AM-04-YERPHI site Challenges and Perspectives

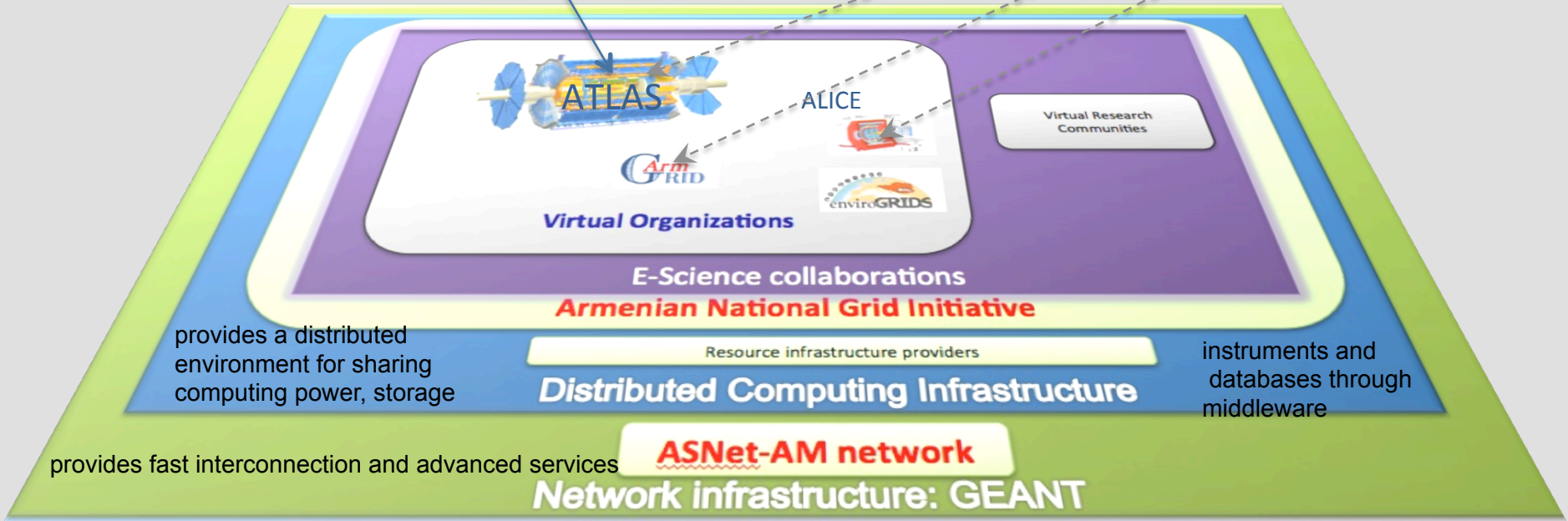### ATLAS Team, A. Alikanyan National Laboratory (YERPHI)

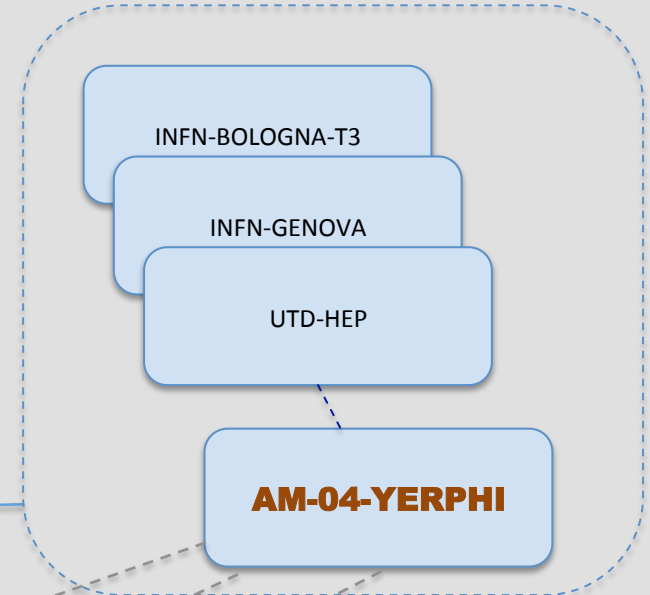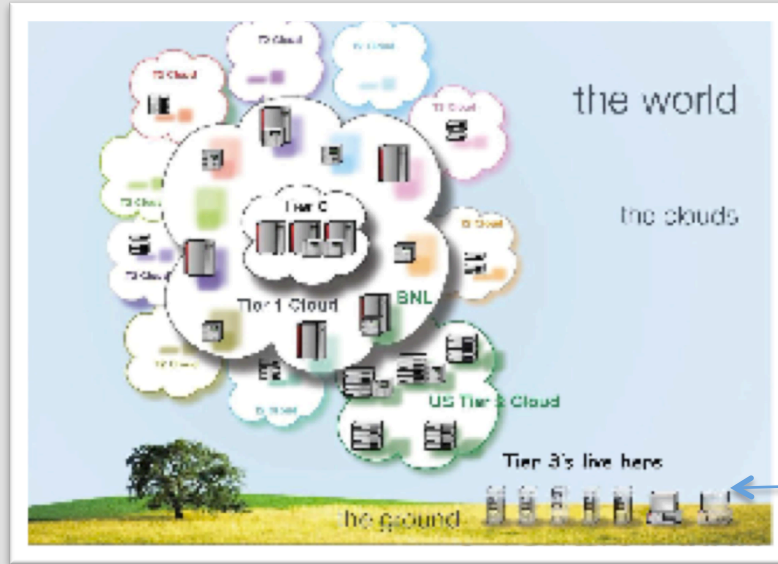### H. Oganezov

