



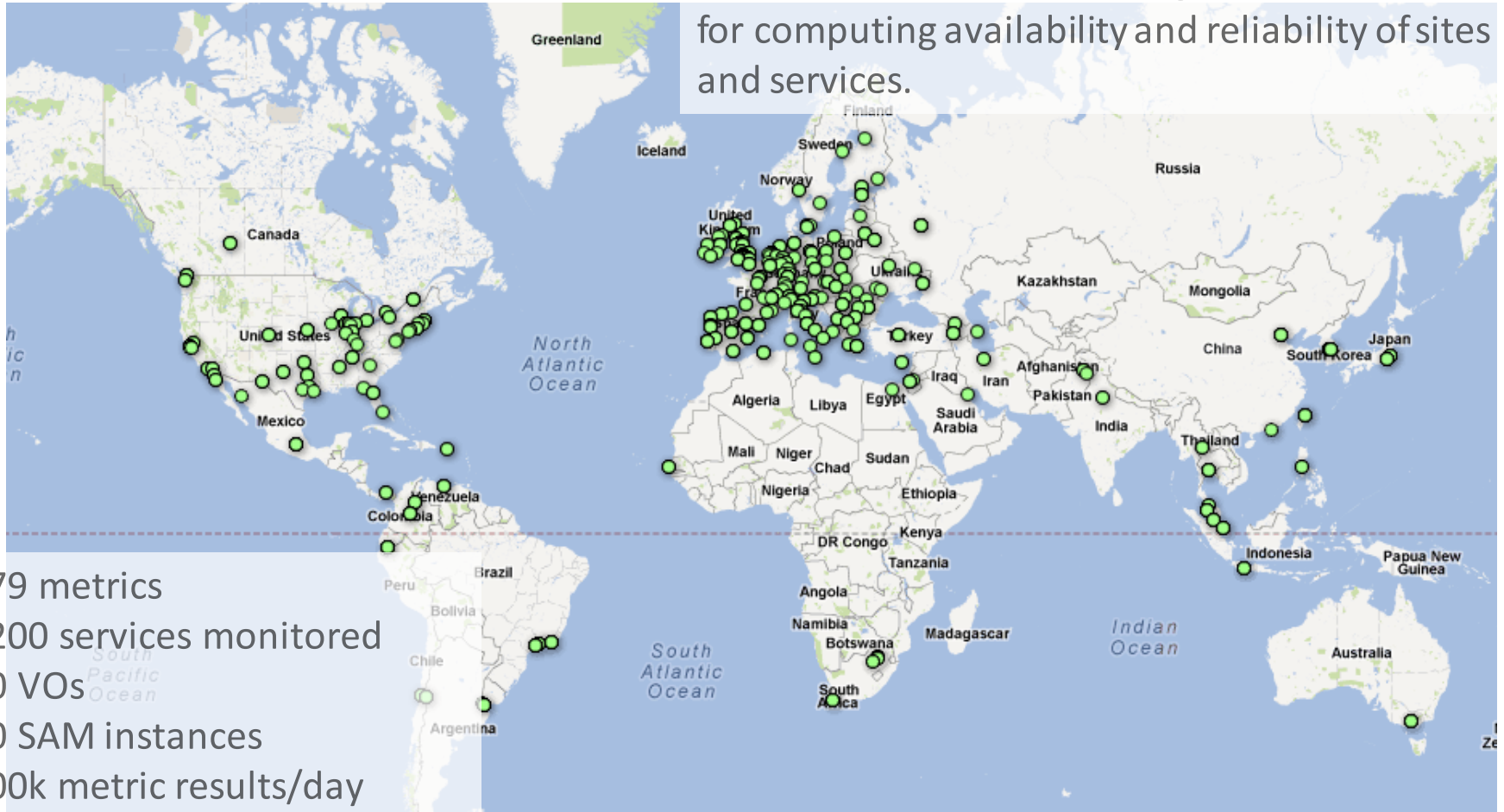
Marian Babik
IT/SDC/MI

SAM PROBES FRAMEWORK



SAM today

SAM - distributed monitoring framework for computing availability and reliability of sites and services.



