

Hands-on Session 1: perfSONAR Toolkit GUI and pScheduler

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Hands-on Workshop on Networking Topics

April 5th, 12th, 2022

perfSONAR Lab Series

Lab Series: perfSONAR

Lab 1: Configuring Admin. Information Using perfSONAR Toolkit GUI

Lab 2: PerfSONAR Metrics and Tools

Lab 3: Configuring Regular Tests Using perfSONAR GUI

Lab 4: Configuring Regular Tests Using pScheduler CLI Part I

Lab 5: Configuring Regular Tests Using pScheduler CLI Part II

Lab 6: Bandwidth-delay Product and TCP Buffer Size

Lab 7: Configuring Regular Tests Using a pSConfig Template

Lab 8: perfSONAR Monitoring and Debugging Dashboard

Lab 9: pSConfig Web Administrator

Lab 10: Configuring pScheduler Limits

Organization of the Lab Manuals

Each lab starts with a section *Overview*

- Objectives
- Lab topology
- Lab settings: passwords, device names
- Roadmap: organization of the lab

Section 1

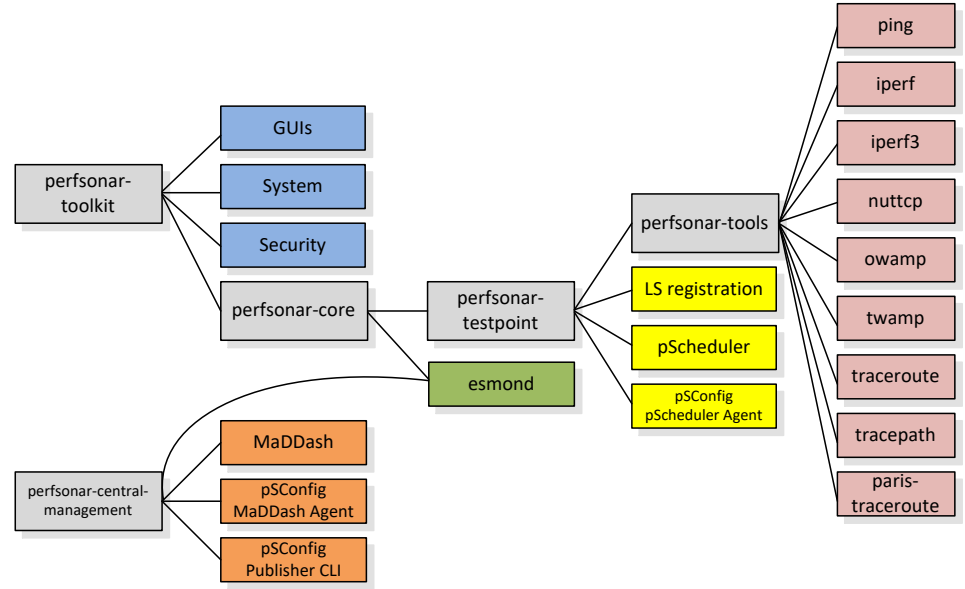
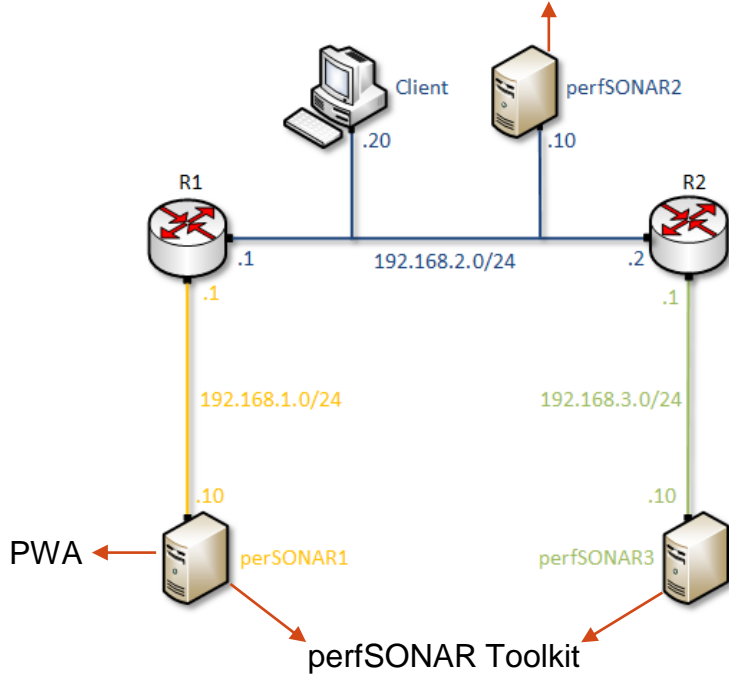
- Background information of the topic being covered (e.g., fundamentals of perfSONAR)
- Section 1 is optional (i.e., the reader can skip this section and move to lab directions)

