

# Slovak status and plans

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*Alice T1/T2 workshop Lyon 4-6.6.2013*

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## Short history :

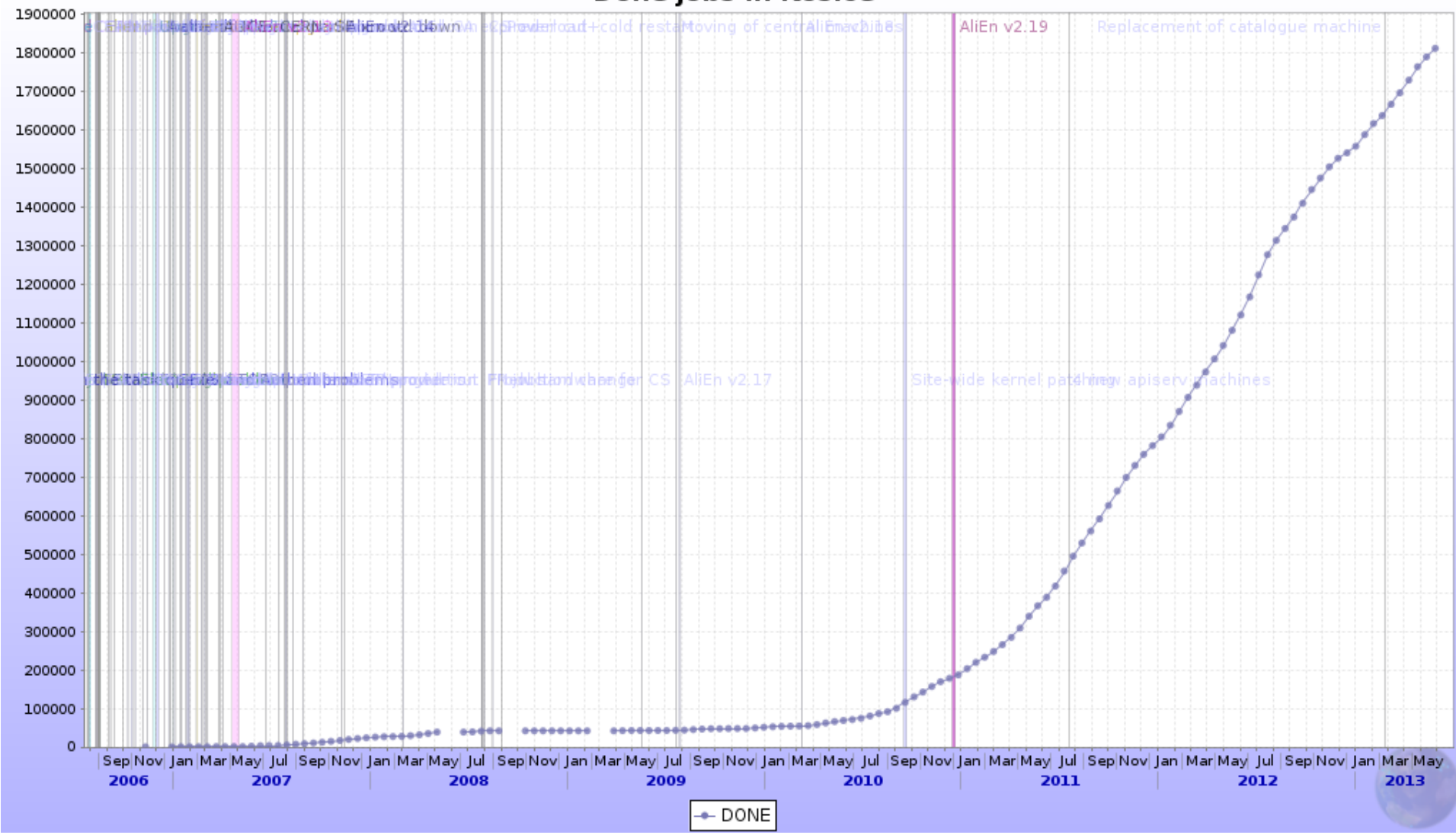
- **2004 – The first steps in building grid cluster for LHC**
  - after our funding agency confirmed its financial support
- **The building of the cluster began with 20 nodes in Kosice**
  - first experience with a GRID specific hardware, software, network gained
- **Feb 2005 -The first site (KE) was certified in EGEE infrastructure**
- **After some testing period it classified for production in the same year**
- **2006 - First jobs were running in ALICE VO**
- **In the same year also Bratislava site joined**

