

Modern Observability for HCL Domino with OpenSource & OpenTelemetry

October 2026, Daniel Nashed

Nash!Com
Communication Systems

Motivation for modern Monitoring



- **Open Telemetry**
  - New Open standard for logging
  - Standard endpoints compatible between different vendors
    - **Grafana Loki**, **VictoriaLogs** and many more
- **Grafana Stack**
  - Often introduced by Kubernetes (K8s), but very flexible & standards based
    - It's not just for K8s
  - Prometheus is a modern statistics collection interface
  - Tools work hand in hand and can be mixed & matched
  - Open Source & free
  - Often replaces older tools based on SNMP monitoring



Grafana

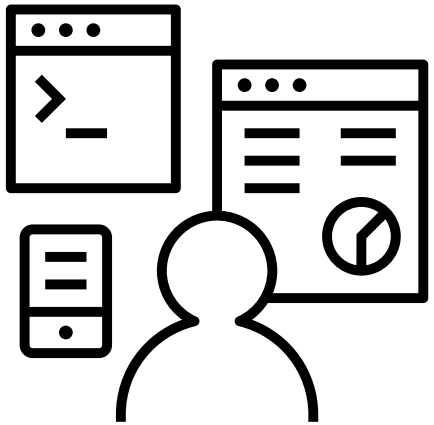


Prometheus

HCL Lifetime Ambassador

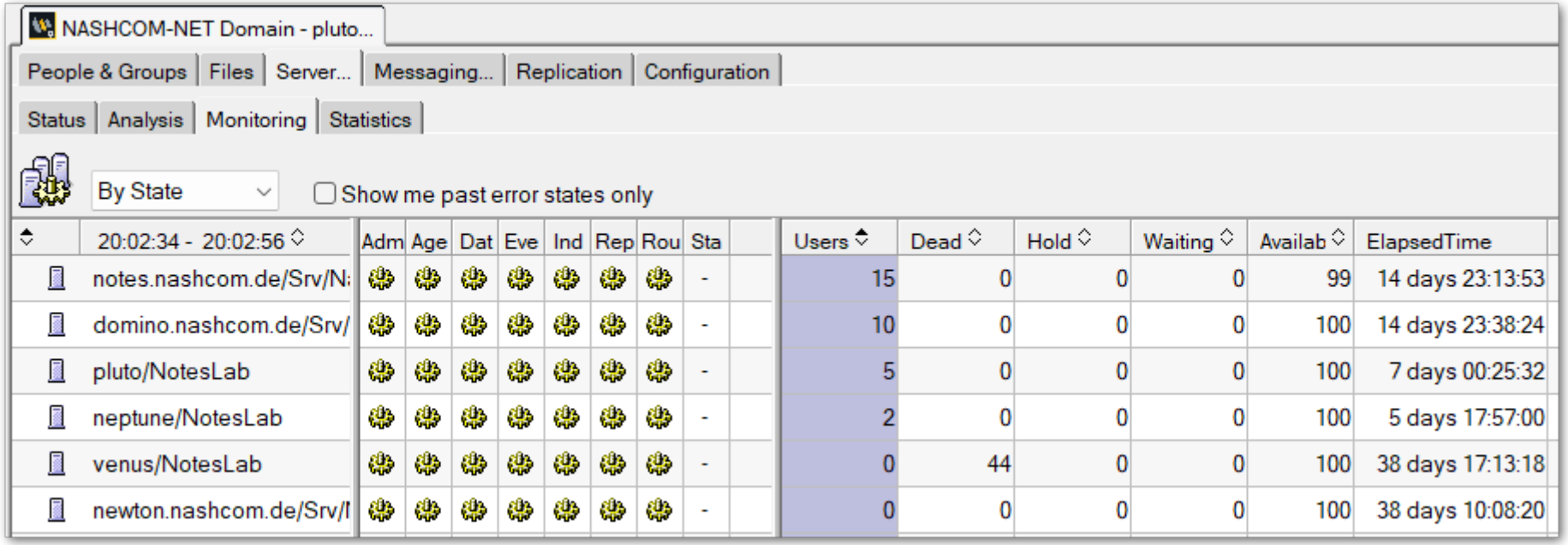
HCL Domino

Domino Stats & Logging



Classical Domino Server Monitoring

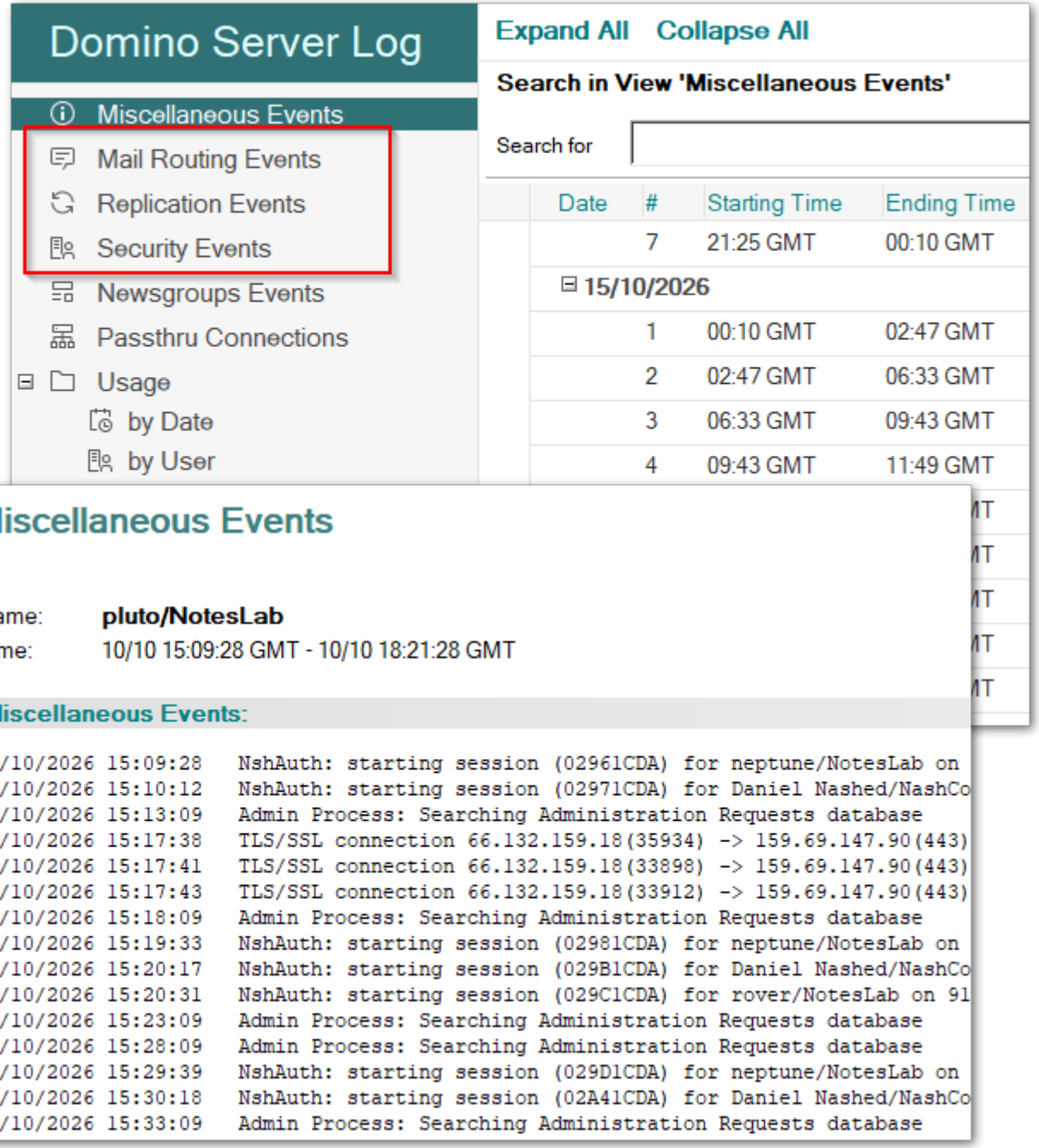
- **Open admin client and watch basic status**
  - Running servertasks
  - Users, Mail Dead/Hold/Waiting, SAI Server, Runtime
- Admin client collects stats and task status live
  - The charting component for stats has been retired – but there is Grafana ...



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log.nsf

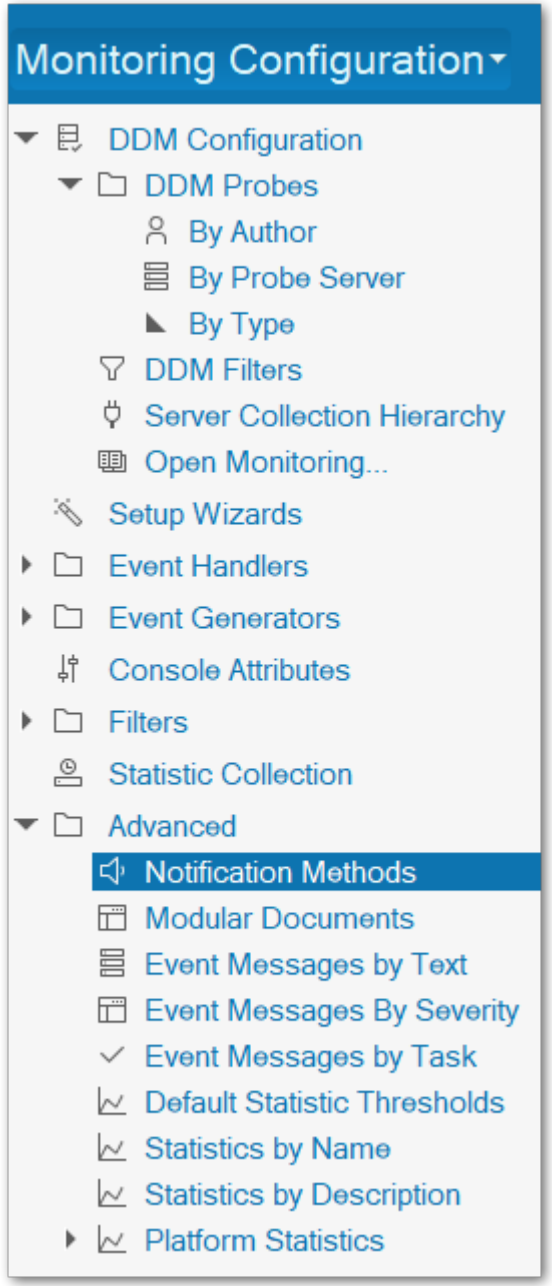
- **Contains most log messages**
  - But not all debug messages are going to **log.nsf**
  - Debug usually only goes to **console.log**
  - All **Miscellaneous** events go into **console.log**
- Mail Routing, Replication, Security Events
  - Are mostly only in **log.nsf** not in **console.log**
- **Db Usage** is also only recorded in **log.nsf**
  - Beside Billing, which is a different story
- **log.nsf** & **console.log** contain formatted messages
  - Those messages would need parsing



