The perfCube: Experiences with perfSONAR on a cubox-i4Pro

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perfSONAR on cubox

- Several organizations have begun playing with these devices
- TCP maximum = 350Mbps
- owamp works well
- ntp clock sync works well
“perfSONAR Light”

• We assume only the most essential perfSONAR components run a on the perfCube
  – In particular, no web interface, no measurement archive
• These are the packages that make up “perfSONAR Light”:
  – bwctl network test tool, which calls iperf3, iperf, nuttcp, ping, traceroute, tracepath
  – owamp network test tool
  – perl-perfSONAR_PS-LSRegistrationDaemon
    • This registers your host in the lookup service
  – perl-perfSONAR_PS-RegularTesting
    • This manages regular testing
  – perl-perfSONAR_PS-MeshConfig-Agent
    • allow your host to be a client of a Mesh Config server.
  – perl-perfSONAR_PS-SimpleLS-BootStrap-client
    • lets your host find which LS to register with
Sample Deployment Model

- Campus deploys a central “measurement archive”
- perfCube on all important subnets
  - Or all subnets?
- All perfCubes are configured to run owamp to a the campus border
  - This would be a faster host
- No regularly scheduled iperf tests
  - Throughput test only for troubleshooting network problems
Throughput limitation?

- Iperf3 on a perfCube only gets 350Mbps, is this a problem?
  - Not really, as iperf3 retransmit profile is still very useful for finding problems:

  - For example, sample iperf3 output:

<table>
<thead>
<tr>
<th></th>
<th>ID</th>
<th>Interval</th>
<th>Transfer</th>
<th>Bandwidth</th>
<th>Retr</th>
<th>Cwnd</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0.00</td>
<td>1.00 sec</td>
<td>139 MBytes</td>
<td>1.16 Gbits/sec</td>
<td>257</td>
<td>33.9 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>1.00</td>
<td>2.00 sec</td>
<td>106 MBytes</td>
<td>891 Mbits/sec</td>
<td>138</td>
<td>26.9 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>2.00</td>
<td>3.00 sec</td>
<td>105 MBytes</td>
<td>881 Mbits/sec</td>
<td>132</td>
<td>26.9 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>3.00</td>
<td>4.00 sec</td>
<td>71.2 MBytes</td>
<td>598 Mbits/sec</td>
<td>161</td>
<td>15.6 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>4.00</td>
<td>5.00 sec</td>
<td>110 MBytes</td>
<td>923 Mbits/sec</td>
<td>123</td>
<td>43.8 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>5.00</td>
<td>6.00 sec</td>
<td>136 MBytes</td>
<td>1.14 Gbits/sec</td>
<td>122</td>
<td>58.0 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>6.00</td>
<td>7.00 sec</td>
<td>88.8 MBytes</td>
<td>744 Mbits/sec</td>
<td>140</td>
<td>31.1 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>7.00</td>
<td>8.00 sec</td>
<td>112 MBytes</td>
<td>944 Mbits/sec</td>
<td>143</td>
<td>45.2 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>8.00</td>
<td>9.00 sec</td>
<td>119 MBytes</td>
<td>996 Mbits/sec</td>
<td>131</td>
<td>32.5 KBytes</td>
</tr>
<tr>
<td>15</td>
<td>9.00</td>
<td>10.00 sec</td>
<td>110 MBytes</td>
<td>923 Mbits/sec</td>
<td>182</td>
<td>46.7 KBytes</td>
</tr>
</tbody>
</table>
Clock stability? Seems pretty good....
NTP sync: +- .2ms

![NTP Sync Graph]
perfCube Image available to play with

• Disk image available at:
  – http://downloads.es.net/public/perfsonar/cubox/images/

• RPM repo of perfSONAR Light components available at:
  – http://downloads.es.net/public/perfsonar/repo/Fedora/20/armhfp/

• Note: This is UNSUPPORTED by the perfSONAR team!
Future Ideas

• Auto-configuration / Auto-discover Support
  – perfCube would query the perfSONAR lookup service to find its local measurement archive
  – perfCube would query the perfSONAR lookup service to find which mesh config to join

• Open question: security model for all this
Debian vs Fedora?

• ARM-based device support is much better on Debian
• perfSONAR currently only supports RHEL-based Oses
  – Easy to build ARM rpms using ‘rpmbuild –rebuild’ command
• Fedora on a cubox support is mostly 1 person at the moment:
  – https://github.com/jmontleon/fedora-20-cubox-i_hb
• Getting everything working on Fedora was (for us) easier than Debian
  – Long term, perfSONAR might add Debian support
More Information

perfCube Install Guide: http://goo.gl/eNsDQA

https://code.google.com/p/perfsonar-ps/wiki/lowCostPerfSONAR


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