#### WLCG Operations and Tools TEG: Immediate Outlook

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# **Executive Summary**

- High-level recommendations were presented on 7<sup>th</sup> February
- Current status : waiting on global (pan-TEG) summary, including definitive prioritization
- Ops & Tools TEG has the correct membership to help guide the implementation of those recommendations given the 'green light'
- Very high level summary of recommendations presented in next slides



## Where we would like to be...

- A small number of well-defined common services would be needed per site;
- Installing, configuring and upgrading these would be "trivial"
- All services would comply to standards, e.g. for error messages, monitoring;
- Services would be resilient to glitches and highly available;
- In case of load (or unexpected "user behaviour") they would react gracefully;
- In case of problems, diagnosis and remedy should be straight-forward and rapid.
- Not necessarily the agreed goals at design & implementation stage – how close can we approach these retro-actively?



# **Details of Recommendations**

- See presentation at <u>TEG Workshop 7 Feb</u> and full report at <u>https://twiki.cern.ch/twiki/bin/view/LCG/WLC</u> <u>GTEGOperations#Documents</u>
- Here, we just reiterate timelines and areas of impact



#### **Global Recommendations**

#	Title	Area	Timeline
R1	WLCG Service Coordination	Operations	From 2012
R2	WLCG Service Commissioning	Operations	From 2012
R3	WLCG Availability Monitoring	Monitoring	2012
R4	WLCG Site Monitoring	Monitoring	2012
R5	WLCG Network Monitoring	Monitoring	LS1
R6	Software deployment	S/W	2012/LS1
R7	Information System (WM TEG)	Underlying Services	2012/LS1
R8	Middleware Services	M/W	2012/LS1
R9	Middleware Deployment	M/W	2012/LS1



# **Order by Time**

- Short term (in progress), specific time bounded and well defined targets
  - Availability, Site & Network monitoring
  - Software deployment
- Medium term, require a WG; need goals and metrics
  Information system, Middleware Services and Deployment
- Long term, require coordination and communication
   Service Coordination and Commissioning



# **Ordering by Principle**

- Reduce operations effort
  - Service Coordination and Commissioning, Site and Network Monitoring, Software deployment, Middleware Services
- Reduce complexity
  - Software deployment, Middleware Services and Deployment
- Minimize inter-dependencies (sites, experiments, services)
  - Software deployment, Information System
- Reduce effort to upgrade and reconfiguration
  - Middleware deployment
- Improve access to information
  - Information System, Availability, Site and Network monitoring
- Improve reaction to service/hardware failures
  - Site Monitoring
- Deploy scalable services (2-3 times above the average load)
  - Middleware Services



## **Conclusions and Outlook**

- Ops & Tools TEG has documented strategy and recommendations for the suggested topics and scope
- TEG report document presented to WLCG and we await the results of the global assessment and prioritization (chairs involved)
- Current TEG membership appropriate for guiding the implementation of the work plan as decided by the MB = Future Evolution





#### **Backup Slides**



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# **Guiding Principles**

- 1. Reduce operations effort
- 2. Reduce complexity
- 3. Minimize dependencies between sites and services (reduce reliance on actions of others)
- 4. Reduce effort to upgrade and reconfigure
- 5. Improve access to information
- 6. Improve reaction to service/hardware failures
- Deploy scalable services (able to handle up to 2-3 times the average load)



## **Recommendations: Monitoring**

- R3: WLCG Availability Monitoring: streamline availability calculation and visualization
  - Converge on one system for availability calculation and for visualization
  - Review/add critical tests for VO availability calculation to better match site usability
    - expose usability also in regular reports (monthly, MB).
- **R4: WLCG Site Monitoring**: deploy a common multi-VO tool to be used by sites to locally display the site performance
  - Site and experiments should agree on a few common metrics between experiments, relevant from a site perspective
- Extensively covered at 14<sup>th</sup> December GDB TEG Status Report
- R5: WLCG Network Monitoring: deploy a WLCG-wide and experiment independent monitoring system for network connectivity