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Domino Event Monitoring

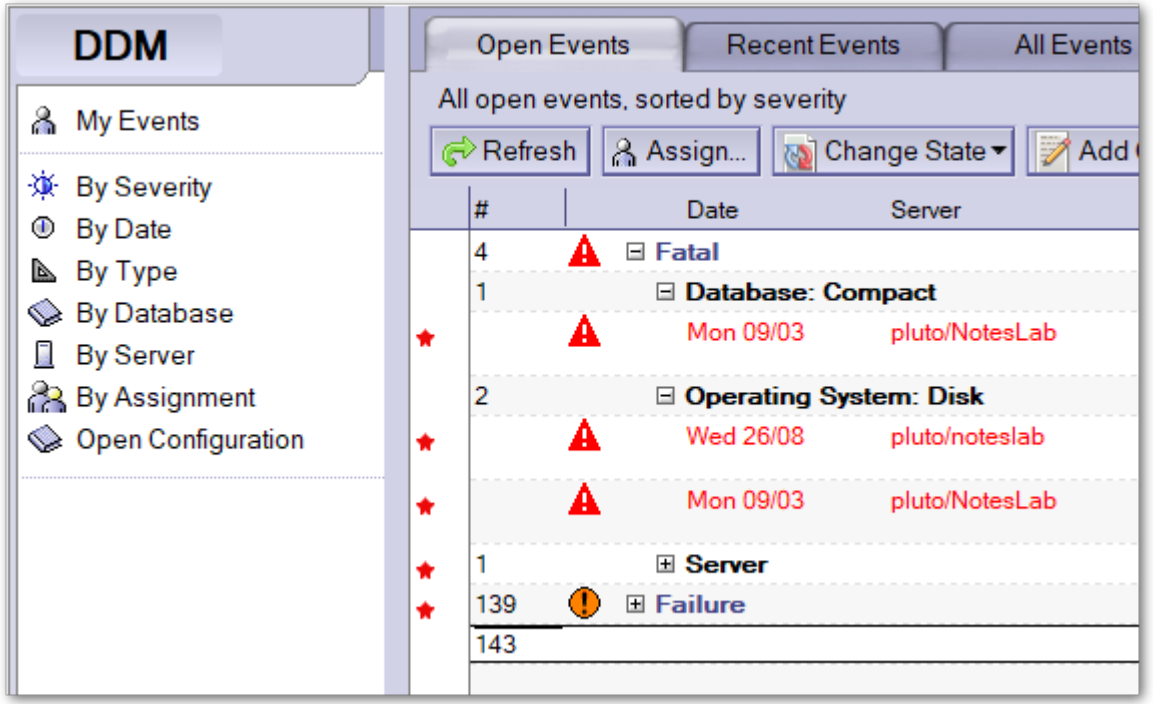
- **Domino Event Monitoring is the base for Domino Log monitoring**
  - **Event** task maps type, severity based on **events4.nsf** configuration
- **events4.nsf** contains
  - Error messages, their text, type and priority
  - Statistics names and short description for many but not all stats
- **Notification types how to log**
  - Log messages are written often to **statrep.nsf** or collected via **SNMP**
  - Severity can be changed
  - Core and servertasks messages
- **Statistics documents**
  - Basic description for most of the stats



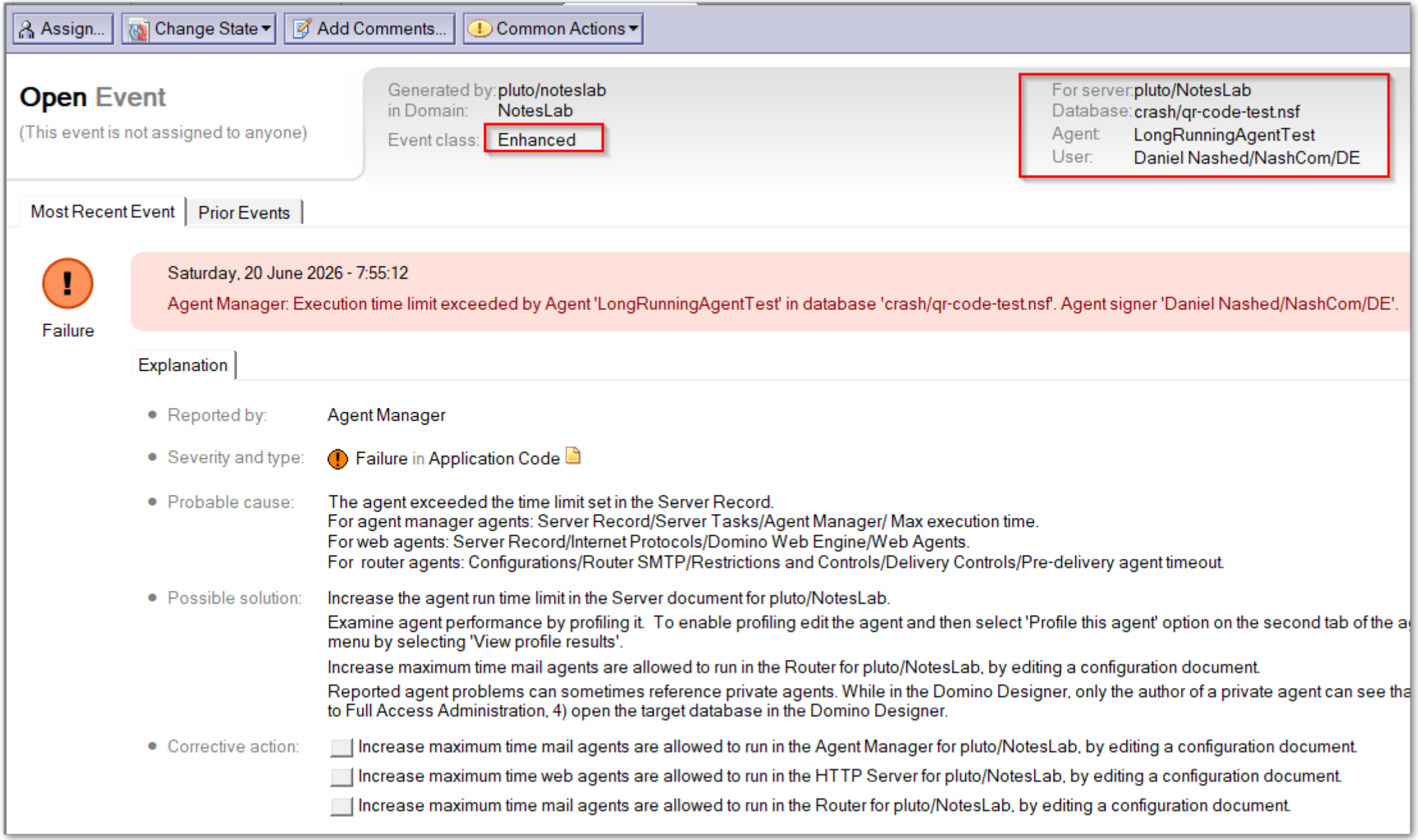
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Domain Monitoring (DDM)

- Standard and **Enhanced Events** are written to **ddm.nsf**
- **Consolidated**, **Correlated** Logging per problem
  - Work flow to assign, (permanently) close events
  - Possible causes & solutions
- **Enhanced events** provide details like DB & doc note.id
- **DDM** also provides "**Embedded Probes**"
  - Code added to core and Domino servertasks to log **Enhanced events** with more context
  - Enable: Compact/Fixup, Replica, ..
- **Problem cause, Possible solution, Corrective action**
  - Is added to to DDM event documents based on configuration documents in **events4.nsf**



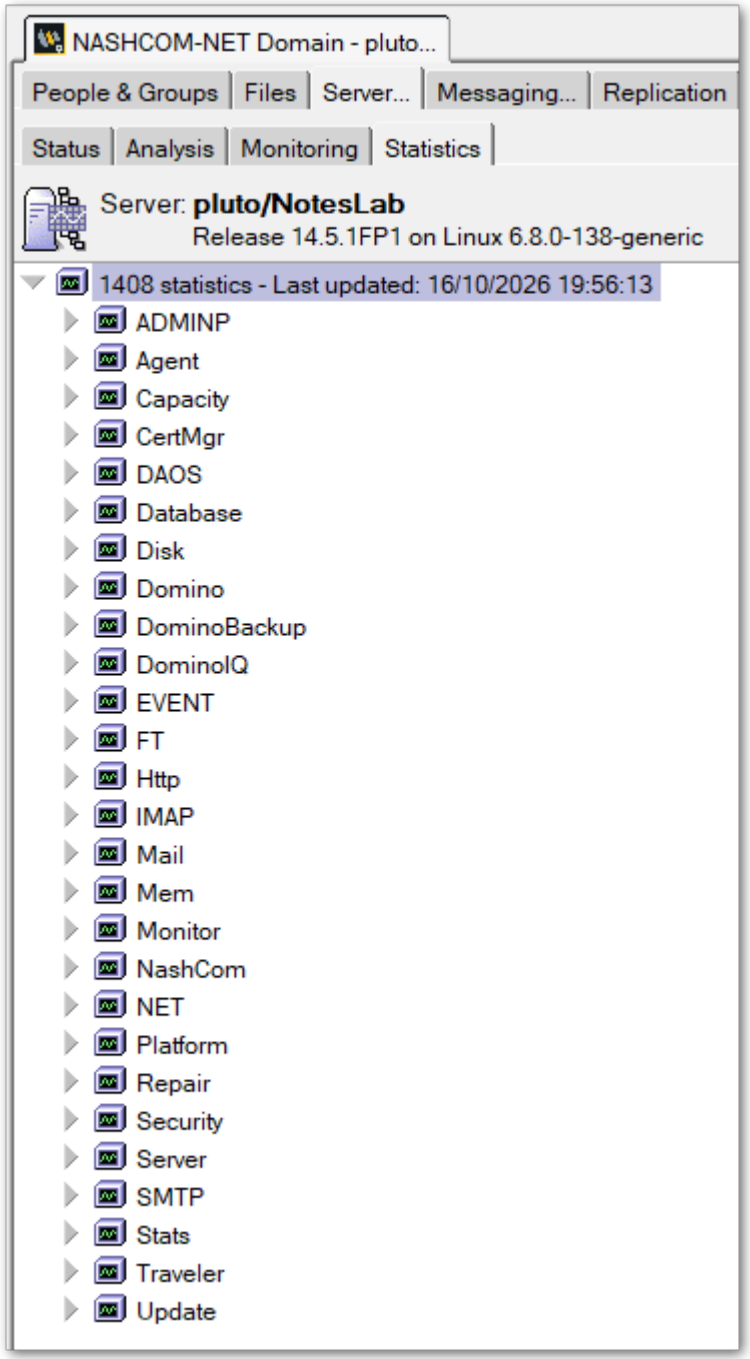
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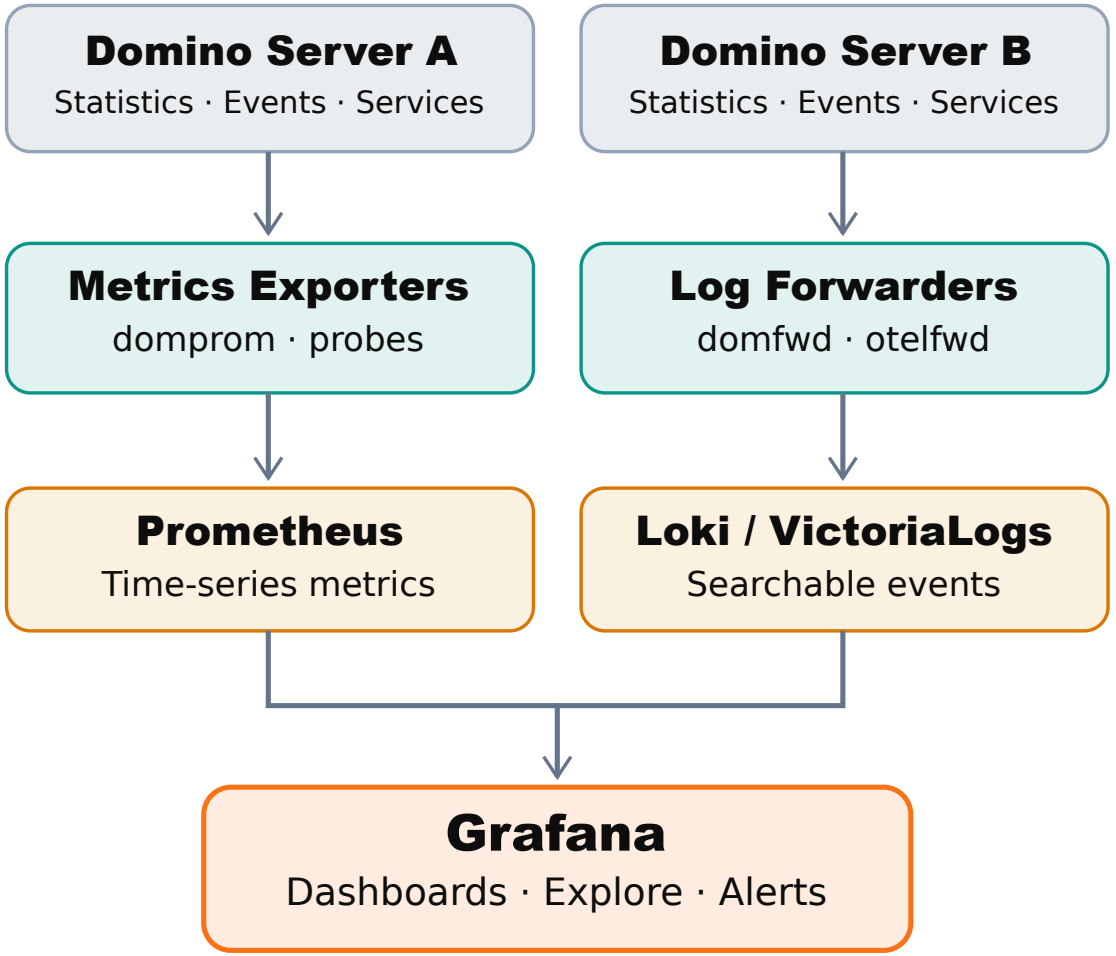
Domino Statistics

