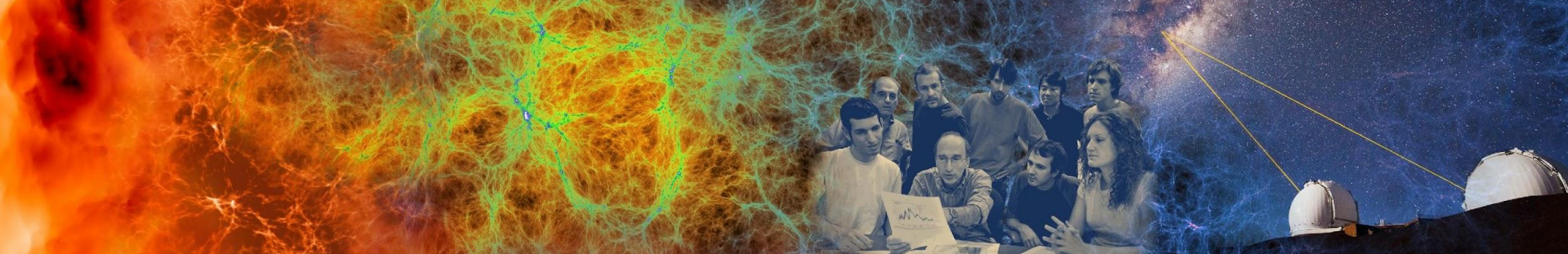


Slingshot Fabric Manager Monitor



Use of RESTful API to drive system success

John Stile
Computational Systems Group
2022-05-02



John Stile

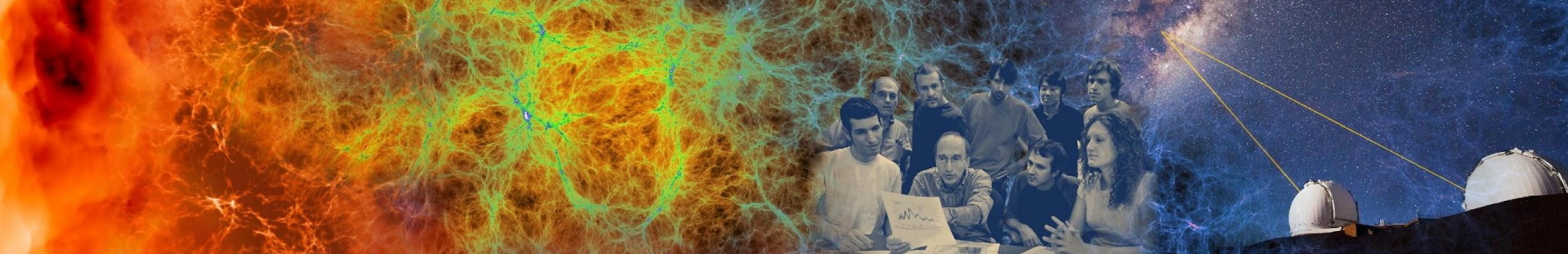


BERKELEY LAB



U.S. DEPARTMENT OF
ENERGY

Office of
Science



About Me:

Prior to NERSC:

SysAdmin, DevOps, Build+Release, SRE

Since Joining CSG in 2020:

Work on supporting Slingshot and Shasta

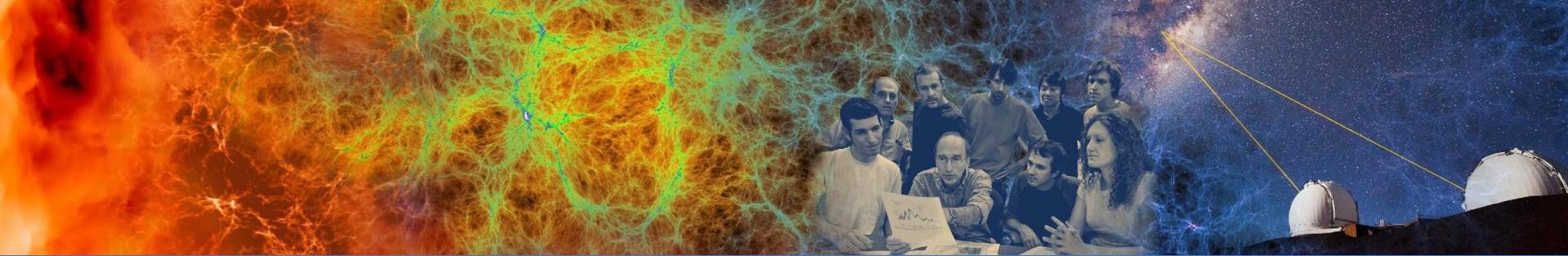


BERKELEY LAB



U.S. DEPARTMENT OF
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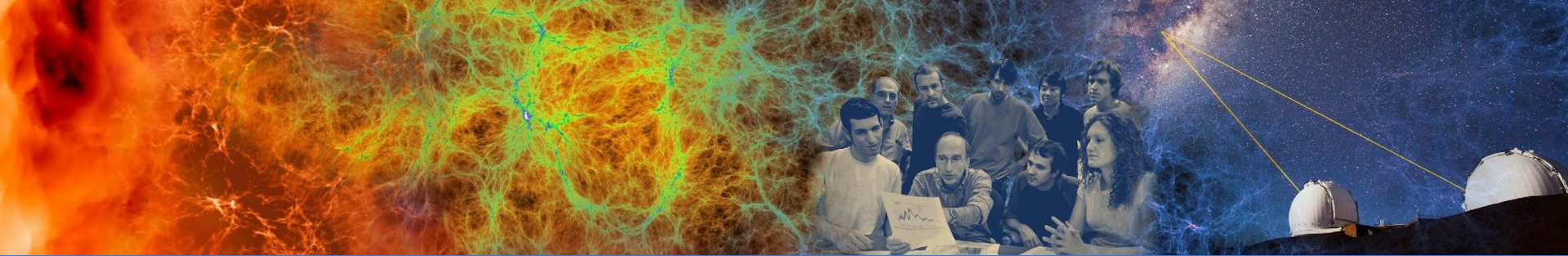
Office of
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Today I will discuss

Slingshot Fabric Manager Monitor

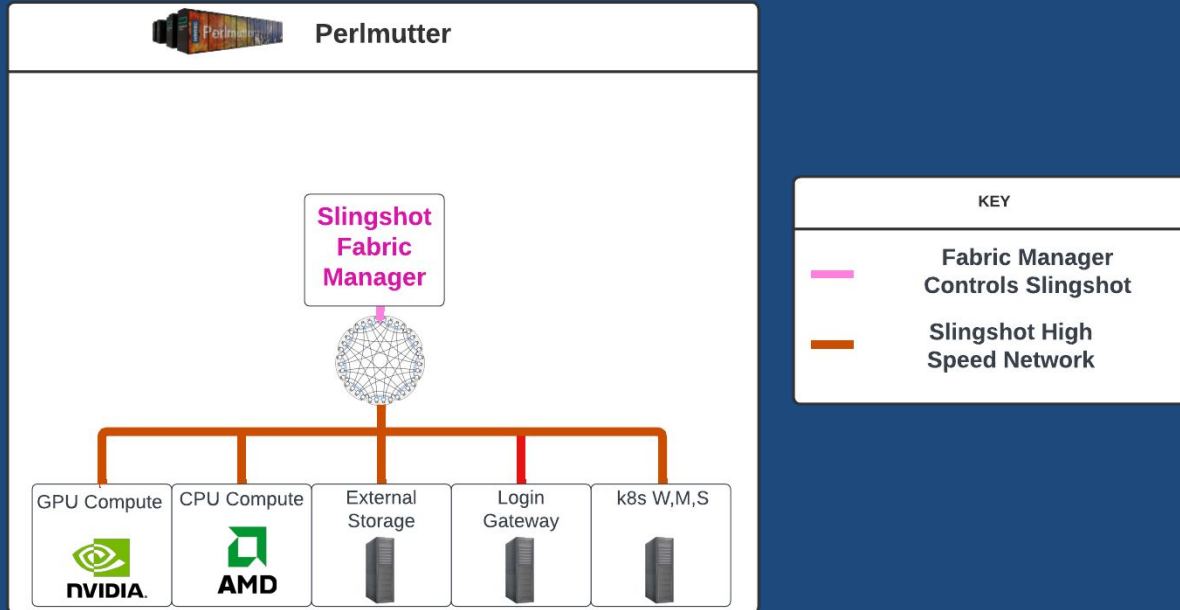


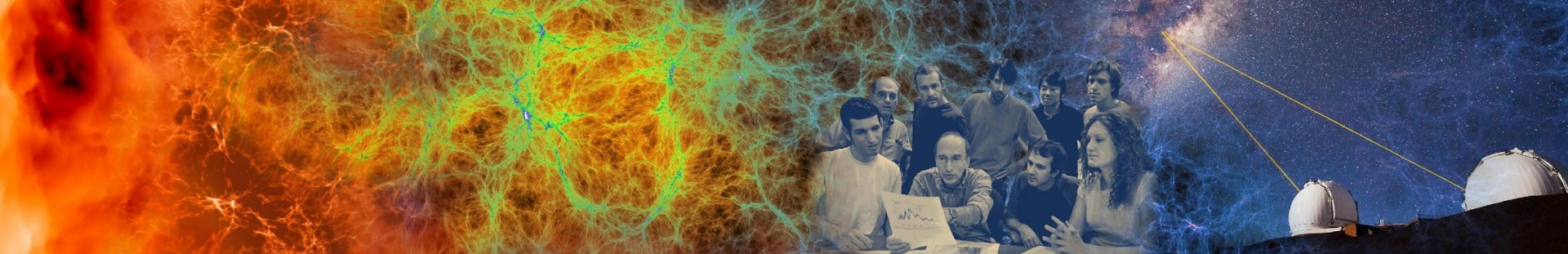


What is the Slingshot Fabric Manager?

Why monitor it?

What is the Slingshot Fabric Manager?





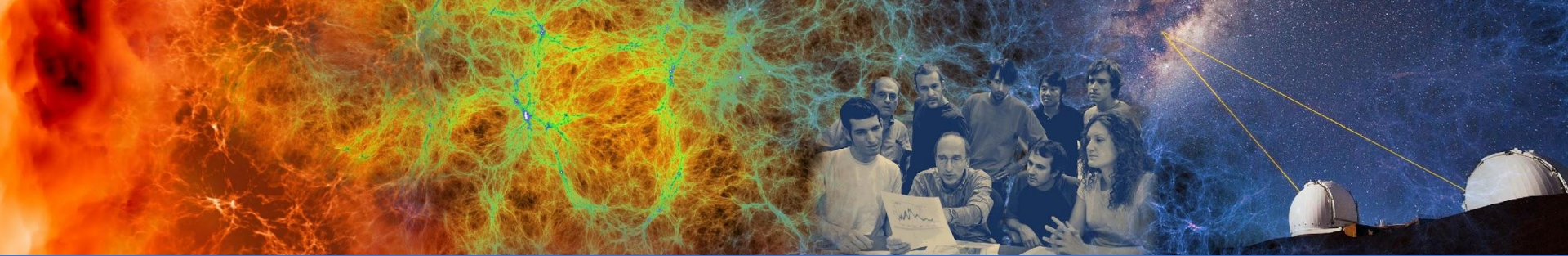
Provides:

Configuration and Controls

Reports health status

Provides a REST API

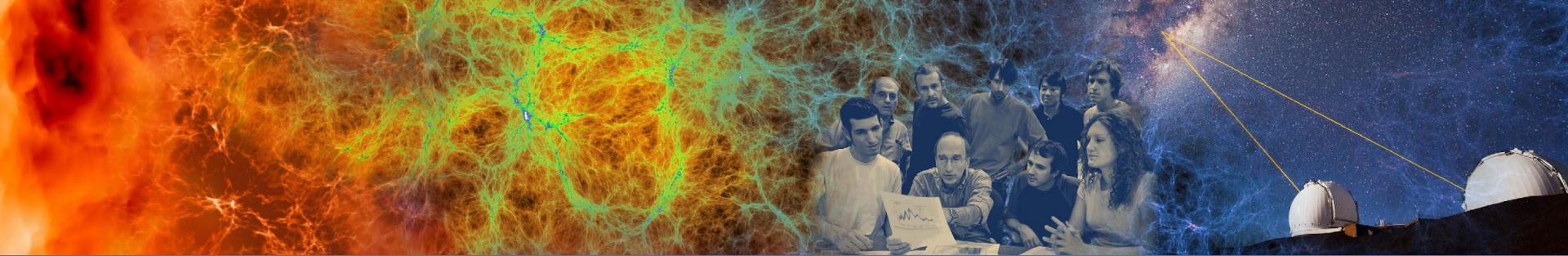
**Slingshot
Fabric
Manager**



Why monitor it?