# Software Deployment

#### • R6: Software deployment

- Adopt CVMFS for use as shared software area at all WLCG sites (Tier-1 and Tier-2)
- Deploy a robust and redundant infrastructure for CVMFS
  - Complete the deployment and test the implemented resilience



# **Information System**

• R7: Information System (consistent with the recommendations of the GDB from June 2011)

#### – Short term:

 improve the Information System via full deployment of the cached BDII and a strengthening of information validation (for instance via nagios probes)

#### – Long term:

- split the information into optimized tools focused to provide structural data (static), meta data, and state data (transient)
- During refactoring the information elements in the BDII should be reviewed and unnecessary elements dropped



#### **Recommendations: Operations**

- R1: WLCG Service Coordination: improve the computing service(s) provided by the sites
  - Clarify scope, frequency and outcome of current meetings;
  - Address specific Tier-2 communication needs
    - Dedicated service coordination meetings
    - Evolve to "Computing as a Service at Tier-2s"
      - less experiment-specific services and interactions
  - Organize with EGI, NDGF and OSG common site administrator training
- R2: WLCG Service Commissioning: establish a core team of experts (from sites and experiments) to validate, commission and troubleshoot services



#### **Middleware Services**

- R8: Review site (middleware) services
  - Refactor existing middleware configurations to establish consistent procedures and remove unnecessary complexity
  - Assess services on scalability, load balancing and high availability aspects
  - Assess clients on retry and fail-over behaviors
  - Team of experts to prioritize open bugs and RFEs
  - Improve documentation based on input from service administrators and users



# **Middleware Deployment**

#### • R9: Middleware Distribution, Configuration, and Deployment

- Middleware configuration should be improved and should not be bound to a particular configuration management tool
- Endorse middleware distribution via EPEL repository for additions to the RHEL/SL operating system family
  - Opportunity to optimize release process
- Encourage sites and experiments to actively participate in the commissioning and validation of middleware components and services
- Maintain compatible middleware clients in the Application Area repository. Establish a compatible UI/WN release in rpm and tar format
- Possibility to produce targeted updates which fix individual problems on request



#### WG1: Recommendations

Item	Description	Effort	Impact
R1.1	Create a WLCG monitoring	Very Moderate	Very
	coordination body		Significant
R1.2	Streamline experiment monitoring common frameworks	Moderate/Significant	Significant
R1.3	Network monitoring	Significant	Significant
R1.4	Streamline availability calculation	Moderate	Significant
	and visualization		
R1.5	Bridge sites and experiments	Significant	Very
	perspectives on		Significant
	availability and usability		
R1.6	Provide a site-oriented view of	Significant	Very
	experiment monitoring metrics		Significant
R1.7	Improve middleware toward	Significant	Very
	service monitoring		Significant



#### WG2 Recommendations

#### Support Tools

Name	Description	Effort	Impact
R2.1	Ensure continuous development and funding of GGUS, including WLCG requirements, in particular a failsafe solution for the full stack and interfaces with other ticketing systems/request trackers as appropriate	Moderate	Significant
R2.2	Provide a unique interface to infrastructure information (now published via GOCDB and OIM), including the ability to send broadcasts or downtime announcements for all WLCG sites and including the publication of VO-specific information about the existing services	Significant	Moderate



## WG2 Recommendations

#### **Underlying Services**

Name	Description	Effort	Impact
R2.3	Implement the WLCG Messaging Roadmap being drafted, which aims at improving security, scalability and reliability/availability	Moderate	Moderate (short term)/Significant (long term)
R2.4	In the short term, improve the stability of the Information System by deploying the cached BDII and the accuracy of the information via better validation tools	Moderate	Significant
R2.5	In the long term, evolve the Information System by re-evaluating the usefulness of existing information and by refactoring the system into separate services for structural data, metadata and state data	Significant	Very significant