- **Domino provides many statistics out of the box**
  - **Core statistics (e.g. Server,Platform)**
    - Maintained by core server
  - **Per servertask statics (e.g. Router, Http, Traveler, ..)**
    - Maintained by each servertask
- **Can be accessed in multiple ways**
  - Admin Client
  - Show stat
  - SNMP
  - Collect task to write it into **statrep.nsf**
  - C-API servertask via **EventRegisterEventRequest()**



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Modern Domino Monitoring

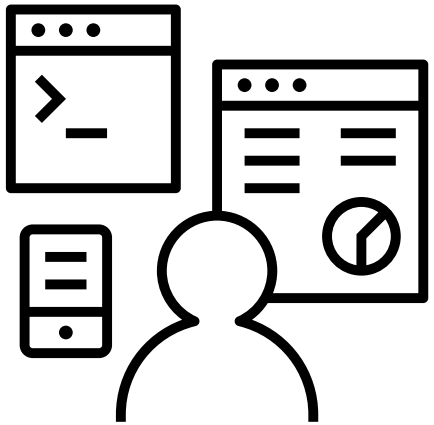


One view across all Domino servers

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HCL Domino

Metrics Integrations



Prometheus – Timeseries Database



Prometheus

Open source metrics and monitoring for your systems and services

Monitor your applications, systems, and services with the leading open source monitoring solution. Instrument, collect, store, and query your metrics for alerting, dashboarding, and other use cases.



Dimensional data model

Prometheus models time series in a flexible dimensional data model. Time series are identified by a metric name and a set of key-value pairs.



Powerful queries

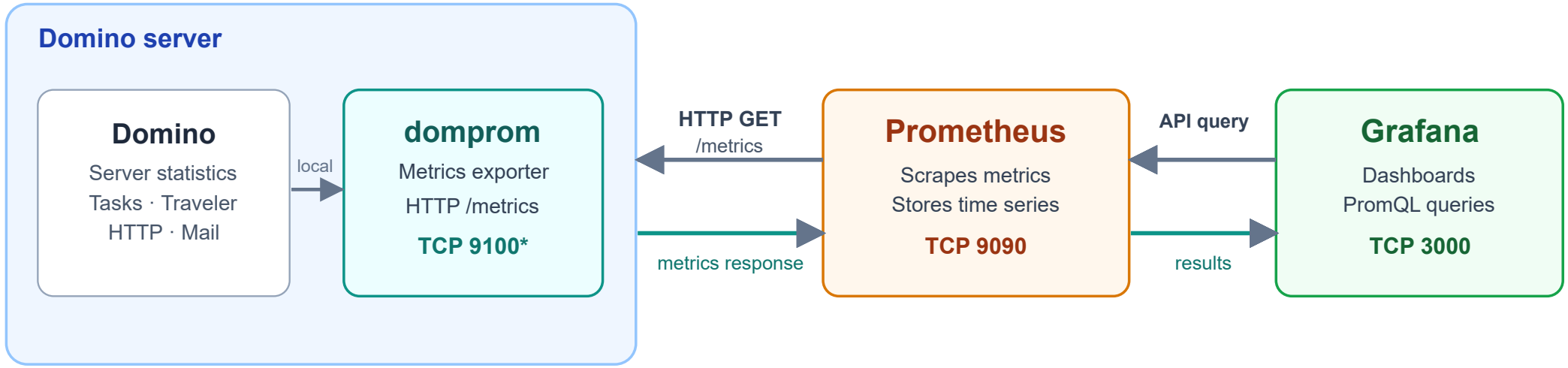
The PromQL query language allows you to query, correlate, and transform your time series data in powerful ways for visualizations, alerts, and more.

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Statistics Monitoring Flow

Domino → Prometheus → Grafana

Metrics collection architecture · arrows indicate who initiates each connection



Connection directions:

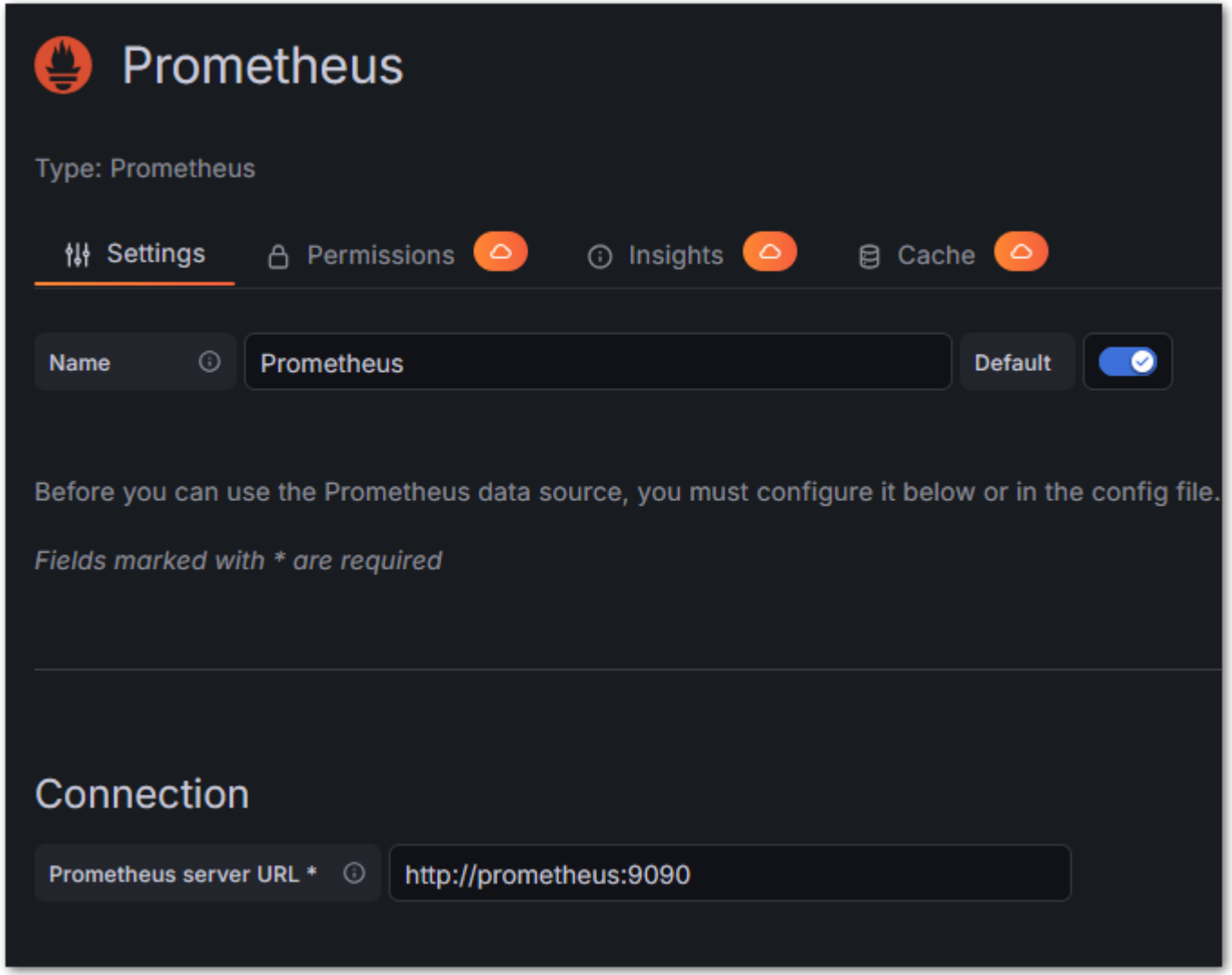
Prometheus → domprom: TCP 9100* (scrape) · Grafana → Prometheus: TCP 9090 (query) · Browser → Grafana: TCP 3000 (UI)

* Example exporter port, configurable; verify your domprom listener. HTTPS / reverse proxy may change exposed ports. Logs use a separate path.