The RESTful API provides access to data

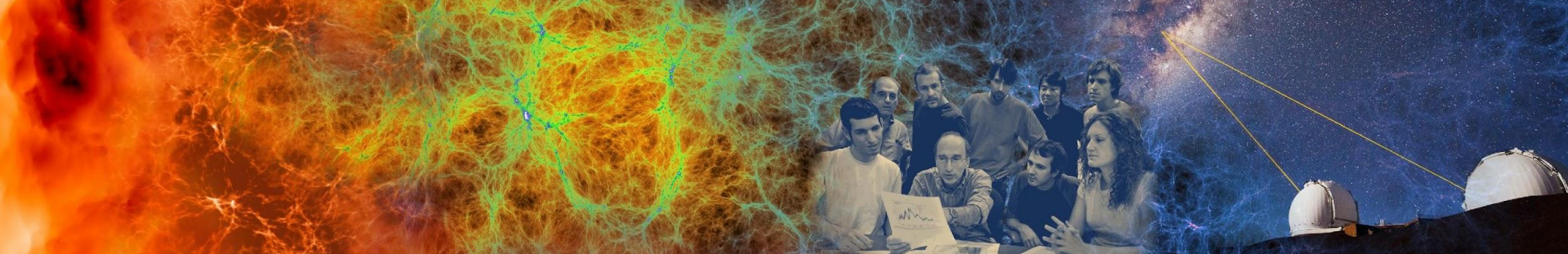
We need Events, Trends, and Alerts



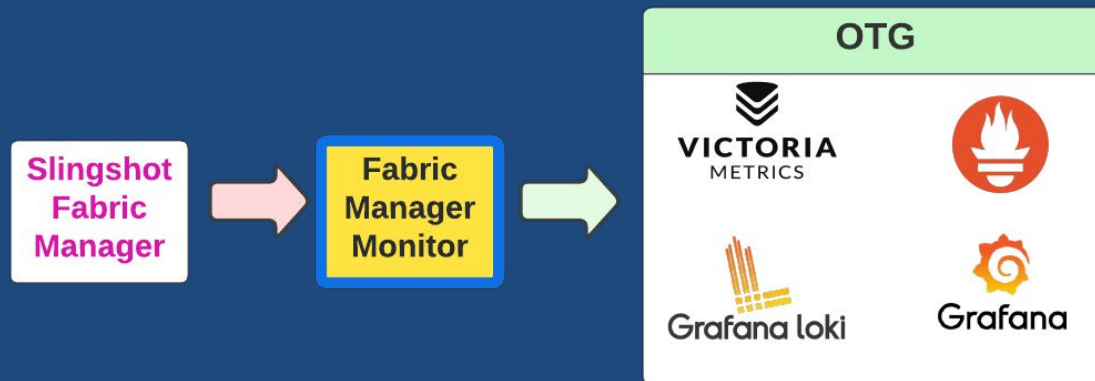
The Operations Group (OTG) provides infrastructure:

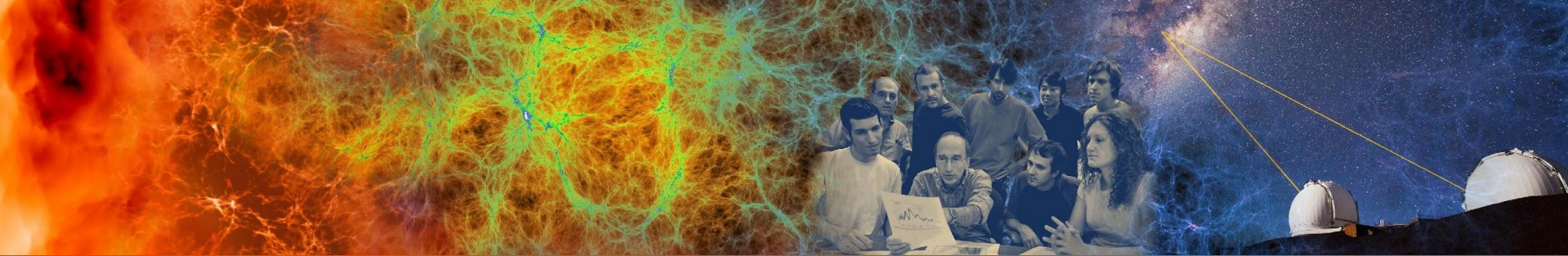
Web GUI:	Grafana
Numeric TS:	Victoria Metrics (VM)
String TS:	Loki
Alerter:	Alert Manager

**** Performant and Reliable Services ****



Role of the Fabric Manager Monitor



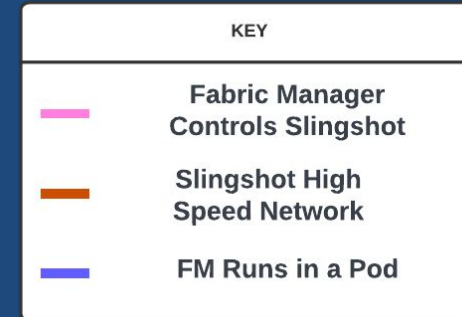
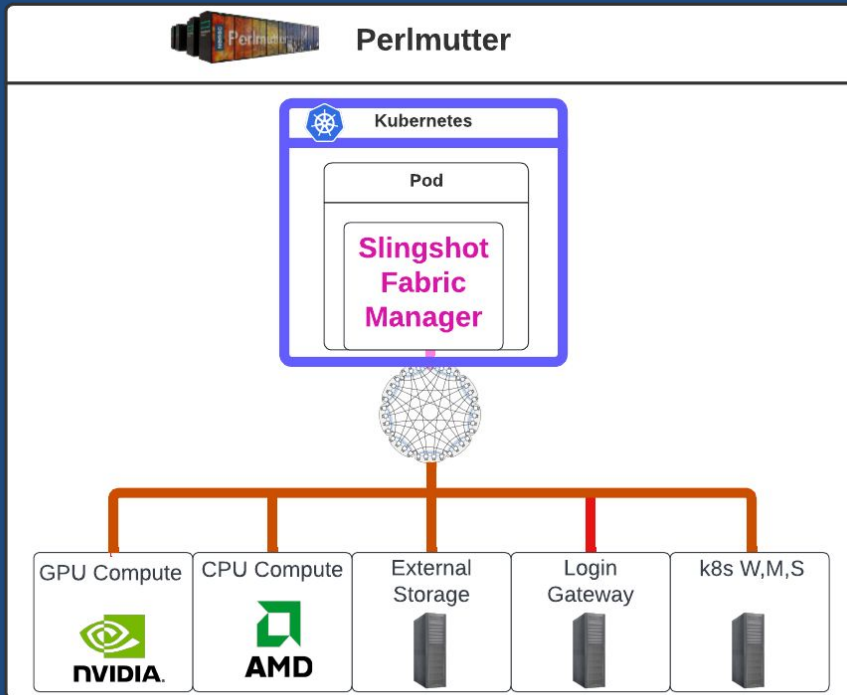


Where will the Fabric Manager Monitor run?

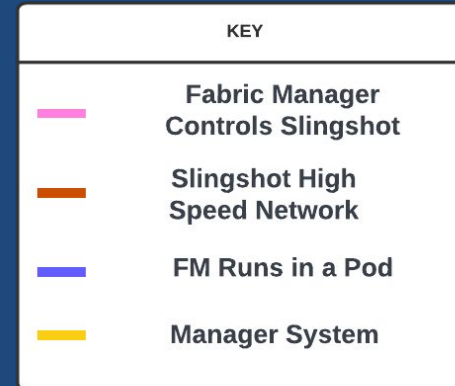
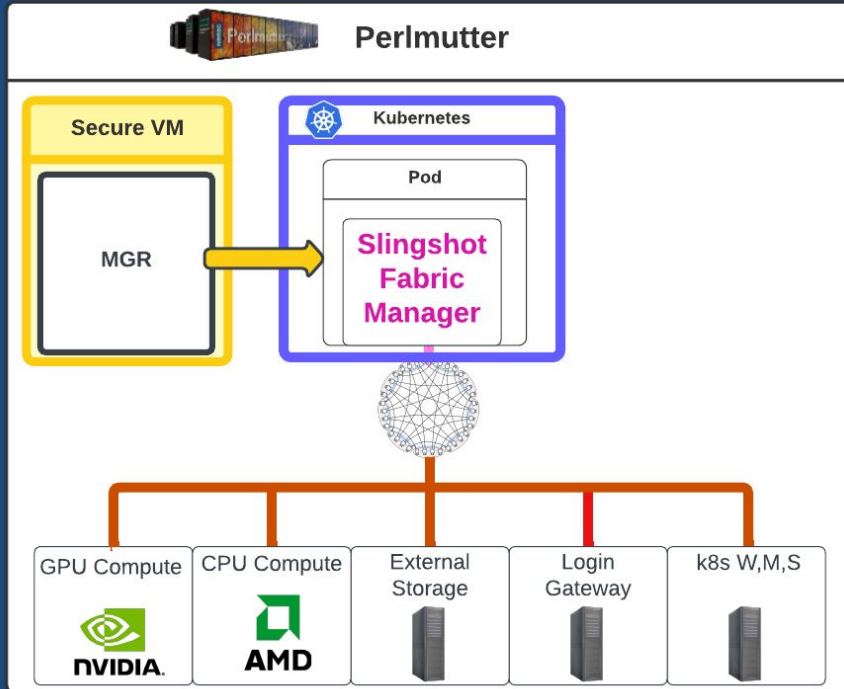
Needs:

