SUSE Best Practices

SAP

Infrastructure Monitoring for SAP Systems

SUSE Linux Enterprise Server 15 SP7 and later

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Infrastructure Monitoring for SAP Systems

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This guide provides detailed instructions on installing and customizing SUSE Linux Enterprise Server and Grafana Alloy to monitor hardware metrics. These insights help maximize the uptime of critical SAP applications. While based on SUSE Linux Enterprise Server 15 SP7, the concepts are also applicable to SUSE Linux Enterprise Server 16.0.

Contents

1 Introduction

Many customers deploy SAP systems, such as SAP S/4HANA, to support mission-critical business functions for their global operations. Consequently, maximizing system availability becomes crucial. IT departments face very demanding SLAs, with many companies now requiring 24x7 reliability for their SAP environments.

The foundation of every SAP system is a solid infrastructure supporting it.

Operating System

SUSE Linux Enterprise Server for SAP applications is the leading Linux platform for SAP HANA, SAP NetWeaver and SAP S/4HANA solutions. It helps reduce downtime by providing the flexibility to configure and deploy various HA/DR scenarios for SAP HANA and NetWeaver-based applications. Additionally, system data monitoring enables proactive problem avoidance.

Hardware

Most modern hardware platforms running SAP systems rely on Intel's system architecture. The combination of SUSE Linux Enterprise Server, the latest generation of Intel Xeon Scalable processors, and Intel Optane DC persistent memory helps deliver fast, innovative, and secure IT services while providing resilient enterprise S/4HANA platforms. The Intel platform allows for deep hardware monitoring, gaining insights into system performance at the physical level. This level of monitoring helps reduce SAP systems downtime in several ways:

Failure prediction

Identifying hardware failures in advance allows customers to react early and in a scheduled manner. This reduces the risk of errors that often occur during emergency operations under the pressure of an unplanned outage.

Failure remediation

Having hardware metrics readily available when diagnosing a root cause of an issue speeds up analysis and reduces the time required to restore operations on that system. It also improves reaction time by providing more precise data about an issue. This is especially valuable for enterprise customers who usually outsource operations to multiple service providers and do not control the environment directly.

This paper describes a monitoring solution for SAP systems that enables metrics to be analyzed within a specific SAP context.

2 Monitoring for SAP systems overview

The solution presented in this document consists mainly of the open source tool Grafana Alloy. The tool acts as a single, local agent that replaces most single exporters by gathering metrics and logs directly via built-in collector functions (Data Collection). It transforms metrics and logs via relabeling and filtering (Data Processing), and forwards the unified telemetry to central backends via a push-based model (Data Push).

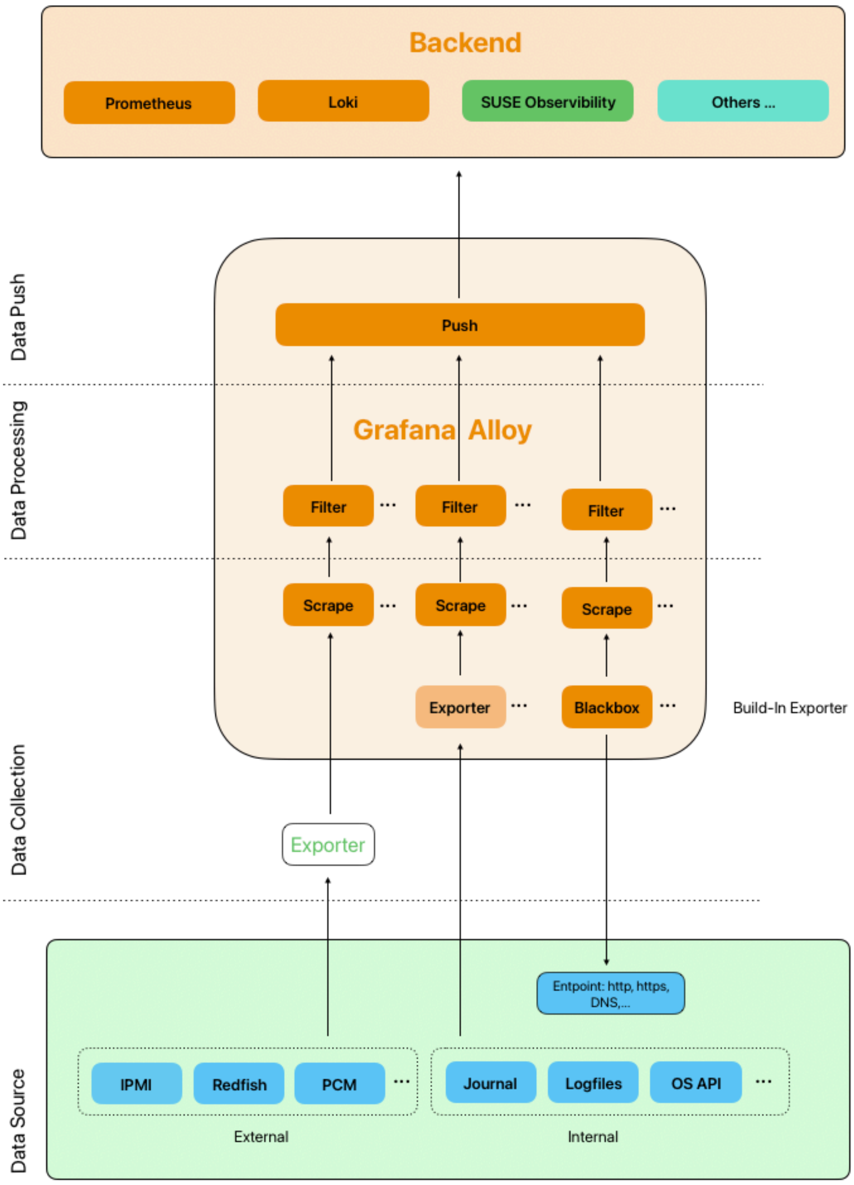


FIGURE 1: MONITORING COMPONENTS

2.1 Data Source

As illustrated in the diagram, **Data Sources** can be categorized by the operating system (Internal Sources) and the underlying hardware (External Sources):

- **Internal Sources:** Information from the operating system itself, such as log files, the systemd journal, and system APIs.
- **External Sources:** Information from outside the main OS, such as hardware data via SNMP and Redfish, or network checks via Blackbox.

