Hardware and software

• Dedicated server with 2 10G ports
  - Only one is connected
  - Outside UCAR firewall

• CentOS Linux

• perfSONAR software

• perfsonar.ucar.edu
Web interface

- http://perfsonar.ucar.edu
- Accessible by anyone
- Web access has less power than command-line access
Global perfSONAR list

- Global Service and Data View
- Lets you find other perfSONAR hosts to test against
Tools

- BWCTL
- OWAMP
- NPAD
- NDT
BWCTL

- “Bandwidth test Controller”
- Wrapper for iperf
- Schedules iperf tests between 2 endpoints
- Can schedule 3rd-party tests
BWCTL example

NCAR to Kansas

perfsonar$ bwctl -s bwctl.kans.net.internet2.edu -T iperf -f m -t 30
bwctl: 35 seconds until test results available

RECEIVER START

bwctl: exec_line: iperf -B 128.117.132.12 -s -f m -m -p 5007 -t 30
bwctl: start_tool: 3523216029.561904

Server listening on TCP port 5007
Binding to local address 128.117.132.12
TCP window size: 0.08 MByte (default)

[ 15] local 128.117.132.12 port 5007 connected with 64.57.16.195 port 5007
[ ID] Interval       Transfer     Bandwidth
[ 15]  0.0-30.2 sec  3549 MBytes  984 Mbits/sec
[ 15] MSS size 8948 bytes (MTU 8988 bytes, unknown interface)
bwctl: stop_exec: 3523216062.493699

RECEIVER END

perfsonar$
BWCTL example

**ORNL to NCAR**

```
perfsonar$ bwctl -c hank.ornl.gov -T iperf -f m
bwctl: 15 seconds until test results available
```

**RECEIVER START**

```
bwctl: exec_line: /usr/local/bin/iperf -B 192.31.96.42 -s -f m -m -p 5001 -t 10
bwctl: start_tool: 3524409768.515053

------------------------------------------------------------
Server listening on TCP port 5001
Binding to local address 192.31.96.42
TCP window size: 0.25 MByte (default)
------------------------------------------------------------
[ 15] local 192.31.96.42 port 5001 connected with 128.117.132.12 port 5001
[ ID] Interval       Transfer     Bandwidth
[ 15]  0.0-10.1 sec    845 MBytes   698 Mbits/sec
[ 15] MSS size 8948 bytes (MTU 8988 bytes, unknown interface)
bwctl: stop_exec: 3524409781.488134
```

**RECEIVER END**

```
perfsonar$
```
OWAMP

- One-Way Ping
- Solves asymmetric routing problem
- Requires good NTP at both ends
OWAMP example

```
perfsonar$ owping perfsonar.nersc.gov:861 -P 8760-8860
Approximately 13.3 seconds until results available
--- owping statistics from [perfsonar.ucar.edu]:39002 to [perfsonar.nersc.gov]:57715 ---
SID: 80375007d1f960eeb117b5287c0b2b6f
first: 2011-08-19T16:23:44.247
last: 2011-08-19T16:23:53.427
100 sent, 0 lost (0.000%), 0 duplicates
one-way delay min/median/max = 15.1/15.3/15.4 ms, (err=0.259 ms)
one-way jitter = 0.1 ms (P95-P50)
Hops = 12 (consistently)
no reordering

--- owping statistics from [perfsonar.nersc.gov]:39587 to [perfsonar.ucar.edu]:43162 ---
SID: 8075840cd1f960eeb5f00abf9bed331f
first: 2011-08-19T16:23:43.932
last: 2011-08-19T16:23:53.957
100 sent, 0 lost (0.000%), 0 duplicates
one-way delay min/median/max = 15.2/15.3/15.4 ms, (err=0.259 ms)
one-way jitter = 0.1 ms (P95-P50)
Hops = 12 (consistently)
no reordering
```

```
NDT

• “Network Diagnostic Tool”
• For checking long paths
• [http://perfsonar.ucar.edu:7123/](http://perfsonar.ucar.edu:7123/)
• Web/Java interface
NDT example

TCP/Web100 Network Diagnostic Tool v5.5.4a
click START to begin

** Starting test 1 of 1 **
Connected to: perfsonar.ucar.edu -- Using IPv4 address
Checking for Middleboxes .................... Done
checking for firewalls .......................... Done
running 10s outbound test (client-to-server [C2S]) .... 930.26Mb/s
running 10s inbound test (server-to-client [S2C]) .... 928.33Mb/s
The slowest link in the end-to-end path is a 1.0 Gbps Gigabit Ethernet subnet

click START to re-test
NPAD

• For checking your local network’s ability to support long-haul transfers

• http://perfsonar.ucar.edu:8000/

• Web/Java interface
Questions?