Fabric Manager REST API
OTG Services REST API

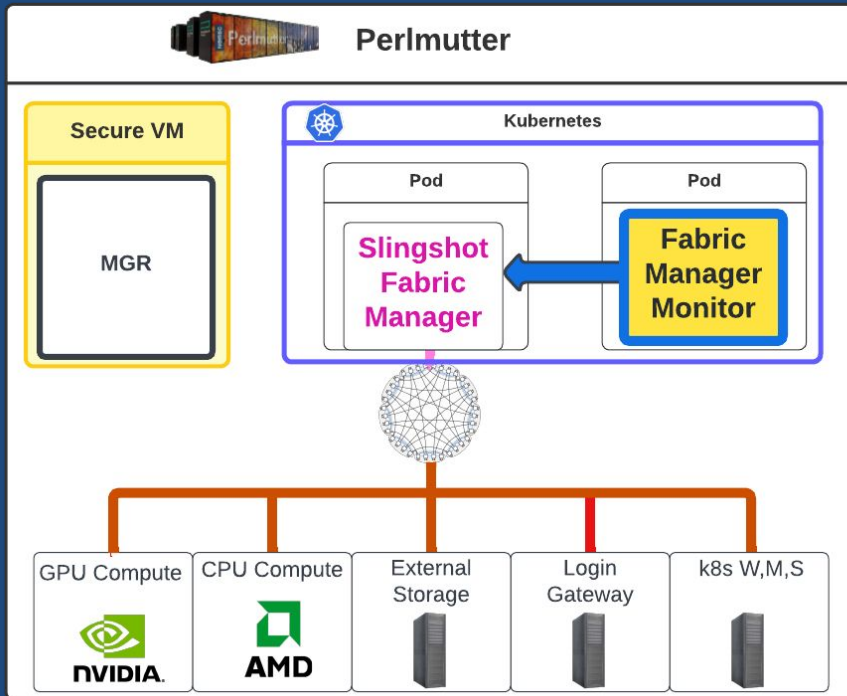
Fabric Manager runs in Kubernetes

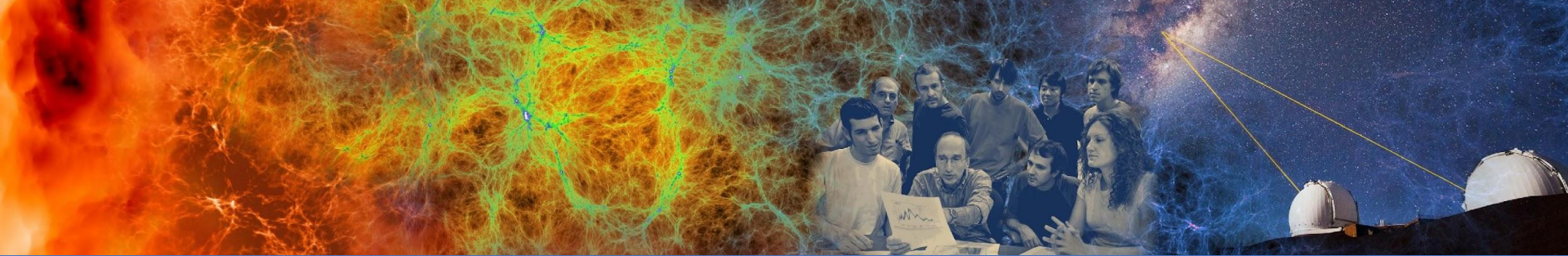


Option 1 : On the MGR



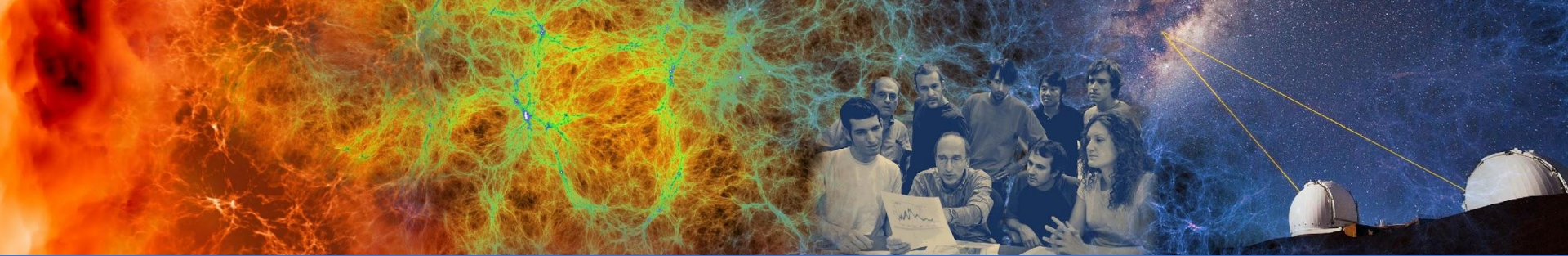
Option 2: On Kubernetes





How should FMM Operate?

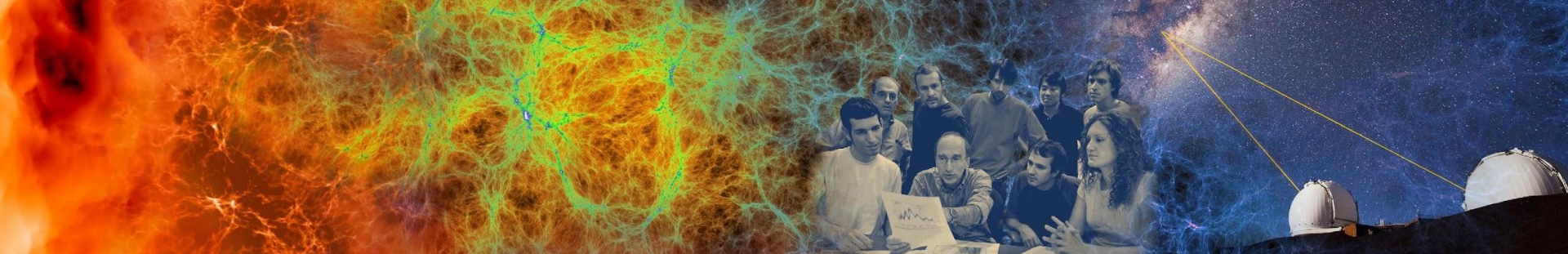
Subscribe vs. Polling



How should FMM Operate?

~~Subscribe vs.~~ Polling

Polling is fine



Project Plan:

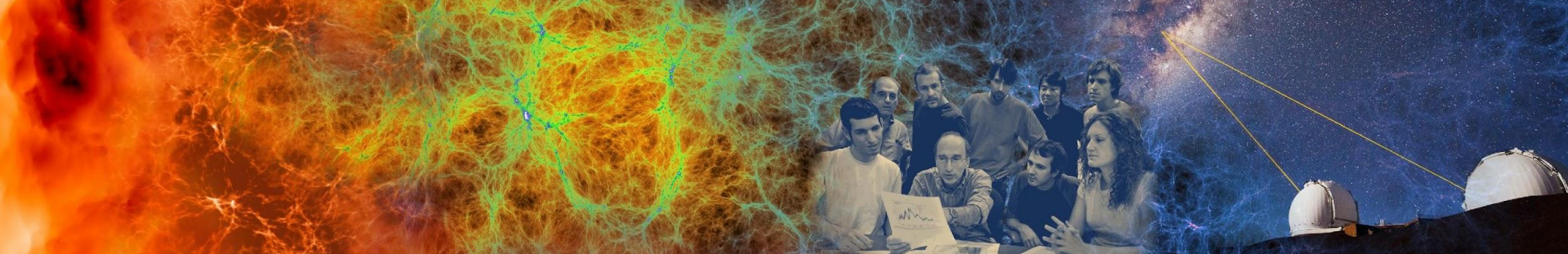
**Write
Program**

Package
in
Image

Specify
Image In
K8S Object

Specify
K8S Object
Helm Chart

Wrap
Helm Chart
in
Loftsman
Project



Project Plan:

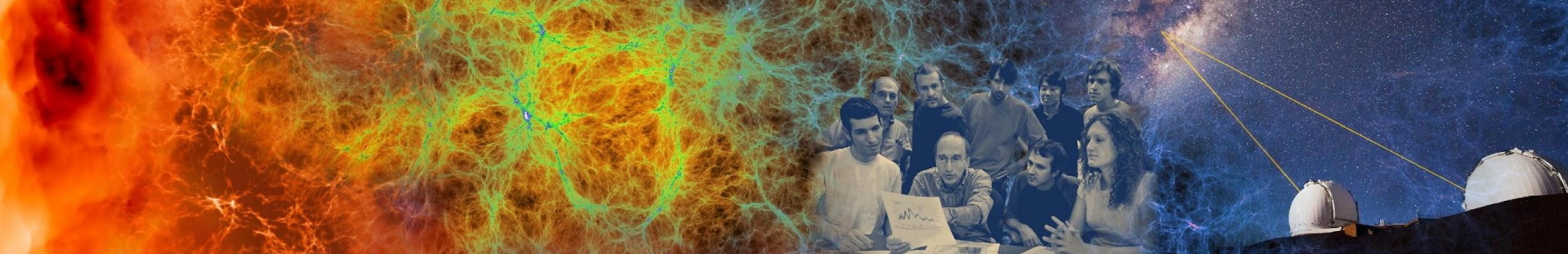
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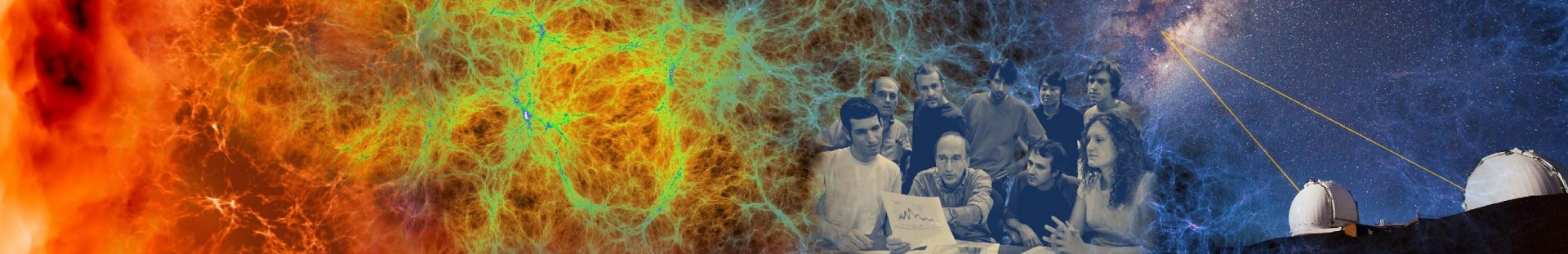
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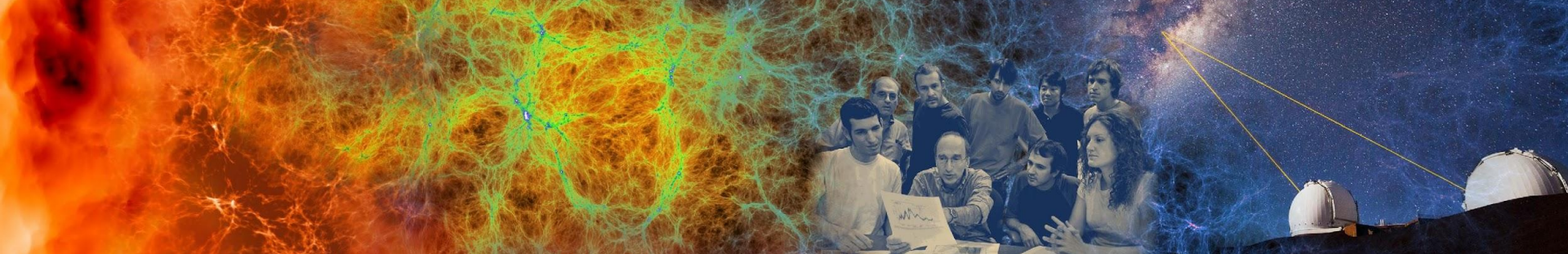
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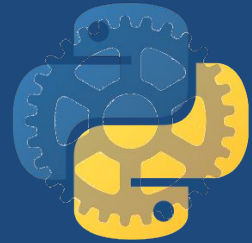
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Write The Program



- Written in Python
- Reads from Fabric Manager REST API
- Convert into metrics
- Write to Victoria Metrics and Loki REST APIs
- Python libs:
 - Logging : Essential for dev and production
 - Requests : HTTP client
 - urllib3 : Handling HTTP Exceptions
 - kubernetes : During dev to run from MRG VM
 - PyYAML : During dev to run from MRG VM

The REST API Client

Fabric Manager REST API Endpoints

General health: `/fabric/health-engines/template-policy`

```
"healthStatus": {  
  "Runtime"           : "CRITICAL",  
  "Configuration"    : "WARNING",  
  "Traffic"           : "HEALTHY"  
  "Security"          : "HEALTHY"  
},  
"healthRecommendations"
```

The REST API Client

Fabric Manager REST API Endpoints

Switch Not Online: `/fabric/topology-maps/template-map`

```
"fabricStatus.enabled" != 'ONLINE'
```

```
AND
```

```
"active" == True
```

Flapping Ports: `/fabric/topology-maps/template-map`

Per switch in `"fabricStatus"`:

```
"fabricPortStateMap" read twice, flag change
```

```
"fabricPortStateMap" read twice, flag change
```


The REST API Client

Fabric Manager REST API Endpoints

Switch Port States: `/fabric/routing-engines/dragonfly/template-routing`

```
count Edge ports Total and Online
count Fabric ports Total and Online
count Switches Total and Online
```

The REST API Client

Metrics Posted to Victoria Metrics

fm_status_configuration	Healthy, Warning, Critical
fm_status_runtime	Healthy, Warning, Critical
fm_status_traffic	Healthy, Warning, Critical
fm_status_api	Healthy, Warning, Critical
fm_switch_offline	List of switch not Online
fm_flap_state_port	List of ports flapping
fm_flap_edge_port	List of ports flapping
fm_edge_ports_total_count	Edge Total
fm_edge_ports_online_count	Edge Online
fm_fabric_ports_total_count	Fabric Total
fm_fabric_ports_online_count	Fabric Online
fm_switches_total_count	Switch Total
fm_switches_enabled_count	Switch Online

The REST API Client

Metrics Posted to Victoria Metrics

<code>fm_status_configuration</code>	Healthy, Warning, Critical
<code>fm_status_runtime</code>	Healthy, Warning, Critical
<code>fm_status_traffic</code>	Healthy, Warning, Critical
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<code>fm_edge_ports_total_count</code>	Edge Total
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<code>fm_fabric_ports_total_count</code>	Fabric Total
<code>fm_fabric_ports_online_count</code>	Fabric Online
<code>fm_switches_total_count</code>	Switch Total
<code>fm_switches_enabled_count</code>	Switch Online