Note

In the previous SUSE Best Practices document, the **Data Source** was defined by the exporters and collectors themselves. We now define the **Data Source** strictly as the origin of the information, independent of the collection tool.

2.2 Data Collection

Data Collection can be performed in two ways: Grafana Alloy either gathers information directly using its built-in exporter function, or it acts as a local receiver for external exporters.

- **Built-in function:** Grafana Alloy features many native exporter functions (such as the legacy Node Exporter and Promtail).
- **Local aggregator:** For specialized datasets, Grafana Alloy acts as a local aggregator for third-party collectors and exporters (for example: PCM, Collectd),

Note

In the previous SUSE Best Practices document, the **Data Collection** was defined by the storage component (Prometheus and Loki), which had to actively "pull" data from every individual exporter across the network. We have now shifted this function to a dedicated layer on the host, centralizing the gathering process locally.

2.3 Data Processing

Data Processing can clean and organize metrics and logs, before the data leaves the system.

- **Relabeling:** Labels can be added or changed on individual data points. This ensures data is easy to find, group and query across all subsequent stages.
- **Filtering:** Unnecessary data can be dropped or reduced to only the essential parts.

2.4 Data Push

Finally, the data is sent to the central databases (for example, Prometheus and Loki). The key benefits of the Alloy-driven approach are:

- **Enhanced Security (Push Approach):** Using a push-based model eliminates the need to open multiple incoming ports (for example, port 9100 for Prometheus Node Exporter) on every host. Grafana Alloy pushes data out, allowing your systems to remain closed and secure.
- **Unified Stream:** Metrics, logs, and traces are pushed together, making network traffic much more efficient.

3 Implementing the monitoring solution

The following sections show how to set up a monitoring solution based on Grafana Alloy that was introduced in the solution overview.

3.1 Installing Grafana Alloy

Grafana Alloy can be installed directly from the SUSE repository. With SUSE Linux Enterprise Server 15 SP7 and SUSE Linux Enterprise Server 16.0., it is part of SUSE Linux Enterprise Server.

```
# zypper in alloy
```

3.2 Base Configuration

This section describes the base configuration of Grafana Alloy. It covers the Alloy service configuration, data collection, data processing, and data push.

3.2.1 Environment File

The service settings are defined in a central environment file. The `/etc/sysconfig/alloy` file controls how the service is launched. The main configuration options are explained below:

/etc/sysconfig/alloy

```
## Path:
## Description: Grafana Alloy settings
## Type:        string
## Default:     ""
## ServiceRestart: alloy
#
# Command line options for Alloy.
#
# The configuration file holding the Alloy config.
CONFIG_FILE="/etc/alloy/config.alloy"

# User-defined arguments to pass to the run command.
CUSTOM_ARGS="--server.http.listen-addr=0.0.0.0:12345"

# Restart on system upgrade. Defaults to true.
RESTART_ON_UPGRADE=true

# Monitoring Group
monitoring_group=infra
```

CONFIG_FILE

Defines the path to the main Alloy configuration. By default, it points to a single file, but is also supports directory-based loading where all files within that folder ending in `.alloy` are used at once.

CUSTOM_ARGS

Allows you to pass additional command-line flags to the service during startup. It is used to enable extra features, adjust performance limits, or fine-tune global settings.

monitoring_group

The `monitoring_group` key-value pair is an example of creating an environment variable. This example sets a custom environment label, similar to the traditional Prometheus `job_name`. It can be used later on in the Alloy configuration via `sys.env("monitoring_group")`.

3.3 Metric configuration

Alloy operates as a programmable pipeline where modular components are linked to manage the metric flow. This architecture allows you to connect specialized exporters, relabeling rules, and scraping engines to transform raw system data into structured time-series metrics. The default config file is stored under:

```
/etc/alloy/config.alloy
```

The following sections describe the individual components used in the configuration. A complete, functional example combining all these elements is provided at the end of this chapter.

3.3.1 Data Collection

The Exporter is the data entry point for the pipeline. Exporters do not send data themselves; instead, they "expose" a list of values that are collected by a scraper later in the process. The following sections discuss the most essential exporters for a standard infrastructure deployment.

prometheus.exporter.unix

The `prometheus.exporter.unix` component is the integrated version of the classic Prometheus Node Exporter. Its primary role is to retrieve hardware and operating system metrics directly from the Linux kernel.

```
prometheus.exporter.unix "unix" {
}
```

prometheus.exporter.process

The `prometheus.exporter.process` component provides granular visibility into individual processes running on the host. While the Unix exporter (`prometheus.exporter.unix`) looks at the "big picture" of the entire server, the Process exporter allows you to zoom in on specific applications.