#### WG2 Recommendations

#### WLCG Operations

Name	Description	Effort	Impact
R2.6	Establish a WLCG central operations team	Significant	Very
	which takes care of driving all actions		significant
	required and approved at a central level after		
	discussions with site and experiment		
	representatives		
R2.7	Ensure that there is a meeting where issues	Low	Significant
	related to WLCG operations can be discussed		
	among experiments, sites and WLCG and		
	capable of approving actions to be executed		
	and followed up		
R2.8	Strengthen the contacts with Tier-2 sites by	Moderate	Significant
	identifying new representative roles to allow		_
	Tier-2's to influence the decision process and		
	to ensure a correct information flow to/from		
	the experiments		



# WG3 Recommendations

Name	Description	Effort	Impact
R3.1	Application software	Moderate (sites);	Moderate (sites),
	configuration Cmake	Disruptive	Significant
		(experiments).	(experiments)
R3.2	Software deployment via	Moderate	Significant
	CVMFS		



## WG4 Recommendations

Recommendation	Description	Effort	Impact
R4.1	Examine	Significant	Potentially
	experiment models		very
	and actual practice		significant
R4.2	Assess services and	Moderate per	Significant
	clients on	service/client	
	robustness		
R4.3	Make use of pilot	Moderate	Very
	instances	(prevents larger	significant
		efforts later)	
R4.4	Reassess open bugs	Moderate after	Very
	and RFEs regularly	significant initial	significant
		investment	
R4.5	Invite precise	Moderate per	Significant
	documentation	product	
	input and feedback		
	for actual use cases		
R4.6	Make use of	Low	Significant
	operations		
	resources of		
	infrastructure		
	projects		



# WG5 Recommendations

#### Middleware Configuration

Name	Description	Effort	Impact
R5.1	Invest in making native middleware configuration as easy as possible, in the manner described above. This activity must be followed up directly otherwise nothing will change	Moderate	Moderate
R5.2	Do not mandate any configuration utility or engine for the community	n/a	n/a
R5.3	Establish soon whether yaim community support or funded effort is possible, in order to allow for transition if not.	Low	Moderate



# WG5 Recommendations

#### Middleware Deployment

Name	Description	Effort	Impact
R5.4	Ensure a recognition model which properly compensates sites who participate in staged rollout	Moderate	Significant
R5.5	Expand opportunities for pre-release pilots. This involves associating the relevant middleware providers, experiments and resource providers. Some incentive for the resource provider is required.	Low	Moderate



# WG5 Recommendations

#### **Middleware Distribution**

Name	Description	Effort	Impact
R5.6	Endorse EPEL as the definitive source for middleware. This policy will have to be communicated to related projects (EMI, EGI, IGE) and the WLCG baseline adapted to reference these packages.	Very significant	Significant
R5.7	Maintain the Application Area releases	Low	Significant
R5.8	Establish ownership of integrated client releases (UI/WN metapackages and tarballs).	Low	Moderate



# **Availability Monitoring Proposal**

- Experiments extend their SAM tests to test more site-specific functionality
  - Any new test contributing to the availability is properly agreed upon with sites and documented
- The SAM framework is extended to properly support external metrics such as from Panda, DIRAC, ...
- The resulting availability will have these properties:
  - Takes into account more relevant site functionality
  - Is as independent as possible from experiment-side issues
  - Is well understood by the sites
- Additional experiment-side metrics are nevertheless used by VO computing operations and published e.g. via SSB



## **Schematic view: Proposal**





#### **Site Monitoring Proposal**

- We miss the equivalent of the today's SSB experiment views tailored for sites
- Proposal to use the SSB framework to provide this functionality as well
  - Advantages: many metrics already in the SSB for ATLAS and CMS
    - No duplication of effort nor issues of consistency
  - Need to agree on a few common metrics between experiments
    - Relevant from a site perspective
  - Some development needed in SSB to facilitate the visualization
  - Some commitment needed from experiment and sites
    - Experiment (support): define and inject metrics, validation
    - Sites: validation, feedback

