

Open Source Solution for Monitoring of Grid Services in WLCG

Wojciech Lapka
SAM Team
CERN

Hepix Workshop'09,
26 – 30 October 2009, Berkeley

- **Motivation**
- **Nagios**
- **Messaging Systems (Apache ActiveMQ)**
- **Architecture**
- **Demo**
- **Conclusion**

- **Experience with Service Availability Monitoring (SAM) framework**
- **Improve the reliability of the grid by giving grid administrators better tools**
- **Provide system which fits future organizational model**
 - Monitoring infrastructure will be managed by Regions
 - Reduce manpower needed centrally
- **Rely on existing and widely accepted solution**

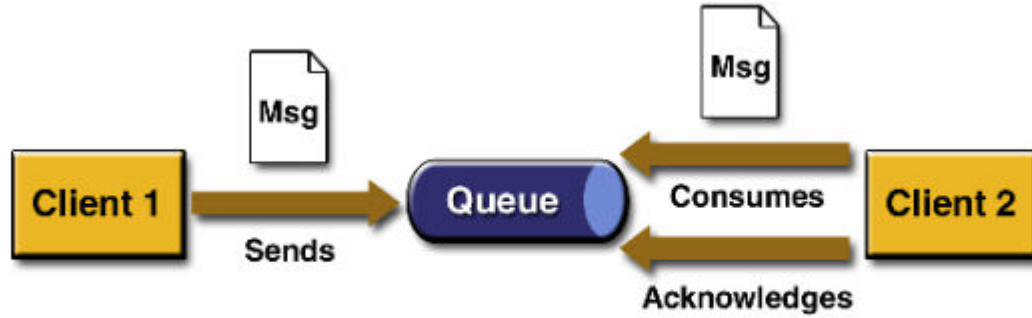
- **What is the Nagios?**
 - open source monitoring framework
 - highly flexible with advanced features
 - widely used & actively developed
- **Why do we need it?**
 - probes need to be executed
 - avoid development & maintenance of house-grown tools
 - provide solution admins are familiar with
 - **50 sites already have already installed egee-NAGIOS**

- **Message exchange between people**
 - Middle ages
 - Messengers hired by King or Lord
 - Nowadays
 - Post Office

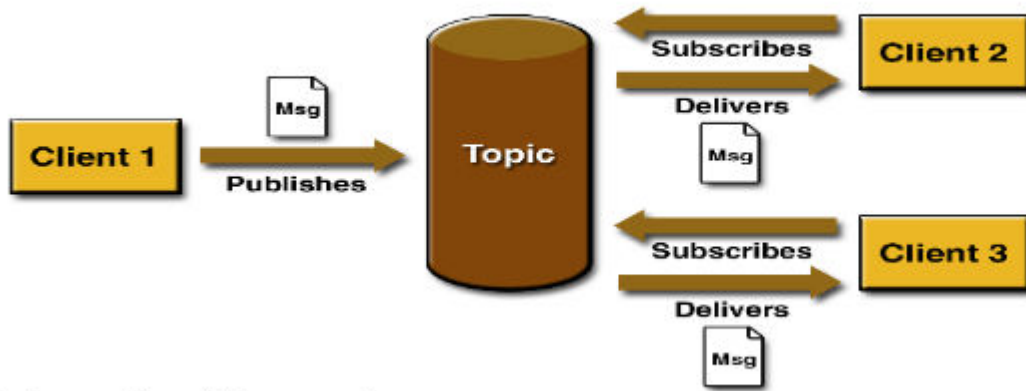
- **Message exchange between computer applications**
 - Past
 - Direct connections between software entities
 - Now and Future
 - SOA: Message broker

- **What is the messaging system?**
 - Method of communication between applications
 - Standardized, asynchronous and scalable communication between distributed entities
 - Reliable network of brokers that provides guaranteed delivery of messages
 - Email is for people what messaging is for applications
 - <https://twiki.cern.ch/twiki/bin/view/EGEE/MsgArchitecture>

- **Why do we need it?**
 - Interaction between distributed monitoring components
 - Standard interface enables easy integration of monitoring software

