

pS-NPtoolkit Customization and Configuration

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Internet2

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perfSONAR

- Internationally defined network measurement architecture
 - Java based implementation
 - Perl based implementation
 - XML schema
- Best Practices Guides
 - <http://code.google.com/p/perfsonar-ps/wiki/Tier2BCP>

Initial Customization

- Disk requires backing store (local hard drive or removable drive)
- Boot hangs until required details are entered
 - Site Details
 - Admin name/email, physical location
 - Project site details
 - USATLAS

Obtaining the Customization menu

- Menu appears at boot
- Run
 - ‘sudo /usr/local/bin/nptoolkit-configure.py’
command

```
Starting Braille terminal driver: brltty: BRLTTY 3.7.2
brltty[28781]: Linux Screen Driver
brltty: Linux Screen Driver
brltty.
Loading device-mapper support.
Assembling MD arrays...done (disabled in /etc/default/mdadm).
Checking file systems...fsck 1.40-WIP (14-Nov-2006)
done.
Setting kernel variables...done.
Mounting local filesystems...mount: /dev/pts already mounted or /dev/pts busy
failed.
Activating swapfile swap...done.
Running 0dns-down to make sure resolv.conf is ok...done.
Setting up networking...
* /etc/network/options is deprecated (see README.Debian of netbase).
Setting up IP spoofing protection...done (rp_filter).
Configuring network interfaces...done.
Loading PCMCIA bridge driver module: yenta_socket.
Starting portmap daemon...
Setting console screen modes and fonts.
Setting up ALSA...done.
Optimizing hardware...done.
Setting up X server socket directory /tmp/.X11-unix...
Setting up ICE socket directory /tmp/.ICE-unix...
INIT: Entering runlevel: 3
Starting IP Services:
Using DHCP assigned IP address.
Looking up external address: done
```

Internet2 Network Performance Toolkit customization script

Tools in **RED** need to be customized

Tools in **MAGENTA** are not required

1. **Configure drive to hold data/customizations**
2. **Configure site settings**
3. Enable/Disable Services
4. Manage Users
5. **Configure BWCTL**
6. **Configure NTP**
7. **Configure OWAMP**
8. **Configure Static IP**
9. Change Timezone
10. **Modify advertised interface**
0. exit

Make a selection:

To return to your computer, press Control-⌘



```
Please select a drive: 1
Drive /dev/sda must be formatted before it can be used
Would you like to format /dev/sda now? [yes]:
mke2fs 1.40-WIP (14-Nov-2006)
/dev/sda is entire device, not just one partition!
Proceed anyway? (y,n) y
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
1048576 inodes, 2097152 blocks
104857 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2147483648
64 block groups
32768 blocks per group, 32768 fragments per group
16384 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

This filesystem will be automatically checked every 32 mounts or
180 days, whichever comes first.  Use tune2fs -c or -i to override.
Saving NPToolkit customizations/logs to /dev/sda... successful.
NPToolkit data/customizations will now be saved to /dev/sda
To change this configuration, rerun this script and select another drive.
Setting reboot flag

Internet2 Network Performance Toolkit customization script
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0. exit

Make a selection: _
```

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0. exit

Make a selection: 2

Please provide some basic information before configuring the toolkit
Default values are in []

Enter your administrator's name [Rich Carlson]: Rich Carlson

Enter your site name [Rich's MAC Laptop]: Rich's Laptop Computer

Enter your site's location [Wherever I happen to be]: You are here!

Enter the projects this site is participating in, separated by spaces (e.g. LHC Internet2 SC08) [USATLAS]: USATLAS

Please choose your connection speed:

1. 100 Mbps
2. 1 Gbps
3. 10 Gbps

Select your connection speed [2]:

Enter an email to be used for trouble reporting [rcarlson@internet2.edu]:

Enter the subject of trouble report emails [Trouble Report from Rich's Laptop]:

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0. exit

Make a selection:

VMware Tools is not installed. Choose the Virtual Machine > Install VMware Tools menu.



Optional Customization

- Manage Users (set passwords)
 - For 'knoppix' user
 - For 'root' user
- Enable/Disable services
 - Easily select throughput or delay based server
 - Control individual tools
 - Allow remote access (sshd)
 - Requires defining root & user passwords

waiting for X server to shut down .FreeFontPath: FPE "/usr/share/fonts/X11/misc:unscaled" refcount is 2, should be 1; fixing.

knoppix@tty1L~]\$

knoppix@tty1L~]\$

knoppix@tty1L~]\$

knoppix@tty1L~]\$ sudo /usr/local/bin/Use of uninitialized value in concatenation (.) or string at /usr/local/perfSONAR-PS/lib/perfSONAR_PS/Services/MP/PingER.pm line 535.

np toolkitUse of uninitialized value in concatenation (.) or string at /usr/local/perfSONAR-PS/lib/perfSONAR_PS/Services/MP/PingER.pm line 535.

-configure.py

Internet2 Network Performance Toolkit customization script

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9. Change Timezone
10. Modify advertised interface
0. exit

Make a selection: Use of uninitialized value in concatenation (.) or string at /usr/local/perfSONAR-PS/lib/perfSONAR_PS/Services/MP/PingER.pm line 535.