179 metrics
4200 services monitored
10 VOs
40 SAM instances
700k metric results/day

Probes and metrics

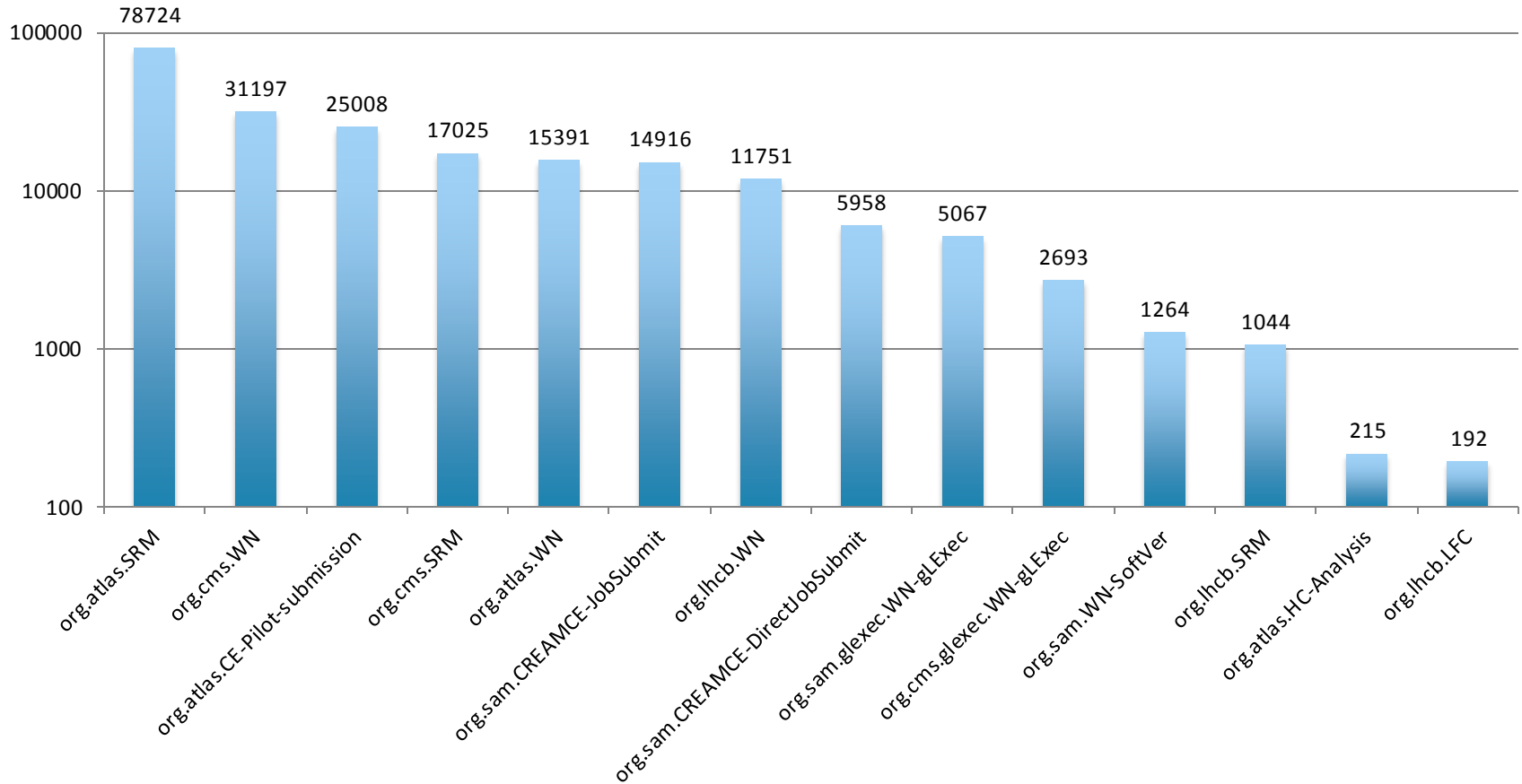
- 30 probes used by WLCG developed by different PTs and experiments covering:
 - ARC, CREAMCE, WMS
 - GLEXEC
 - SRM probes, LFC
 - BDII
 - WN probes (file replication)
 - Experiment-specific probes (SRM, WN, ...)
- Implementing 113 metrics