SCGCCW 2014 TBILISI
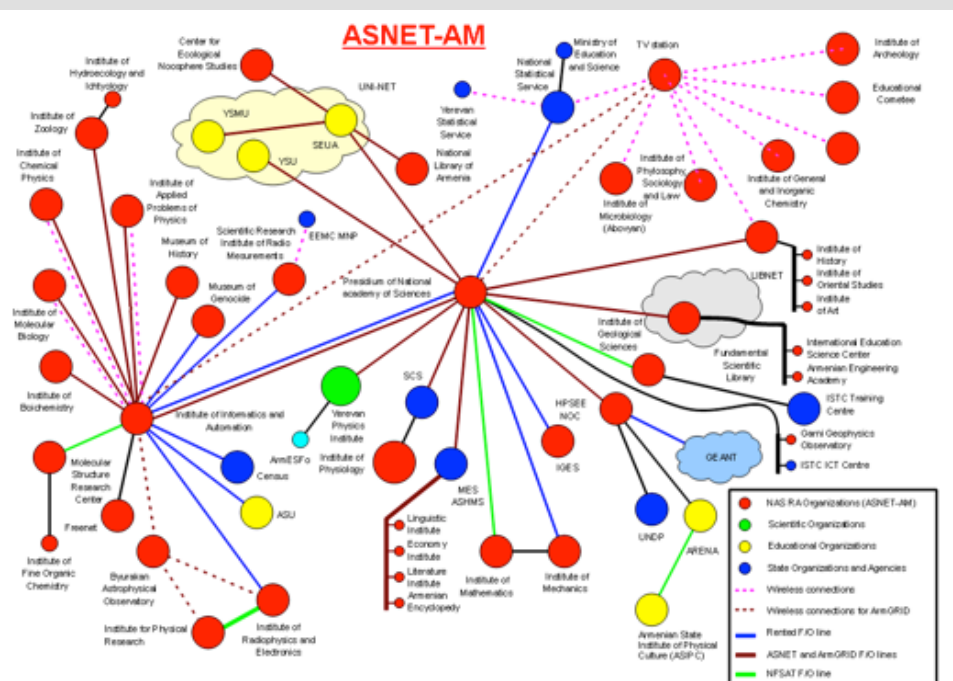
Third ATLAS South Caucasus Grid & Cloud Computing Workshop

the world

the clouds

INFN-BOLOGNA-T3

INFN-GENOVA

UTD-HEP

AM-04-YERPHI

ATLAS

ALICE

Virtual Research Communities

Virtual Organizations

E-Science collaborations

Armenian National Grid Initiative

provides a distributed environment for sharing computing power, storage

Resource infrastructure providers

Distributed Computing Infrastructure

instruments and databases through middleware

provides fast interconnection and advanced services

ASNet-AM network

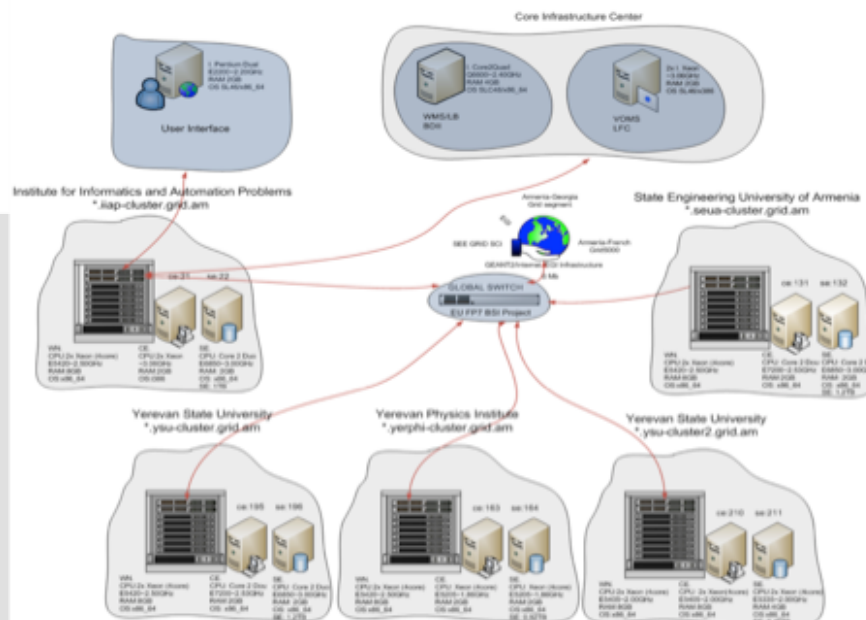**Network infrastructure: GEANT**

Armenian e-infrastructure is a complex national IT infrastructure consists of both communication and distributed computing infrastructures. The infrastructure is operated by the

