

# perfSONAR

## Visual Performance Degradation Troubleshooting with perfSONAR

TechEX 2019

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New Orleans, LA, USA — December 10<sup>th</sup> 2019



# perfs-SONAR

## Starting Point

Help network engineers work with pScheduler



# Spotting a performance issue

	Geneva	Kaunas	London	Madrid	Sofia
Austria - ps02.aco.net	Green	Green	Green	Green	Green
Belgium - perfsonar.r2.brudie.belnet.net	Black	Black	Black	Black	Black
Croatia - psmall.st.carnet.hr	Green	Green	Green	Green	Green
Denmark - pssmall.grid.aau.dk	Green	Green	Green	Green	Green
Estonia - perfSonar.eenet.ee	Green	Green	Green	Green	Green
<b>France - paris1-snd-022.perfsonar.renater.fr</b>	Yellow	Yellow	Yellow	Yellow	Yellow
Germany - psbrix.rrze.uni-erlangen.de	Green	Green	Green	Green	Green
Germany - psmall-test.x-win.dfn.de	Green	Yellow	Green	Yellow	Green
Greece - perfsonar-node.grnet.gr	Green	Green	Green	Green	Green
Hungary - perfsonar.debrecen3.hbone.hu	Green	Green	Green	Green	Green
<b>Ireland - bob.heanet.ie</b>	Purple	Purple	Yellow	Purple	Purple

# Debugging a performance issue



But need to wait another 8 hours to see next measurement...

# Debugging, using pScheduler CLI

- Launch ad-hoc measurements on the CLI
  - Need to access a perfSONAR node through ssh
  - Need to know the pScheduler syntax
- Once the results are available, no easy way to compare
- And results are not automatically stored into an archive
  - Unless you're a pScheduler wizard
  - (thanks Mark for the webinars!)

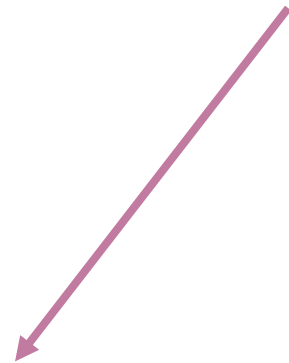
# What about ...

	Geneva	Kaunas	London	Madrid	Sofia
Austria - ps02.aco.net	■	■	■	■	■
Belgium - perfsonar.r2.brudie.belnet.net	■	■	■	■	■
Croatia - psmall.st.carnet.hr	■	■	■	■	■
Denmark - pssmall.grid.aau.dk	■	■	■	■	■
Estonia - perfSonar.eenet.ee	■	■	■	■	■
<b>France - paris1-snd-022.perfsonar.renater.fr</b>	■	■	■	■	■
Germany - psbrix.rrze.uni-erlangen.de	■	■	■	■	■
Germany - psmall-test.x-win.dfn.de	■	■	■	■	■
Greece - perfsonar-node.grnet.gr	■	■	■	■	■
Hungary - perfsonar.debrecen3.hbone.hu	■	■	■	■	■
<b>Ireland - bob.heanet.ie</b>	■	■	■	■	■

# What about this?

	Geneva	Kaunas	London	Madrid	Sofia
Austria - ps02.aco.net	Green	Green	Green	Green	Green
Belgium - perfsonar.r2.brudie.belnet.net	Black	Black	Black	Black	Black
Croatia - psmall.st.carnet.hr	Green	Green	Green	Green	Green
Denmark - pssmall.grid.aau.dk	Green	Green	Green	Green	Green
Estonia - perfSonar.eenet.ee	Green	Green	Green	Green	Green
<b>France - paris1-snd-022.perfsonar.renater.fr</b>	Yellow	Yellow	Yellow	Yellow	Yellow
Germany - psbrix.rrze.uni-erlangen.de	Green	Green	Green	Green	Green
Germany - psmall-test.x-win.dfn.de	Green	Yellow	Green	Yellow	Green
Greece - perfsonar-node.grnet.gr	Green	Green	Green	Green	Green
Hungary - perfsonar.debrecen3.hbone.hu	Green	Green	Green	Green	Green
<b>Ireland - bob.heanet.ie</b>	Pink	Pink	Yellow	Pink	Pink

**Test now**



# Launch a new test

- From mesh specs
- Choose MP from mesh
- Change test parameters
- Store results into mesh archive

Throughput from MaDDash ✕

**Source end-point:**  
Preselected from chosen MP line ▾  
perfSONAR node One  
perfSONAR node Two  
perfSONAR node Three  
perfSONAR node Four  
...