As shown in the example, this component is configured to monitor `nginx` as the specific process.

```
prometheus.exporter.process "process" {
  track_children = false

  matcher {
    comm = ["nginx"]
  }
}
```

prometheus.exporter.blackbox

The `prometheus.exporter.blackbox` component monitors the availability of services by sending network probes to specific endpoints. It tests the availability and the response quality of network services, such as Websites, APIs, or DNS servers, to ensure they are responding within acceptable limits.

```
prometheus.exporter.blackbox "blackbox" {
  config = "{ modules: { http_2xx: { prober: http, timeout: 5s } } }"
  target {
      name    = "Webserver"
      address = "https://webserver01.domain"
      module  = "http_2xx"
    }
}
```

prometheus.exporter.snmp

The `prometheus.exporter.snmp` component enables Grafana Alloy to collect telemetry from network hardware by using the Simple Network Management Protocol (SNMP) to query devices like routers, switches, and similar. The example below collects SNMP data from a Cisco switch. (Note that this component requires an accompanying configuration file.)

```
prometheus.exporter.snmp "cisco_switches" {
  config_file = "/etc/alloy/snmp.yml"

  target "cbs250_main" {
    address = "192.168.178.2"
    module  = "if_mib"
    auth    = "alloy_v2c"
  }
}
```

prometheus.exporter.self

The `prometheus.exporter.self` component is a specialized internal monitor designed for the health of Alloy itself. It allows the Alloy agent to collect and expose its own operational metrics.

```
prometheus.exporter.self "self" {
}
```

3.3.2 Data Collection - Scraper

The scrape component is the active "worker" of the metrics pipeline. While exporters are responsible for making data available, the scraper is responsible for collecting that data. It functions by "pulling" metrics from one or more exporters at a defined time interval.

prometheus.scrape

In the example below, the scraper pulls the data from the `prometheus.exporter.unix` and forwards it to the Data Push component `prometheus.remote_write`:

```
prometheus.scrape "os" {
    scrape_interval = "15s"
    targets     = prometheus.exporter.unix.os.targets
    forward_to = [ prometheus.remote_write.to_prometheus.receiver]
}
```

3.3.3 Data Processing

When telemetry has been identified and collected, it often requires modification before being sent to the backend. Alloy uses relabeling components to standardize data, remove sensitive information, or add organizational context.

prometheus.relabel

The `prometheus.relabel` component is the standard component for modifying metrics after they have been scraped. It acts as a filter and transformation engine that typically sits between the scraper and the Data Push components. The example below creates or modifies the following labels:

```
prometheus.relabel "to_be_compatible" {
    forward_to = [ prometheus.remote_write.to_prometheus.receiver, ]

    // rule01
    rule {
        source_labels  = ["exporter"]
        target_label   = "exporter"
        replacement    = "alloy"
    }


    // rule02
    rule {
        source_labels  = ["instance"]
        target_label   = "instance"
        replacement    = constants.hostname
    }

    // rule03
    rule {
        source_labels  = ["job"]
        target_label   = "job"
        replacement    = sys.env("monitoring_group")
    }
}
```

- **Identifying the Agent (rule01):** This rule ensures the data is tagged with the name `alloy` so you can easily identify which software collected the metrics.
- **Standardizing the Hostname (rule02):** This rule replaces the technical address (such as an IP) with the actual system host name, making it easier to find the server.
- **Using Environment Variables (rule03):** This rule grabs the `monitoring_group` variable from your system settings (see: `/etc/sysconfig/alloy`) and works like the legacy Prometheus `job_name`. By setting this to values like `infra`, `test`, or `services`, you can easily categorize and filter your targets in Grafana.

3.3.4 Data Push

prometheus.remote_write

The `prometheus.remote_write` component is the final destination handler for metrics within the Alloy pipeline. When data has been collected by a scraper and processed by any relabeling stages, this component handles the secure transmission of that data to a backend, such as Prometheus.

```
prometheus.remote_write "to_prometheus" {
    endpoint { url = "http://prometheus-server:9090/api/v1/write" }
}
```

3.3.5 Putting it all together

To provide a clear picture of the entire configuration, the following example shows a complete Alloy setup. The `prometheus.exporter.unix` component is the best example of a native replacement for the traditional Prometheus Node Exporter. In this scenario, Alloy scrapes the internal exporter data, applies custom labels to identify the source, and forwards the processed data to a central Prometheus backend.

```
prometheus.exporter.unix "localhost" {
}

prometheus.scrape "unix" {
    scrape_interval = "10s"
    targets     = prometheus.exporter.unix.localhost.targets
    forward_to = [ prometheus.relabel.to_be_compatible.receiver, ]
}

prometheus.relabel "to_be_compatible" {
    forward_to = [ prometheus.remote_write.to_prometheus.receiver, ]

    rule {
        source_labels  = ["exporter"]
        target_label   = "exporter"
        replacement    = "alloy"
    }
    rule {
        source_labels  = ["instance"]
        target_label   = "instance"
```

```
        replacement    = constants.hostname
    }
    rule {
        source_labels  = ["job"]
        target_label   = "job"
        replacement    = sys.env("monitoring_group")
    }
}

prometheus.remote_write "to_prometheus" {
    endpoint { url = "http://prometheus-server:9090/api/v1/write" }
}
```

3.4 Log configuration

Following the same logic as metrics, the log components allow you to collect, parse and filter system events before they reach the backend.

3.4.1 Data Collection

Unlike metric exporters, which take a snapshot at specific time intervals, log components stay "attached" to the files. As soon as a new line is written to a log file, the collector detects it and sends it immediately (similar to the `tail -f` command).

The following sections outline the essential log components.

loki.source.journal

The `loki.source.journal` component reads logs directly from the systemd journal. It retreives not only the log message itself but also a complete set of metadata, such as the unit name, PID, and priority.

```
loki.source.journal "journal" {
  max_age       = "24h0m0s"
  relabel_rules = discovery.relabel.journal.rules
  forward_to    = [loki.relabel.journald.receiver]
}
```

loki.source.file

The `loki.source.file` component is the standard tool for collecting logs from traditional text files stored on the local file system.

```
loki.source.file "logfile" {
  targets    = [
    {__path__ = "/var/log/logfile.log"},
  ]
  forward_to    = [loki.relabel.logfiles.receiver]
}
```

3.4.2 Data Processing

Similar to metric data, logs often require modifications before being sent to the backend.

