LCA2006 Systems Administration Miniconf:

System Monitoring with WBEM

Tim Potter

Software Engineer, HP

What is WBEM?

- Web
- Based
- Enterprise
- Management

WBEM is:

A protocol for managing network resources.

WBEM is:

Peer and successor to SNMP.

WBEM is:

- XML requests and responses over HTTP
- TCP port 5988 (insecure)
- TCP port 5989 (SSL)

WBEM is:

- An object oriented database
- With remote procedure calls
- With async notifications
  - Indications
  - Like SNMP traps

Scenario

- New widget on your network
- Managed by WBEM
- What do you do?

PyWBEM

- Download and install PyWBEM
- http://pywbem.sourceforge.net
- Start tooling around

Exploring WBEM

- Connect to device

```
$ python
>>> import pywbem
>>> conn =
 pywbem.WBEMConnection
   ('widget.foo.com',
     ('username','password'))
```

Exploring WBEM

- Get list of CIM classes

```
>>> conn.EnumerateClassNames(
  DeepInheritance = True)
['CIM_AFService',
 'CIM_AuthenticationRole,
 ...]
```

Schema Reference

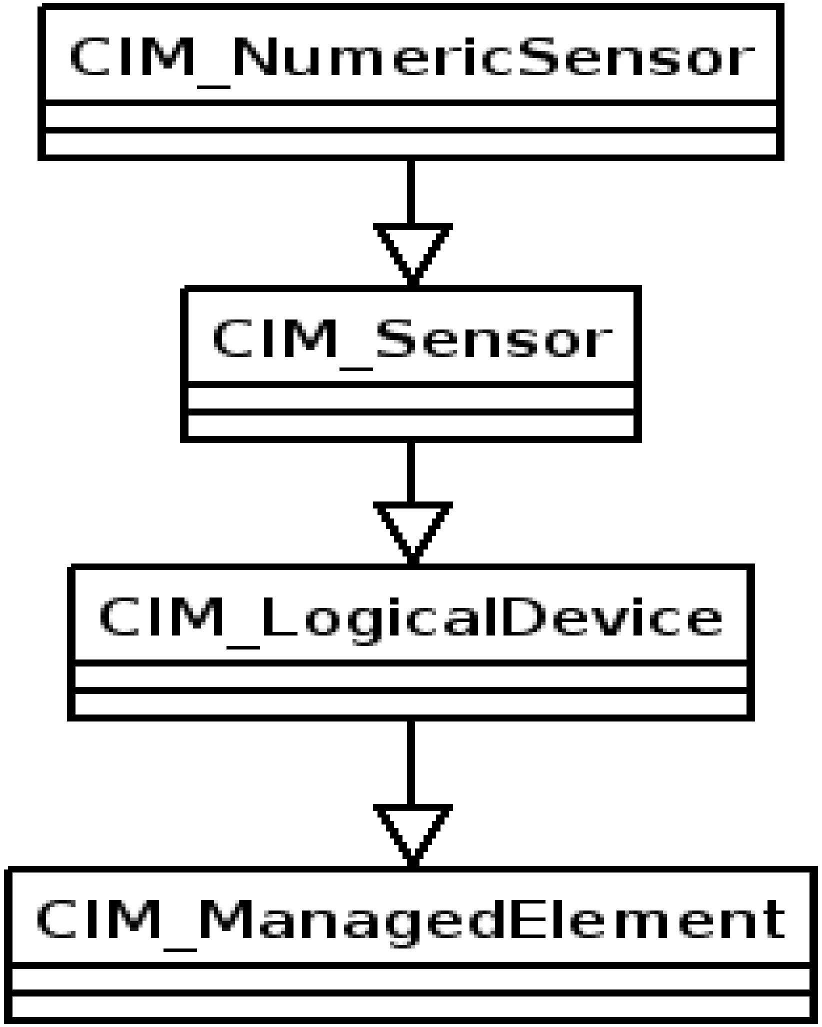
- Latest version available on the DMTF website

http://dmtf.org/standards/cim/cim_schema_v211

Schema Reference

- Class diagrams show CIM class ancestry
- Properties of superclass inherited in subclass

Schema Reference



Schema Reference

- MOF files contain property descriptions
- Equivalent to a SNMP MIB
- CIM schema distributed as MOF files

Exploring WBEM

- Some classes that may be present on your device
  - CIM_ComputerSystem
  - CIM_Sensor
  - CIM_PowerSupply

Exploring WBEM

- Get overall status of device

```
>>> cs =
 conn.EnumerateInstanceNames
 ('CIM_ComputerSystem')
>>> i =
 conn.GetInstance(cs[0])
```

Exploring WBEM

- Get overall status of device

```
>>> print
 i['OperationalStatus']
[3]
>>> print
 i['StatusDescriptions']
['Degraded']
```

Exploring WBEM

```
>>> ps =
 conn.EnumerateInstances
   ('CIM_PowerSupply')
>>> print
 ps[0]['Description']
'Power Supply 1'
```

Associations

- Can relate managed objects to each other via associations
- e.g temperature sensor X is connected to CPU Y
- API quite complicated

Associations

- Simple monitoring script

```
>>> for s in <get sensors>:
>>>     i = conn.GetInstance(s)
>>>     print i['OperationalStatus']
```

Indications

- Equivalent of SNMP traps
- Sent as HTTP POST request to a WBEM server
- Subscription API also quite complicated

Example Code

- The PyWBEM home page has lots of examples
- http://pywbem.sf.net/examples/

Key Takeaways

- Mmmm... Takeaway...
- WBEM = CIM Schema + XML + HTTP + SSL
- Object oriented manageability
- Use PyWBEM for exploration

Key Takeaways

- Not present in many devices yet
- Being pushed by big vendors
- Will appear on your radar sometime!

invent