IHEP tier-2 computing center: status and operation

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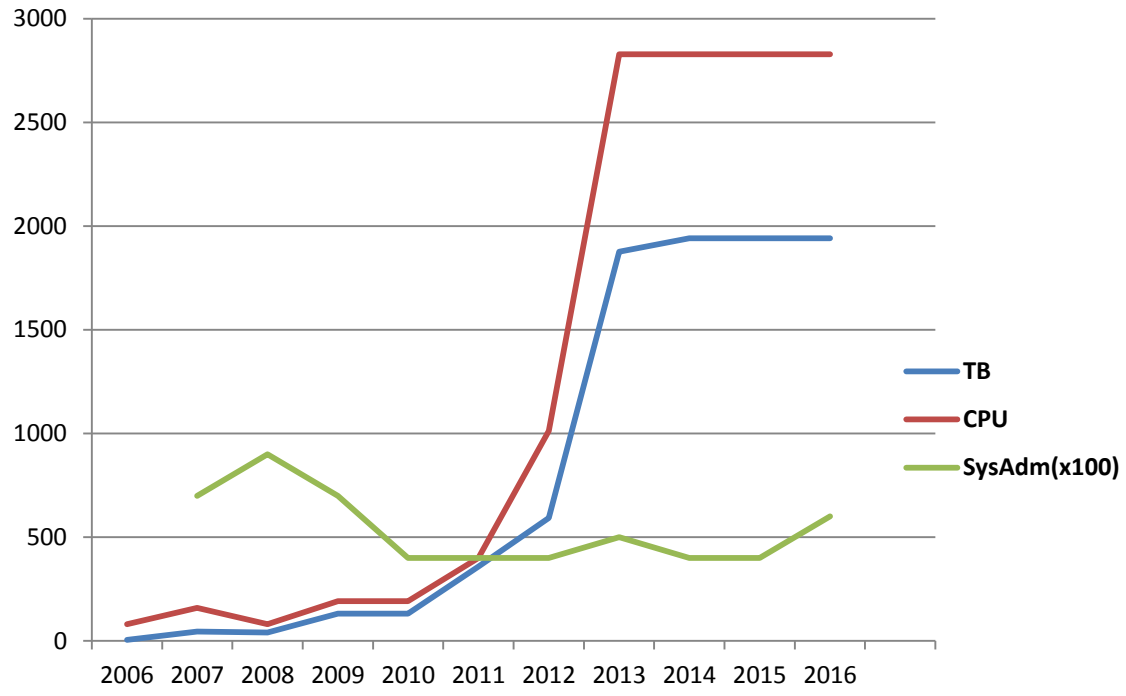
RU-Protvino-IHEP site is the one of three biggest WLCG Tier-2 centers in Russia. The computing infrastructure serves for "big four" high energy physics experiments such as Atlas, Alice, CMS, LHCb and local experiments at IHEP such as OKA, BEC, radio biology stands and others. In this presentation the current status of the computing capacities, networking and engineering infrastructure will be shown as well as the contribution of the grid site to the collaboration experiments.

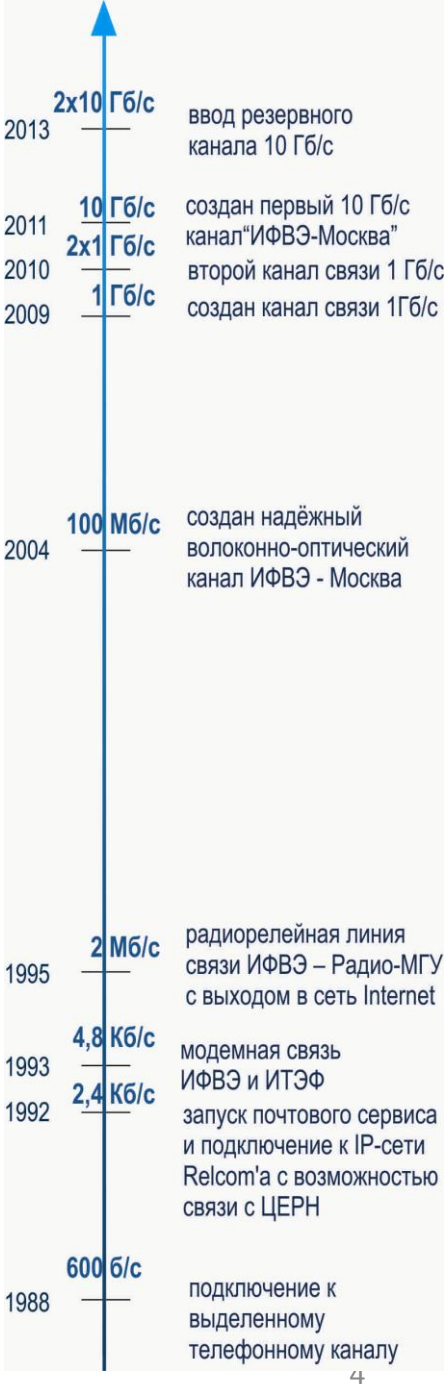
Introduction

- RU-Protvino-IHEP site participates in the Worldwide LHC Computing Grid from very beginning since **2003**.
- In that time were installed and configured the first grid infrastructure services like CE, SE, WNs, UI on **16** two-core Pentium III 900MHz.
- After increasing network bandwidth to 100Mb/s, then to 1Gb/s and in the end to 10Gb/s we became one of the biggest Tier-2 site in Russia with **3k CPU** (**24000** HEP-SPEC06) and **2PTB** disks space.
- In the present time our site serves for four LHC experiments (Atlas, Alice, CMS, LHCb) and many small experiments inside the Institute. We implement shared CPU schema that allows achieving 24x7 CPU resource usage.

