

Grafana Plugins, Past and Future

Plus New Cloud Data Sources

Daniel Lee, Grafana Labs

Agenda

- Cloud Datasources
- Google Stackdriver presentation - Joy Wang
- Oracle Cloud Infrastructure presentation - Mies Hernandez van Leuffen
- Community Plugins
- Future of Grafana Plugins

Grafana Now Supports The 3 Major Clouds

- Grafana Labs uses all 3 clouds and so do lots of Grafana users
- Avoid vendor lock-in - hybrid/multi-cloud
- Fits with our core vision to democratize metrics
- Helping teams better understand their systems by unifying, visualizing, and analyzing their measurement data - wherever it comes from

Supported Cloud Datasources

- AWS Cloudwatch
 - Created in 2015 by Mitsuhiro Tanda
- Azure Monitor
 - First as a plugin. Included in Grafana 6.0 as a core data source
- Google Stackdriver
 - Released as beta for 5.3. Officially released in Grafana 6.0

Introduction to Azure Monitor

- Supports 4 Azure Services
 - Azure Monitor
 - Application Insights
 - Azure Log Analytics
 - (Application Insights Analytics)
- Support for:
 - Infrastructure metrics
 - application metrics
 - log-based metrics

Azure Monitor - Why move it to Core Grafana?

- Azure is used by lots of Grafana users
- The Grafana team is committing to a higher level of support
- Gets Grafana Alerting

Azure Monitor in Grafana

Please welcome Brendan Burns from Microsoft

Azure Portal

My Dashboard ▾

+ New dashboard

↑ Upload

↓ Download

 Edit

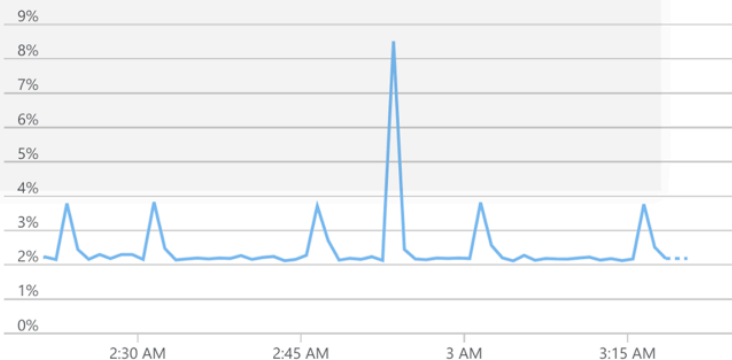
 Share

↗ Full screen

 Clone

 Delete

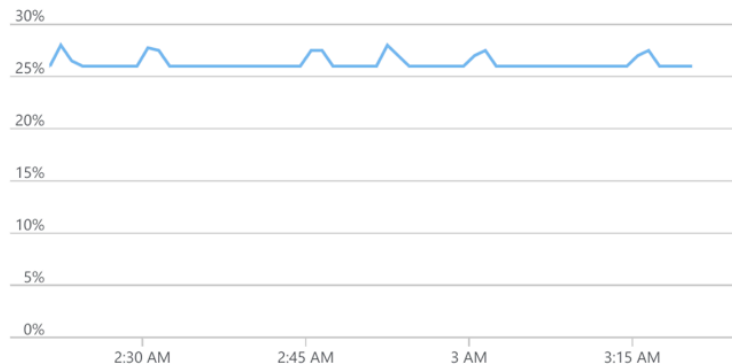
CPU percentage



Percentage CPU (Avg)
grafana

2.47 %

Memory usage



Memory percentage (Avg)
grafana

26.28 %

Azure Monitor Dashboard in Grafana



Azure Monitor - Support for multiple clouds


Azure Monitor API Details

Azure Cloud	Azure China	
Subscription Id	Azure	9da108e59e55 
Tenant Id	Azure US Government	-481a115f7cbd 
Client Id	Azure Germany	d1ae81f44e37 
Client Secret	configured	

reset

Azure Monitor - Mix queries from the services

Queries to

 Azure Monitor

Add Query

Query Inspector

?

▼ A

Service

Azure Monitor

Resource Group

\$rg

Namespace

Microsoft.Compute/virtualMachines

Resource Name

\$rn

Metric

Percentage CPU

Aggregation

Average

Time Grain

1 minute

Legend Format

{{metric}}

▼ B

Service

Application Insights

Metric

requests/count

Aggregation

sum

Group By

request/urlHost ✕

Filter

your/groupby eq 'a_value'

Time Grain

auto


Auto Interval

1m

Legend Format

alias patterns (see help for more info)

Azure Monitor Query Editor



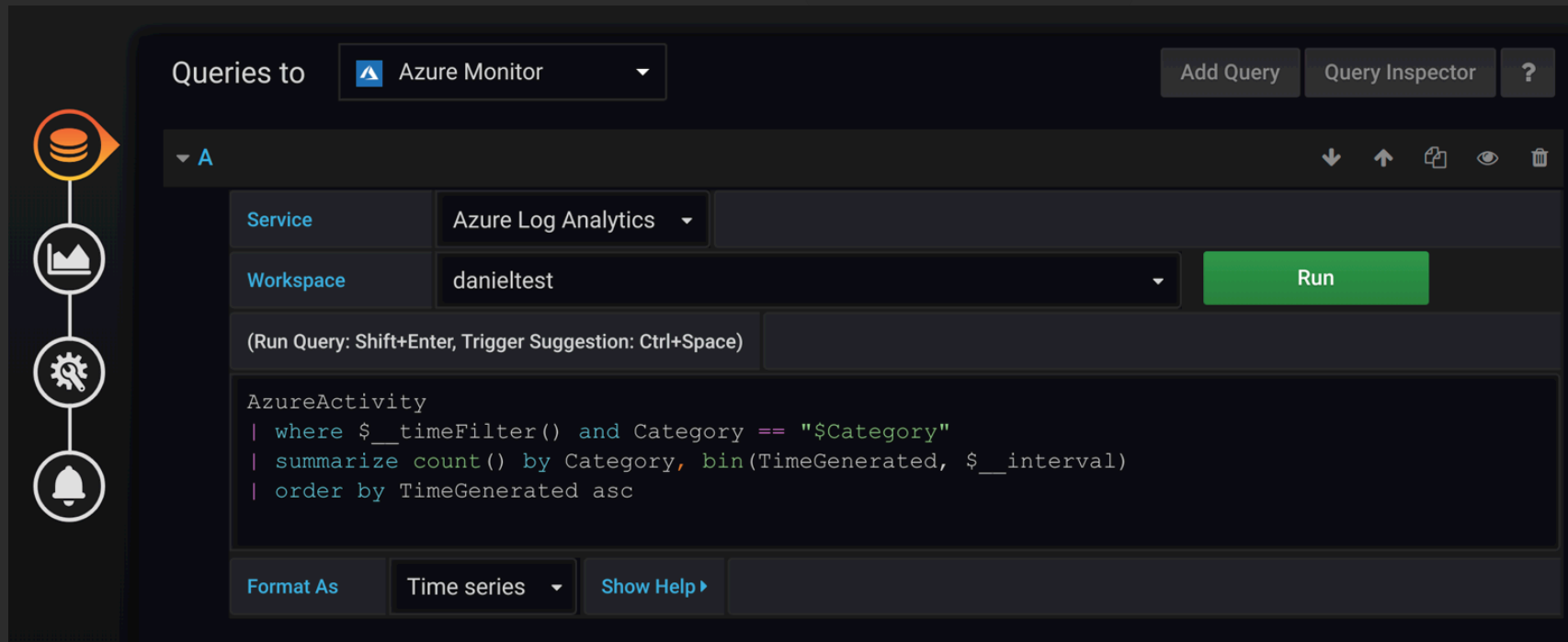
Queries to Azure Monitor Add Query Query Inspector ?