The REST API Client

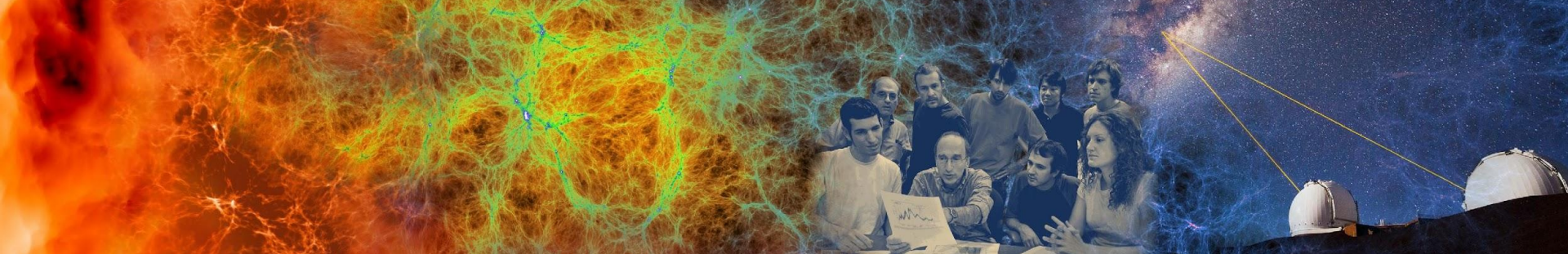
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fm_switches_enabled_count	Switch Online

The REST API Client

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Package program in Image



podman



SETUPTOOLS

Package Python Program

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│   ├── Dockerfile  
│   ├── README.md  
│   ├── setup.py  
│   └── src  
│       └─ fabric_manager_monitor  
│           ├── fabric_manager_monitor.py  
│           └─ __init__.py  
└─ tests  
    └─ fixtures  
        ├── healthy.json  
        ├── semi_healthy.json  
        └─ unhealthy.json
```

```
<!-- class=row-1 row-first row-last -->  
<!-- class=col-1 col-first -->  
<!-- class=view-field view-field-title --> <!-- class=field-content -->  
<!-- class=view-field view-field-uc-product-image -->  
<!-- class=field-content -->  
<!-- href=/yellowleather/products/shoes/cafya-leather-shoes -->  
</!-- -->  
<!-- class=view-field view-field-display-price --> <!-- class=view-label view-label-display-price -->  
</!-- -->  
<!-- class=col-2 -->  
<!-- class=view-field view-field-title --> <!-- class=field-content -->  
<!-- class=view-field view-field-uc-product-image -->  
<!-- class=field-content -->  
<!-- href=/yellowleather/products/belts/embossed-spread-vintage-belt -->  
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Build The image

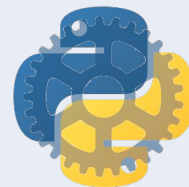
Base Image Decision:

- Base Image: **Alpine-python**
 - Python only program
 - Small (Fast start, Light storage)
 - Few dependencies
 - Well maintained
- Packaging: **Wheel (whl) file**
 - Python only program
 - Simple install, handling dependencies



Build The image

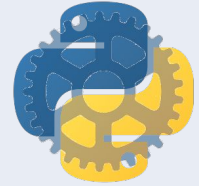
Dockerfile: Layer 1 - The Builder



```
FROM python:3.9.5-alpine3.13 AS builder
RUN apk add --no-cache build-base
RUN addgroup -g 1000 -S python \
    && adduser -u 1000 -S python -G python
ENV PYTHONUNBUFFERED=1
COPY ./src /code/src
COPY setup.py /code
COPY README.md \
    /code
RUN chown -R python:python /code
WORKDIR /code
USER python
RUN python setup.py bdist_wheel
```

Build The image

Dockerfile: Layer 2 - The Runner



```
FROM python:3.9.5-alpine3.13
ENV PATH="${PATH}:/app/bin" PYTHONPATH="/app"
RUN mkdir -p /app/job_logs && mkdir /run/lock
COPY --from=builder /code/dist/*.whl /packages/
RUN apk update \
    && apk upgrade \
    && apk add --no-cache --virtual .build-deps \
    libffi \
    openssl \
    && /usr/local/bin/python -m pip install --upgrade pip \
    && pip install --upgrade --target /app /packages/*.whl \
    && rm -rf /root/.cache/pip/* \
    && apk --purge del .build-deps
LABEL maintainer="John Stile <jstile@lbl.gov>" version="0.1"
CMD /bin/bash
```

Package Image

Build -> Ship -> Import



Package Image

Build -> Ship -> Import

Ensure the Podman user socket is available

```
systemctl --user enable --now podman.socket  
systemctl --user status podman.socket
```



Package Image

Build -> Ship -> Import

Ensure the Podman user socket is available

```
systemctl --user enable --now podman.socket  
systemctl --user status podman.socket
```

Build, tag, push

```
podman build . -f Dockerfile --tag "${IMG_NAME}:${NOW}"  
podman push --format=docker "${IMG_REPO}/${IMG_NAME}:${NOW}"  
podman search --list-tags "${IMG_REPO}/${IMG_NAME}"
```



Package Image

Build -> Ship -> Import

Ensure the Podman user socket is available

```
systemctl --user enable --now podman.socket  
systemctl --user status podman.socket
```

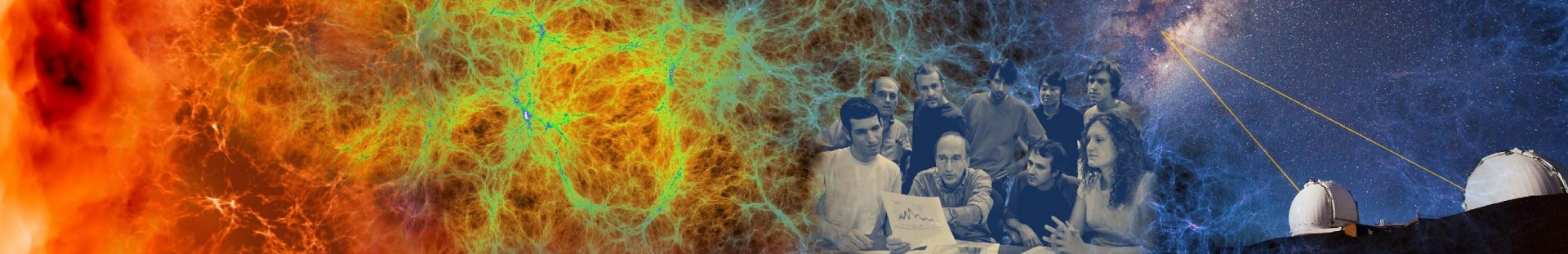
Build, tag, push

```
podman build . -f Dockerfile --tag "${IMG_NAME}:${NOW}"  
podman push --format=docker "${IMG_REPO}/${IMG_NAME}:${NOW}"  
podman search --list-tags "${IMG_REPO}/${IMG_NAME}"
```

Copy image between external and shasta repos

```
skopeo sync --src docker --dest docker \  
"${IMG_REPO}/${IMG_NAME}:${NOW}" \  
"${SHASTA_IMG_REPO}/nersc/${IMG_NAME}:${NOW}"
```





Project Plan:

Write
Program

Package
in
Image

**Specify
Image In
K8S Object**

Specify
K8S Object
Helm Chart

Wrap
Helm Chart
in
Loftsman
Project

Deploy Image in Kubernetes

Deployment Decision:

- Helm Chart Objects:

CronJob

: Python runs periodically

ConfigMap

: Machine specific vars

- Namespace:

services

- External Dependencies

secret: admin-client-auth

: Slingshot API Credentials

secret: loki-user

: Loki API Credentials



Deploy Image in Kubernetes

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Deploy Image in Kubernetes

Deployment Decision:

- Helm Chart Objects:

CronJob

: Python runs periodically

ConfigMap

: Machine specific vars

- Namespace:

services

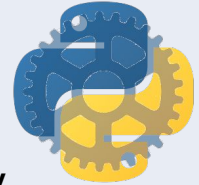
- External Dependencies

secret: admin-client-auth

: Slingshot API Credentials

secret: loki-user

: Loki API Credentials



Deploy Image in Kubernetes

Deployment Decision:

- Helm Chart Objects:

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: Machine specific vars

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services

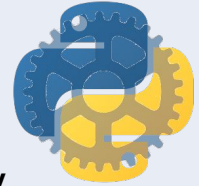
- External Dependencies

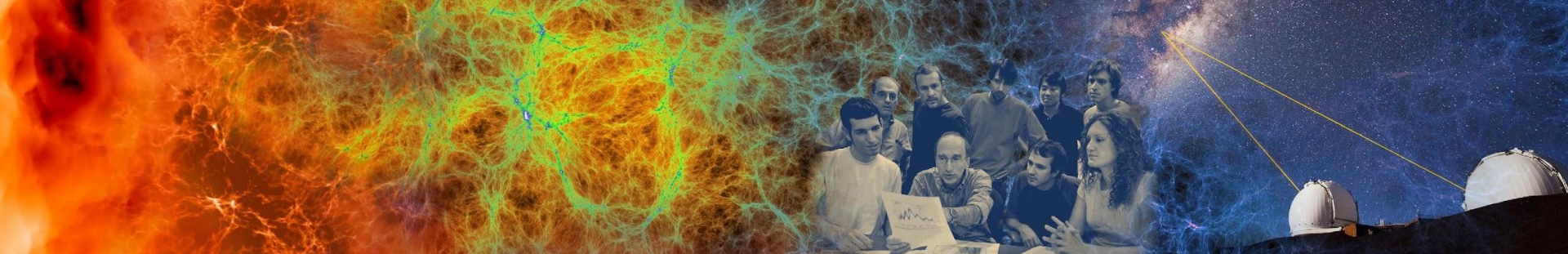
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: Slingshot API Credentials

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Project Plan:

Write
Program

Package
in
Image

Specify
Image In
K8S Object

**Specify
K8S Object
Helm Chart**

**Wrap
Helm Chart
in
Loftsman
Project**

Deploy Image

loftsman

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```
<!-- class=row-1 row-first row-last -->
<td class=col-1 col-first>
  <div class=view-field view-field-title> <span class=field-content> <a href=/yellowleather/products/shoes/cafya-leather-shoes?color=yellow> Cafya Leather Shoes </a>
  <div class=view-field view-field-uc-product-image>
    <div class=field-content>
      <a href=/yellowleather/products/shoes/cafya-leather-shoes?color=yellow> Cafya Leather Shoes </a>
    </div>
  </div>
  <div class=view-field view-field-display-price> <span class=view-label view-label-display-price> $119.99 </span>
  </div>
</td>
<td class=col-2>
  <div class=view-field view-field-title> <span class=field-content> <a href=/yellowleather/products/belts/embossed-spread-wing-cglo-belt?color=yellow> Embossed Spread Wing Cglo Belt </a>
  <div class=view-field view-field-uc-product-image>
    <div class=field-content>
      <a href=/yellowleather/products/belts/embossed-spread-wing-cglo-belt?color=yellow> Embossed Spread Wing Cglo Belt </a>
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  </div>
</td>
<td class=col-3 col-last>
  <div class=view-field view-field-title> <span class=field-content> <a href=/yellowleather/products/hats/leather-hat?color=yellow> Leather Hat </a>
  <div class=view-field view-field-uc-product-image>
    <div class=field-content>
      <a href=/yellowleather/products/hats/leather-hat?color=yellow> Leather Hat </a>
    </div>
  </div>
  <div class=view-field view-field-display-price> <span class=view-label view-label-display-price> $119.99 </span>
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```

