EGI-InSPIRE

UMD Quality Criteria
Data Capabilities
v4

Document identifier:	EGI-DATA-QC-v4.doc
Date:	**15/10/2012**
Document Link:	https://documents.egi.eu/document/1153

Abstract

This document describes the Quality Criteria that all software of the UMD distribution must meet.



Document Log

Issue	Date	Comment	Author/Partner
v0.1	02/11/2010	First draft	Enol Fernández
v1.0	03/11/2010	Changed Management, Traceability and Monitoring section	Enol Fernández
v1.1	03/11/2010	Added Probe description in GEN_MON_1	Enol Fernández
v1.2	11/11/2010	Some formatting update	Enol Fernández
v1.3	31/01/2011	Better test specification	Enol Fernández
1.4	09/02/2011	Review of criteria	Enol Fernández
2 DRAFT 1	24/06/2011	Preparation of new release	Enol Fernández
2	02/08/2011	Reorganisation, added new criteria.	Enol Fernández
3 DRAFT 1	13/10/2011	First draft of release 3	Enol Fernández
3 DRAFT 2	24/01/2012	Second draft of release 3	Enol Fernández
4 DRAFT 1	21/05/2012	First public draft of release 4	Enol Fernández
4 DRAFT 2	23/07/2012	Second public draft of release 4	Enol Fernández

TABLE OF CONTENTS

1 DATA ACCESS

Criteria for the Data Access Capability are based on OGSA-DAI and WS-DAI interface as reference.

1.1 WS-DAI Interface

WS-DAIR API	
ID	**DATAACCESS_API_1**
Description	Data Access Appliances must implement (at least one of) the WS-DAI realizations and support all the functionality included in the interface.
Mandatory	YES
Applicability	Data Access Appliances

Input from Technology Provider	WS-DAI API support using the relational [R 3] or XML [R 4] realization. Ideally include a test-suite that covers all the documented functions in the WSDL.	
Test Description	**Pre-condition**	Valid user credentials.
	Test	Test all functionality of WS-DAI using the relational or XML realization, with correct/incorrect input and with valid and invalid credentials.
	Expected Outcome	Log of all the operations performed. All the functions work as documented.
Pass/Fail Criteria	WS-DAI API is provided for the supported realizations. Check both correct and invalid input. Invalid output should throw an exception as documented. Test also with valid and invalid credentials. Invalid credentials should throw security related exceptions.	
Related Information	UMD Roadmap [R 1] WS-DAIR [R 3] WS-DAIX[R 4] #665: Data availability	
Revision Log	V2: Merged DATAACCESS_API_* V3: changed wording	

1.2 OGSA-DAI Criteria

Deployment of data resources		
ID	**DATAACCESS_OGSADAI_1**	
Description	The OGSA-DAI implementation should allow the deployment of data resources with SQL, XML or files sources.	
Mandatory	YES	
Applicability	OGSA-DAI Data Access Appliance.	

Input from Technology Provider	Support for deployment of SQL, XML and file data resources.	
Test Description	**Pre-condition**	Existing SQL data resource.
	Test	Deploy SQL data resource. Test queries against deployed resource.
	Expected Outcome	SQL data resources is available, queries are executed correctly.
	Pre-condition	Existing XMLDB data resource.
	Test	Deploy XMLDB data resource. Test queries against deployed resource.
	Expected Outcome	XMLDB data resource is available, queries are executed correctly.
	Pre-condition	Existing file data resource.
	Test	Deploy file data resource. Test queries against deployed resource.
	Expected Outcome	File data resource is available, queries are executed correctly.
	Pre-condition	Existing remote resource.
	Test	Deploy remote resource. Test queries against deployed resource.
	Expected Outcome	Remote resource is available, queries are executed correctly.
	Pre-condition	Deployed data resource.
	Test	Undeploy resource. Test queries against resource.
	Expected Outcome	Remote resource is no longer available; queries are not executed correctly.
Pass/Fail Criteria	Data resources can be deployed/undeployed and queries against the resources are executed correctly.	
Related Information	OGSA-DAI [R 5]	
Revision Log	V3: changed wording	

Management of data resources access	
ID	**DATAACCESS_OGSADAI_2**
Description	The OGSA-DAI implementation must allow the definition of which users are allowed to access the deployed resources
Mandatory	YES
Applicability	OGSA-DAI Data Access Appliance.