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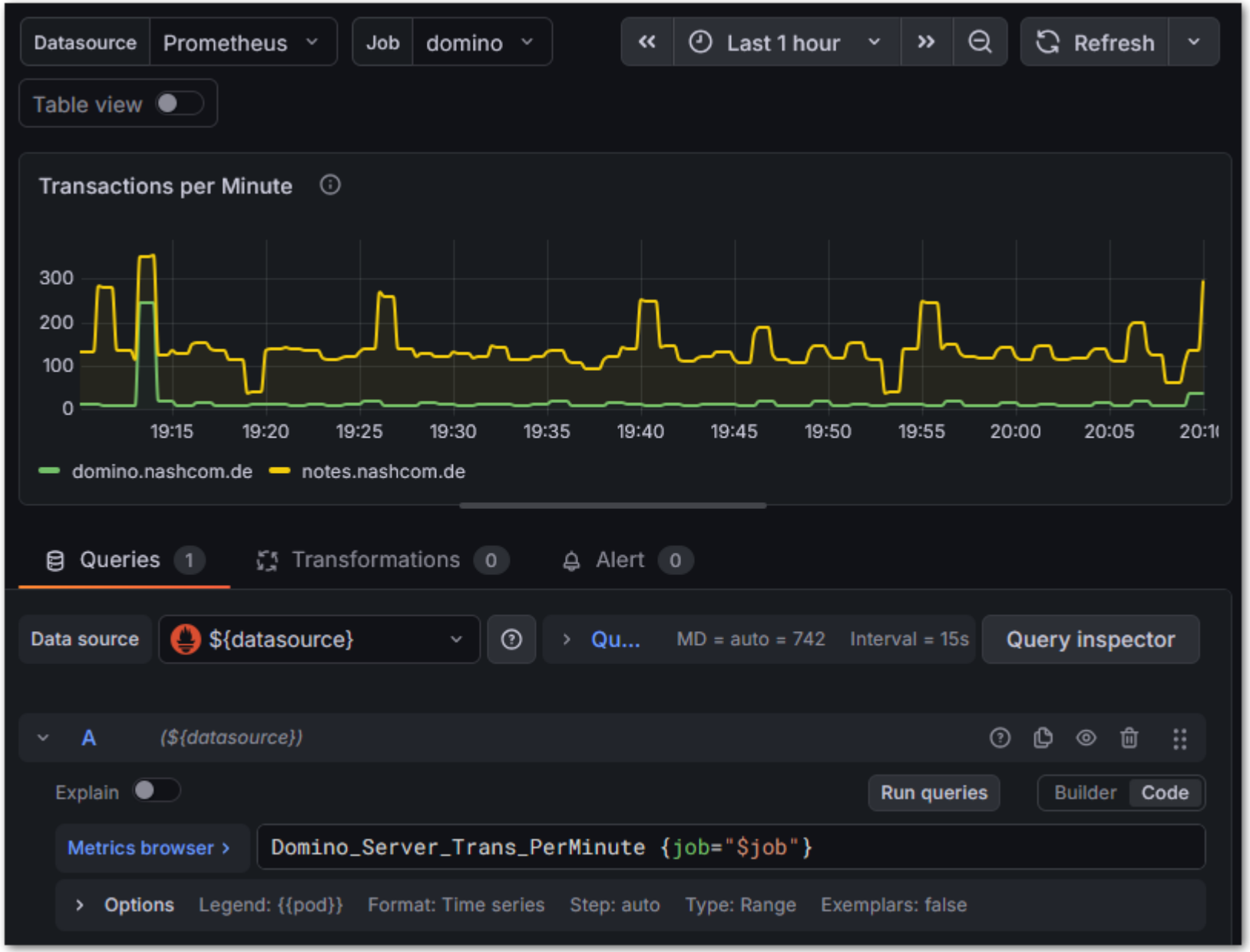
Data Source for Grafana

Prometheus



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Grafana Dashboarding



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Prometheus compatible Metrics Endpoint

- **https://host:9100/metrics**
- **Prometheus stats format**
  - Numeric data only – No text!
  - Requires converting stat names
    - Only certain chars supported
  - Usually lowercase
  - HELP & TYPE line describe stats
- **Scraped by Prometheus server**
  - Usually stats are **pulled**
    - Prometheus push is possible

```
# HELP Domino_Server_ConcurrentTasks_Waiting Domino Stat - Server.ConcurrentTasks.Waiting
# TYPE Domino_Server_ConcurrentTasks_Waiting gauge
Domino_Server_ConcurrentTasks_Waiting 0
# HELP Domino_Server_ElapsedTimeDays Domino Stat - Server.ElapsedTimeDays
# TYPE Domino_Server_ElapsedTimeDays gauge
Domino_Server_ElapsedTimeDays 11.142
# HELP Domino_Server_ElapsedTimeMinutes Domino Stat - Server.ElapsedTimeMinutes
# TYPE Domino_Server_ElapsedTimeMinutes gauge
Domino_Server_ElapsedTimeMinutes 16044
# HELP Domino_Server_EnvSeqNo Domino Stat - Server.EnvSeqNo
# TYPE Domino_Server_EnvSeqNo gauge
Domino_Server_EnvSeqNo 3250
# HELP Domino_Server_ExpansionFactor Domino Stat - Server.ExpansionFactor
# TYPE Domino_Server_ExpansionFactor gauge
Domino_Server_ExpansionFactor 1
# HELP Domino_Server_MailBoxes Number of mail boxes used by mail server. [Mailboxes]
# TYPE Domino_Server_MailBoxes gauge
Domino_Server_MailBoxes 1
```


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Domino Prometheus Integration

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- **domprom - Domino Servertask**
  - Queries Domino statistics locally
    - All numeric stats which are not excluded (like platform stats)
  - Calculates additional **DominoHealth_** stats
- Writes stats into **/local/notesdata/domino/stats/domino.prom**
- **Prometheus Node Exporter**
  - Configured to read all ***.prom** files

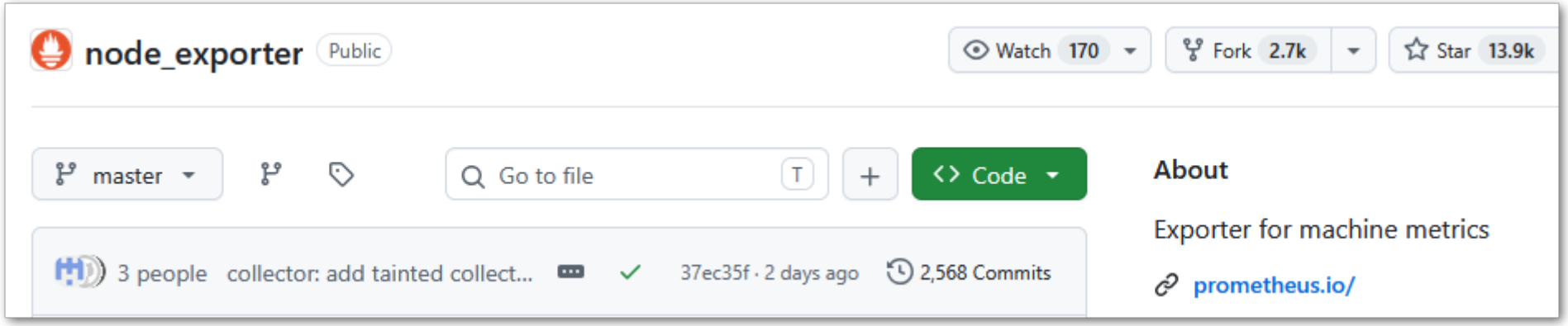
```
> load domprom
...domprom: Domino Mailbox pending mail statistics collection: enabled
...domprom: Domino Prometheus Exporter 1.0.8
...domprom: Statistics Interval: 64 seconds, File: /local/notesdata/domino/stats/domino.prom
...domprom: Statistic Transactions Interval: 180, File: /local/notesdata/domino/stats/domino_trans.prom
...domprom: Mailbox Statistic Interval: 300
...domprom: Copyright Daniel Nashed/Nash!Com 2024-2026 (https://github.com/nashcom/domino-grafana)
```


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Prometheus Node Exporter

Prometheus

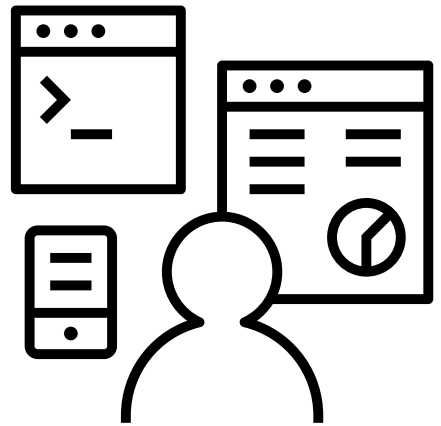
- **Listening endpoint usually on port TCP 9100 (unencrypted, but often firewalled)**
  - Queries native Linux stats and ***.prom** files
- **Different deployment methods**
  - Installed in Domino Container image, started by **entrypoint.sh**
    - Only collects ***.prom** files
  - Run on Linux host started via **systemd**
    - Also collects Linux stats



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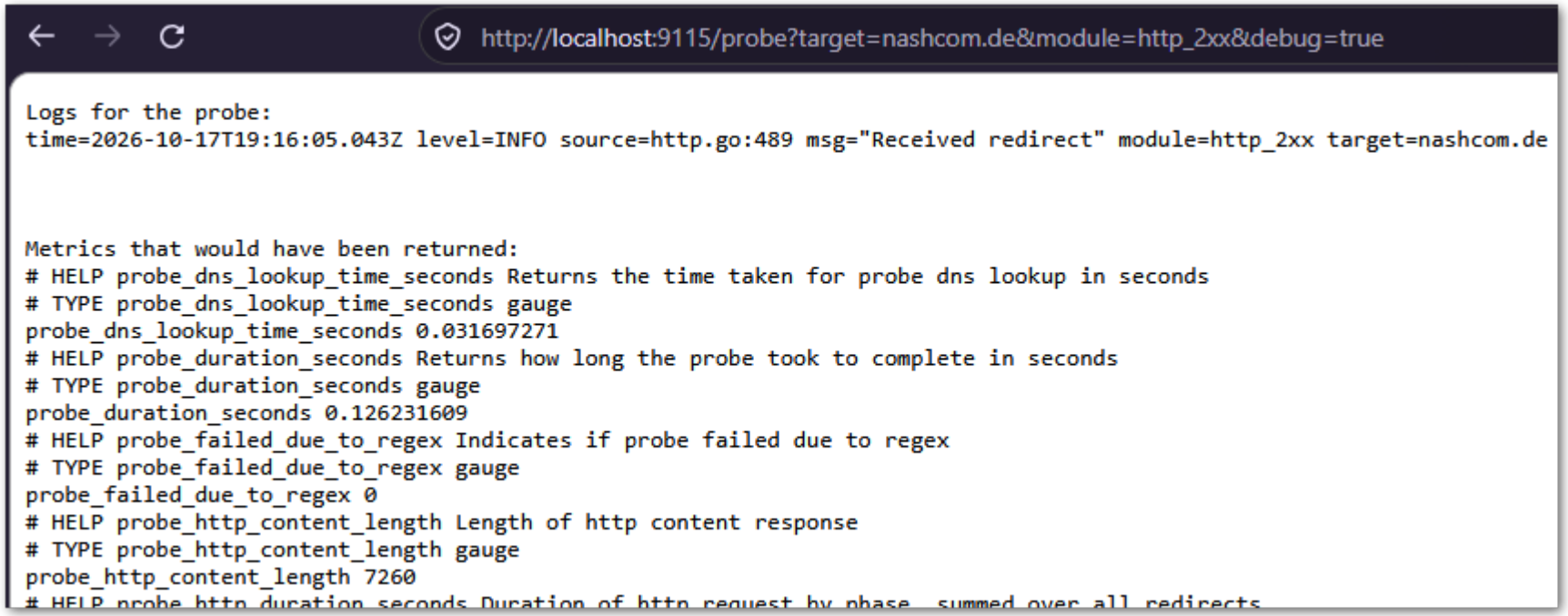
Probing Domino



