



2023 Internet2 Technology Exchange

Science DMZs and Networking for All

Hands-on session 2: Measuring Performance Metrics with perfSONAR and Displaying them on Grafana

Jose Gomez

University of South Carolina

<https://research.cec.sc.edu/cyberinfra/>

University of South Carolina (USC)

Energy Sciences Network (ESnet)

September 18, 2023



perfSONAR 5 Lab Library

- Lab experiments

Lab 1: Introduction to Mininet

Lab 2: Setting Administrative Information via perfSONAR Toolkit GUI

Lab 3: Scheduling Regular Tests Using perfSONAR GUI

Lab 4: Configuring Regular Tests Using pScheduler CLI Part I (throughput, latency, and traceroute)

Lab 5: Configuring Regular Tests Using pScheduler CLI Part II (repeat, store, monitor, and cancel)

Lab 6: Defining Regular Tests with a pSConfig Template

Lab 7: Configuring pScheduler Limits

Lab 8: Visualizing pScheduler Measurements using Grafana

Lab 9: Observing the Impact of TCP Window Scaling and Small TCP Buffer Sizes

Lab 10: Investigating the Effects of MTU Mismatch

Organization of the labs

Each lab starts with a section *Overview*

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

Section 1

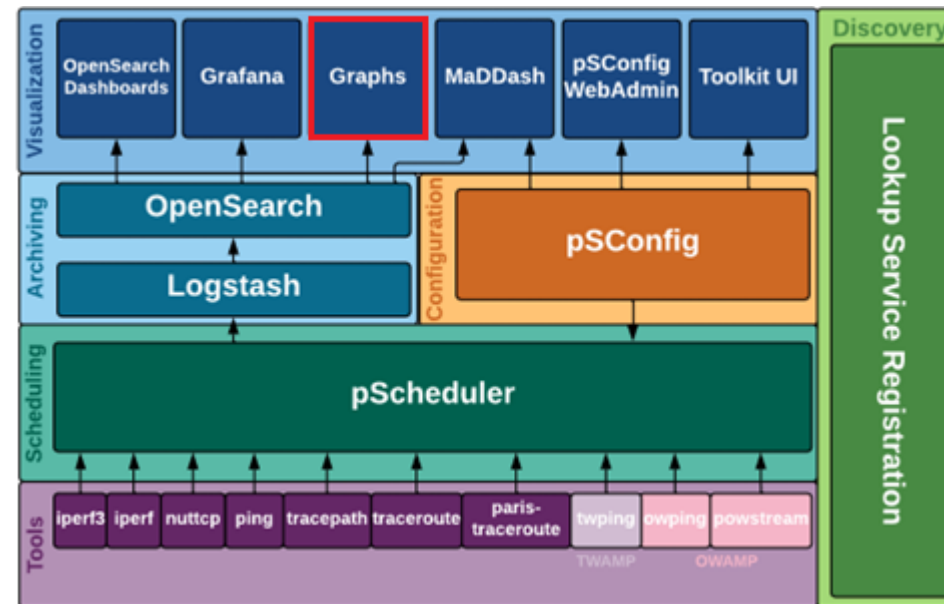
- Background information of the topic being covered (e.g., fundamentals of perfSONAR)
- Section 1 is optional (i.e., the reader can skip this section and move to lab directions)

Section 2... n

- Step-by-step directions

Lab Description

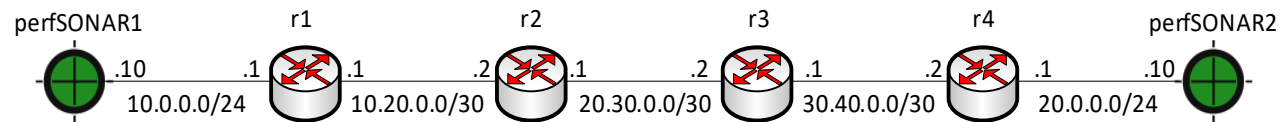
- This lab shows how to show perfSONAR measurements on Grafana
- The user will display throughput, latency, and loss measurements on a dashboard
- The dashboard shows the measurements produced by pScheduler and stored in the OpenSearch database



