ANSL site of LHC and ALICE Computing Grids. Deployment and Operation.

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Actuality of WLCG site deployment in ANSL

ANSL is heavily involved in the ***ALICE*** **, ATLAS** and **CMS** experiments. The ***ANSL*** groups:

- participated in the R&D works on the stage of the detectors design;
- contributed to the construction of detectors components;
- carried out Monte Carlo studies of the performance of detectors;
- have been developing software for the computing environment of experiments

Joining of ***ANSL*** to ***WLCG*** has always been a very hot issue!

Two important implications:

- Giving the ***ANSL*** users possibility to perform the analysis on large sets of data
- Incorporation of ***ANSL*** cluster in ***WLCG***, which means allocation its Grid resources to the LHC computing

The first essay to deploy a WLCG site in ANSL

February-May 2007:

Artem Harutyunyan has deployed the EGEE/***WLCG*** middleware on a (mini)-site comprising three computers, provided by ***ANSL***/***ALICE*** team . On 20th of May 2007 the ***ANSL*** site has been certified as “production site” of ***WLCG***.

After almost one year of operation the site was put into suspended mode because of unacceptably low quality of network connection (low speed, frequent outages)!

ArmGrid and *ArmNGI* Foundation

In 2008, seven Armenian governmental and non-governmental organisations have signed agreement on the development of a national Grid infrastructure-*ArmGrid*:

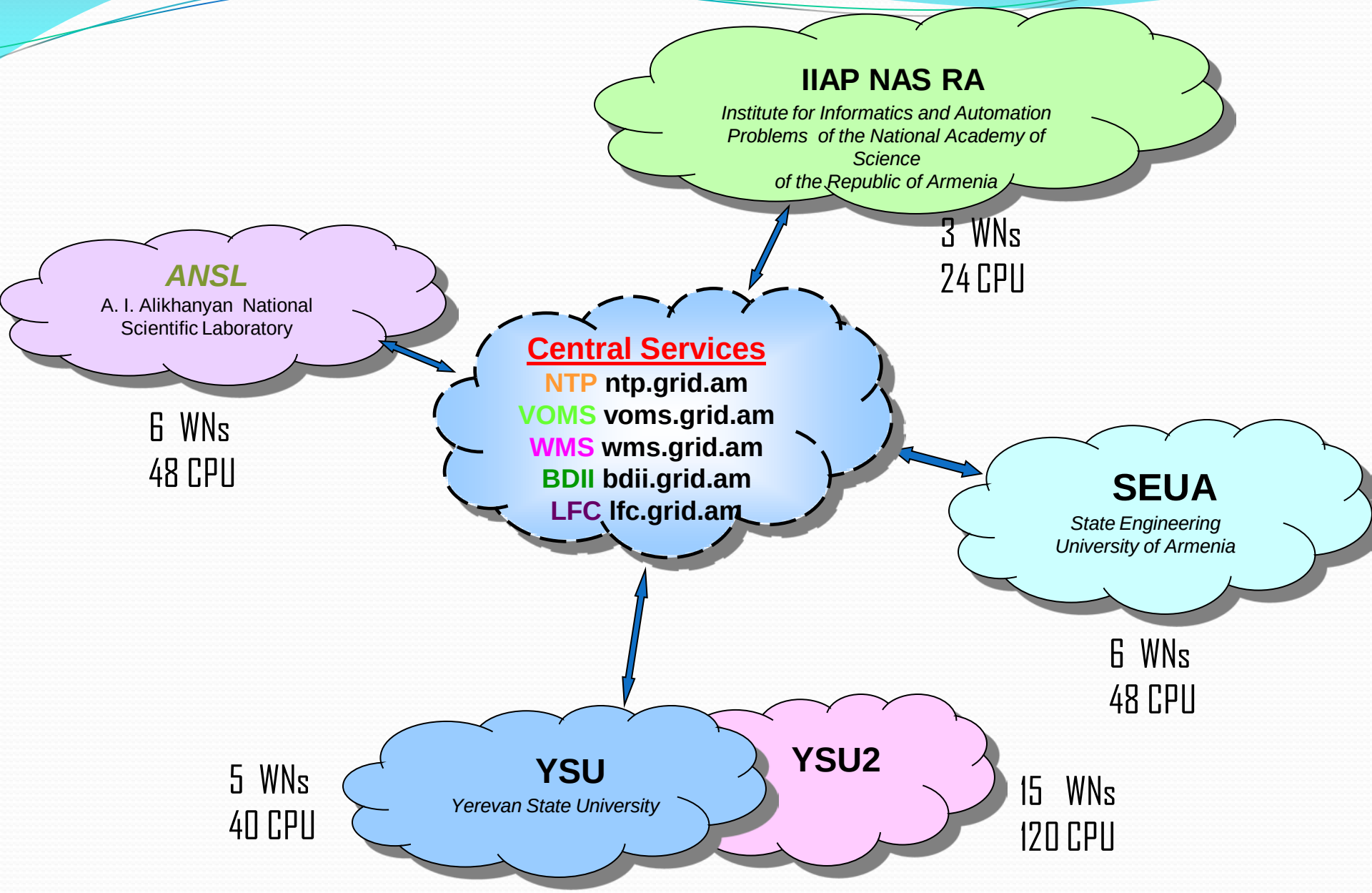
State Committee of Science
National Academy of Science
Yerevan State University
State Engineering University of Armenia,
Yerevan Physics Institute
Institute for Informatics and Automation Problems
Armenian e-Science Foundation

