Open Source Solution for Monitoring of Grid Services in WLCG

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CERN

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Outline

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

Motivation

- **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**

Nagios

- **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**

Messaging Systems

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

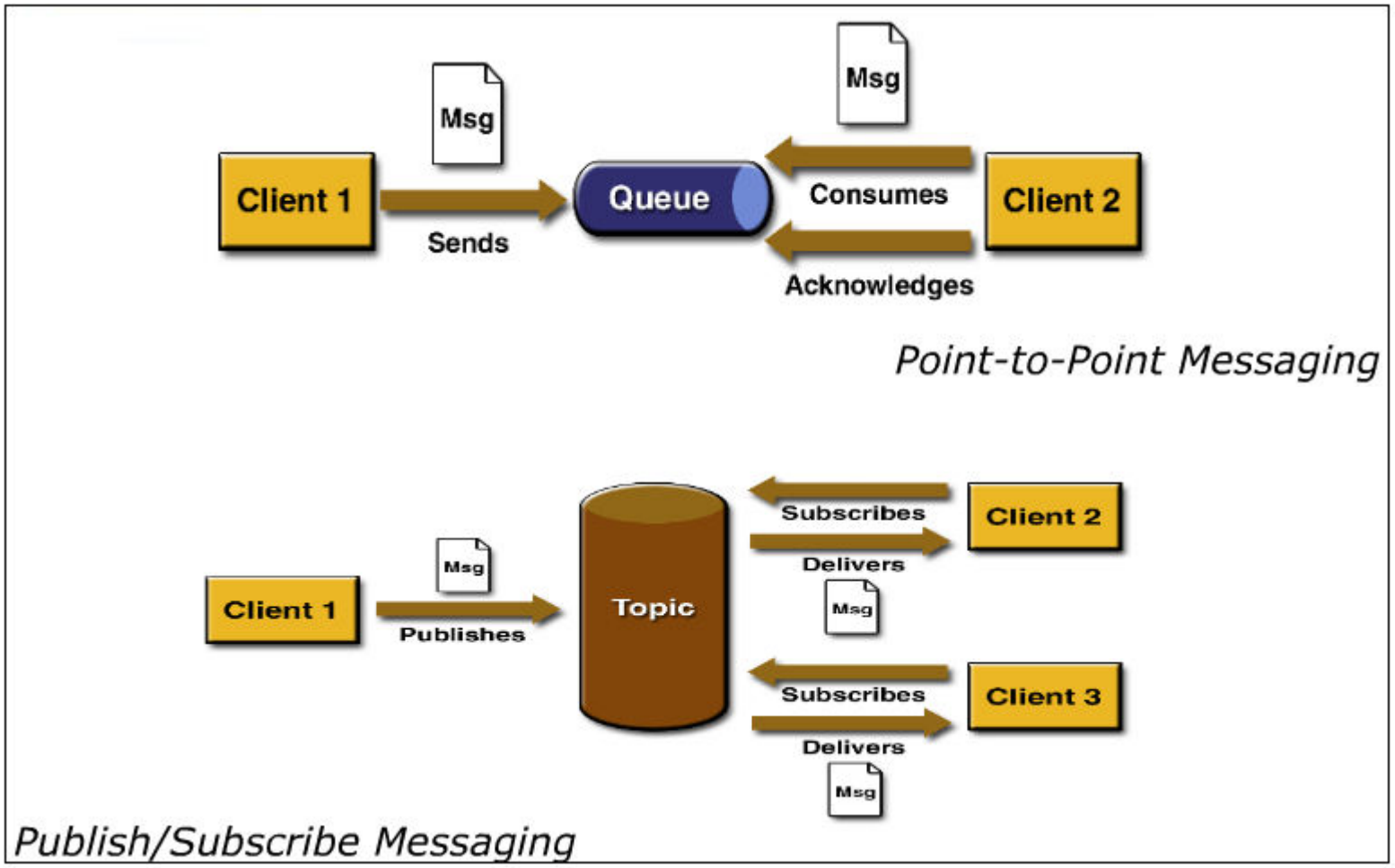
- **Message exchange between computer applications**
  - Past
    - Direct connections between software entities
  - Now and Future
    - SOA: Message broker

Messaging Systems

- **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

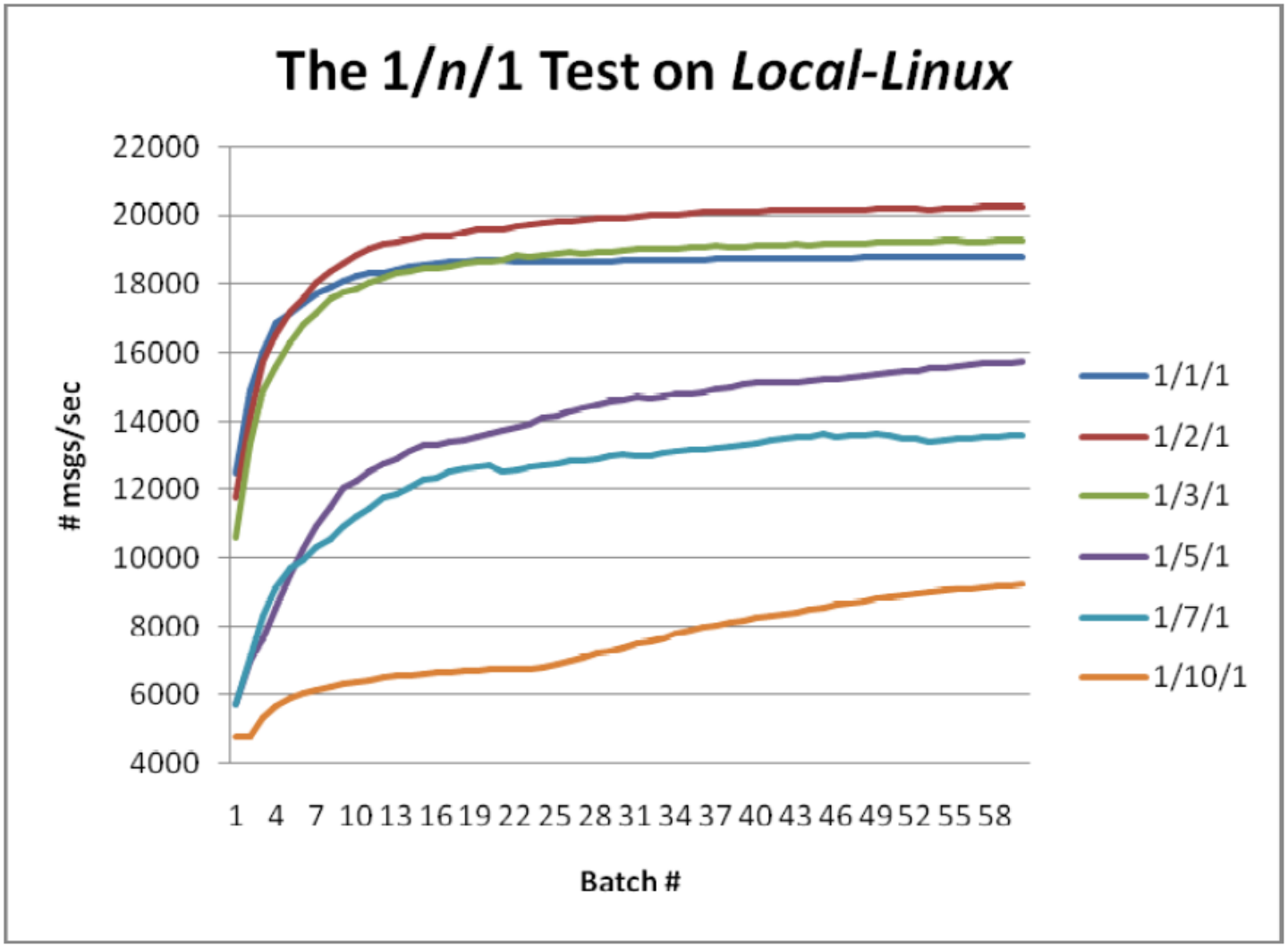
Messaging Systems



Messaging Systems

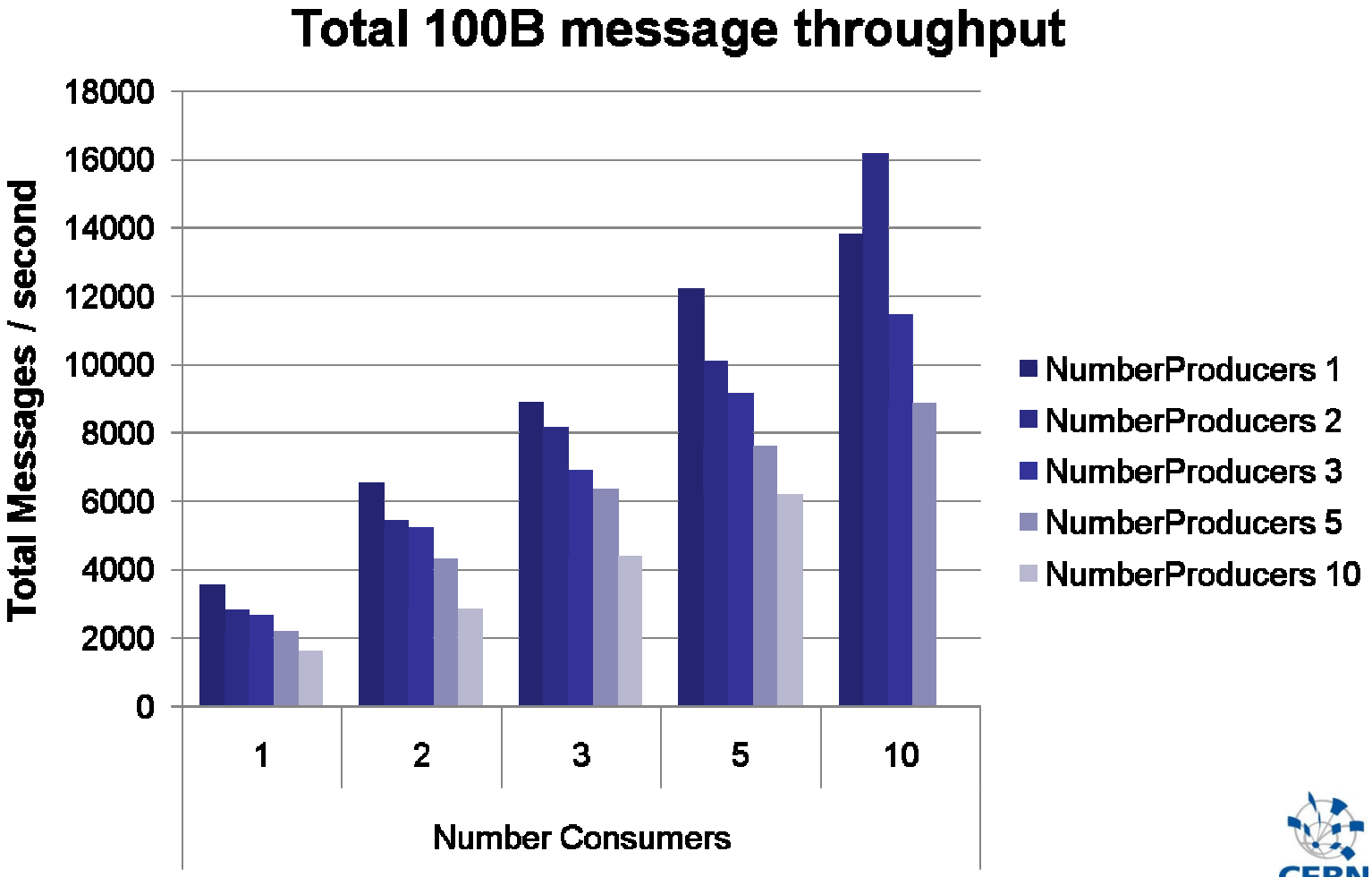
- **FUSE Message Broker**
  - based on Apache ActiveMQ
  - industry support contract has been signed
  - training organized in July 2009
- **Good performance characteristics**
  - 1K – 20K messages per second depending on features used
- **Deployment**
  - networked brokers at CERN and SRCE (Croatia)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

