

# INFN-Torino

## Scientific Computing Infrastructure



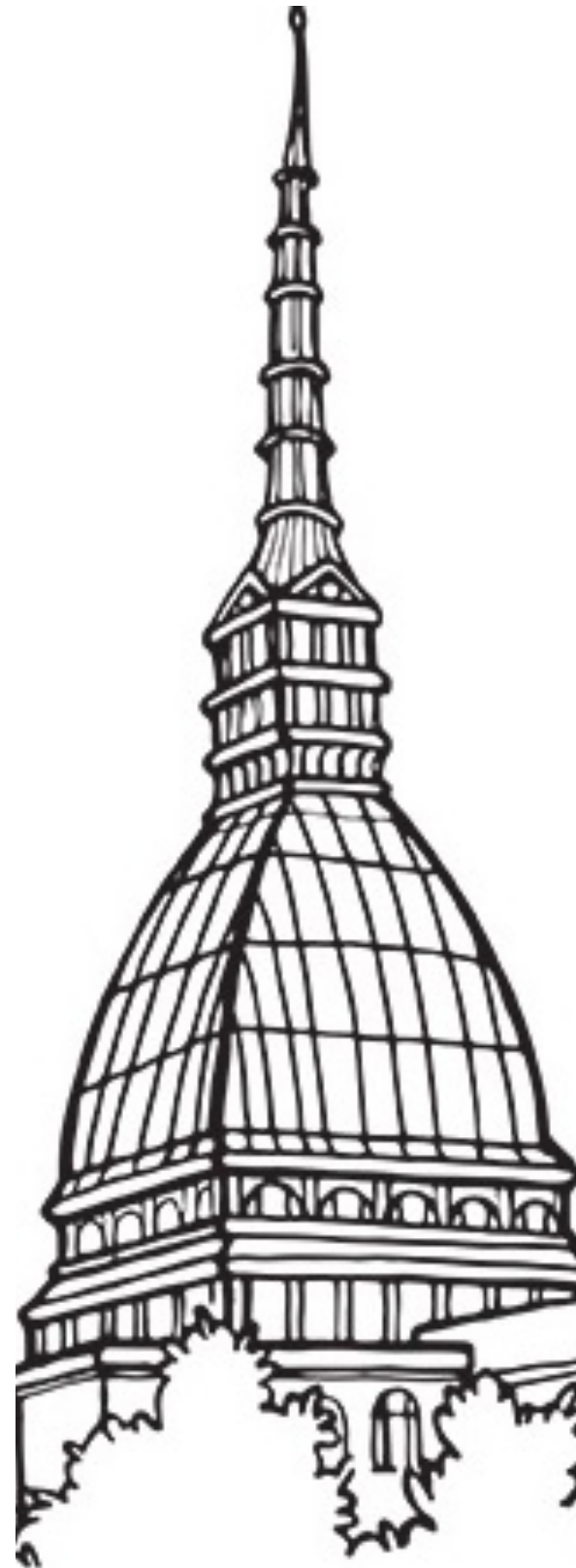
Meeting dei siti italiani di Belle II — Only Remote — 28 dic 2020