Section 2... n

- Step-by-step directions

Pod Design

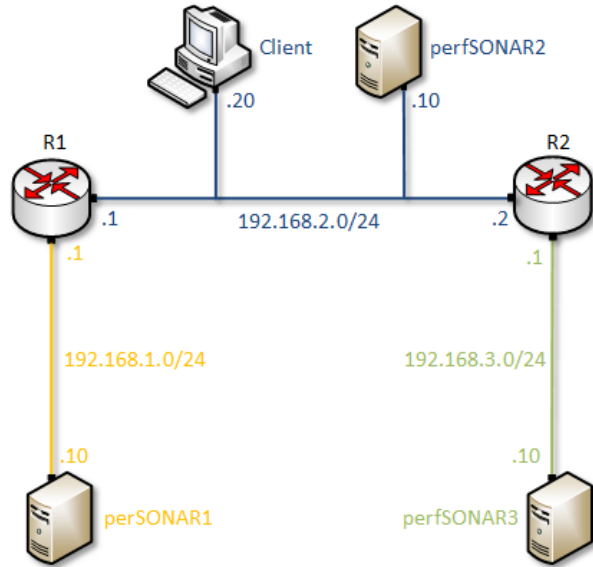
perfSONAR Toolkit + Central Management



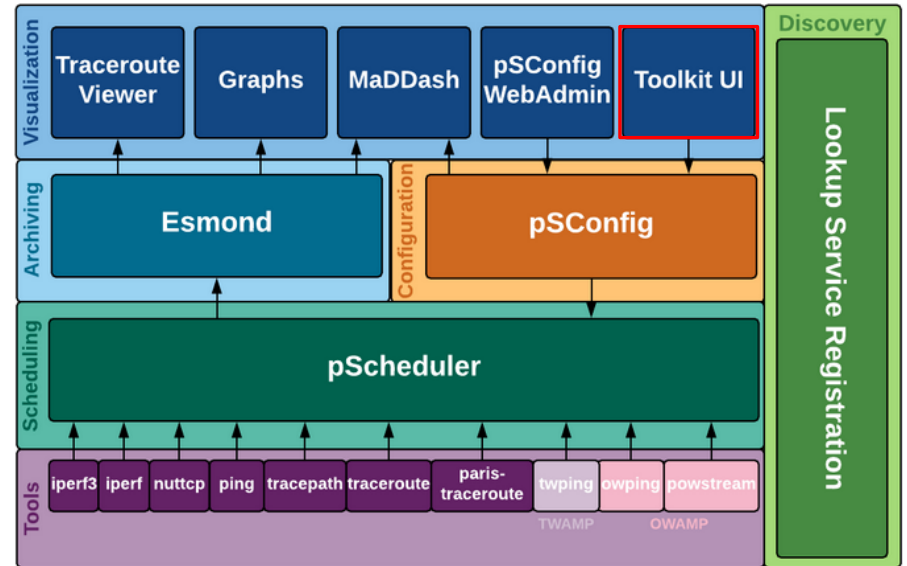
Lab 3: Configuring Regular Tests using perfSONAR GUI

perfSONAR Toolkit GUI

The user can configure administrative information and regular tests via perfSONAR Toolkit GUI



