Monitoring and accounting in the INFN-Cloud infrastructure

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INFN Cloud monitoring

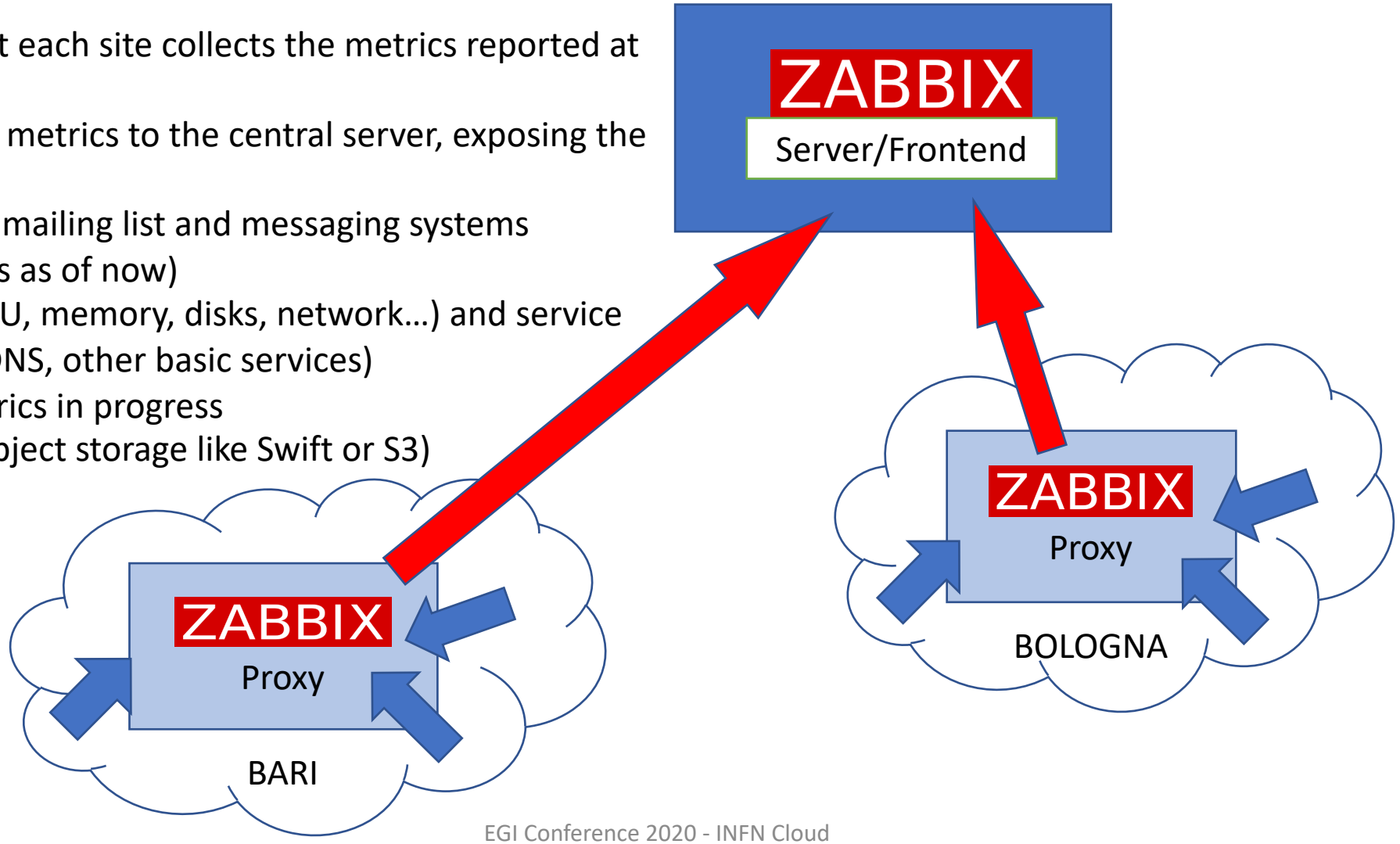
- INFN Cloud is born on top of an existing cloud (*backbone*) that federates ReCaS-BARI and CNAF
- The backbone is an autonomous *tightly coupled federation*
- Other sites can join the INFN Cloud (*loosely coupled*)
- The monitoring solution chosen for the INFN Cloud monitoring is Zabbix