**Destination end-point:**  
Choose from MP columns ▾  
perfSONAR node A  
perfSONAR node B  
perfSONAR node C  
perfSONAR node D  
...

↔  
Reverse

**Test parameters**

Test type and tool: Throughput with tool as in mesh ▾

Interface: Same as in mesh      Protocol: Same as in mesh ▾

Test duration: Same as in mesh      Units: Same as in mesh ▾

[+ Advanced Parameters](#)

Store results into archive      **Trigger test now**



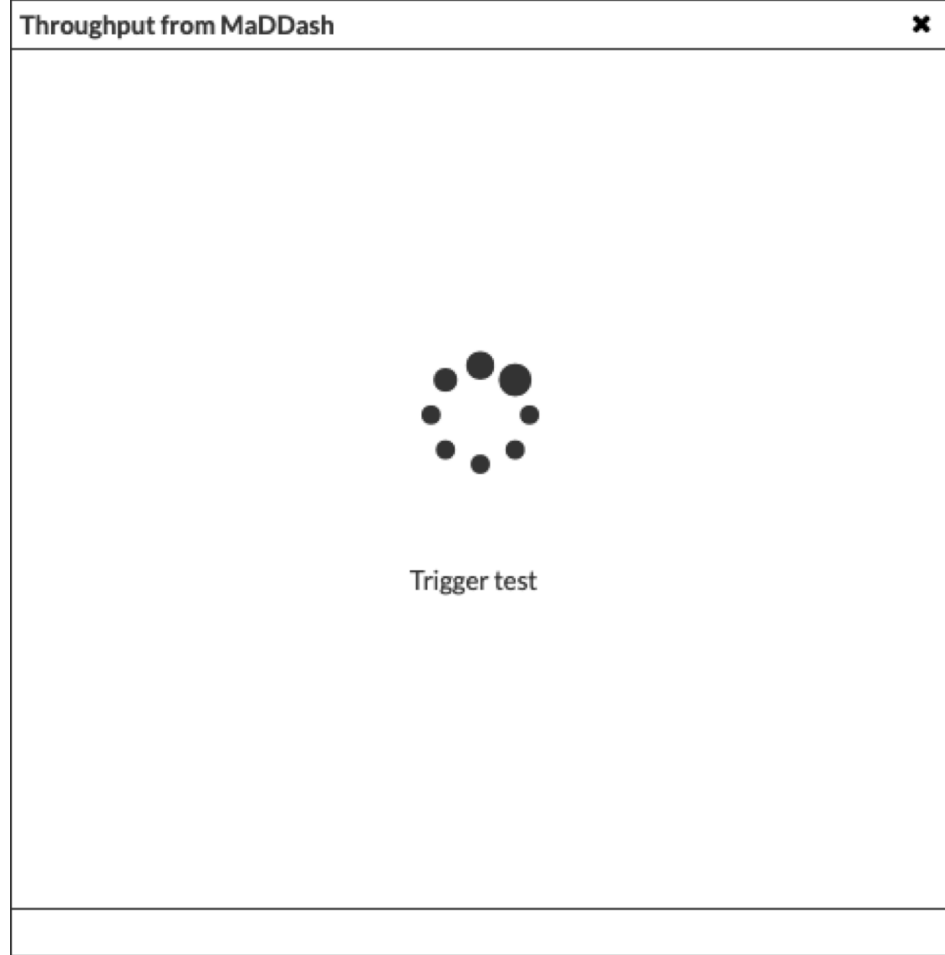
# Performing the test

- Contacting pScheduler



# Performing the test

- Trigger the test



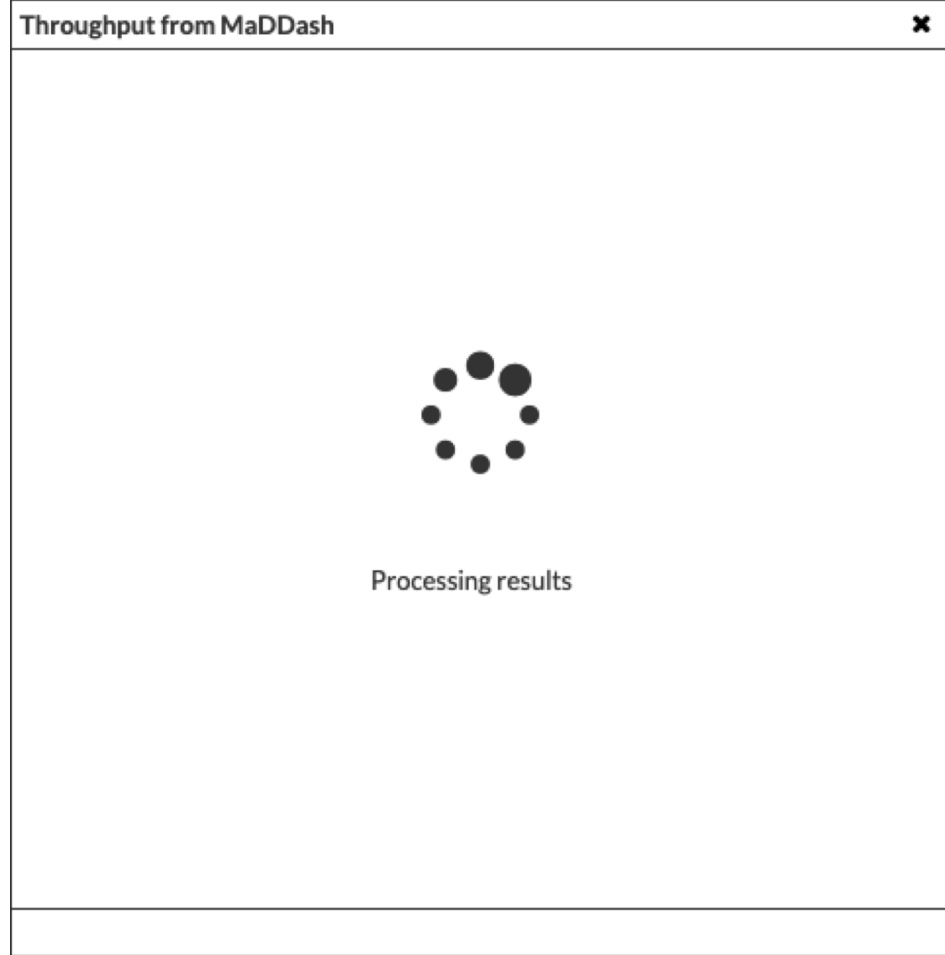
# Performing the test

- Waiting for results