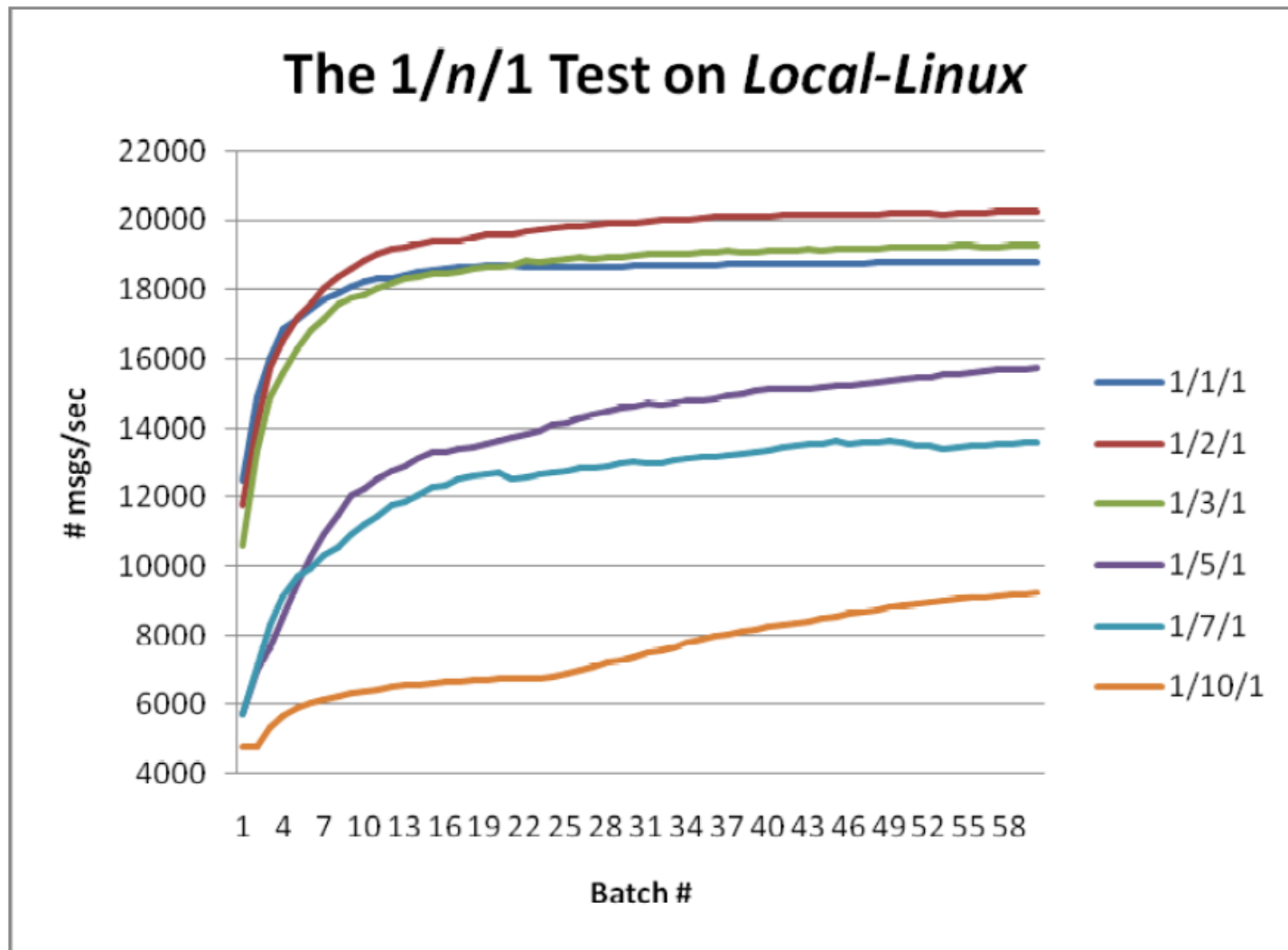


Point-to-Point Messaging



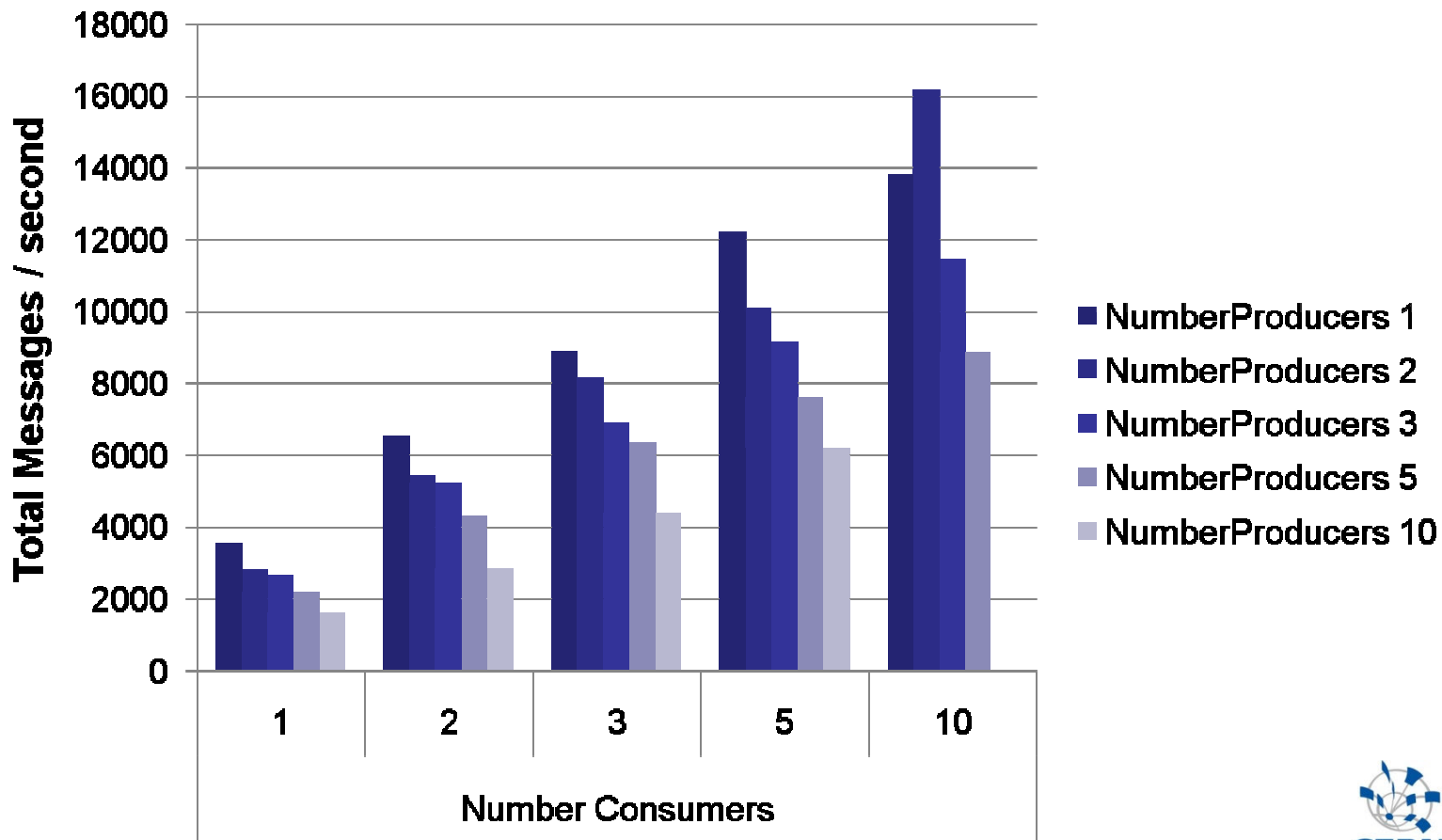
Publish/Subscribe Messaging

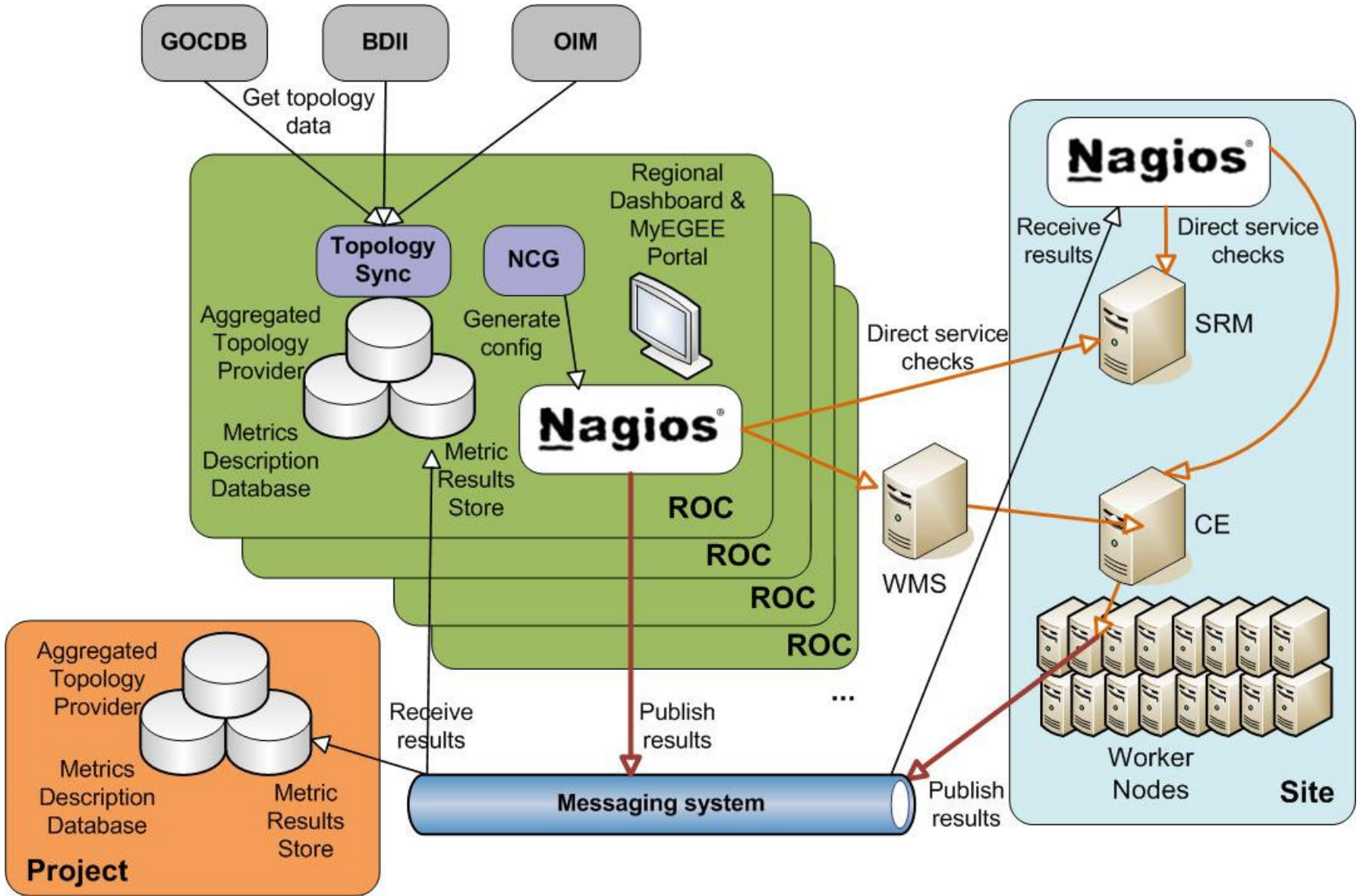
- **FUSE Message Broker**
 - based on Apache ActiveMQ
 - industry support contract has been signed
 - training organized in July 2009
- **Good performance characteristics**
 - 1K – 20K messages per second depending on features used
- **Deployment**
 - networked brokers at CERN and SRCE (Croatia)
 - <https://twiki.cern.ch/twiki/bin/view/EGEE/MsgServerDetails>
- **Packages for SL4 & SL5 available**
- **Security**
 - SSL authentication and authorization



From "Optimizing FUSE Message Broker" - <http://open.iona.com/resources/collateral/#whitepapers>

Total 100B message throughput





Extended Information - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://ngsm2-egEE.srce.hr/nagios/cgi-bin/extinfo.cgi?type=2&host=bdii-egEE.srce.hr&service=org.bdii.Entries-roc

Most Visited Getting Started Latest Headlines EGEE SA1 i386 TWiki's ITGD web Directory listing /rpms... Index of /sa1/centos4/... Previous https://network.cern.c... Radio Lac One FM

Extended Information

Service Information

Last Updated: Fri Oct 23 17:36:25 CEST 2009
 Updated every 90 seconds
 Nagios® Core™ 3.2.0 - www.nagios.org
 Logged in as /DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=wlapka/CN=623537/CN=Wojciech Lapka

[View Information For This Host](#)
[View Status Detail For This Host](#)
[View Alert History For This Service](#)
[View Trends For This Service](#)
[View Alert Histogram For This Service](#)
[View Availability Report For This Service](#)
[View Notifications For This Service](#)

Service
org.bdii.Entries-roc
 On Host
bdii-egEE.srce.hr
 [\(bdii-egEE.srce.hr\)](http://bdii-egEE.srce.hr)

Member of
[BDII](#), [Nagios](#), [remote](#)

161.53.0.235

Click here:

Extra Actions

Service State Information

Current Status:	CRITICAL (for 1d 16h 23m 50s)
Status Information:	CRITICAL
Performance Data:	
Current Attempt:	1/4 (HARD state)
Last Check Time:	10-23-2009 17:12:35
Check Type:	PASSIVE
Check Latency / Duration:	N/A / 0.000 seconds
Next Scheduled Check:	N/A
Last State Change:	10-22-2009 01:12:35
Last Notification:	N/A (notification 0)
Is This Service Flapping?	N/A
In Scheduled Downtime?	NO
Last Update:	10-23-2009 17:36:19 (0d 0h 0m 6s ago)

Active Checks:	DISABLED
Passive Checks:	ENABLED
Obsessing:	DISABLED
Notifications:	ENABLED
Event Handler:	ENABLED
Flap Detection:	DISABLED

Service Commands

- [Enable active checks of this service](#)
- [Re-schedule the next check of this service](#)
- [Submit passive check result for this service](#)
- [Stop accepting passive checks for this service](#)
- [Start obsessing over this service](#)
- [Disable notifications for this service](#)
- [Send custom service notification](#)
- [Schedule downtime for this service](#)
- [Disable event handler for this service](#)
- [Enable flap detection for this service](#)

Service Comments

[Add a new comment](#) [Delete all comments](#)

Entry Time	Author	Comment	Comment ID	Persistent	Type	Expires	Actions
This service has no comments associated with it							

Done

Extended Information - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://sam-ce-roc.cern.ch/nagios/cgi-bin/extinfo.cgi?type=2&host=bdii-egee.srce.hr&service=org.bdii.Entries

Most Visited Getting Started Latest Headlines EGEE SA1 i386 TWiki's ITGD web Directory listing /rps... Index of /sa1/centos4/... Previous https://network.cern.c... Radio Lac One FM

Extended Information Extended Information

Service Information
 Last Updated: Fri Oct 23 17:37:18 CEST 2009
 Updated every 900 seconds
 Nagios® 3.0.6 - www.nagios.org
 Logged in as /DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=wlapka/CN=623537/CN=Wojciech Lapka

[View Information For This Host](#)
[View Status Detail For This Host](#)
[View Alert History For This Service](#)
[View Trends For This Service](#)
[View Alert Histogram For This Service](#)
[View Availability Report For This Service](#)
[View Notifications For This Service](#)

Service
org.bdii.Entries
 On Host
bdii-egee.srce.hr
(bdii-egee.srce.hr)

Redirected to Regional Nagios (ROC)

Member of
[SERVICE_Top-BDII](#), [SITE_egee.srce.hr_Top-BDII](#)
[local, org.bdii](#)
 161.53.0.235

Click here:

Extra Actions

Service State Information

Current Status: **OK** (for 11d 0h 3m 29s)
 Status Information: OK: time=0s, entries=3331
 Performance Data: time=0s entries=3331c
 Current Attempt: 1/4 (HARD state)
 Last Check Time: 10-23-2009 17:33:53
 Check Type: ACTIVE
 Check Latency / Duration: 0.101 / 0.572 seconds
 Next Scheduled Check: 10-23-2009 18:33:53
 Last State Change: 10-12-2009 17:33:49
 Last Notification: N/A (notification 0)
 Is This Service Flapping? N/A
 In Scheduled Downtime? **NO**
 Last Update: 10-23-2009 17:37:11 (0d 0h 0m 7s ago)

Active Checks: **ENABLED**
 Passive Checks: **ENABLED**
 Obsessing: **ENABLED**
 Notifications: **ENABLED**
 Event Handler: **ENABLED**
 Flap Detection: **DISABLED**

