perfSONAR 5.0

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perfSONAR

perf5.0NAR

Released on 17th April 2023

perfSONAR is developed by a partnership of   ESnet · GÉANT · INDIANA UNIVERSITY · INTERNET2 · RNP · UNIVERSITY OF MICHIGAN

A new version, quite some changes

- What's in the release?

- Why upgrade to perfSONAR 5.0?

- What to check after your 5.0 upgrade?

- What other information do you need to know?

- What is coming after 5.0?

# The path to perfSONAR 5.0

- perfSONAR 4.0 was 6 years ago…exactly (April 17, 2017)

- perfSONAR 5.0 Beta first released on May 31, 2022

- The largest change is the replacement of the default archive where measurements are stored

The Old: Esmond

- Default archive that most users run
- Django app with custom REST API
- Use two backend databases
    - PostgreSQL
    - Cassandra

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ESnet GÉANT INDIANA UNIVERSITY INTERNET2 RNP UNIVERSITY OF MICHIGAN
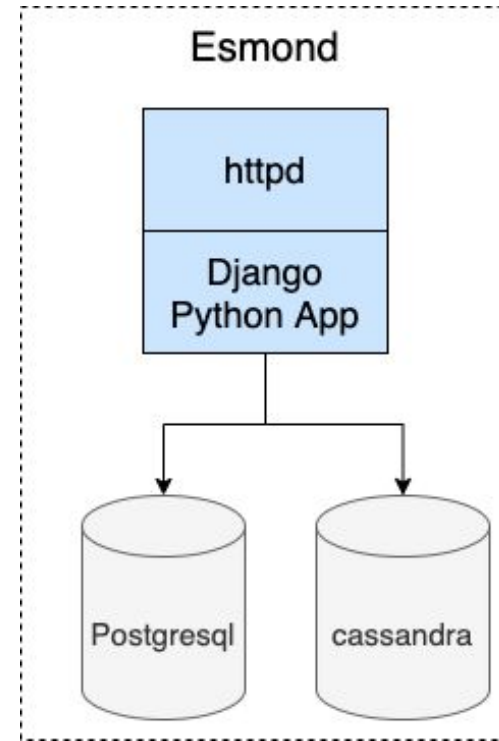
Why replace esmond?

- Many good open source options for time-series storage
  - Rich query languages
  - Integration with off-the-shelf visualization platforms
  - Better support for backups, scaling, etc
  - Cloud vs On-Prem Deployments
- Stability
  - Cassandra one of the main source of issues on user list
- Maintainability
  - Less custom code
  - Many old libraries that need large rewrites to update
- Community successes from which we can learn
  - WLCG, NetSage, Stardust, others

The New: OpenSearch

- Derivative of Elasticsearch with friendlier licensing
- Default perfSONAR bundles now rely on OpenSearch
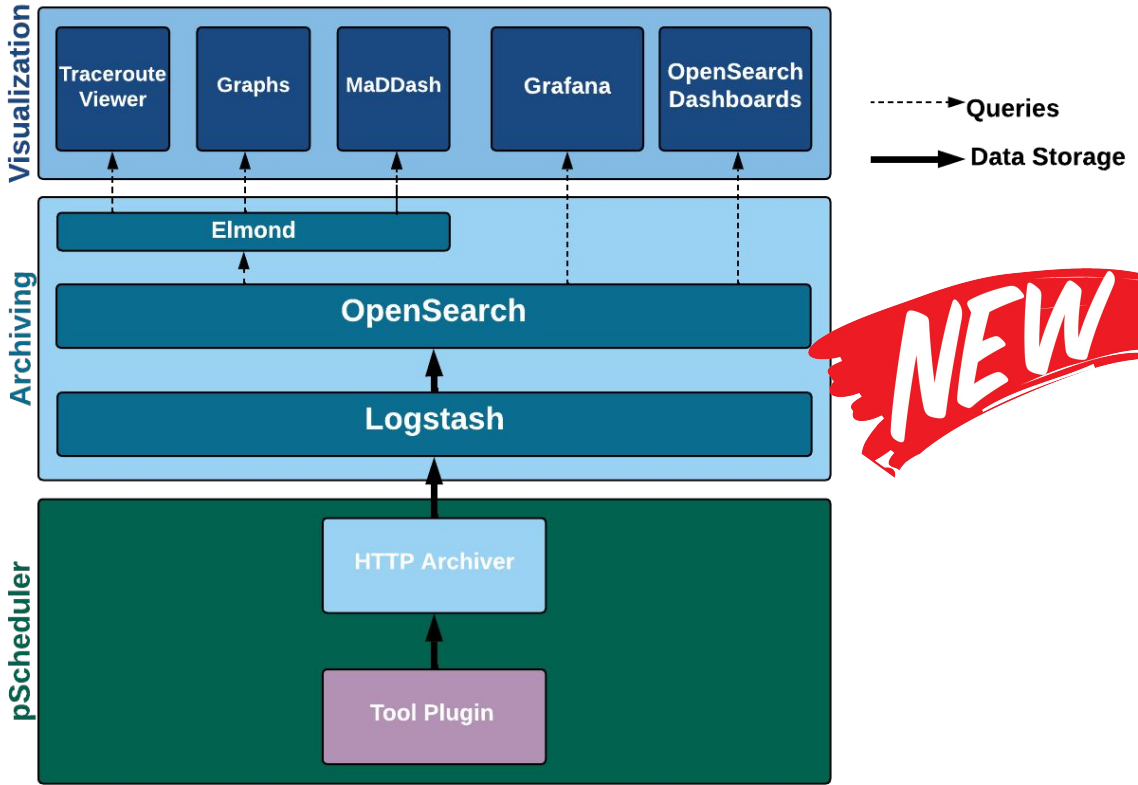- We will maintain compatibility with Elasticsearch for those with existing installations