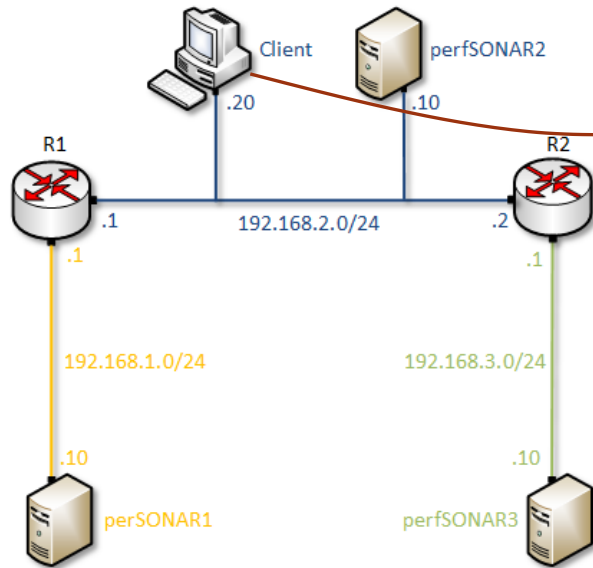
Lab topology



perfSONAR layers

perfSONAR Toolkit GUI

The user can configure administrative information and regular tests via perfSONAR Toolkit GUI



Lab topology

perfSONAR Toolkit on perfSONAR-Toolkit

perfSONAR-Toolkit

Organization: University of South Carolina
Address: Columbia, SC 29201 US (map)
Administrator: Jose Gomez (gomezgj@email.sc.edu)

SERVICE	STATUS	VERSION	PORTS	SERVICE LOGS
esmond	Running	2.1.3-1.e17		View
lsregistration	Running	4.1.6-1.e17		View
owamp	Running	3.5.8-1.e17	861	View
pscheduler	Running	1.1.6-2.e17		View
psconfig	Running	4.1.6-1.e17		View
twamp	Running	3.5.8-1.e17	862	View

perfSONAR Toolkit GUI

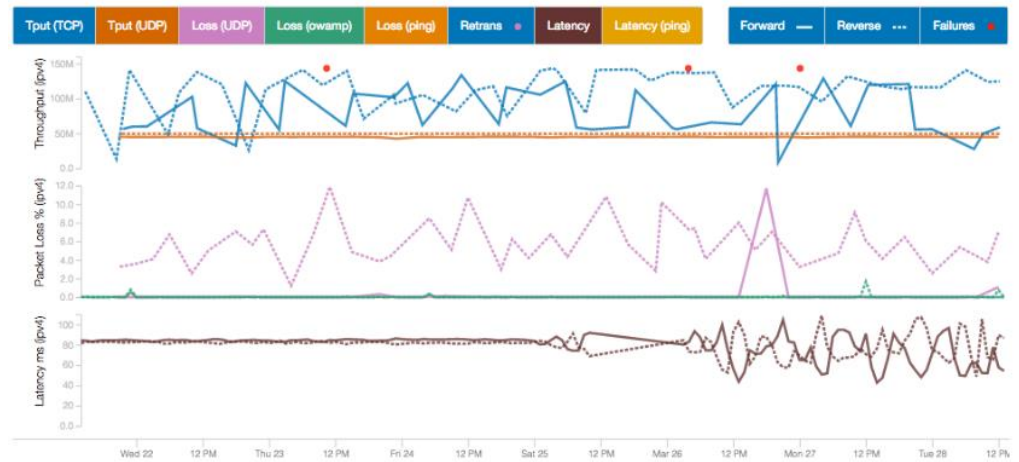
perfSONAR Toolkit GUI

Results are displayed in the perfSONAR Toolkit GUI (e.g., throughput, latency, packet loss, traceroute)

The screenshot shows the perfSONAR Toolkit GUI. At the top, it identifies the organization as the University of South Carolina, located in Columbia, SC, with contact information for Jose Gomez. Below this, a list of services is shown, including esmond, lsregistration, owamp, pscheduler, psconfig, and twamp, all in a 'Running' state. The 'Test Results' section is highlighted with a red box and shows two test entries. The first entry shows a throughput of +4.69 Gbps and a latency of +2.94 ms. The second entry shows a throughput of +4.69 Gbps and a latency of +0.374 ms.