Institute for Informatics and Automation Problems (IIAP), which is the leading ICT research and technology development institute of the National Academy of Sciences of the Republic of Armenia (NAS RA).
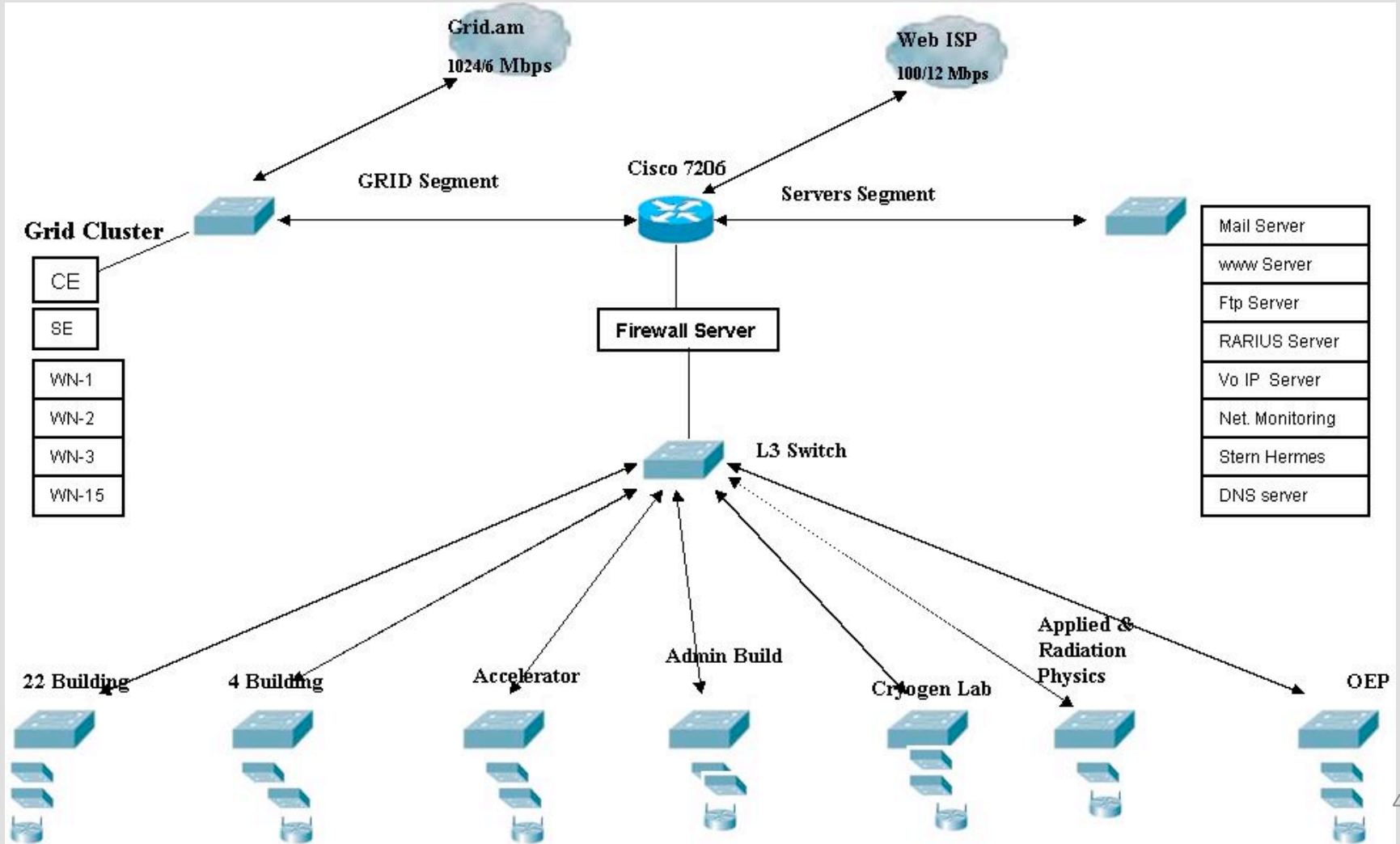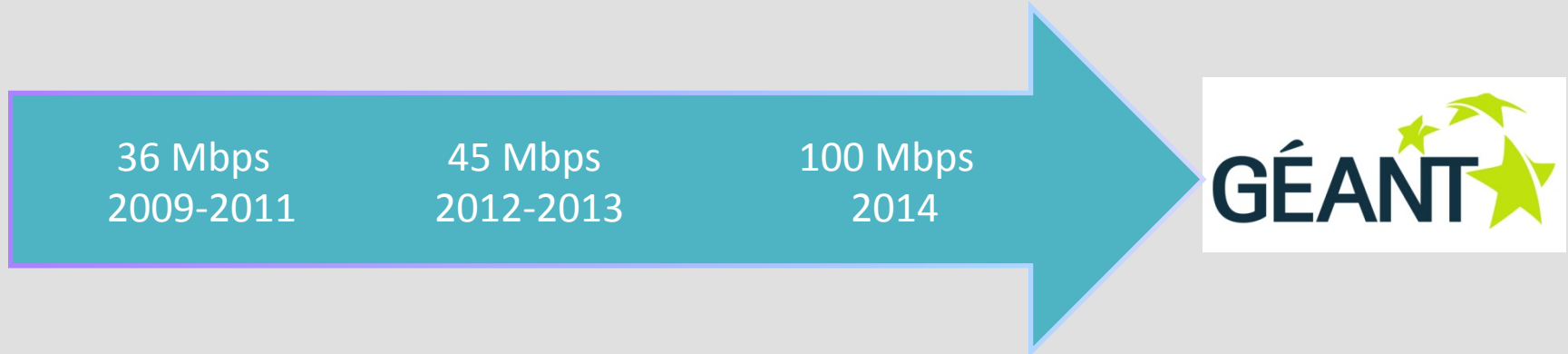
3