Why Zabbix

- Robust, supported, mature, reliable, widely used, well documented
- A bit more complex than Nagios (if you only need alarms)
- Less expressive than Grafana
- Zabbix provides APIs
  - Grafana can behave as a Zabbix «dashboard/frontend»
  - Monitoring can be easily developed using simple JSON/RPC calls

Backbone monitoring architecture

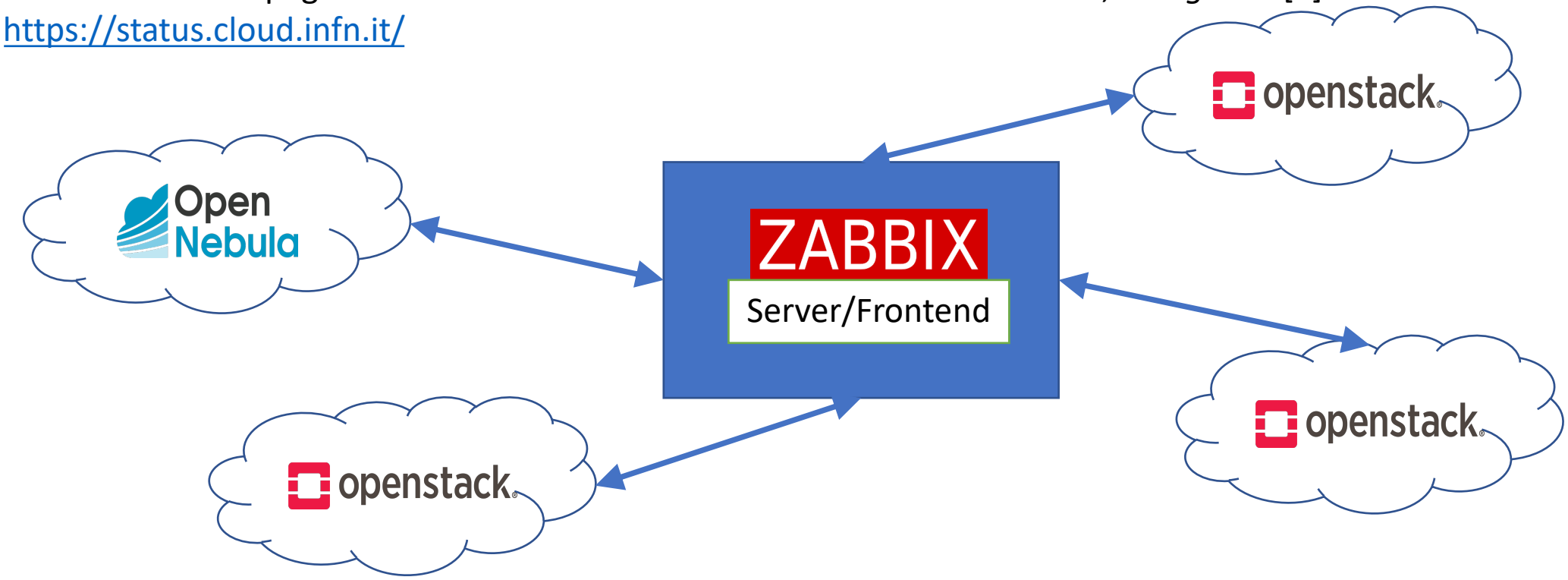
- A Zabbix proxy at each site collects the metrics reported at low level
- Proxies send the metrics to the central server, exposing the Zabbix frontend
- Notifications via mailing list and messaging systems (Microsoft Teams as of now)
- Host metrics (CPU, memory, disks, network…) and service metrics (CEPH, DNS, other basic services)
- Some other metrics in progress (i.e. backbone object storage like Swift or S3)



INFN Cloud monitoring architecture

- A separated instance of Zabbix exposed on the Internet
- Provides monitoring for
  - All the INFN Cloud PaaS «building blocks»
  - Federated clouds (i.e. VM cycle)
- The INFN Cloud status page shows the users the overall status of the federation, *at a glance*[*]
  - https://status.cloud.infn.it/