**Stefano Lusso**

# INFN-Torino Scientific Computing Infrastructure

## PLANT RENEWAL

- **Uninterruptible Power Supply**
- **Cooling System**





# INFN-Torino Scientific Computing Infrastructure

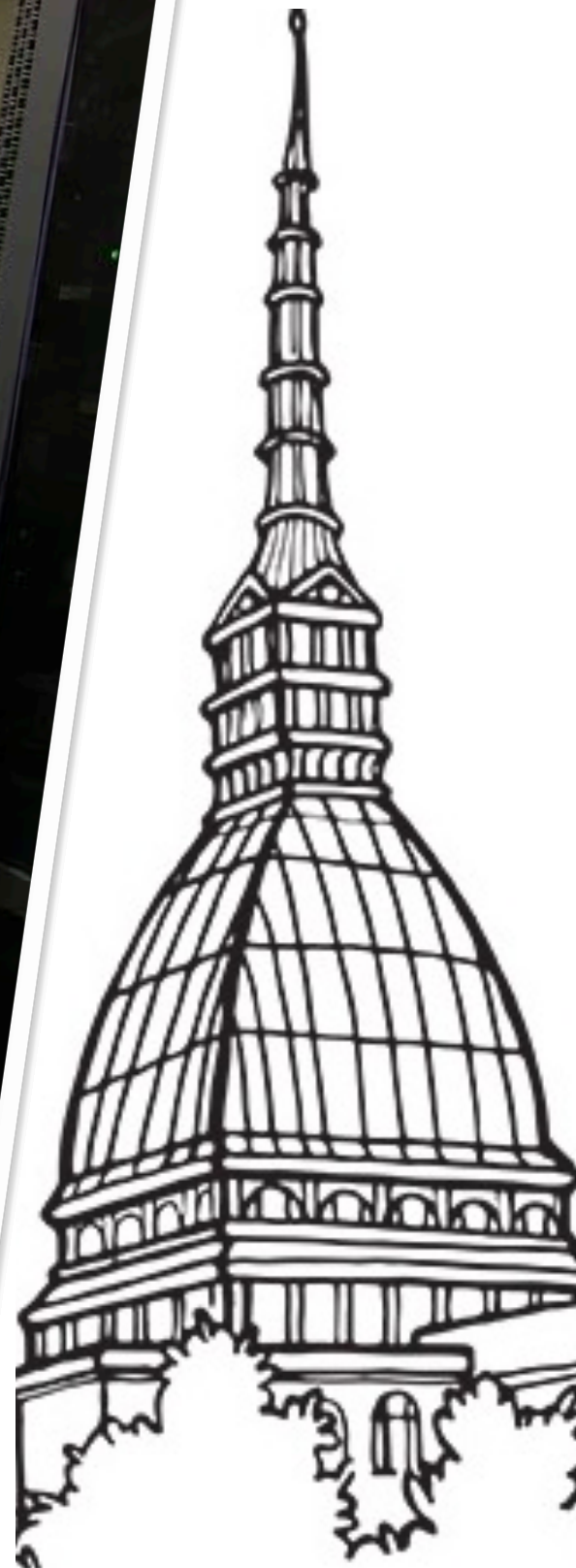
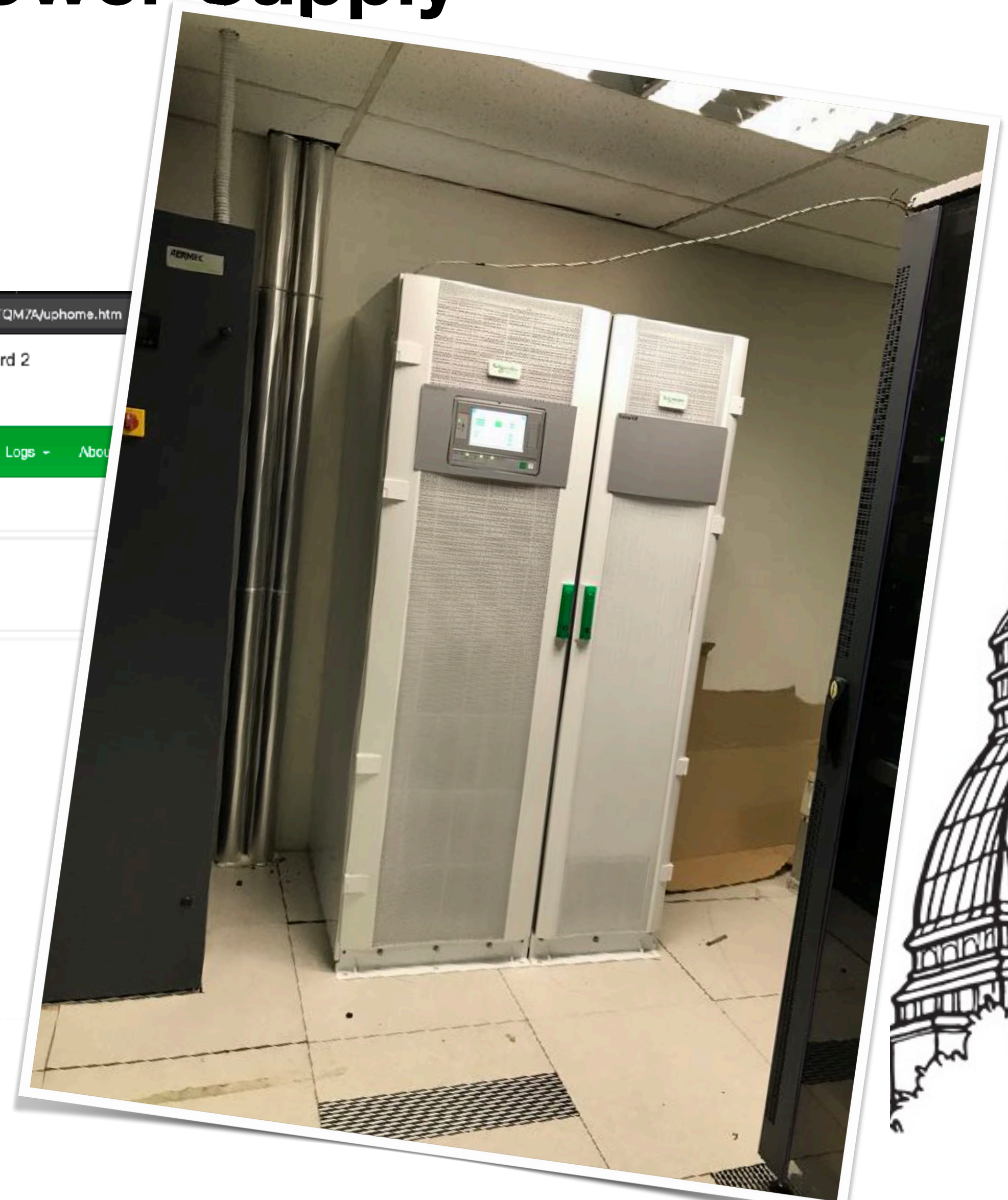
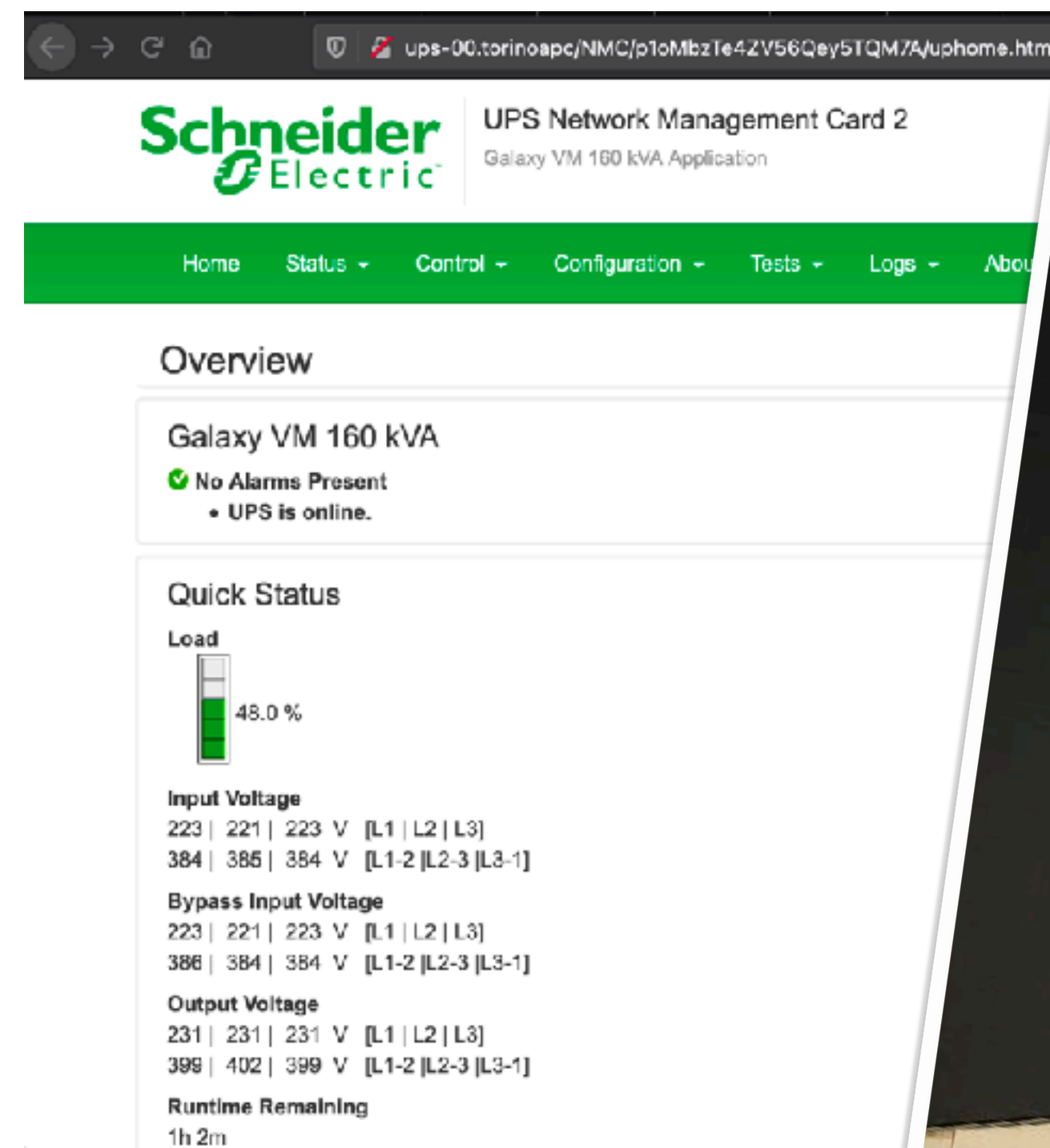
## Uninterruptible Power Supply