3

You may enable or disable any service or groups of services

- 1 Disable Stock Bandwidth Services (BWCTL, NDT, NPAD)
- 2 Disable Stock Latency Services (OWAMP, PingER)
- 3 Enable SSH
- 4 Disable Web Services
- 5 Disable BWCTL
- 6 Disable OWAMP
- 7 Disable NDT
- 8 Disable NPAD
- 9 Disable PingER
- 10 Disable SNMP MA
- 11 Disable perfSONAR-BUOY
- 12 Enable All Services
0. exit

Make a selection: _

```
Starting Advanced Power Management daemon...
Starting advanced IEEE 802.11 management: disabled via /etc/default/hostapd.
/usr/local/sbin/ls_registration_daemon.pl --config=/usr/local/etc/ls_registration_daemon.conf --pidfile=/var/run/ls_registration_daemon.pid --output=/var/log/perfSONAR/ls_registration_daemon.log --user=perfsonar --group=perfsonar
/etc/rc3.d/S20ls_registration_daemon start: LS Registration Daemon started
Starting internet superserver: inetd.
* Not starting S.M.A.R.T. daemon smartd, disabled via /etc/default/smartmontools
tftpd-hpa disabled in /etc/default/tftpd-hpa
Starting NTP server: ntpd.
Starting bwctldbwctldb[3744]: FILE=time.c, LINE=123, NTP: Status UNSYNC (clock offset problems likely)
Starting NDT Services: fakewww web100srv.
Starting NPAD serverStarting owampdowampd[3777]: FILE=time.c, LINE=112, NTP: Status UNSYNC (clock offset issues likely)
/usr/local/perfSONAR-PS/perfsonar-daemon.pl --config /usr/local/etc/perfSONAR/PingER.conf --logger=/usr/local/etc/perfSONAR/PingER_logger.conf --pidfile=PingER.pid --logger=/usr/local/etc/perfSONAR/PingER_logger.conf --user=perfsonar --group=perfsonar 2> /dev/null
/etc/init.d/PingER.sh start: PingER started
/usr/local/perfSONAR-PS/perfsonar-daemon.pl --config /usr/local/etc/perfSONAR/pSB_MA.conf --logger=/usr/local/etc/perfSONAR/pSB_MA_logger.conf --piddir=/var/run --pidfile=pSB_MA.pid --user=perfsonar --group=perfsonar
/etc/init.d/pSB.sh start: pSB started
/usr/local/perfSONAR-PS/perfsonar-daemon.pl --config /usr/local/etc/perfSONAR/SNMP_MA.conf --logger=/usr/local/etc/perfSONAR/SNMP_MA_logger.conf --piddir=/var/run --pidfile=SNMP_MA.pid --user=perfsonar --group=perfsonar
/etc/init.d/snmpMA.sh start: SNMP MA started
/etc/rc3.d/S65pSB_collector.sh: line 9: use: command not found
/etc/rc3.d/S65pSB_collector.sh: line 10: use: command not found
/etc/rc3.d/S65pSB_collector.sh: line 11: use: command not found
/etc/rc3.d/S65pSB_collector.sh: line 13: my: command not found
/etc/rc3.d/S65pSB_collector.sh: line 15: syntax error near unexpected token '('
/etc/rc3.d/S65pSB_collector.sh: line 15: `my %constants = ();'
/etc/rc3.d/S65pSB_master.sh: line 9: use: command not found
/etc/rc3.d/S65pSB_master.sh: line 10: use: command not found
/etc/rc3.d/S65pSB_master.sh: line 11: use: command not found
/etc/rc3.d/S65pSB_master.sh: line 13: my: command not found
/etc/rc3.d/S65pSB_master.sh: line 15: syntax error near unexpected token '('
/etc/rc3.d/S65pSB_master.sh: line 15: `my %constants = ();'
Starting anac(h)ronistic cron: anacron.
Starting periodic command scheduler: crond.
Starting web server (apache2)...apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.0.1 for ServerName
.
Setting Local options: Turning off TSO optionCannot get device rx csum settings: Operation not supported
Cannot get device udp large send offload settings: Operation not supported
.
Debian GNU/Linux 4.0 Knoppix tty1

Knoppix login: knoppix
Welcome to Knoppix!
knoppix@tty1l~]$
```

Operating and Using

- Finding other servers and services
 - <https://your.new.host>
 - Login as 'knoppix'
- Scheduling tests to other servers
- Visualizing the results

Measurement Tools

https://192.168.1.41/

obdii scanner

Most Visited ▾ Getting Started Latest Headlines ↗

Chicago... Meas... perform... Amtrak ... ASUSTe... Main Pa... BNL Accom... Tier2BC... Welcom...