A ↓ ↑ 📄 👁 🗑

Service	Azure Monitor					
Resource Group	\$rg	Namespace	Microsoft.Compute/virtualMachines	Resource Name	\$rn	
Metric	Percentage CPU	Aggregation	Average	Time Grain	1 minute	
Legend Format	{{metric}}					


Relative time 1h Time shift 1h Hide time info ☐

Azure Log Analytics Query Editor



The screenshot displays the Azure Log Analytics Query Editor interface. On the left, a vertical sidebar contains four icons: a hamburger menu, a line chart, a gear, and a bell. The main panel is titled "Queries to" and shows a dropdown menu set to "Azure Monitor". To the right of this are buttons for "Add Query", "Query Inspector", and a help icon. Below the "Queries to" section, a dropdown menu shows "A". To the right of this are icons for download, upload, copy, eye, and trash. The main query editor area has a "Service" dropdown set to "Azure Log Analytics" and a "Workspace" dropdown set to "danieltest". A green "Run" button is positioned to the right of the workspace dropdown. Below these is a text box containing the query: `(Run Query: Shift+Enter, Trigger Suggestion: Ctrl+Space)`
`AzureActivity`
`| where $__timeFilter() and Category == "$Category"`
`| summarize count() by Category, bin(TimeGenerated, $__interval)`
`| order by TimeGenerated asc`
At the bottom, there is a "Format As" dropdown set to "Time series" and a "Show Help" link.

Azure Monitor - Dimension Filtering

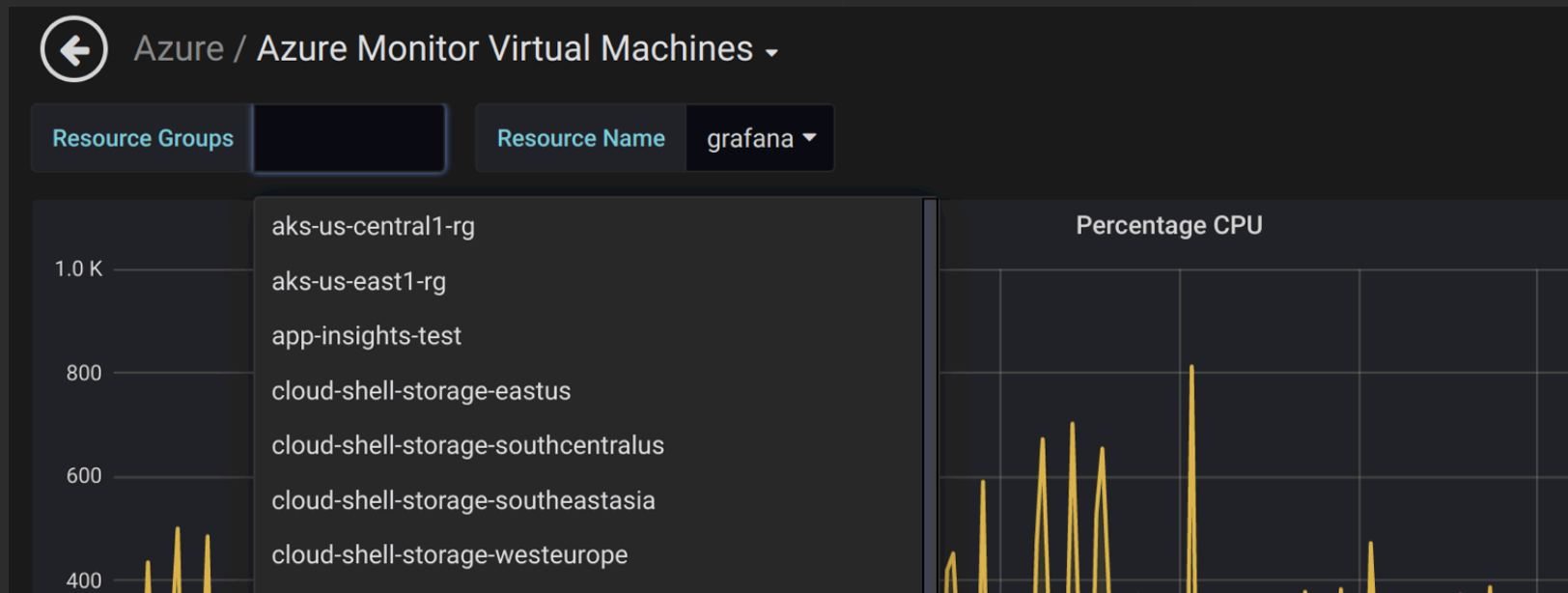


Queries to Azure Monitor





▼ A

Service	Azure Monitor			
Resource Group	grafanastaging	Namespace	Microsoft.Storage/storageAccounts/blobServices	
Metric	Blob Count	Aggregation	Average	
Dimension	Blob type	eq	PageBlob	
Legend Format	alias patterns (see help for more info)			

Azure Monitor - Templating




Azure Monitor service has alerting




Alert

Rule

Name	Percentage CPU Alerting alert	Evaluate every	1m	For	1m	
------	-------------------------------	----------------	----	-----	----	---

Conditions

WHEN	avg ()	OF	query (A, 24h, now)	IS ABOVE	10	
<div>+</div>						

No Data & Error Handling

If no data or all values are null	SET STATE TO	No Data	▼
If execution error or timeout	SET STATE TO	Alerting	▼

Azure Monitor - Provisioning

```
apiVersion: 1

datasources:
- name: gdev-azureMonitor
  type: grafana-azure-monitor-datasource
  access: proxy
  jsonData:
    azureLogAnalyticsSameAs: false
    cloudName: azuremonitor

    clientId: 999b7ed8-1aed-486e-9789-819770bbb999
    subscriptionId: 99993801-6ee6-49de-9b2d-9106972f9999
    tenantId: 9993f661-a933-4b3f-8176-51c4f982e999

    appInsightsAppId: DEMO_APP

    logAnalyticsClientId: 9992db7c-6f6f-4e88-93d9-9ae126c0a999
    logAnalyticsDefaultWorkspace: 9991b44e-3e57-4410-b027-6cc0ae6de999
    logAnalyticsSubscriptionId: 99993801-6ee6-49de-9b2d-9106972f9999
    logAnalyticsTenantId: 9993f661-a933-4b3f-8176-51c4f982e999

  secureJsonData:
    clientSecret: MyVerySecretClientSecret

    appInsightsApiKey: DEMO_KEY

    logAnalyticsClientSecret: MyVerySecretLogAnalyticsClientSecret
```

Stackdriver in Grafana

Please welcome Joy Wang from Google

Stackdriver

Stackdriver is a broad suite of products to improve the development experience on GCP as well as other cloud environments:

Monitoring

- Platform, system, app, and custom metrics
- Uptime/health checks
- Dashboards and charts
- Alerts and notifications

Logging

- Platform, system, app, and audit logs
- Log search/view/filter
- Logs-based metrics
- Error notification and Dashboard

APM

- Trace - Latency analysis across distributed apps
- Profiler - CPU and memory profiling
- Debug - In production debug and conditional snapshots

IRM

- Command and control system for incidents
- Team collaborations
- Post-mortems and communications