Input from Technology Provider	Support for user management of data resources.	
Test Description	**Pre-condition**	Existing data resource. Valid user credentials
	Test	Allow access to user. Test the access.
	Expected Outcome	User is allowed to access the data resource.
	Pre-condition	Existing data resource. Valid user credentials
	Test	Deny access to user. Test the access.
	Expected Outcome	User is not allowed to access the data resource.
Pass/Fail Criteria	Appliance must allow the admission/denial of users to data resources.	
Related Information	OGSA-DAI [R 5]	
Revision Log	V3: changed wording	

Deployment of activities at resource	
ID	**DATAACCESS_OGSADAI_3**
Description	The OGSA-DAI implementation should allow the deployment of activities in server.
Mandatory	YES
Applicability	OGSA-DAI Data Access Appliance.

Input from Technology Provider	Support for deployment of activities.	
Test Description	**Pre-condition**	OGSA-DAI server available; Activity classes available at server.
	Test	Deploy activity at server. Add activity to resource. Test execution of activity.
	Expected Outcome	Activity is available and executed correctly.
Pass/Fail Criteria	Appliance must allow the deployment of activities and their execution.	
Related Information	OGSA-DAI [R 5]	
Revision Log	V3: changed wording	

Workflow creation and execution		
ID	**DATAACCESS_OGSADAI_4**	
Description	The OGSA-DAI implementation should allow the creation of workflows with activities	
Mandatory	YES	
Applicability	OGSA-DAI Data Access Appliance.	

Input from Technology Provider	Support for the creation and execution of workflows.	
Test Description	**Pre-condition**	Existing OGSA-DAI server.
	Test	Create simple workflow, synchronous execution in server.
	Expected Outcome	Workflow is executed. Status and data results of workflow can be retrieved.
	Pre-condition	Existing OGSA-DAI server.
	Test	Create simple workflow, asynchronous execution in server.
	Expected Outcome	Workflow is executed. Status and data results of workflow can be retrieved.
Pass/Fail Criteria	Appliance must allow the creation of workflows and their execution in both synchronous and asynchronous mode.	
Related Information	OGSA-DAI [R 5]	
Revision Log	V3: changed wording	

2 METADATA CATALOGUE

Criteria for the Metadata Catalogue Capability are based on gLite LFC [R 6] and gLite AMGA [R 7]

2.1 LFC Implementation

2.1.1 LFC API

LFC API	
ID	**METADATA_LFC_API_1**
Description	LFC Metadata Catalogue Appliances must implement the LFC API.
Mandatory	YES
Applicability	LFC Metadata Catalogue Appliances

Input from Technology Provider	Support for the LFC API. Any deviation from the API should be documented. Ideally, provide a complete test suite that includes tests for all the documented functions.	
Test Description	**Pre-condition**	Valid user credentials.
	Test	Test all functionality of LFC API, with correct/incorrect input and with valid and invalid credentials.
	Expected Outcome	Log of all the operations performed. All the documented functions work as documented.
Pass/Fail Criteria	Pass if the LFC API support is tested for all the available language bindings.	
Related Information	gLite LFC [R 6]	
Revision Log		

2.1.2 LFC Functionality

Directory Management	
ID	**METADATA_LFC_FUNC_1**
Description	LFC Metadata Catalogue Appliances must allow users to organize the files in directories.
Mandatory	YES
Applicability	LFC Metadata Catalogue Appliances

Input from Technology Provider	Support for directory management operations.	
Test Description	**Pre-condition**	Valid user credentials. Available Catalogue server.
	Test	Create new directory.
	Expected Outcome	New directory is created at server.
	Pre-condition	Valid user credentials. Available Catalogue server. Existing directory
	Test	List contents of directory.
	Expected Outcome	Contents of directory are returned.
	Pre-condition	Valid user credentials. Available Catalogue server. Existing empty directory
	Test	Remove directory.
	Expected Outcome	Directory is removed.
	Pre-condition	Valid user credentials. Available Catalogue server. Existing non-empty directory
	Test	Remove directory.
	Expected Outcome	Directory is not removed. Message is shown.
Pass/Fail Criteria	Pass if the Appliance provides support for managing directories.	
Related Information	gLite LFC [R 6]	
Revision Log		