ArmGrid project is funded by Armenian government and International funding organizations (ISTC, FP7).

ArmGrid is connected to the international research network GEANT2 by a 6 Mbpsec bandwidth.

In 2009, the partners of *ArmGrid* have reached agreement on the establishment of Armenian National Grid Initiative (*ArmNGI*) Foundation (http://www.grid.am). The official registration of *ArmNGI* Foundation is under process.

ArmGrid Infrastructure



Deployment of WLCG/ALICE site on ANSL cluster

Deployment of a fully operational ***WLCG***/***ALICE*** site on the base of a standard, *ArmGrid* - specific configuration of ***ANSL*** cluster represented a two-step procedure:

1st step - installation of VO-BOX, CREAM-CE and XROOTD targeted to provide the ***ALICE*** Grid functionality and to create environment necessary for the accomplishment of the 2nd step

2nd step - installation of the AliEn (***ALICE*** Environment) - specific services and application software on VO-BOX

ANSL Cluster (yerphi-cluster.grid.am)

Standard configuration of ANSL cluster before WLCG and AliEn deployment:

6 worker nodes: ***WN1-WN6***	**Each of them has:** **CPU:** 2 physicalcores *4 logicalcores = 8 cores; Clock rate: 2.50 GHz **RAM**: 8GB; **HDD**: 160GB; **OS**: SLC 5.4 x86_64; **SWAP**: 24 GB **Middleware**: glite–WN_3.2.0 **FQDNs**: *wn1-6.yerphi-cluster.grid.am*
CE	**CPU**: 1 core 1.86 GHz; **RAM**: 2 GB; **HDD**: 160 GB; **OS**: SLC 4.8 x86_64 **Middleware**: LCG-CE (glite-lcg-CE _3.1.0), **FQDN**: *ce.yerphi-cluster.grid.am*
SE	**CPU**: 2 cores 1.86 GHz; **RAM**: 2 GB; **HDD**: 1 TB; **OS**: SLC 4.8 x86_64 **Middleware**: LCG-SE (glite-SE_dpm_mysql_3.1.0), **FQDN**: *se.yerphi-cluster.grid.am*