IHEP resources evolution

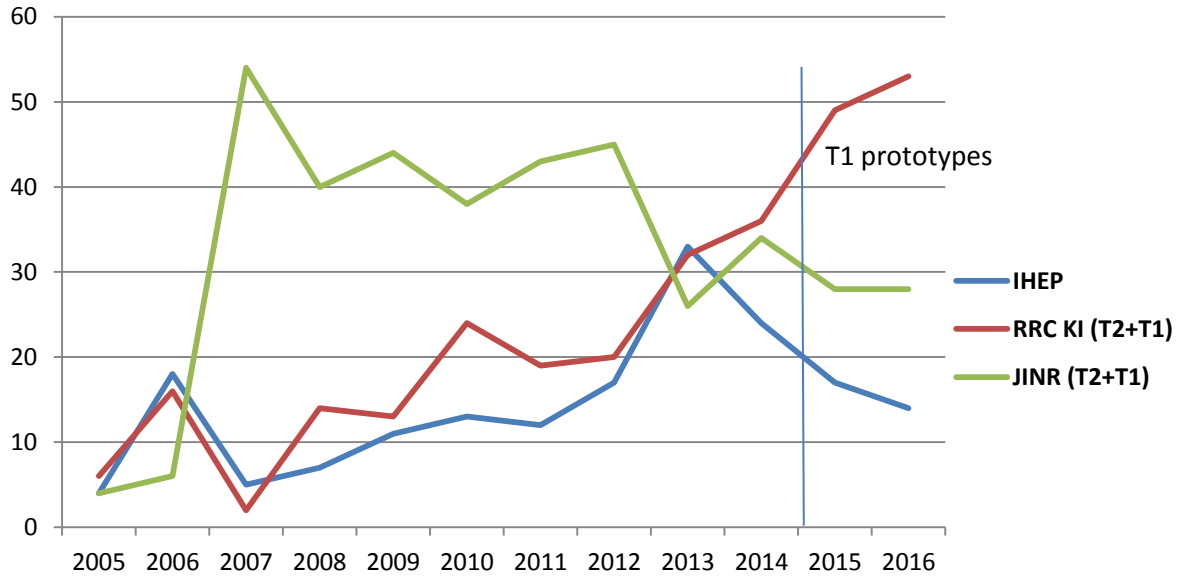


growth of the IHEP grid resources by year in TB and CPU



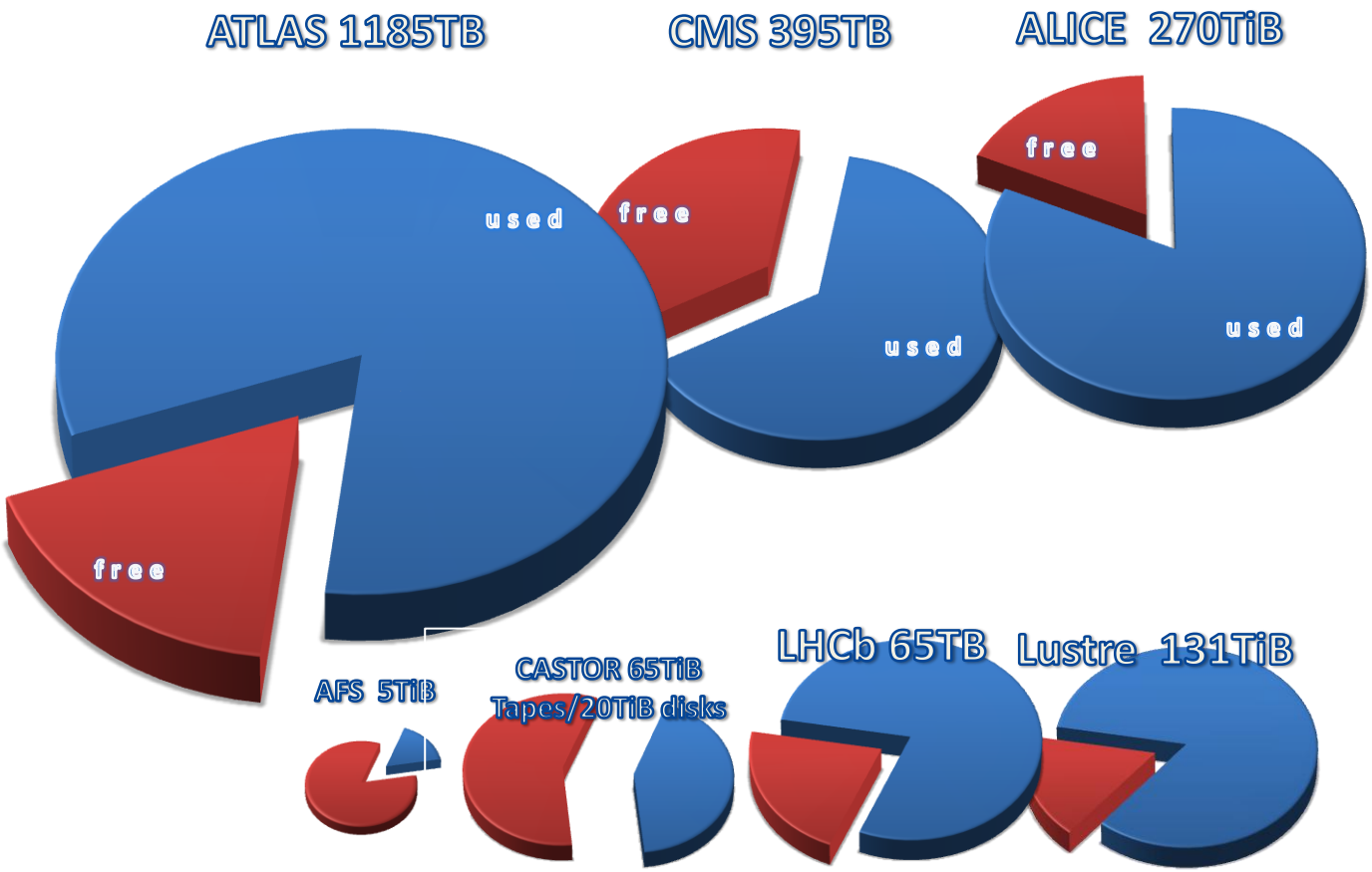
Current status: resourses

- 2828 CPU, 24390 HEP-SPEC06;
- 1942 TB: Atlas 1185, CMS 395, Alice 297, LHCb 65;
- 2x10Gb/s Internet channels
  (LHCONE shared with RDIG 10Gb/s);
- Manpower – 5 people;
- one of three big grid-sites in Russia:

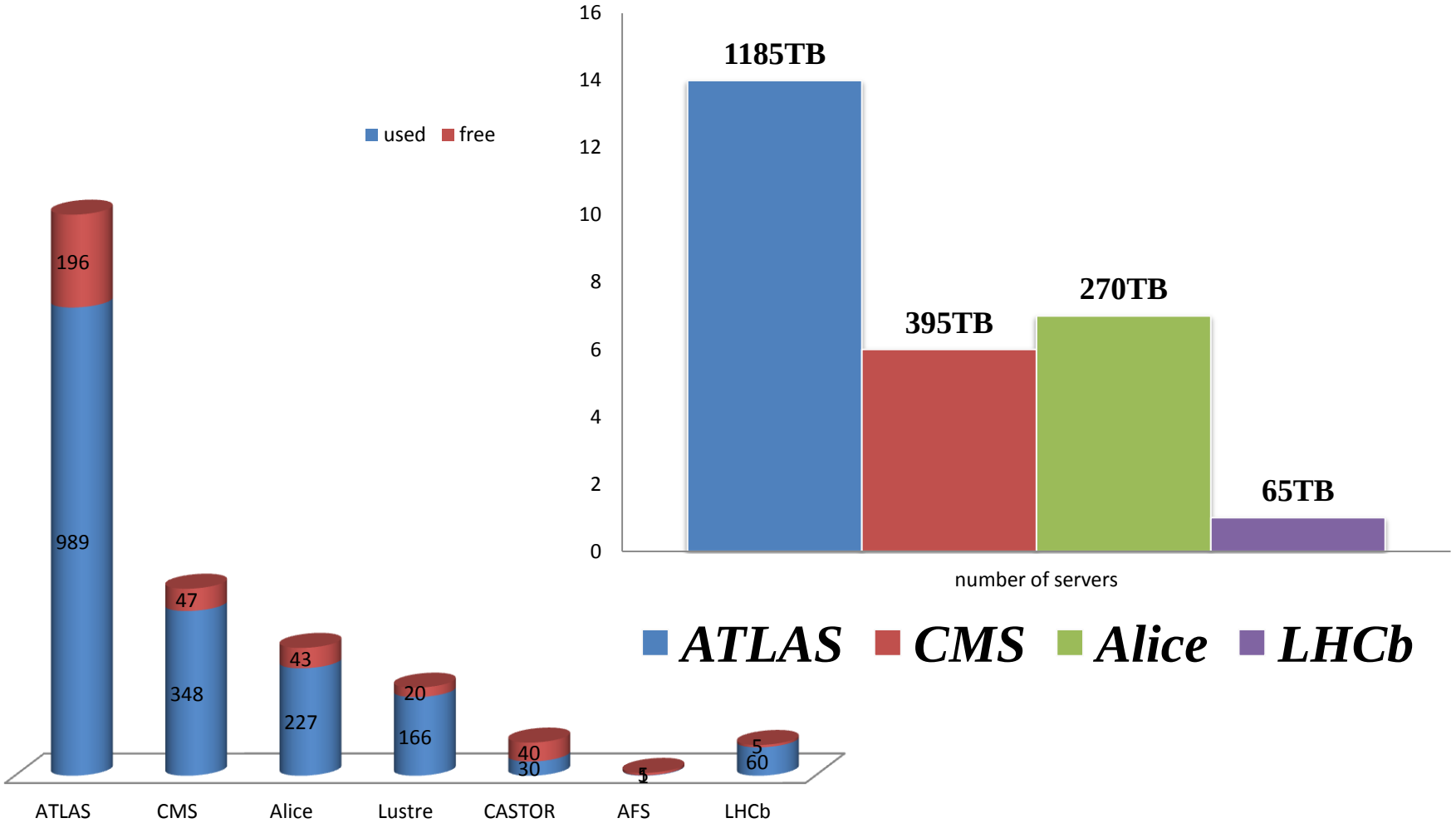


Contibution in % to RDIG by normalised CPU time

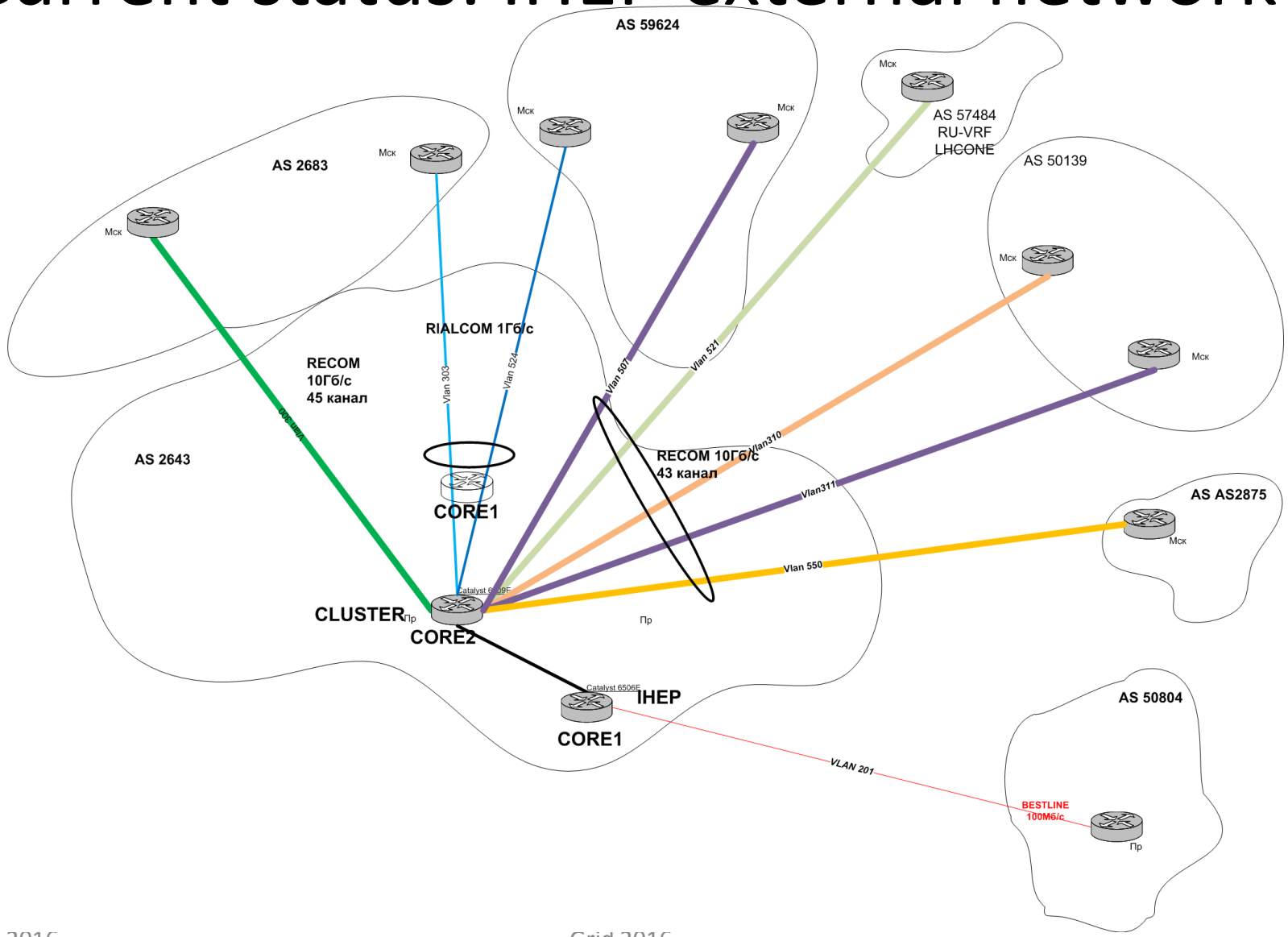
Current status: storages



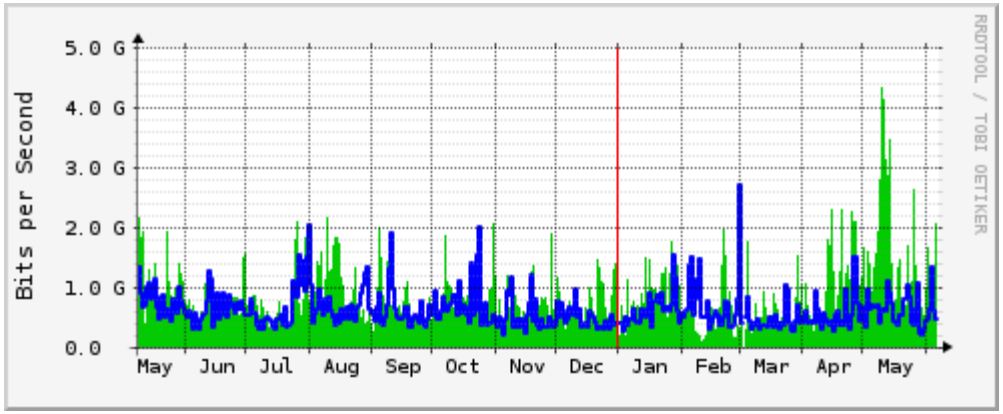
Current status: storages2



Current status: IHEP external network