Probes	Used by	Maintained by
CREAMCE (WMS)	OPS, ATLAS, ALICE, CMS, LHCb	CREAM PT
DirectCREAMCE	OPS, LHCb, ALICE	
ARC	OPS	ARC PT
GLEXEC	ATLAS, LHCb, ALICE, OPS	GLEXEC PT + SAM
CMS-GLEXEC	CMS	CMS
BDII	OPS	BDII PT
SRM	OPS	dCache PT
LFC	ATLAS, LHCb, OPS	DPM PT
ATLAS SRM	ATLAS	ATLAS
CMS SRM	CMS	CMS
LHCb SRM	LHCb	LHCb
ATLAS WN	ATLAS	ATLAS
CMS WN	CMS	CMS
LHCb WN	LHCb	LHCb
gen. WN	OPS, ALICE	OPS
WN replication tests	OPS	DPM PT

Probes and metrics

- Probe can implement multiple metrics
- Metrics can be executed with different credentials
 - 31 OPS metrics (ops, pilot)
 - 5 ALICE metrics (alice, pilot)
 - 35 ATLAS (production, lcgadmin, pilot)
 - 22 CMS (production, lcgadmin, pilot)
 - 20 LHCb (production, pilot)

Metric results received per metric group (30th May 2013)



NAGIOS Probes Framework

- NAGIOS probe framework
 - Well-defined interface for probes (status/output) and many examples
- Both polling and pushing supported
- Currently both approaches are used
 - 1. Active - Polling for BDII, Job Submission
 - 2. Passive – Pushing results to messaging and then via nsca or pipe to NAGIOS
 - 2.1 Passive - Submitted by active (WN)
 - 2.2. Passive – Directly published from 3rd party monitoring systems (ATLAS-HC)

Probes Development

- Different possibilities:
 1. Following instructions for developing NAGIOS probes (BDII, nagios-exchange)
 2. Using python-gridmon - SAM NAGIOS probe library (CREAMCE, WMS, SRM)
 3. Publishing metric results to messaging
 - WN, ATLAS HC; LHCb Dirac (started)

Probes Development with python-gridmon

- Container for metrics
- Grid security support (VOMS proxy)
- Configurable interaction with NAGIOS
- Integration in EPEL ongoing
- Used by SRM, CE probes and their extensions for experiments

Probes Development – 3rd party systems

- Can publish metric results directly to message bus
 - Automatically imported by SAM to NAGIOS
- Steps:
 - Adding metric(s) to Profile Management
 - Add metric configuration (passive)
 - Start publishing results to messaging
 - Results automatically processed by SAM