Grafana Labs

Incidents repository

Why Did We Build the Plugin Together

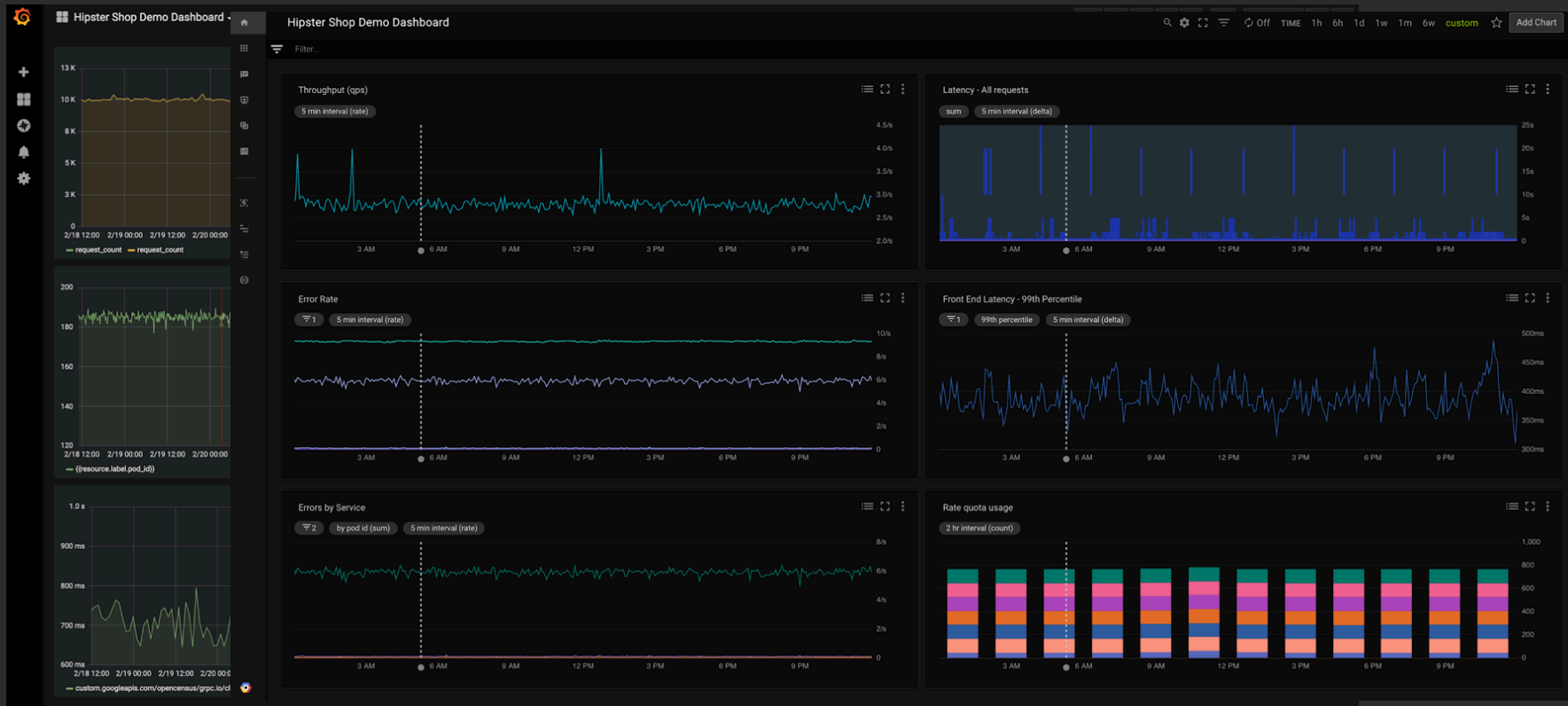
We Hear Our Users' Feedback And We Took Actions

We  Open Source

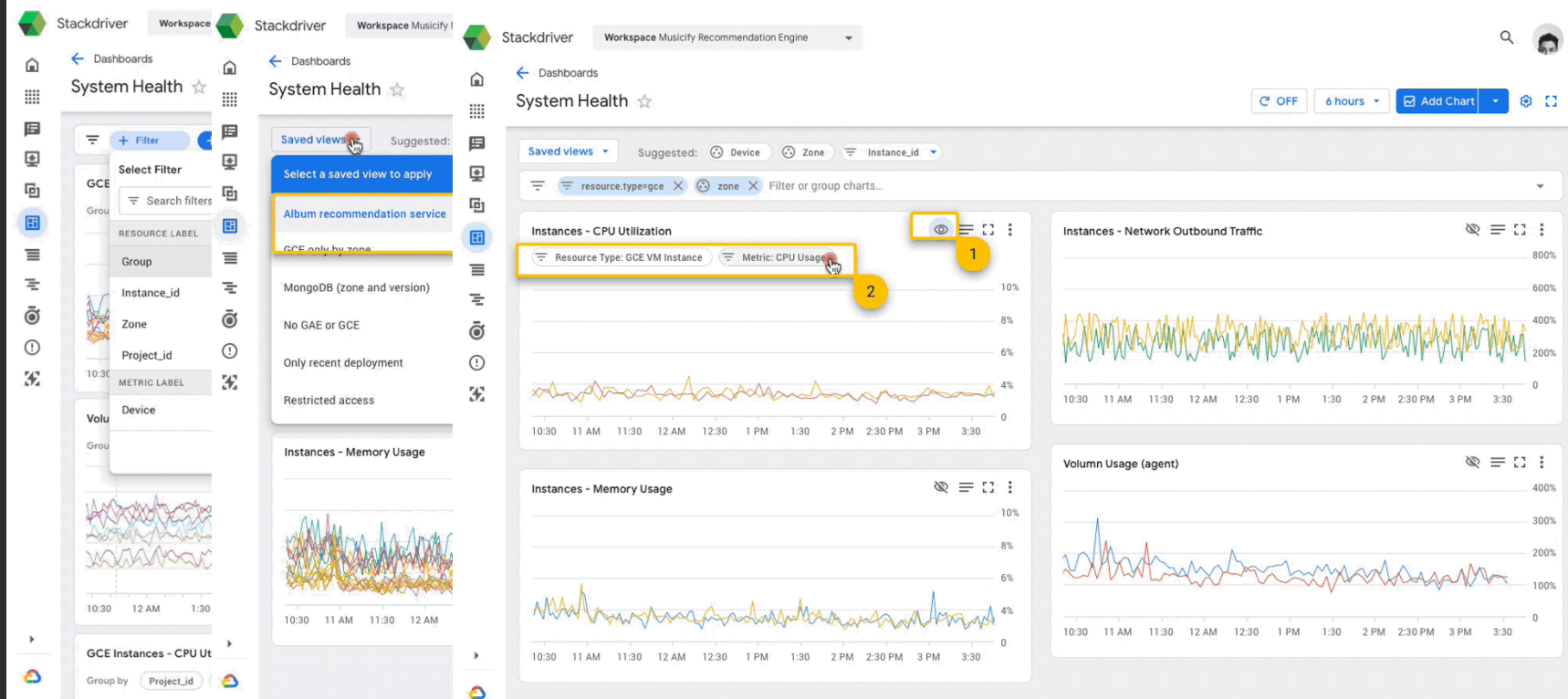
We Learn From The Community

We Continuously Improve

Stackdriver and Grafana Stackdriver Plug-in

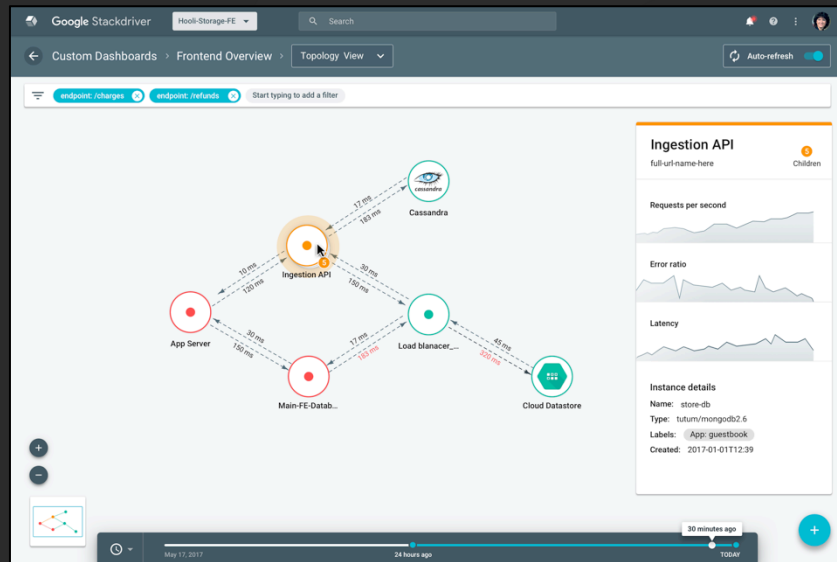


Stackdriver Dashboard Next Steps



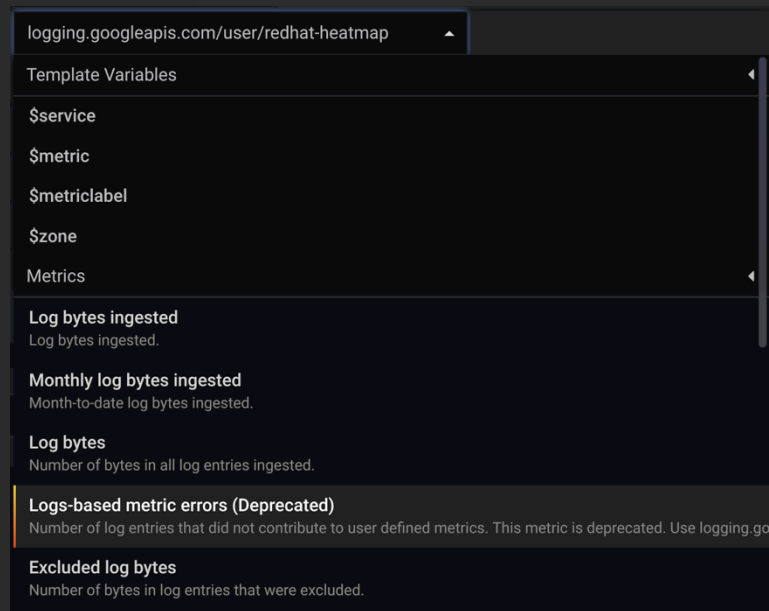
Stackdriver Monitoring Also Introducing

- Kubernetes monitoring
- Expanded multi-cloud and hybrid observability
- Metric query language
- SLO monitoring
- Service graph and service dashboard
- APIs for everything
- Metric granularity and retention



