Offloading in CloudVeneto

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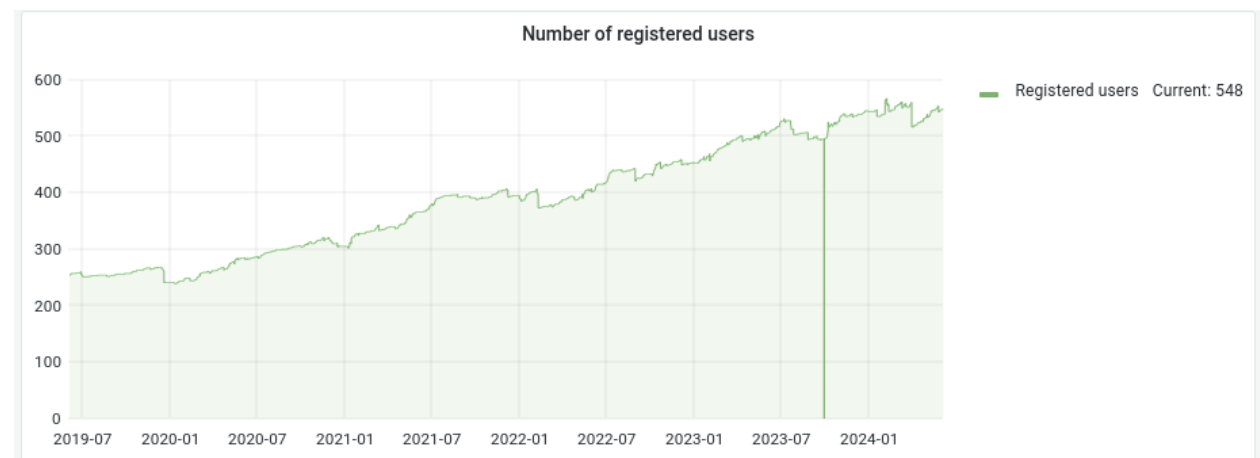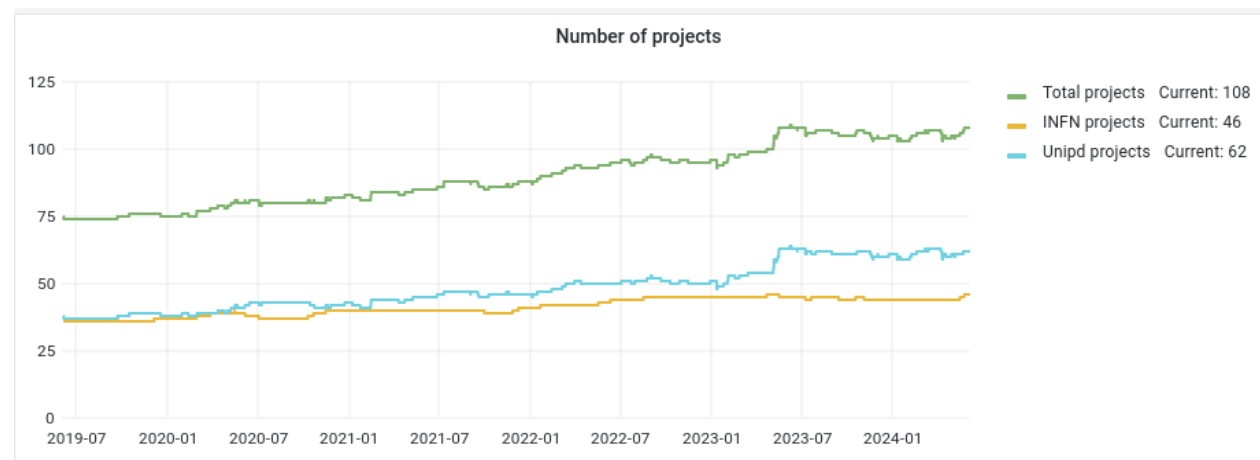
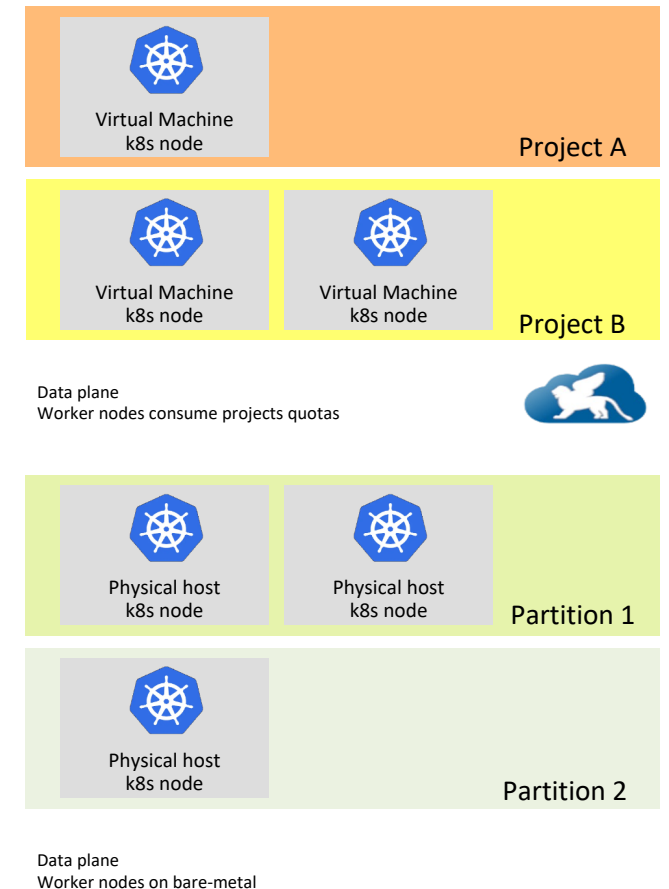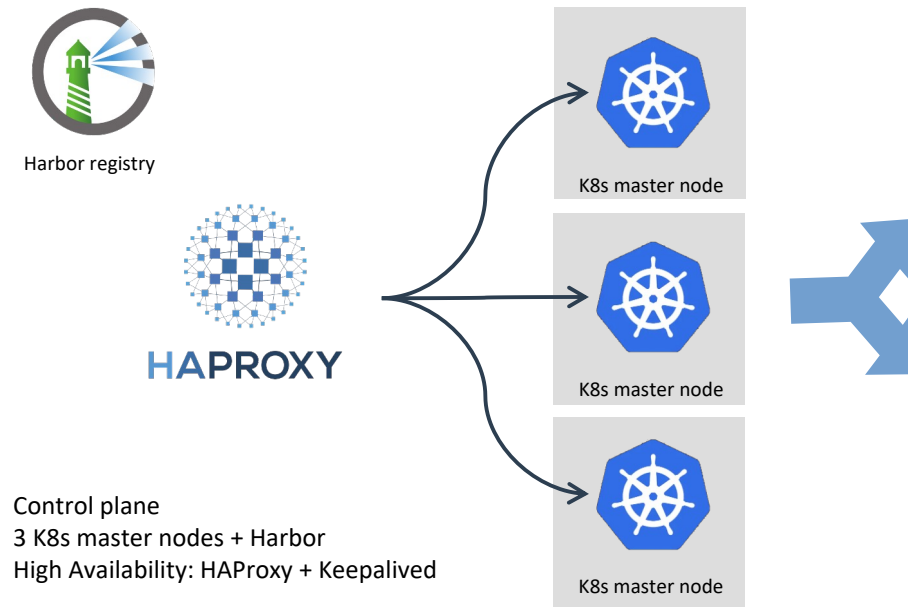PNRR - ICSC » Spoke 2 » WP2