Service Commands

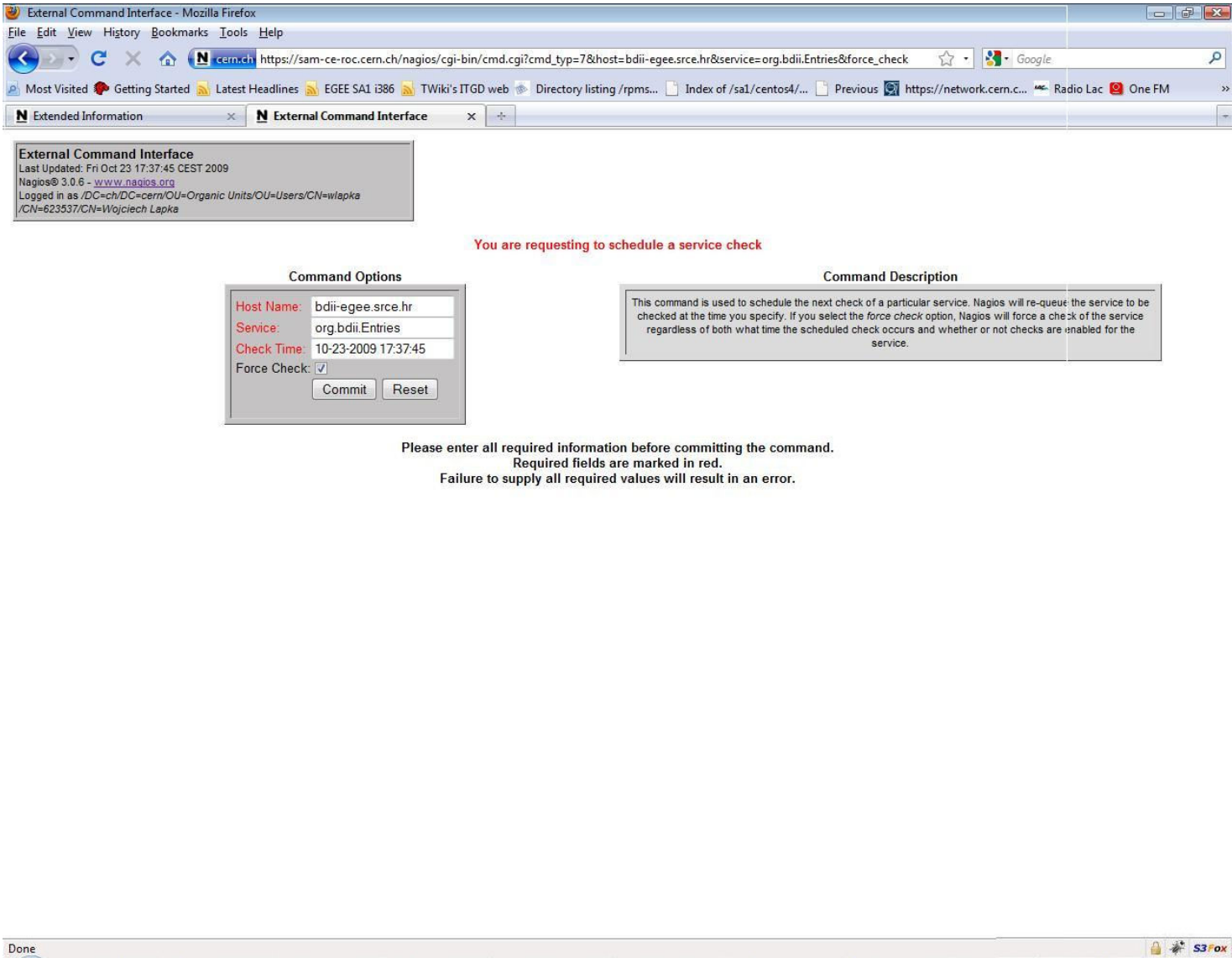
- Disable active checks of this service
- Re-schedule the next check of this service
- Submit passive check result for this service
- Stop accepting passive checks for this service
- Stop obsessing over this service
- Disable notifications for this service
- Send custom service notification
- Schedule downtime for this service
- Disable event handler for this service
- Enable flap detection for this service

Service Comments

[Add a new comment](#) [Delete all comments](#)

Entry Time	Author	Comment	Comment ID	Persistent	Type	Expires	Actions
This service has no comments associated with it							

Done S3Fox



External Command Interface - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://sam-ce-roc.cern.ch/nagios/cgi-bin/cmd.cgi?cmd_typ=7&host=bdii-egEE.srce.hr&service=org.bdii.Entries&force_check

Extended Information External Command Interface

External Command Interface
 Last Updated: Fri Oct 23 17:37:45 CEST 2009
 Nagios® 3.0.6 - www.nagios.org
 Logged in as /DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=wlapka/CN=623537/CN=Wojciech Lapka

You are requesting to schedule a service check

Command Options

Host Name:
 Service:
 Check Time:
 Force Check:

Command Description

This command is used to schedule the next check of a particular service. Nagios will re-queue the service to be checked at the time you specify. If you select the *force check* option, Nagios will force a check of the service regardless of both what time the scheduled check occurs and whether or not checks are enabled for the service.

Please enter all required information before committing the command.
 Required fields are marked in red.
 Failure to supply all required values will result in an error.

Done

Current Network Status - Mozilla Firefox

File Edit View History Bookmarks Tools Help

https://ngsm2-egEE.srce.hr/nagios/cgi-bin/status.cgi?host=all&stye=detail&servicestatusypes=2

Most Visited Getting Started Latest Headlines EGEE SA1 i386 TWiki's ITGD web Directory listing /rps... Index of /sa1/centos4/... Previous https://network.cern.c... Radio Lac One FM

Current Network Status

Last Updated: Fri Oct 23 17:35:23 CEST 2009
 Updated every 90 seconds
 Nagios® Core™ 3.2.0 - www.nagios.org
 Logged in as /DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=wlapka/CN=623537/CN=Wojciech Lapka

[View History For all hosts](#)
[View Notifications For All Hosts](#)
[View Host Status Detail For All Hosts](#)

Display Filters:
 Host Status Types: All
 Host Properties: Any
 Service Status Types: Ok
 Service Properties: Any

Test result imported from Regional (ROC) Nagios

Host Status Totals

Up	Down	Unreachable	Pending
4	0	0	0
All Problems		All Types	
0		4	

Service Status Totals

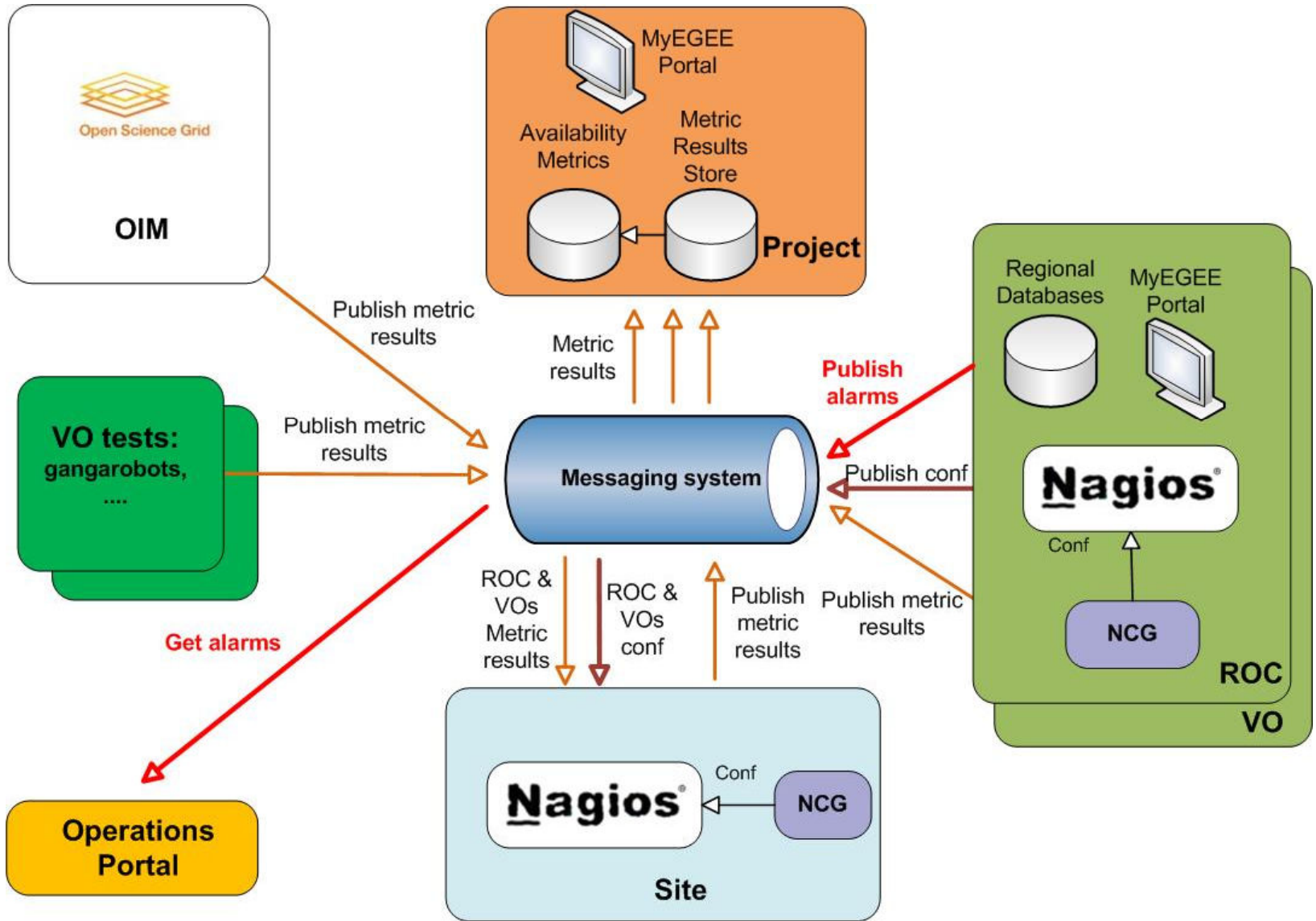
Ok	Warning	Unknown	Critical	Pending
133	1	38	3	0
All Problems		All Types		
42		175		

