June 14th, LHCOPN/LHCONE Meeting
Jason Zurawski – Research Liaison

LHCONE Monitoring Thoughts
LHCONE Monitoring

- LHCONE Monitoring = Hard Problem(?)
- Current Use Case: USATLAS
- Possible Solutions
Hard Problem To Solve?

• Participants
  – Multiple Domains (e.g. Building, Campus, Regional, Backbone, Exchange Point)
  – Multiple Parties (e.g. VO management, Local/Regional/National IT staff)

• Technologies
  – Monitoring at all layers of the OSI stack (e.g. light levels all the way up to application performance)

• Governance
  – Conversations about this over last 2 days – who runs LHCONE? Can someone enforce monitoring rules?
  – Value add: installation of monitoring tools and someone to ensure they work
  – Some central facility to manage the tickets/process?
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• Hardware/Software
  – perfSONAR-PS Performance Toolkit
    (http://psps.perfsonar.net/toolkit)
  – 2 Dedicated Machines per T1 and T2 (Bandwidth and Latency Monitoring)

• Use Case
  – Regular full mesh testing (OWAMP/BWCTL/PingER)
  – Diagnostic tools on demand (NDT/NPAD)
  – Alarms built using NAGIOS
    • Throughput drops below threshold
    • Loss/Latency increase beyond threshold
    • Monitoring hosts/services become unreachable
USATLAS – Setting Up Tests
Source: atlas-npt2.bu.edu (192.5.207.252) -- Destination: lhcmn.bnl.gov (192.12.15.23)

Maximum atlas-npt2.bu.edu -> lhcmn.bnl.gov 937.92 Mbps
Average atlas-npt2.bu.edu -> lhcmn.bnl.gov  913.95 Mbps
Last atlas-npt2.bu.edu -> lhcmn.bnl.gov 915.50 Mbps

Maximum lhcmn.bnl.gov -> atlas-npt2.bu.edu  937.90 Mbps
Average lhcmn.bnl.gov -> atlas-npt2.bu.edu 877.25 Mbps
Last lhcmn.bnl.gov -> atlas-npt2.bu.edu 934.56 Mbps
USATLAS

• Implementing other Components
  – Dashboard
    • Python based, integrated with perfSONAR-PS NAGIOS probes.
    • Web Service calls to remote instances to gain status info
    • Developed by BNL for USATLAS
  – Integration into data movement software
    • Still in pipe-dream phase – use perfSONAR-PS APIs to get data from monitoring hosts
    • Intelligent decisions about data movement (e.g. who to download from ala bit-torrent, or when to start a dynamic circuit vs use IP)
USATLAS – “Complete” View

The Experimental Independent perfSONAR Dashboard

Status as of: Mon Jun 06 10:28:59 EDT 2011

Throughput

Latency

The rows of the table represent SOURCE nodes for a throughput test while the columns represent DESTINATION nodes. Each cell in the table contains the result of two versions of a BNPfT throughput test for the specified source and destination. Tests are configured to run on BOTH the source and destination once every 4 hour period. The upper link in each cell represents the results of the throughput test initiated from the SOURCE node. The lower link in each cell represents the results of the throughput test initiated from the DESTINATION node.

The rows of the table represent SOURCE nodes for a test while the columns represent DESTINATION nodes. Each cell in the table represents a source-destination LATENCY test via OAMP (500 UDP packets/test) tests, 1/minute. The metric we are plotting is the packet loss between the source and destination averaged over the last 30 minutes. Each cell contains the result of two tests.
USATLAS – Per-Pair Performance

The Experimental Independent perfSONAR Dashboard

Throughput History Plot

Source:atlas-npt2.bu.edu, destination=lhcbmon.bnl.gov, monitor=atlas-npt2.bu.edu

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**Support Structure**

– Community mailing lists, meetings with pS PS engineers for debugging/feature requests
– Support on installation/upgrading (2 or so times a year) as required
– No PERT – performance problems are handled by USATLAS with the help of Internet2/ESnet typically organizing testing and resource coordination with peer networks

**Difference vs MDM**

– No Help Desk
– Machines are under local control only (we don’t maintain persistent login access)
– Testing is up to the VO, we can help get things started.
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Potential Solutions

• Similar to USATLAS Approach
  – Mandate direct participants purchase at least 1 (preferable 2) machines for monitoring purposes.
    • Stationed at the network core (near the storage/processing equipment)
    • Bonus deployment at the edge
  – Encourage Backbone/Regional/XP operators to do the same. Harder to enforce outside of the VO...
  – Compile list of desirable functionality (e.g. regular testing, on demand testing, complete OS vs packages, etc.).
    • Market based study of what is available vs what could be developed.
  – Form (or use this) WG to serve as community support
    • Installation
    • Configuration
    • Trouble shooting
Possible Enhancements

- New Software Development
  - LHC Community is not afraid to innovate – do the current solutions in the monitoring space scale? Is anything new needed? Anything need to be changed?

- PERT/Help Desk
  - Home for the homeless w/ regards to trouble tickets.
  - Work with the networking partners to track progress
  - Handle issues with installation/configuration in the event that the open source model is not sufficient

- Non-Local Control of monitoring
  - Central authority to own/maintain the infrastructure instead of allowing domains to manage this role
Discussion

moderator kitteh

disapproves ur submishinz.