ACL Operations		
ID	**METADATA_LFC_FUNC_2**	
Description	LFC Metadata Catalogue Appliances must allow users to set permissions on the entries.	
Mandatory	YES	
Applicability	LFC Metadata Catalogue Appliances	

Input from Technology Provider	Support for ACL management of LFC.	
Test Description	**Pre-condition**	Valid user credentials. Available LFC server. Existing entry
	Test	Show entry owner and permission
	Expected Outcome	Entry owner and permission are returned.
	Pre-condition	Valid user credentials with administrator privileges. Available LFC server. Existing entry.
	Test	Change owner of entry. Show entry owner.
	Expected Outcome	Owner of entry is changed and returned.
	Pre-condition	Valid user credentials with administrator privileges. Available LFC server. Existing entry.
	Test	Change group of entry. Show entry group.
	Expected Outcome	Group of entry is changed and returned.
	Pre-condition	Valid user credentials. Available LFC server. Existing entry.
	Test	Check the entry ACL is enforced.
	Expected Outcome	The permissions of entry are correctly enforced.
Pass/Fail Criteria	Pass if the Appliance provides support for managing ACL on catalogue entries.	
Related Information	gLite LFC [R 6]	
Revision Log		

Entry Comments	
ID	**METADATA_LFC_FUNC_3**
Description	LFC Metadata Catalogue Appliances must allow users to set comments on the catalogue entries.
Mandatory	YES
Applicability	LFC Metadata Catalogue Appliances

Input from Technology Provider	Support for the comment management of LFC	
Test Description	**Pre-condition**	Valid user credentials. Available LFC server. Existing entry
	Test	Set comment of an entry. Show comment to entry.
	Expected Outcome	The comment is correctly set and shown.
	Pre-condition	Valid user credentials. Available LFC server. Existing entry with comment.
	Test	Delete comment of an entry. Show comment to entry.
	Expected Outcome	The comment is correctly removed and nothing is shown.
Pass/Fail Criteria	Pass if the Appliance provides support for managing comments on catalogue entries.	
Related Information	gLite LFC [R 6]	
Revision Log		

User/Group Map Management		
ID	**METADATA_LFC_FUNC_4**	
Description	LFC Metadata Catalogue Appliances must allow the definition and management of user and group maps.	
Mandatory	YES	
Applicability	LFC Metadata Catalogue Appliances	

Input from Technology Provider	Support for the user/group management of LFC.	
Test Description	**Pre-condition**	Valid admin user credentials. Available LFC server.
	Test	List all user/group mappings
	Expected Outcome	List of all user/group mappings is shown.
	Pre-condition	Valid admin user credentials. Available LFC server.
	Test	List user mappings for specific user DN.
	Expected Outcome	List of user mappings is shown.
	Pre-condition	Valid admin user credentials. Available LFC server.
	Test	List group mappings for specific group name.
	Expected Outcome	List of group mapping is shown.
	Pre-condition	Valid admin user credentials. Available LFC server. Non existing user/group mapping.
	Test	Set new user/group mapping. List the user/group mapping.
	Expected Outcome	New mapping is set and shown accordingly.
	Pre-condition	Valid admin user credentials. Available LFC server. Existing user/group mapping.
	Test	Set new user/group mapping for a user/group. List the user/group mapping.
	Expected Outcome	New mapping is set and shown accordingly.
	Pre-condition	Valid admin user credentials. Available LFC server. Existing user/group mapping.
	Test	Remove user/group mapping for a user/group. List the user/group mapping.
	Expected Outcome	Mapping is removed and not shown.
Pass/Fail	Pass if the Appliance provides support for managing the mapping of users and	

Criteria	groups.
Related Information	gLite LFC [R 6]
Revision Log	

Entry Management		
ID	**METADATA_LFC_FUNC_5**	
Description	LFC Metadata Catalogue Appliances must allow users to create entries and to manage those entries.	
Mandatory	YES	
Applicability	LFC Metadata Catalogue Appliances	