[*] basata su https://staytus.co/



Monitoring di INFN Cloud

1. INFN Cloud

Object Storage	Operational
Backbone - Cloud Compute (Bari)	Operational
Backbone - Cloud Compute (CNAF)	Operational
Authentication	Operational
Cloud Compute	Operational

https://status.cloud.infn.it/

Backbone

PaaS

5. PaaS services

Infrastructure Manager	Operational
Orchestrator	Operational
CPR	Operational
CMDB	Operational
Dashboard	Operational

Monitoring di INFN Cloud

2. Federated Cloud - CloudVeneto

CloudVeneto - Cloud Compute	Operational

3. Federated Cloud - ReCaS-Bari

RECAS-BARI – Cloud Compute	Operational

4. Federated Cloud - Cloud@CNAF

Cloud@CNAF - Cloud Compute	Operational

Status of a cloud that federates to INFN Cloud ➔ ***basis for the calculation of the Availability/Reliability of the federated site***

https://status.cloud.infn.it/

Monitoring the user level services

- When requested by the particular use case, by design monitoring is included in the deployment
  - Some use cases have it already
  - Working groups on Mesos,

Accounting

- Server based on RabbitMQ, APEL and Grafana
- Client basato su InfluxDB, collectd, cASO e APEL-SSM
- Status
  - Just tested at INFN-PADOVA (September ‘20), fully working
  - Installation in production happening now at backbone/CNAF

Accounting building blocks

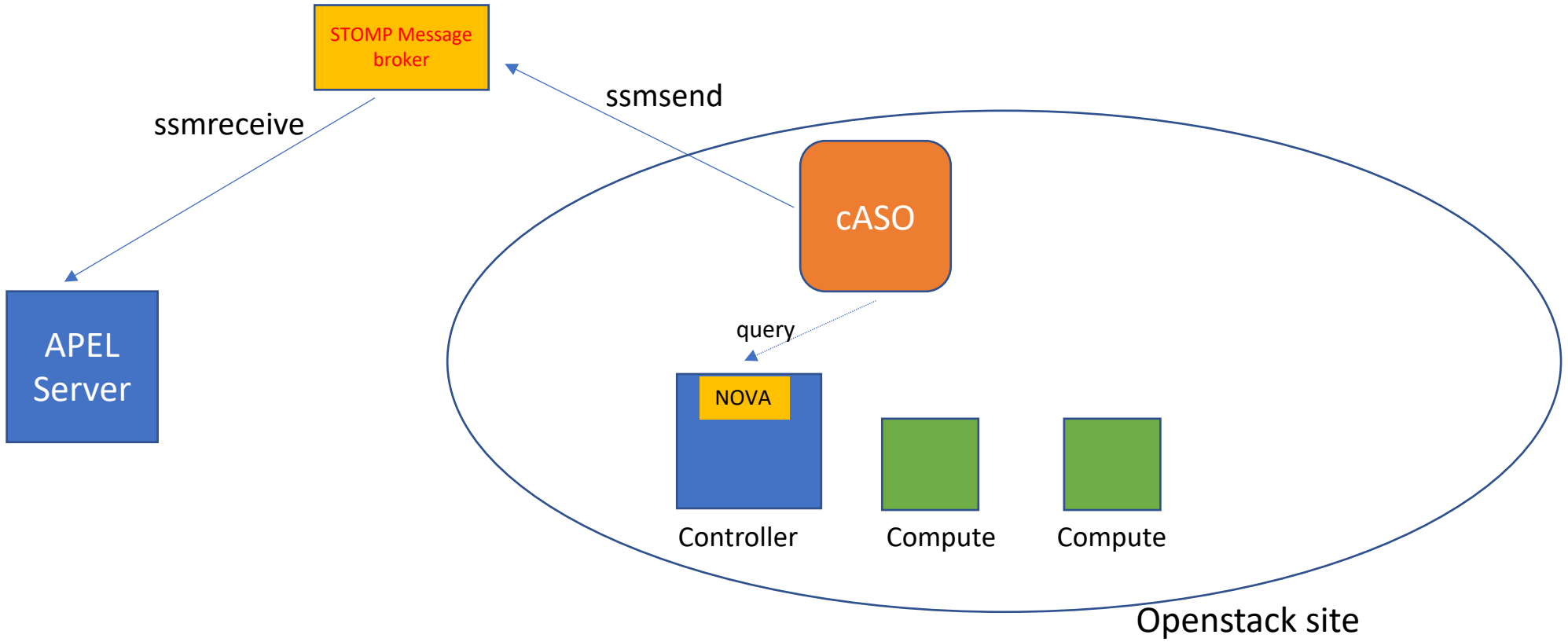
Metrics (wallclocktime, cputime, disk usage, etc.) based on the EGI Cloud Accounting Usage Record