SOURCE	DESTINATION	THROUGHPUT	LATENCY (MS)	LOSS
192.168.2.10	192.168.3.10	+ 4.69 Gbps + 3.37 Gbps	+ 2.94 + 1.12	+ 0 + 0
192.168.2.10	192.168.1.10	+ 4.69 Gbps + 5.04 Gbps	+ 0.374 + 2.12	+ 0 + 0

perfSONAR Toolkit GUI



perfSONAR test results

Registering to the Netlab Portal

- If you DID NOT register in the Netlab portal, please use the following link:
- <https://portal.netdevgroup.com/learn/kjebre/enroll/>
- Fill out the form with your full name, email address, and password
- Check your email inbox for the verification key
- Complete your enrollment by accepting the terms and conditions and claiming your free access
- Finalize the registration by claiming your free access

The image shows three sequential screenshots of the Netlab Portal registration process, connected by orange arrows. Each screenshot has a blue sidebar with icons for Learn, Account, and Help.

Screenshot 1: Registration Form
Title: Workshop on Networking Topics
Status: Not currently logged in
Buttons: Register, Log In
Fields: Full Name, Email Address, Password
Text: Our Privacy Policy explains how we respect your personal data.
Note: A password or passphrase of 15 characters minimum is required.
Button: Register

Screenshot 2: Email Verification
Title: Workshop on Networking Topics
Status: Logged in as gomezgaona+1@gmail.com
Section: Email verification
Alert: Please verify your email address!
Text: In order to use our services the email address of your NDG Online Portal account must be verified. Look for the verification email and find the 6 character Verification Key. Enter it below to continue.
Link: Resend Verification email
Field: Verification Key
Button: Verify

Screenshot 3: Complete Enrollment
Title: Workshop on Networking Topics
Status: Email verified
Section: Complete Enrollment
Text: By checking this box:
List:

- ✓ I agree to the above NDG Terms of Use.
- ✓ I agree to the NDG Privacy Policy.
- ✓ I represent that I am at least 13 years old.
- ✓ I represent that I have read and agree to NDG's use of cookies as described in the Cookie Policy.

I consent to provide NDG the following personal information:

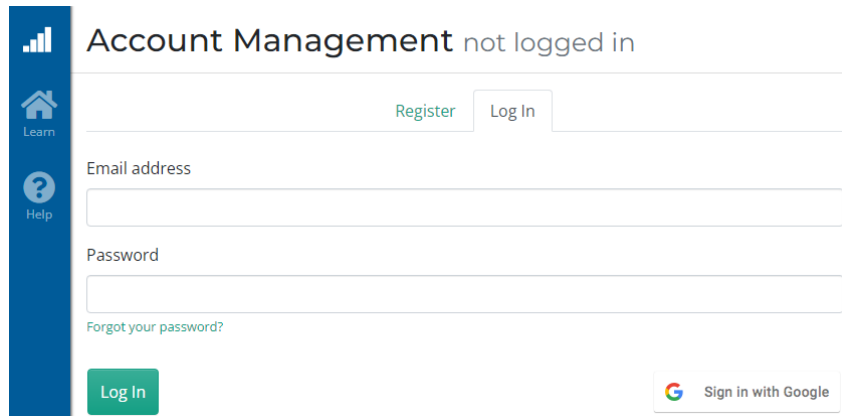
- ✓ My full name to identify my use of NDG services.
- ✓ My email address to communicate with me for support and updates about my course access.

I would like NDG to send me additional information about surveys, new course content, new labs or additional information. This is optional and I may unsubscribe at any time.