loki.relabel

Like `prometheus.relabel`, the `loki.relabel` component is the standard component for modifying logs after they have been captured.

```
loki.relabel "logfiles" {
  forward_to    = [loki.write.to_loki.receiver]

  rule {
    source_labels  = ["job"]
    target_label   = "job"
    replacement    = sys.env("monitoring_group")
   }

  rule {
    source_labels  = ["log_type"]
    target_label   = "log_type"
    replacement    = "journald02"
   }
}
```

3.4.3 Data Push

loki.write

The `loki.write` cocmponent serves as the final destination handler for logs within the Grafana Alloy pipeline. When log entries have been collected and processed through various stages, this component handles the transmission of the resulting streams to a log backend, such as Grafana Loki.

```
loki.write "to_loki" {
    endpoint { url = "http://loki-server:3100/loki/api/v1/push" }
}
```

3.4.4 Putting it all together

To provide a clear picture of how Grafana Alloy handles logging, the example below shows a complete configuration for `journald`. In this setup, Alloy replaces the traditional Promtail agent by reading system logs directly, adding custom labels for better searchability, and forwarding them to a central Loki backend.

```
loki.source.journal "journal" {
  max_age       = "24h0m0s"
  forward_to    = [loki.relabel.journald.receiver]
  labels        = {log_type = "journald"}
}


loki.relabel "journald" {
  forward_to    = [loki.write.to_loki.receiver]
  rule {
    source_labels = ["__journal__systemd_unit"]
    target_label  = "unit"
  }
  rule {
    source_labels = ["__journal__hostname"]
    target_label  = "hostname"
  }
  rule {
    source_labels = ["__journal__kernel_device"]
    target_label  = "kernel_device"
  }
```

```
  rule {
    source_labels = ["__journal__priority"]
    target_label  = "prio"
  }
  rule {
    source_labels  = ["instance"]
    target_label   = "instance"
    replacement    = constants.hostname
  }
  rule {
    source_labels  = ["job"]
    target_label   = "job"
    replacement    = sys.env("monitoring_group")
   }
  rule {
    source_labels  = ["log_type"]
    target_label   = "log_type"
    replacement    = "journald"
   }
}

loki.write "to_loki" {
    endpoint { url = "http://loki-server:3100/loki/api/v1/push" }
}
```

4 Migrating to Grafana Alloy

Migrating to Grafana Alloy is straightforward and does not require starting from scratch. It also supports a mixed environment, providing the flexibility to integrate existing exporters alongside the new system. This ensures a safe transition with no data loss.

4.1 Migrating from metrics exporter

The metrics migration process is straightforward because Grafana Alloy is natively compatible with the Prometheus ecosystem. Most standard collectors are now built-in, allowing you to replace external binaries with the internal components described above. No formal migration tool is required for this process; instead, you can simply follow the configuration steps outlined above.

4.1.1 Keeping existing exporters

For cases where a specialized exporter is not yet built into, you can use Grafana Alloy as a local scraper to collect that data from that existing (external) exporter. This still gives you the power to filter and relabel your metrics before they are sent to the backend.

Integrating Intel Processor Counter Monitor (PCM)

One example of integrating special exporter is the Intel Processor Counter Monitor (PCM).

Intel Processor Counter Monitor (PCM) is a specialized tool used to monitor real-time performance and energy metrics of Intel processors, such as memory bandwidth and CPU resource utilization.

Unlike the previous SUSE Best Practices guide, this integration runs the PCM sensor within a Docker container, ensuring access to the latest version in an isolated environment.

```
# modprobe msr

# docker run -d --name pcm --privileged -p 9738:9738 ghcr.io/intel/pcm
```

Grafana Alloy can then scrape these hardware metrics locally, apply custom labels, and forward the data to a central Prometheus backend.

```
prometheus.scrape "intel_pcm" {
  targets = [
    {"__address__" = "localhost:9738"},
  ]
  forward_to = [ prometheus.relabel.to_be_compatible.receiver, ]
}


prometheus.relabel "to_be_compatible" {
    forward_to = [ prometheus.remote_write.to_prometheus.receiver, ]

    rule {
        source_labels  = ["exporter"]
        target_label   = "exporter"
        replacement    = "alloy"
    }
    rule {
        source_labels  = ["instance"]
        target_label   = "instance"
        replacement    = constants.hostname
```

```
    }
    rule {
        source_labels  = ["job"]
        target_label   = "job"
        replacement    = sys.env("monitoring_group")
    }
}


prometheus.remote_write "to_prometheus" {
    endpoint { url = "http://prometheus-server:9090/api/v1/write" }
}
```

4.2 Migrating from Promtail log exporter

As Promtail has officially reached EOL on March 2, 2026, Grafana Alloy has taken over its role as the primary logging agent. To simplify the transition, the `alloy convert` utility automatically translates your existing Promtail configurations into the new Alloy syntax.

The command is straightforward and requires two components: the source Promtail configuration file and a target output path.

```
# alloy convert --source-format=promtail --output=<OUTPUT_CONFIG_PATH> /etc/loki/
promtail.yaml
```

For demonstration, the following `promtail.yaml` file is used:

```
server:
  http_listen_port: 9080
  grpc_listen_port: 0

positions:
  filename: /var/lib/promtail/positions.yaml

clients:
  - url: http://loki-host:3100/loki/api/v1/push

scrape_configs:
- job_name: journal
  journal:
    max_age: 24h
    labels:
      job: loki_messages

  relabel_configs:
```

```
    - source_labels: ['__journal__systemd_unit']
      target_label: 'unit'

    - source_labels: ['__journal__hostname']
      target_label: 'host'
```

The conversion tool reads the Promtail file and automatically changes the settings into the correct Alloy format. Execute the following command to start the process:

```
alloy convert --source-format=promtail --output=/tmp/config.alloy /etc/loki/promtail.yml
```