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CloudVeneto

- CloudVeneto.it is an OpenStack based IaaS;

- Funded by INFN and ten departments of the University of Padova, since 2018;

- More than 500 users and 100 projects;

- Its hypervisors and storage nodes are spread across PD and LNL, with a dedicated connection;

- INFNCloud federated:
  - "catch-all" projects on private network;
  - AI_INFN.

Owner	Cores	GPUs	RAM (GB)
INFN-PD	1200	13	5792
INFN-LNL	864	0	5120
UNIPD	1152	0	6144
Other	1688	8	8352
Total	4904	25	25408

Number of projects

Total projects   Current: 108
INFN projects   Current: 46
Unipd projects   Current: 62

Number of registered users

Registered users   Current: 548

Container-as-a-Service (CaaS)

- Fully centrally managed orchestration platform in the cloud;

- Centralized Kubernetes Control Plane without worker;

- Users can create and customize nodes using resources from CloudVeneto within their tenants;

- K8s nodes (private or shared), deployed as VMs;

- Administrators can also deploy nodes on bare-metal.

Harbor registry

HAPROXY

K8s master node

K8s master node

K8s master node

Control plane
3 K8s master nodes + Harbor
High Availability: HAProxy + Keepalived

Virtual Machine
k8s node

Project A

Virtual Machine
k8s node

Virtual Machine
k8s node

Project B

Data plane
Worker nodes consume projects quotas

Physical host
k8s node

Physical host
k8s node

Partition 1

Physical host
k8s node

Partition 2

Data plane
Worker nodes on bare-metal

Offloading on CloudVeneto

- We're testing offloading on CaaS nodes;

- Two tenants involved:
  - CMS
  - AI_INFN

- Custom sidecar plugin implemented in Python:
  - Incorporates a Flask server and translates the calls into K8s commands;

- Currently validating on CMS AF and AI_INFN FlashSim.