Vendor tests

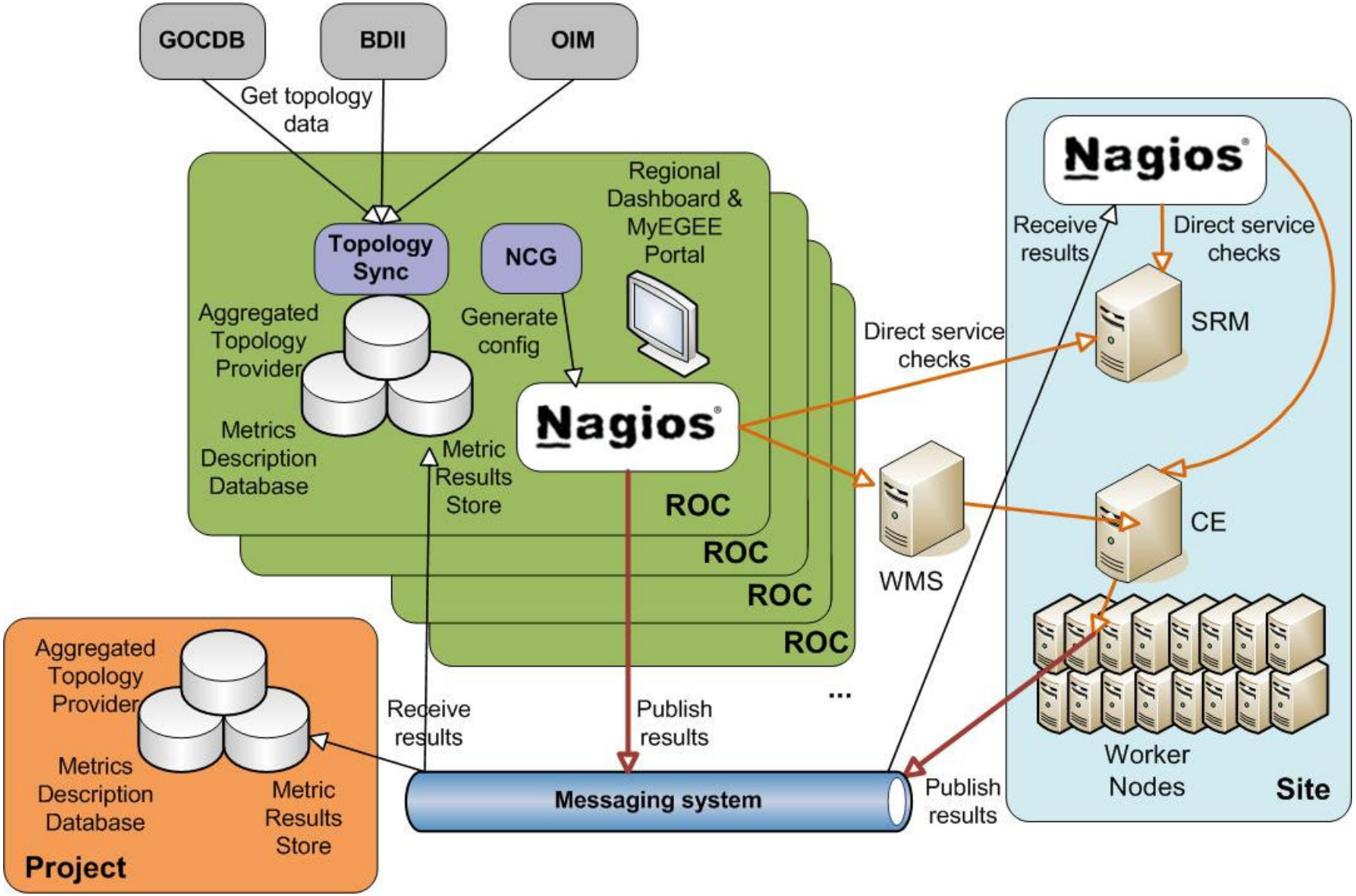


From “Optimizing FUSE Message Broker” - http://open.iona.com/resources/collateral/#whitepapers

