End-Site Control Plane Service (ESCaPeS) Monitoring with Periscope

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End Site Control Plane System (ESCPS)

• Network service to facilitate site use of circuit services:
  – Accept and process user/app requests for circuit services
  – Provide local interface to & coordination of WAN circuit services
  – Configure local network infrastructure for use of circuits
  – Monitor local network segments of end-to-end path
  – Long term vision: End site component of federated control plane for circuit services
- Link
- Uncontrolled segment (dedicated/over-provisioned)
  - ESCPS-controlled segment
  - ESCPS virtual circuit (OSCARS in LAN)
  - 3rd party segment (statically configured)
  - Virtual circuit (WAN)
XSP – eXtensible Session Protocol

• XSPd implements protocol frontend
  — Accepts on-demand reservation requests from clients
  — Signals ESCaPeS to allocate a circuit and monitors circuit status

[Diagram of XSP and ESCaPeS interactions]

XSP_CIRCUIT=TERAPATHS

<SRC, DST>

Monitoring Agent

ESCPS Status

ESCP Properties
  → BW
  → Duration
  → Traffic Class
  → Ports
Periscope

• A Django-based application that gathers, caches, analyzes and displays performance data
  – Also presents data via RESTful and WS interfaces

• A user- (or session-) oriented tool that captures context

• Proactive gathering of data improves response time
  – Caching the user’s world
Periscope Overview

Periscope

Periscope

Blip

GridFTP

XIO driver

libxsp

Host / Disk

TCP stats

BlipPP

Calipers

WAN

XSP Daemon

Periscope

XSP Daemon

Periscope

perfSONAR

Network Monitoring

Periscope

Calipers

libxsp

GridFTP

XIO driver

Host / Disk

TCP stats

BlipPP
Monitoring Architecture

1. Host statistics collection and reporting with event daemon.
2. XSP client requests path on application request, sends path and application-specific parameters.
3. XSPd signals ESCaPeS to reserve path based on local config.
4. XSPd monitors path status and reports state to monitoring agent.
5. Agent requests Filter based forwarding or policy based routing counters from router monitor when path is active.
6. Monitoring agent caches measurement data (SNMP).
7. The agent visualizes the network topology and handles client requests for dynamically updated charts and path status.
Host and Application Metrics

• Basic Lightweight perfSONAR Probes (BLiPPs) gather host performance data
  – From /proc, etc

• NetLogger and Calipers instrument read() and write() system calls, calculate duration, summarize over time with varying granularity
ESCaPeS Monitoring
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ESCaPeS Monitoring
GridFTP Monitoring
Unified Network Information Service (UNIS)

- Merges TS & LS
- Topology model
  - Tree of nodes at different layers (Network/Node/Port)
  - Relations between arbitrary nodes
  - Node properties
- ‘GIS for networks’
- Relates MPs, MAs to topology
Links and Paths (and Links)
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Layer 2 Circuit Endpoint

Layer 2 Device
Layer 2 Device
Layer 2 Device
Layer 2 Device
Links and Paths (and Links)

TCP endpoint for GridFTP

TCP endpoint for GridFTP

IP Device

IP Device

IP Device

IP Device
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