The New: How it fits together

Elmond: Backward compatibility interface for queries

OpenSearch: Stores the data

Logstash: Adds additional metadata and formats for storage

What are the benefits of upgrading?

- OpenSearch enables some **new capabilities**
  - You can now integrate perfSONAR data directly in visualisation tools like Grafana. Try our MaDDash-like plugin.
  - New API options including a SQL interface for querying data
  - Foundation for many new features in future releases like better viz, alarming and more
- **Ubuntu 20** support (More on other OSes later)
- **Convenience** features
  - configure-archives option now enabled by default in pSConfig
  - Host info JSON service now available on testpoint - if you are in WLCG dashboards this makes the testpoint a viable option
- **Toolkit UI** Improvements
  - pScheduler Plot command integrated in UI
  - Minor adjustments such as a logout button and more

What are the benefits of upgrading (continued)?

- New pScheduler Plug-ins
  - **Tests:**
    - MTU (mtu)
    - pScheduler Response Time (psrespose)
    - WiFi BSSID Scan (wifibssid)
    - 802.1x Authentication (dot1x)
    - DHCP Response Time (dhcp)
  - **Tools:**
    - halfping - tests latency by halving the return value of the round-trip time as determined by ping.
  - **Archives:**
    - postgresql - Inserts results into a column in a table
    - tcp - Open a connection to a TCP port, send result, disconnect
    - udp - Sends results in datagrams (those that will fit in them)

And what can I do with all that?

- Here is some screenshots of a Grafana dashboard example

Plugins / OpenSearch

Version	From	Dependencies	Signature
2.2.0	Grafana Labs	⚙ Grafana >=9.0.0	🔒 Signed **Level:** ⚙ Grafana Labs **Signed by:** Grafana Labs

Uninstall **Create a OpenSearch data source** ⬅ Click Here

Overview ▾

OpenSearch Grafana Data Source

With the OpenSearch Grafana data source plugin, you can run many types of simple or complex OpenSearch queries to visualize logs or metrics stored in OpenSearch. You can also annotate your graphs with log events stored in OpenSearch. The OpenSearch Grafana data source plugin uses Piped Processing Language (PPL) and also supports AWS Sigv4 authentication for Amazon OpenSearch Service.

Adding the data source

1. Install the data source by following the instructions in the Installation tab of this plugin's listing page.
2. Open the side menu by clicking the Grafana icon in the top header.
3. In the side menu under the `Dashboards` link you should find a link named `Data Sources`.
4. Click the `+ Add data source` button in the top header.
5. Select *OpenSearch* from the *Type* dropdown.

> **Note:** If you're not seeing the `Data Sources` link in your side menu it means that you do not have the `Admin` role for the current organization.

Name	Description
`Name`	The data source name. This is how you refer to the data source in panels and queries.
`Default`	Default data source means that it will be pre-selected for new panels.
`Url`	The HTTP protocol, IP, and port of your OpenSearch server.
`Access`	Server (default) = URL needs to be accessible from the Grafana backend/server, Browser = URL needs to be accessible from the browser.

Access mode controls how requests to the data source will be handled. Server should be the preferred way if nothing else stated.