**Model: Schneider Electric Galaxy VM 160 kVA**

**Output: 144.0kWatt / 160.0kVA**

**Efficiency: >95%**

**Lithium-ion battery ready**





# INFN-Torino Scientific Computing Infrastructure

## Cooling System

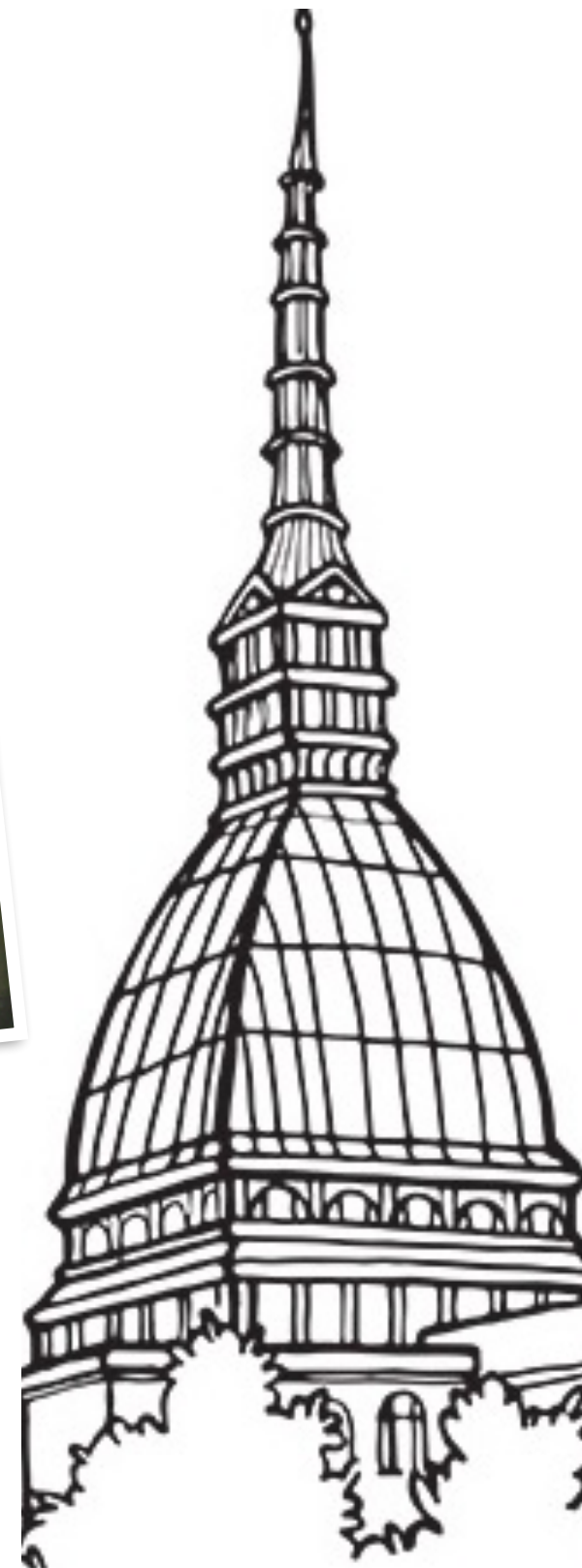
**Chiller: 2 \* AERMEC NRB-N 0704**

**Output: 174.5 kWatt** (12 °C / 7 °C)

**Efficiency (EER) >3**

**Circuits: 2**

**Compressors: 4 scroll**

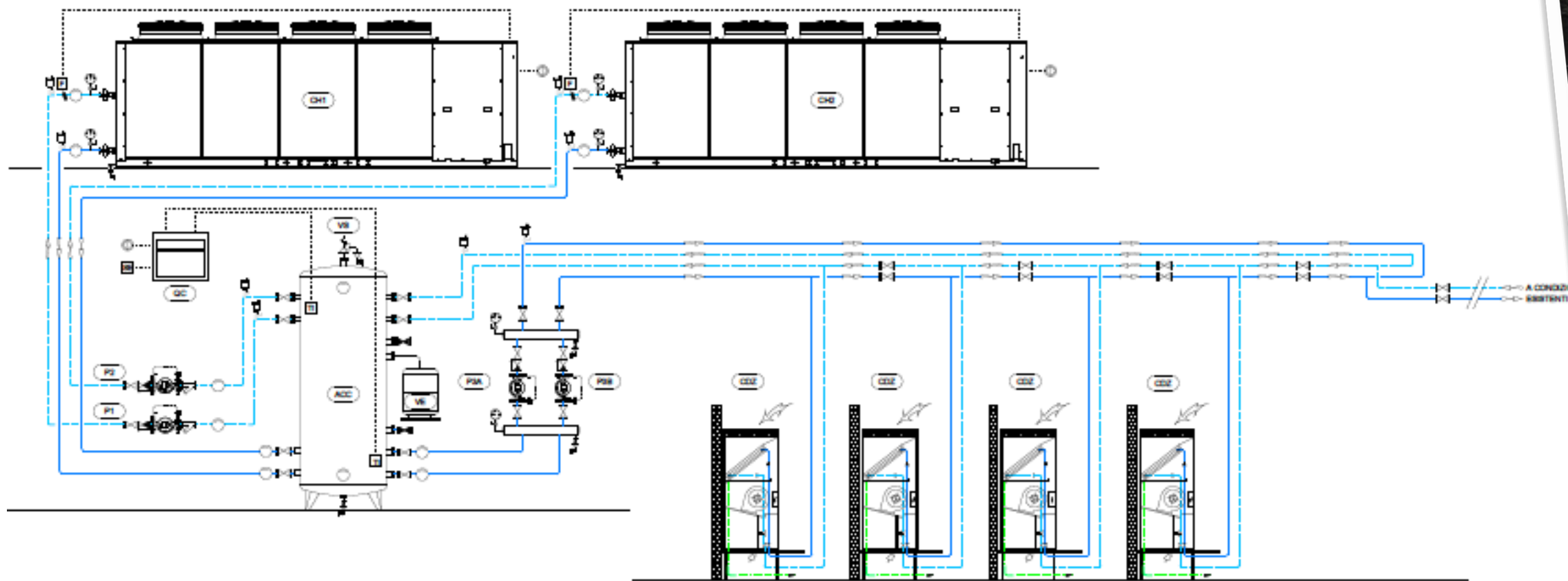




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## Cooling System Circuit

**Chiller -> Primary Circuit**  
**Inertial water reservoir**  
**Double Ring Secondary Circuit**  
**4 “under” Unit (20kW) + APC InRow**