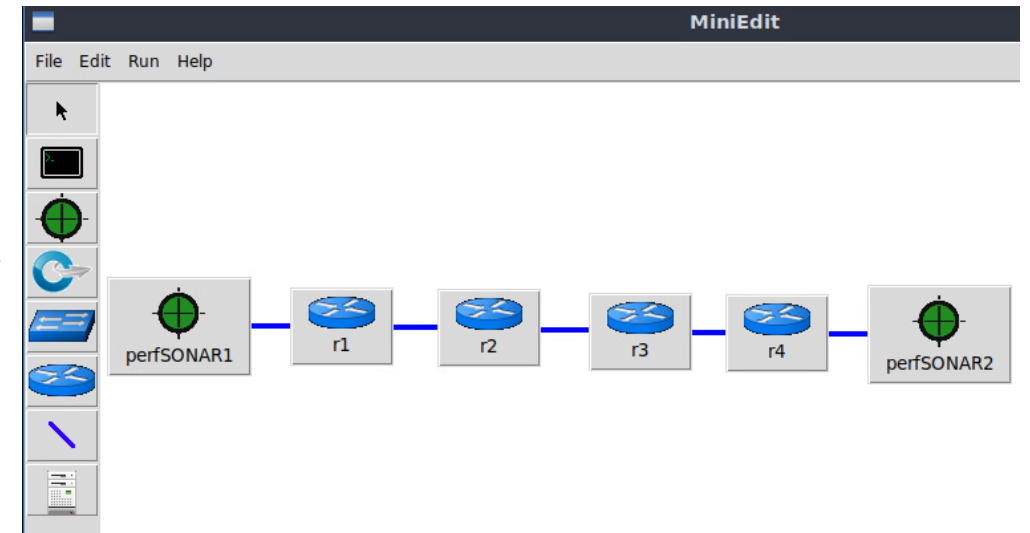
perfSONAR Layers

Lab Description

- The lab presents a basic topology with two perfSONAR nodes and multiple routers
- The topology runs on Mininet which interacts with real traffic



Lab scenario



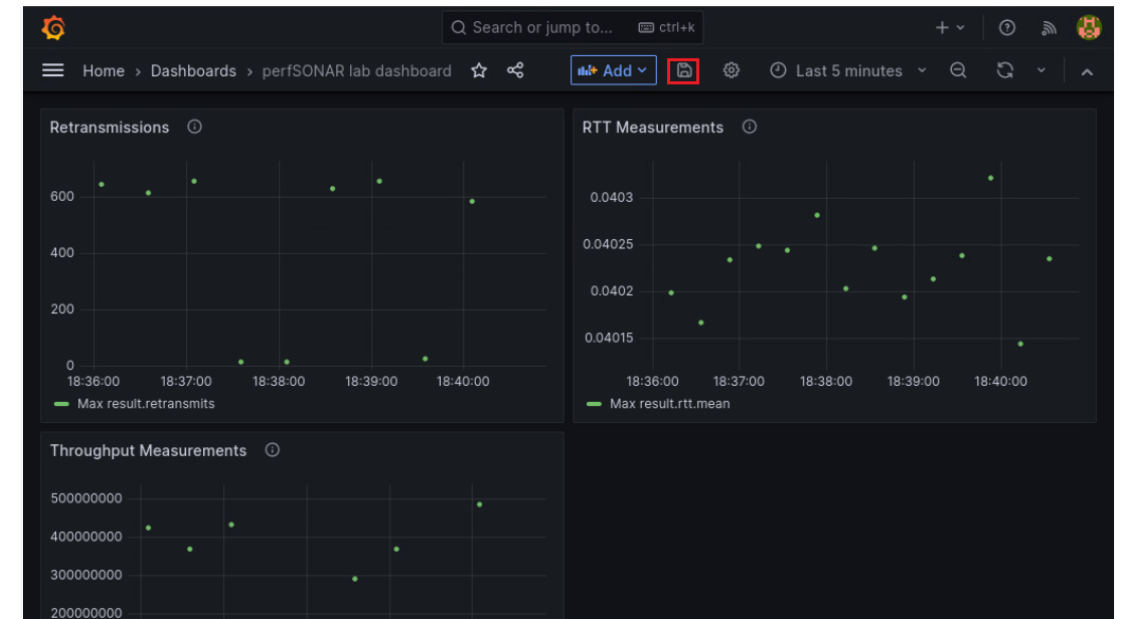
Mininet topology

Lab Description

- The user launches Grafana on a Docker container
- The lab manual shows the steps to create and organize basic dashboards

```
admin@lubuntu-vm: ~  
File Actions Edit View Help  
admin@lubuntu-vm: ~  
admin@lubuntu-vm:~$ sudo docker run -d -p 3000:3000 grafana/grafana-oss  
[sudo] password for admin:  
44f43a1a9d45c9c6618fd38b18913a96cf4fd71c5929d97c14b544f081cc9513  
admin@lubuntu-vm:~$
```

Running Grafana on a Docker container



Displaying and organizing perfSONAR measurements