Prometheus Blackbox Exporter

Prometheus

- **Query API to query remote servers**
  - Example httpp_2xx check
- Returns Prometheus Node Exporter endpoint stats
  - Simple example below



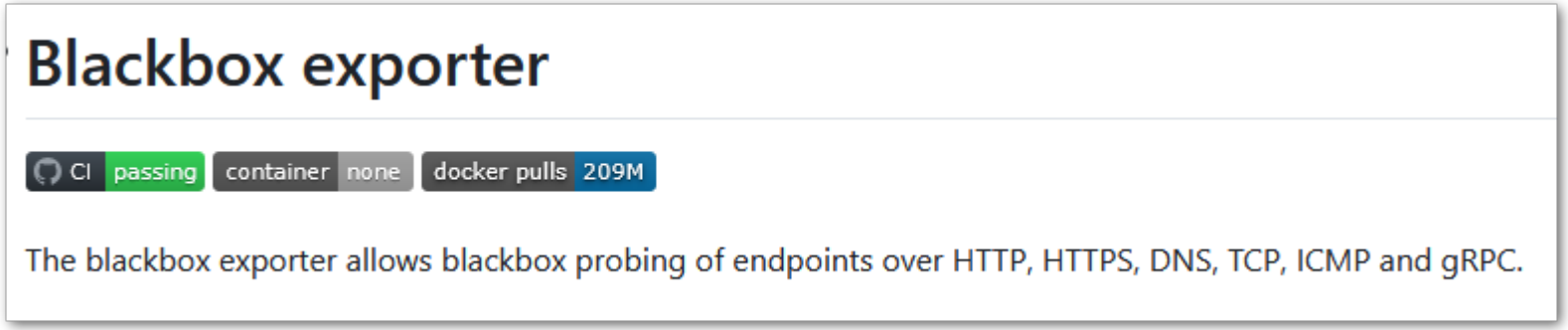
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Prometheus Blackbox Exporter

Prometheus

- **Usually running as container image**
  - Included in our Grafana compose stack
- **Returns results in Node Exporter format**
  - Configured on Prometheus side
  - Writes into Prometheus database
  - Results can be queried as normal metrics
- http://localhost:9115/probe?target=nashed.de





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Traveler End to End Monitoring

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- **First step is to use the Traveler authenticated Health probe**
  - https://traveler.example.com/traveler?action=getStatus
- **Active Sync (EAS) Go based client**
  - https://github.com/nashcom/eas-tools
  - Querying needs an account and stable instance
- **Probing**
  - Send & Receive with the same account
  - Send external mail & measure the time the mail takes
- **Exposes a Prometheus statistics endpoint**
  - Prometheus endpoints are the new standard

```
- job_name: blackbox-traveler

  metrics_path: /probe

  params:
    module: [traveler_status]

  static_configs:

    - targets:
        - https://traveler.example.com/traveler?action=getStatus
      labels:
        pod: traveler.example.com
        namespace: domino

  relabel_configs:
    - source_labels: [__address__]
      target_label: __param_target

    - source_labels: [__param_target]
      target_label: instance

    - target_label: __address__
      replacement: blackbox-exporter:9115
```


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Blackbox Exporter for Domino?

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- **Prometheus Backbox Exporter** supports a couple of protocols
  - This includes PostgreSQL including TLS support
- But **NRPC** isn't included
  - What about building our own Blackbox exporter?
  - https://github.com/nashcom/domino-blackbox-exporter
- Very similar syntax

GET /probe

Probes a Domino server via NRPC. Returns Prometheus metrics.

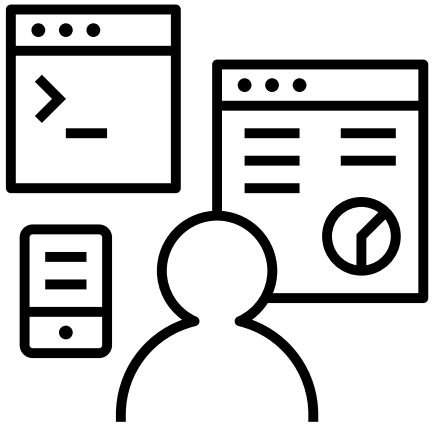
Parameter	Required	Description
`target`	yes	Domino server hostname or CN to probe
`db`	no	Database path to open after a successful ping (e.g. `names.nsf`). Adds `domino_probe_database_open` and `domino_probe_database_open_seconds` to the response.
`auth`	no	Authentication token. Required if `DOMPROBE_AuthToken` is set. Alternative to `Authorization: Bearer` header.

```
GET /probe?target=domino01.acme.com
GET /probe?target=domino01.acme.com&db=names.nsf
```


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Log Integrations



Collecting Logs

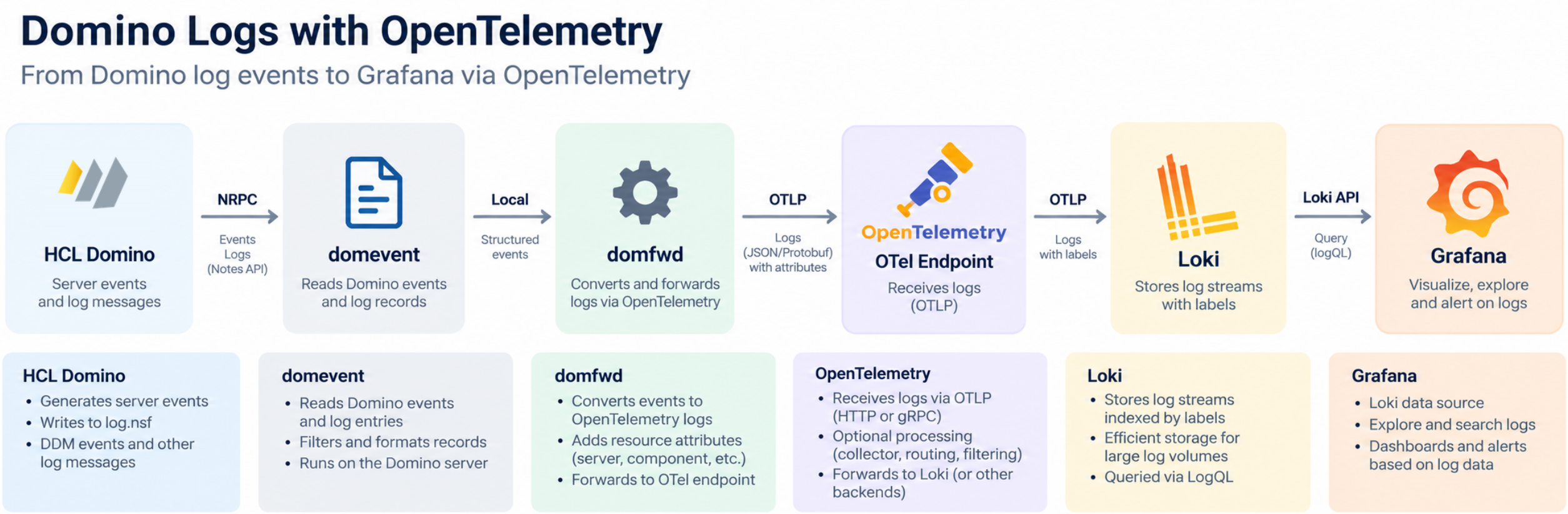
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- **Most log integration is based on collecting standard text logs**
  - **console.log** contains all logs
  - But logs are just full strings and would need parsing
  - Often standard logs is all we have

- NGINX for example can generate JSON formatted logs
- Domino provides event monitoring integration which can provide detailed log information
  - Event log can be converted to JSON or even OpenTelemetry format

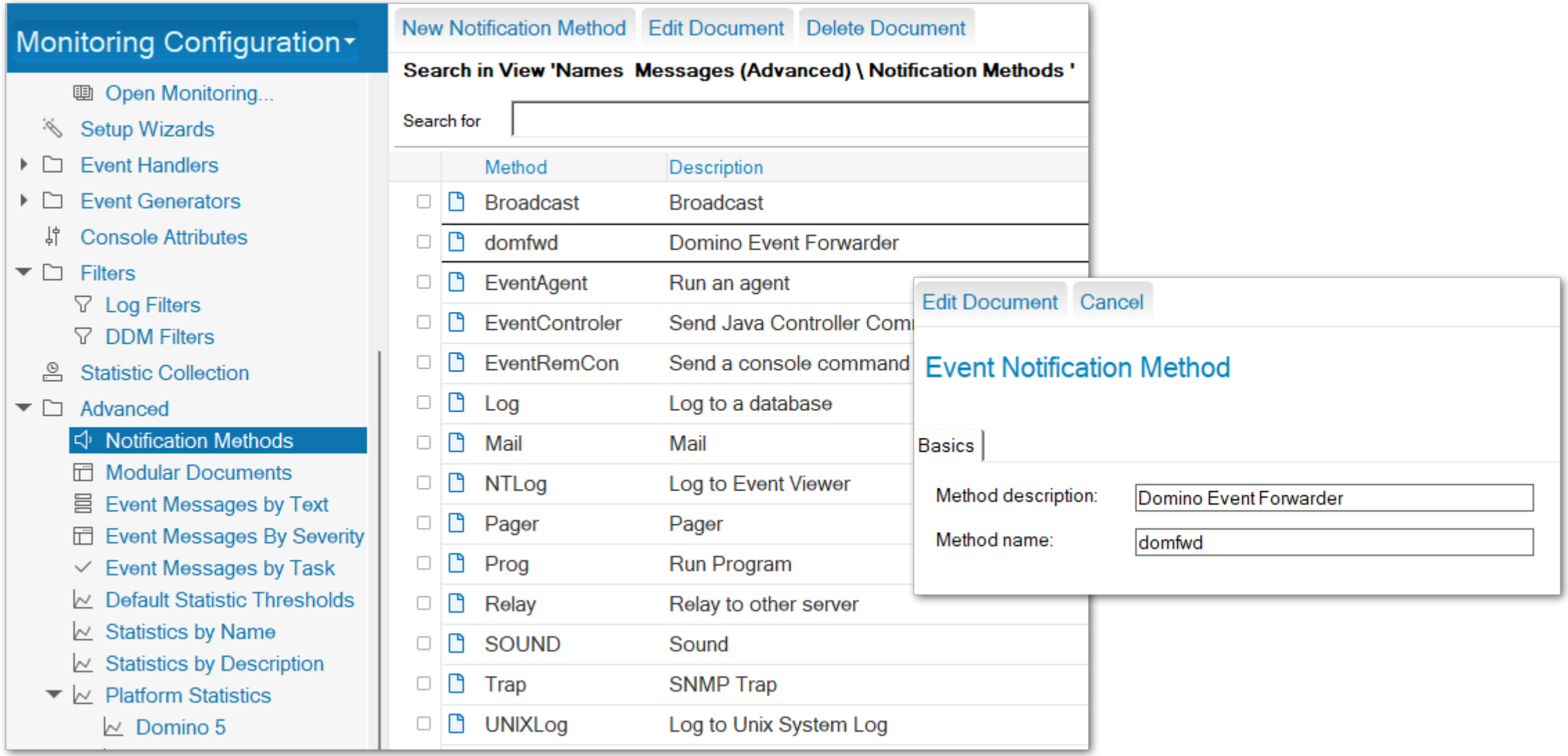
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Flow for Event Messages