Stackdriver in Grafana

- Great to work with Google
- 1st datasource in React
- Can use Grafana alerting



Oracle Cloud Infrastructure Datasource

Please welcome Mies Hernandez van Leuffen from Oracle

ORACLE®

Cloud Native Labs



Oracle Cloud Infrastructure Data Source for Grafana

Micha “mies” Hernandez van Leuffen
VP of Solution Development
@mies

#OracleCloudNative
cloudnative.oracle.com



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About me and Oracle Cloud Native Labs

- Founder and CEO of Wercker; container native CI/CD
- VP of Solution Development at Oracle Cloud Native Labs
- Build customer-deployable cloud native/container native solutions to bridge the gap between Oracle Cloud Infrastructure (OCI) and open source communities.

<http://cloudnative.oracle.com>



GRPC



Oracle Cloud Infrastructure



Oracle Cloud Native Framework – Open and Integrated



Oracle Cloud Infrastructure Data Source for Grafana

- Data Source plug-in for the OCI Monitoring Services APIs
- Visualize data and metrics related to OCI resources
- Current metrics available:
 - Compute Agent, Block Store, LBaaS, VCN (Virtual Cloud Network)
- Supports local installation (Mac, Linux), Kubernetes & VM-based installation
- Easy configuration and setup

OCI Monitoring Services:

Telemetry service for operations staff, dashboard developers, and SRE, providing:

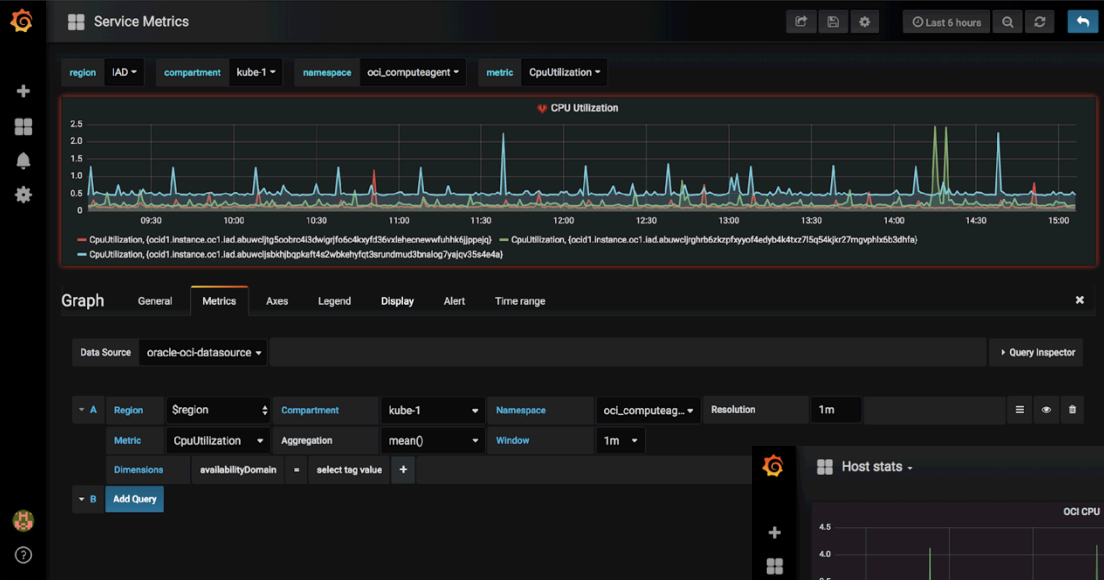
- Out of the box aggregated metrics for OCI services and resources
- Discover and retrieve metrics from Public Monitoring API
- Pre-configured dashboards in OCI console for visualization



<https://www.trybooster.com/>

Available in Grafana Marketplace and OSS at: <https://github.com/oracle/oci-grafana-plugin>

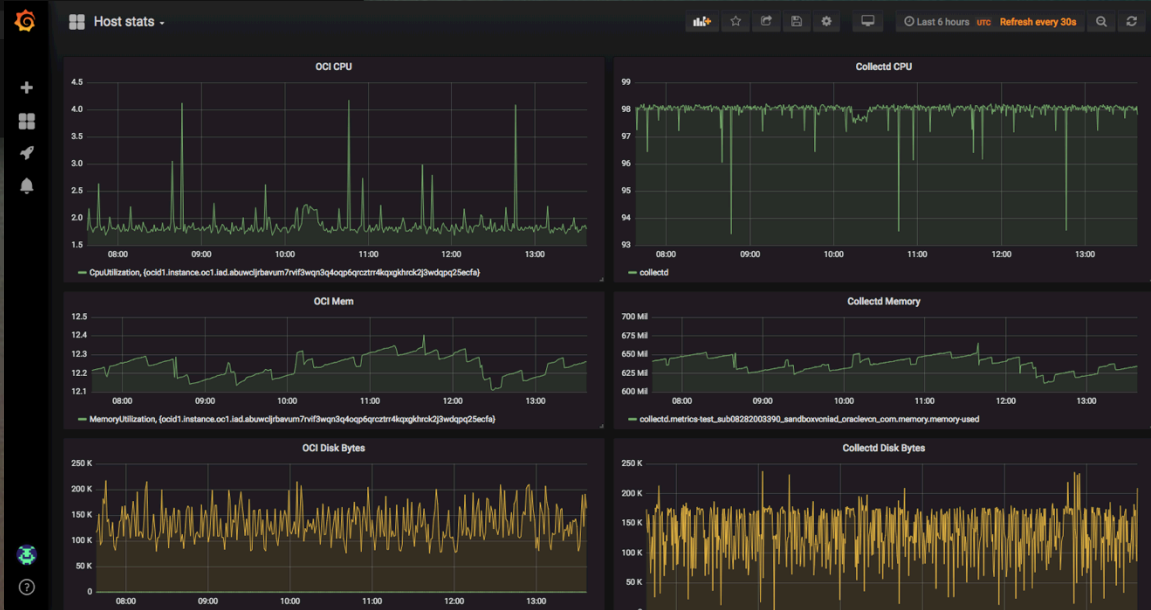
Docs : <https://github.com/oracle/oci-grafana-plugin/tree/master/docs>



Oracle Cloud Infrastructure Data Source for Grafana

Come see more
dashboards at the
booth!

ORACLE



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https://cloud.oracle.com/en_US/tryit - 300 Hours Free!