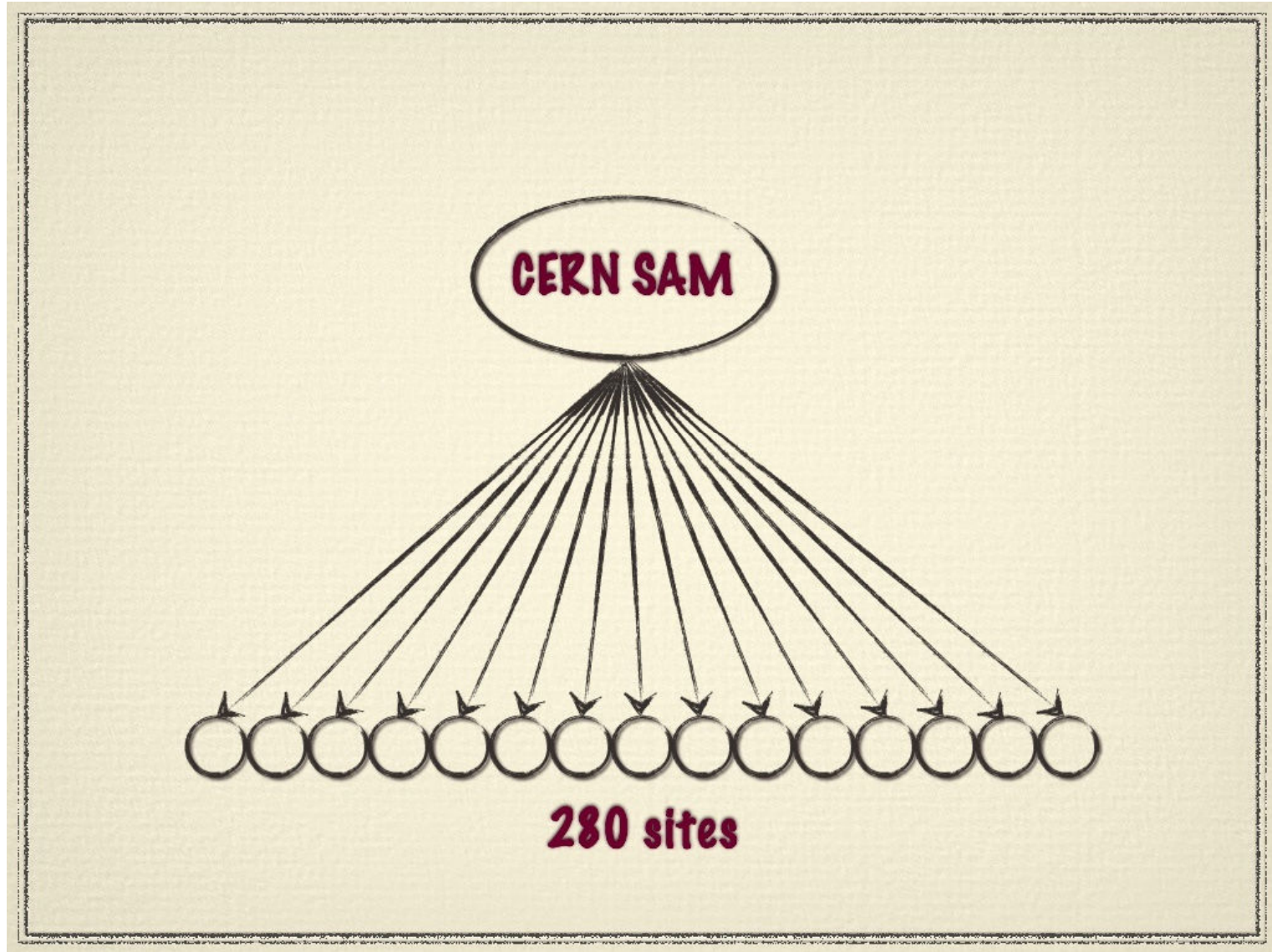
Service Status Details For All Hosts

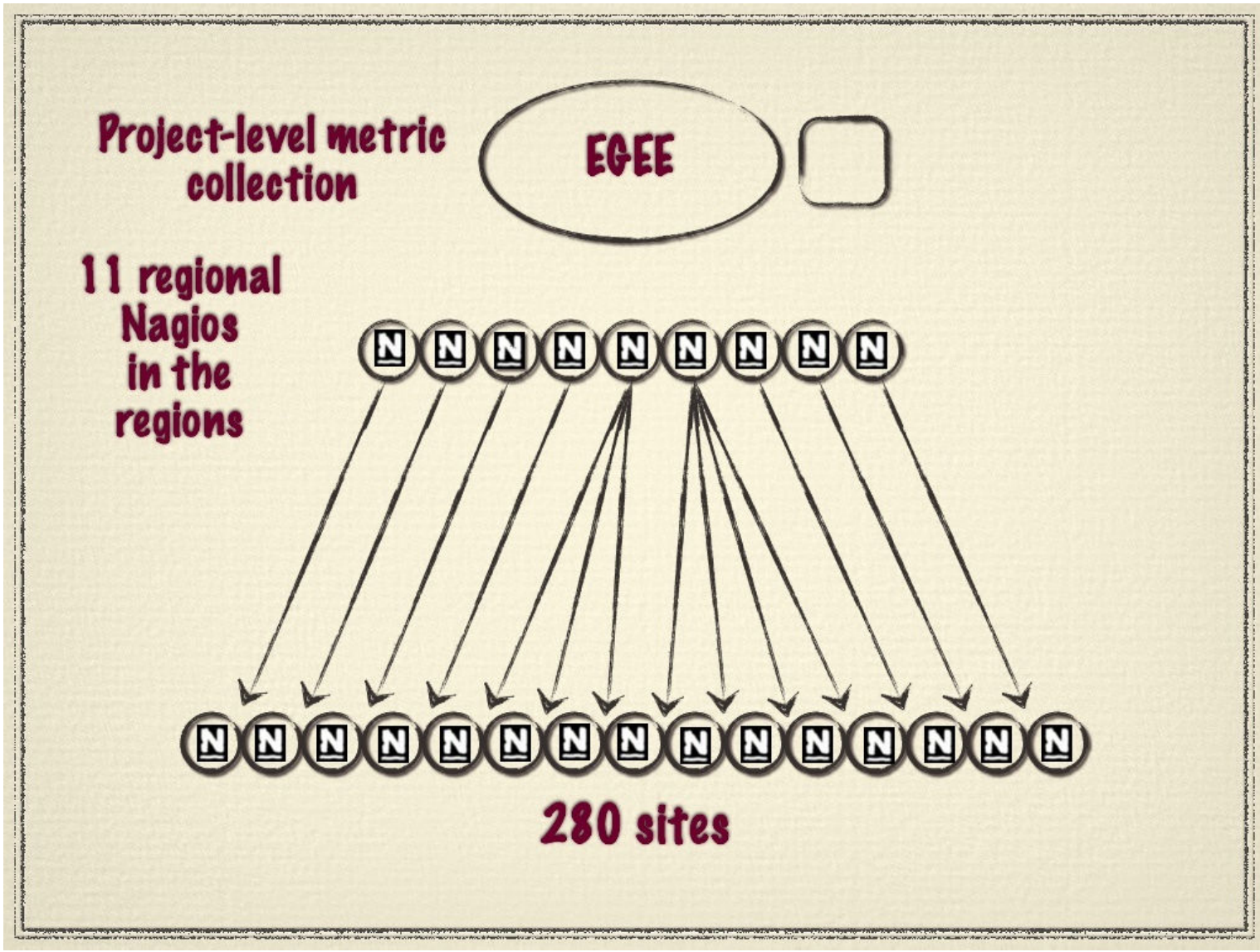
Host	Service	Status	Last Check	Duration	Attempt	Status Information
bdii-egEE.srce.hr	BDII-check-OPS	OK	10-23-2009 16:56:39	1d 17h 8m 19s	1/1	SAM status: ok
	org.bdii.Entries-roc	OK	10-23-2009 17:12:35	1d 16h 22m 48s	1/4	ha3-egEE.srce.hr: OK: entries=3332 time=0.249164 sec
	org.bdii.Freshness	OK	10-23-2009 17:21:52	1d 16h 18m 41s	1/4	OK: freshness=204s, entries=1
	org.bdii.Freshness-roc	OK	10-23-2009 17:22:35	1d 16h 57m 48s	1/4	ha3-egEE.srce.hr: OK: createTimeStamp=Fri Oct 23 15:21:24 2009 UTC, diff=1 min
	org.bdii.Published-roc	OK	10-23-2009 17:20:27	1d 16h 14m 56s	1/4	ha3-egEE.srce.hr: OK: GlueServiceEndpoint=ldap://bdii-egEE.srce.hr:2170/mds-vo-name=local,o=grid
	org.egEE.npm.Top-BDII	OK	10-23-2009 17:30:04	2d 2h 23m 21s	1/1	OK
	org.nagios.BDII-Check	OK	10-23-2009 17:21:51	1d 16h 16m 8s	1/4	LDAP OK - 0.046 seconds response time
org.nmap.Top-BDII	OK	10-23-2009 17:33:52	1d 16h 13m 35s	1/2	NMAP OK - open	
ce1-egEE.srce.hr	APEL-pub-OPS	OK	10-23-2009 15:25:03	1d 18h 10m 20s	1/1	SAM status: ok
	CE-ATLAS-sft-lca-tag-Atlas	OK	10-23-2009 17:00:08	1d 16h 57m 11s	1/1	SAM status: ok
	CE-host-cert-valid-OPS	OK	10-23-2009 16:48:46	1d 16h 52m 10s	1/1	SAM status: ok
	CE-sft-brokerinfo-OPS	OK	10-23-2009 17:12:59	1d 17h 22m 39s	1/1	SAM status: ok
	CE-sft-caver-OPS	OK	10-23-2009 17:13:05	1d 17h 22m 32s	1/1	SAM status: ok
	CE-sft-csh-LHCb	OK	10-23-2009 15:30:40	1d 19h 42m 5s	1/1	SAM status: ok
	CE-sft-csh-OPS	OK	10-23-2009 17:13:00	1d 17h 22m 38s	1/1	SAM status: ok
	CE-sft-job-Alice	OK	10-23-2009 17:13:17	1d 23h 10m 9s	1/1	SAM status: ok
	CE-sft-job-Atlas	OK	10-23-2009 16:45:16	1d 17h 50m 20s	1/1	SAM status: ok
	CE-sft-job-LHCb	OK	10-23-2009 15:25:12	1d 20h 11m 0s	1/1	SAM status: ok
	CE-sft-job-OPS	OK	10-23-2009 16:25:39	1d 17h 9m 18s	1/1	SAM status: ok
	CE-sft-lca-rm-OPS	OK	10-23-2009 17:13:41	0d 3h 21m 37s	1/1	SAM status: ok
	CE-sft-softver-OPS	OK	10-23-2009 17:12:59	1d 17h 22m 38s	1/1	SAM status: ok
	CE-sft-vo-swdir-Alice	OK	10-23-2009 17:02:03	1d 19h 46m 31s	1/1	SAM status: ok
	CE-sft-vo-swdir-Atlas	OK	10-23-2009 17:00:04	1d 16h 57m 14s	1/1	SAM status: ok