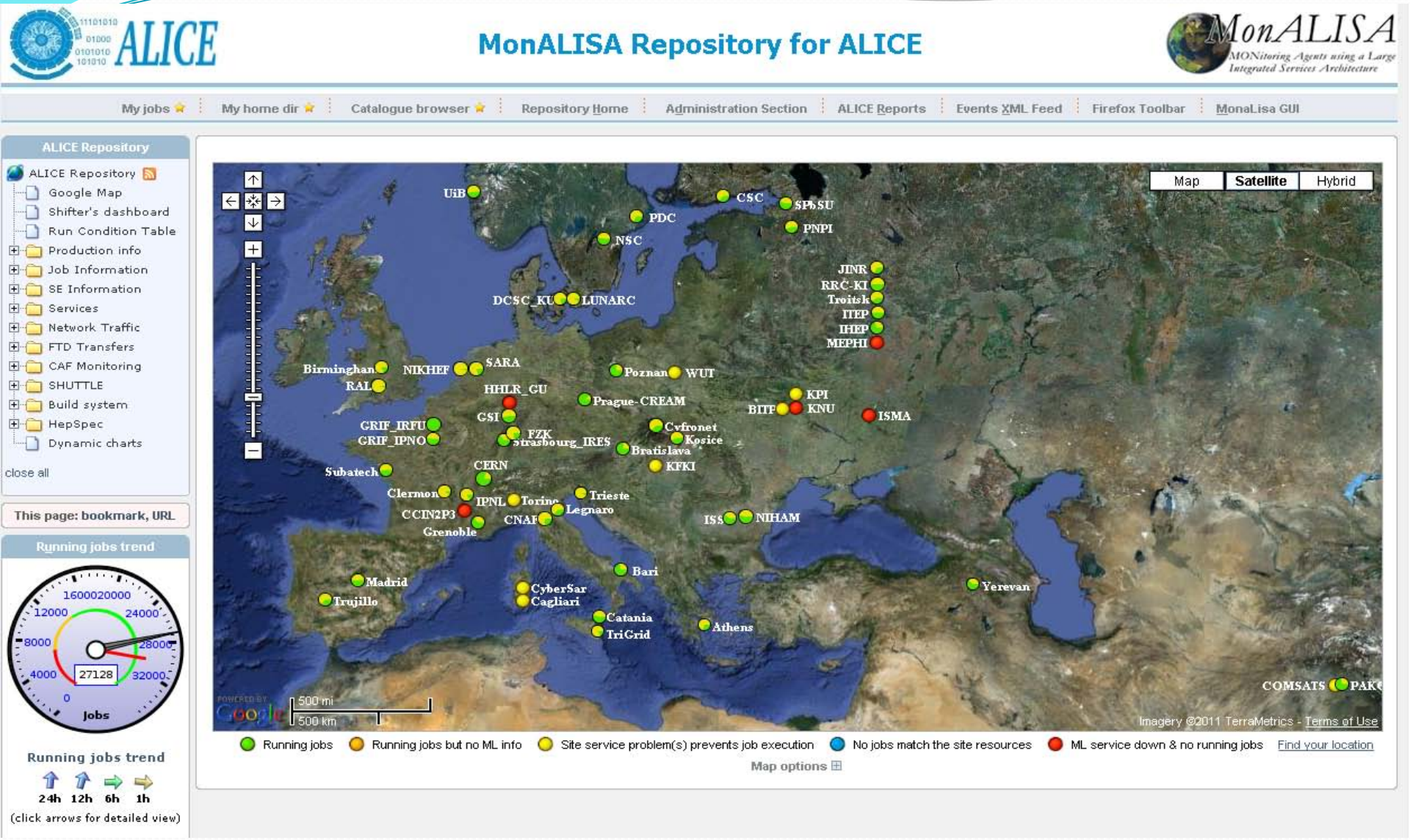
WLCG/ALICE site on ANSL cluster

Additional hardware and software configuration for WLCG/ALICE site deployment on ANSL cluster