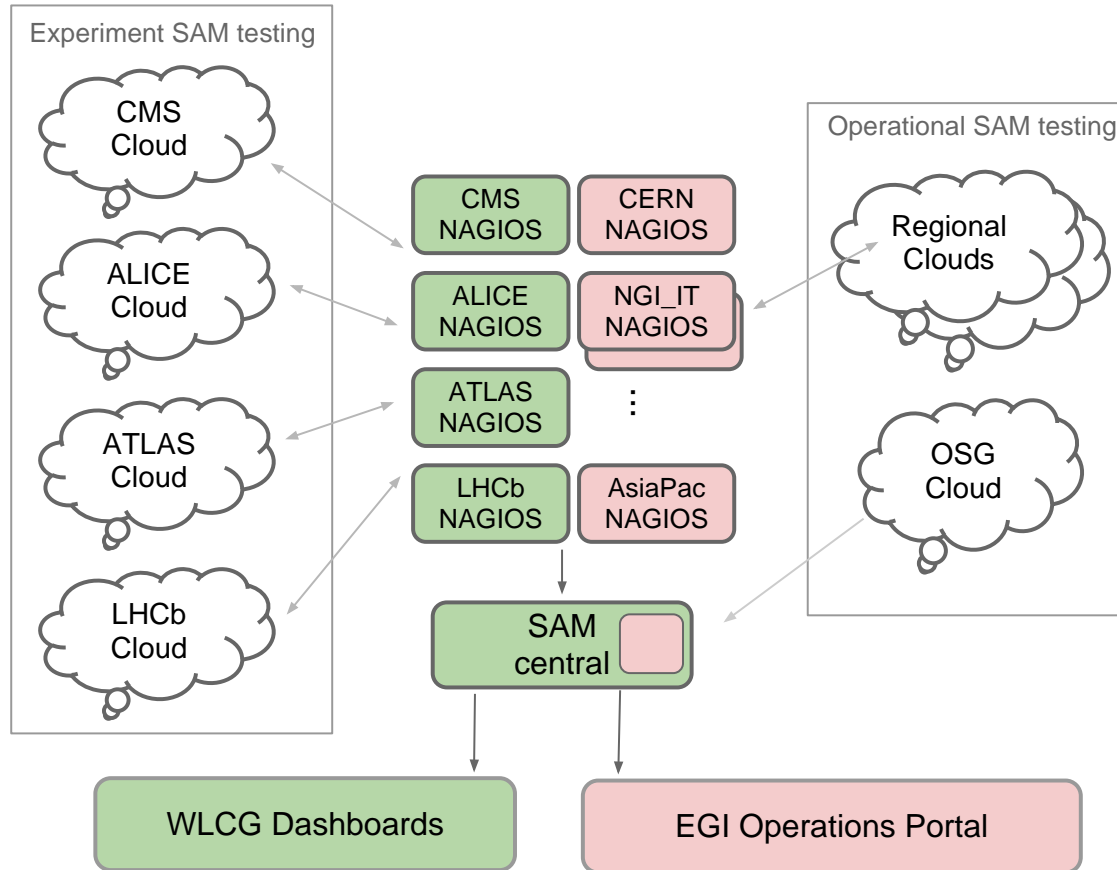
Message format

```
Message Broker URI: stomp://sam-validation.msg.cern.ch:6163/
Message Broker destination: /queue/grid.probe.metricOutput.EGEE.sam-lhcb-preprod_cern_ch
2013-07-04 10:07:17,852 ConnStomp INFO slept in message dispatch loop.
2013-07-04 10:07:18,853 ConnStomp INFO slept in message dispatch loop.
2013-07-04 10:07:18,855 ConnStomp DEBUG Sending MESSAGE
2013-07-04 10:07:18,855 ConnStomp DEBUG headers : {u'nagios_host': u'localhost.localdomain', 'destination':
'/queue/grid.probe.metricOutput.EGEE.sam-lhcb-preprod_cern_ch', u'role': u'site', u'sitename': u'UKI-
SOUTHGRID-BRIS-HEP', u'ROC': u'UNDEFINED', 'persistent': 'true'}
2013-07-04 10:07:18,855 ConnStomp DEBUG body : 'serviceURI: lcgce03.phy.bris.ac.uk:8443/cream-pbs-short
hostName: localhost.localdomain
serviceFlavour: CE
siteName: UKI-SOUTHGRID-BRIS-HEP
metricStatus: CRITICAL
metricName: emi.cream.glexec.WN-gLExec
summaryData: CRITICAL: glexec command not found
gatheredAt: bse11.phy.bris.ac.uk
timestamp: 2013-07-04T09:07:18Z
nagiosName: emi.cream.glexec.WN-gLExec-/lhcb/Role=pilot
role: site
voName: lhcb
serviceType: org.sam.WN
EOT
'
```

Questions

- Is SAM monitoring with OPS credentials essential for WLCG ?
 - Currently provided through EGI/NGIs
 - Consuming significant amount of central resources
 - Removing OPS from reports ongoing (see May WLCG MB)