# Performing the test

- Processing the results



# Displaying the results

- Same information as on the CLI:
  - Intervals
  - Summary

Throughput from MaDDash ✕

Source end-point: Chosen MP one  
Destination end-point: Chosen MP two

Test results:

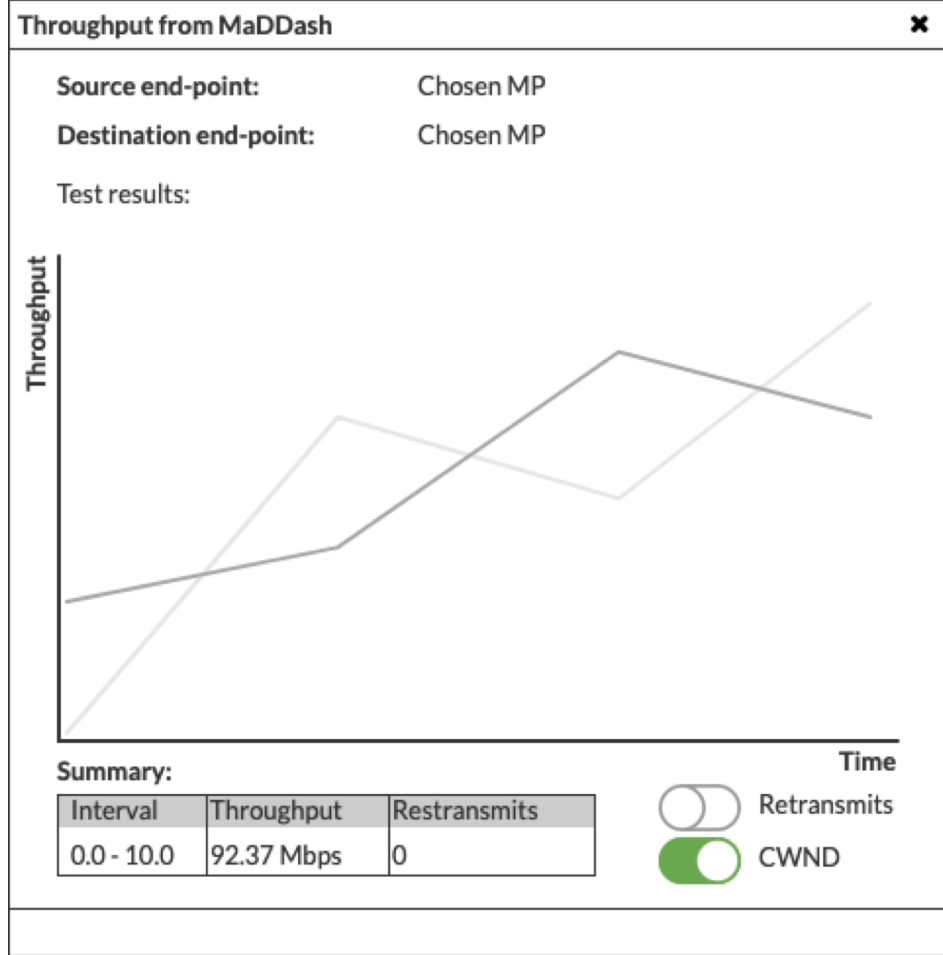
Interval	Throughput	Retransmits	Current Window
0.0 - 1.0	88.00 Mbps	0	841.09 KBytes
1.0 - 2.0	98.26 Mbps	0	979.61 KBytes
2.0 - 3.0	90.17 Mbps	0	979.61 KBytes
3.0 - 4.0	90.22 Mbps	0	979.61 KBytes
4.0 - 5.0	95.31 Mbps	0	979.61 KBytes
5.0 - 6.0	95.28 Mbps	0	979.61 KBytes
5.0 - 7.0	90.37 Mbps	0	979.61 KBytes
7.0 - 8.0	90.74 Mbps	0	979.61 KBytes