AANL network topology

- LAN includes 10 buildings at Yerphi and Aragats ,Nor-Hamberd Stations
- computer network consists of over 400 workstations.,

AANL GRID bandwidth allocation

36 Mbps
2009-2011

45 Mbps
2012-2013

100 Mbps
2014

GÉANT

Network is provided by GEANT and by the channel rented from the local telecom companies (Arminco, ADC).

IP Group "Grid" members and policies:

- GRID Cluster
- Grid oriented servers and services
- ALICE,ATLAS Collaboration Workstations
- Access to ASNET and Educational Network 1000 Mbps Access to Outside Armenia 6 Mbps No session Limits

Site overview: services

Services

Hostname (service type)	URL	Production	Monitored	Scope(s)
ce.yerphi-cluster.grid.am (APEL)		✔	✔	EGI
bdii.yerphi-cluster.grid.am (Site-BDII)		✔	✔	EGI
ce.yerphi-cluster.grid.am (CREAM-CE)		✔	✔	EGI
se.yerphi-cluster.grid.am (SRM)		✔	✔	EGI
apel.yerphi-cluster.grid.am (gLite-APEL)		✔	✔	EGI
wms.grid.am (WMS)		✔	✔	EGI
bdii.grid.am (Top-BDII)		✔	✔	EGI
sam.grid.am (ngi.SAM)		✔	✔	EGI
myproxy.grid.am (MyProxy)		✔	✔	EGI
wms.grid.am (LB)		✔	✔	EGI
voms.grid.am (VOMS)		✔	✔	EGI
argus.grid.am (emi.ARGUS)		✔	✔	EGI

Site overview: Gstat monitoring
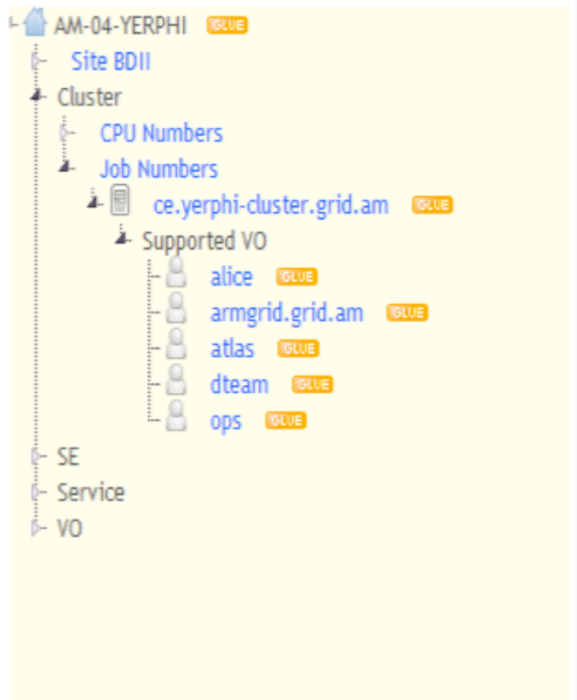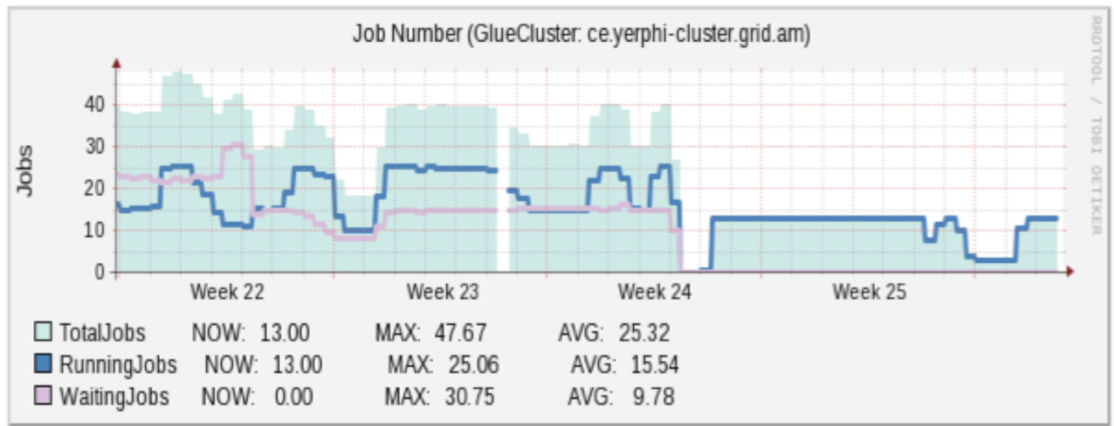
2007: the AM-04-YERPHI site has been certified as "production site" of WLCG

✓ **Computational resources**

- CPU: 6 nodes x 2 cpus

per node X 4 cors per cpus= 48 cors

- HDD:160 GB

- RAM: 8 GB

.