Scan me

Grafana Plugins - Year in Review

- Lots of new plugins
- Lots of updates and improvements to existing plugins

So Many New Plugins - Datasources

- LinkSmart SensorThings (IOT)
- JSON (fork of the SimpleJson DS)
- Warp10 (IOT TSDB)
- Akumuli (new TSDB)
- DarkSky (weather)
- MetaQueries
- SumoLogic
- Thruck (Nagios, Icinga)

So Many New Plugins - Panels

- ePict
- Statusmap
- Singlestat Math
- Windrose
- Boom table for Graphite
- Parity Report
- Traffic Lights
- Radar Graph
- SVG
- Multistat
- Annotations List

Community Plugin Highlights - Zabbix Datasource

- Zabbix supports loadable modules
- Allows real-time history export into different databases
- InfluxDB added as Direct DB Connection datasource to plugin
- Can query history data directly from InfluxDB
- A big thanks to Gleb Ivanovsky for his Zabbix InfluxDB module - effluence

Zabbix - new Problems Panel

Problems					
Host	Severity	Status	Problem	Time	Details
database01	Warning	PROBLEM	Processor load is too high on data	16 Dec 2018 16:43:13	i
frontend01.te...	Warning	PROBLEM	Processor load is too high on fron	16 Dec 2018 16:17:33	i
backend04	Disaster	PROBLEM	Test Disaster on backend04	03 Dec 2018 20:54:47	i
backend04	Warning	PROBLEM	Processor load is too high on bac	03 Dec 2018 20:54:47	i
backend04	Information	PROBLEM	Test Information on backend04	03 Dec 2018 20:54:47	i
backend04	Not classified	PROBLEM	Test Not classified on backend04	03 Dec 2018 20:54:47	i
backend03	Disaster	PROBLEM	Test Disaster on backend03	03 Dec 2018 20:45:32	i
backend03	Warning	PROBLEM	Processor load is too high on bac	03 Dec 2018 20:45:32	i
backend03	Information	PROBLEM	Test Information on backend03	03 Dec 2018 20:45:32	i
backend03	Not classified	PROBLEM	Test Not classified on backend03	03 Dec 2018 20:45:32	i

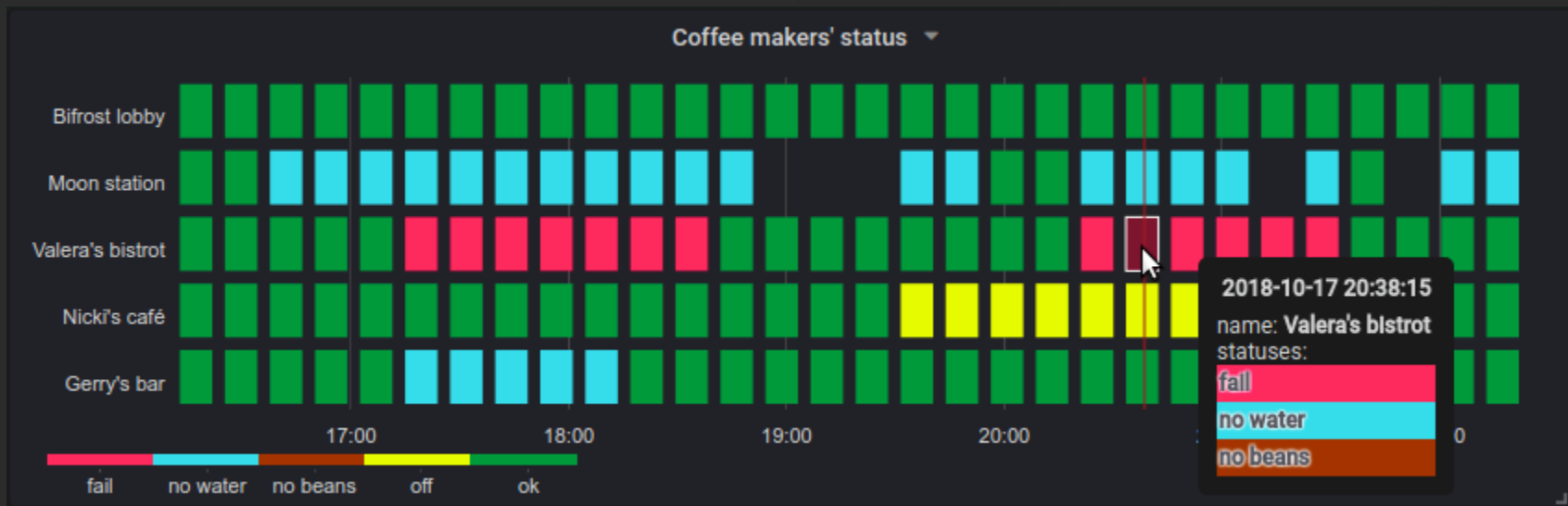
[Previous](#)

Page 1 of 3

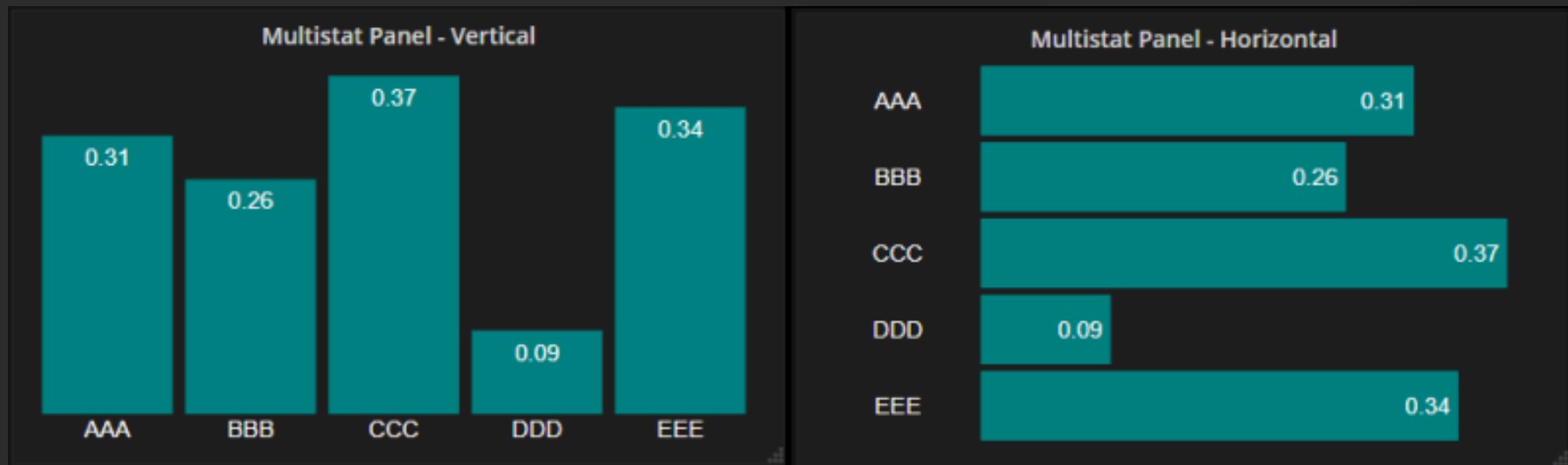
10 rows

[Next](#)

Multistat Panels - Statusmap



Multistat Panels - Multistat

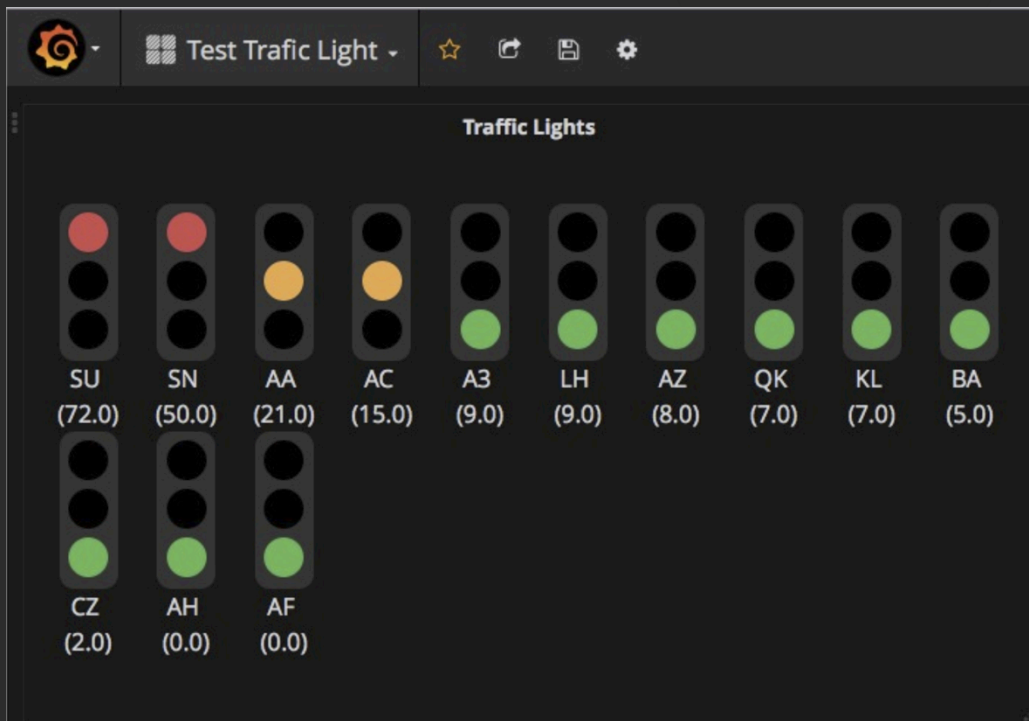


Multistat Panels - Parity Report

NETWORK REPORT ▼

Name	Difference ▼	Equation
Check 1	99.99%	23.96 GB = 2.00 MB
Check 3	77.27%	5.00 MB = 22.00 MB
Check 4	76.74%	5.00 MB = 21.50 MB
Check 2	60%	5.00 MB = 2.00 MB
Check 5	60%	5.00 MB = 2.00 MB
Check 6	60%	5.00 MB = 2.00 MB