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## Plant Renewal Troubles

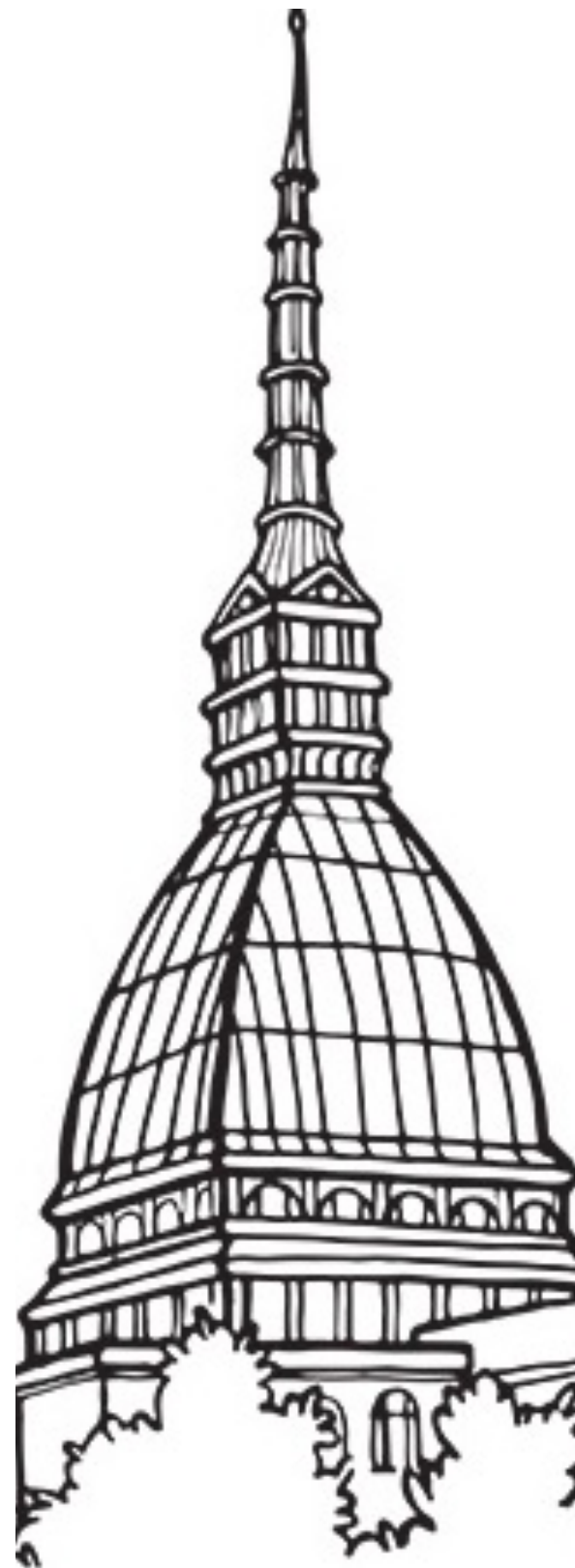
**Extremely unqualified manpower**

[...]

**The APC InRow circuit was connected in the opposite way**

**The circuit