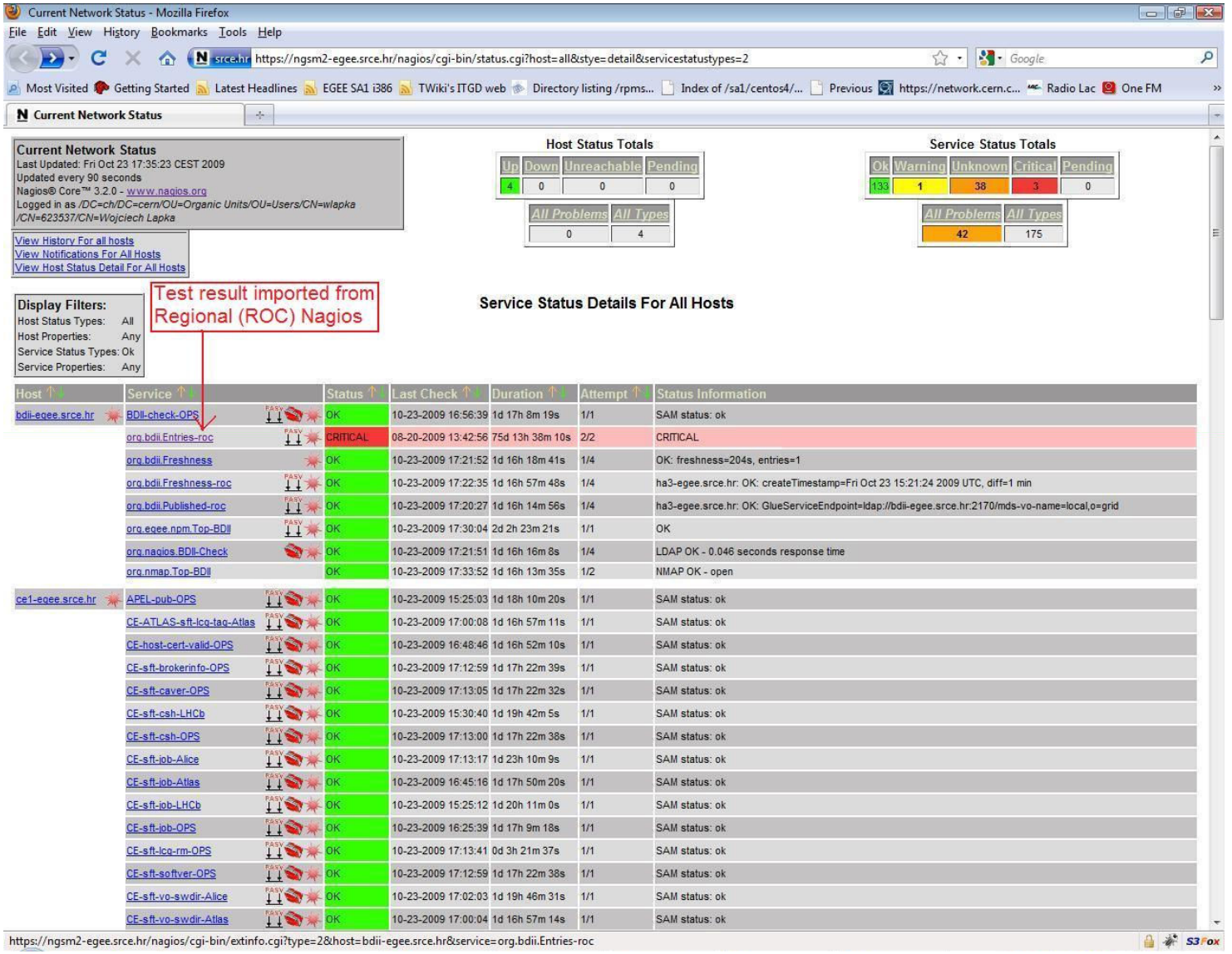
CERN openlab tests



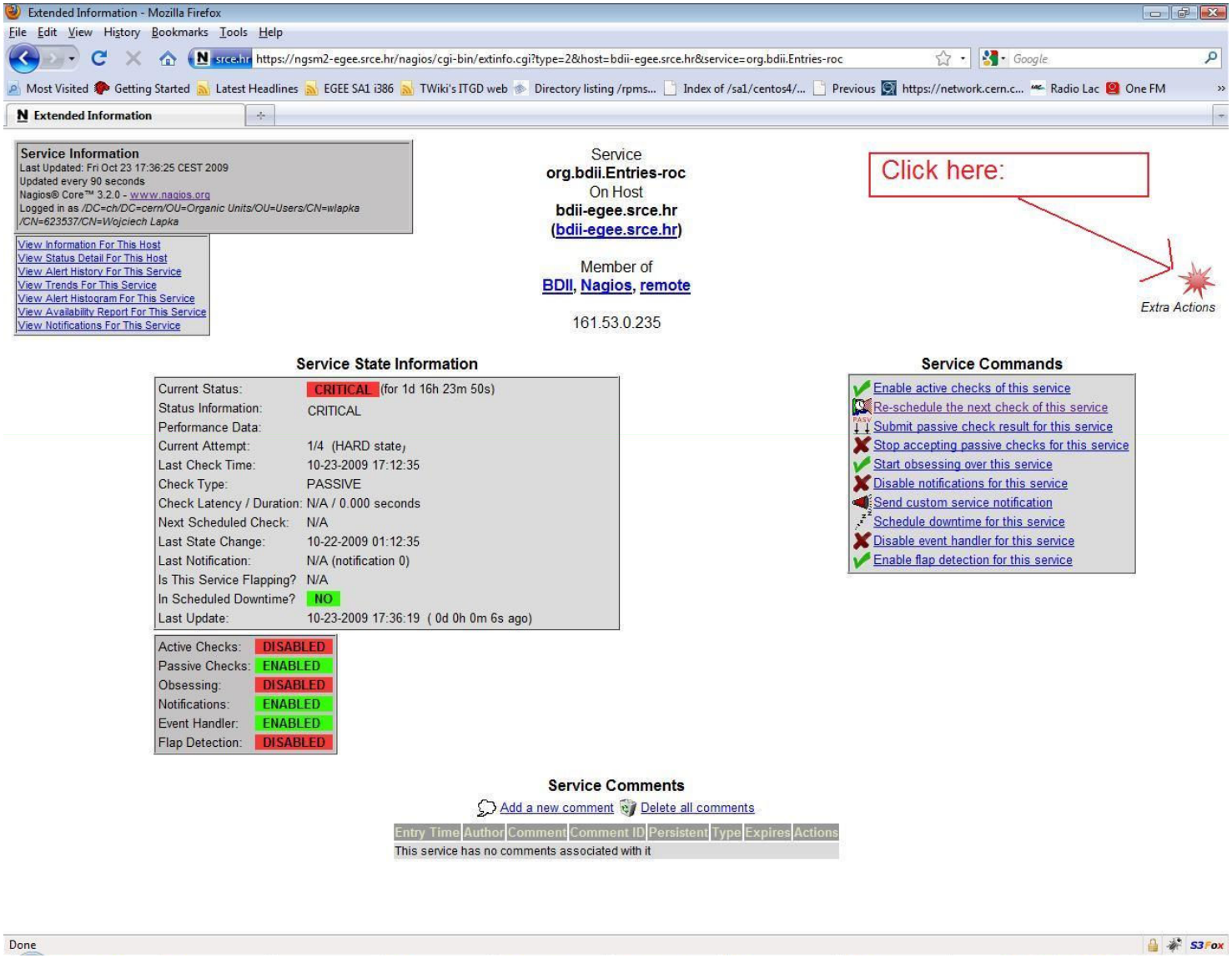
Architecture - Regions



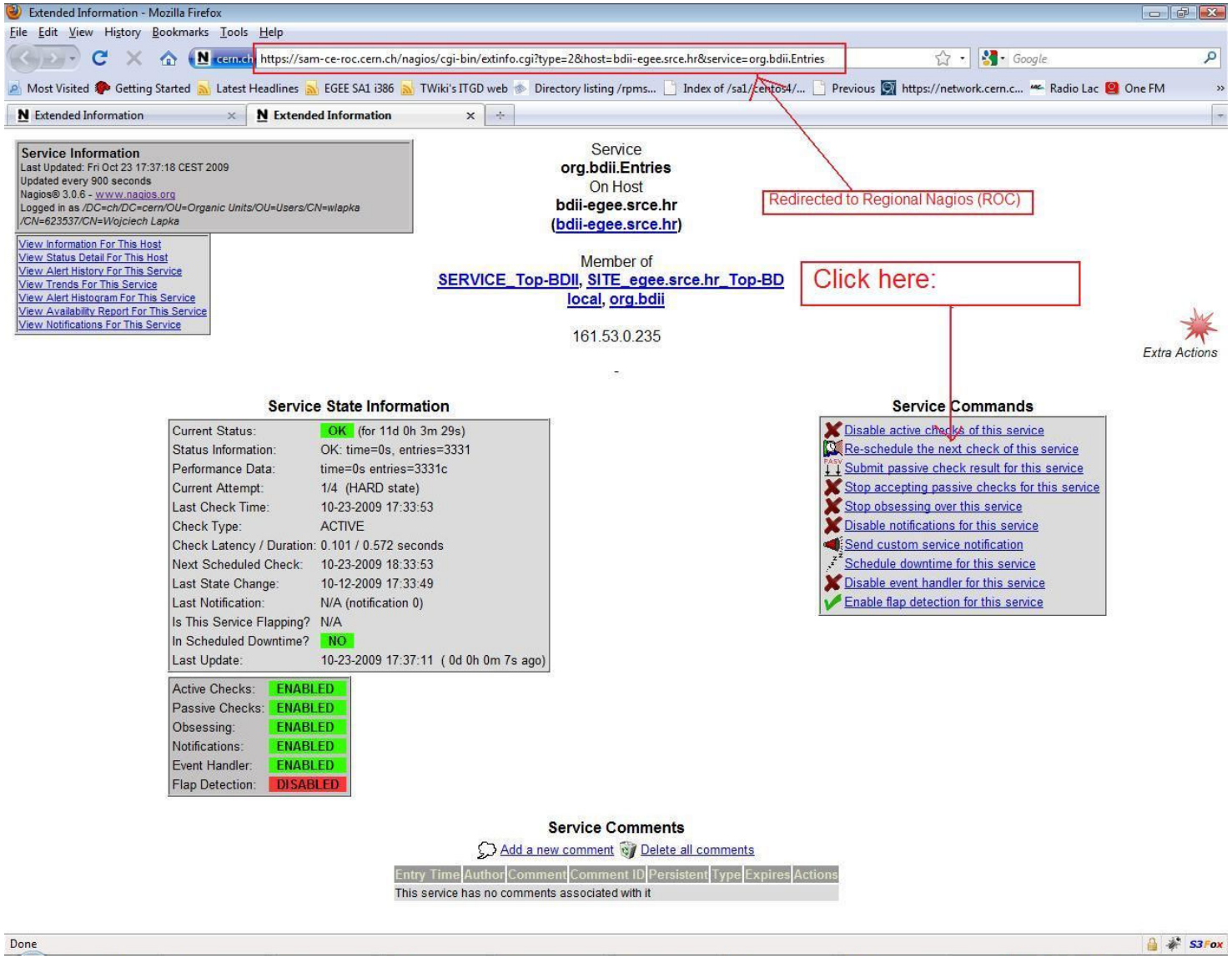
Site Nagios – ROC checks (1/5)



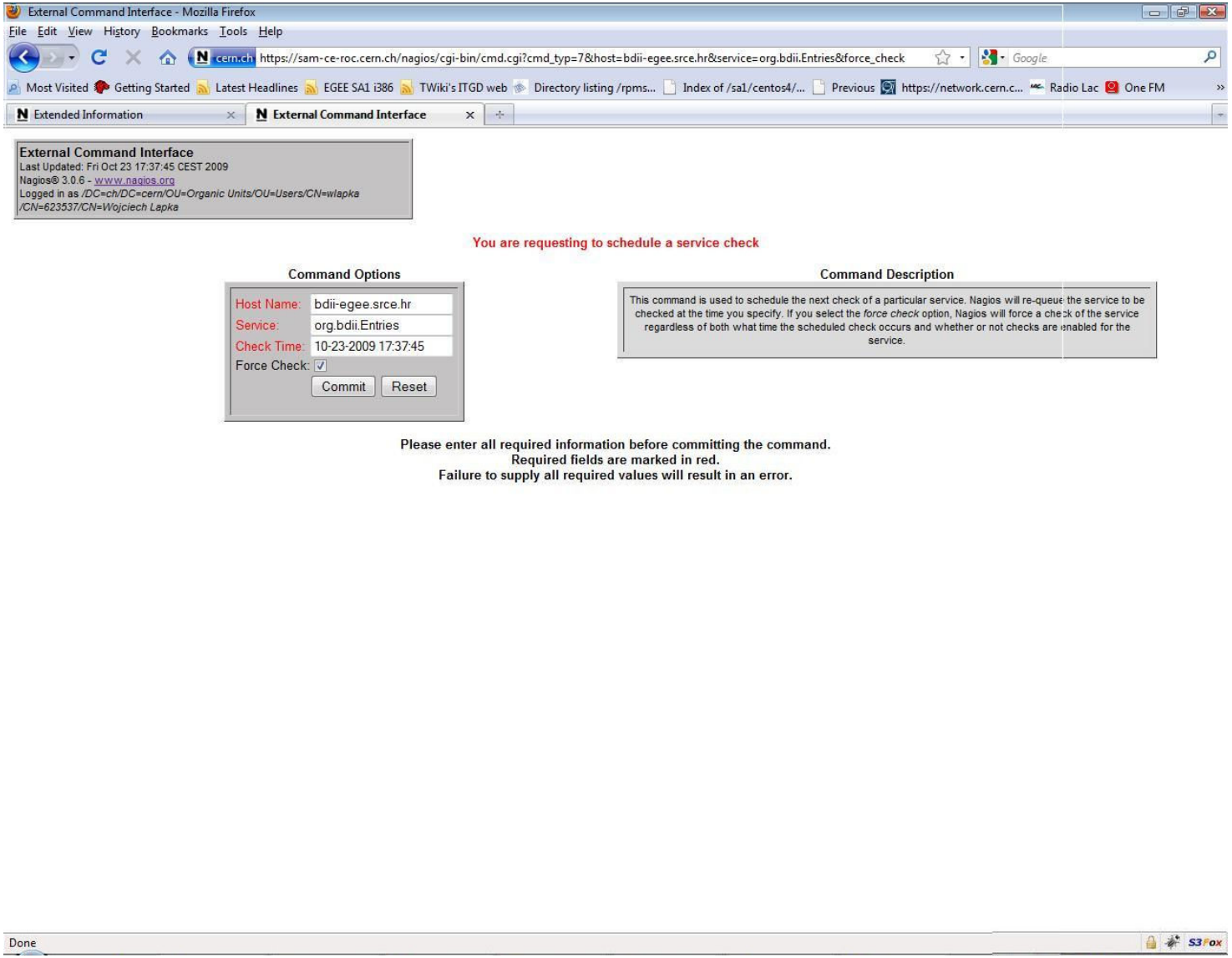
Site Nagios – ROC checks (2/5)



Site Nagios – ROC checks (3/5)



Site Nagios – ROC checks (4/5)