✓ **Storage Capacity**
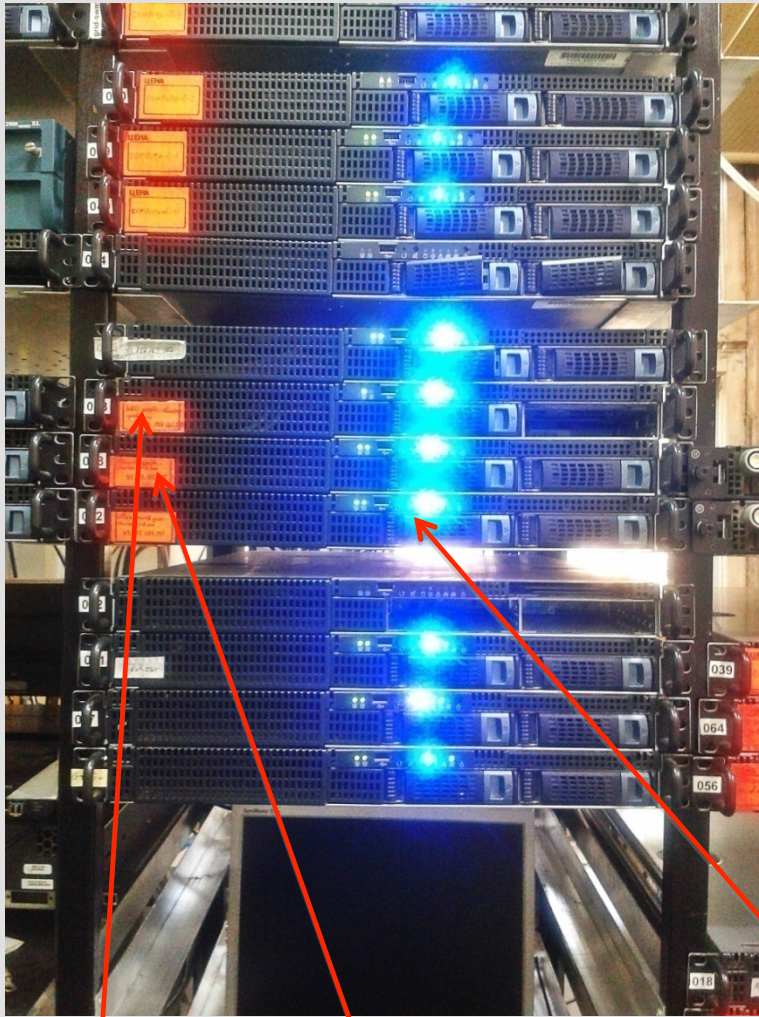
- 50TB

✓

✓ **Supported VOs:**

✓ ATLAS
✓ ALICE

Clusters

October 20-th 2011 : Site status as ATLAS GRID site was approved by ICB

Allocated Storage 10TB (nfs)