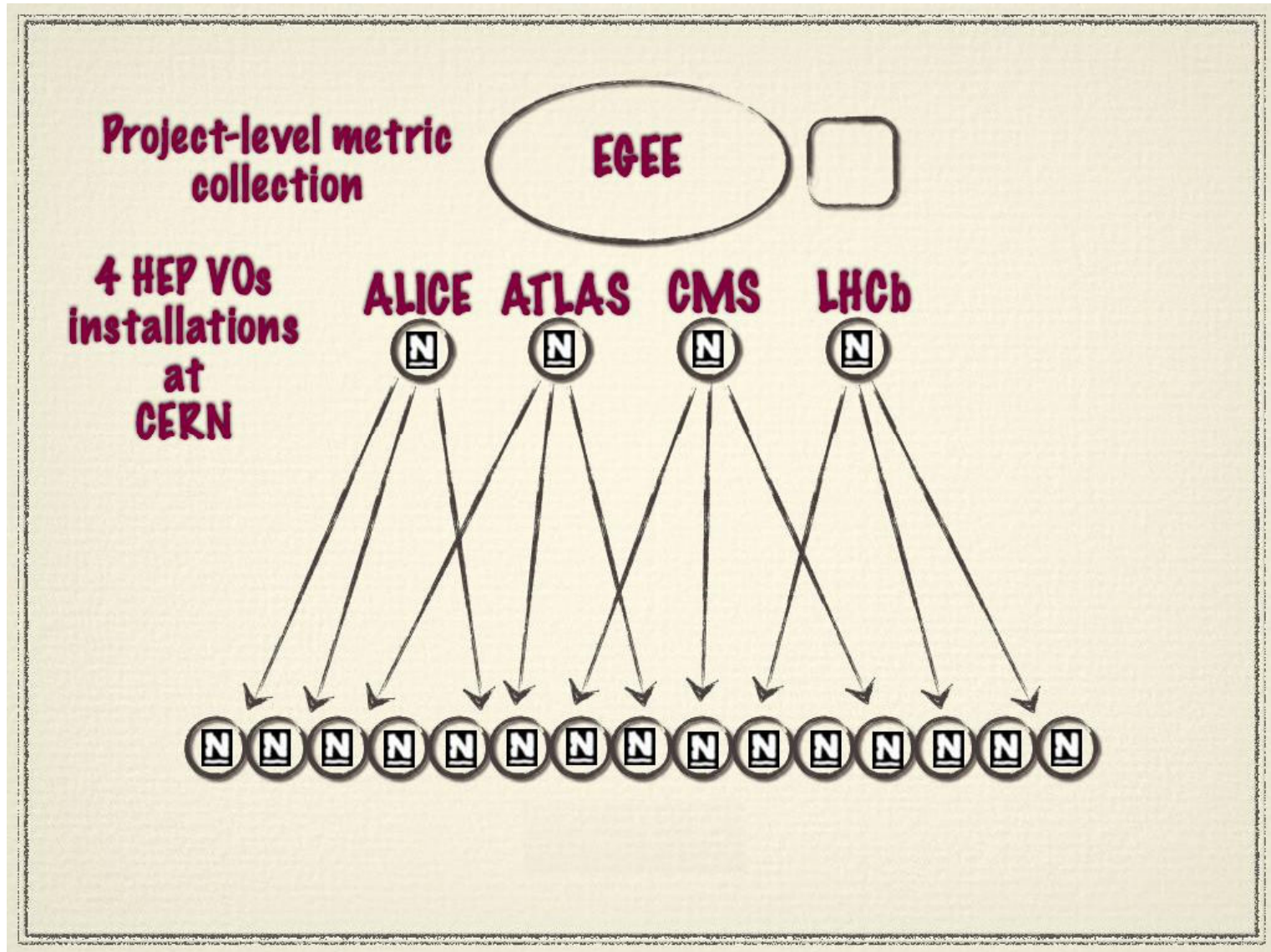
https://ngsm2-egEE.srce.hr/nagios/cgi-bin/extinfo.cgi?type=2&host=bdii-egEE.srce.hr&service=org.bdii.Entries-roc