breakers were non adjusted**

**The pipes were connected unsafely to the ceiling**



# INFN-Torino Scientific Computing Infrastructure

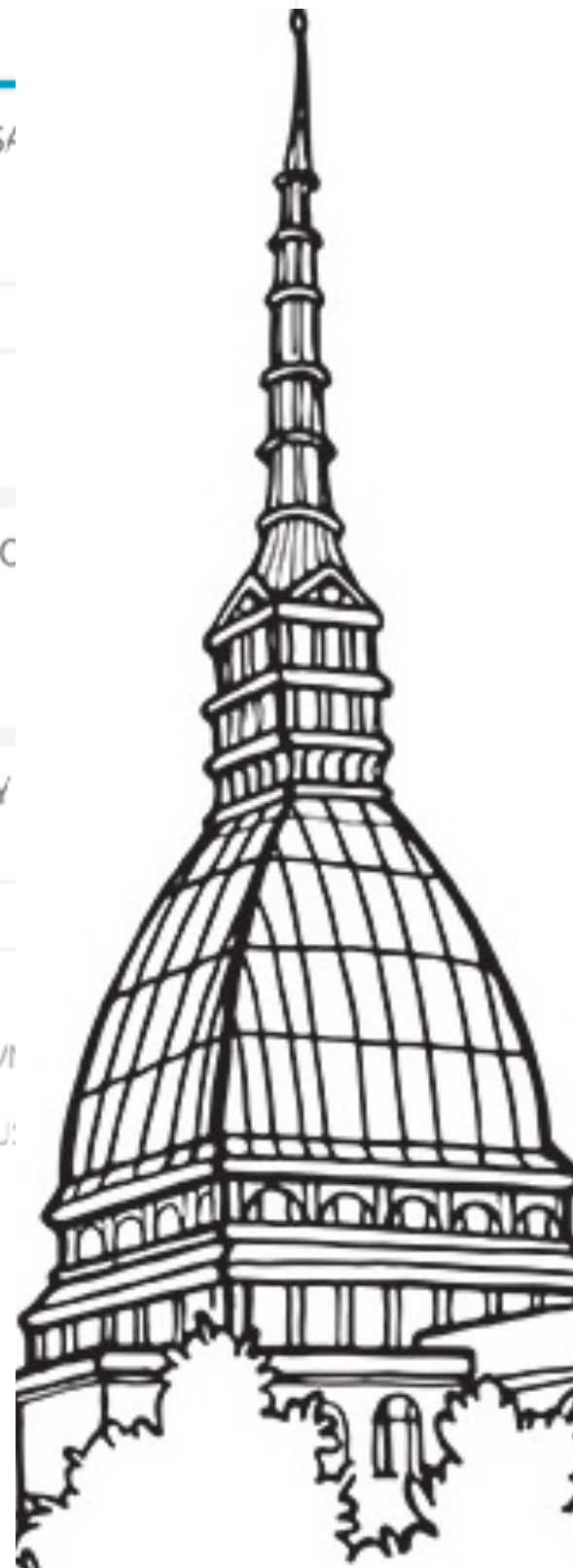
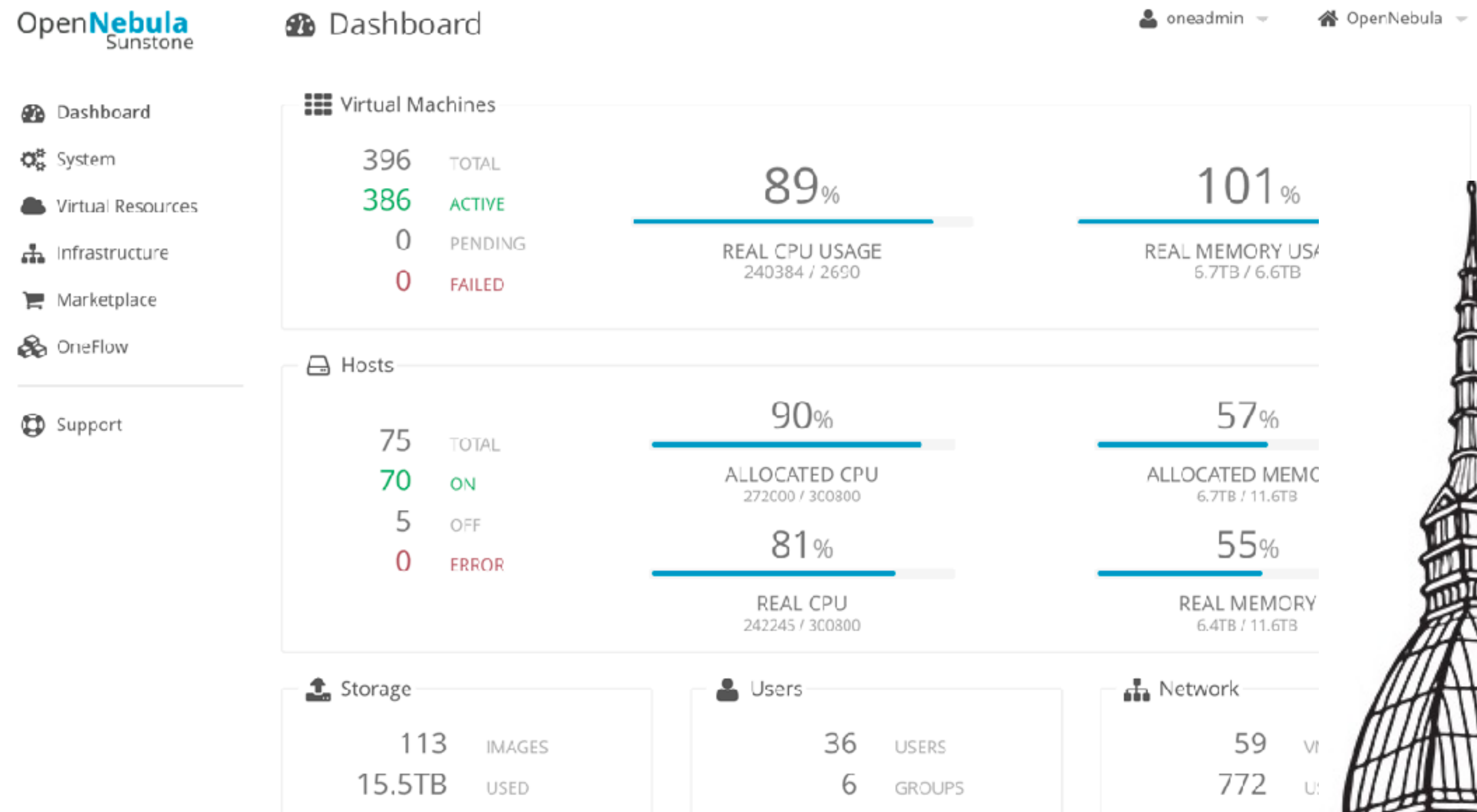
## The cloud infrastructure