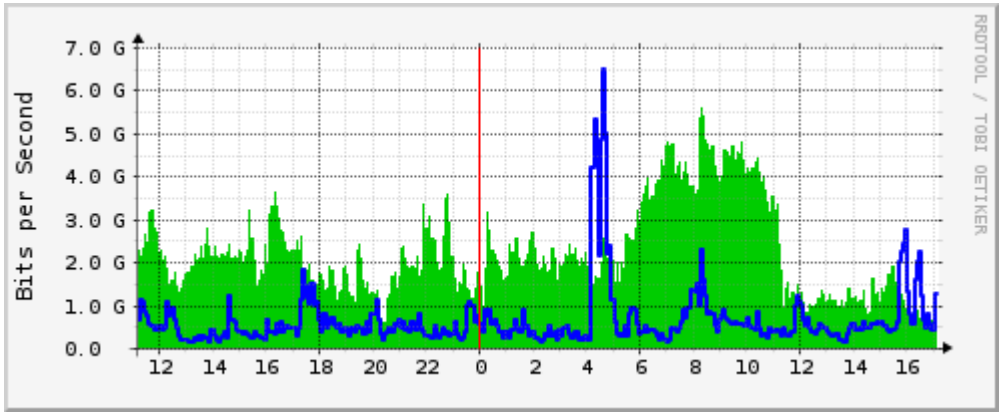


Currnet status: IHEP external network2



Internet channel switch from RUNNet to KI 31 December 2015

no limits per site shared bandwidth for RDIG

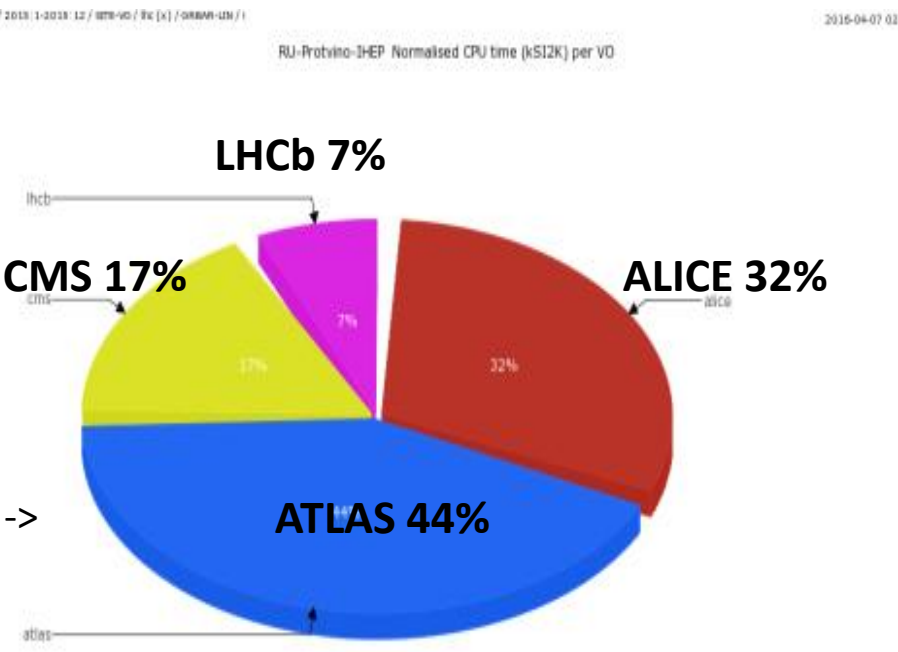


Current status: VO usage

Current fairshare setup:

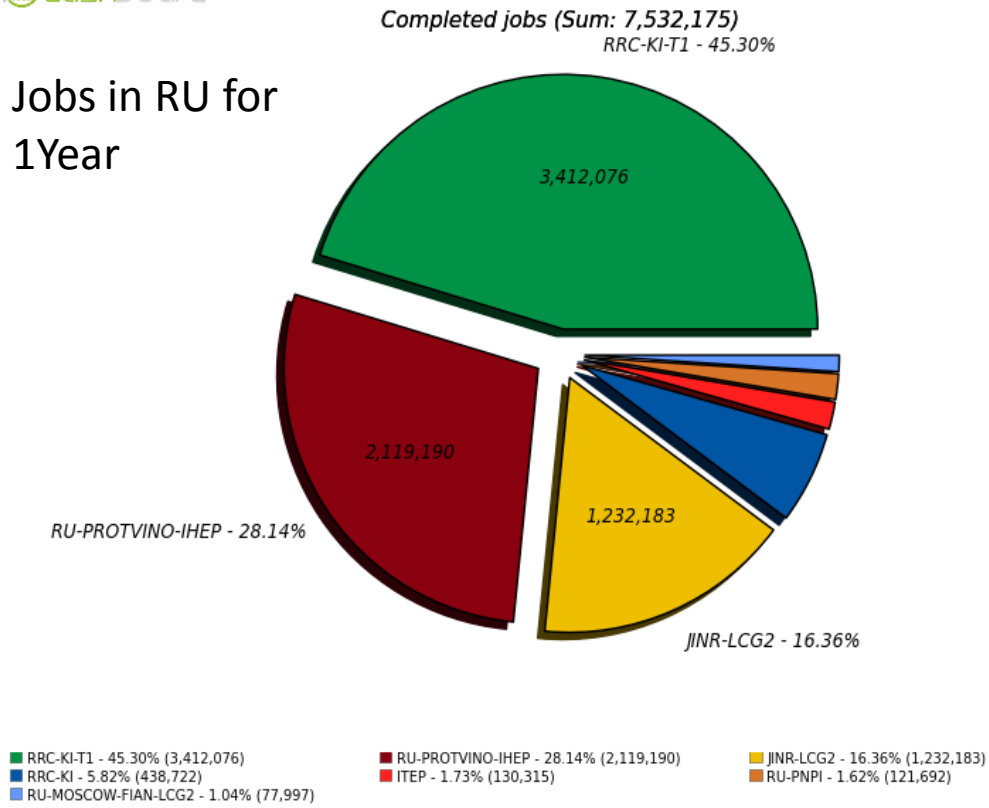
- ATLAS 52%
- CMS 30%
- ALICE 12%
- LHCb 6%