SAM OPS vs EXP infrastructure



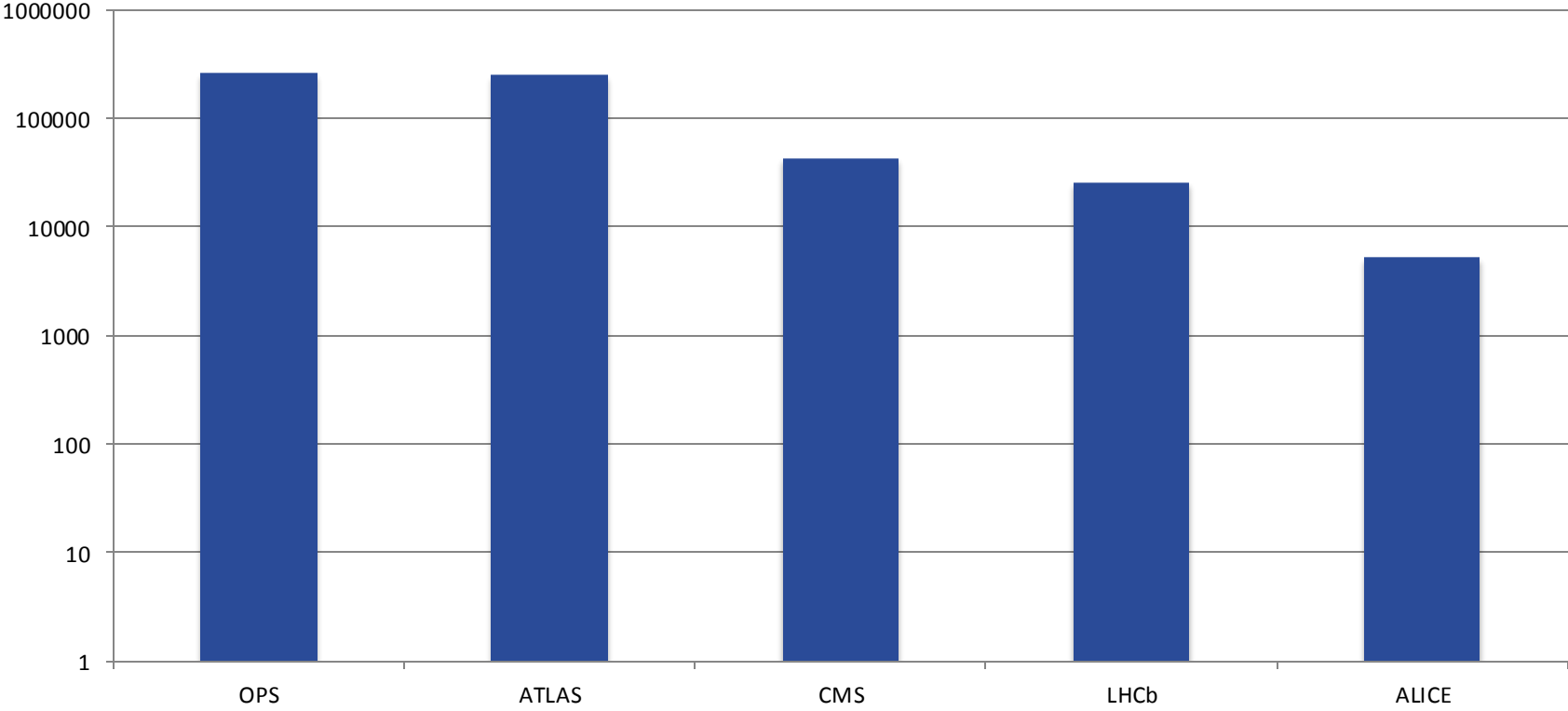
Legend

Exp. testing infrastr.

OPS testing infrast.

Use of SAM

Metric results per VO received by SAM
(30 August 2012)



Questions

- Is it essential to have all metrics in NAGIOS ?
 - It's also possible to avoid NAGIOS and publish metrics directly to SAM central service
- Do we need VO independent metrics ?
 - e.g. BDII
- Do we need to run metrics with multiple FQANs ?
- Is current metric results expiration [policy](#) appropriate ?
 - not enforced right now, but important to keep aggregation performance
 - metric results kept 3 months
 - metric status changes kept 12 months

Issues

- How do we move away from WMS-based job submission testing ?
 - job submission probe that can send WN payload depends now on WMS; used for ARC, OSG and CREAM
 - what are the alternatives ? condor-g; direct-cream probe extension; new arc probes ?

Summary

- SAM/Nagios offers flexible probe framework with many existing probes
- Different possibilities exists to develop probes
- Job submission probes might require significant changes (soon)
 - To move away from WMS
 - To preserve our investment in WN tests

References

- [SAM Documentation](#)
- [SAM Probe Framework](#)
- [Importing results from external monitoring systems](#)



BACKUP SLIDES



Probes and metrics setup

- Probe environment
 - now emi-nagios, previously glite-ui
 - emi-ui possible (but has unicore, etc.)
- Probe configuration (Nagios API, probe defaults)
- Metric configuration
 - Probe to metrics mapping
 - Metric dependencies
 - Probe command line arguments (--add-wn-tarball)
 - Probe variable arguments (vo, fqan, broker)
 - Frequencies,
- Metric aggregations
 - Profile management (groups services and metrics)