○ ATLASSCRATCHDISK 2T
○ ATLASLOCALGROUPDISK 7.00T
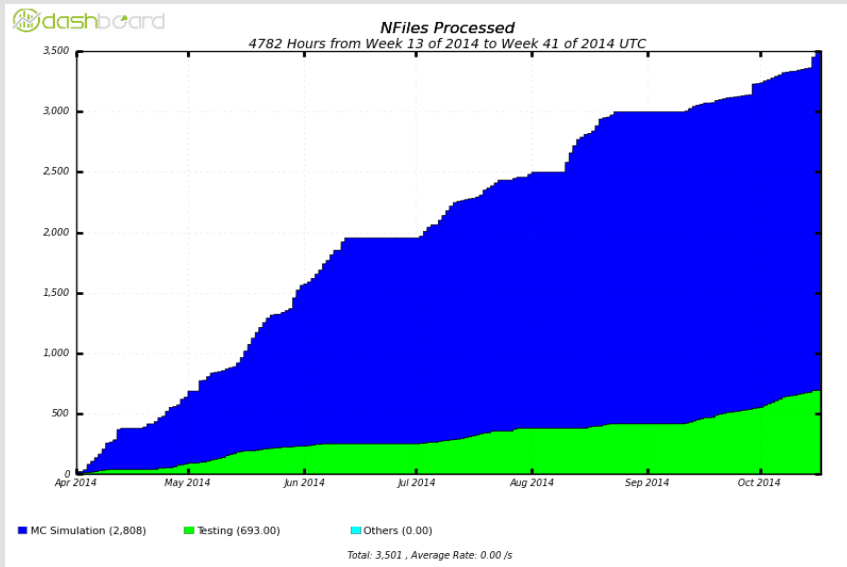○ ATLASPRODDISK 1024.00G

Frontier/ Squid cluster

perfSONAR node

xrootd cluster
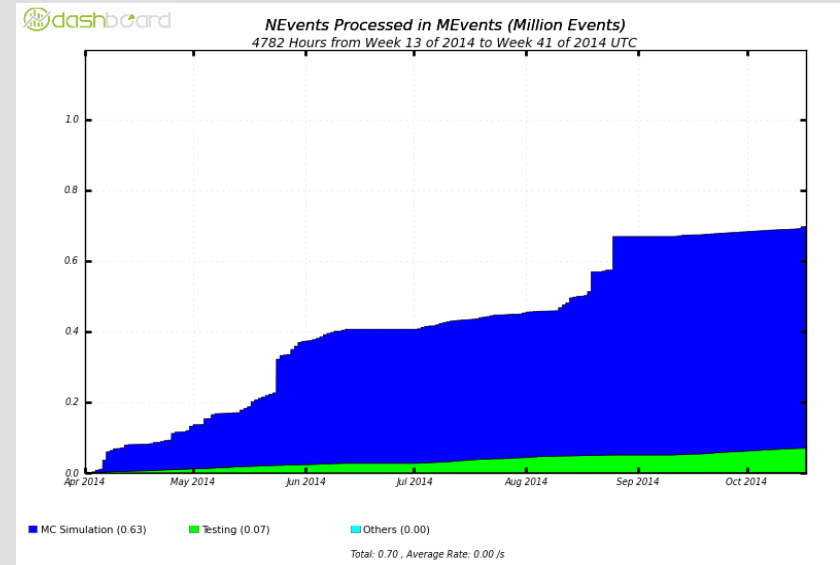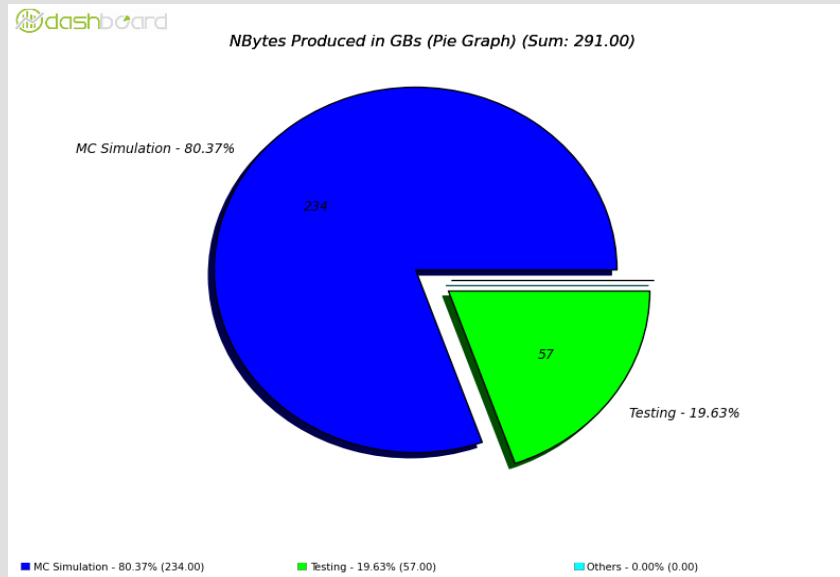
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Functionality: low priority production