Multistat Panels - Traffic Lights



Multistat Panels - Boom Table

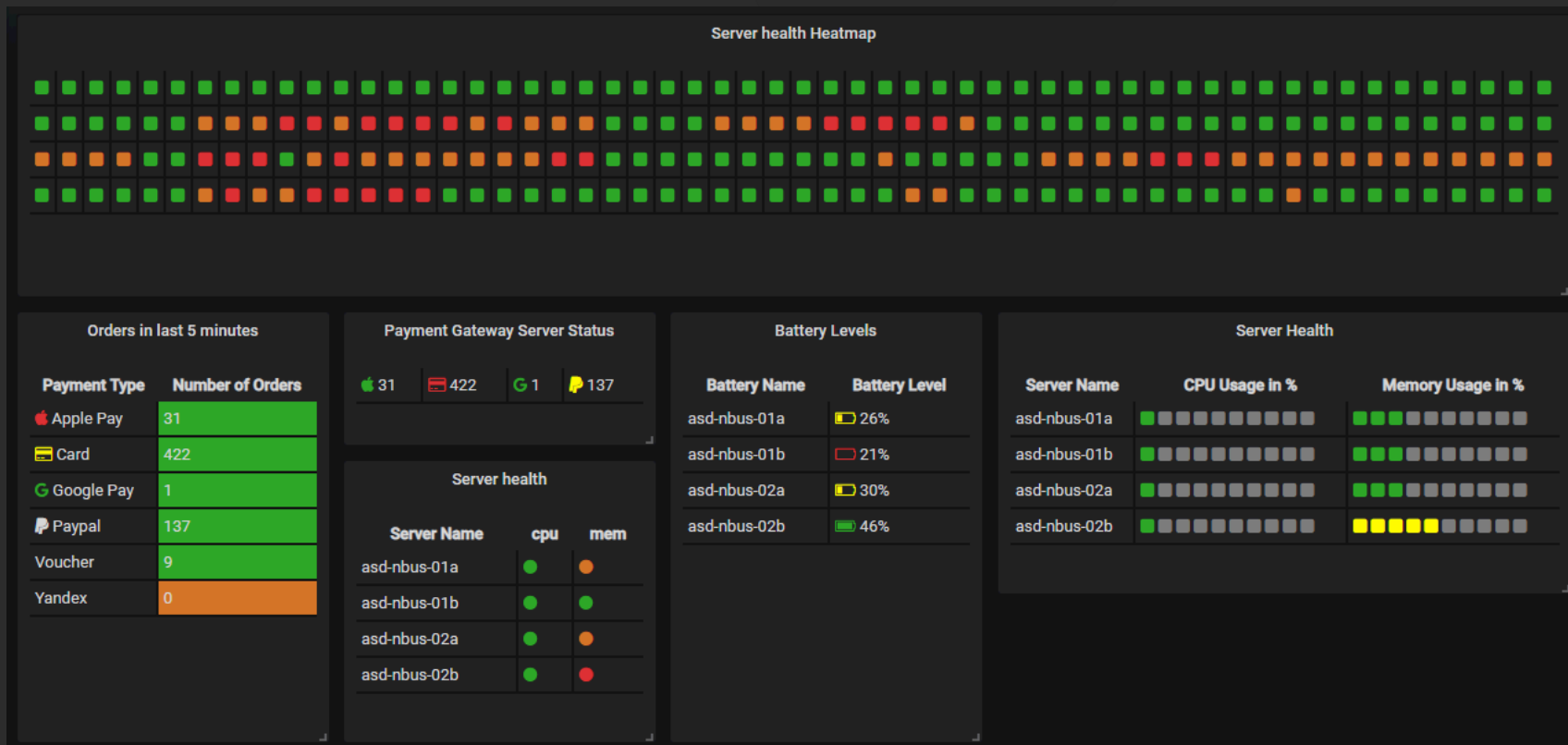
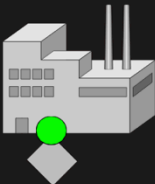


Image Panels - SVG

Panel Title



SVG General Metrics **SVG Builder** SVG Events Time range

Use SVG Builder ☒

Canvas

Property	Value
Width	100%
Height	100%
Viewport X	0
Viewport Y	0
Viewport Width	1000
Viewport Height	1000

Elements

Name	ID	x	y	rotation	r-center x	r-center y	scale	
plant	plant	100	100	0	0	0	2	↑ ↓
square	square	200	600	45	75	75	1	↑ ↓
light-green	light-green	220	500	0	0	0	1	↑ ↓

Add new

Repository: rtmaster


Categories: indicators

SVG: light-green

+ Add

SVG Panel - Last 6 hours

Clock Demo



Visualization SVG

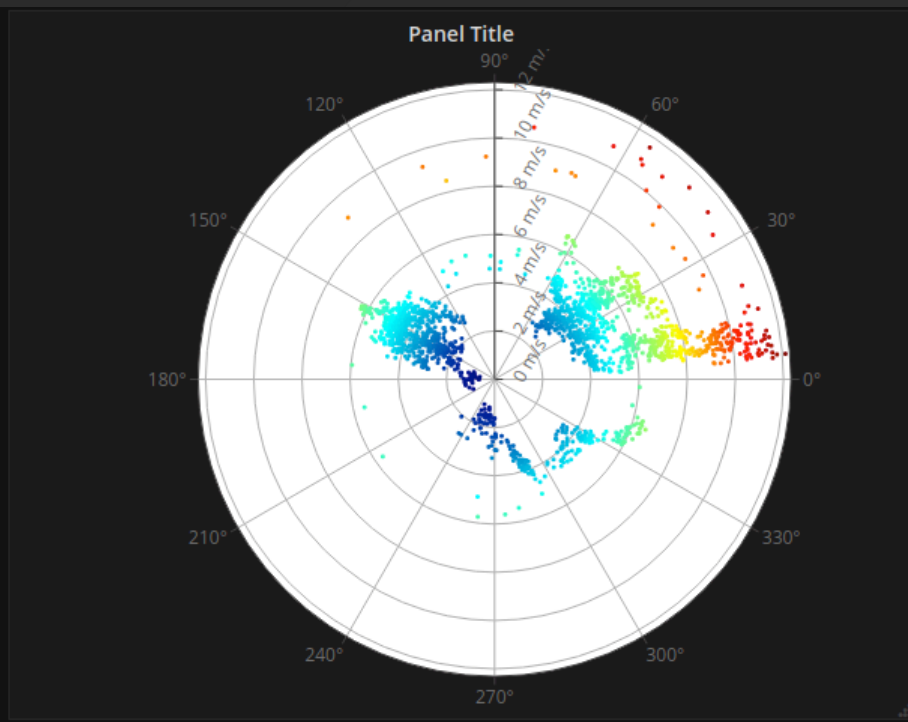
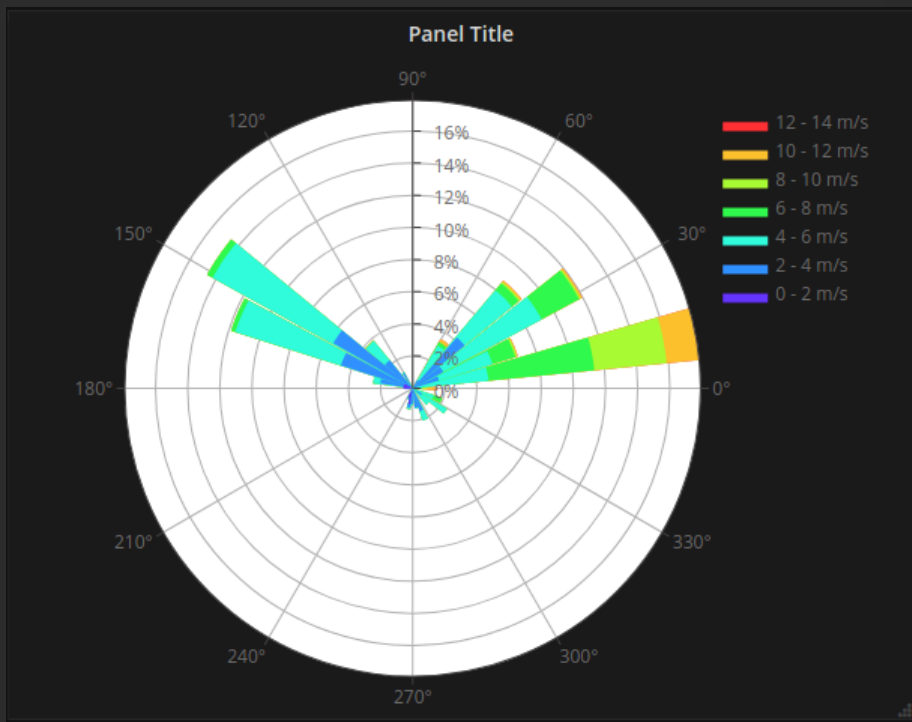
Events