This generates the following Grafana Alloy configuration:

```
discovery.relabel "journal" {
  targets = []

  rule {
    source_labels = ["__journal__systemd_unit"]
    target_label  = "unit"
  }

  rule {
    source_labels = ["__journal__hostname"]
    target_label  = "host"
  }
}

loki.source.journal "journal" {
  max_age       = "24h0m0s"
  relabel_rules = discovery.relabel.journal.rules
  forward_to    = [loki.write.default.receiver]
  labels        = {
    job = "loki_messages",
  }
}

loki.write "default" {
  endpoint {
    url = "http://loki-host:3100/loki/api/v1/push"
  }
  external_labels = {}
}
```

5 Troubleshooting

5.1 Alloy Web UI

The Grafana Alloy Web GUI provides a wealth of information. By default, it can usually only be accessed locally via:

```
http://localhost:12345
```

External Access

By setting the option `--server.http.listen-addr=0.0.0.0:12345`, the Grafana Alloy UI can also be accessed externally. When enabling external access, ensure the port is protected by a firewall or a reverse proxy, as Grafana Alloy does not provide native authentication for its Web interface.

This option can be configured in `/etc/sysconfig/alloy` under `CUSTOM_ARGS` (see section 3.1.1 Environment File).

```
[...]

# User-defined arguments to pass to the run command.
CUSTOM_ARGS="--server.http.listen-addr=0.0.0.0:12345"

[...]
```

5.1.1 Component health

The first step is to verify the health of each individual component. This status overview is available directly on the main page of the Alloy Web UI. The dashboard provides a real-time status overview of every active component in the pipeline.

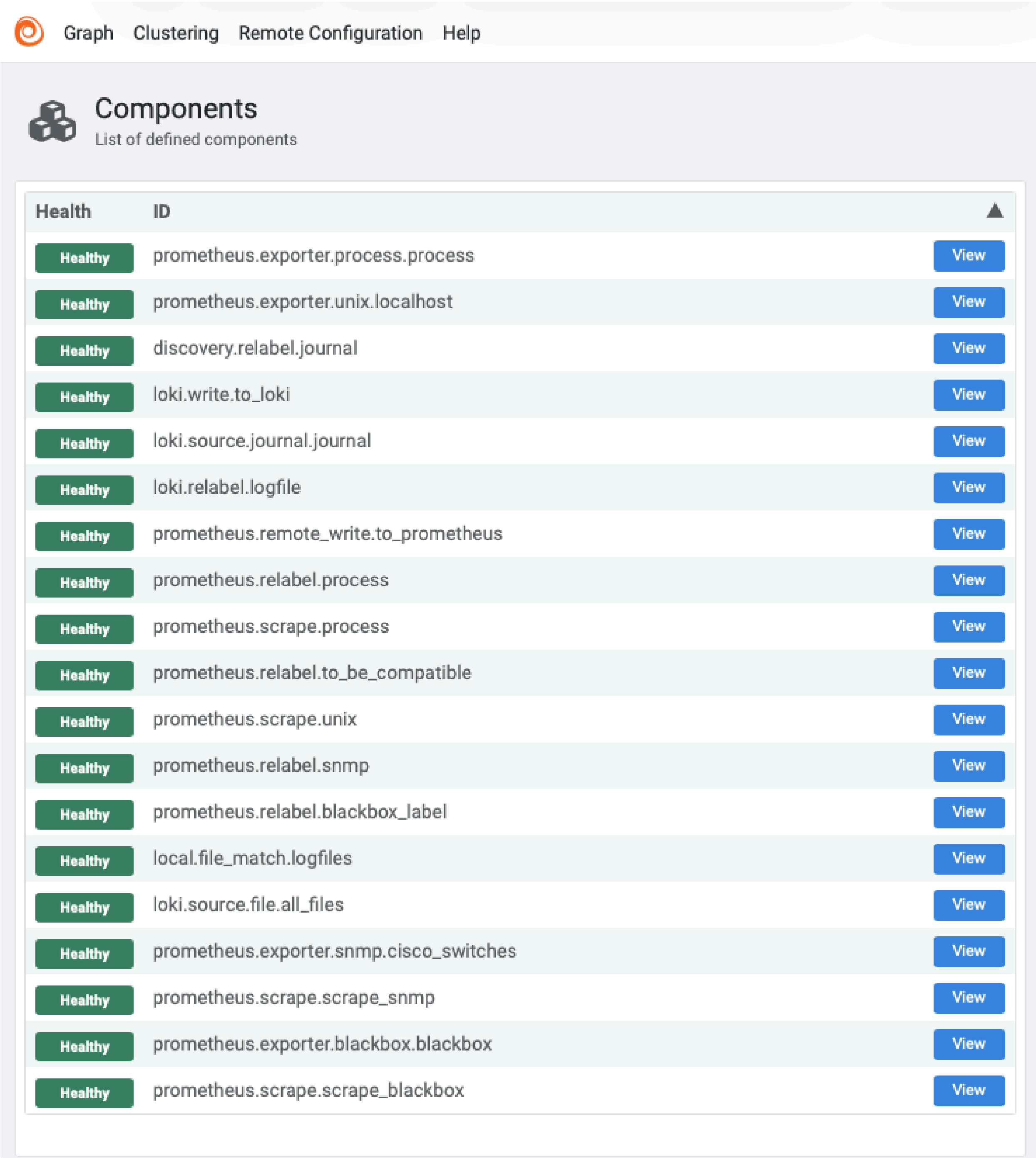


FIGURE 2: COMPONENT HEALTH STATUS

5.1.2 Verifying Data Flow

The Graph tab shows a visual map of all active pipelines. It displays how components connect and how data flows between them.