Number of Processed files

Number of Processed Events files

Number of Produced files

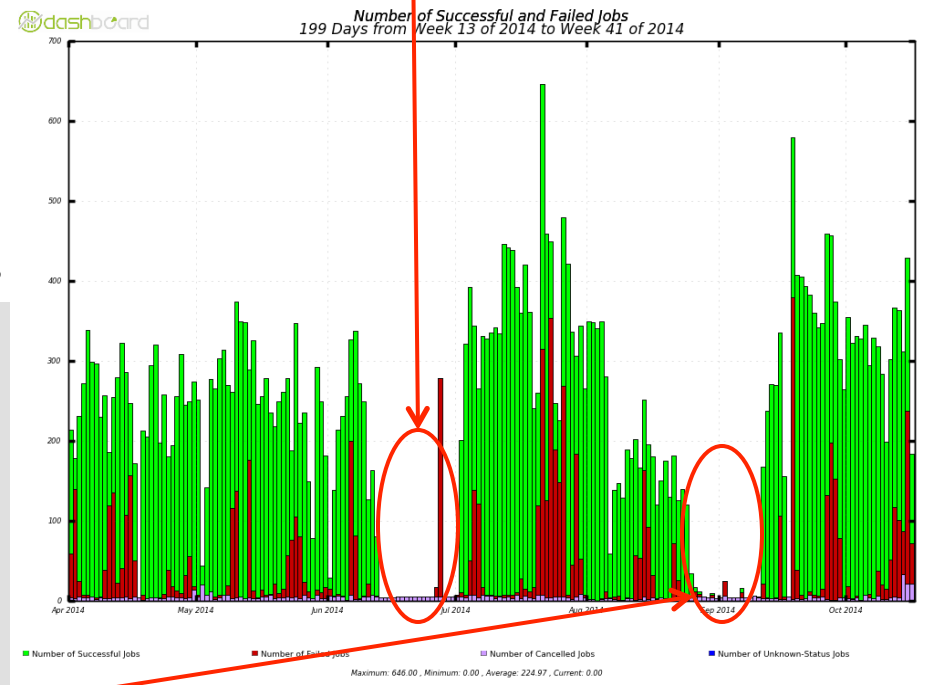Downtime (Site maintenance)
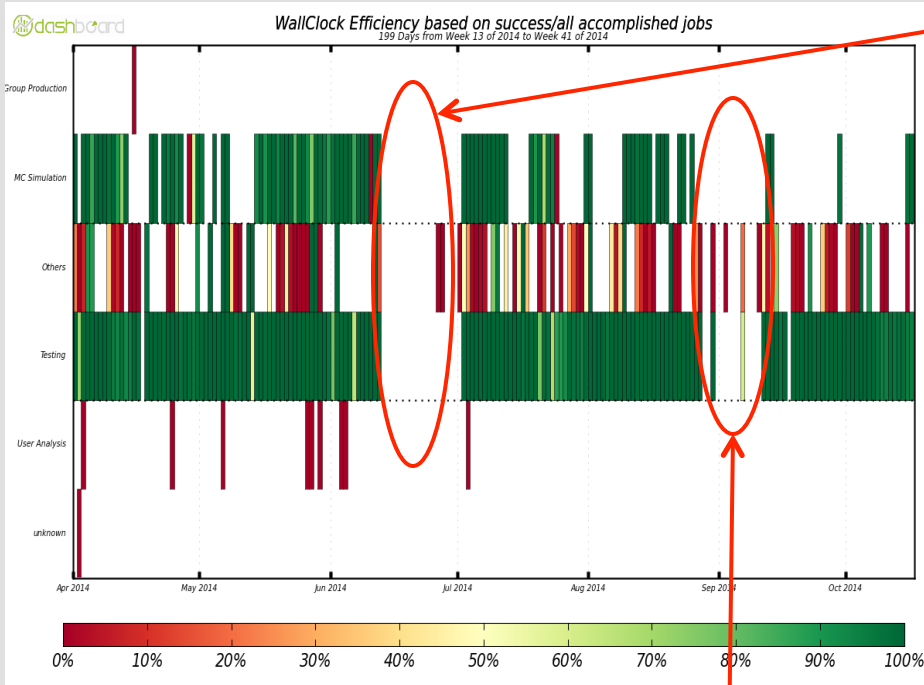
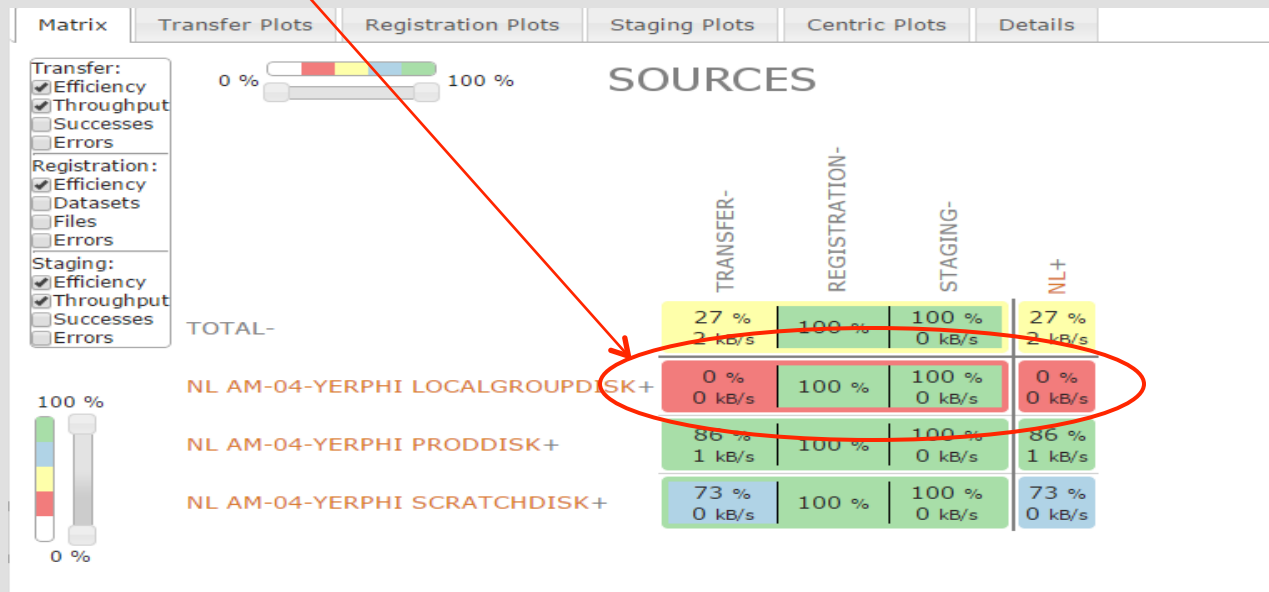WallClock Efficiency