VO-BOX	**CPU**: 2 cores, 1.9 GHz; **RAM**: 4 GB; **HDD**: 160 GB; **OS**: SLC 5.4 x86_64 **Middleware**: VO-BOX (glite-VOBOX _3.2.0) **FQDN**: *alice-vobox.yerphi-cluster.grid.am* ***The machine is provided by ANSL director. RAM is provided by ANSL/ALICE team***
CREAM-CE +Torque	**CPU**: 2 cores, 1.9 GHz; **RAM**: 4 GB; **HDD**: 160 GB; **OS**: SLC 5.4 x86_64 **Middleware**: CREAM-CE (glite-CREAM _3.2.0), Torque (TORQUE_utils_3.2.0) **FQDN**: *alice-cream.yerphi-cluster.grid.am* ***The machine is provided by ANSL director. RAM is provided by ANSL/ALICE team***
XROOTD	**CPU**: 2 cores, 2.93 GHz**;** **RAM**: 4 GB; **HDD**: 1 TB; **OS**: SLC 5.4 x86_64 **Middleware**: XROOTD **FQDN**: *alice-xrootd.yerphi-cluster.grid.am* ***The machine is provided by ANSL/ALICE team***

The involved procedure of the site deployment is documented in detail. The preparation of a complete guide is planned (during September-October 2011). The guide will be presented to the *ALICE* Collaboration.