Summary:

Interval	Throughput	Retransmits
0.0 - 10.0	92.37 Mbps	0

# Plotting the results

- Histogram of all intervals
- In a dedicated window or in Grafana ... still up for discussion ... and development!



# Some options to visualise results

- Powerful and easy to use JS library: D3
- JS library already in use by pS toolkit: React
- Looking for balance between:
  - most flexible solution
  - least maintenance burden

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## Current status & looking forward

What have we done so far?

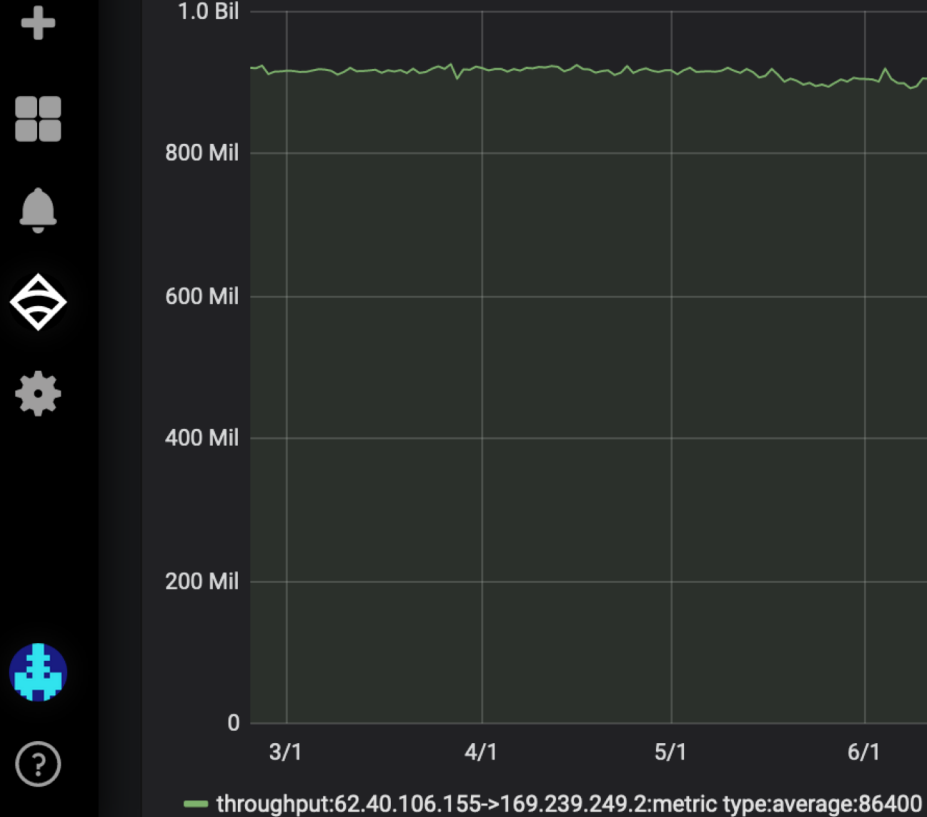




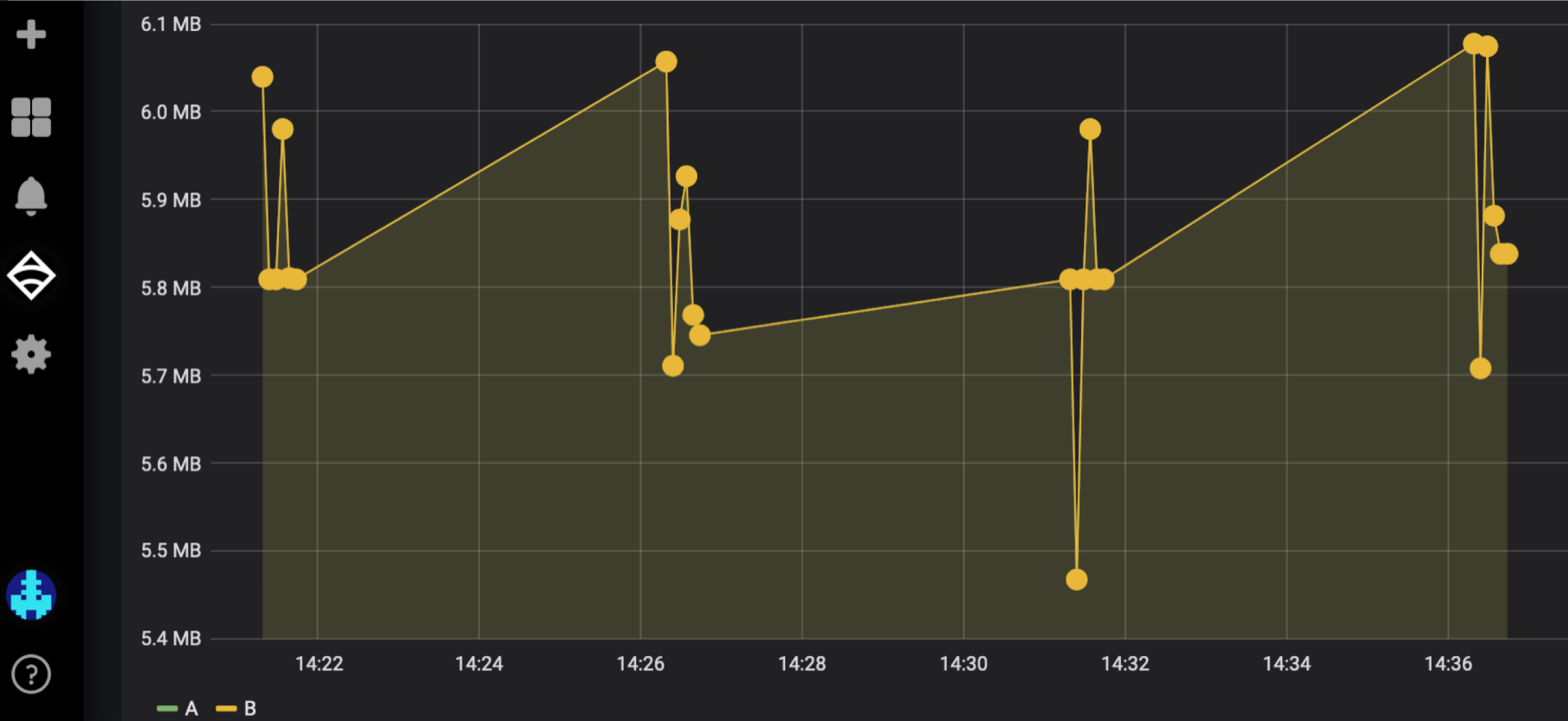
# Using Grafana

- Commonly used dashboard tool
- Great to compare metrics coming from different sources
- Can we provide a data-source plugin for Grafana?
  - Esmond data-source
  - pScheduler data-source

# Grafana with Esmond data-source



# Grafana with pScheduler data-source



# What's on our roadmap

- MaDDash on-demand testing and visualisation
- Grafana histogram visualisation
  - Because a single measurement is a time series of intervals
- On the fly Grafana dashboard creation
  - On-demand tests can be numerous
- Selecting MP from Lookup Service information
  - Broader use case than the MaDDash one
  - Similar in usage to the defunct psUI

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## Thanks!

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