JavaScript Code: `onHandleMetric(ctrl, svgnode)`

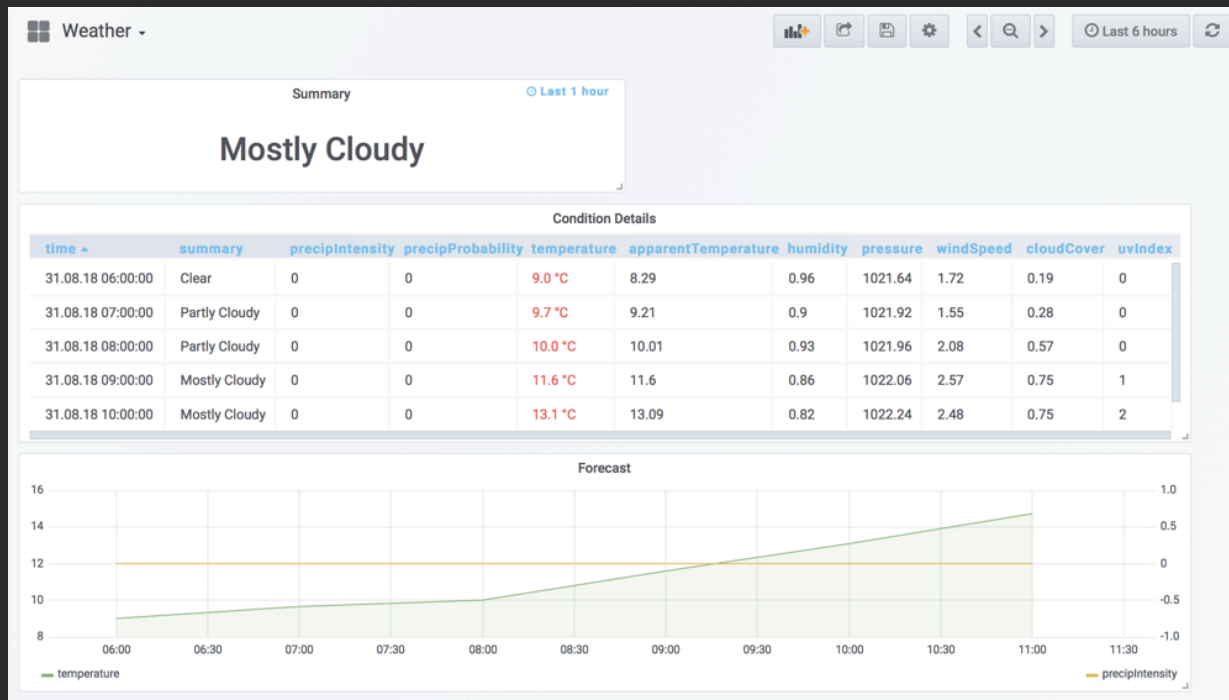
- This code is executed upon every refresh
- @param {MetricsPanelCtrl} ctrl Instance of current grafana panel object.
- @param {HTMLElement} svgnode Html DOM node containing svg data.

```
1 var now = new Date();
2 var angle = 360 * now.getHours() / 12;
3 $(svgnode).find("#hourhand").attr("transform", "rotate("+angle.toString()+ " 100 100)");
4 var angle = 360 * now.getMinutes() / 60;
5 $(svgnode).find("#minutehand").attr("transform", "rotate("+angle.toString()+ " 100 100)");
6 var angle = 360 * now.getSeconds() / 60;
7 $(svgnode).find("#secondhand").attr("transform", "rotate("+angle.toString()+ " 100 100)");
```