Deploy Image

loftsmann

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```
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  <div class=view-field view-field-title> <span class=field-content> <!--
  <div class=view-field view-field-uc-product-image>
    <div class=field-content>
      <!-- href=/yellowleather/products/shoes/cafya-leather-shoes?color=yellow
    </div>
  </div>
  <div class=view-field view-field-display-price> <span class=view-label view-label-display-price>
  </div>
</td>
<td class=col-2>
  <div class=view-field view-field-title> <span class=field-content> <!-- href=/yellowleather/products
  <div class=view-field view-field-uc-product-image>
    <div class=field-content>
      <!-- href=/yellowleather/products/belts/embossed-spread-vin-cglo-belt?color=black
    </div>
  </div>
  <div class=view-field view-field-display-price> <span class=view-label view-label-display-price>
  </div>
</td>
<td class=col-3 col-last>
  <div class=view-field view-field-title> <span class=field-content> <!-- href=/yellowleather/products
  <div class=view-field view-field-uc-product-image>
    <div class=field-content>
      <!-- href=/yellowleather/products/hats/leather-hat?color=yellow
    </div>
  </div>
  <div class=view-field view-field-display-price> <span class=view-label view-label-display-price>
  </div>
</td>
```

Deploy Image

loftsman

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<!-- class=row-1 row-first row-last -->
<!-- class=col-1 col-first -->
<!-- class=view-field view-field-title --> <!-- class=field-content --> <!-- href=/yellowleather/products/shoes/ -->
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<!-- class=field-content -->
<!-- href=/yellowleather/products/shoes/ -->
</div>
</div>
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<!-- class=field-content -->
<!-- href=/yellowleather/products/hats/leather-hat -->
</div>
</div>
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</div>
</div>
```

Deploy Image

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<!-- class=row-1 row-first row-last -->
<td class=col-1 col-first>
  <div class=view-field view-field-title> <span class=field-content> <a href=/yellowleather/products/shoes/cafya-leather-shoes?cg=types&f=last-image> cafya-leather-shoes </a>
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  <div class=view-field view-field-title> <span class=field-content> <a href=/yellowleather/products/hats/leather-hat?cg=types&f=last-image> leather-hat </a>
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<!-- class=row-1 row-first row-last -->
<id class="col-1 col-first" -->
  <div class="view-field view-field-title" <!-- class="field-content" --> <!-- href="/yellowleather/products/shoes/cafya-leather-shoes" type="text/html" --> </div>
  <div class="view-field view-field-uc-product-image" -->
    <div class="field-content" -->
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    </div>
  </div>
  <div class="view-field view-field-display-price" <!-- class="view-label view-label-display-price" -->
  </div>
</id>
<id class="col-2" -->
  <div class="view-field view-field-title" <!-- class="field-content" --> <!-- href="/yellowleather/products/belts/embossed-spread-vintage-belt" type="text/html" -->
  <div class="view-field view-field-uc-product-image" -->
    <div class="field-content" -->
      <!-- href="/yellowleather/products/belts/embossed-spread-vintage-belt" type="text/html" -->
    </div>
  </div>
  <div class="view-field view-field-display-price" <!-- class="view-label view-label-display-price" -->
  </div>
</id>
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  <div class="view-field view-field-title" <!-- class="field-content" --> <!-- href="/yellowleather/products/hats/leather-hat" type="text/html" -->
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loftsman

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<!-- href=/yellowleather/products/hats/leather-hat -->
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</div>
</div>
```


Deploy Image

loftsmann

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```
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<!-- class=row-1 row-first row-last -->
<td class=col-1 col-first>
  <div class=view-field view-field-title> <span class=field-content> <a href=/yellowleather/products/shoes/cafya-leather-shoes?color=yellow> Cafya Leather Shoes </a>
  <div class=view-field view-field-uc-product-image>
    <div class=field-content>
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  <div class=view-field view-field-title> <span class=field-content> <a href=/yellowleather/products/belts/embossed-spread-wing-cglo-belt?color=yellow> Embossed Spread Wing Cglo Belt </a>
  <div class=field-content>
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  </div>
</td>
```

Deploy Image

Deploy Helm Chart:

```
loftsman manifest validate {manifest_path}
```

```
helm lint {chart_path}
```

```
helm dependency update {chart_path}
```

```
helm package {chart} --destination {tmp_dir}
```

```
loftsman ship -l
```

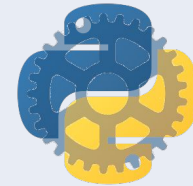
```
-manifest-path {manifest_path} \
```

```
--charts-path {tmp_dir}
```

```
<!-- class=row-1 row-first row-last -->
<!-- class=col-1 col-first -->
<!-- class=view-field view-field-title --> <!-- class=field-content --> <!-- href=/yellowleather/products/shoes/ -->
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</div>
</div>
```

Side Note: test_pod.yaml

```
apiVersion: v1
kind: Pod
metadata:
  name: fabric-manager-monitor-development
  namespace: services
spec:
  containers:
  - image: registry.local/<img>:<tag>
    name: fabric-manager-monitor-test-container
    imagePullPolicy: IfNotPresent
    args:
    - /bin/sh
    - -c
    - while [ 1 ]; do sleep 10; done
    env:
    - name: CLUSTERNAME
      valueFrom:
        configMapKeyRef:
          name: fabric-manager-monitor-test-cm
    volumeMounts:
    - name: fabric-manager-monitor-test-config
      mountPath: /shasta_config
  volumes:
  - name: fabric-manager-monitor-test-config
    configMap:
      name: fabric-manager-monitor-test-cm
```



Test/Debug: Run

Create -> Test -> Delete

Create:

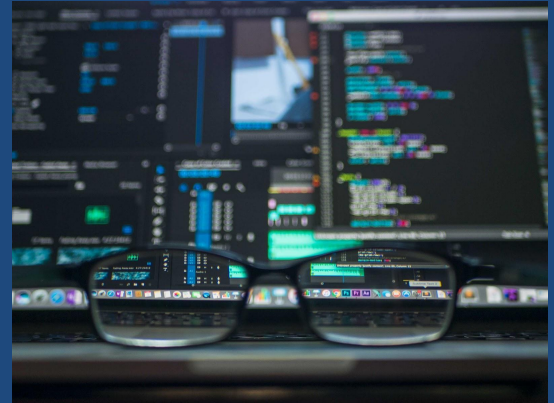
```
kubectl create -f test_pod.yaml
```

Test:

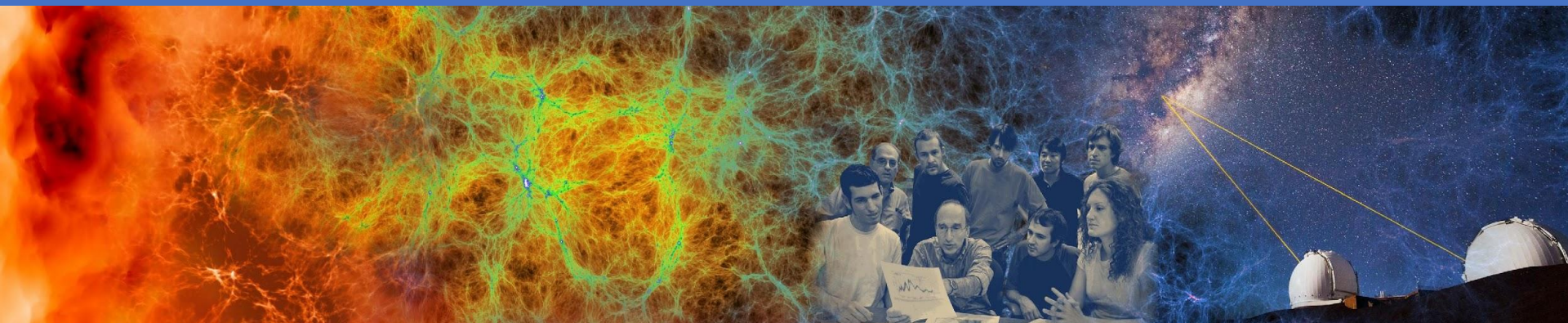
```
kubectl -n services \  
  exec -it \  
fabric-manager-monitor-test-container \  
  - /bin/ash
```

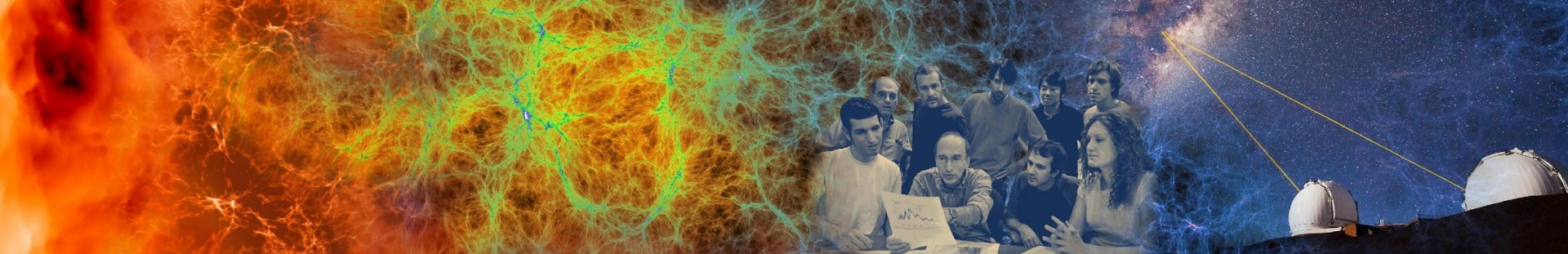
Delete:

```
kubectl delete -f test_pod.yaml
```

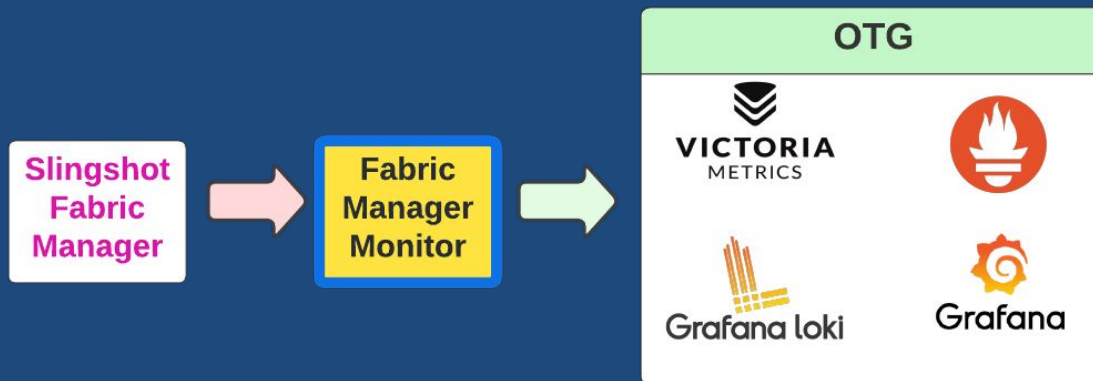


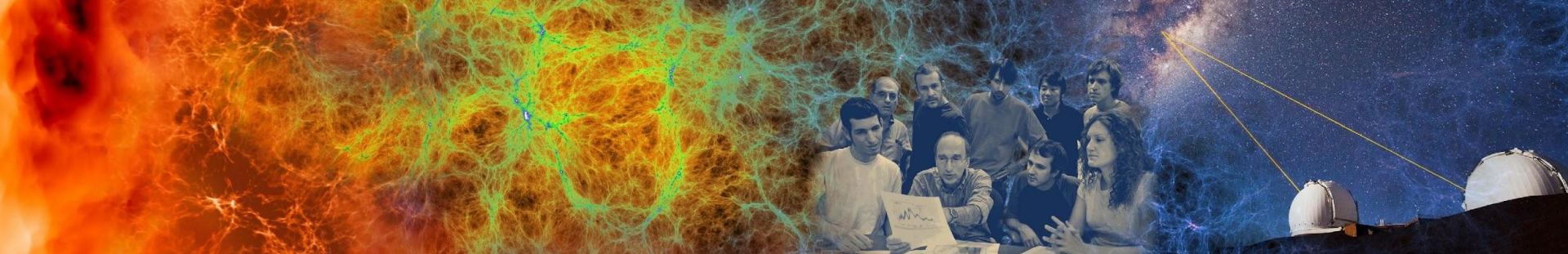
Data Presentation and Alerts





Data Flows to OTG Services





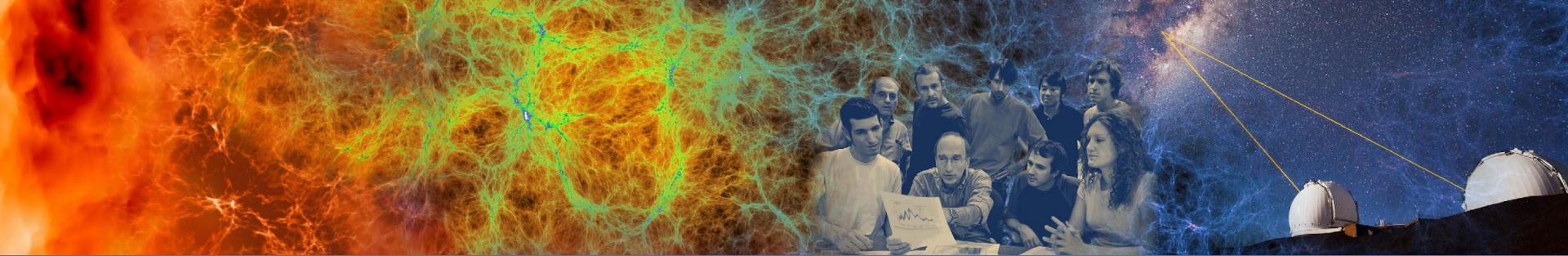
Data Storage:

Numeric data ->



Log data ->





Numeric data in Victoria Metrics



fm_status_configuration	Healthy, Warning, Critical, Unknown
fm_status_runtime	...
fm_status_traffic	...
fm_status_api	...
fm_switch_offline	List of xnames
fm_flap_state_port	List of xnames
fm_flap_edge_port	List of xnames

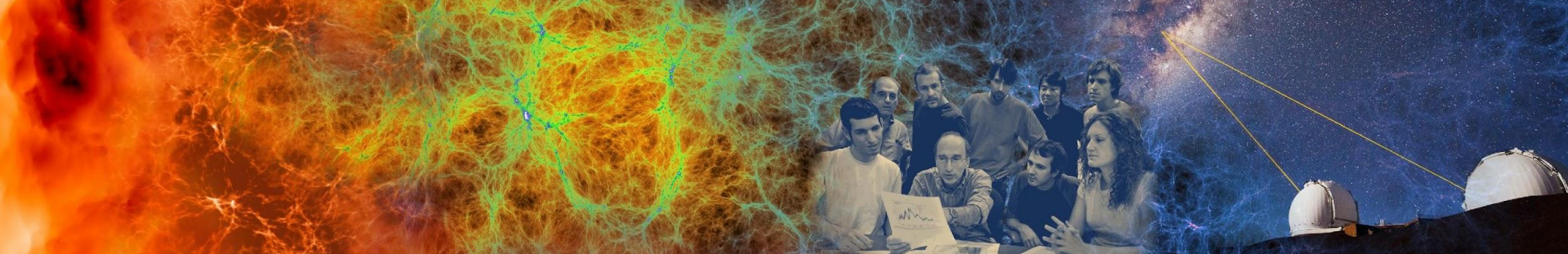


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String data in Loki



Stream:

```
cluster_name  
app : fabric_manager_monitor
```

Values:

```
t_stamp,  
log_level,  
switch_time,  
xname,  
description
```

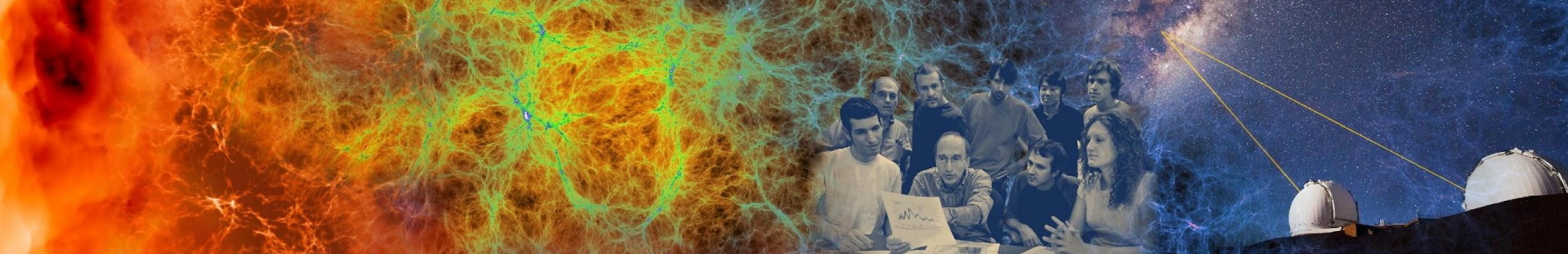


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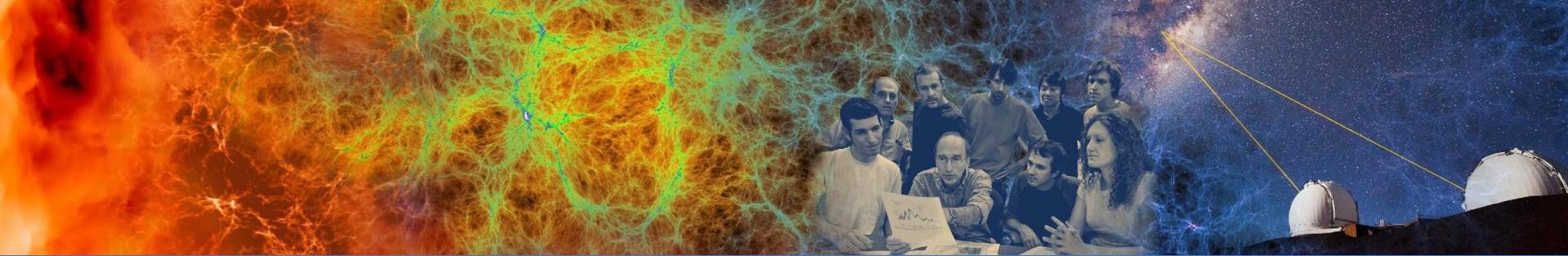
Alerts:

VictoriaMetrics rules set in vmalert,
alerting done by **alertmanager**

Loki rules are in Loki,
alerting done by **alertmanager**

Example: FMSwitchOfflineDetected
uses Loki

```
Shasta-alerter APP 15:35
[FIRING:1] FMSwitchOfflineDetected
Grafana
Alert: - critical
Description:
Details:
  • alertname: FMSwitchOfflineDetected
  • alert_type: loki
  • cluster: alvarez
  • problem: fm_switch_offline
  • production: true
  • rule_editor: siqideng
  • severity: critical
  • state: UNKNOWN
  • xname: xl302c0r3b0
Show less
```



Current challenge:
Visualize the data



Represent Data:

fabric health not numeric:

Healthy,

Warning,

Critical,

Unknown

PromQL wants numeric data



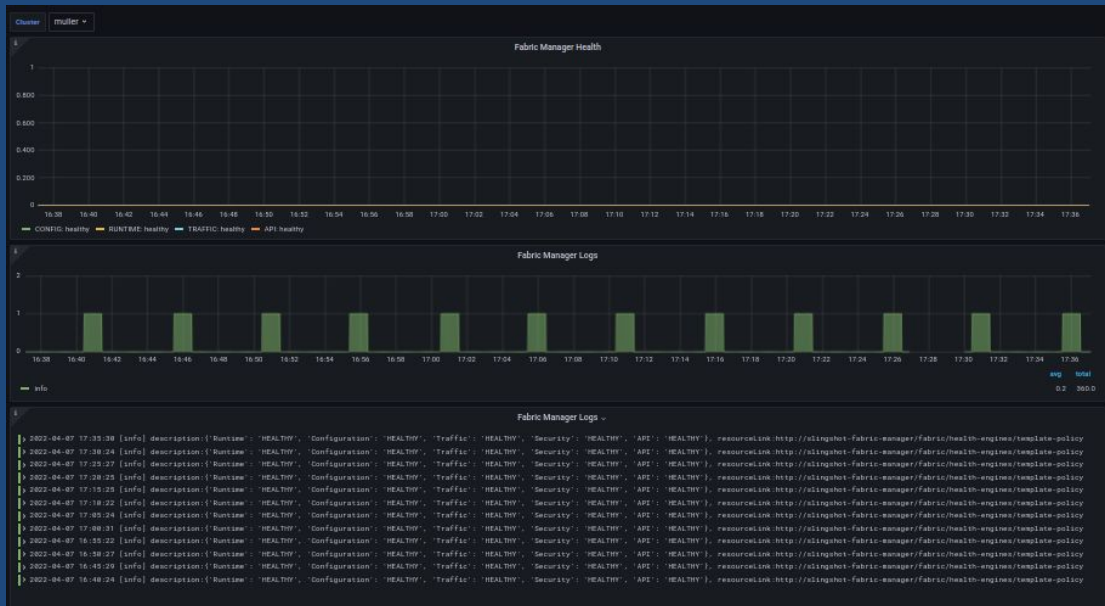
Visualize the data

First Attempt Dashboard:

Top Chart:

- FM Health:
- Ports (Edge, Fabric)
- Switches

Any mark on the top chart is bad



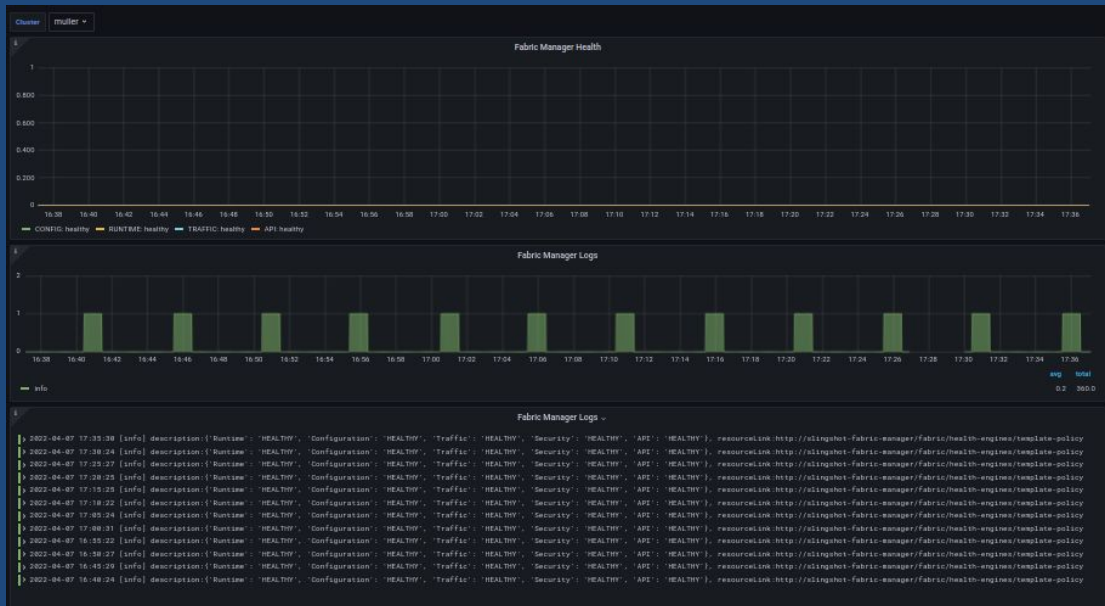
Visualize the data

First Attempt Dashboard:

Middle Chart:

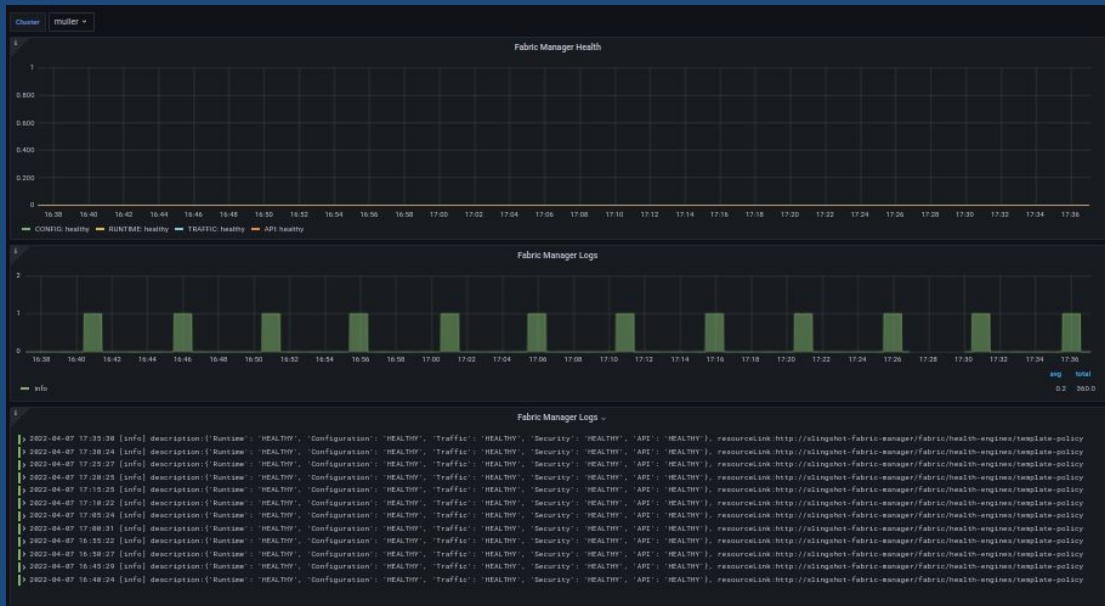
- Loki logs, as bar chart
- Color by Log Level
- Levels: Info, warning, critical

