Using Performance Co Pilot to monitor SNMP devices

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http://wob.zot.org/2/projects/show/pcp

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January 2012
What is SNMP?

- Hopefully familiar to this audience
- **Simple Network Monitoring Protocol** is used for monitoring any devices (e.g., routers or switches)
- Uses an open ended “OID” dotted number, translated to an open ended text metric name.
- Out of Band “MIB” files describe name to number mappings and contain the metric semantics
  
  Eg: `1.3.6.1.2.1.1.3.0` is `sysUpTime.0`

- The main industry standard for monitoring
Origins of Performance CoPilot

- How do you monitor a 512 processor machine
  - top does not scale!

- How do you monitor a cluster of 20x512 processor machines?

- How do you know if what you are observing today has happened before?

- How do you correlate today’s event with other activity on the system?
PCP Overview

- What is PCP?
  - **Performance Co-Pilot**
  - Open source **toolkit** for system level performance analysis
  - Live and historical
  - Extensible (monitors, collectors)
  - Distributed
Apache Agent (PMDA)
Postgres Agent (PMDA)
KVM Agent (PMDA)

Daemon (PMCD)

Proxy

pmlogger
pmie
pminfo
pmchart

$pminfo -f snmp.version
snmp.version value "0.3"

Architecture

pmchart

pmlogger
pmie
pminfo

$ pminfo -f snmp.version
snmp.version value "0.3"
Monitor tools

- pminfo, pmprobe, pmdumptext
- pmlogextract, pmlogsummary, pmwtf
- pmchart
- pmstat
- pmie
PCP toolkit includes

- One common protocol for both archives and live
- Real time Conditional Alerting
- Log analysis tools
- A GUI charting tool
- Both Centralised and distributed
PCP compared to SNMP

- Also Monitors devices
- Has an open ended metric names but a fixed size number space
  Eg: kernel.percpu.cpu.sys is 60.0.2
- The Agent (PMDA) defines all the semantics of each metric, including the name to number map
- Homepage: http://oss.sgi.com/projects/pcp/
Why an SNMP bridge?

- At work, we use PCP extensively
- This leaves out monitoring of all non general purpose OS systems - at least these:
  - Network Switches, Power Rails
  - SAN systems, Server LOM
- Also, the rest of the world uses SNMP
- No general purpose PCP to SNMP gateway exists
What I wanted

- Load SNMP hostnames and credentials
- Determine enough metadata to export the right PCP metric info
- Allow side-by-side logging of SNMP and PCP and comparison within the existing tools
- Provide a dynamic interface to debug and discover SNMP data
Demo

- pmchart monitoring network traffic
Not Demo

• Pminfo:

$ pminfo -f snmp.host.localhost.1.3.6.1.2.1.2.2.1.2

snmp.host.localhost.1.3.6.1.2.1.2.2.1.2

  inst [1 or "1"] value "lo"
  inst [2 or "2"] value "eth0"
  inst [4 or "4"] value "wlan0"
  inst [8 or "8"] value "usb0"

• Config:

host localhost $COMMUNITY

map single 1.3.6.1.2.1.1.3.0    TIMETICKS 1   sysUpTime
map column 1.3.6.1.2.1.2.2.1.2 STRING 10 ifDescr
map column 1.3.6.1.2.1.2.2.1.10 COUNTER32 + ifInOctets
TODO ..

- Add multi threading and caching to avoid timeouts
- Improve the PCP Perl bindings
- Add Dynamic mappings!
- Load the MIBS, lose the numbers
- Add Virtual Hosting to PCP
- Lots of fine tuning as well …


- My SNMP gateway patchset:  [http://wob.zot.org/2/projects/show/pcp](http://wob.zot.org/2/projects/show/pcp)
Thank You

- Questions?

- Performance Co Pilot Homepage:
  http://oss.sgi.com/projects/pcp/

- My SNMP patchset:
  http://wob.zot.org/2/projects/show/pcp
  git://wob.zot.org/9/pcp.git
Schema

- Is:
  
  \[
  \text{snmp.host.$hostname.N...N or snmp.host.$hostname.N...N[rownr]}
  \]

- PCP “PMID”s: 22bits
  - each metric name has an ID
  - Config defines static mappings, then add an offset for each host
    \[
    \text{pmid = (hostID * maxmaps + mapID)}
    \]
- Instance IDs: 32bits, currently only used for simple table rows