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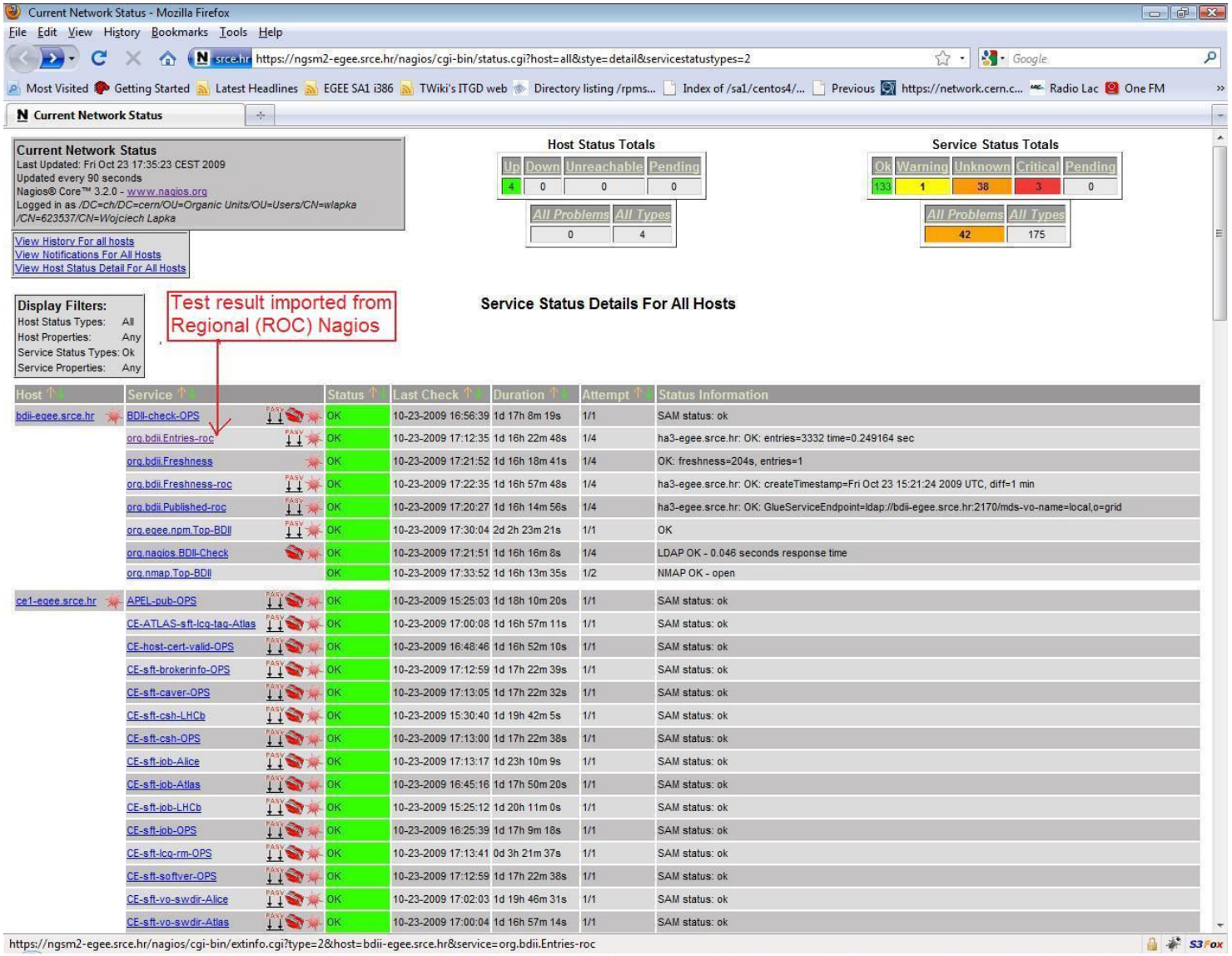
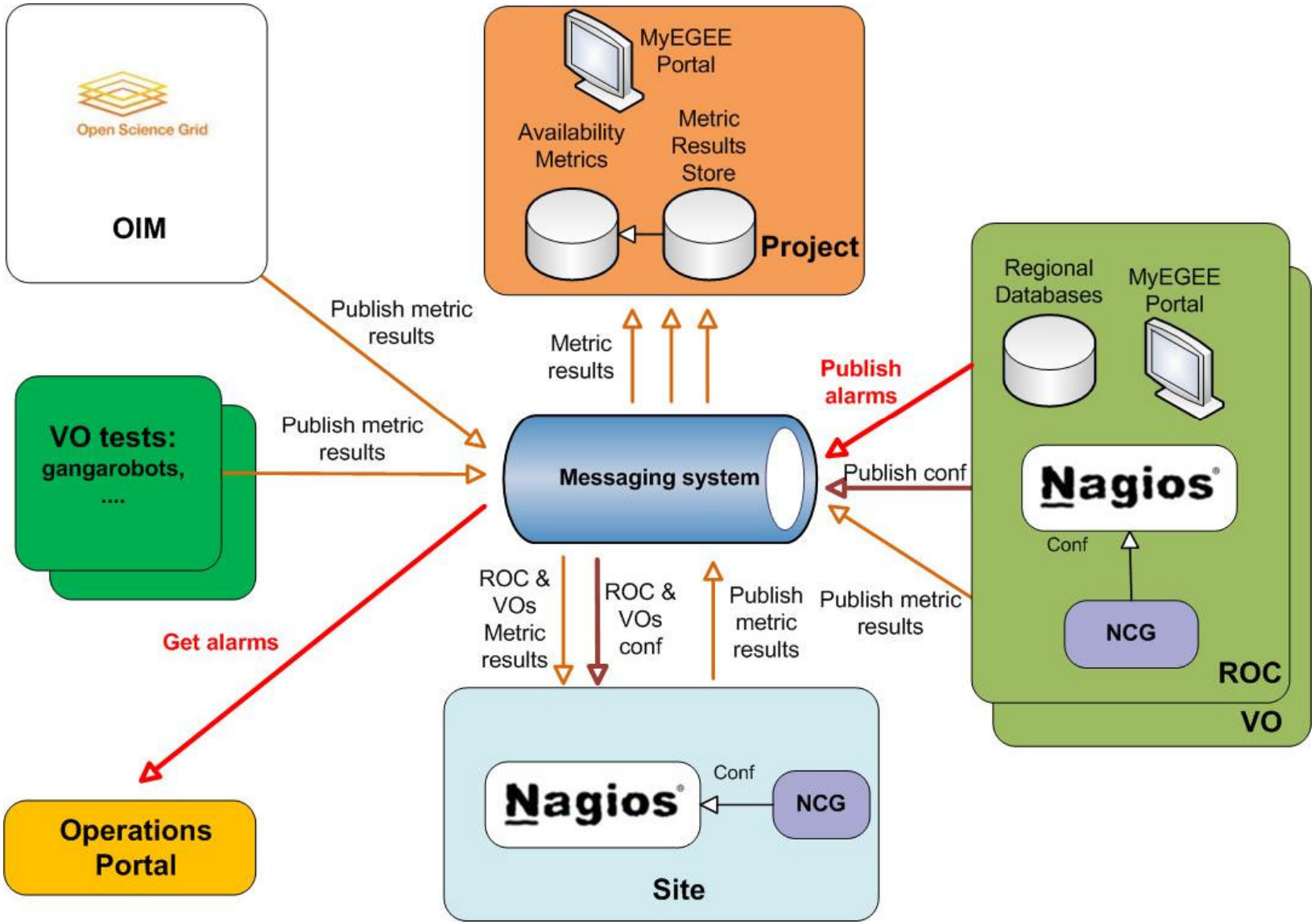
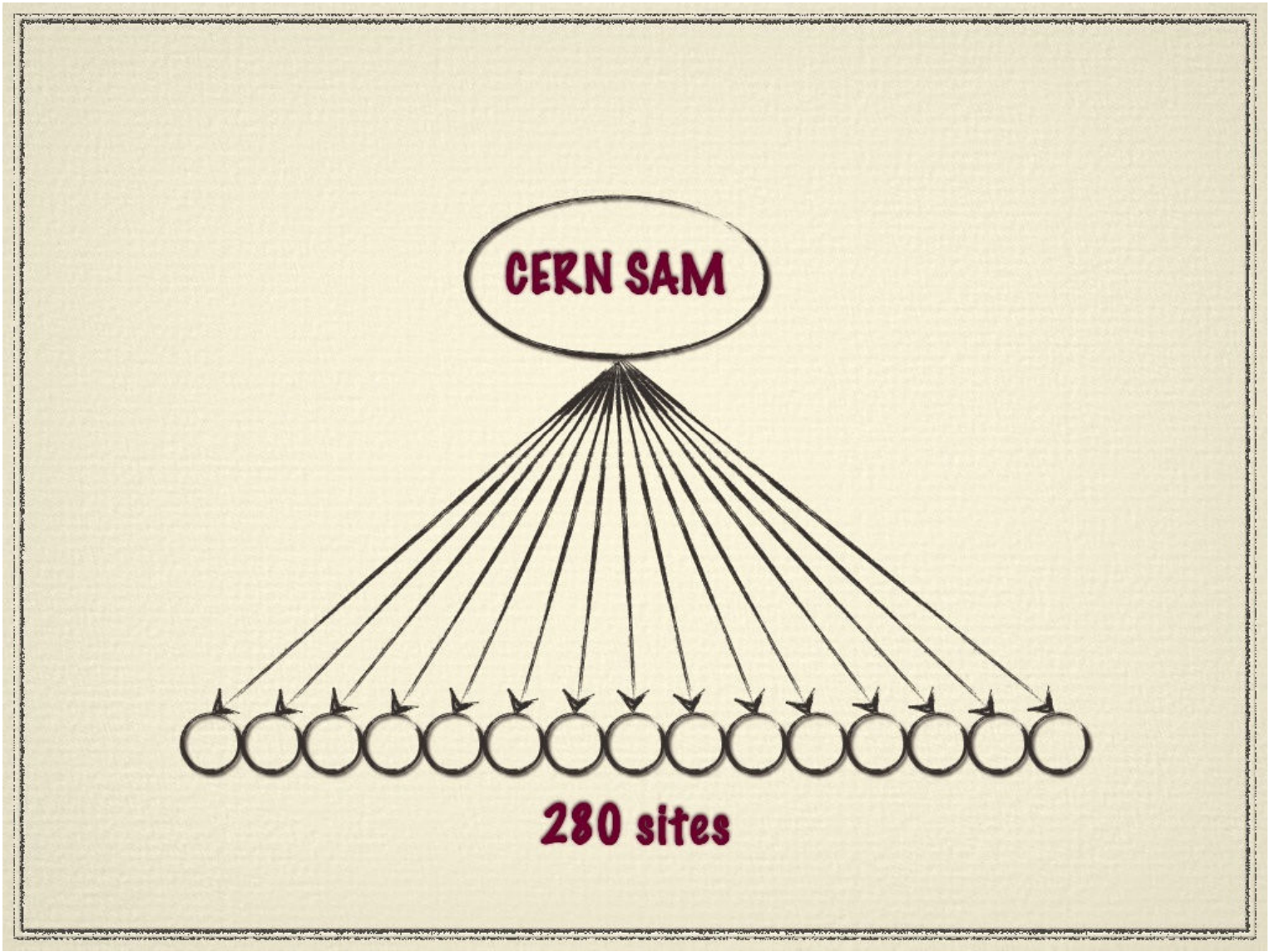