Button: Complete Enrollment

Accessing the Virtual Labs

- If you already registered, login to the Netlab portal using the following link:
- <https://portal.netdevgroup.com/account/login>
- Click on the “*Workshop on Networking Topics - perfSONAR*” course
- Select the lab you want to run (e.g., Lab 3)



Account Management not logged in

Register Log In

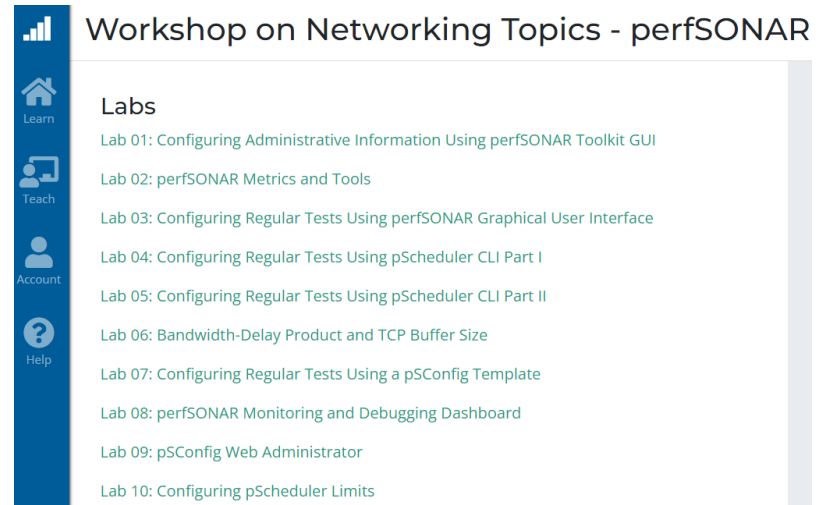
Email address

Password

Forgot your password?

Log In

Sign in with Google



Workshop on Networking Topics - perfSONAR

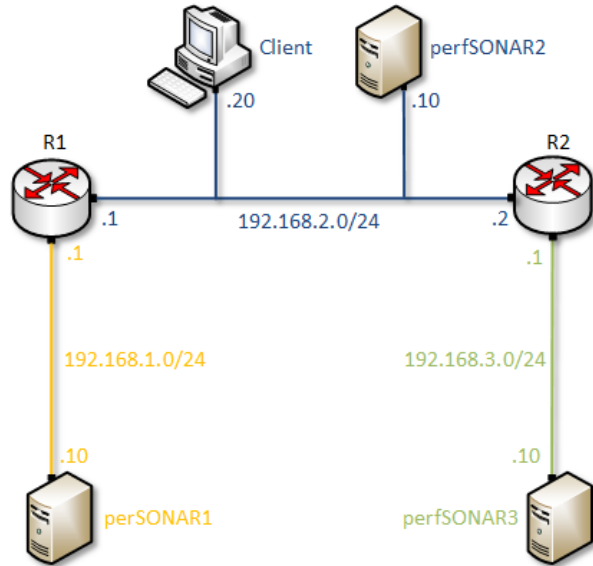
Labs

- Lab 01: Configuring Administrative Information Using perfSONAR Toolkit GUI
- Lab 02: perfSONAR Metrics and Tools
- Lab 03: Configuring Regular Tests Using perfSONAR Graphical User Interface
- Lab 04: Configuring Regular Tests Using pScheduler CLI Part I
- Lab 05: Configuring Regular Tests Using pScheduler CLI Part II
- Lab 06: Bandwidth-Delay Product and TCP Buffer Size
- Lab 07: Configuring Regular Tests Using a pSConfig Template
- Lab 08: perfSONAR Monitoring and Debugging Dashboard
- Lab 09: pSConfig Web Administrator
- Lab 10: Configuring pScheduler Limits