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Domino Event Monitoring – New Notification Method

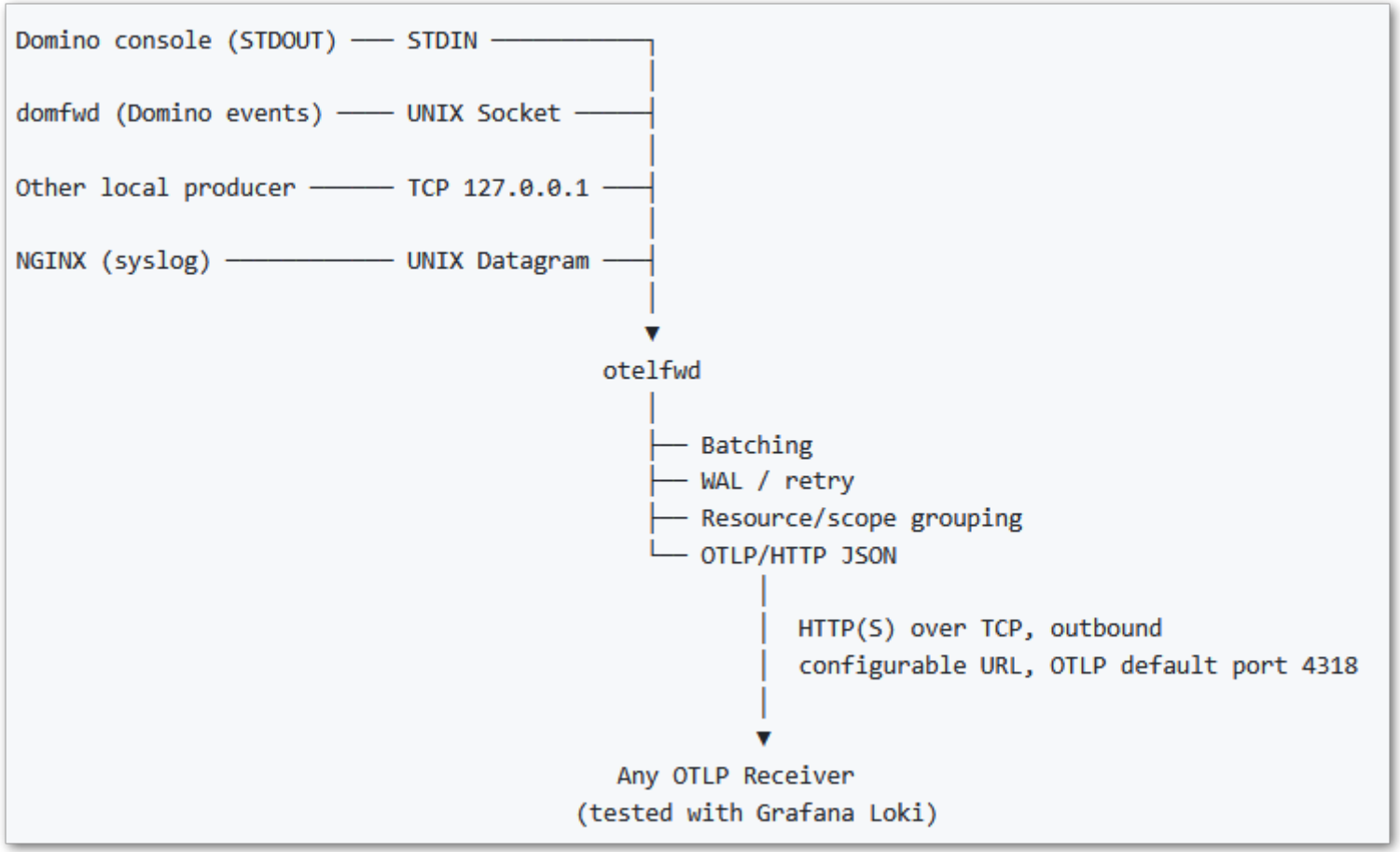


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Event Logging via domfwd & otelfwd

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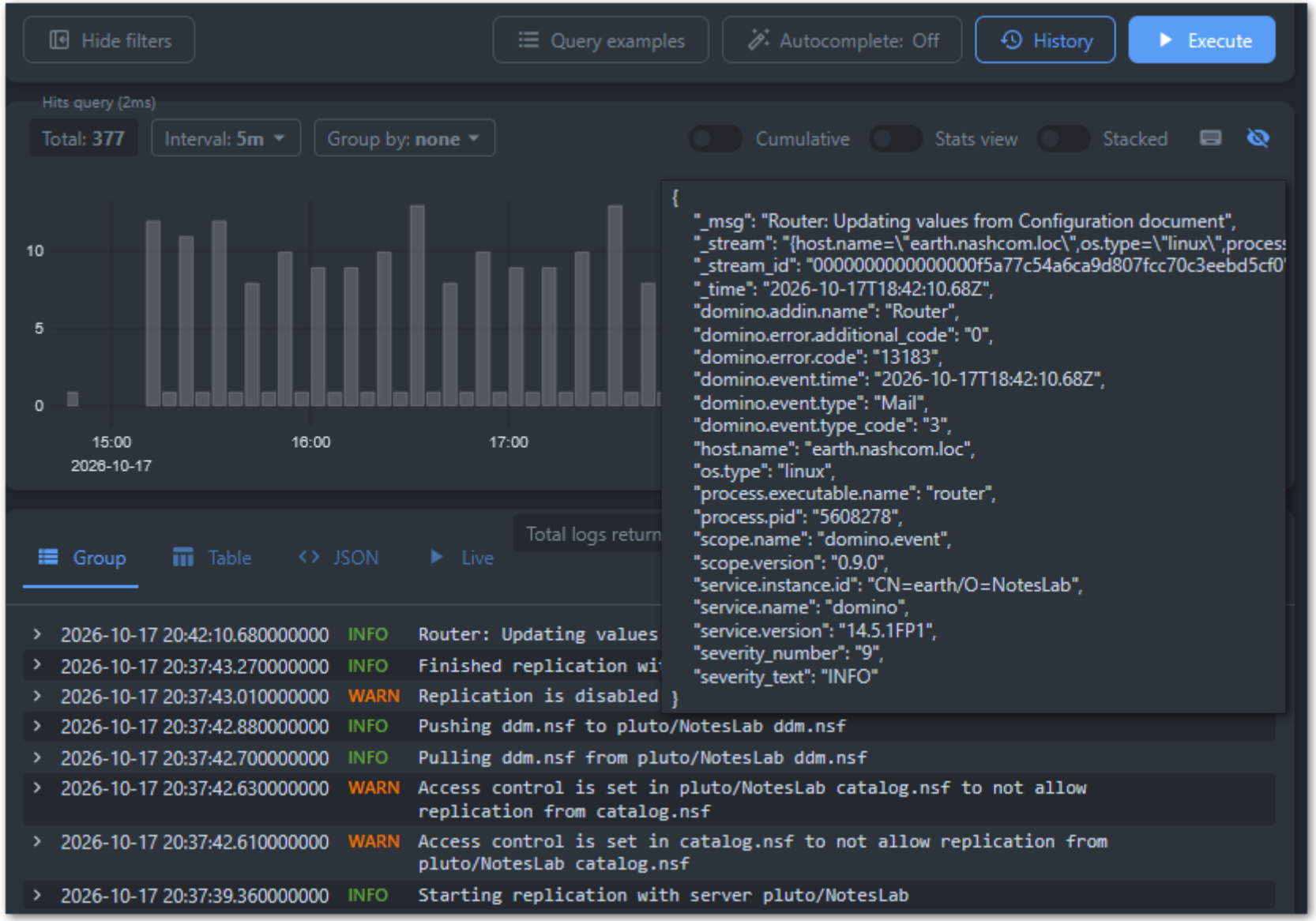
- **Different log sources**
  - console.log + notes.log
  - Domino Events via **domfwd** task
  - NGINX and other input
- Local Forwarder (**otelfwd**)
  - Different ingestion options
    - STDIN, TCP, UNIX Socket
  - Different input formats
  - OpenTelemetry Protocol (**OTLP**)
- **HTTPS connection to OTel back-end**
- Write Append Log (WAL) protects against data loss



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Example OpenTelemetry Target - VictoriaLogs

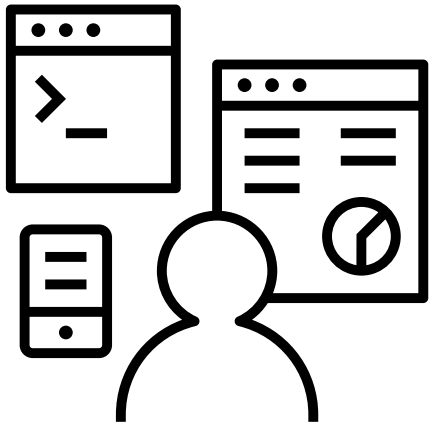
- **Two interesting log databases**
  - Garafana Loki
  - VictoriaLogs
- **VictoriaLogs**
  - Very easy to use & lightweight
  - Local Docker container
- JSON data is mapped to GUI
  - Can be displayed in multiple ways