cASO (for OpenStack), oneacct (for OpenNebula)

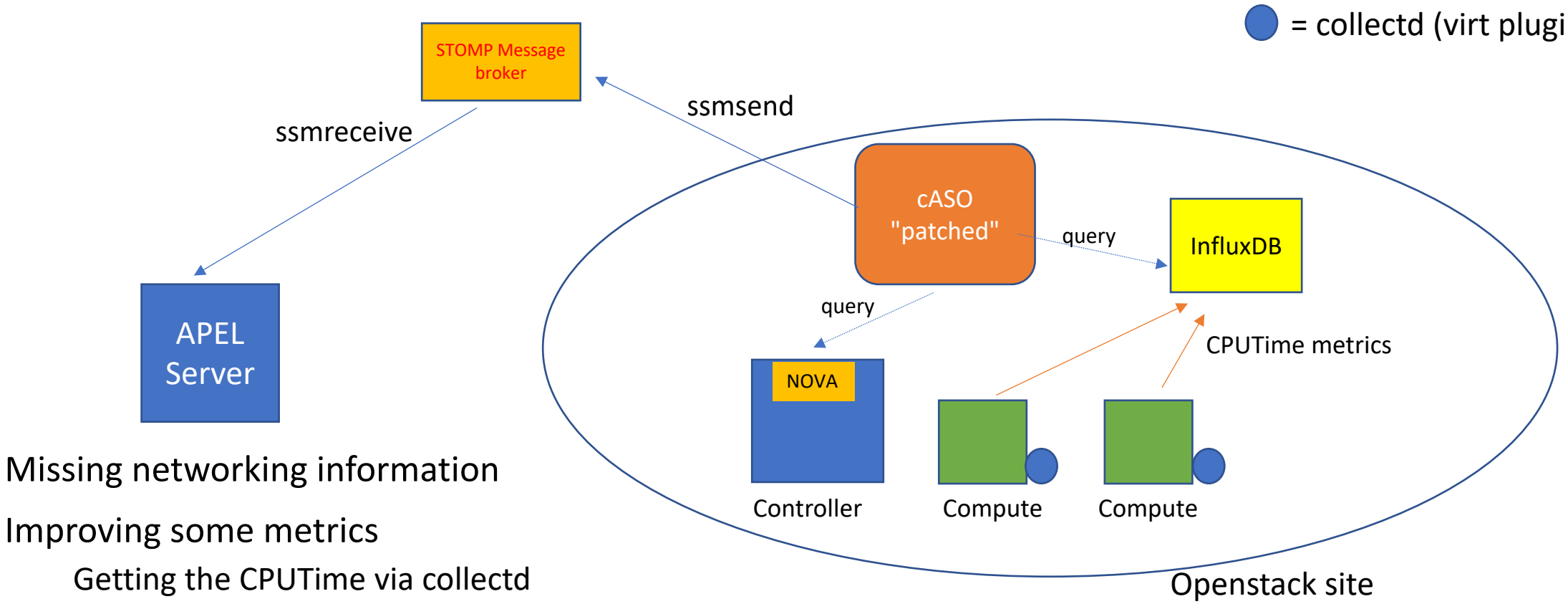
APEL tools *ssmsend*, *ssmreceive* (based on the STOMP protocol)