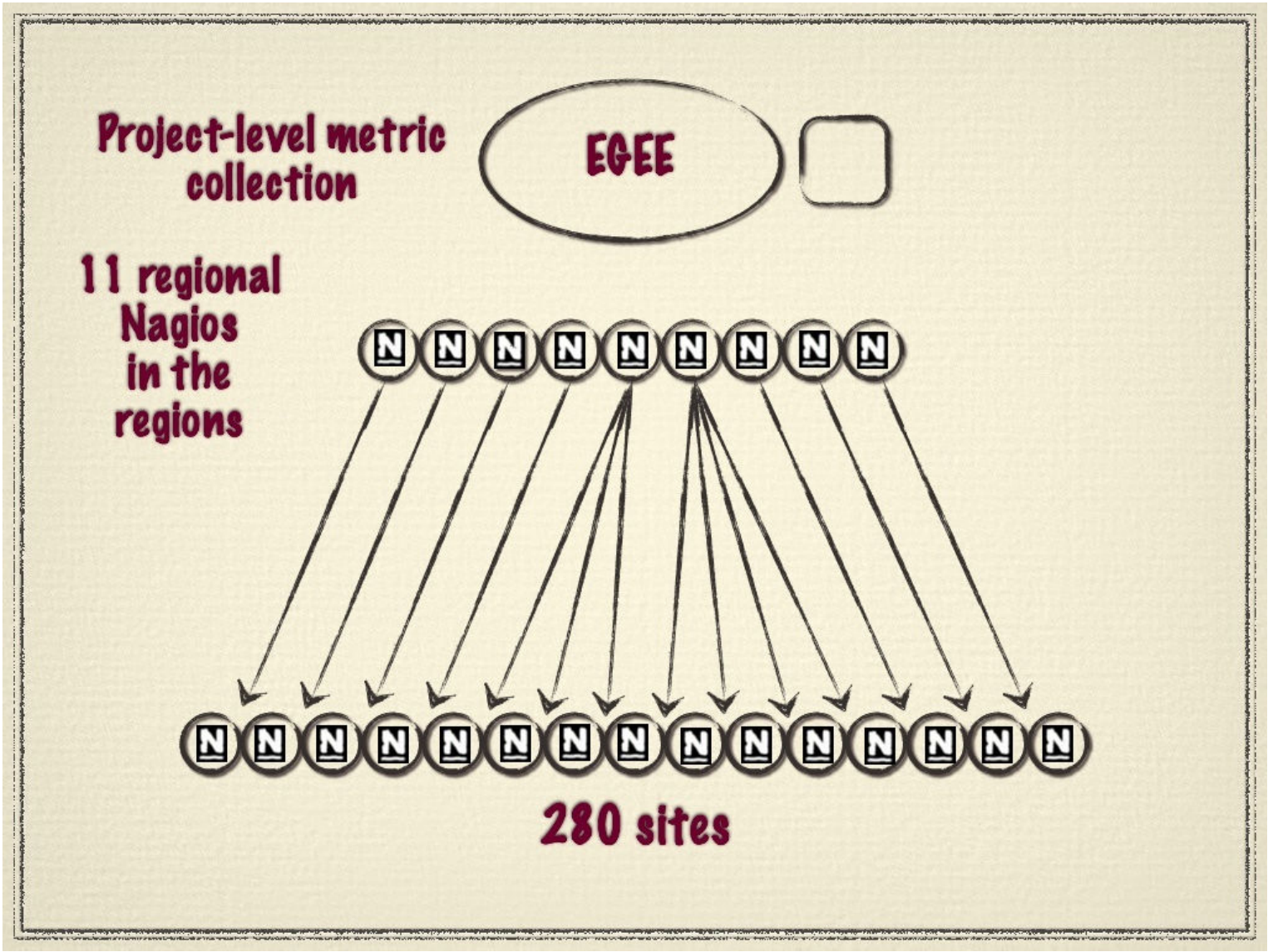
Integration with Messaging



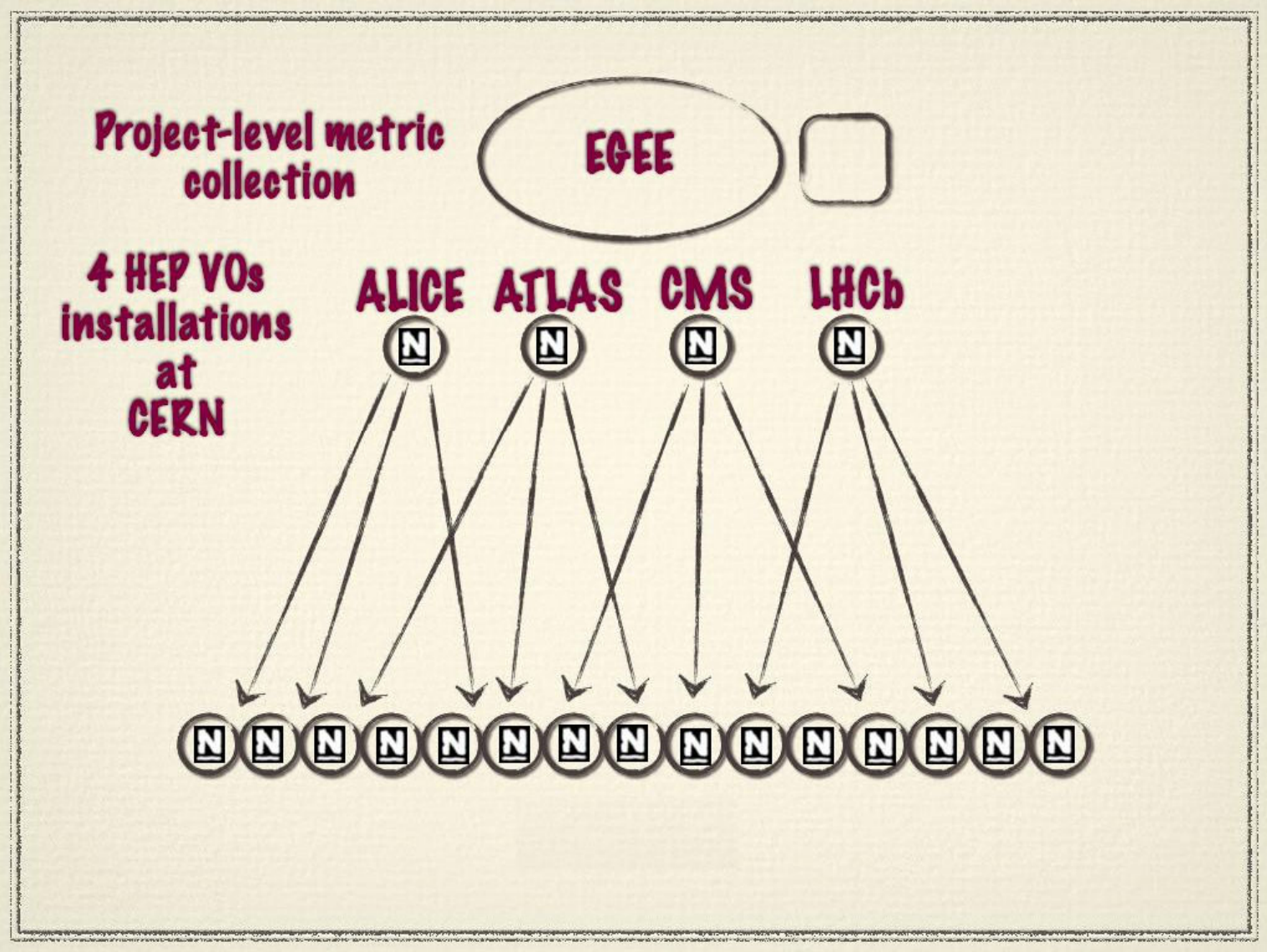
SAM – existing architecture



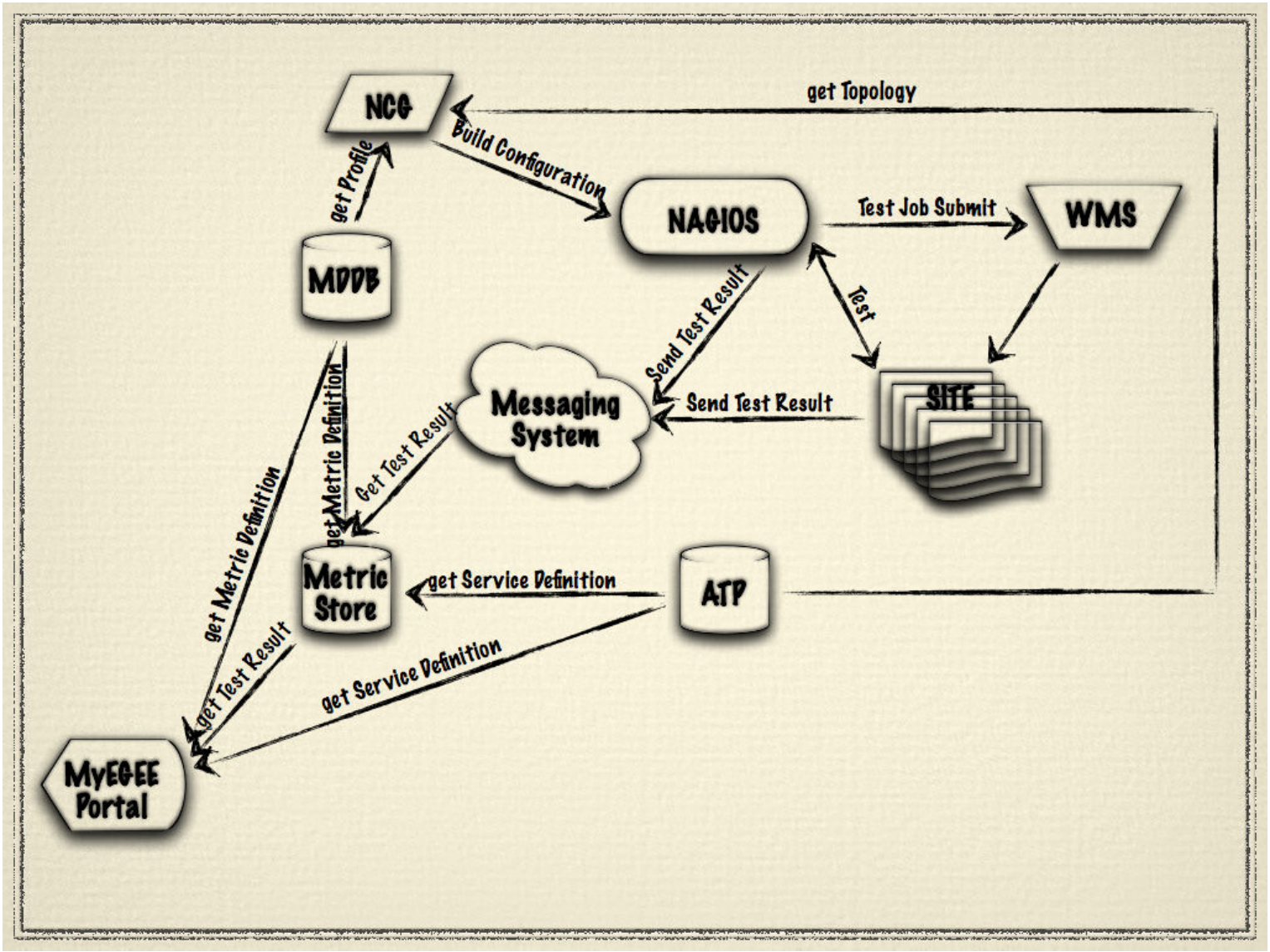
SAM - enhanced architecture



SAM – HEP VOs


Project-level metric collection
EGEE
4 HEP VOs installations at CERN
ALICE
ATLAS
CMS
LHCb

Data Flow


NCG
get Topology
Build Configuration
get Profile
NAGIOS
Test Job Submit
WMS
MDDB
Send Test Result
Test
Messaging System
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SITE
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Metric Store
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ATP
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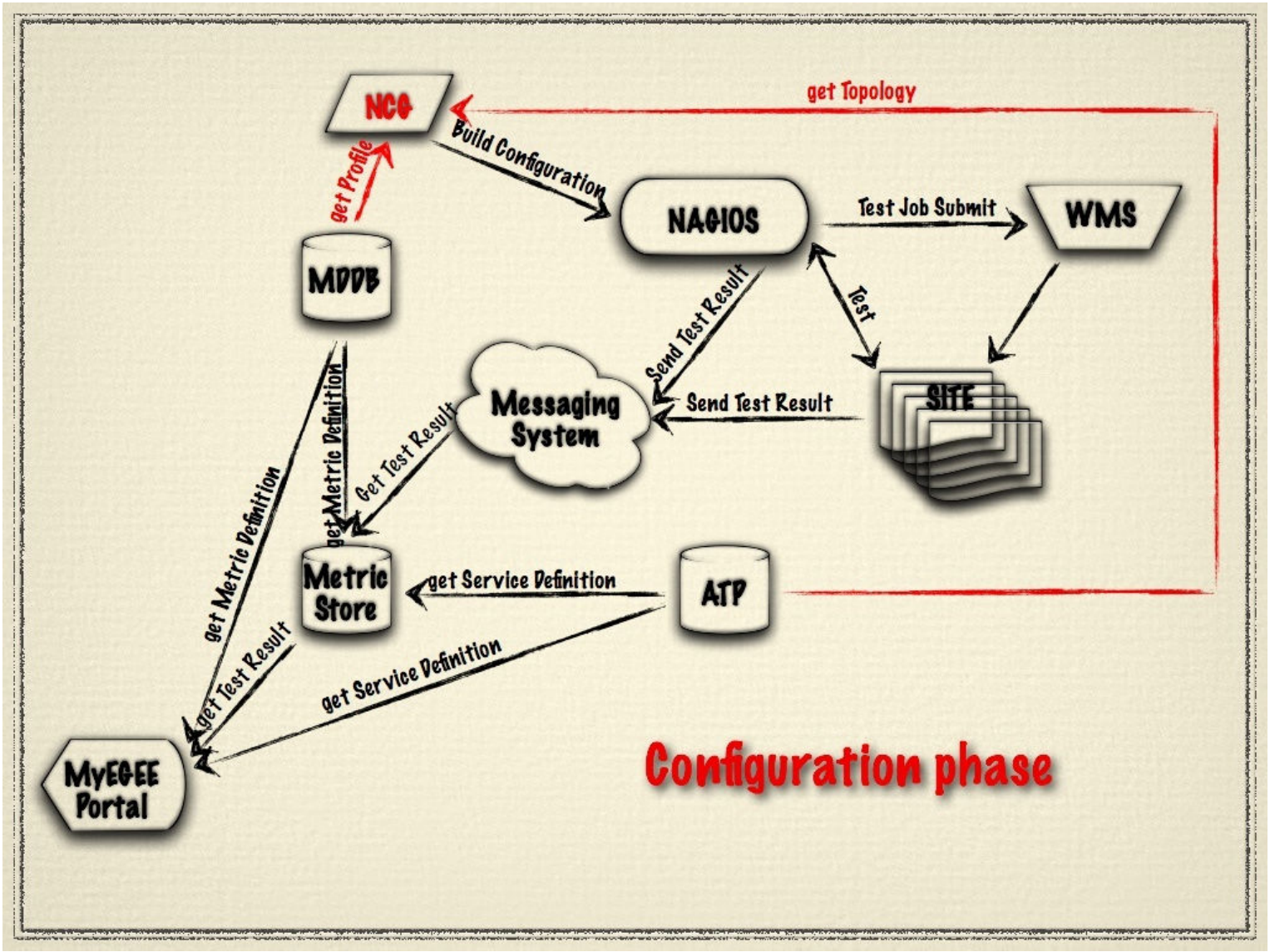
get Service Definition
MyEGEE Portal