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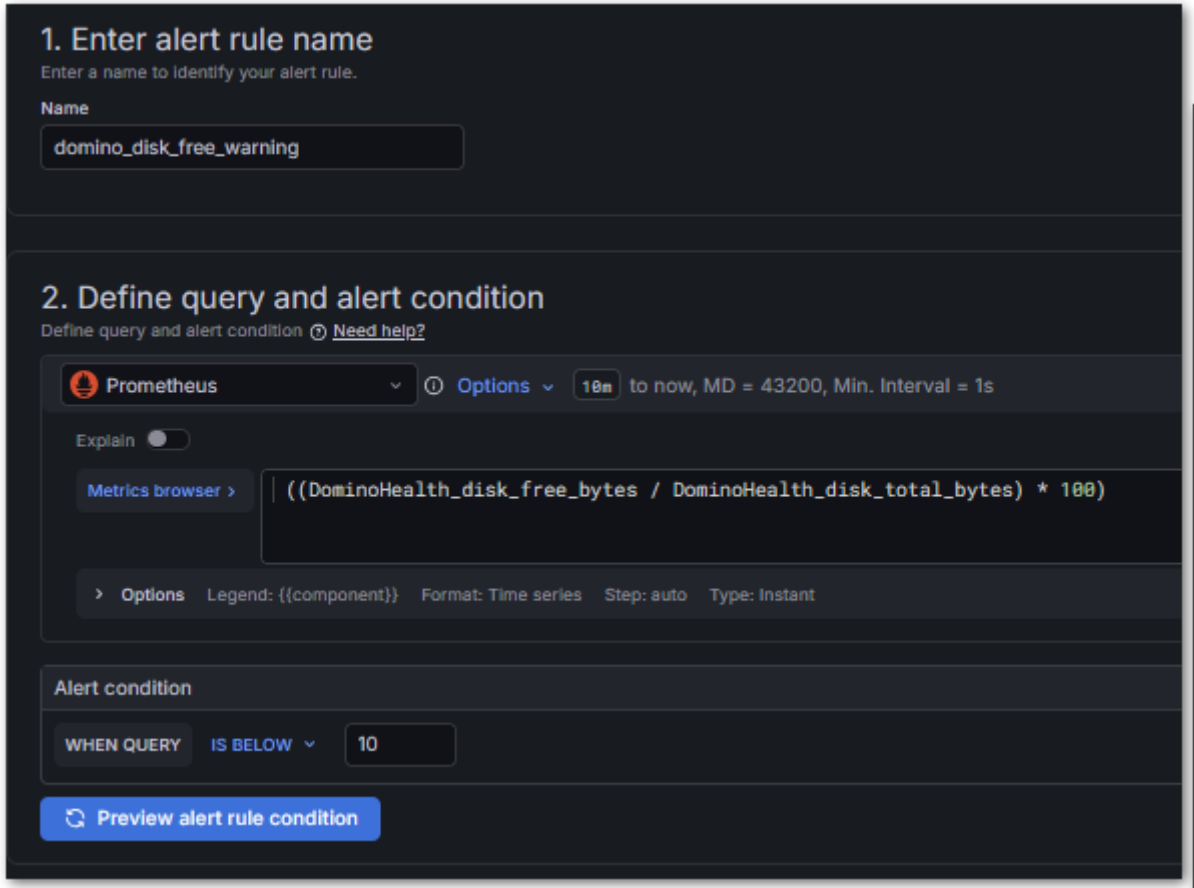
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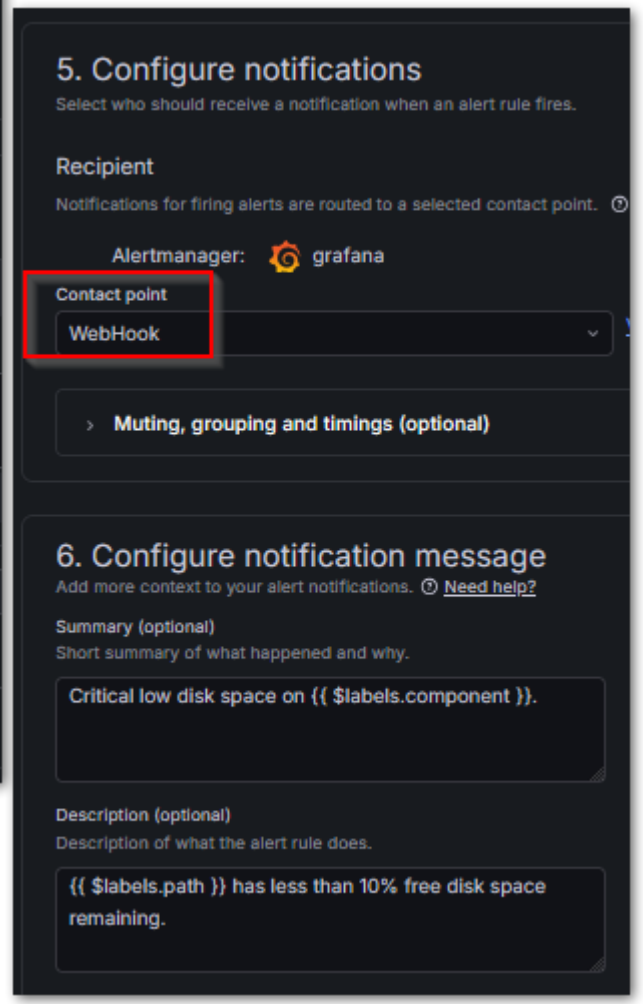
Alterting



Grafana Alerting

- Alerts based on statistics
- Separate notification config
- Very flexible configuration

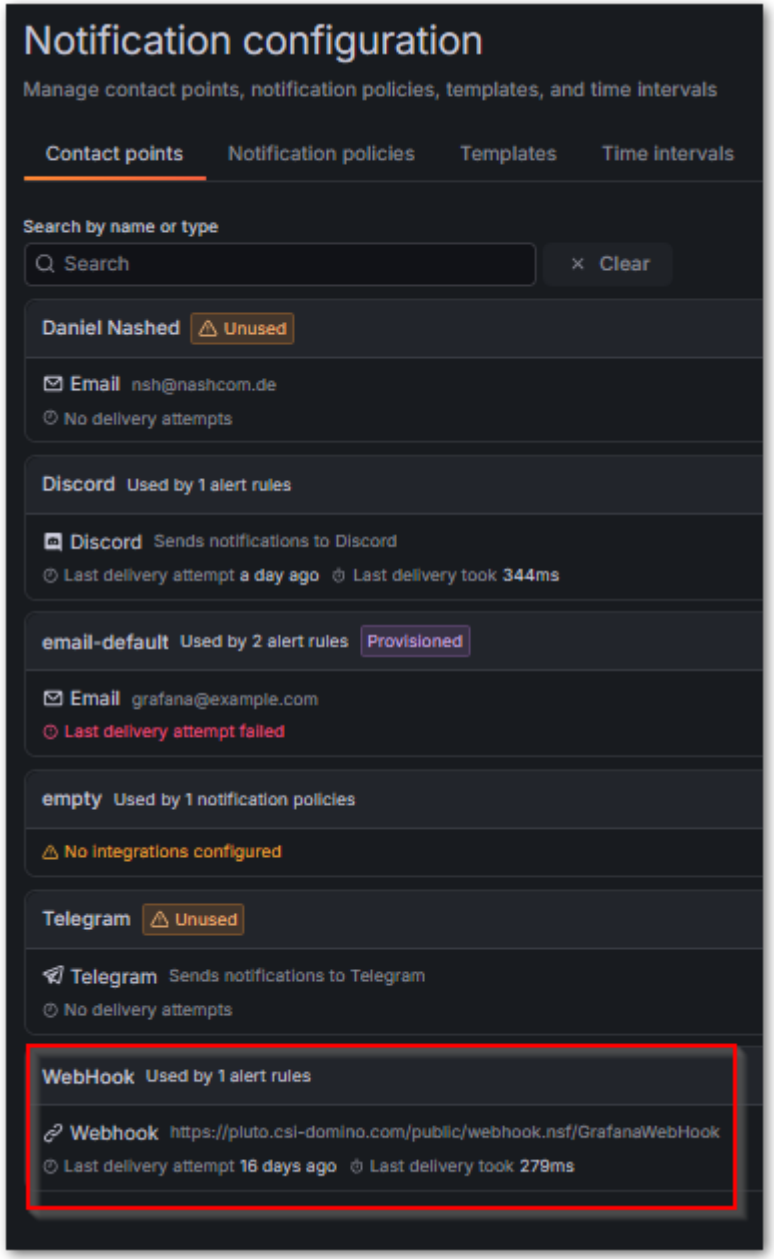




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Grafana Alert Notifications

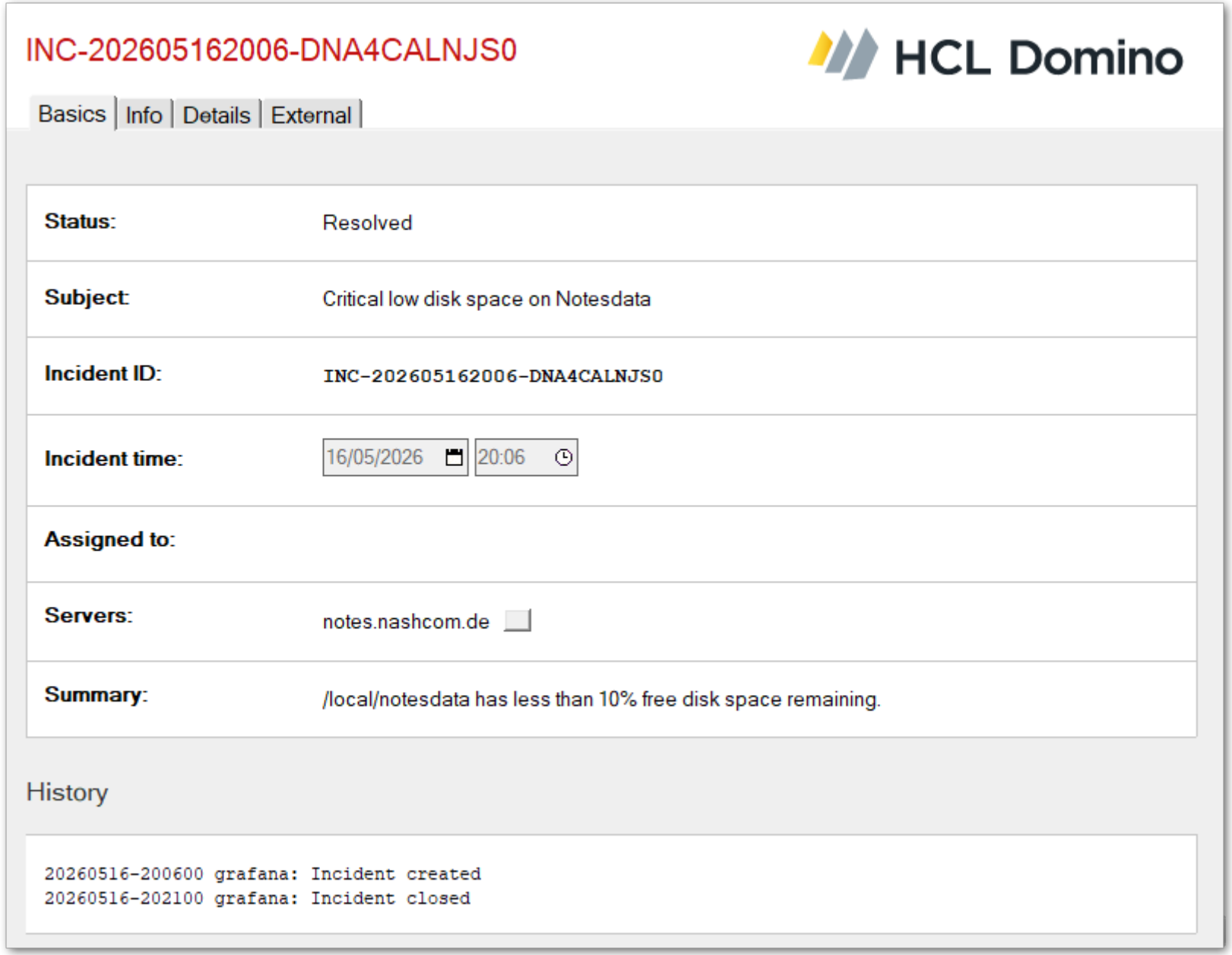
- **Mail Notification**
- **Support for multiple chat clients**
- **Webhook**
  - Most flexible integration point
  - Could be sent to a Notes agent
- **Recommendation**
  - Use a webhook and let Domino dispatch events
- Idea
  - Application to route by event and time
  - Can we used to generate tickets