Certificate expiration issue

Number of Successful and Failed jobs

Data Transfers

Problem with big file transferring

Connection time out

perfSONAR stands for PERformance Service Oriented Network monitoring Architecture

perfSONAR is designed to be:
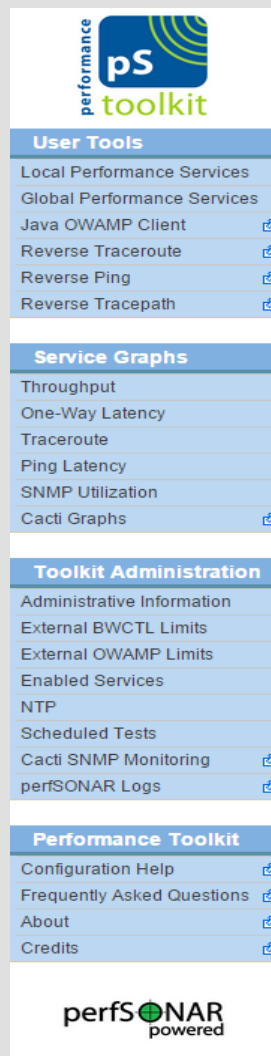
- ➢ Decentralised and Scalable

- • Large number of networks and services, large volume of data

- • Each domain can set its own security policy

- ➢ Secure

- • Will not put participating networks at risk of attack or congest them

Main purpose
- • aiding network problem diagnosis and speeding repairs
- • identifying structural bottlenecks in need of remediation
- • providing a standard measurement of various network performance related metrics over time as well as "on-demand" tests.

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perfSONAR deployment at AANL

Current network problem:

- issue with big file transferring(~10 Gb) - connection timeouts and connectivity problem (packet loss)

- perfSonar diagnostic will use to better optimize decisions in workflow and data management – tune timeout value, number of streams, etc

- optimize data distribution (DDM) based upon a better understanding of the network between sites

pS-Performance Node For AANL In Yerevan , AM

Host Information

Organization Name	AANL
City, State, Country	Yerevan, , AM
Zip Code	0036
Latitude,Longitude	40.12,44.29
Administrator Name	Hovhannes Oganezov
Administrator Email	hogane@cern.ch

Communities This Host Participates In

GEANT pS-NPToolkit-3.3.2 grid.am ATLAS asnet.am

Host Status

Primary Address	93.187.165.182
MTU	1500
NTP Status	Synced
Globally registered	Yes

Services Offered

Bandwidth Test Controller (BWCTL)[1] — Running
- tcp://psaanl.yerphi–cluster.grid.am:4823

Network Diagnostic Tester (NDT)[1] — Running
- tcp://psaanl.yerphi–cluster.grid.am:3001
- http://psaanl.yerphi–cluster.grid.am:7123

Network Path and Application Diagnosis (NPAD)[1] — Running
- tcp://psaanl.yerphi–cluster.grid.am:8001
- http://psaanl.yerphi–cluster.grid.am:8000

One–Way Ping Service (OWAMP)[1] — Running
- tcp://psaanl.yerphi–cluster.grid.am:861

perfSONAR–BUOY Regular Testing (Throughput)[1] — Running

perfSONAR–BUOY Measurement Archive[1] — Running
- http://psaanl.yerphi–cluster.grid.am:8085/perfSONAR_PS/services/pSB

Sidebar menu:

User Tools
- Local Performance Services
- Global Performance Services
- Java OWAMP Client
- Reverse Traceroute
- Reverse Ping
- Reverse Tracepath

Service Graphs
- Throughput
- One-Way Latency
- Traceroute
- Ping Latency
- SNMP Utilization
- Cacti Graphs

Toolkit Administration
- Administrative Information
- External BWCTL Limits
- External OWAMP Limits
- Enabled Services
- NTP
- Scheduled Tests
- Cacti SNMP Monitoring
- perfSONAR Logs

Performance Toolkit
- Configuration Help
- Frequently Asked Questions
- About
- Credits

Current status:
- ➢ installed and configured
- ➢ site is registered in GOCDB
- ▪ Waiting to add site in mesh configuration

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We are facing problems

- ➤ Each problem
  - is particularly tricky and time consuming
    - » better communication needed with VO supporters
    - » with service experts

A reliable network is critical

- ➤ it is necessary for stable operations of the Grid and other high network activities

Sum tests failed due to error

- ➤ maximum number of jobs exceeded

We receive more jobs than we can run . Number of job slots is limited.

Perspectives

Fix the network configuration problems according to perfSONAR test results

➢perfSONAR deployment could help

➢to monitor network conditions in a full-mesh topology(i.e. between any combination of 2 sites)

➢CERN experts' help could make it easier to solve end-to-end problems

➢perfSonar diagnostic will use to better optimize FTS transferring: timeout and stream numbers still need to be revised

Expanding computational resources dynamically will give an opportunity to increase number of cores when resources are available.