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Plugins / **ESNET Matrix Panel**

Version	From	Downloads	Dependencies	Signature
1.0.6	esnet	3,457	Grafana >=8.0.0	🔒 Signed

Matrix Panel Plugin that allows comparison of two non-timeseries categories

Website | License

Install ⬅ Click Here

📄 **Overview**   🕐 Version history

Matrix Panel Plugin

This plugin creates a 2D matrix showing the relationship between 2 selected fields (source and target). Note: This is NOT inteded to use with time series data or large data sets. It also will not render if there are >200 rows or columns

Top Source to Destination Orgs by Volume

Last 6 hours

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Packet Loss Over Time by Sender

ps-dev-staging-u20-1.c.esnet-perfsonar.internal	< 0.100% < 0.100% < 0.100%
ps-dev-staging-u18-1.c.esnet-perfsonar.internal	< 0.100% < 0.100% < 0. < 0.100%
ps-dev-staging-tp-1.c.esnet-perfsonar.internal	< 0.100% < 0.100% < 0.100%
ps-dev-staging-tk-1.c.esnet-perfsonar.internal	< 0.100% < 0.100% < 0.100% < 0.100 < 0.100% < 0 < 0
ps-dev-staging-d10-1.c.esnet-perfsonar.internal	< 0.100% < 0.100% < 0.100%

05:30   06:00   06:30   07:00   07:30   08:00   08:30   09:00   09:30   10:00   10:30   11:00

■ < 0.100%   ■ 0.100%+   ■ 1%+

Maximum Packet Loss	Highest Average Packet Loss by Sen...		Highest Average Packet Loss by Rec...	
	Sender Host	Max Packet Los	Receiver Host	Max Packet Los
	ps-dev-staging-...	0.167	ps-dev-staging-t...	0.167
	ps-dev-staging-t...	0.167	ps-dev-staging-t...	0.167

Dashboards / Import dashboard

Import dashboard from file or Grafana.com

⬆️

Upload dashboard JSON file

Drag and drop here or click to browse

Accepted file types: .json, .txt

Import via grafana.com

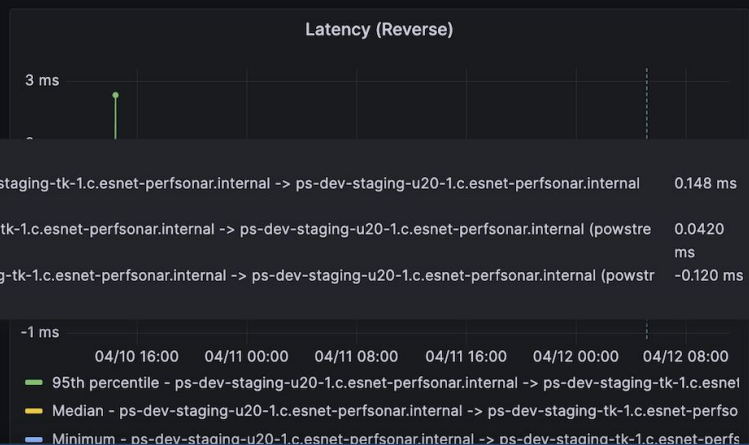| Grafana.com dashboard URL or ID | Load |

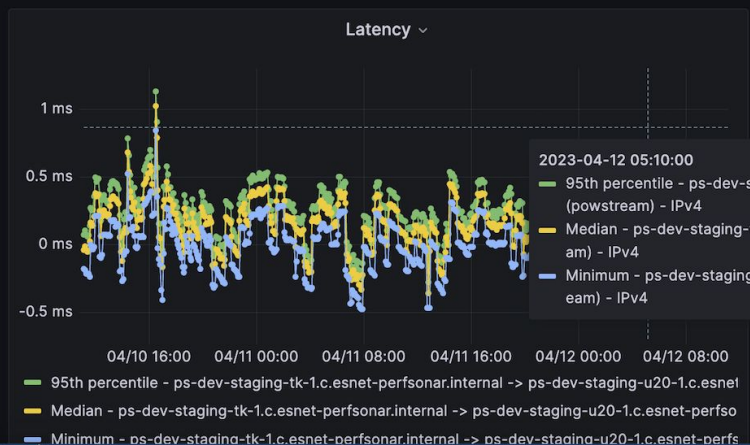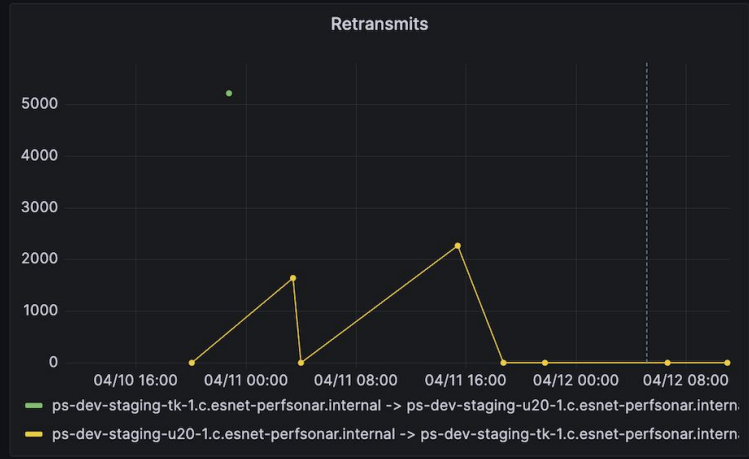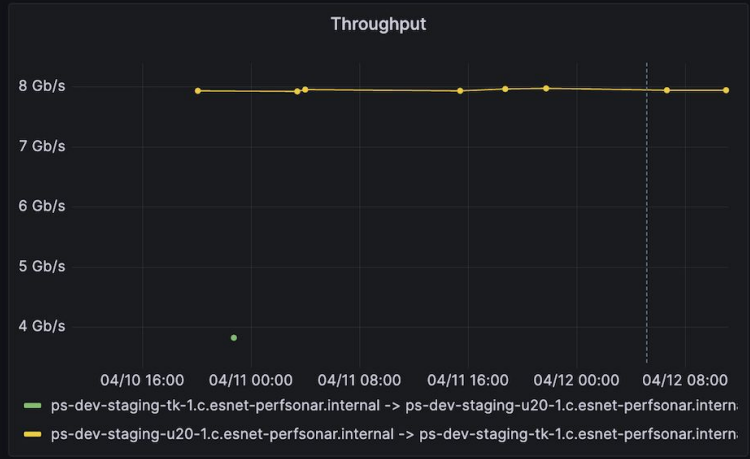**Import via panel json**

```
{
    "field": "meta.ip_version",
    "id": "6",
    "settings": {
      "min_doc_count": "1",
      "order": "desc",
      "orderBy": "_term",
      "size": "0"
    },
    "type": "terms"
}
```