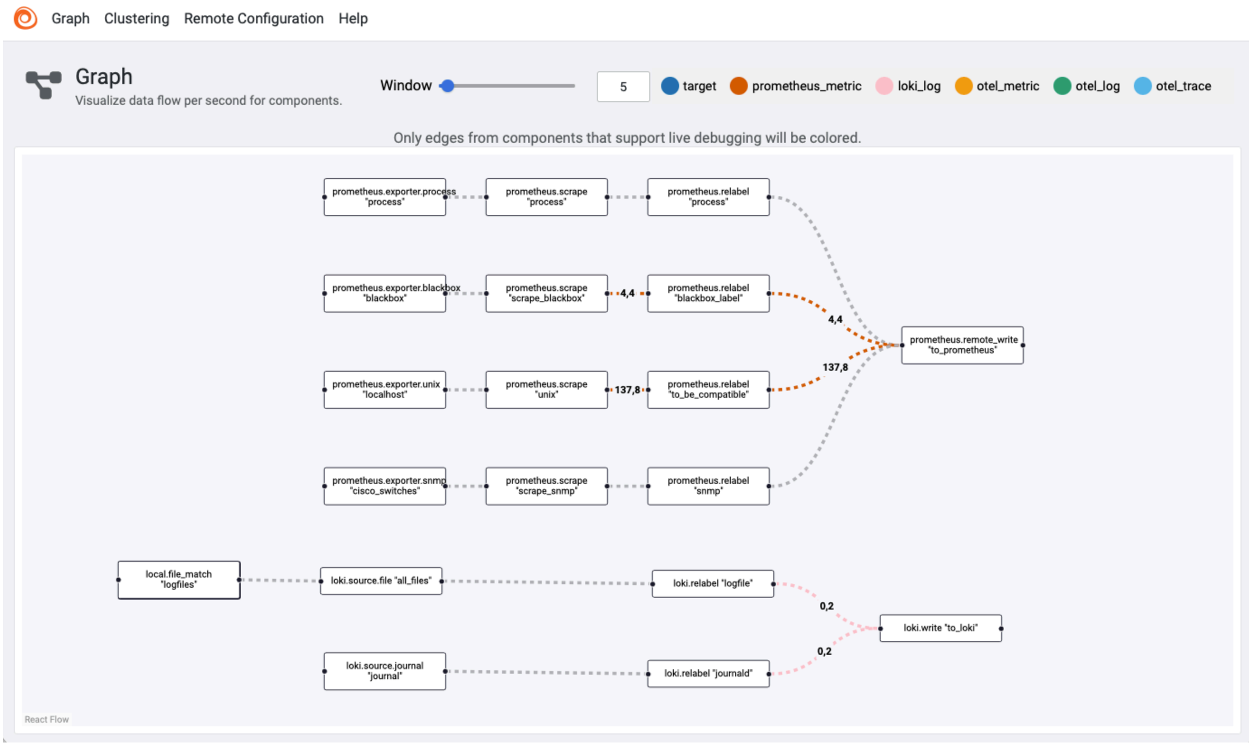
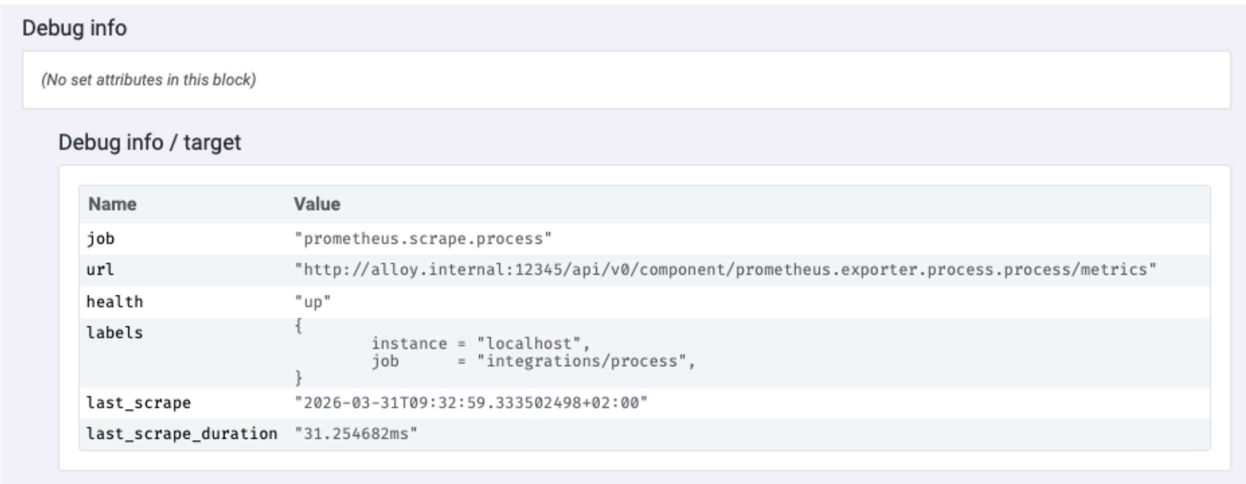


FIGURE 3: VISUALIZING DATA FLOW

5.1.3 Checking the scrape debug information

Because Grafana Alloy is scraping the data from build-in and external exporters, it is important to check the scrape data. The following illustration highlights essential debug information.



Debug info

(No set attributes in this block)

Debug info / target

Name	Value
job	"prometheus.scrape.process"
url	"http://alloy.internal:12345/api/v0/component/prometheus.exporter.process.process/metrics"
health	"up"
labels	{ instance = "localhost", job = "integrations/process", }
last_scrape	"2026-03-31T09:32:59.333502498+02:00"
last_scrape_duration	"31.254682ms"

FIGURE 4: VISUALIZING THE SCRAPE COMPONENT

job

The **Job** field simply identifies the component type.

url

By accessing this URL endpoint in a browser, you can verify the raw metric data. If the output contains only a few lines of metrics and these lines point only to the scrape values themselves (for example to `scrape_errors`), Grafana Alloy is failing to retrieve data from the exporter.

health

It is important to note that a status of "Up" only indicates that the component itself is running and functional. This status does not guarantee that data is being successfully scraped or delivered.

labels

Displays the labels and their current values at this stage of the pipeline. Keep in mind that a subsequent relabeling component could change or even remove these labels.

last_scrape

This field indicates the exact timestamp of the last successful scrape performed by the component.

last_scrape_duration

This value represents the total time required to scrape all data from the target. An unexpectedly short duration may indicate that the component is failing to retrieve the full dataset. Conversely, an excessively long scrape duration could suggest network latency, resource bottlenecks, or a target that is struggling to respond.