Weather - Windrose Panel



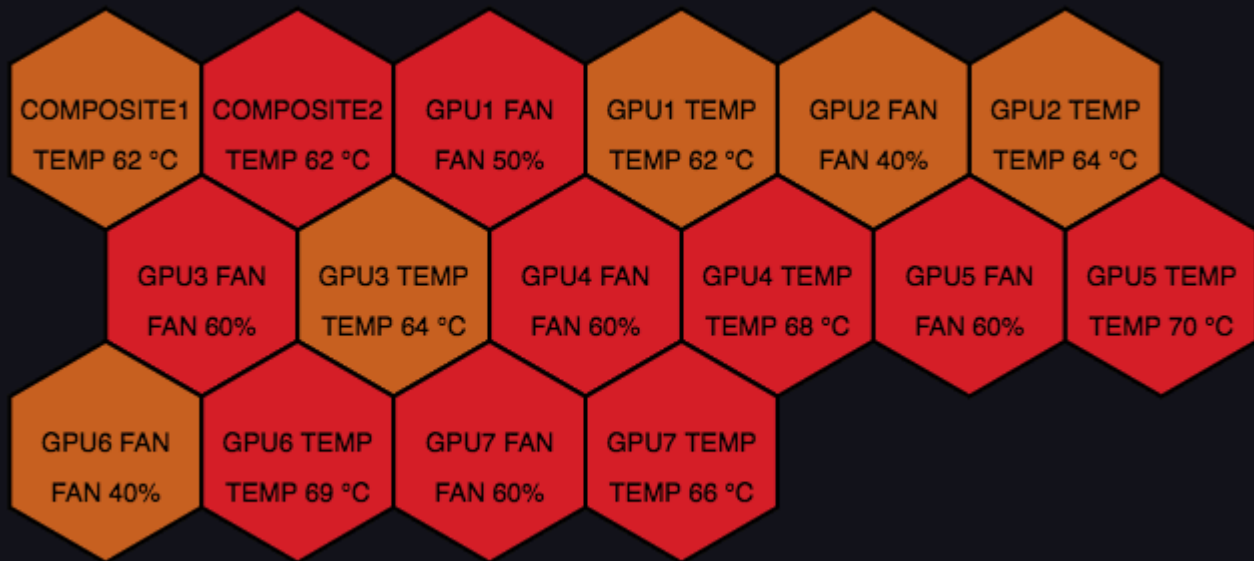
Weather - Darksky Datasource



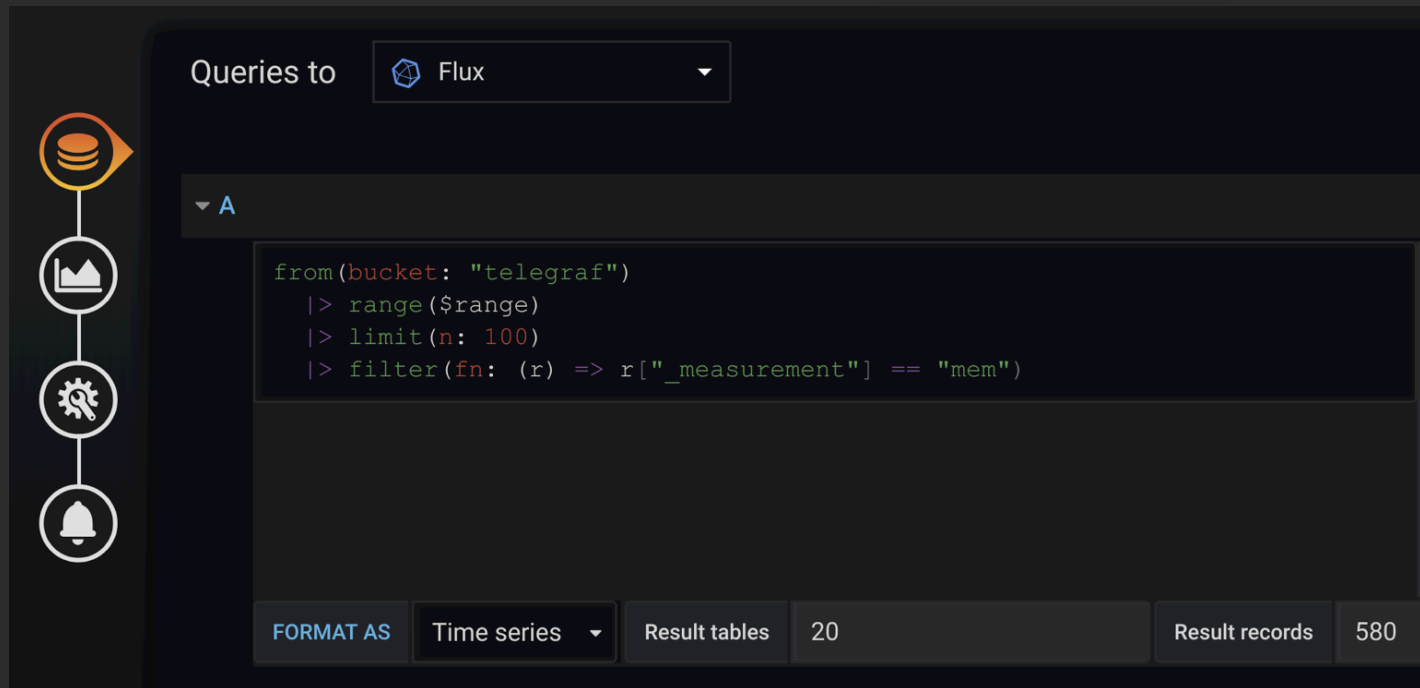
New Plugins From Grafana Labs

- Azure Data Explorer Datasource
- Polystat Panel
- Flux (InfluxDB) Datasource
- Sensu App

Polystat Panel



Flux Datasource

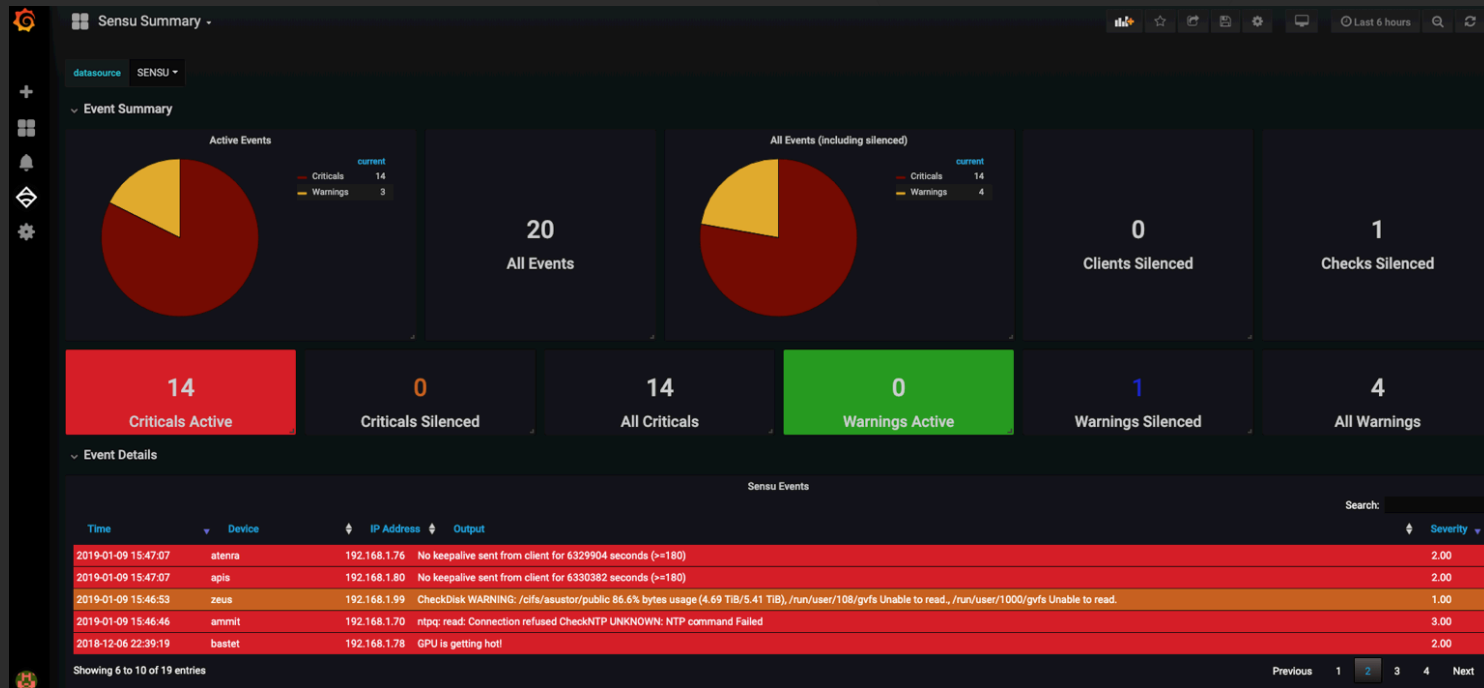


The image shows a screenshot of the Grafana web interface. On the left sidebar, there are four icons: a database icon (orange), a line graph icon (white), a gear icon (white), and a bell icon (white). The main panel is titled "Queries to" and has a dropdown menu set to "Flux". Below this, there is a section labeled "A" containing a Flux query. The query is as follows:

```
from(bucket: "telegraf")
  |> range($range)
  |> limit(n: 100)
  |> filter(fn: (r) => r["_measurement"] == "mem")
```

At the bottom of the panel, there are several controls: a "FORMAT AS" button, a dropdown menu set to "Time series", a "Result tables" button, a text input field containing "20", a "Result records" button, and a text input field containing "580".

Sensu App



Improvement areas for Plugin Development

- Plugins have been a huge success but...
- Datasources can't use Grafana alerting
- Lack of reusable components
- Lack of TypeScript typings
- No rules or guidance on building plugins
- Grafana is being converted to React, what happens with plugins?

The Future of Plugins - Backend Plugins

- Hooks and extension points are incredibly useful
- Currently all plugins are frontend only
- New backend plugins
 - Backend component for datasource plugins
 - Alert Notifiers
 - Pluggable alerting engine

Our not-so-secret secret

- Backend plugins for datasources is already in Grafana
 - but not quite ready
 - Documentation needs to be written
 - Continuous Integration for binaries (Linux, Darwin and Windows)
 - Some plugins are already using this feature:
 - Oracle OCI Datasource
 - Consul Datasource
 - AWS Cloudwatch Logging Datasource

The Future of Plugins - React and @grafana/ui

- New UI component library being created while migrating Grafana to React
- Used for building Grafana and for React plugins
- Published to npm as an alpha last week

Build your own React plugin - Gauge Component

```
import React, { PureComponent } from 'react';
import { Gauge, PanelProps } from '@grafana/ui';

interface Options {
  serverName: string;
}

interface Props extends PanelProps<Options> {}

export class Panel extends PureComponent<Props> {
  render() {
    const { options, width, height } = this.props;
    return (
      <div>
        <h2>Server {options.serverName}</h2>
        <Gauge
          value={10}
          width={width}
          height={height}
          minValue={0}
          maxValue={100}
        />
      </div>
    );
  }
}
```

Work with us on plugins

- Plugins are a huge part of Grafana's future
- We want to build a larger plugins community
- Want to improve existing plugins (including core plugins)
- (And we're hiring - we are remote-first and focused on open-source)

Summary

- All major cloud providers have support in Grafana
- Loads of great plugins to help you integrate with Grafana and visualize your data
- React plugins and the @grafana/ui library will make creating plugins easier
- New hooks and plugin types coming for the Grafana backend

Workshops Tomorrow

- Extending Grafana
- Torkel and Peter will demonstrate the new @grafana/ui library