
CIM_Printer.Name           = DELL2A2001
CIM_Printer.Name           = LXKB8F86D
CIM_Printer.Name           = LXKBD0C65
CIM_Printer.Name           = NPIC9B224
CIM_Printer.Name           = NPI24F196
CIM_Printer.Name           = NPIC9B220
CIM_Printer.Name           = NPIC9B224
CIM_Printer.Name           = Error: OID not found 1.3.6.1.2.1.1.5.0
CIM_Printer.Name           = Error: OID not found 1.3.6.1.2.1.1.5.0
CIM_Printer.Name           = Error: OID not found 1.3.6.1.2.1.1.5.0
CIM_Printer.Name           = LXKD6B28A
CIM_Printer.Name           = OKI9053706
CIM_Printer.Name           = Error: OID not found 1.3.6.1.2.1.1.5.0
CIM_Printer.Name           = Phaser 6120-8889
CIM_Printer.Name           = sg-lexington
CIM_Printer.Name           = sg-castelo
CIM_Printer.Name           = sg-fb2008
CIM_Printer.Name           = Pinehurst Gold 150
```

- Need for a somewhat more sophisticated calculation of Name
 - This is just sysName, but some printers will not have an assigned IP name

Sample Analysis 2 - InputTray Health



```
===== Searching for InputTray\HealthState
```

```
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 10 (Degraded/Warning)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 25 (Critical failure)
CIM_PrintInputTray.HealthState      = 10 (Degraded/Warning)
CIM_PrintInputTray.HealthState      = 10 (Degraded/Warning)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 25 (Critical failure)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 10 (Degraded/Warning)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 10 (Degraded/Warning)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 5 (OK)
CIM_PrintInputTray.HealthState      = 10 (Degraded/Warning)
```

```
. . .
```

Next Steps



- Me
 - Get out the last few bugs :-)
 - Edit license and copyright into all the files
 - Package
 - Submit to PWG
- You
 - Examine the output files
 - Find bugs, suggest improvements
 - Suggest naming and status algorithms

Questions?

