JUNO plan for DC24

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JUNO experiment

❖ The Jiangmen Underground Neutrino Observatory (JUNO) is a neutrino experiment, located at Jiangmen, in Southern China

- ● JUNO-TAO is a satellite detector to improve sensitivity of JUNO on mass hierarchy study

❖ JUNO is expected to take data in 2024 (most likely in the second half)

- ● Installations are in full swing
- ● Commissioning was started this year

❖ Data volume for JUNO

- ● Raw data: 2.4 PB/year (2PB from JUNO, 600TB from JUNO-TAO) , 5GB/file
- ● Simulated and reconstructed data: 600TB/year
- ● In total, ~8TB/day

JUNO distributed computing

- ❖ JUNO distributed computing is built based on DIRAC

  - MC production is running

  - Current transfer is using DIRAC DMS + FTS
    - Raw data transfer in 2024 will use the same infrastructure

  - Rucio is being evaluated
    - Testbed is ready

- ❖ Migration to HTTP TPC is complete

- ❖ Token migration is ongoing, expected to be ready before the end of 2023

- ❖ JUNO already started using LHCONE in 2021

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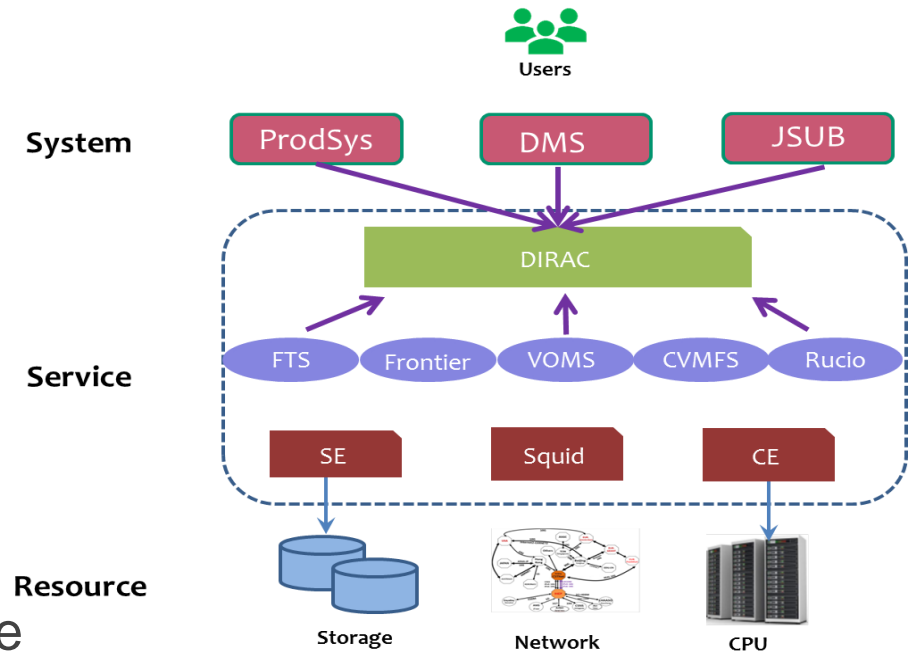
DC24 for JUNO

❖ Data will be transferred to three data centers: CNAF(100%), IN2P3(1/3), JINR(100%）

❖ Main goals of DC24 for JUNO

- Scale tests on both services and network to prepare for data taking
  - DIRAC, FTS, monitoring, IAM, Storage, probably Rucio (testbed)
  - Simulate production traffic with full rate
- Tests on HTTP TPC and token support
- Tests on recent upgrade of international link
  - The link between IHEP and Europe will be chang the bandwidth increased from 10Gb/s to 100Gb/s coming month
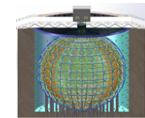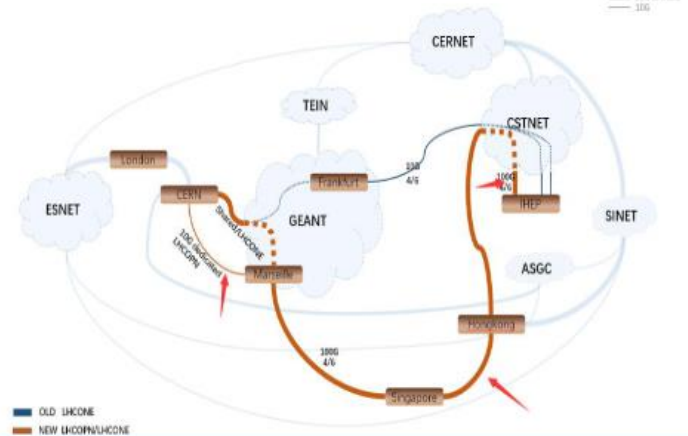
Old : IHEP – CSTNET – GEANT – Frankfurt – CERN(10Gb/s)
New: IHEP – CSTNET – Singapore – Marseille – CERN(100Gb/s)

- Tests on IPv6, now JUNO is using IPv4

Timeline and plans 1/2

❖ Data Challenge during 2024

- First few weeks of March is fine to us

- Consider to do together with LHCb, CMS, Atlas traffic to see if affected each other
  - IHEP also LHCb T1, CMS/Atlas T2
  - CNAF, IN2P3 LHC T1

- Plan to do with backfilling injection, together with production and commissioning traffic

❖ Monitoring plans to be provided via FTS monitoring

- ❖ FTS messages->ActiveMQ->logstash->ES->Kibana was just set up
- ❖ Dashboard is not completed
- ❖ Hope to get more experience from LHC monitoring dashboard

Timeline and plans 2/2

❖ Ramp-up challenges during 2023

- Can start from September

- Prepare necessary machinery, and simulate with small scale tests
  - Prepare transfer injection tools
  - Complete FTS monitoring and token supports
  - Upgrade to perfsonar5.0 to predict available network bandwidth

- ❖ Any suggestions?

- ❖ Thank you!