5.2 Live Debugging

This feature allows you to inspect live data as it moves through the pipeline in real time. It is used for verifying the output of specific components, ensuring that labels and values are correctly assigned after the data has been processed.

To uilize this functionality, specific debugging options must be enabled within the Alloy configuration file.

```
livedebugging {
  enabled = true
}
```

Keep in mind that this feature is not available on all components. Live debugging is currently available only for a specific subset of components:

- loki.relabel
- prometheus.relabel
- prometheus.scrape
- prometheus.remote_write

To view live data, select one of the supported components mentioned above and click the blue **Live Debugging** button at the top.

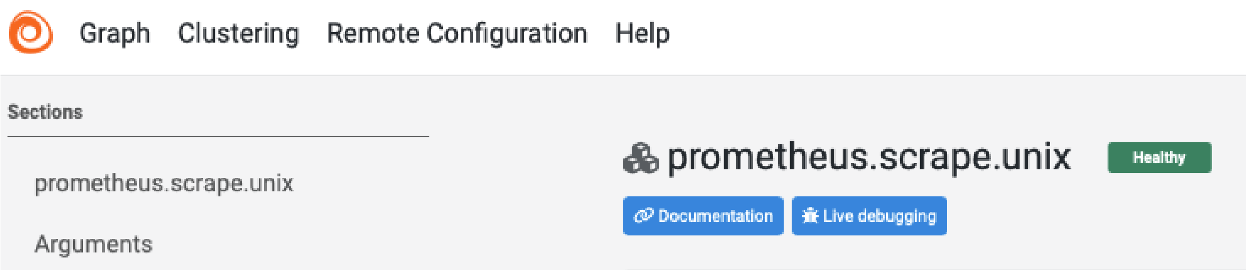


FIGURE 5: VISUALIZING THE SCRAPE COMPONENT STEP 1

The **Live Debugging** view opens, displaying a real-time stream of data.

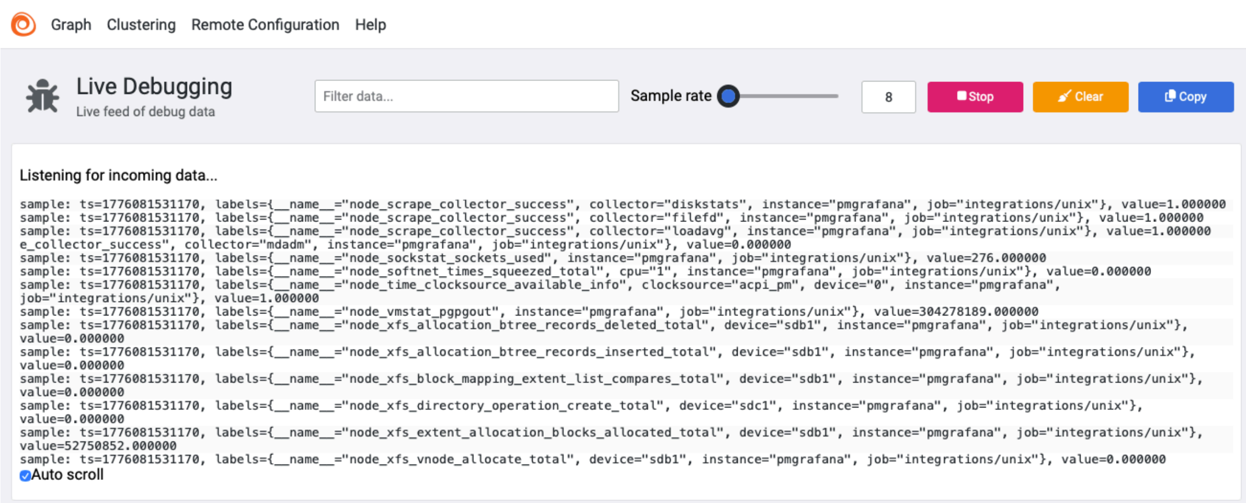


FIGURE 6: VISUALIZING THE SCRAPE COMPONENT STEP 2

> **Note**
>
> While live debugging is highly effective for resolving configuration issues, it should not be left enabled in high-traffic production environments. This feature consumes additional CPU and memory to buffer data for real-time visualization, which can impact overall system performance.

5.3 Support Bundle

The support bundle provides a collection of diagnostic data from the running Grafana Alloy instance. It creates a compressed file containing the current configuration and logs.

The bundle can be generated locally by running the following command:

```
# curl -o support-bundle.zip  http://localhost:12345/-/support
```

5.4 Verifying permissions

Alloy runs under the `alloy` user account. By default, this user has the following permissions:

```
# id alloy
uid=461(alloy) gid=471(alloy) Gruppen=476(systemd-journal),471(alloy)
```

The `alloy` user may encounter issues reading log files if the correct permissions are not configured. You can verify whether the user has the necessary access to a specific file by executing the following command:

```
# sudo -u alloy head -n 3 /var/log/zypper.log
head: cannot open '/var/log/zypper.log' for reading: Permission denied
```

6 Examples

This section provides configuration examples for different use cases.