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Dispatch & Create Incidents

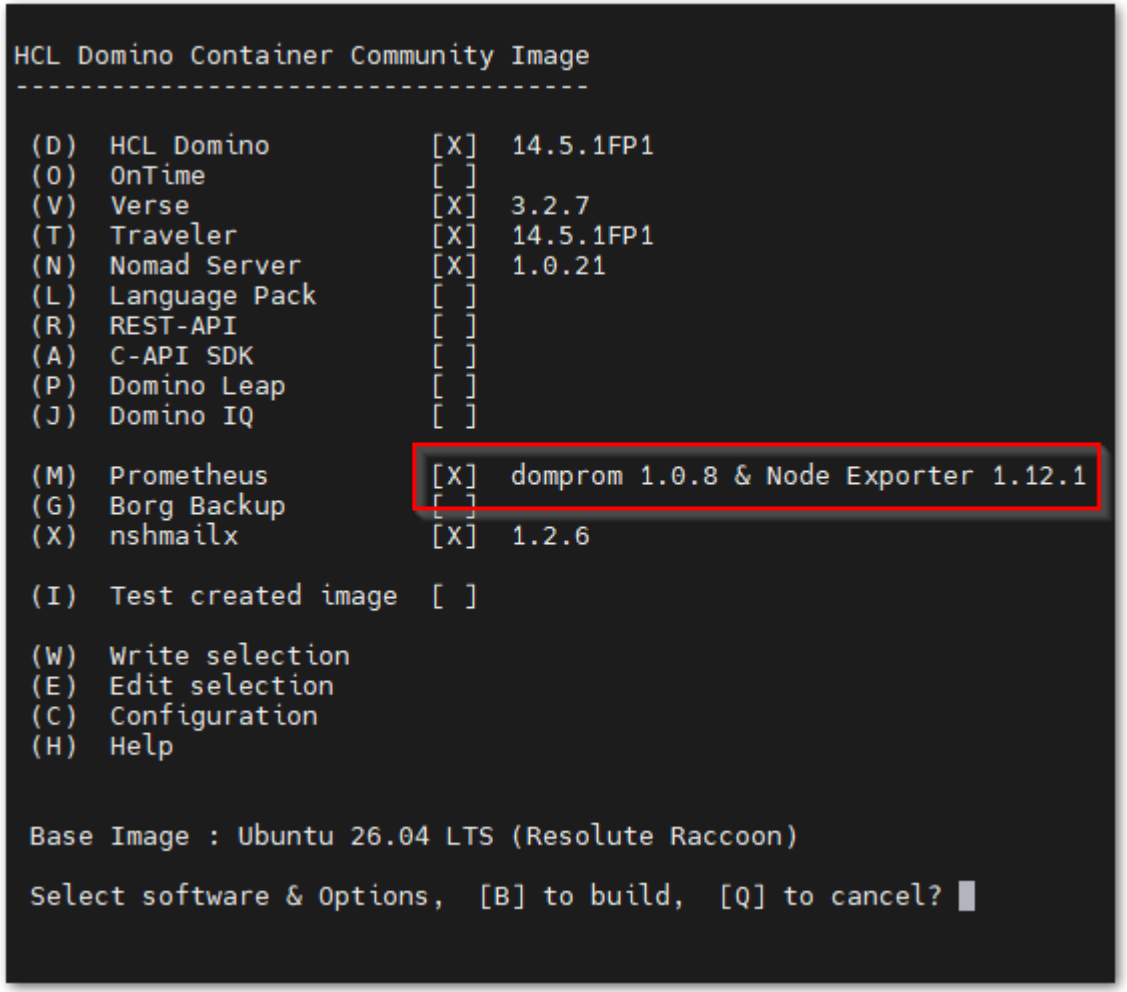
- **Webhook → Notes Agent**
- Create doc with **JSON** payload
  - Event can contain full context
- Link to document can be sent to a notification application
- **ntify.sh**
  - Interesting & self hosted
  - Uses iOS Notification Service Extension (NSE)
  - Ensures notification payloads are delivered by own server



Domino Container Image

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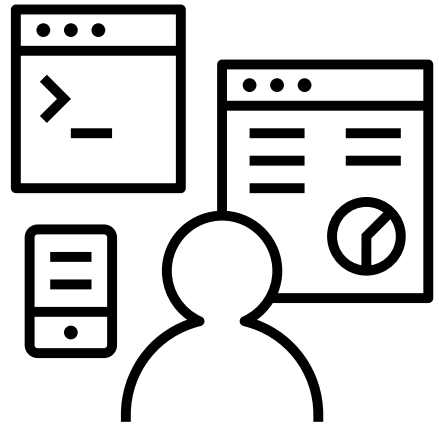
- **The container image provides a simple build option**
  - domprom
  - Node Exporter
- The image just needs configuration
  - Schedule **domprom** as a startup servertask
  - Set environment variables to start Node Exporter
    - Or run it on the Docker host
    - The project contains a **install_node_exporter.sh** script
      - Project: **domino-grafana,** Directory: **exporter**



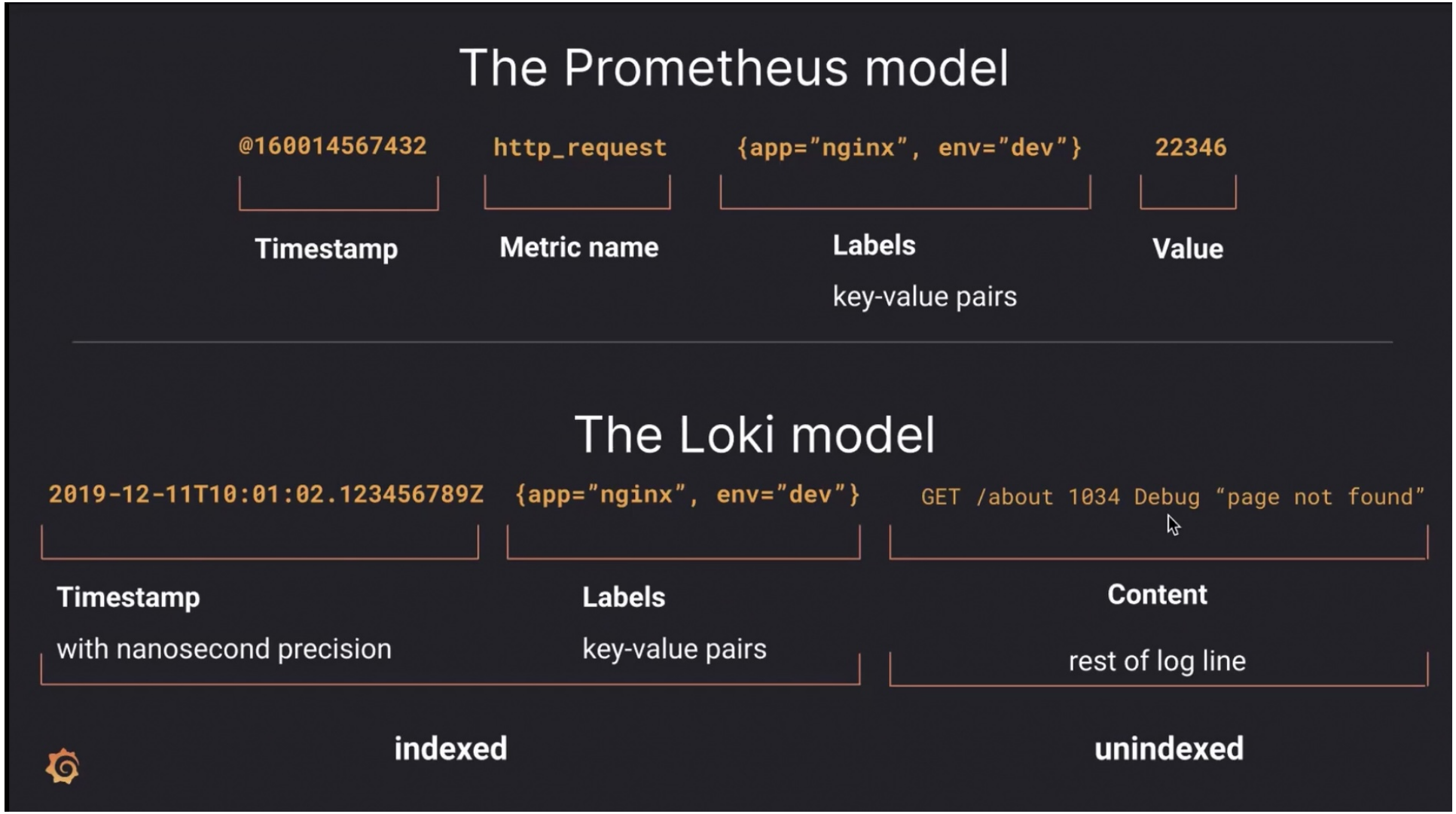
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Final Thoughts



The right Labeling is important



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Standard Tools enable AI Integration

- **AI Integration – MCP Servers**
  - Combining observability, infrastructure and administration
- **Observability MCP Servers**
  - Grafana MCP Server and VictoriaLogs MCP Server
  - AI access to statistics, metrics, and logs
  - Combine information from multiple data sources
- **Kubernetes MCP Server**
  - Comprehensive MCP integration for Kubernetes environments
  - Inspect workloads, resources, and cluster status
  - Particularly useful when running Domino on Kubernetes
- **Administrative MCP Servers**
  - For example: Nash!Com MCP and REST-API for administative tasks

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Take Aways

HCL Domino

- **Domino already provides valuable monitoring data**
  - We extend existing capabilities rather than replacing them
- **Metrics and logs complement each other**
  - Metrics reveal **trends** and **conditions**; logs provide **details**
- **Open standards connect the components**
  - Prometheus metrics and OpenTelemetry make integration easier
- **Monitor services, not just servers**
  - Blackbox probes help verify real application functionality
- **Centralized alerting brings everything together**
  - A unified view across Domino and the surrounding infrastructure

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Where to start

HCL Domino

- **Start with metrics**
  - Deploy **domprom** and **Node Exporter**
  - Connect Prometheus and explore your Domino statistics in Grafana
- **Add availability monitoring**
  - Use blackbox probes to monitor Domino NRPC, HTTP, and critical application services
- **Configure meaningful alerts**
  - Start with a few critical conditions: server availability, service failures, and resource problems
- **Centralize your logs**
  - Forward Domino events and logs via **OpenTelemetry** to **Loki** or **VictoriaLogs**
- **Expand to the entire infrastructure**
  - Include Linux, reverse proxies, Traveler, databases, and other services in the same monitoring environment

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Questions & Answers



- Thanks for your interest!
  Open questions? Feedback?

  GitHub Projects
  - https://github.com/nashcom/domino-grafana/
  - https://github.com/nashcom/domino-log-forwarder
  - https://github.com/nashcom/eas-tools
  - https://github.com/nashcom/domino-blackbox-exporter

- Ask questions via GitHub Issues

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