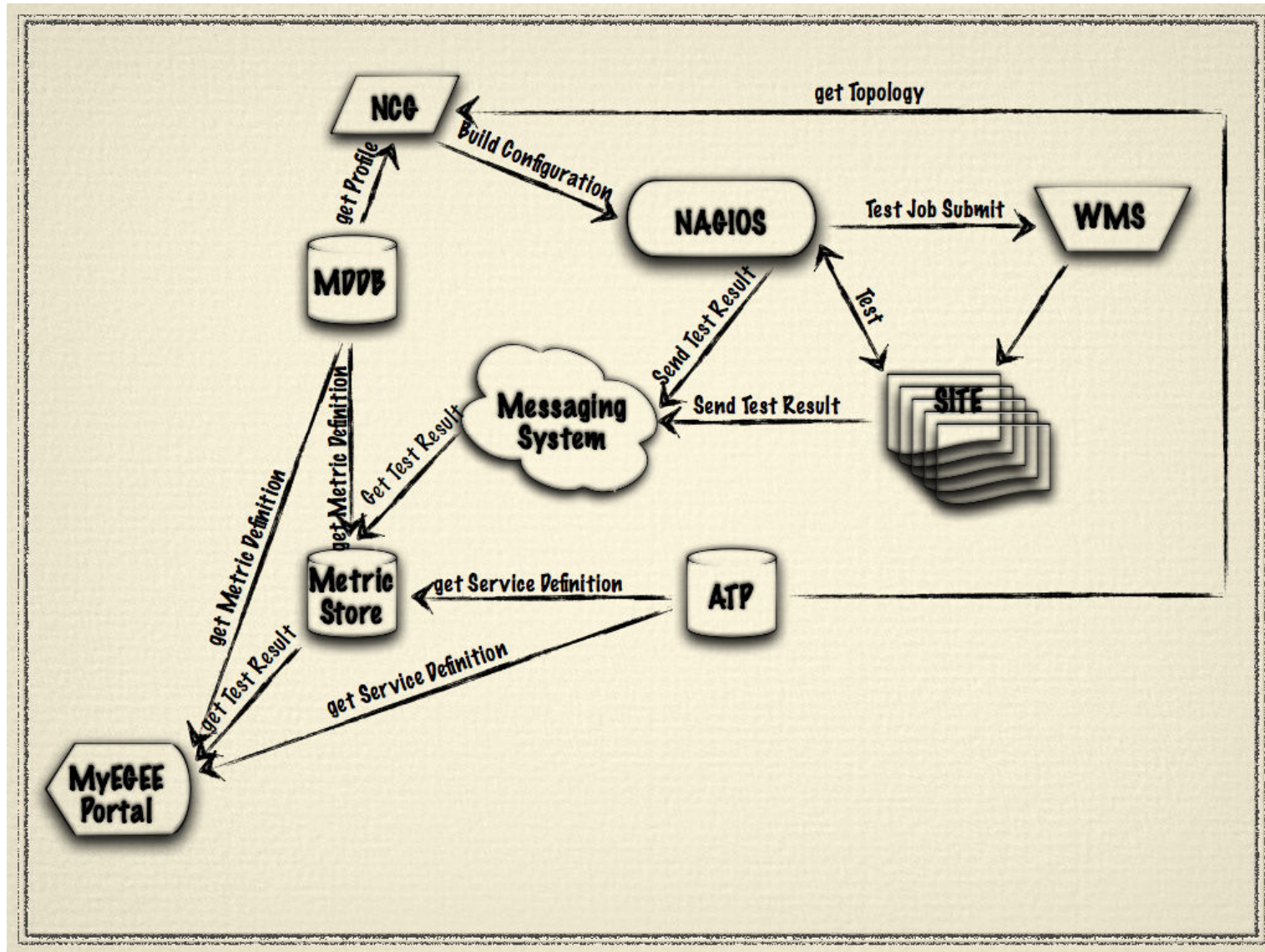
Integration with Messaging

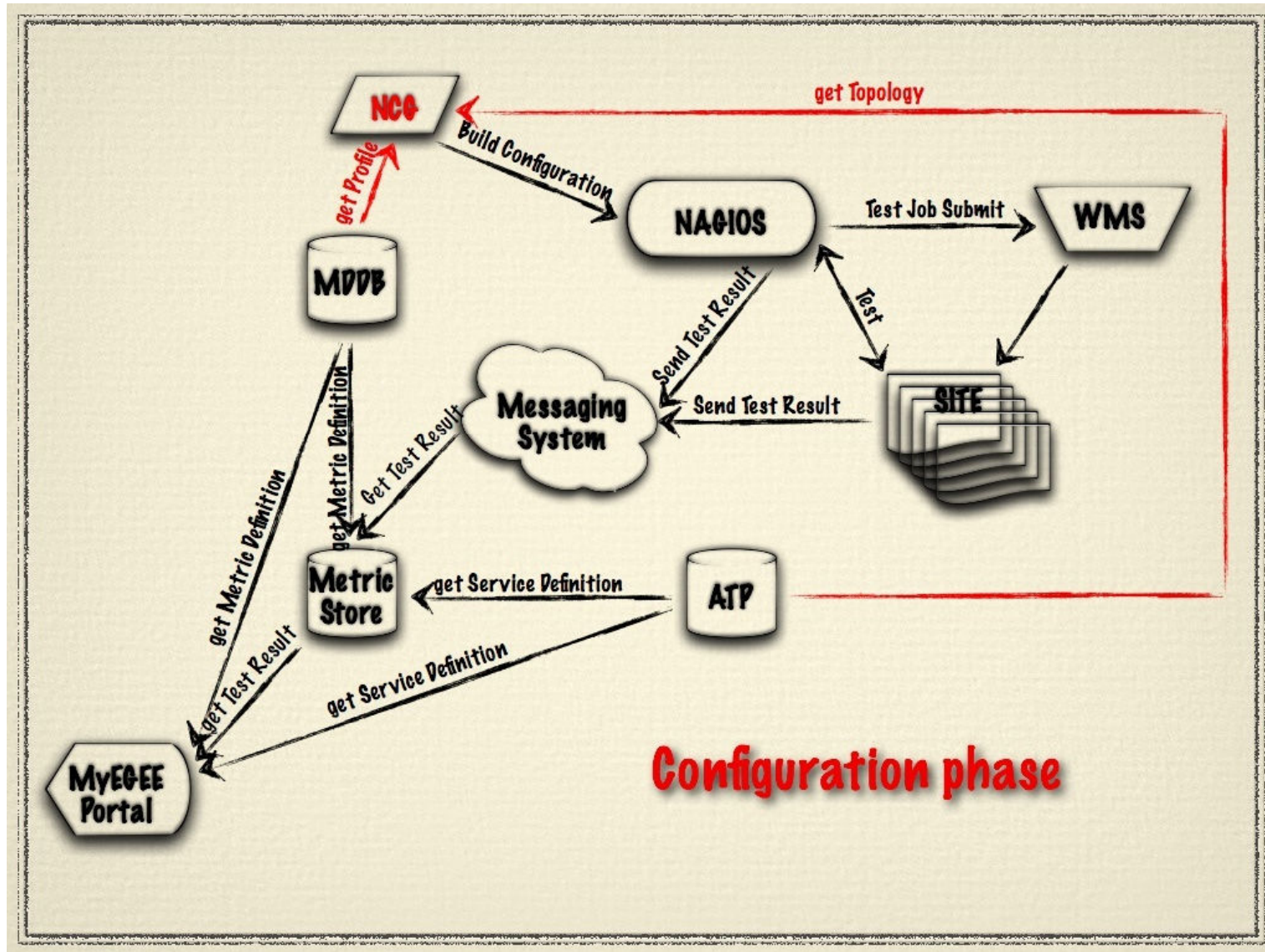


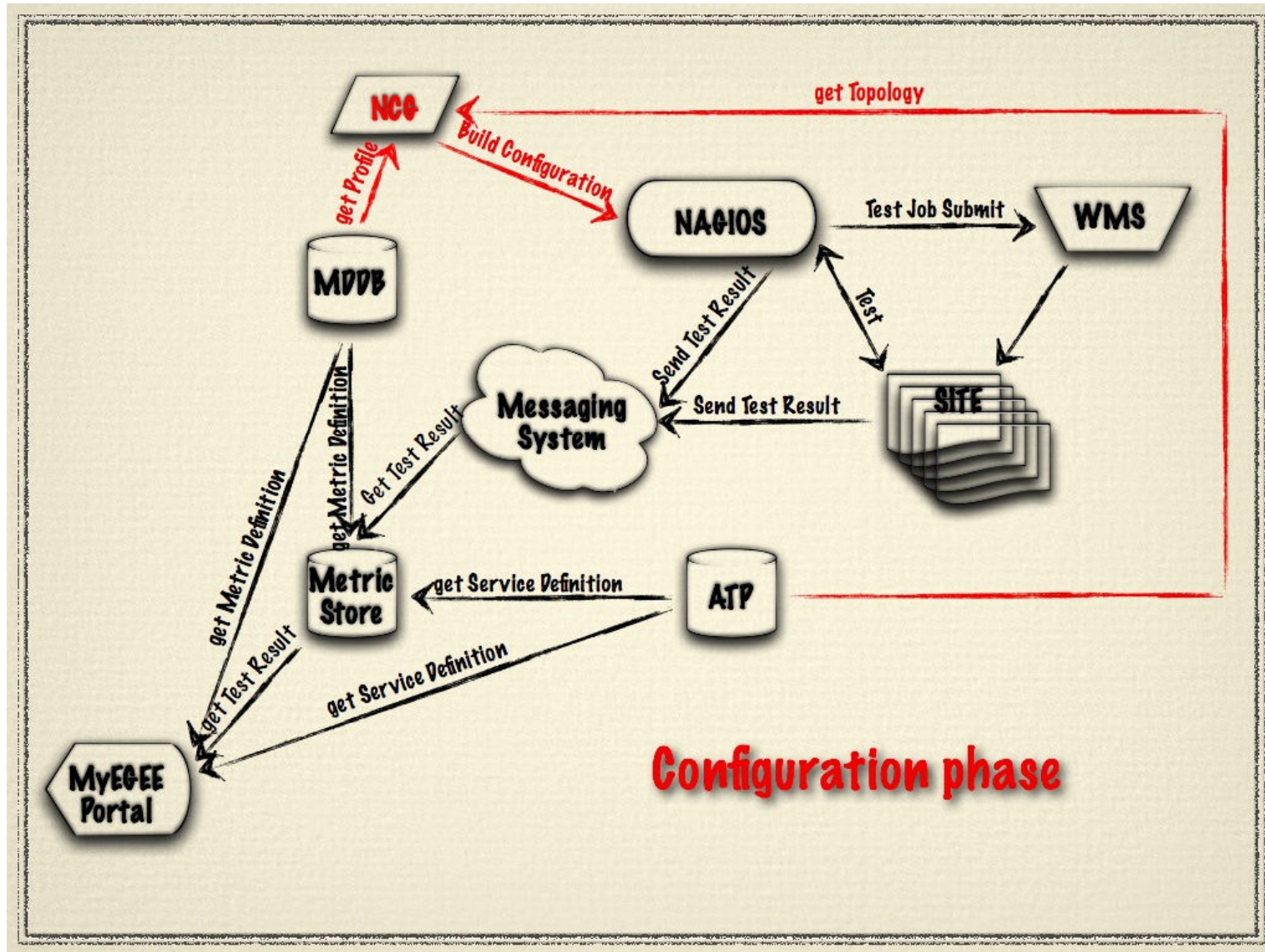


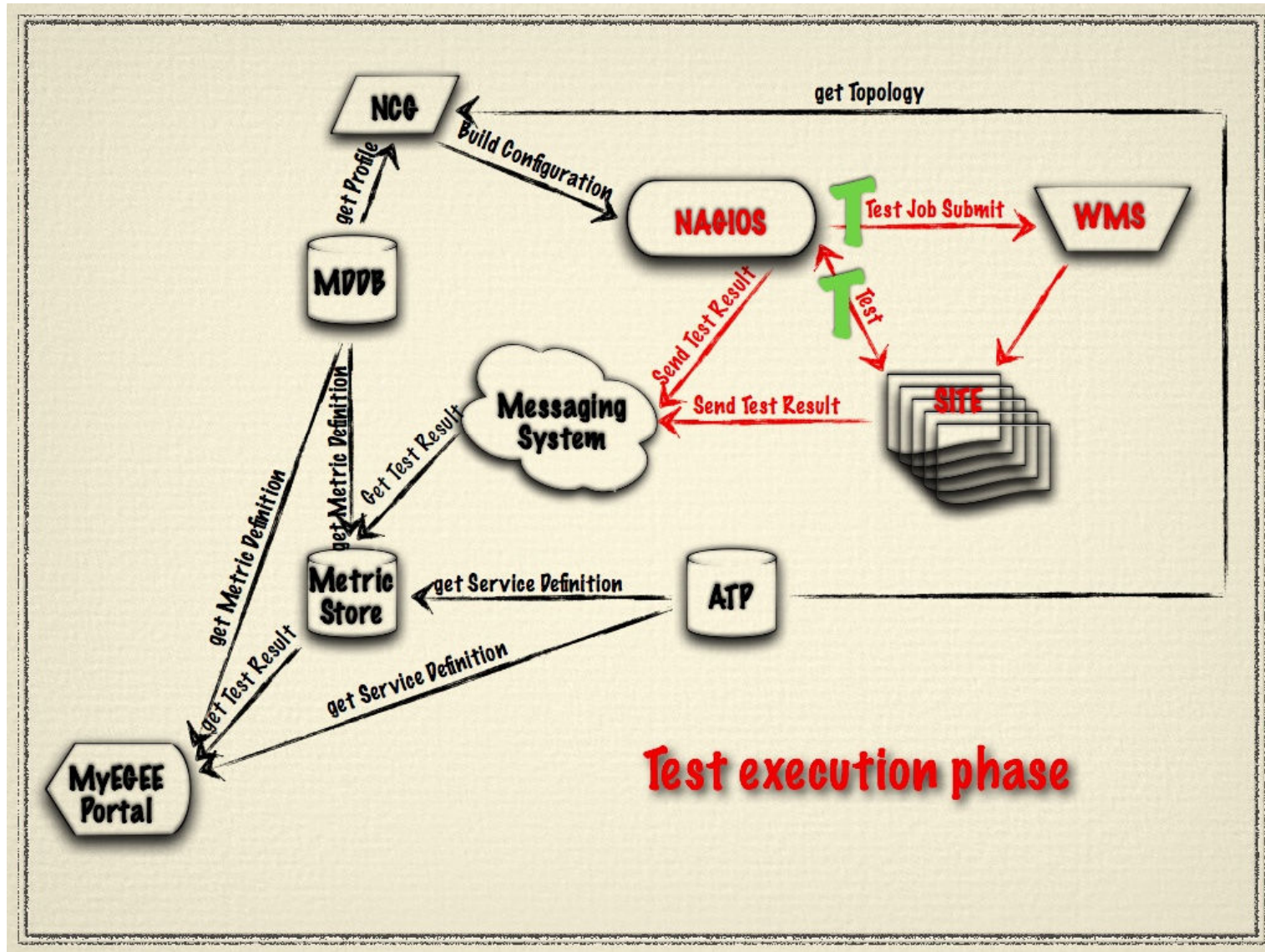


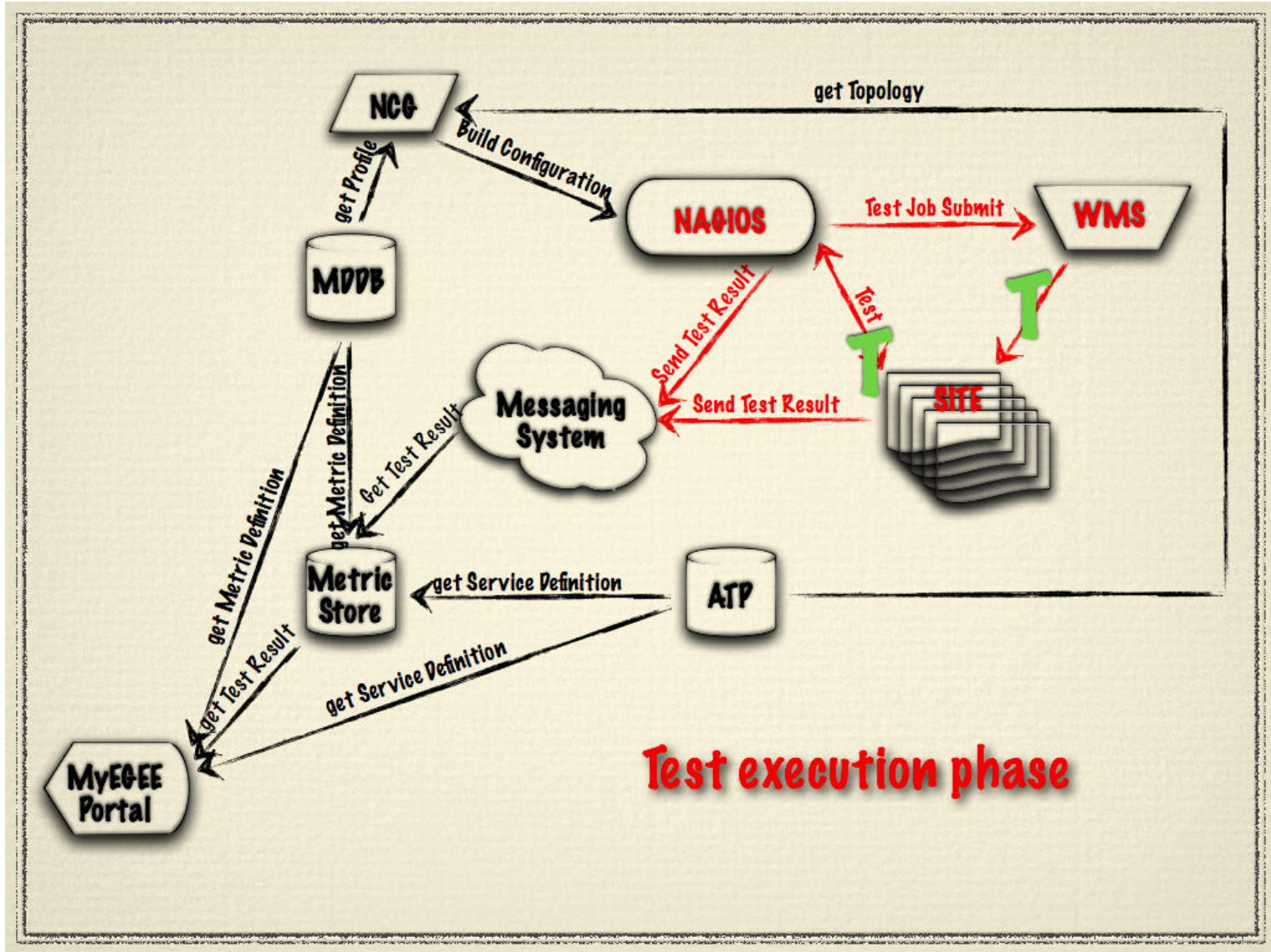




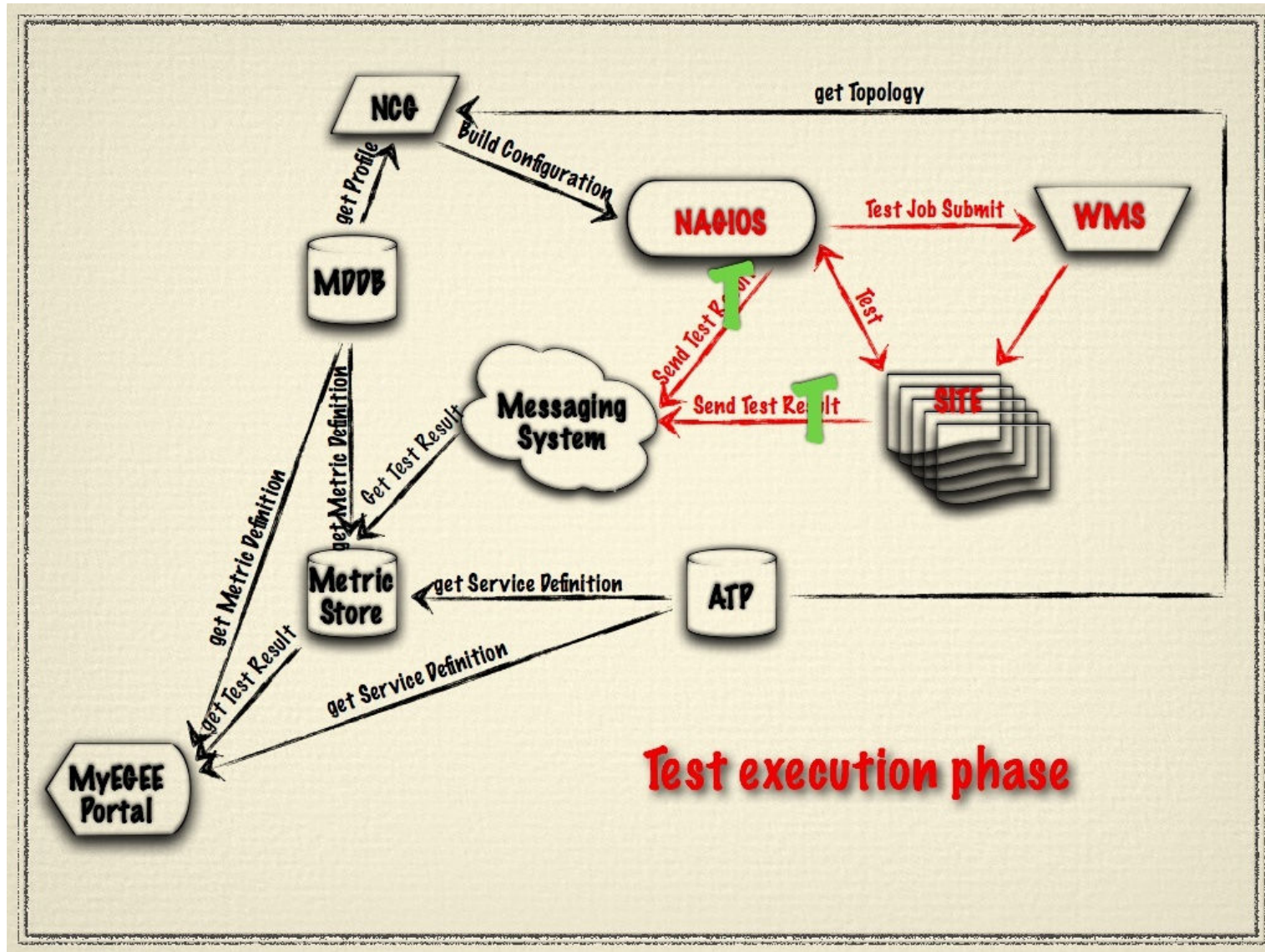


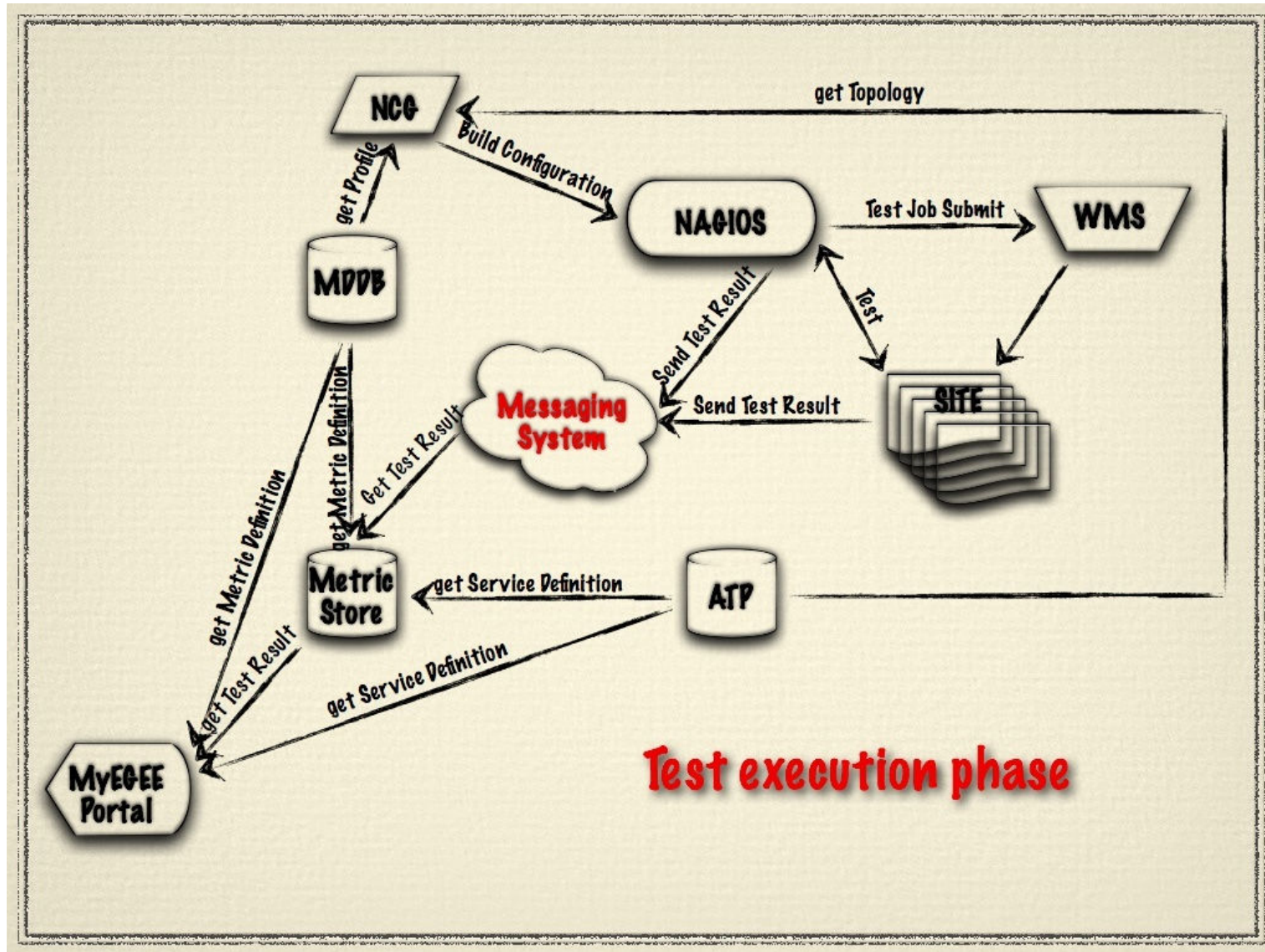


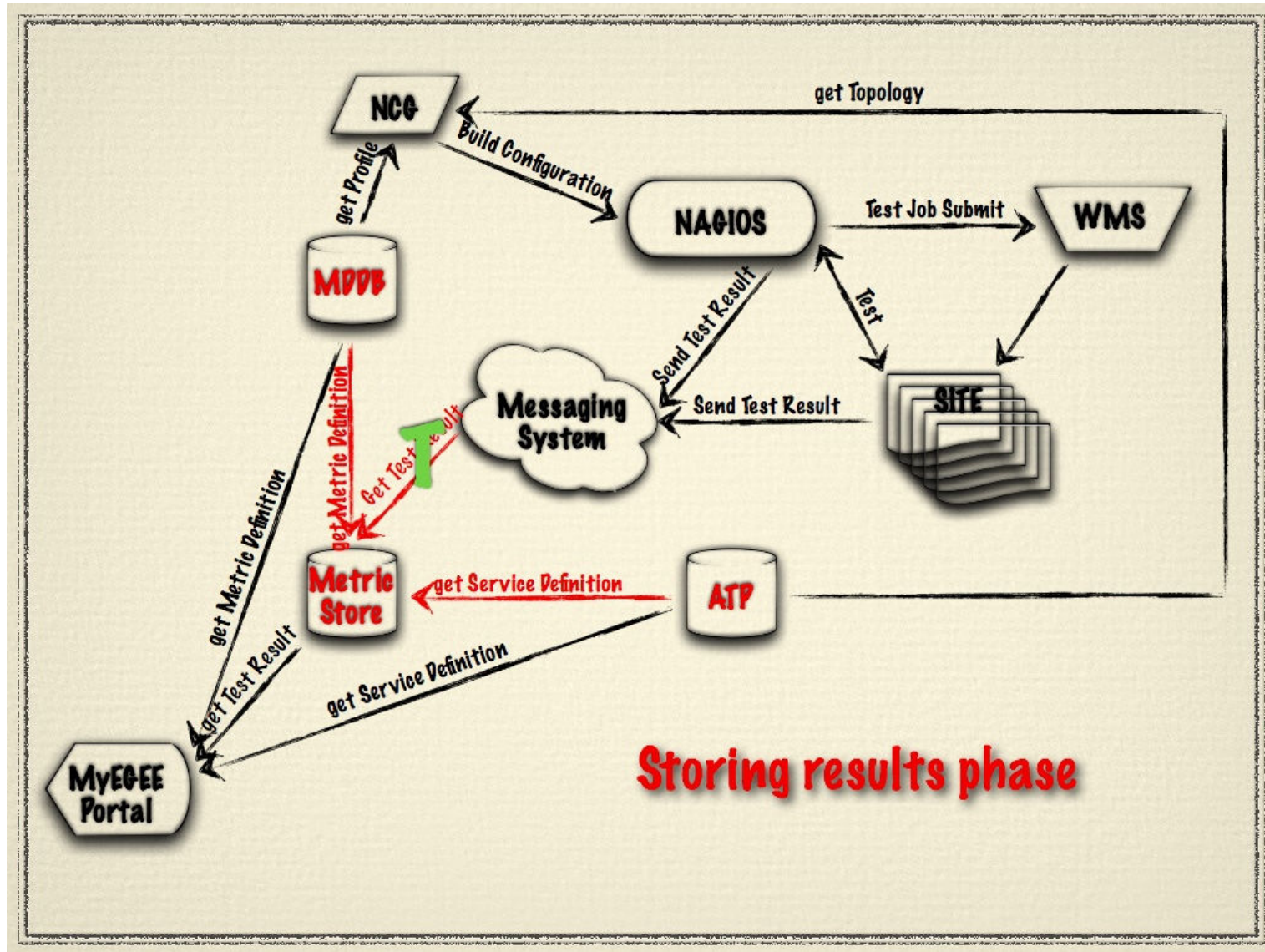


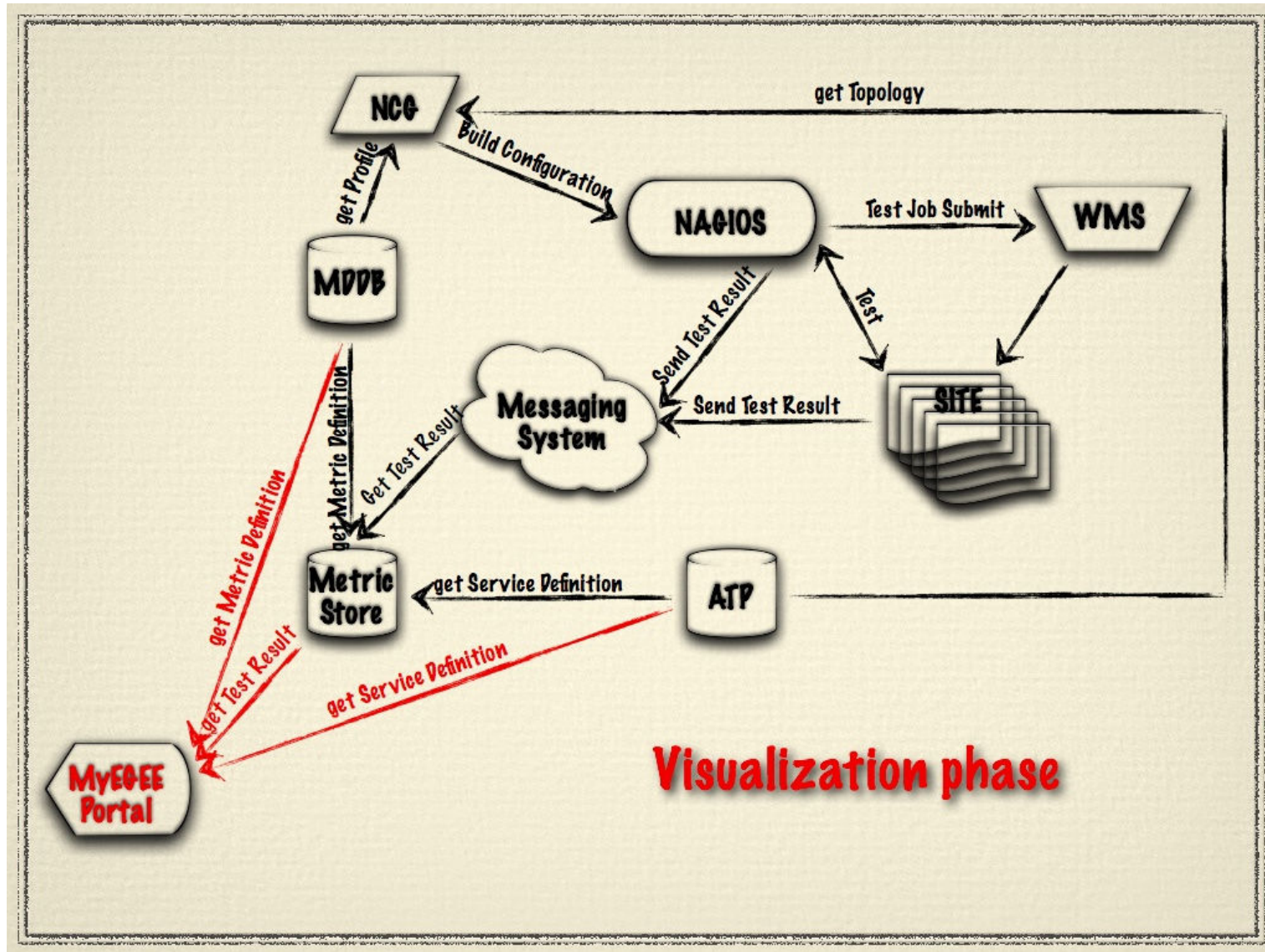


Test execution phase









Today is a day to give back. Find a service opportunity near you.

Change theme from Cool | Add stuff >

- Home
- Google Calendar
- Top Stories
- Date & Time
- bluewin.ch - Infos To...
- BBC News | News F...
- Weather
- Google Reader
- Dictionary
- ToDo
- SAM Status History

- Chat**
- Google Talk
 - AIM Messenger
 - Chat Gadget
 - MSN Messenger 3.2

- Updates**
- Friends

Chat

Search, add, or Invite

- John Shade
- Set status here

Chat with friends in iGoogle!

Rather stay offline?
[Sign out of chat.](#)

- Wojciech Lapka
- @CERN (google.c...

SAM Status History

Between Aug 12, 2009 and Sep 11, 2009

- argoce01.na.infn.it
Site-BDII
Aug 19, 2009 | Aug 27, 2009 | Sep 3, 2009 | Sep 11, 2009 |
- atlasce1.lnf.infn.it
Site-BDII
Aug 19, 2009 | Aug 27, 2009 | Sep 3, 2009 | Sep 11, 2009 |
- bdi1-site.frascati.enea.it
Site-BDII
Aug 19, 2009 | Aug 27, 2009 | Sep 3, 2009 | Sep 11, 2009 |
- ce-01.grid.sissa.it