Data Flow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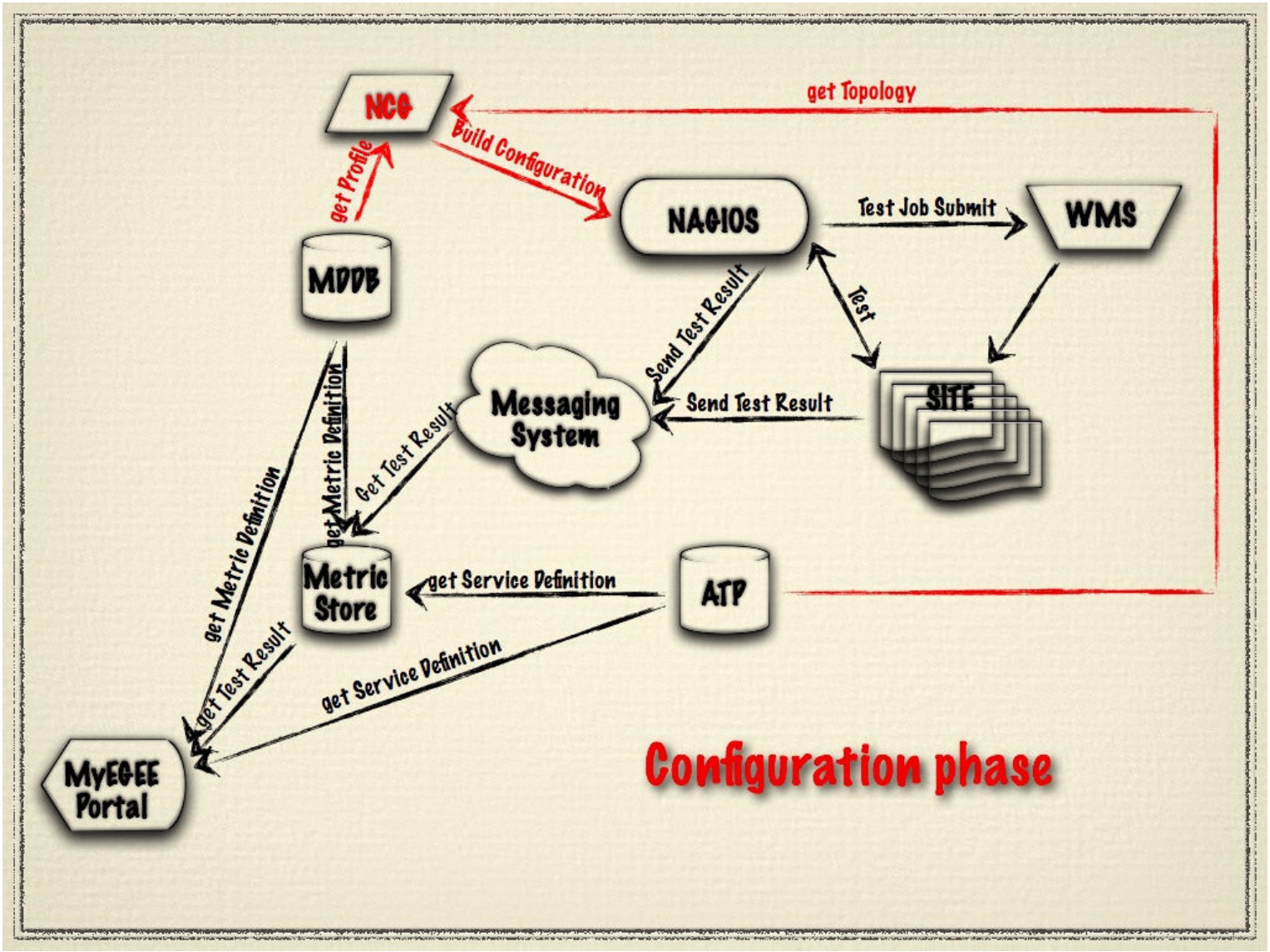
Configuration phase

Data Flow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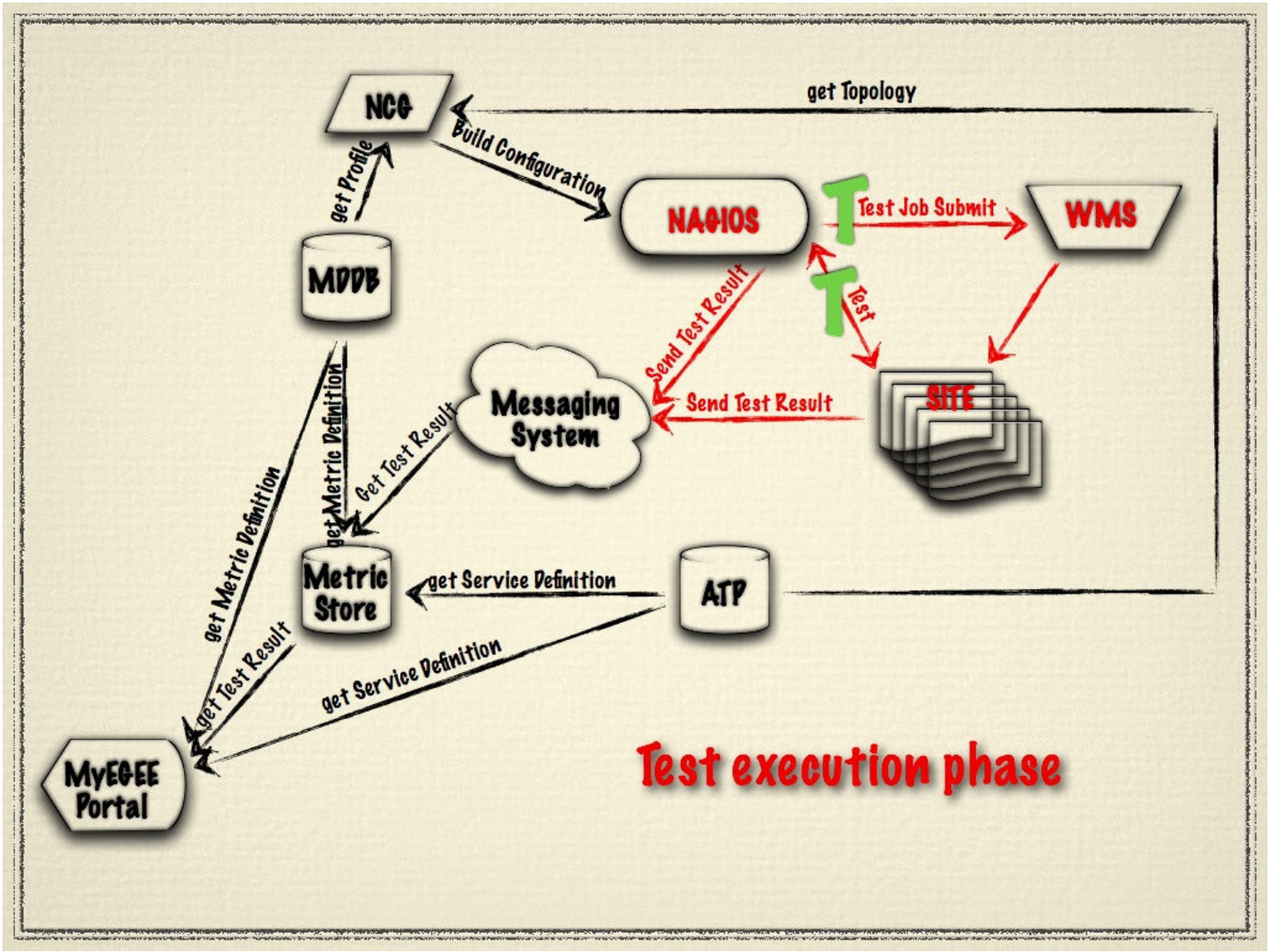
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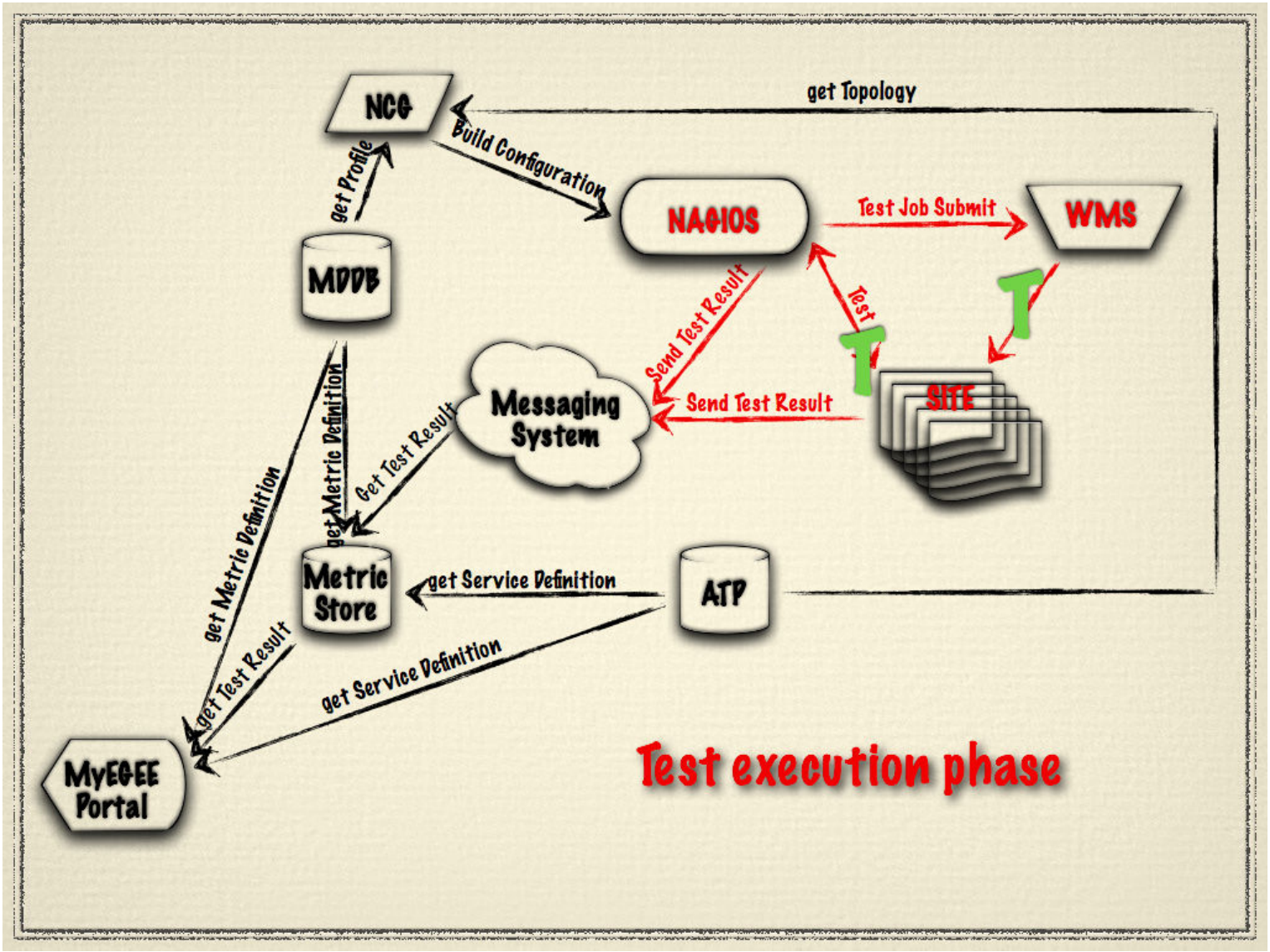
MyEGEE Portal
Test execution phase