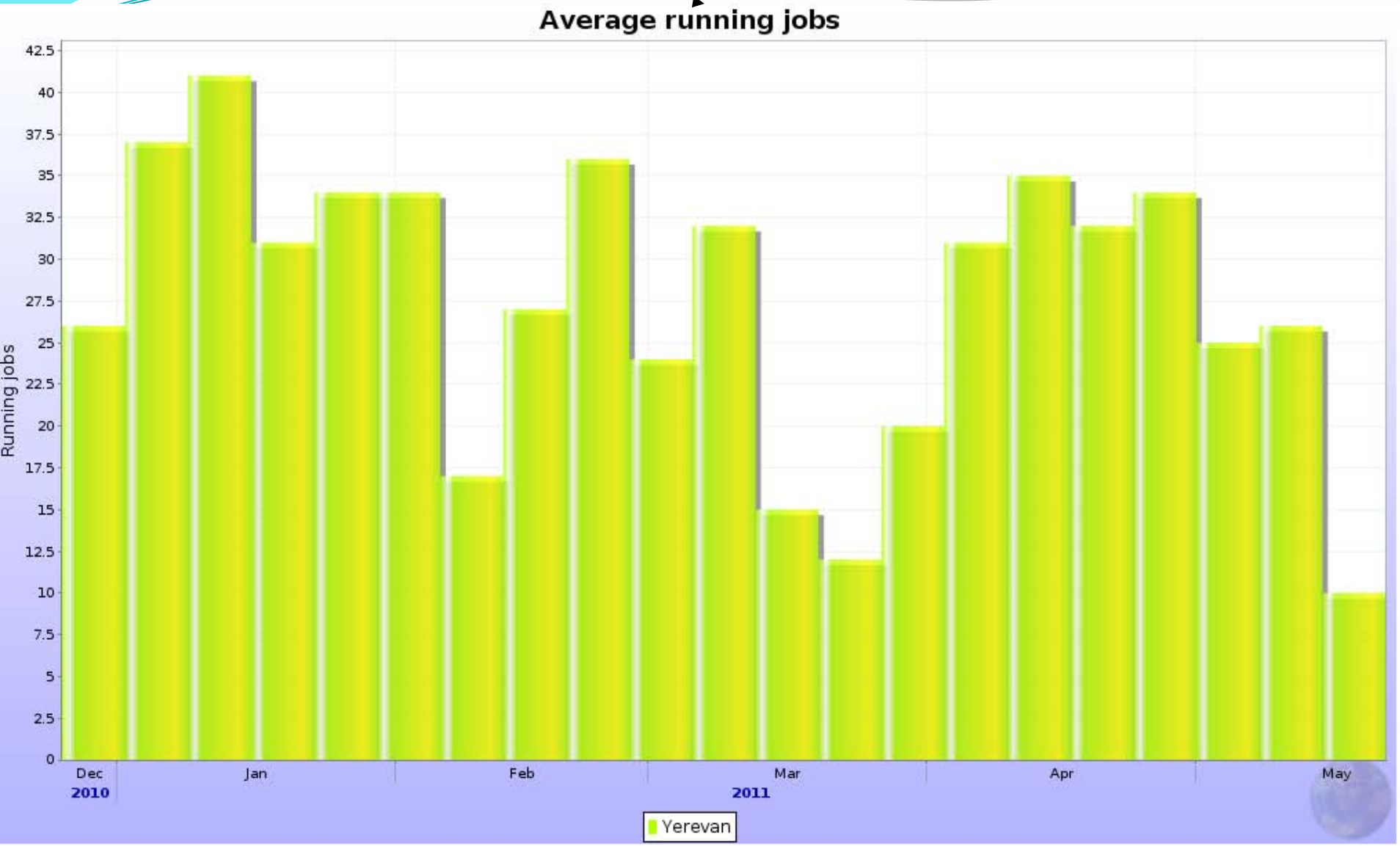
Site operation started in December 2010



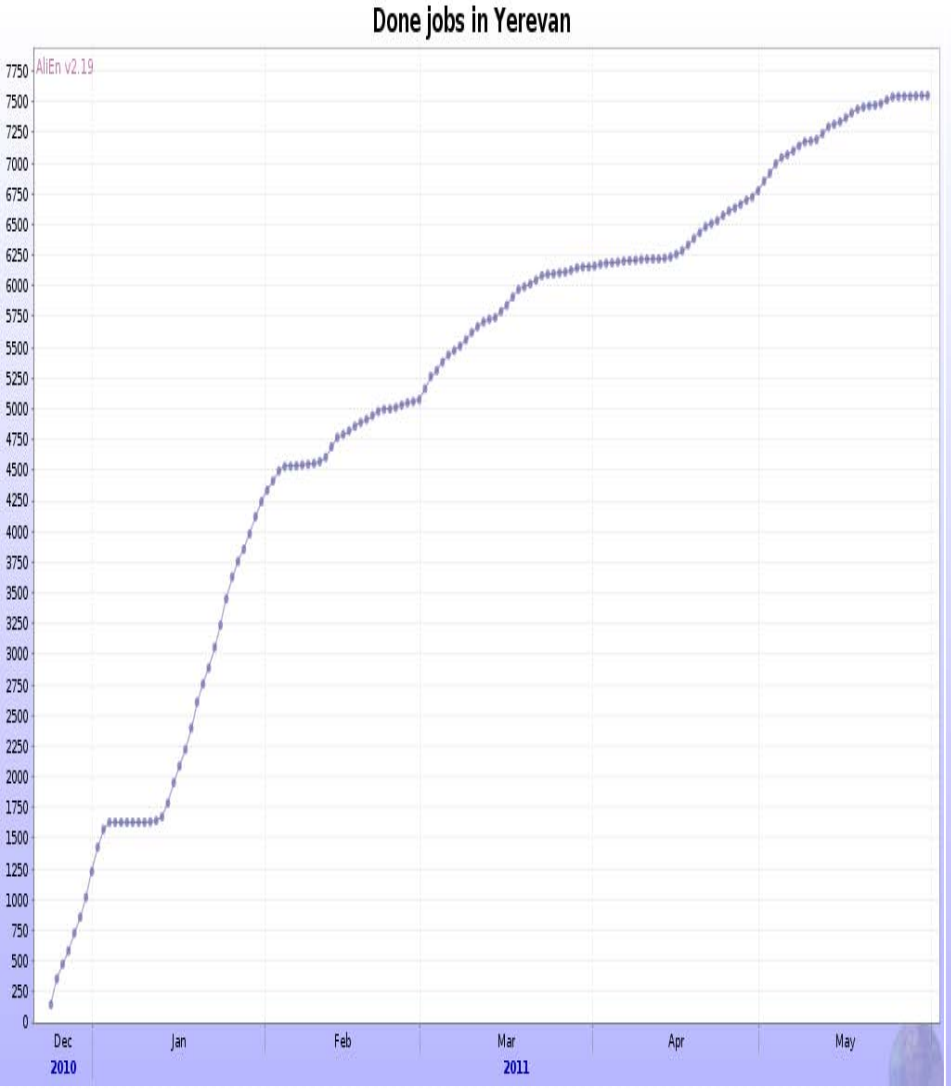