Real usage for 2015 ->

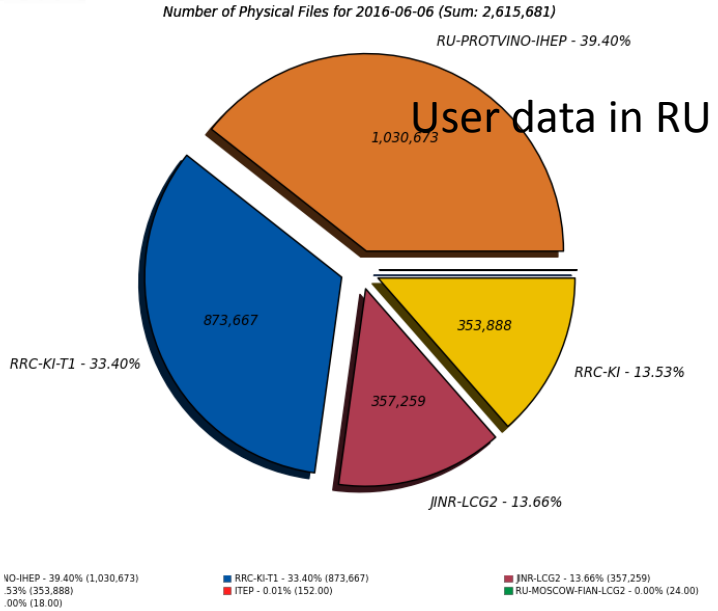


Sites usage by ATLAS last year

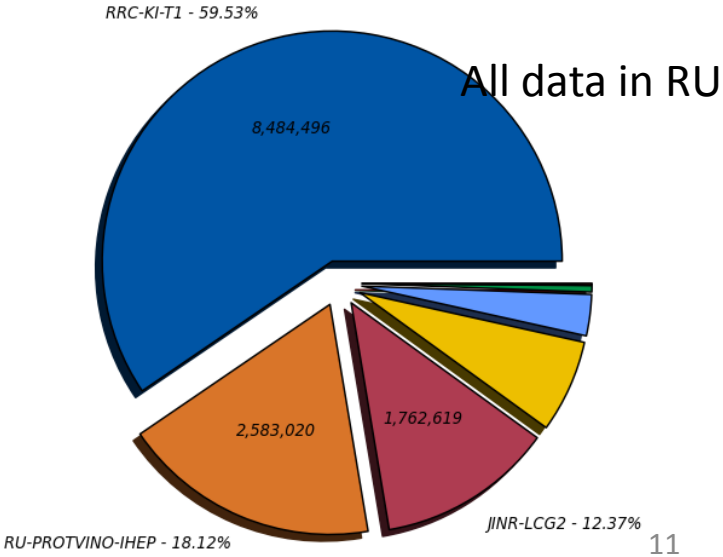
Jobs in RU for 1Year



User data in RU

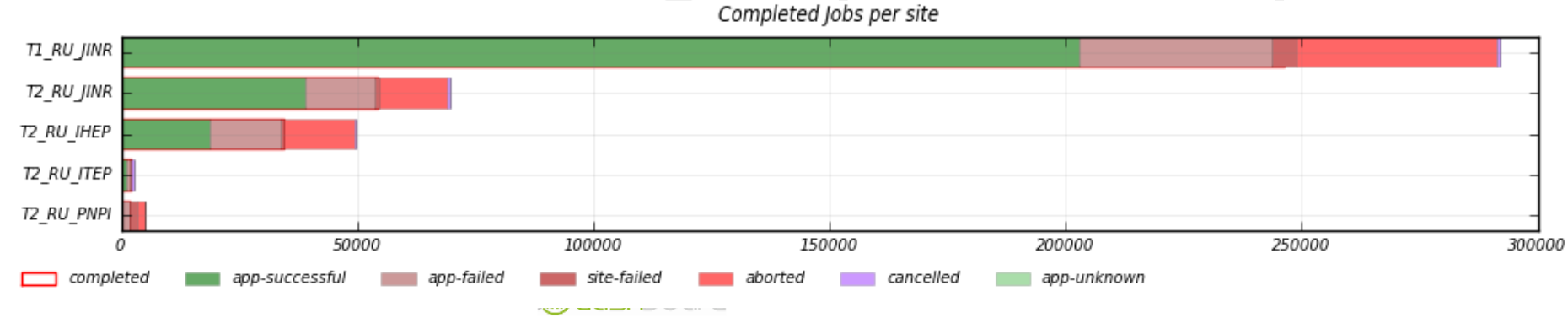


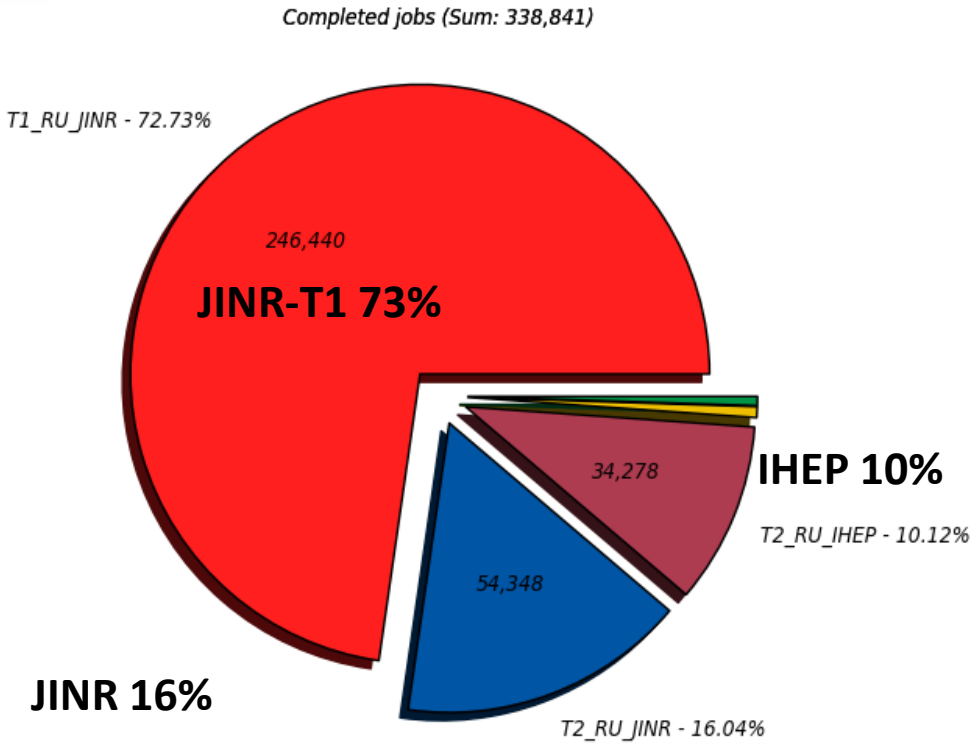
All data in RU



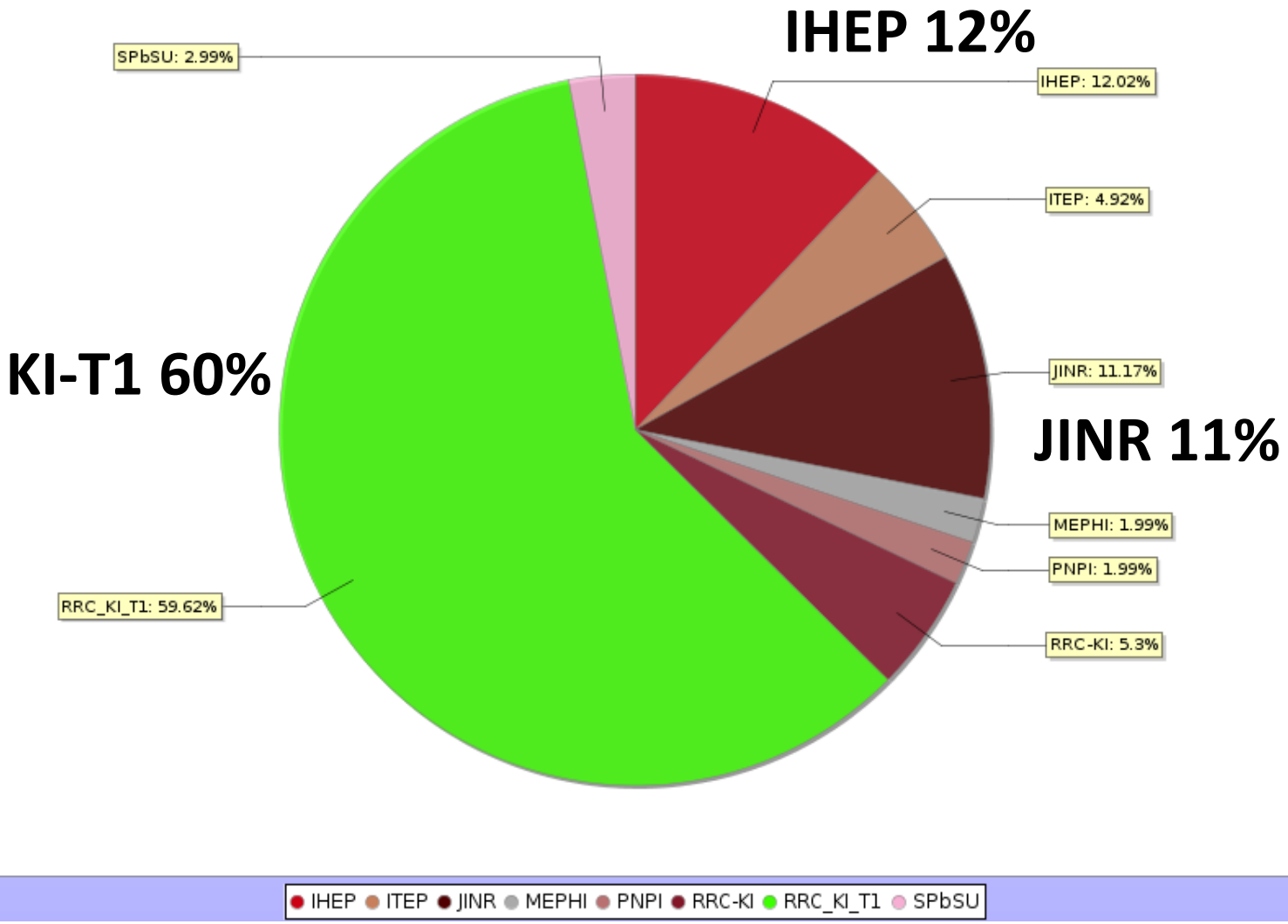
IHEP has status of Tier-2D alpha site in ATLAS with availability more than 95%