APEL server

Accounting original testbed



Accounting improved architecture

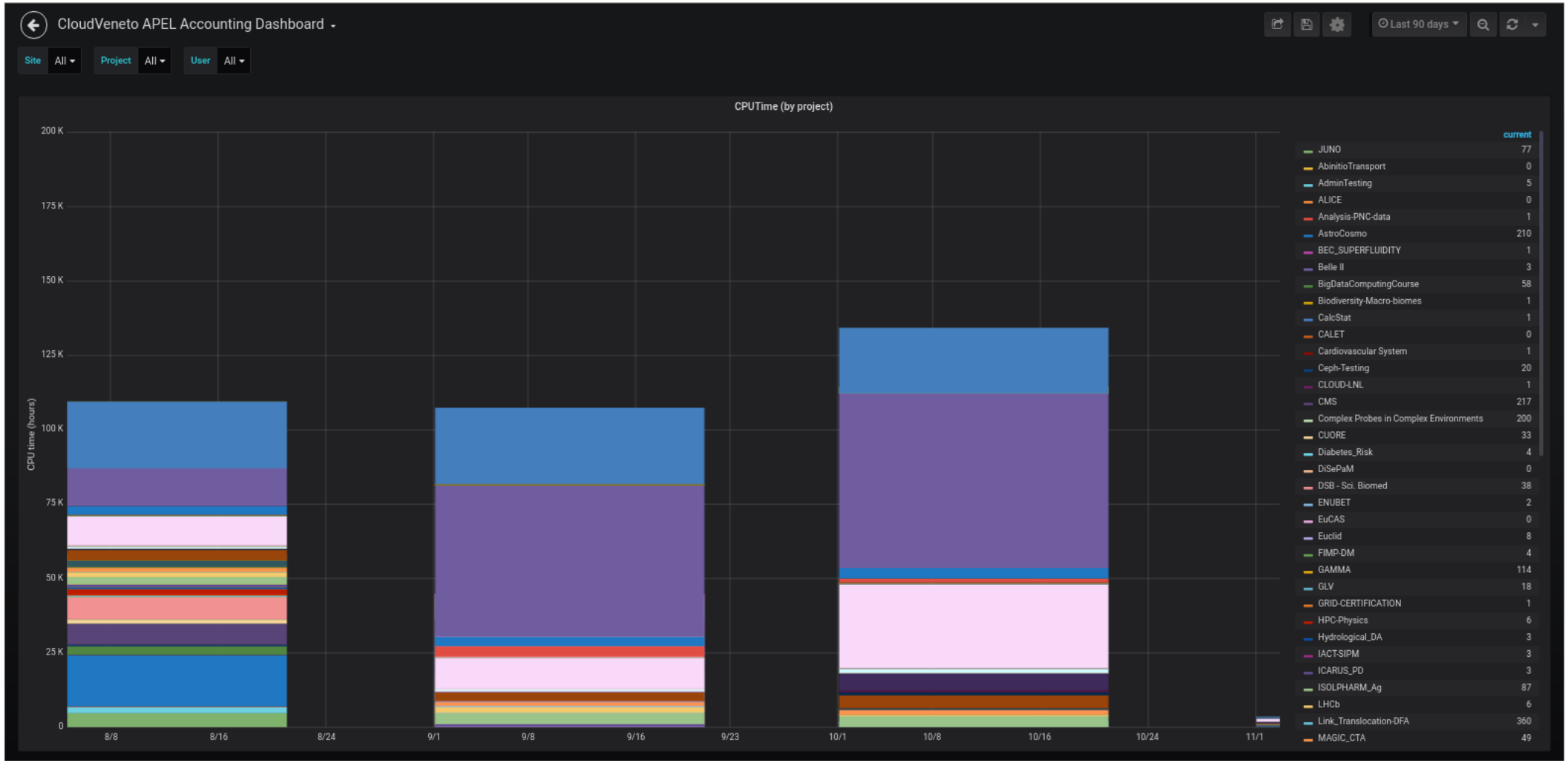


Missing networking information

Improving some metrics

Getting the CPUTime via collectd

Collectd on the CloudVeneto testbed



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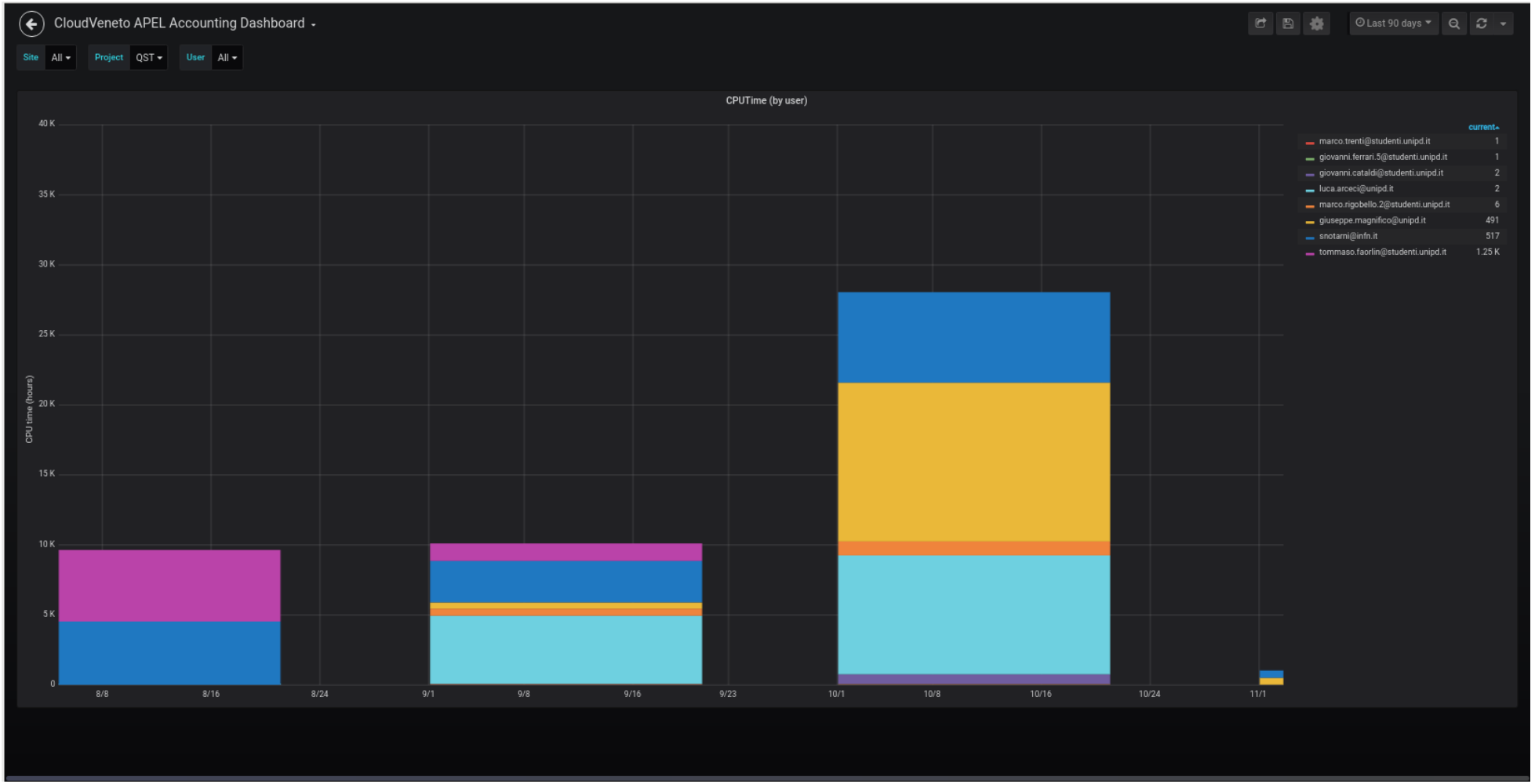

Plans and objectives

- Improve the **robustness** of the service
  - Zabbix HA implementation relying on frontend/server/DB replication
- Evaluate the Operational Level Agreement fulfilment with the federated clouds
  - Add and improve probes to allow testing of the federated clouds and their A/R evaluation
- Focus on embedding monitoring into the available deployments
  - All requiring use cases to bring monitoring into the deployment
  - Grafana to be used as common dashboard for the users, on top of Zabbix or Nagios (or stg else)