http://alimonitor.cern.ch/map.jsp

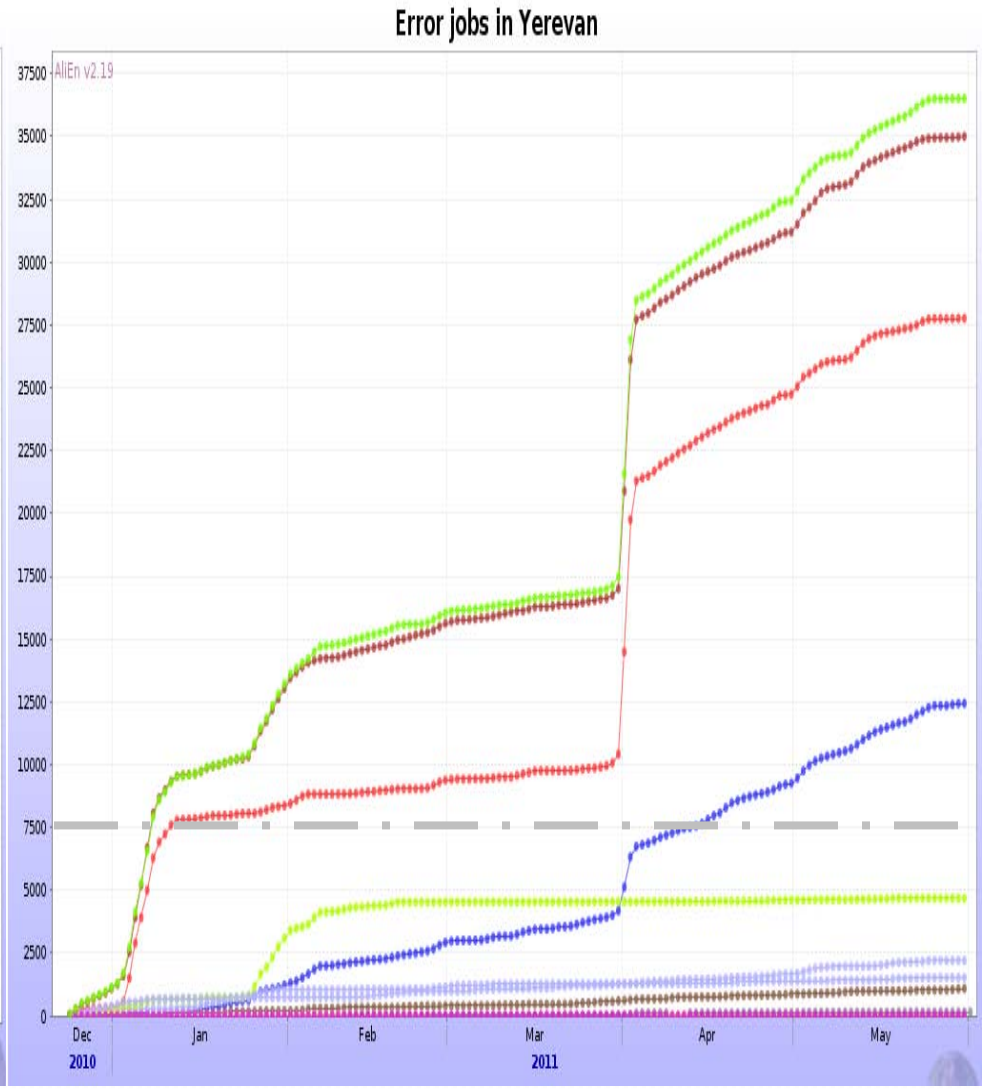
Site monitoring details.
There are subtle points (data)!