Data Flow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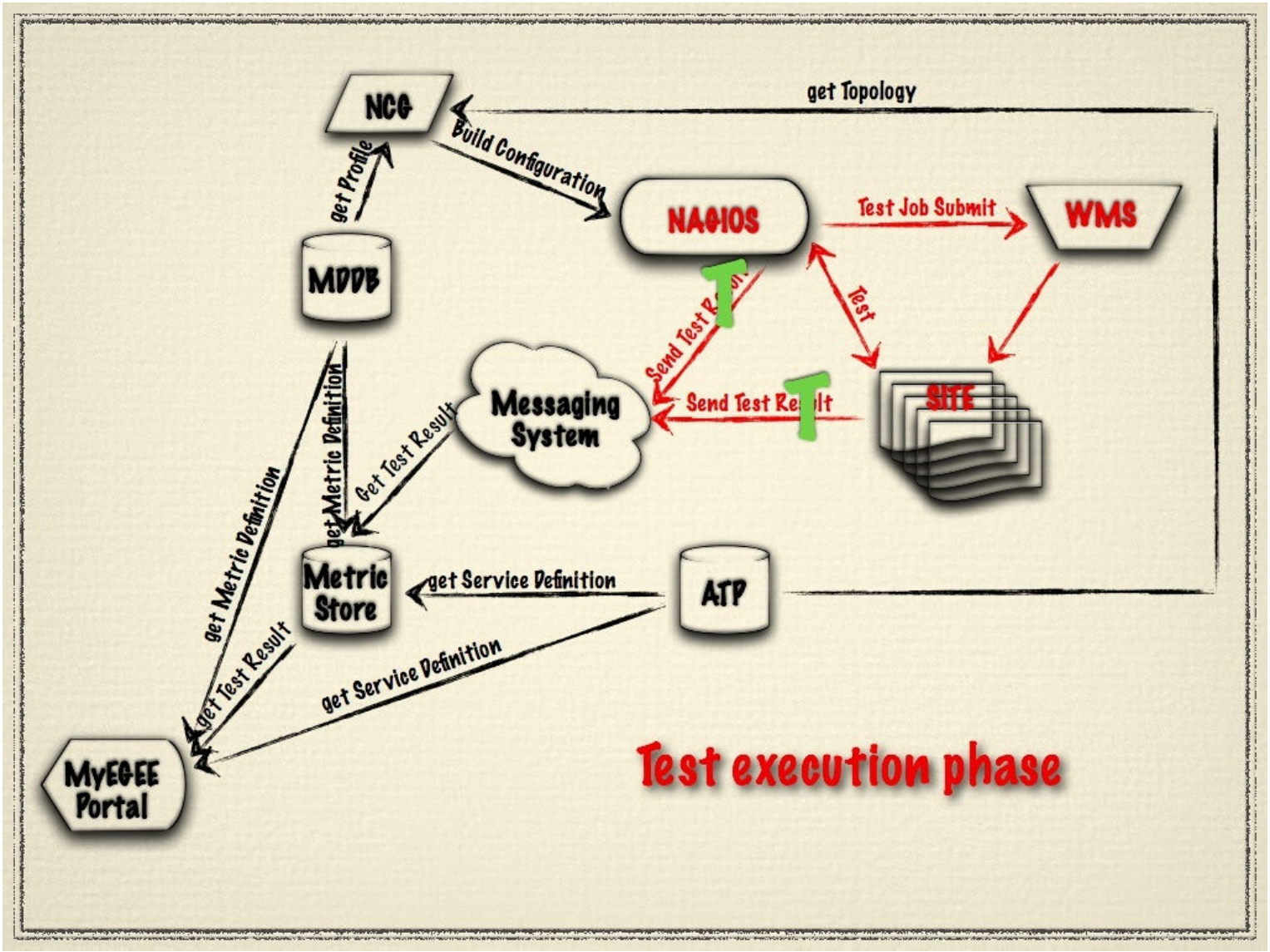
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Test execution phase

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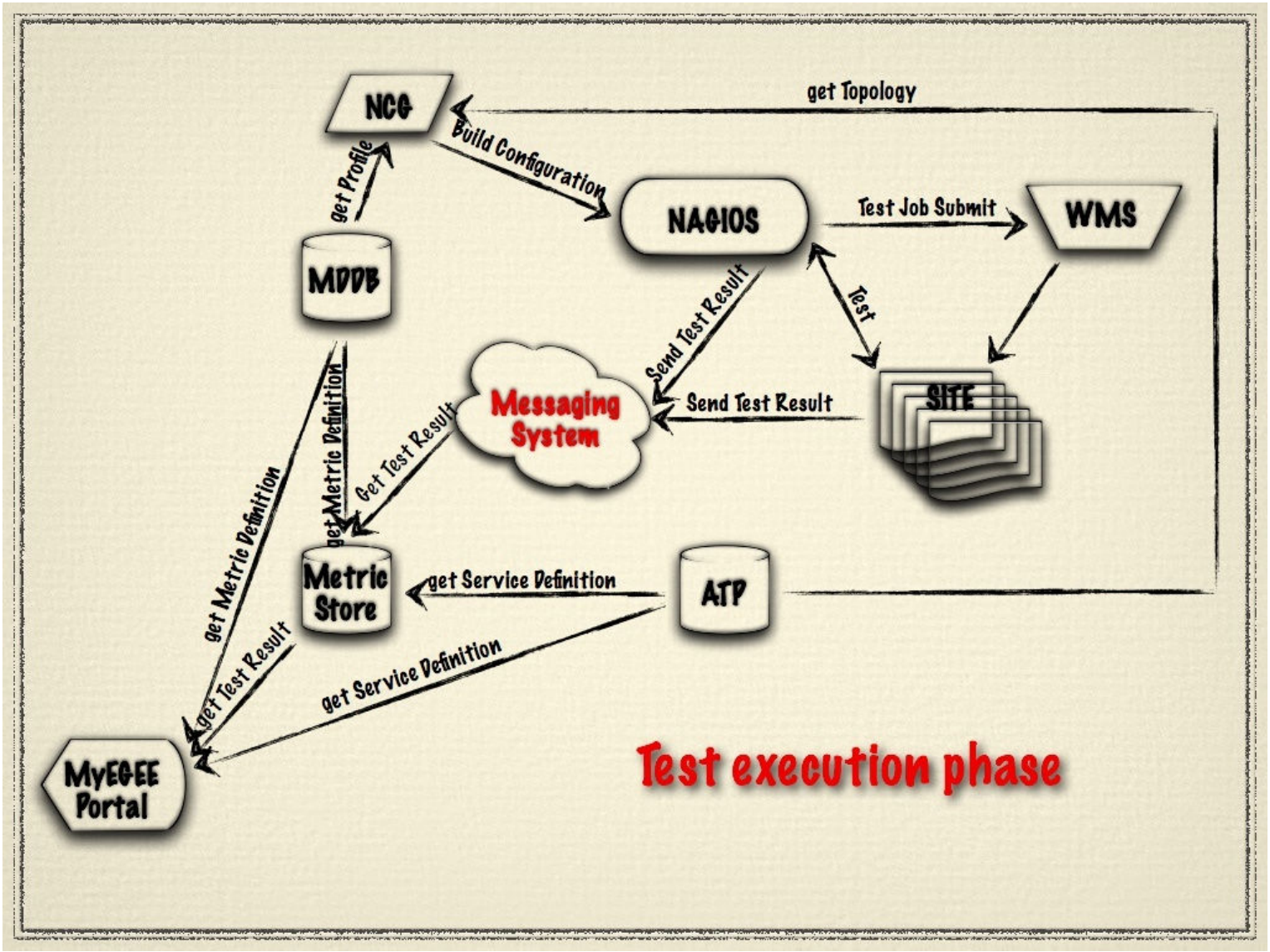
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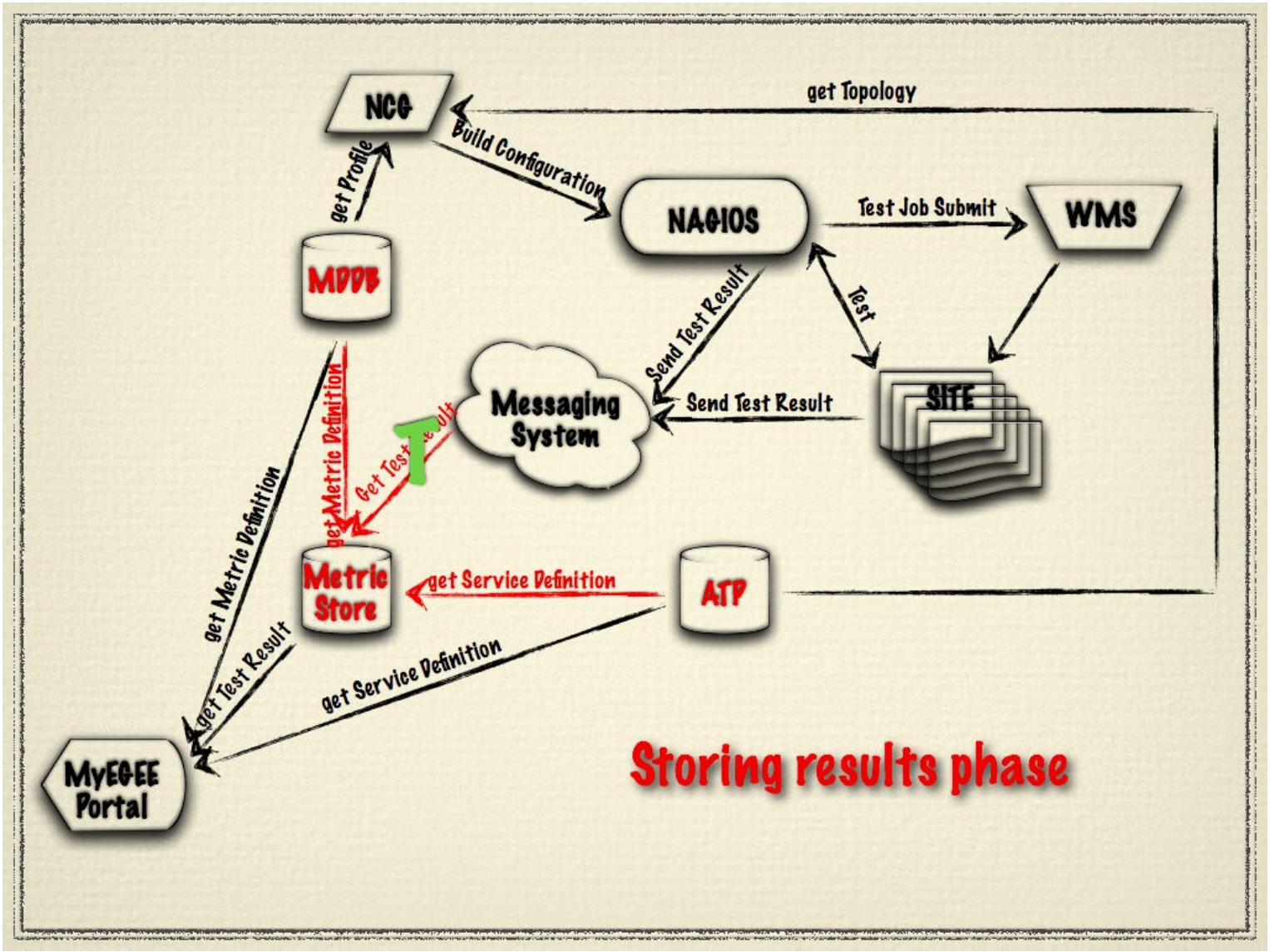
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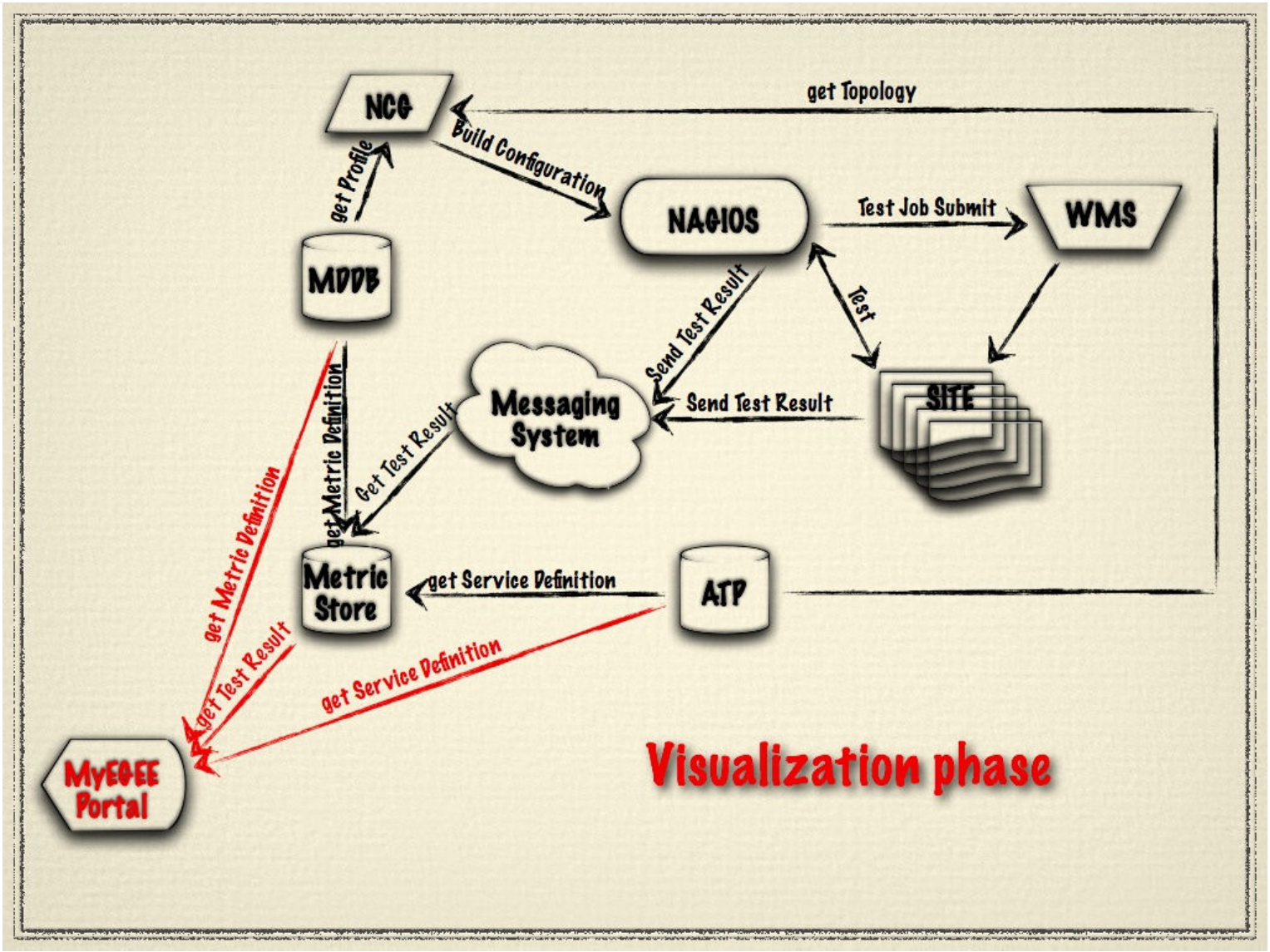
MyEGEE Portal
Storing results phase