Stable funding has enabled to enlarge the cluster from the 20 nodes of the year 2006 to its current size

Years (according EGI accounting reports for Alice jobs ):

Site	year	ALICE ( number of jobs per year)
<b>FMPHI-UNIBA</b>	2010	3,226,108
	2011	6,438,676
	2012	7,849,868
	2013	5,475,144 ( <i>up to May</i> )
<b>IEPSAS-Kosice</b>	2010	2,737,380
	2011	7,160,704
	2012	8,099,620
	2013	4,083,616 ( <i>up to May</i> )

# Done jobs in Kosice



**FMPHi-UNIBA** CPU cores 476  
Storage 190 TB



## IEP-SAS Kosice

CPU cores 448

Storage 100 TB



<u>Site</u>	<u>Year</u>	<u>CPUs</u>	<u>Cores</u>	<u>Disk (TB)</u>
<b>FMP<i>h</i>I-UNIBA</b>	2012	86	356	300
	2013	116	476	380
	2014		524	
<b>IEPSAS-Kosice</b>	2012	76	324	130
	2013	106	448	210
	2014	53	560	450



Operating system: Scientific Linux (in version 5.8 )

Middleware: Umd2

VObox: wlcg-vobox ( version 1.0.0-1 )  
Alien is alien.v2-19.210

Storage: based on the xrootd ( 3.2.6 )

**Hardware platform (and admins) are shared by other VO ( ATLAS, HONE) and sometimes their needs might cause minor interference**

e.g. Atlas :

- different technologies used for SE in Slovak clusters
- the FMPhI cluster is using the Disk Pool Manager ( DPM)
- the IEP-SAS cluster is using the dCache