Jobs Monitoring



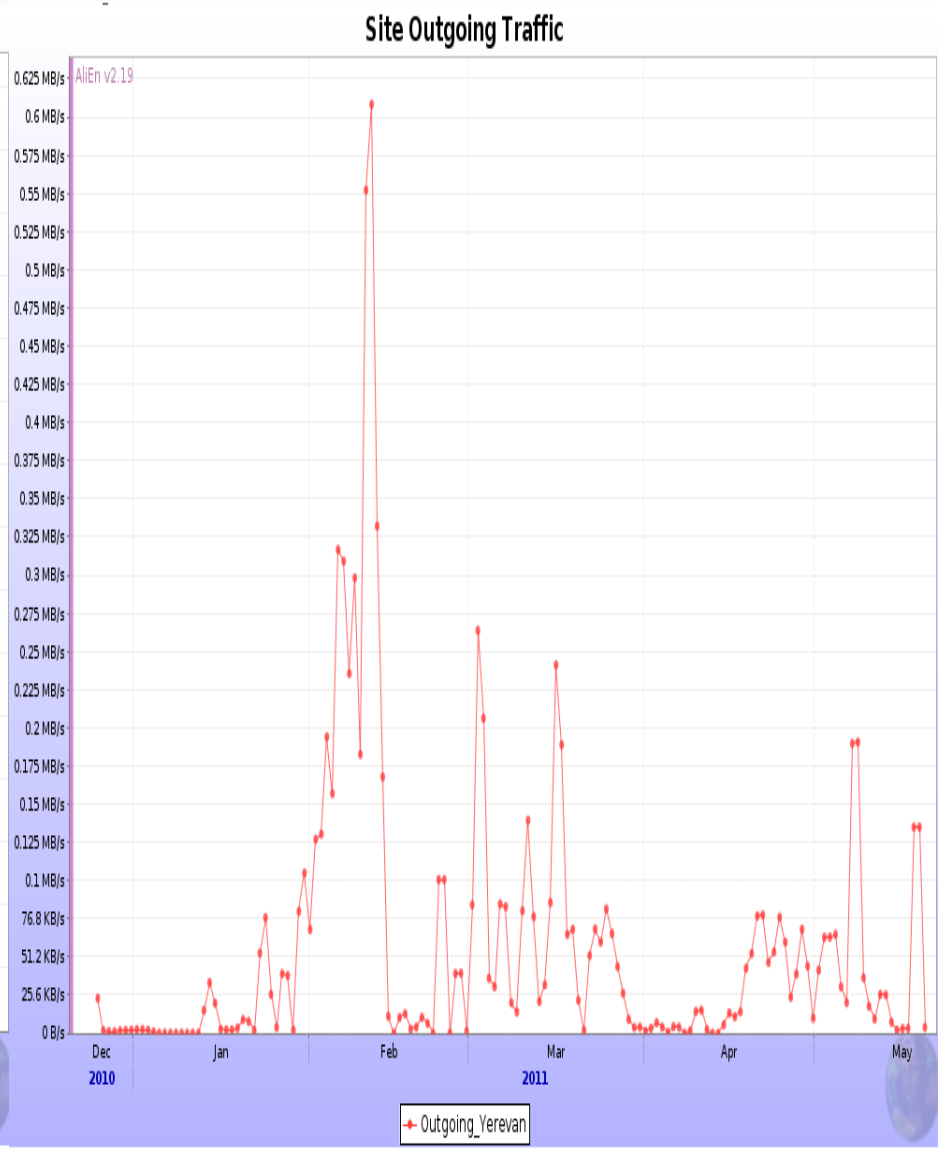
Jobs Monitoring





Why the ratio of error and done jobs is so high ~ 5!

Network Traffic Monitoring



How To?

1. Increase the efficiency of small sites (e.g. Yerevan) without upgrading the hardware.
2. Make the Job Broker aware of the available RAM to avoid receiving jobs requiring more RAM than is actually available.

THANK YOU