Introduction to MaDDash

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Overview

• Motivation
• What is MaDDash?
• Configuration Strategy
• Advanced Topic: Notifications
So you’ve got these fluffy new perfSONAR nodes...
...but there is such a thing as too much fluffiness
The Need

- Users need a clear way to visualize a large number of tests, whether it is within an organization or across multiple institutions
- The tests perfSONAR supports primarily have two endpoints
- Tests can often be grouped together by purpose (e.g. test connectivity between all these hosts dedicated to project X)

How do we capture the known relationships between tests and leverage this knowledge to find patterns representing network performance issues?
Existing solutions?

- Lots of good “host” monitoring solutions exist, all of which are inherently one dimensional
Enter MaDDash

- Builds 2-dimensional grids of measurements
- Rows and columns represent endpoints of tests - though generic enough they could be other things
- Each cell is colored based on result compared to a threshold: e.g. OK, Warning, Critical
- Highly customizable
  - Definable thresholds
  - Custom rules to match common patterns
  - Customizable colors
How MaDDash works

• **MaDDash does not execute any network measurements.**
• MaDDash periodically queries archives for measurements that have already run.
• **Two main components:**
  • maddash-server
    • Java process that aggregates results on schedule, applies thresholds and looks for patterns
    • Dashboards defined in YAML configuration file (which most people never touch..more later)
    • Capable of sending various types of notifications
    • REST API for looking at summarized results
  • maddash-webui
    • Web frontend that queries maddash-server REST API and displays results
Anatomy of a Dashboard: Basics
Anatomy of a Dashboard: Grids

Mesh

A
B
C

A
B
C

A to C requested by A*

C to A requested by C*

Disjoint

D
E

A
B
C

A to E requested by A*
E to A requested by E*

*If requester is marked “no-agent” then other side requests test
<table>
<thead>
<tr>
<th>Server</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>RedCLARA Miami</td>
<td>Unidirectional Loss Col-&gt;Row</td>
</tr>
<tr>
<td>acs244.bham.ac.uk</td>
<td>Sporadic loss</td>
</tr>
<tr>
<td>ams-hbn-1g.perfsonar.ac.za</td>
<td>Unidirectional Loss Row-&gt;Col</td>
</tr>
<tr>
<td>ccperfsonar2.in2p3.fr</td>
<td>Bidirectional/Sporadic Loss</td>
</tr>
<tr>
<td>cpt-is-1g.perfsonar.ac.za</td>
<td>OK</td>
</tr>
<tr>
<td>epgperf.ph.bham.ac.uk</td>
<td>OK</td>
</tr>
<tr>
<td>lcg102.jinr.ru</td>
<td>Configuration problem</td>
</tr>
</tbody>
</table>
Anatomy of a Dashboard: Reports

ESnet - ESnet to International Throughput Testing - Throu

Throughput >= 0.5Gbps
Throughput < 0.5Gbps
Throughput <= 0.1Gbps

Found a total of 13 problems involving 13 hosts in the grid

ESnet - ESnet to International Throughput Testing - Throughput

perfsonar-test1.kek.jp

Unable to find any throughput measurements
Category: CONFIGURATION
Potential Solutions:
- Verify the host is up
- Verify that `httpd` is running on the host (`systemctl status httpd`)
- Verify that `cassandra` is running on the host (`systemctl status cassandra`)
- Verify that the `pSConfig pScheduler Agent` is running (`systemctl status pconfig-pscheduler-agent`)
- Look for any `pscheduler` errors with the command `pscheduler troubleshooting`
- Verify the host is pointing at the correct `pSConfig` template with the command `pconfig remote list`
- Verify when the host last updated its measurement configuration with `pconfig pscheduler-stats`
- Verify the host allows access to TCP port 443 and 5201 required for the measurement to run
- Look for errors in `/var/log/perfsonar/pconfig-agent.log`
- Look for errors in `/var/log/pScheduler/pScheduler.log`

netperf.ayy.fl

Throughput is below warning or critical thresholds to a majority of sites
Category: PERFORMANCE

sampaps02.lf.usp.br

Throughput is below warning or critical thresholds to a majority of sites
Building Dashboards with pSConfig

- **pSConfig** is a framework for defining the measurements you want run among one or more hosts
- A single source of truth for both measurement hosts and your dashboards
- Currently two agents:
  - **pscheduler-agent**: It reads the template file(s) and generates pScheduler tasks
  - **maddash-agent**: It reads the template file(s) and generates a maddash.yaml file
1. Define pSConfig JSON file (by hand, using pSConfig Web Admin, etc)

2. Point at the JSON file by running the following on each measurement host:

   ```bash
   # psconfig remote add --configure-archives "https://10.0.0.1/example.json"
   ```

3. Point at the JSON file by running the following on MaDDash host:

   ```bash
   # psconfig remote add "https://10.0.0.1/example.json"
   ```

MaDDash/pSConfig Quickstart:

https://docs.google.com/document/d/1k7FT66MKPy3JjpD5k0OFAfITpSdFmZ6huhTUDQ2rGGY/edit
MaDDash can send reports from previous slides to generate notifications.

- **Supported notification types:**
  - Email
  - ServiceNow (Coming in v4.2 - currently in beta)

- Requires editing maddash.yaml file directly (commented example in default file)

```yaml
notifications:
  -
    name: "My Email Report"
    type: "email"
    schedule: "0 * * * ?"
    problemReportFrequency: 86400
    minimumSeverity: 1
    parameters:
      dashboardUrl: "http://dashboard.domain.example"
      mailServer:
        address: "127.0.0.1"
        port: 25
      from: "dashboard@domain.example"
      to:
        - "email1@domain.example"
        - "email2@domain.example"
```
Closing remarks

• MaDDash’s goal is to make it easier to analyze the results of a large number of point-to-point measurements.
• It is integrated with other perfSONAR tools like pSConfig to make keeping the dashboards and actual measurements aligned while trying to minimize the steps required to setup.
• MaDDash can highlight a lot of issues, but it is just the messenger - still significant work to solve those issues.
• MaDDash is another tool in the toolbox, and can hopefully help identify issues in conjunction with other measurement/monitoring information.
Further Information

Quickstart Guide: https://docs.google.com/document/d/1k7FT66MKPy3JjpD5k0OFAFITpSdFmZ6huhTUDQ2rGGY/edit

Official Docs: http://docs.perfsonar.net/#displaying-measurements-with-maddash

ESnet Dashboard: http://ps-dashboard.es.net

Support List: perfsonar-user@perfsonar.net