T2 sites usage by CMS last year

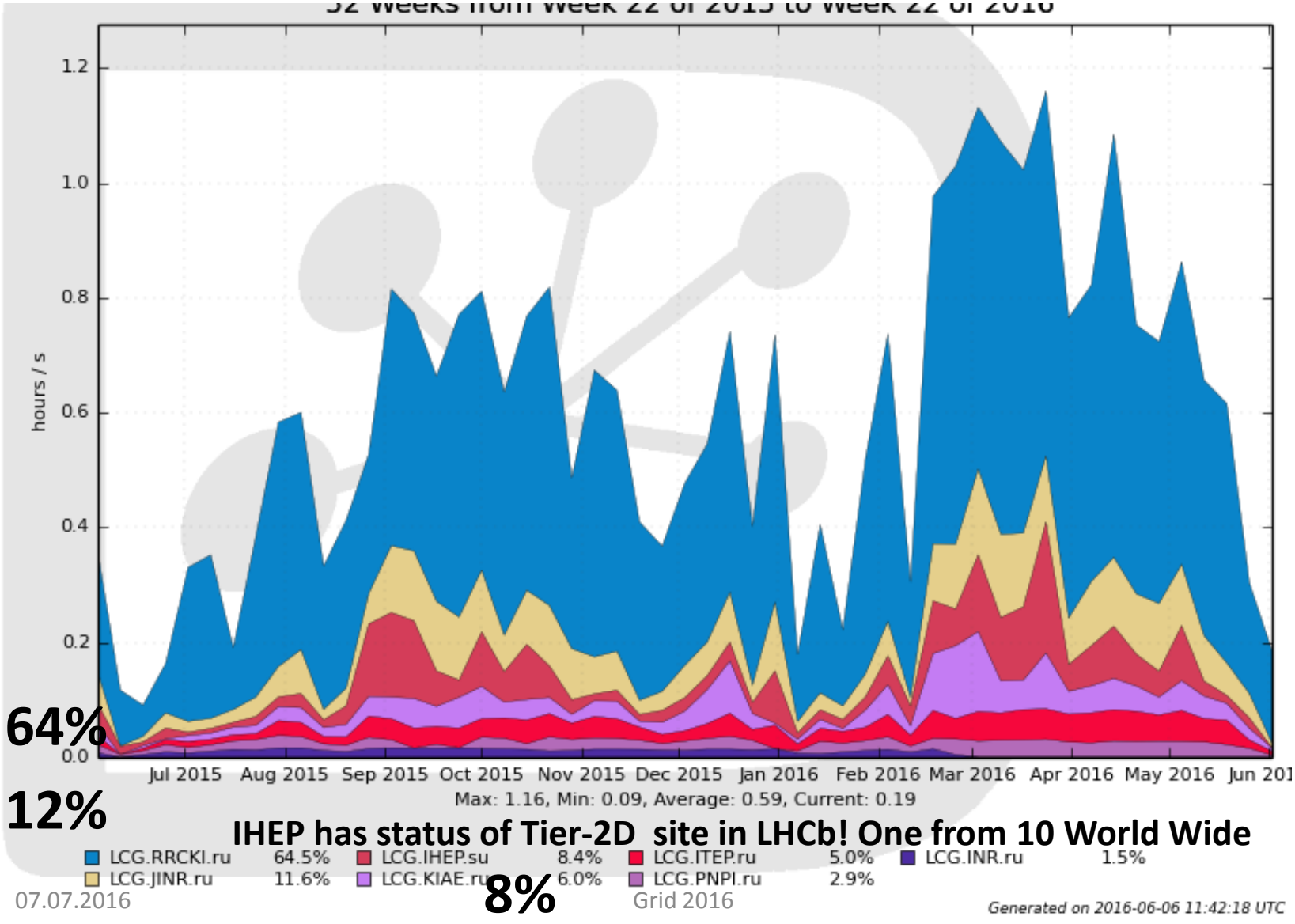




T2 sites usage by Alice last year



T2 sites usage by LHCb last year



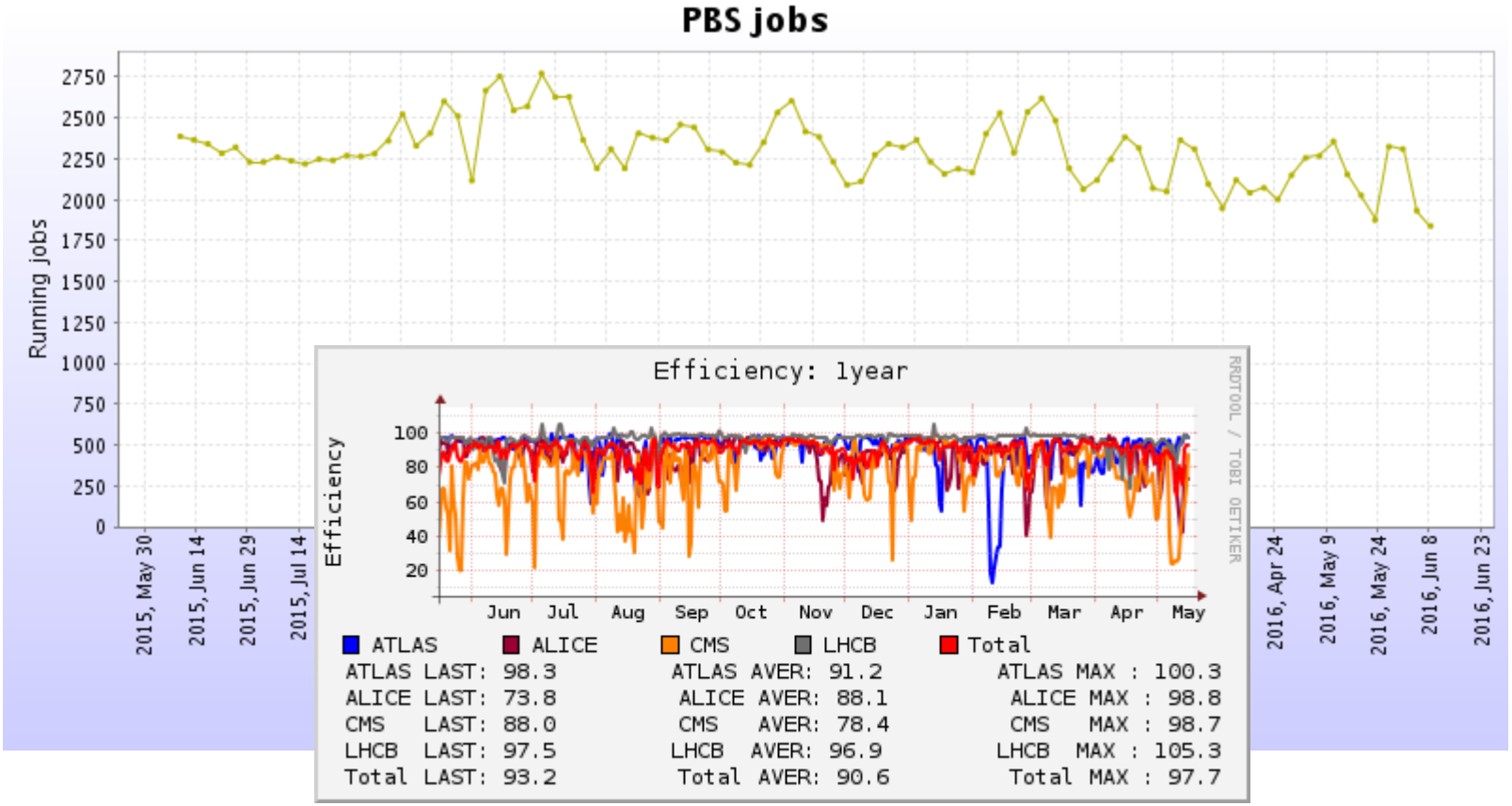
64%

12%

8%

IHEP has status of Tier-2D site in LHCb! One from 10 World Wide

IHEP 24x7 cluster with high reliability and availability and efficiency



Average 90%

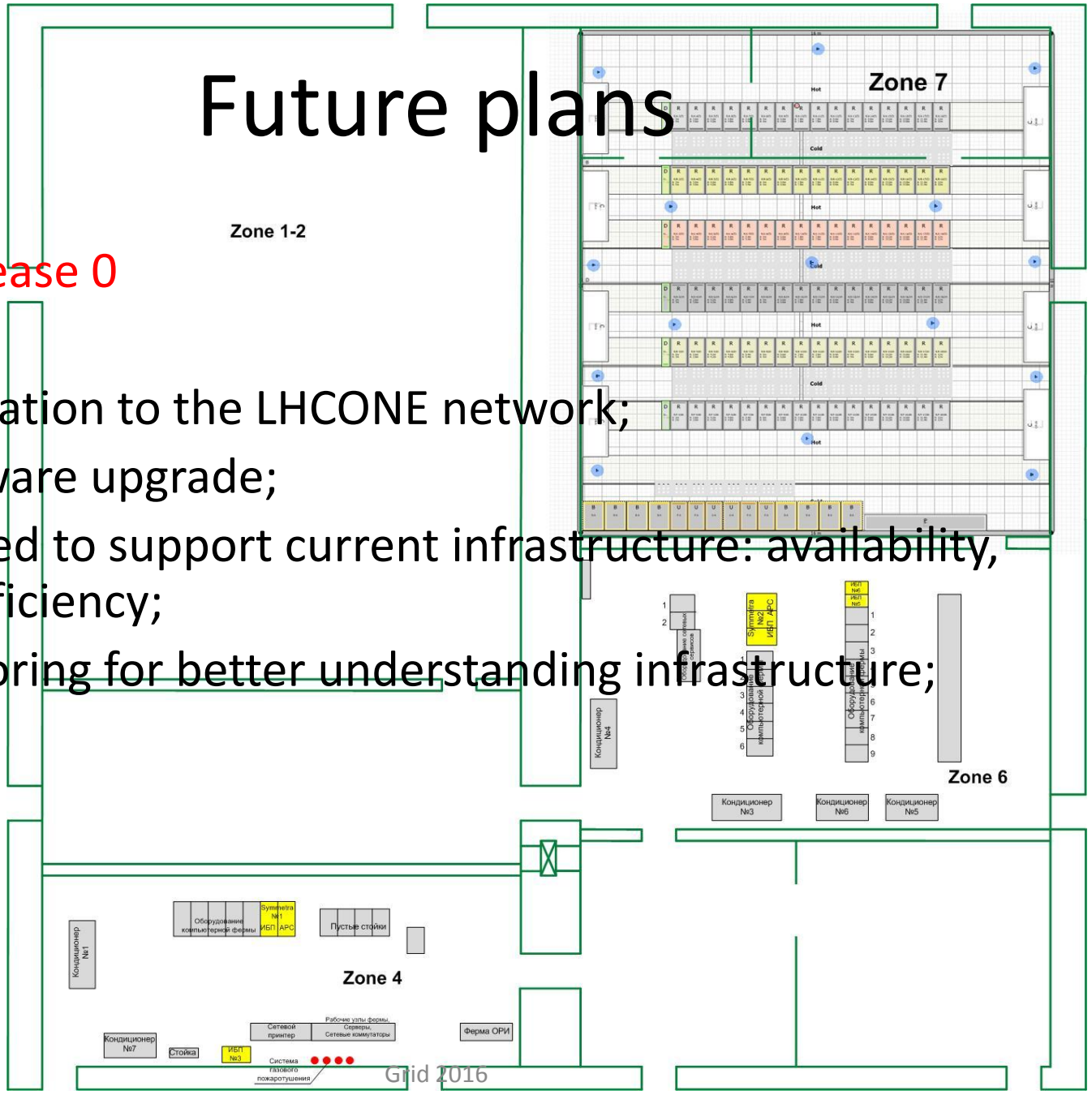
Works for smooth run in 2016

- IHEP data center modernization to renew cooling capacities; √
- Manpower increasing; √
- System and middleware software upgrade; √
- Works focused in supporting current infrastructure: availability, reliability, efficiency; √
- External network modernisation; √

Future plans

CPU&DISC increase 0

- Better integration to the LHCONE network;
- System software upgrade;
- Works focused to support current infrastructure: availability, reliability, efficiency;
- More monitoring for better understanding infrastructure;



Thank you!

Any questions?