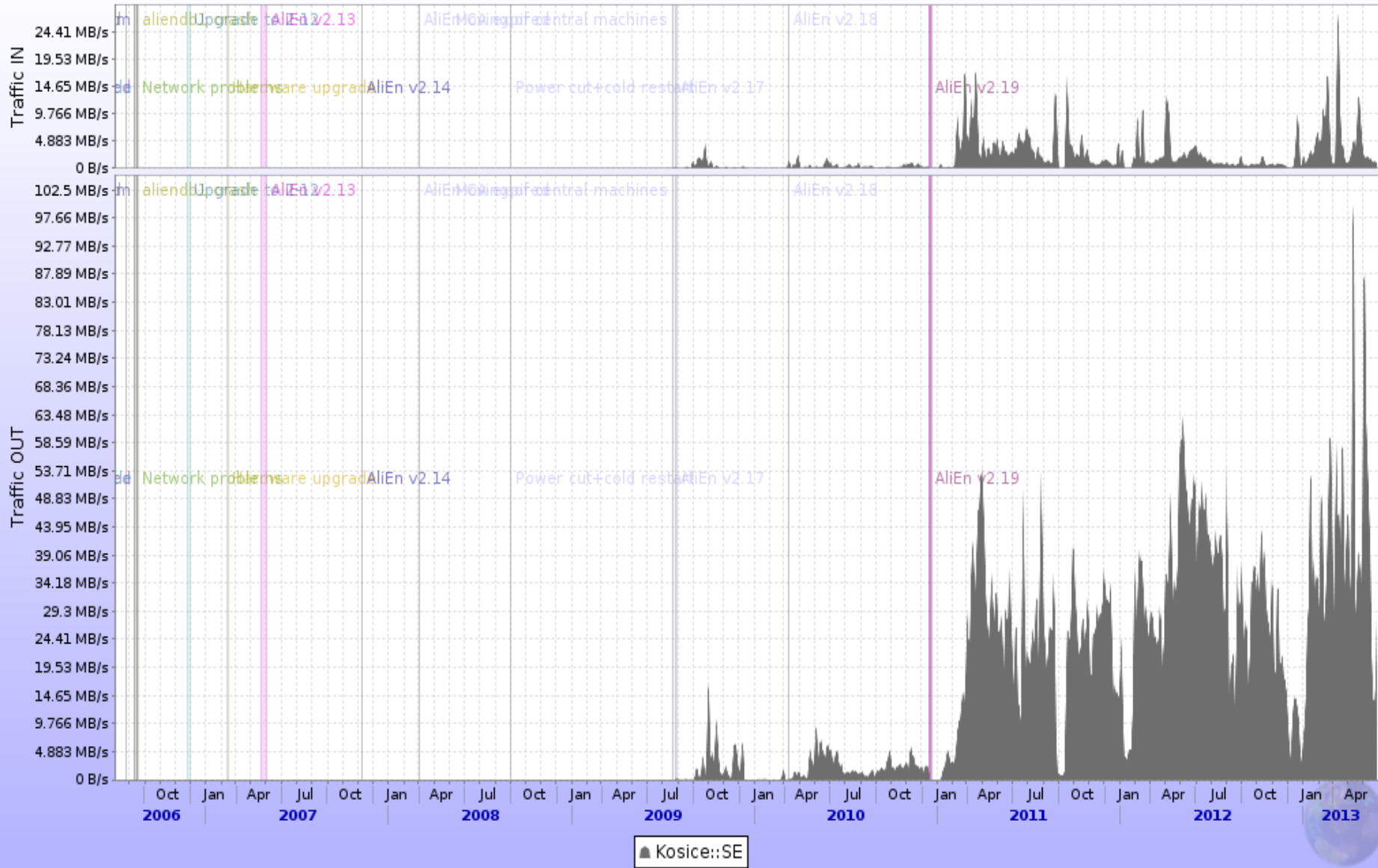


SANET - Slovenská akademická a dátová sieť  
(Marec 2013)



- Academic network (**SANET**) provides 1Gb for each site
- Limitation due to the **Backbone with 10Gb**
- Local network is 1Gb

# Aggregated network traffic per SE



**The goal (urgent):** To solve several persistent problems that negatively affect continuity of operation:

- **Underpowered air conditioning** (overheating in the summer months, running at maximum wears it down faster)
- **Occasional power cuts** (battery powered UPS cannot hold for too long, unavoidable downtimes)
- **Limited network throughput** (1Gb WAN, 1Gb LAN)

**The longer term goals:**

- Disk storage (larger capacity of disk storage)
- Update CPU's ( more powerful and energy-saving)

**=====> reliability first !!!**

### Air conditioning:

- The existing system is somehow underpowered and old .
- Doesn't meet the needs for the cooling especially during summer months.
- Complete replacement of air conditioning system with free cooling system.

### Electricity:

- Diesel powered backup generator
- Strengthening of the electric power grid

## **Sept 2012 signed MoU with WLCG**

- Agreement with our Funding agency till 2015
  - renewable
  - fixed budget (sets limits for the further development of the computing infrastructure in the near future)

## ▪ **IEPSAS**

- **2.1 FTE** (I. Kulkova, M.Straka, J. Vrlakova)
  - local IT group administrators
  - physicist(s) - more expected in the future

## ▪ **FMPHI**

- **0.5 FTE**
  - 1 PhD student (M. Meres)
  - support from IT group with networking



## Summary :

- Slovak LHC Grid resources has provided reliable computing resources for the last 4 years
- Steady increase in computing power and storage volume was possible thanks to stable financing
- Short term goals of the further development are aimed at elimination of prevailing problems affecting continuity of operation - 1<sup>st</sup> priority for the next 1-2 years