Shows trends in Log type



Visualize the data

First Attempt Dashboard:



Bottom Chart:

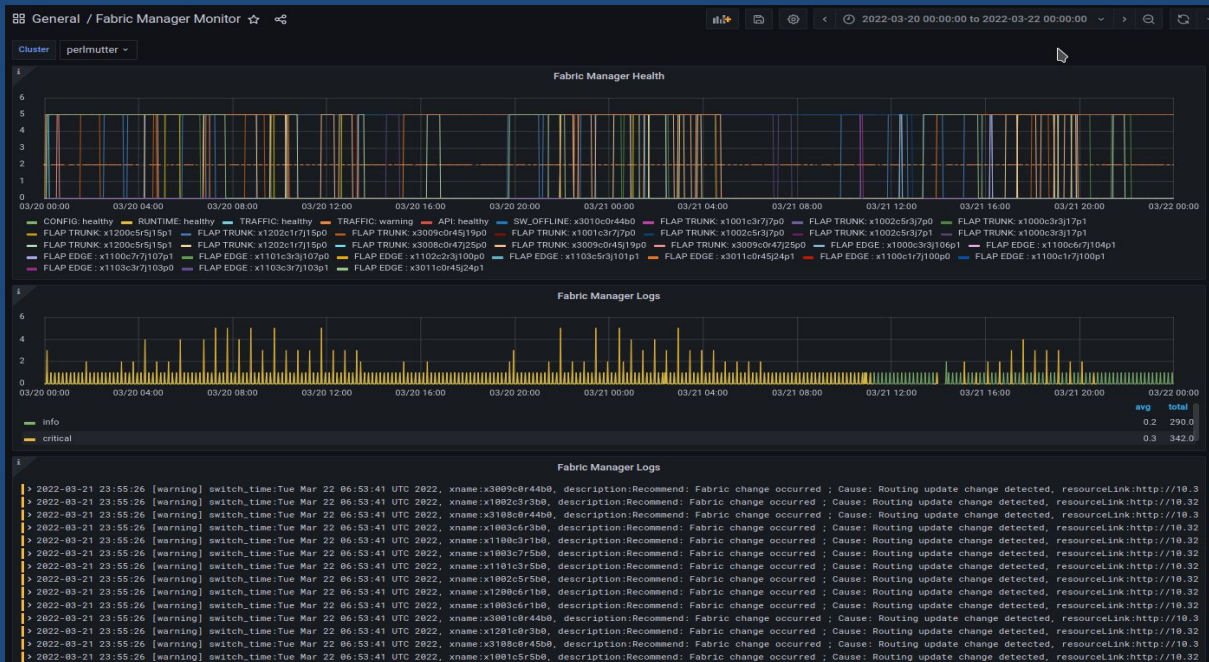
- Loki logs
FM REST API Text
Messages from the FMM

When Metrics are enough, Words Help



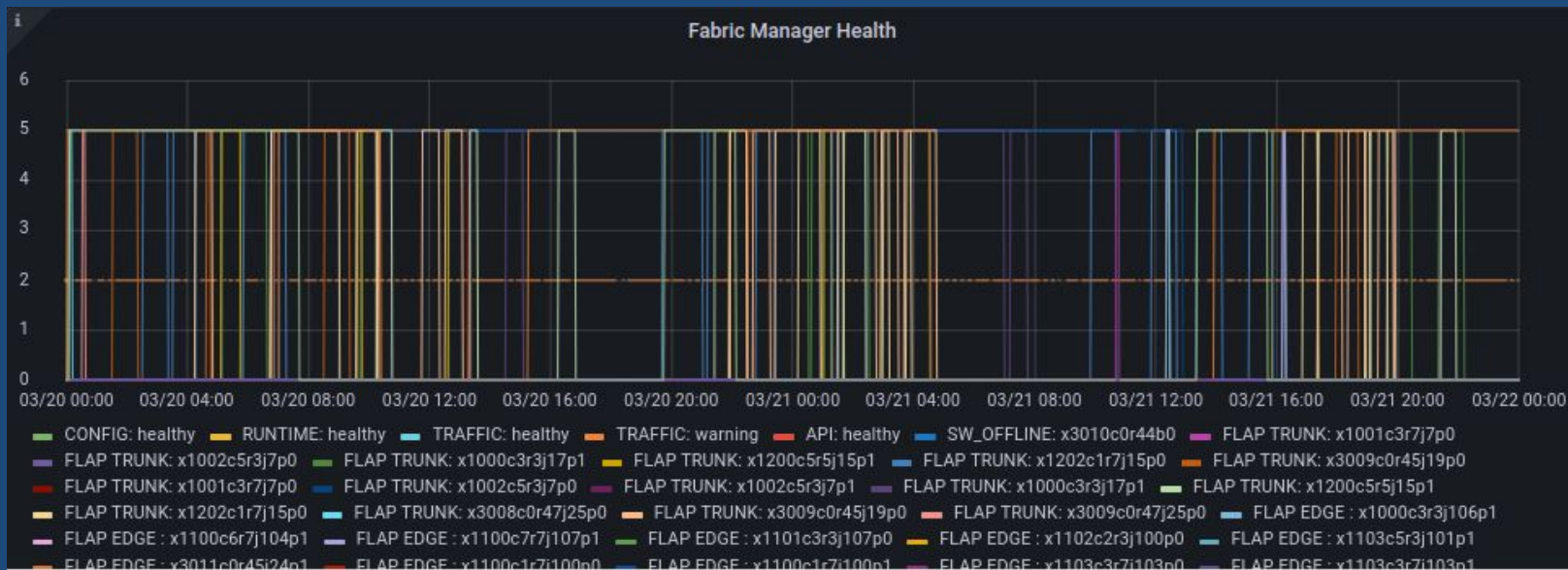
Visualize the data

Unhappy Fabric: Closer Look



Visualize the data

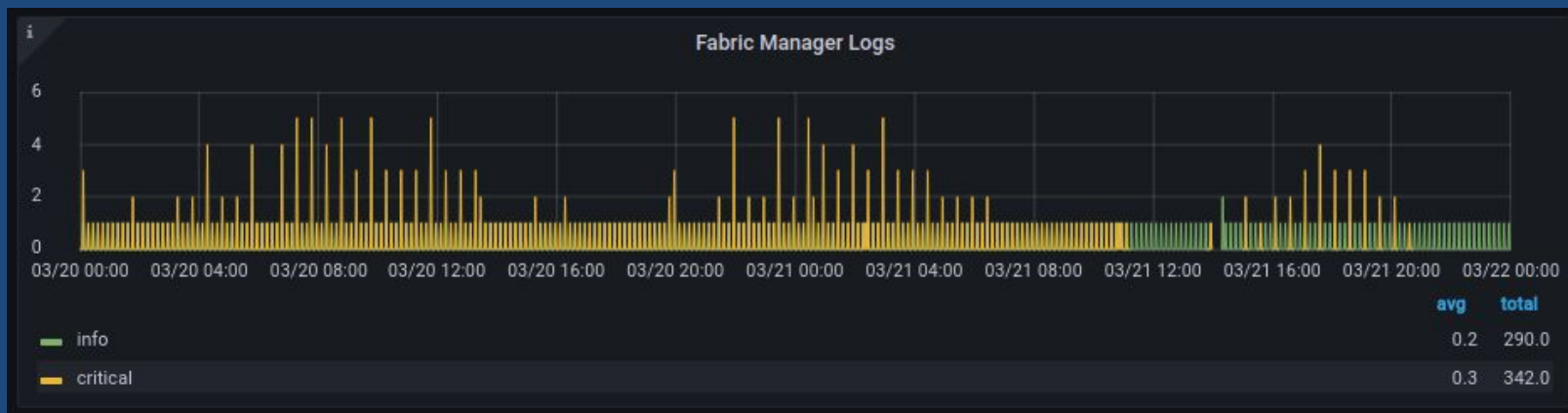
Unhappy Fabric: Closer Look



Visualize the data

Unhappy Fabric: Closer Look

Frequency of messages show something has been happening for a while



Visualize the data

Unhappy Fabric: Closer Look

Frequency of messages show something has been happening for a while

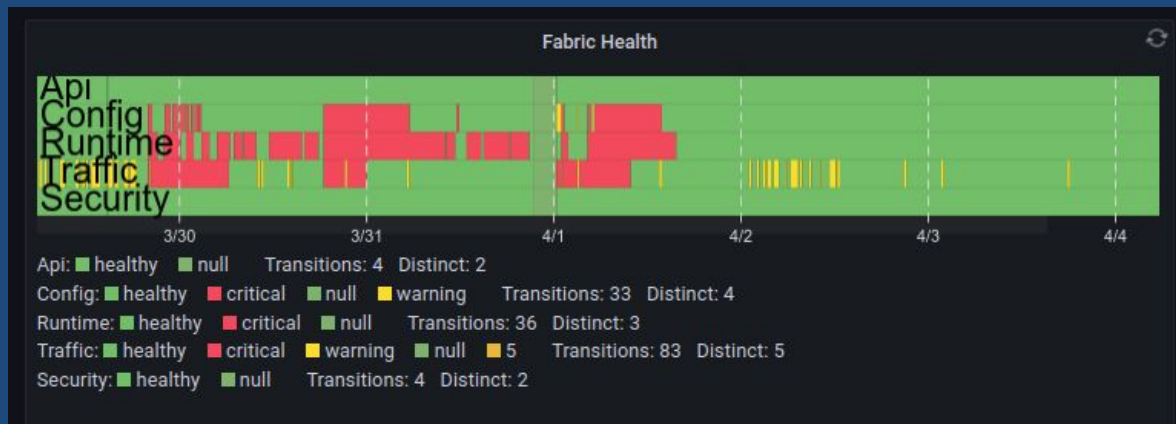
```
“Check on error reading Firmware Version from Switch ; Cause: Switch firmware read failure: Connection reset by peer, resourceLink:http://10.38.128.51:8000/fabric/agents/x1202c0r3b”
```

```
i
Fabric Manager Logs
> 2022-03-21 23:55:26 [warning] switch_time:Tue Mar 22 06:53:41 UTC 2022, xname:x3009c0r44b0, description:Recommend: Fabric change occur
> 2022-03-21 23:55:26 [warning] switch_time:Tue Mar 22 06:53:41 UTC 2022, xname:x1002c3r3b0, description:Recommend: Fabric change occurre
> 2022-03-21 23:55:26 [warning] switch_time:Tue Mar 22 06:53:41 UTC 2022, xname:x3108c0r44b0, description:Recommend: Fabric change occur
> 2022-03-21 23:55:26 [warning] switch_time:Tue Mar 22 06:53:41 UTC 2022, xname:x1003c6r3b0, description:Recommend: Fabric change occurre
> 2022-03-21 23:55:26 [warning] switch_time:Tue Mar 22 06:53:41 UTC 2022, xname:x1100c3r1b0, description:Recommend: Fabric change occurre
> 2022-03-21 23:55:26 [warning] switch_time:Tue Mar 22 06:53:41 UTC 2022, xname:x1003c7r5b0, description:Recommend: Fabric change occurre
> 2022-03-21 23:55:26 [warning] switch_time:Tue Mar 22 06:53:41 UTC 2022, xname:x1101c3r5b0, description:Recommend: Fabric change occurre
> 2022-03-21 23:55:26 [warning] switch_time:Tue Mar 22 06:53:41 UTC 2022, xname:x1003c5r5b0, description:Recommend: Fabric change occurre
```