Measurement Tools

User Tools:

- [Global Set Of Services](#)
- [Cacti Graphs](#)
- [PingER Graphs](#)
- [OWAMP Java Applet](#)

Configuration:

- [PingER Landmarks](#)
- [perfSONAR-BUOY Mesh](#)
- [Cacti SNMP Monitoring](#)

Service Status:

Service: OWAMP ^[1] Status: Running Address(es): <ul style="list-style-type: none">• tcp://192.168.1.41:861
Service: BWCTL ^[1] Status: Running Address(es): <ul style="list-style-type: none">• tcp://192.168.1.41:4823
Service: NPAD ^[1]

Done 192.168.1.41

perfSONAR Global Service and Data View

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[perfSONAR-BUOY \(Iperf Data\)](#)

[perfSONAR-BUOY \(OWAMP Data\)](#)

[PingER](#)

BWCTL Servers		
Internet2 BWCTL Server	192.168.69.132:4823	BWCTL Server at Internet2 in Ann Arbor, MI, USA
Internet2 BWCTL Server	192.168.1.41:4823	BWCTL Server at Internet2 in Ann Arbor, MI, USA
ESnet BWCTL Server	198.128.1.239:4823	BWCTL Server at ESnet in Berkeley, CA
Internet2 BWCTL Server	207.75.164.153:4823	BWCTL Server at Internet2 in Ann Arbor, MI USA

perfSONAR-BUOY Measurement Configuration

Select Configuration Option

Clear Screen

BWCTL IPv4

BWCTL IPv6

OWAMP IPv4

OWAMP IPv6

Select IPv4 BWCTL Instances to Include in Measurements

LHC Associated BWCTL Instances

Add *lab246.internet2.edu* (e.g. 207.75.164.246) to the mesh:

Other BWCTL Instances

Add *desk153.internet2.edu* (e.g. 207.75.164.153) to the mesh:

Add *dyn1-239.es.net* (e.g. 198.128.1.239) to the mesh:

Enter test Description

Enter a name for this test set:

Select Test Type

Description: *Hourly TCP Throughput (iperf)*

Window Size: *4m*

Test Frequency: *1 Hour(s)*

Test Length: *60 Seconds(s)*

Internet2 Pinger MP Configuration Manager

Monitored Domains (will be stored in the landmarks config file)

- cern.ch ·
- cmsaf.mit.edu ·
- fnal.gov ·**
- hep.wisc.edu ·
- ihepa.ufl.edu ·
- rcac.purdue.edu ·
- slac.stanford.edu ·
- ucsd.edu ·
- ultralight.org ·
- unl.edu ·

Domain Name:
fnal.gov

pinger ·

Add and Configure new Domain Node

Remove

Add new Domain

Save MP landmarks XML

Reset

The following sites may be used to populate your landmarks file

Known Project US-Atlas Sites

Internet2 NDT server

http://192.168.1.41:7123/

obdii scanner

Most Visited Getting Started Latest Headlines

Chicago... Inter... perform... Amtrak ... ASUSTe... Main Pa... BNL Accom... Tier2BC... Welcom...

Internet2 Web100 based Network Diagnostic Tool (NDT)

Located at Ann Arbor, MI, USA; 1000 Mbps (Gigabit Ethernet) network connection

This java applet was developed to test the reliability and operational status of your desktop computer and network connection. It does this by sending data between your computer and this remote NDT server. These tests will determine:

- The slowest link in the end-to-end path (Dial-up modem to 10 Gbps Ethernet/OC-192)
- The Ethernet duplex setting (full or half);
- If congestion is limiting end-to-end throughput.

It can also identify 2 serious error conditions:

- Duplex Mismatch
- Excessive packet loss due to faulty cables.

A test takes about 20 seconds. Click on "start" to begin.

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

START Statistics More Details... Report Problem Options

Applet Tcpbw100 started

Brief instructions

- The test results are most accurate over a short network path. If this NPAD server (located at Some Organization in Some City, State, Country) is not near you, look for a closer server from the list of [Current NPAD Diagnostic Servers](#).
- Have an end-to-end application performance goal ([target round-trip time](#) and [target data rate](#)) in mind. Enter the parameters on the form below and click **Start Test**. Messages will appear in the log window as the test runs, followed by a diagnostic report.
- In the diagnostic report, failed tests (in red) indicate problems that will prevent the application from meeting the end-to-end performance goal. For each message, a question-mark link ([\(?\)](#)) leads to additional detailed information about the results.
- Every test is fully logged and test results are [public](#). We use the logs and results to further refine the software.

For more information, see the [NPAD Documentation](#), especially the sections:

- [NPAD Diagnostic Procedure](#) - the full instructions.
- [Theory and Method](#) - why the the tests work.
- [Outcomes](#) - what to do next in the broader debugging context.

Test from server 192.168.1.41 to this machine

Round Trip Time (msec):

Target Rate (Mbps):

Log:

Please send comments and suggestions about the server to [Joe Admin <joe.admin@organization.edu>](mailto:joe.admin@organization.edu).

Command line client

Conclusions

- pS-NPToolkit V2.0beta
 - <http://www.perfsonar.net/download.html>
- Image allows easy installation of suite of tools
 - 1 server set to run delay tests
 - 1 server set to run throughput tests
- Simple customization scripts
- Compatible with GEANT appliance
- Expandable to Tier3 sites, Campus, and regional networks