### OpenNebula orchestrator

- 70 KVM Hypervisors
- 3000 Cores (HT)
- 385 running VM
- 36 tenants

### Main tenants

- WLCG Tier-2
- BesIII
- Compass
- Theoretician
- Alice-local

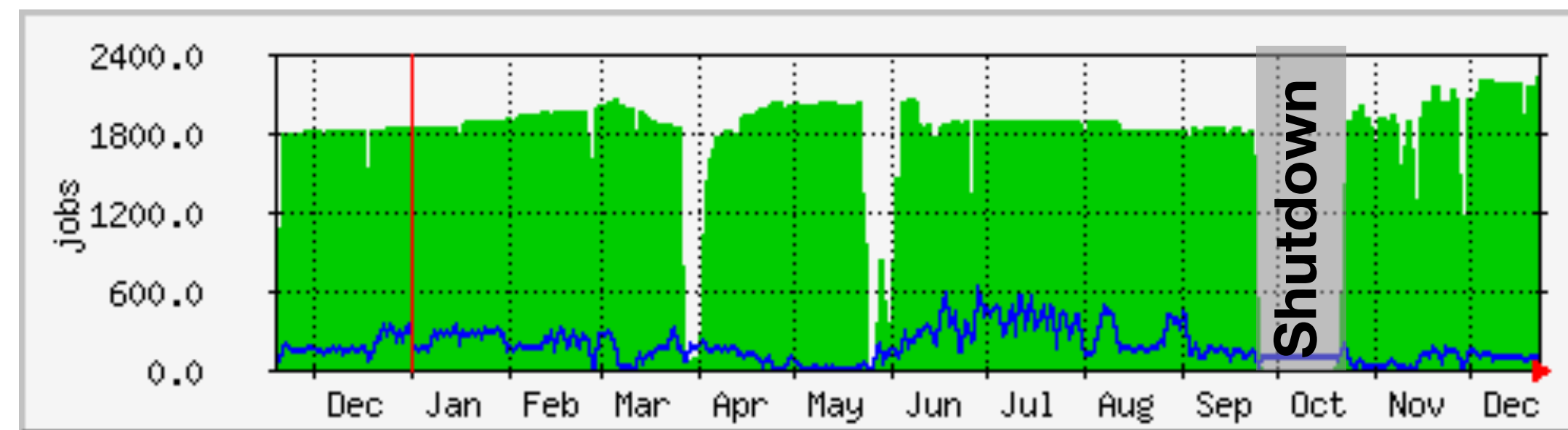


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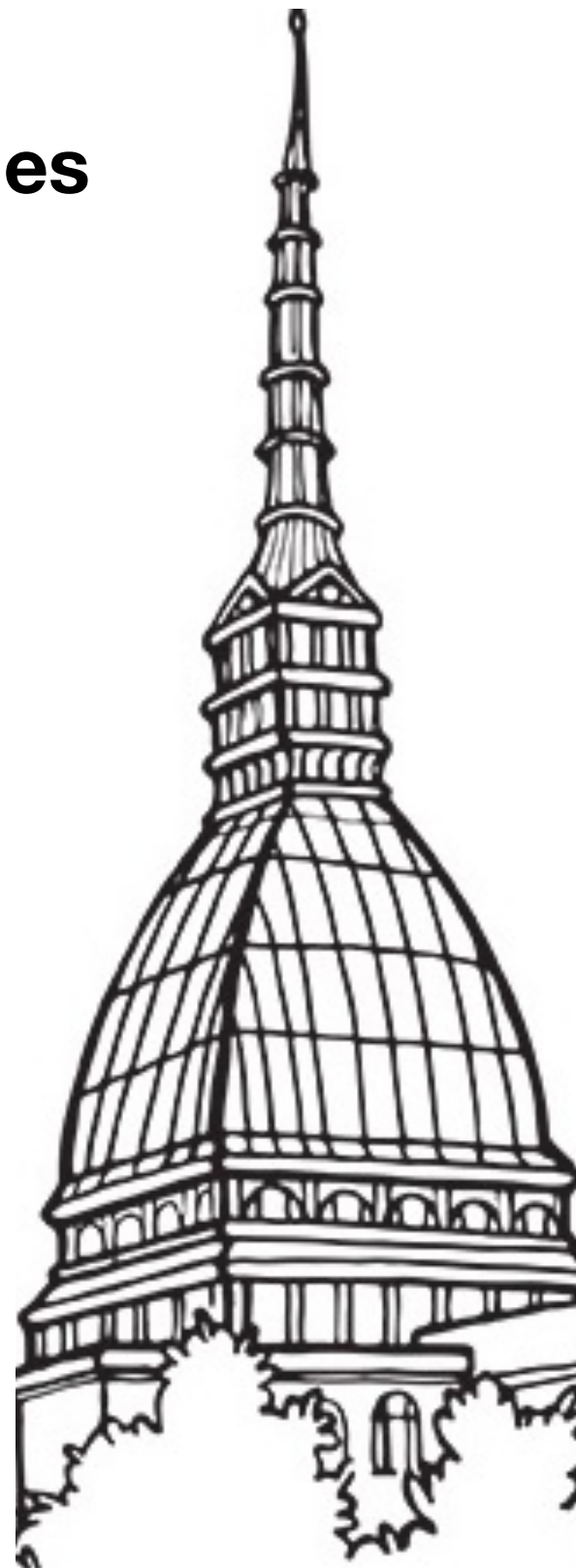
## The WLCG Tier-2