6.1 Blackbox

The configuration example below shows how to use the blackbox exporter to monitor the availability of API-endpoints or Websites.

```
prometheus.exporter.blackbox "blackbox" {
  config = "{ modules: { http_2xx: { prober: http, timeout: 5s } } }"
  target {
      name    = "SUSE"
      address = "https://suse.com"
      module  = "http_2xx"
    }
  target {
      name    = ""
      address = "https://rancher.com"
      module  = "http_2xx"
    }
}

prometheus.scrape "scrape_blackbox" {
    scrape_interval = "15s"
    targets    = prometheus.exporter.blackbox.blackbox.targets
    forward_to = [ prometheus.relabel.blackbox_label.receiver]
}

prometheus.relabel "blackbox_label" {
    rule {
        source_labels = ["job"]
        regex         = ".*/(.+)"
        target_label  = "instance"
        replacement   = "$1"
    }

    rule {
        target_label = "job"
        replacement  = "blackbox"
    }

    forward_to = [prometheus.remote_write.to_prometheus.receiver]
}

prometheus.remote_write "to_prometheus" {
    endpoint { url = "http://prometheus-server:9090/api/v1/write" }
}
```

6.2 SNMP

The configuration example below shows how to use the SNMP exporter to collect SNMP traps.

```
// wget https://raw.githubusercontent.com/prometheus/snmp_exporter/main/snmp.yml -O /etc/
alloy/snmp.yml

prometheus.exporter.snmp "cisco_switches" {
  config_file = "/etc/alloy/snmp.yml"
  target "cbs250_main" {
    address = "192.168.178.2"
    module  = "if_mib"
    auth    = "alloy_v2c"
  }
}

prometheus.scrape "scrape_snmp" {
  targets         = prometheus.exporter.snmp.cisco_switches.targets
  scrape_interval = "60s"
  scrape_timeout  = "55s"
  forward_to      = [prometheus.relabel.snmp.receiver]
}

prometheus.relabel "snmp" {
    forward_to = [ prometheus.remote_write.to_prometheus.receiver, ]
    rule {
        target_label   = "instance"
        replacement    = "cisco"
    }
    rule {
        target_label   = "job"
        replacement    = "snmp"
    }
}

prometheus.remote_write "to_prometheus" {
    endpoint { url = "http://prometheus-server:9090/api/v1/write" }
}
```

6.2.1 Process

The configuration example below shows how to use the process exporter to monitor the status of a process in the operating system.

```
prometheus.exporter.process "process" {
  track_children = false
  matcher {
    comm = ["nginx"]
  }
}

prometheus.scrape "process" {
  targets     = prometheus.exporter.process.process.targets
  forward_to = [prometheus.relabel.process.receiver]
}

prometheus.relabel "process" {
    forward_to = [ prometheus.remote_write.to_prometheus.receiver, ]
    rule {
        target_label    = "exporter"
        replacement     = "alloy"
    }
    rule {
        target_label    = "job"
        replacement     = "process"
    }
}

prometheus.remote_write "to_prometheus" {
    endpoint { url = "http://prometheus-server:9090/api/v1/write" }
}
```

6.2.2 Logfiles

The configuration example below shows how to use the `file_match` functionality to collect log files.

```
local.file_match "logfiles" {
    path_targets = [
        { "__path__" = "/var/log/messages" },
        { "__path__" = "/var/log/warn" },
        { "__path__" = "/var/log/*.log" },
    ]
}

loki.source.file "all_files" {
    targets     = local.file_match.logfiles.targets
    forward_to     = [loki.relabel.logfile.receiver]
}

loki.relabel "logfile" {
  forward_to = [loki.write.to_loki.receiver]
  rule {
    source_labels  = ["instance"]
    target_label   = "instance"
    replacement    = constants.hostname
  }
  rule {
    source_labels  = ["job"]
    target_label   = "job"
    replacement    = sys.env("monitoring_group")
   }
  rule {
    target_label = "log_type"
    replacement  = "files"
  }
}

loki.write "to_loki" {
    endpoint { url = "http://loki-server:3100/loki/api/v1/push" }
}
```

7 Miscellaneous

Reloading the configuration

After modifying the configuration file, use the following command to apply the changes without restarting the service:

```
curl -X POST 127.0.0.1:12345/-/reload
```

Splitting configuration files

In complex environments, splitting the `config.alloy` file into separate files can improve organization and simplify management. For example, individual pipelines can be stored in dedicated files such as `unix.alloy` or `journald.alloy`.

Common components, such as `prometheus.remote_write` or `loki.write`, can also be placed in a single shared file. This allows multiple pipelines to push data to the same destination without duplicating the configuration.

To enable this, modify the `CONFIG_FILE` variable in `/etc/sysconfig/alloy` as follows:

```
# The configuration file or directory holding the Alloy config.
CONFIG_FILE="/etc/alloy/"
```

Alloy automatically loads and merges all files within that folder ending in `.alloy`, allowing them to function as a single configuration.

Directory Structure Example

When `CONFIG_FILE` is set to `/etc/alloy/`, the directory can be organized as follows:

- **unix.alloy:** Contains components for collecting Linux system metrics (for example, `prometheus.exporter.unix`, `prometheus.relabels`).
- **journald.alloy:** Contains components for collecting system logs (for example, `loki.source.journal`, `loki.relabel`).
- **outputs.alloy:** Contains the central `prometheus.remote_write` and `loki.write` components used by all pipelines.

8 Summary

Maintaining the availability of SAP S/4HANA is critical for ensuring uninterrupted business operations. This document has demonstrated how Grafana Alloy provides a modern, unified approach to monitor these systems, enabling administrators to identify and resolve issues before they cause costly downtime.

The primary benefits include:

- **All-in-One Tool:** One single agent handles metrics, logs, and traces, significantly simplifying the overall monitoring infrastructure.
- **Streamlined Troubleshooting:** Tools like the Graph view and Live Debugging allow you to quickly isolate and fix pipeline or configuration errors.
- **Backend Flexibility:** The data destination (backend) is easily interchangeable without requiring changes to the core collection logic.

By switching to Grafana Alloy, you gain a more efficient, scalable, and flexible foundation for enterprise-grade observability.

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