Site-BDII
Aug 19, 2009 | Aug 27, 2009 | Sep 3, 2009 | Sep 11, 2009 |
- ce-01.roma3.infn.it
Site-BDII
Aug 19, 2009 | Aug 27, 2009 | Sep 3, 2009 | Sep 11, 2009 |
- ce-cyb.ca.infn.it
Site-BDII
Aug 19, 2009 | Aug 27, 2009 | Sep 3, 2009 | Sep 11, 2009 |
- ce-enmr.cern.unifi.it
Site-BDII
Aug 19, 2009 | Aug 27, 2009 | Sep 3, 2009 | Sep 11, 2009 |
- ce.scope.unina.it
Site-BDII
Aug 19, 2009 | Aug 27, 2009 | Sep 3, 2009 | Sep 11, 2009 |

Date & Time

Dictionary

Search Dictionary.com

[Quel Es Ton Niveau De QI?](#)
Réponds à Toutes Les Questions & Compare tes Résultats Maintenant!
Ads by Google

bluewin.ch - Infos Top Stories

Information is temporarily unavailable.

Google Reader (11)

All items (11) refresh mark all as read

- Washington drama 'was exercise' from BBC News | News Front Page | World Edition
- Ancelotti calm over transfer ban from BBC News | News Front Page | World Edition
- Baby P trio's appeal bid refused from BBC News | News Front Page | World Edition
- Foster child at bomb plotter home from BBC News | News Front Page | World Edition
- Rockets hit Israel from Lebanon from BBC News | News Front Page | World Edition

Weather

Geneva 19°C Current: Mostly Cloudy
Wind: E at 2 km/h Humidity: 60%

Fri	Sat	Sun	Mon
24° 11°	22° 8°	22° 6°	18° 5°

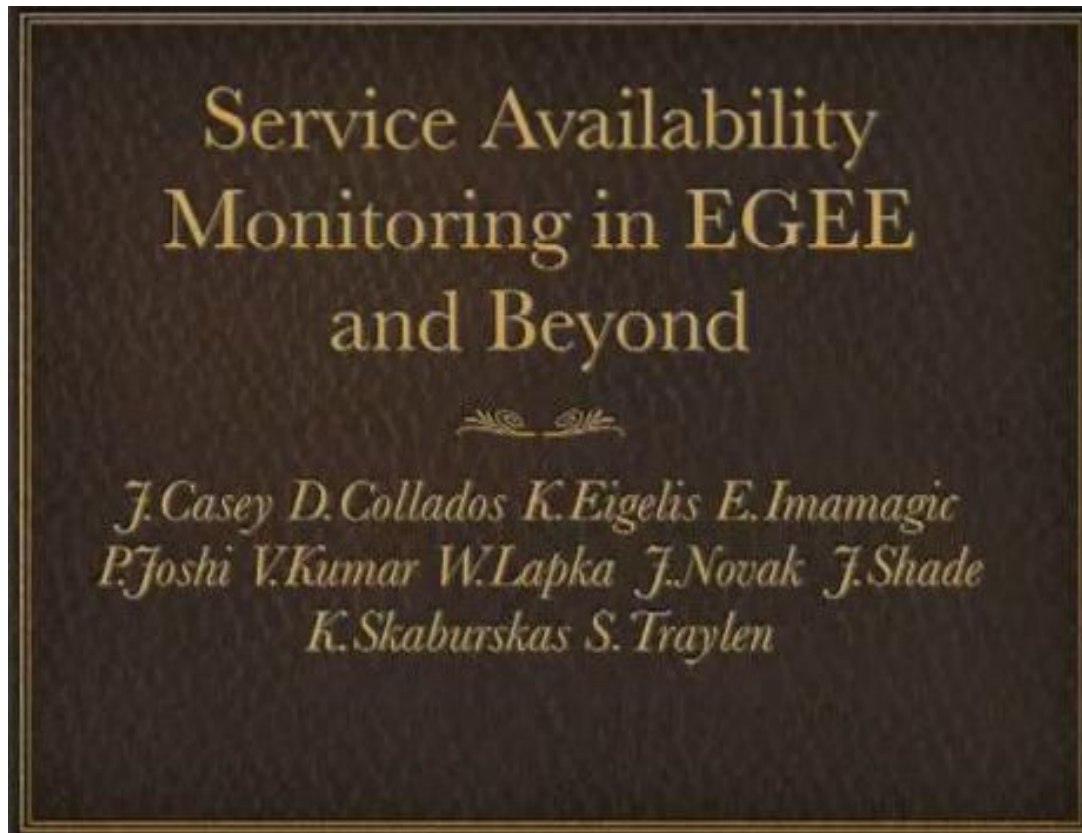
Top Stories