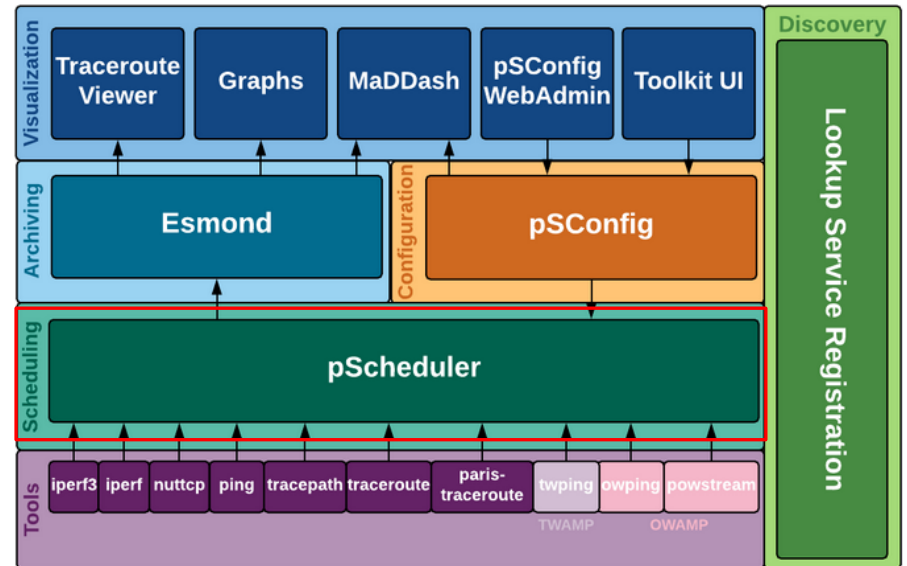
Lab 4: Configuring Regular Tests using pScheduler CLI

The pScheduler Command

The pScheduler coordinates, executes, and optionally stores network measurements (e.g., latency, packet loss rate, throughput)



Lab topology

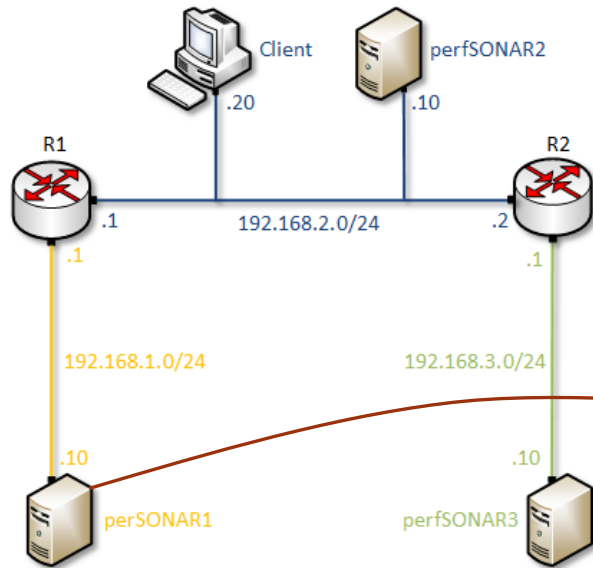


perfSONAR layers

The pScheduler Command

The pScheduler command creates new tasks.

```
pscheduler task throughput --source 192.168.1.10 --dest 192.168.2.10
```



Lab topology

```
admin@perfsonar1 ~1$ pscheduler task throughput --source 192.168.1.10 --dest 192.168.2.10
Submitting task...
Task URL:
https://192.168.1.10/pscheduler/tasks/396795a3-abad-4fc8-ba64-66c304bc2247
Running with tool 'iperf3'
Fetching first run...

Next scheduled run:
https://192.168.1.10/pscheduler/tasks/396795a3-abad-4fc8-ba64-66c304bc2247/runs/1f09ecf0-3875
fa4-f9adc8cc4a17
Starts 2019-07-27T21:22:37Z (~7 seconds)
Ends 2019-07-27T21:22:56Z (~18 seconds)
Waiting for result...

* Stream ID 5
Interval      Throughput    Retransmits   Current Window
0.0 - 1.0    6.01 Gbps     156           800.74 KBytes
1.0 - 2.0    5.51 Gbps     283           773.23 KBytes
2.0 - 3.0    5.75 Gbps     211           495.22 KBytes
3.0 - 4.0    5.77 Gbps     0             773.23 KBytes
4.0 - 5.0    5.69 Gbps     22            722.55 KBytes
5.0 - 6.0    5.67 Gbps     0             896.31 KBytes
6.0 - 7.0    5.28 Gbps     69            608.92 KBytes
7.0 - 8.0    5.23 Gbps     136           868.80 KBytes
8.0 - 9.0    5.18 Gbps     178           786.26 KBytes
9.0 - 10.0   5.59 Gbps     27            991.88 KBytes

Summary
Interval      Throughput    Retransmits
0.0 - 10.0    5.56 Gbps     1082

No further runs scheduled.
admin@perfsonar1 ~1$
```

Throughput task