← Copy file contents here

Load   Cancel

And what can I do with all that?

- Grafana dashboard example

- See our cookbook at
  https://docs.perfsonar.net/grafana_cookbook.html

What to check after 5.0 upgrade?

- ✅ Are my tests still running?
  - Look at your toolkit pages
  - Look at your pscheduler schedule
- ✅ Do I see measurement results?
  - Look at your toolkit pages
  - Look at your MaDDash instance
- ✅ Is my host still registered with the Lookup Service?
  - Search for it on https://stats.perfsonar.net

Other changes

- pScheduler limits changes
  - If you have made any changes to your limits file, then you will need to manually update them.
  - **pScheduler will stop running on update if your limits are not valid!**
  - Run the helper script here to check your limits:

    https://github.com/perfsonar/pscheduler-limit-checker-for-5.0
- We no longer support the 5.0 ISO image
  - Users can install the base operating system of their choice and use yum or apt to install perfSONAR

Packaging Changes

- **perfsonar-centralmangement retired:** This was the bundle that installed esmond and maddash on the same host
- **New perfsonar-archive package:** This installs and configures OpenSearch and Logtsash for you. If you want a replacement for centralmangement then install *perfsonar-archive* and *maddash*
- **New optional perfsonar-dashboards package:** Installs OpenSearch Dashboards (equivalent of Kibana) for browsing data.

What's after 5.0? — Short term

- **Additional OSes**:
  - Alma 8, Alma 9 (works with other flavors of EL as well like Rocky)
    - Currently finalising, might get release by the end of the month
  - Ubuntu 22, Debian 11 and 12
    - In the works, release at some time during summer
- **Bug fixes**
  - 5.0.1 released on April 20th
 - 5.0.x releases will follow as required

What's after 5.0? — Longer term

- **Probably in 5.1 (tbc)**
  - **Grafana visualisation** and **MaDDash Replacement** (In Progress)
    - See https://grafana.com/grafana/plugins/esnet-matrix-panel/
  - Threaded **iperf3** (In Progress)
  - Threaded **powerstream** (In Progress)
  - pSConfig in python (In Progress)
  - New pScheduler plugins
- **Probably in a later release (tbc)**
  - Revamped PWA (Early Design Phase)
  - New toolkit UI based on Grafana and PWA

Problems, questions? Get in touch!

- Updated **documentation** at https://docs.perfSONAR.net

- We are here to help you!

- Through the **perfsonar-user** mailing list:

  - https://lists.internet2.edu/sympa/info/perfsonar-user

- **WP6T3** in the GÉANT project:

  - perfsonar@lists.geant.org

  - GÉANT Slack space: #perfsonar channel
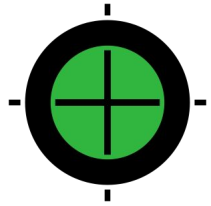
Question and answer icon by iconosphere from The Noun Project

Thank You

www.geant.org