- Obama Speaks at Capital's 9/11 Commemoration New York Times - [all 1618 related >](#)
- Defiant in Campaign Video, Wilson Says "I Will Not Be Muzzled" Gant Daily - [all 3678 related >](#)
- Rockets hit Israel from Lebanon

- **Multilevel monitoring based on proven commodity software**
- **System fits the organizational model of the grid**
- **Provide the means for administrators to better monitor their services**
- **Integration with existing components to automate operations of monitoring instances**

- **OAT web page**
https://twiki.cern.ch/twiki/bin/view/EGEE/OAT_EGEE_III
- **OAT Multi-level monitoring architecture**
<https://twiki.cern.ch/twiki/bin/view/EGEE/MultiLevelMonitoringOverview>
- **OAT Milestones**
<https://twiki.cern.ch/twiki/bin/view/EGEE/MultiLevelMonitoringMilestones>
- **Operations Automation Strategy**
<https://edms.cern.ch/document/927171>

- **Watch our demo:**
 - <http://tinyurl.com/EgeeSAM> (YouTube)
 - <http://www.youtube.com/watch?v=PADq2x8q0kw>



Thanks to the following people for their contributions:

- James Casey (CERN)
- Emir Imamagic (SRCE, Croatia)
- Pradyumna Joshi (BARC, India)
- Rajesh Kalmady (BARC, India)
- Vaibhav Kumar (BARC, India)
- Digambar Sonvane (BARC, India)
- Steve Traylen (CERN)
- **SAM Team at CERN:**
 - John Shade
 - David Collados
 - Karolis Eigelis
 - Judit Novak
 - Konstantin Skaburskas



Questions?

- Wojciech.Lapka@cern.ch