Visualize the data

Second attempt at Health:

“Discrete” Visualization has Maps



Mappings

Value Mappings

x	0	→	healthy
x	2	→	warning
x	3	→	critical
x	1	→	unk

+Add a value mapping

Color Mappings

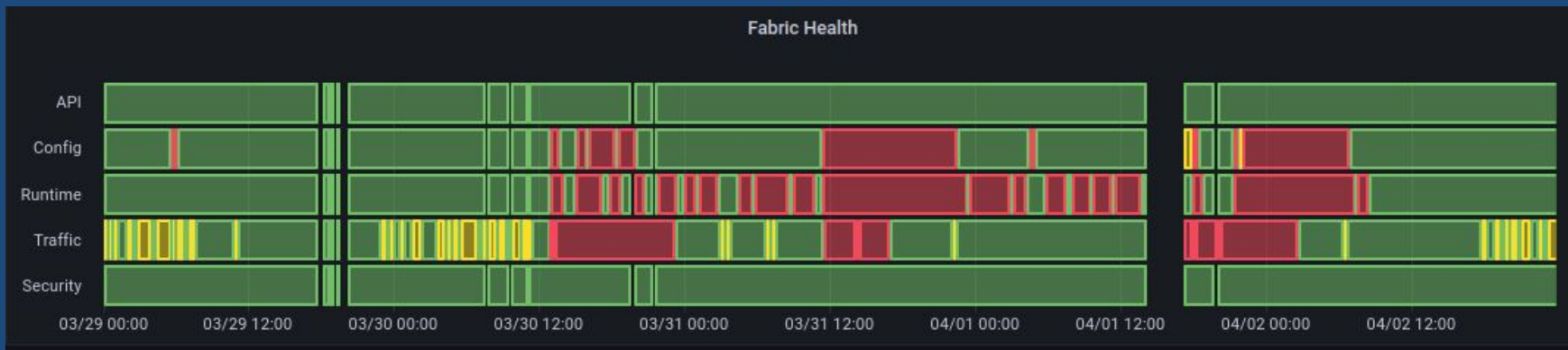
x	healthy	→	#73BF69	●
x	warning	→	#FAE2A	●
x	critical	→	#F2495C	●
x	unk	→	#ccccdc	●

+Add a Color mapping +Add Current Values

Visualize the data

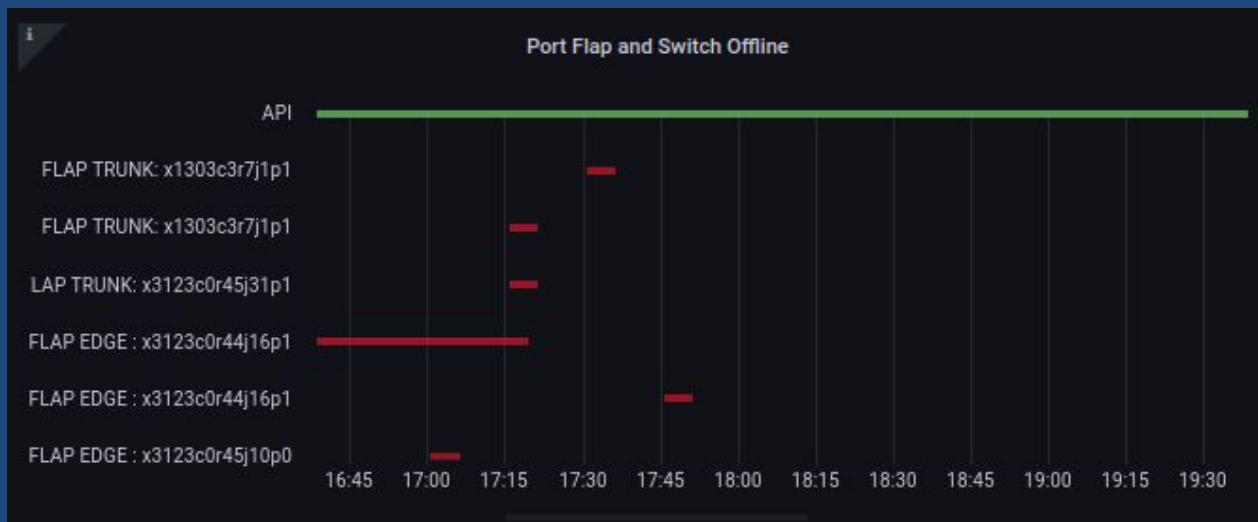
Third attempt at Health:

“**State Timeline**” Visualization also has Maps



Visualize the data

Problem displaying Switch Offline and Port Flaps
“**State Timeline**” Visualization to the rescue



Visualize the data

Overall status of ports and jacks

Standard “**Time Series**” does the job



Visualize the data

Current Dashboard

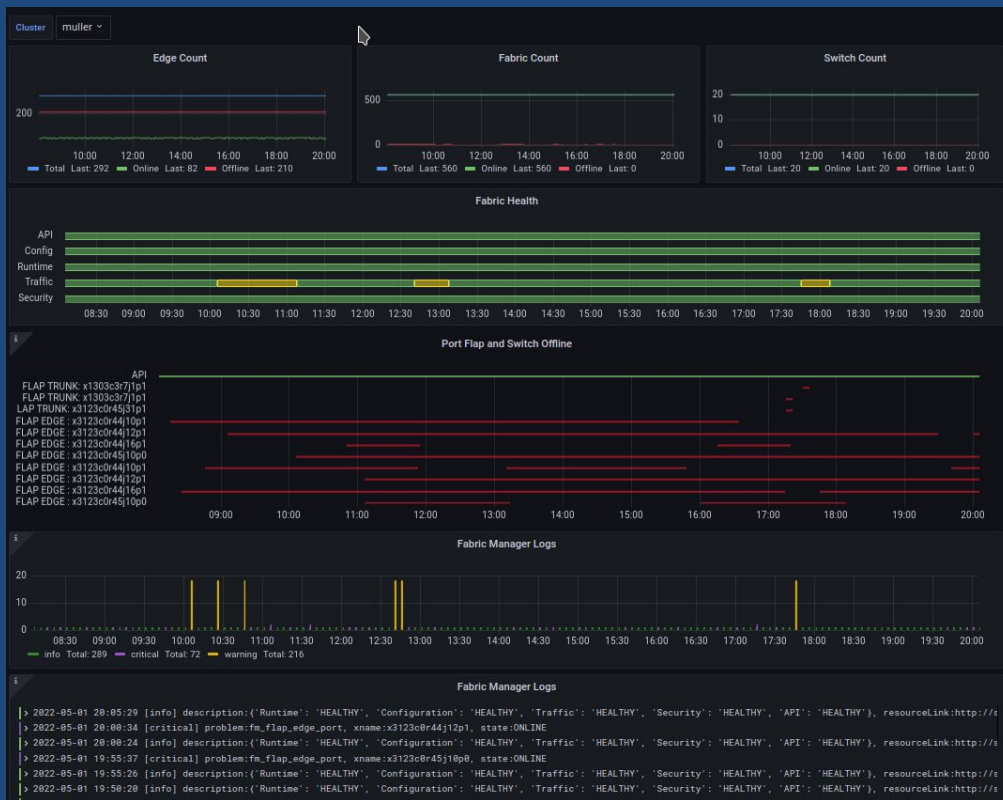
1st Chart: Count state of ports and jacks

2nd Chart: API, Config, Run, Traffic, Sec

3rd Chart: Port Flap and Switch Offline

4th Chart: Graph of loki logs

5th Chart: FM String stored in Loki



Visualize the data

Ongoing challenge: Long term problems:

Storing all port states in metric: slingshot_switch_ports

Table

Time	__name__	cluster	form	port_name	port_sti	port_t	switch_name	switch_	Value
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j2p0	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j2p1	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j4p0	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j4p1	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j6p0	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j6p1	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j8p0	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j8p1	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j9p0	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r1j9p1	ONLINE	fabric	x1000c0r1b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r3j2p0	ONLINE	fabric	x1000c0r3b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r3j2p1	ONLINE	fabric	x1000c0r3b0	ONLINE	1
2022-05-01 20:21:4...	slingshot_switch_p...	perlmutter	json	x1000c0r3j4p0	ONLINE	fabric	x1000c0r3b0	ONLINE	1

Visualize the data

Current challenge: use kafka data

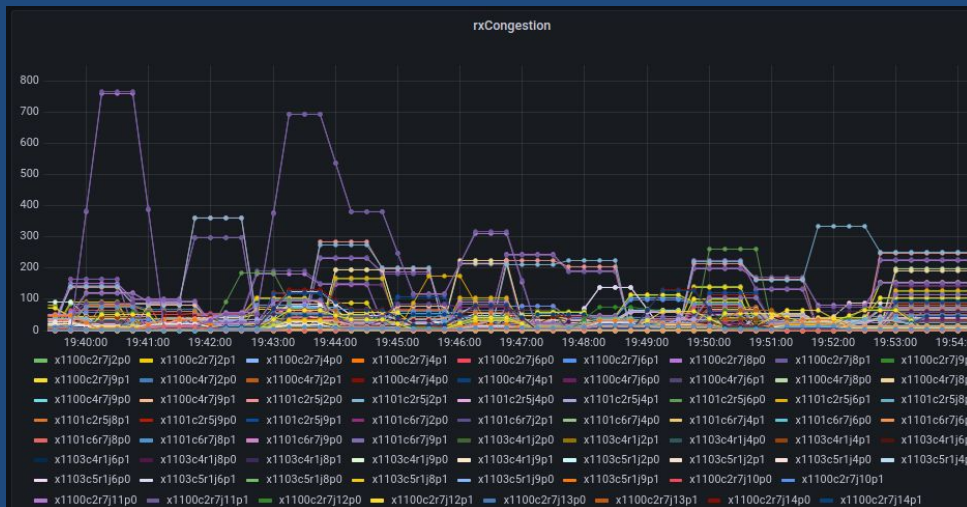
All our slingshot data is sent off to kafka, but how do we use it?

```
fmctl update /switch-telemetry/settings statistics.values=["3635"]
fmctl update /switch-telemetry/settings
collector.value=http://istio-ingressgateway.hmnlb
fmctl update /fabric/topology-policies/template-policy
fabricPropertyMap.SyslogServer=<IP OF SHASTA RSYSLOG>
fmctl get /fabric/topology-policies/template-policy --raw |jq -r
'.fabricPropertyMap.SyslogServer'
```

Visualize the data

Current challenge: use kafka data

This shows just one of the metrics:

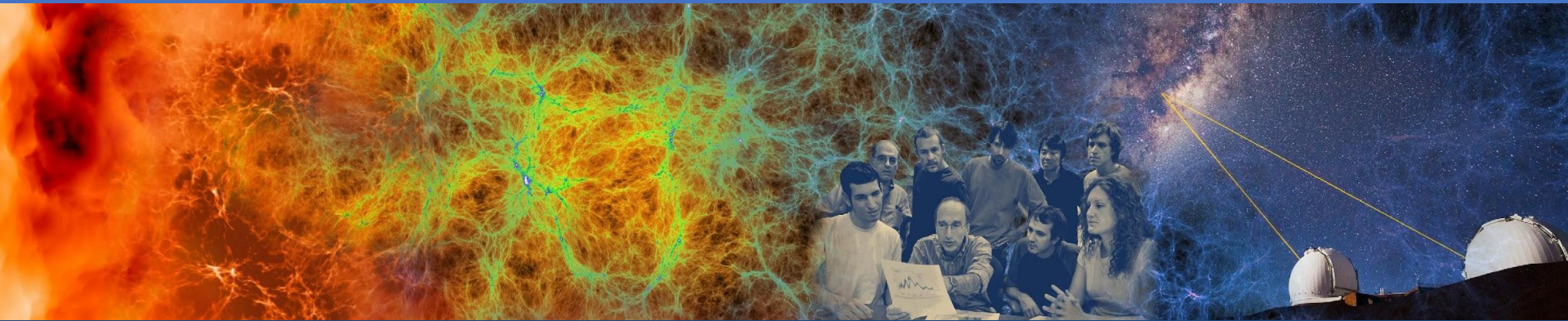


Conclusion:

To use an RESTful API requires a lot of plumbing.

Creating insight from metrics is an evolving endeavor

Fabric Manager RESTful API needs to provide actionable advice.



Questions?