~2400 job slot

Entrypoint: **CREAM CE**



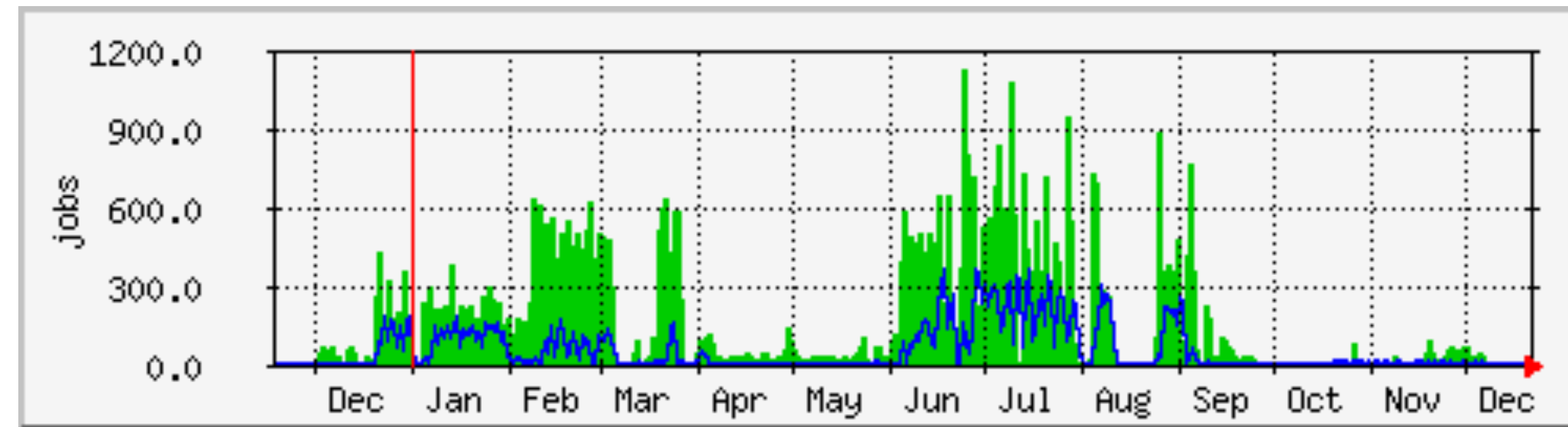
All queues  
running  
queued



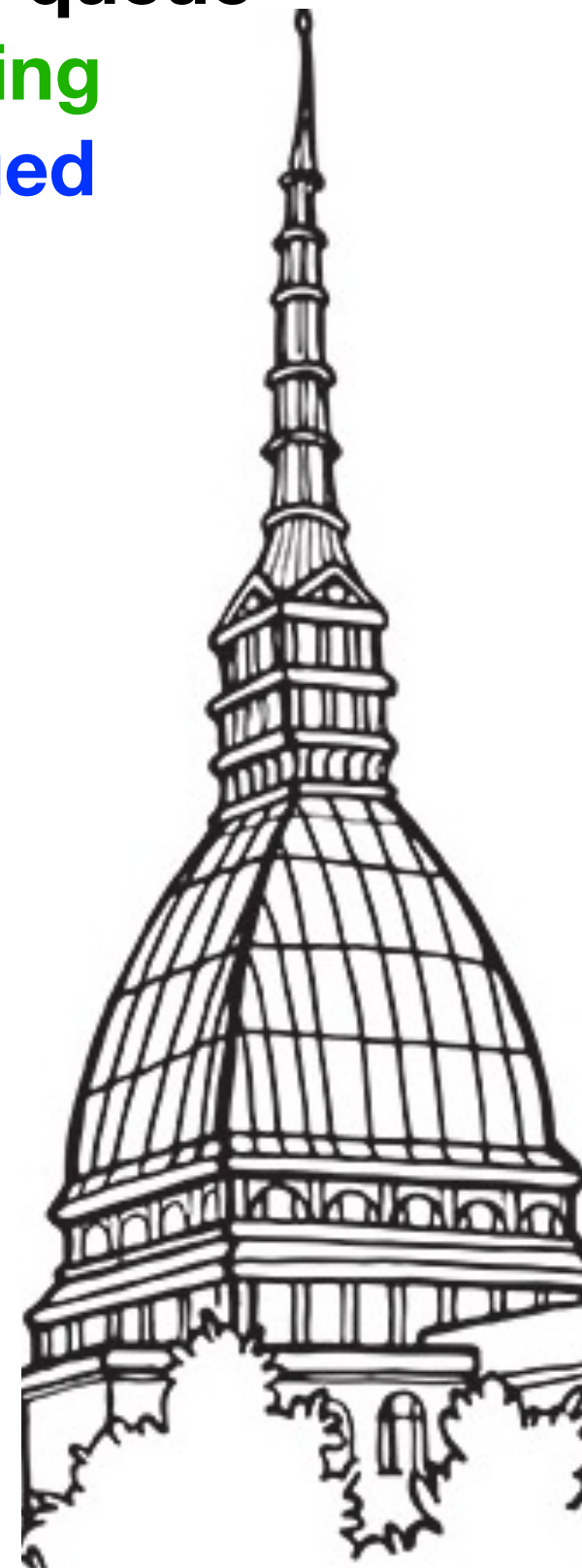


# INFN-Torino Scientific Computing Infrastructure

## Belle on WLCG



**Belle queue**  
running  
queued



**Some issues in submission**

**CREAM CE superseded by HTCondor CE**  
**Plan to migrate in 2021**



# INFN-Torino Scientific Computing Infrastructure

## Belle storage nightmare

### Combined Procurement started in 2019

- Two iterations

winner: (P.O.S. Data System S.r.l.)

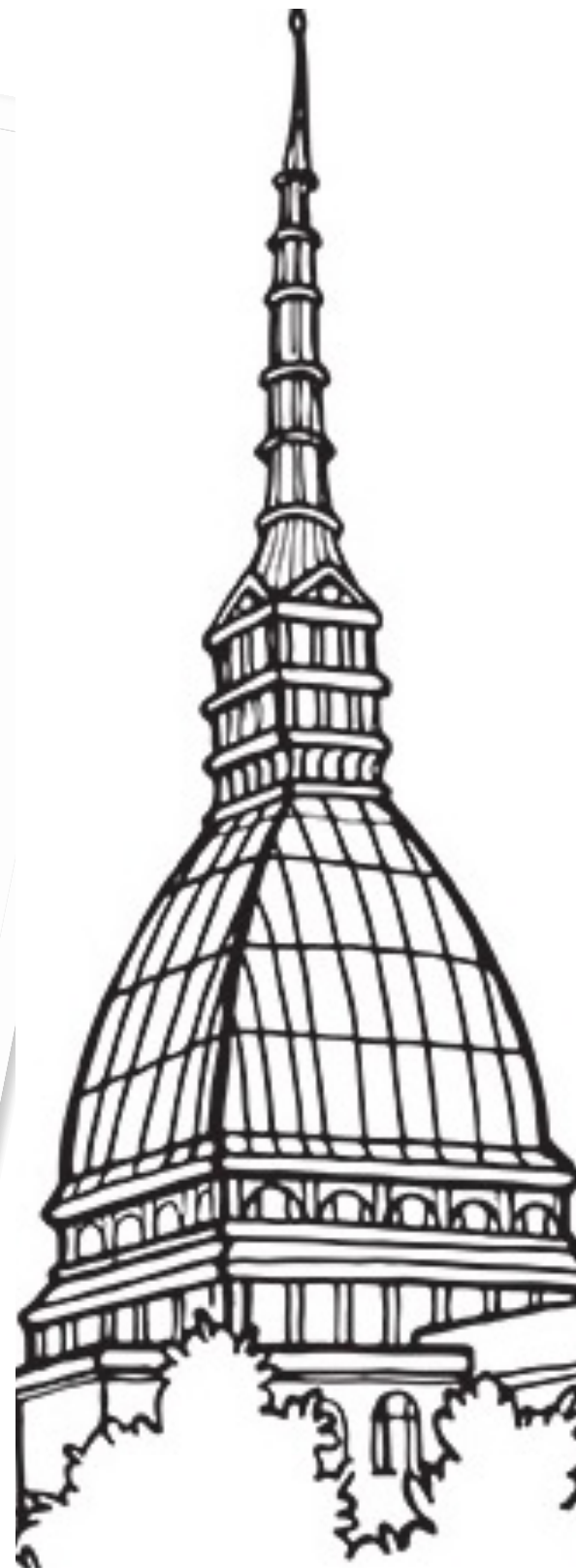
Systems:

- Lenovo ThinkSystem DE6000H (Controller Enclosure)
- Lenovo ThinkSystem DE600S (Expansion Enclosure)

560 TBL (70 x 8 TB HDD)

Last update: dec. 7 2020

Delivery? Next year..





# Questions?