Data Flow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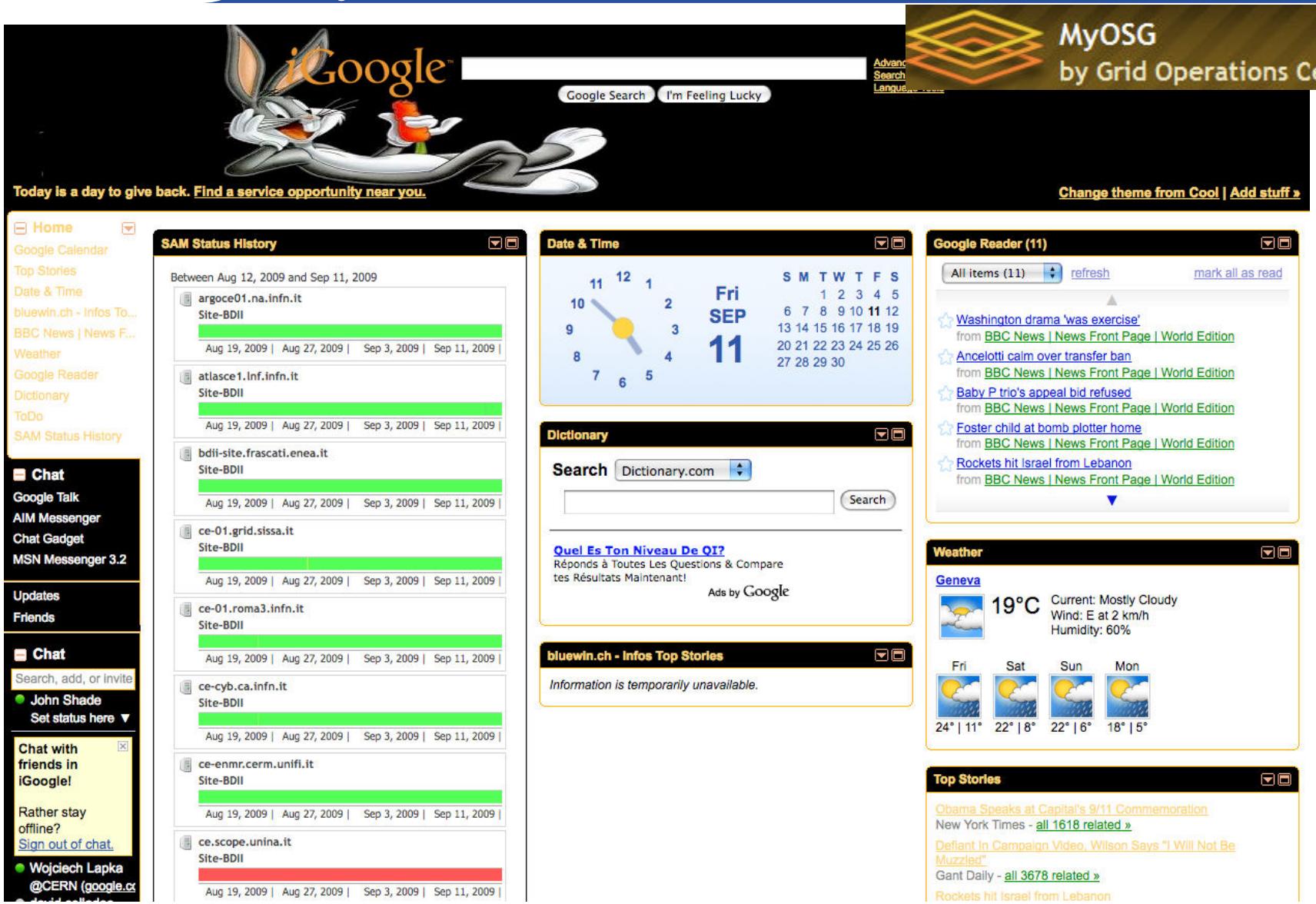
MyEGEE Portal
Visualization phase

MyEGEE portal & iGoogle



Conclusion

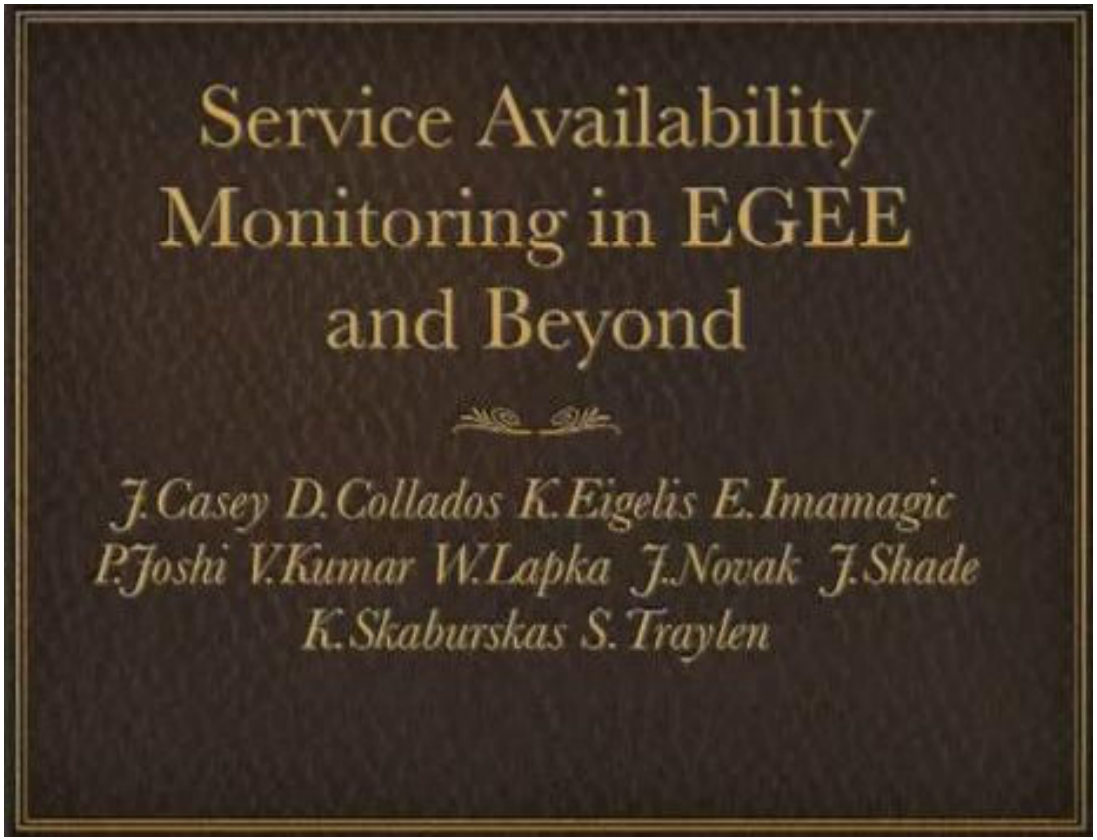
- Multilevel monitoring based on proven commodity software
- System fits the organizational model of the grid
- Provide the means for administrators to better monitor their services
- Integration with existing components to automate operations of monitoring instances

Links

- 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

Demo

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



Acknowledgments

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- 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

Thank you!

Questions?

- Wojciech.Lapka@cern.ch