Input from Technology Provider	Support for the entry management operations.	
Test Description	**Pre-condition**	Valid user credentials. Available Catalogue server. Available SE with file to register.
	Test	Create new entry (register file in server).
	Expected Outcome	New entry is created at server. GUID is returned
	Pre-condition	Valid user credentials. Available Catalogue server with existing entry. Available SE to register replica
	Test	Register new replica of the file in a new SE
	Expected Outcome	Entry is updated with the new replica
	Pre-condition	Valid user credentials. Available Catalogue server. Existing entry
	Test	List replicas of entry.
	Expected Outcome	Replica list is returned.
	Pre-condition	Valid user credentials. Available Catalogue server. Existing entry.
	Test	Remove one of the entry replicas
	Expected Outcome	Replica is removed. If it was the last one, remove also the entry.
	Pre-condition	Valid user credentials. Available Catalogue server. Existing entry.
	Test	Remove entry.
	Expected Outcome	Entry is removed (with all replicas)
Pass/Fail Criteria	Pass if the Appliance provides support for managing entries.	
Related Information	gLite LFC [R 6]	
Revision Log		

2.2 AMGA Implementation

2.2.1 AMGA Interface

AMGA Soap Interface	
ID	**METADATA_AMGA_API_1**
Description	AMGA Metadata Catalogue Appliances must implement the complete AMGA WSDL API [**¡Error! No se encuentra el origen de la referencia.**]
Mandatory	YES
Applicability	AMGA Metadata Catalogue Appliances

Input from Technology Provider	Support for the AMGA SOAP API. Any deviation from the API should be documented. Ideally, provide a complete test suite that includes tests for all the functionality.	
Test Description	**Pre-condition**	Valid user credentials.
	Test	Test all functionality of AMGA WSDL, with correct/incorrect input and with valid and invalid credentials.
	Expected Outcome	Log of all the operations performed. All the documented functions work as documented.
Pass/Fail Criteria	Pass if the AMGA WSDL API is tested and works as documented.	
Related Information	gLite AMGA [R 7]	
Revision Log		

AMGA Streaming Interface	
ID	**METADATA_AMGA_API_2**
Description	AMGA Metadata Catalogue Appliances must implement the complete AMGA streaming API [**¡Error! No se encuentra el origen de la referencia.**]
Mandatory	YES
Applicability	AMGA Metadata Catalogue Appliances

Input from Technology Provider	Support for the AMGA Streaming API. Any deviation from the API should be documented. Ideally, provide a complete test suite that includes tests for all the functionality.	
Test Description	**Pre-condition**	Valid user credentials.
	Test	Test all functionality of AMGA Stream protocol, with correct/incorrect input and with valid and invalid credentials.
	Expected Outcome	Log of all the operations performed. All the documented functions work as documented.
Pass/Fail Criteria	Pass if the API is tested and working as documented for all the available language bindings.	
Related Information	gLite AMGA [R 7]	
Revision Log		

2.2.2 AMGA Functionality

AMGA Streaming Interface	
ID	**METADATA_AMGA_FUNC_1**
Description	AMGA Metadata Catalogue Appliances must allow users to organize the files in directories.
Mandatory	YES
Applicability	AMGA Metadata Catalogue Appliances

Input from Technology Provider	Support for the directory management operations of AMGA.	
Test Description	**Pre-condition**	Valid user credentials. Available AMGA server.
	Test	Create new directory.
	Expected Outcome	New directory is created at AMGA server.
	Pre-condition	Valid user credentials. Available AMGA server. Existing directory
	Test	List contents of directory.
	Expected Outcome	Contents of directory are returned.
	Pre-condition	Valid user credentials. Available AMGA server. Existing empty directory
	Test	Remove directory.
	Expected Outcome	Directory is removed.
	Pre-condition	Valid user credentials. Available AMGA server. Existing non-empty directory
	Test	Remove directory.
	Expected Outcome	Directory is not removed. Message is shown.
	Pre-condition	Valid user credentials. Available AMGA server. Existing directory (different to current)
	Test	Change current directory to existing directory. Check current directory.
	Expected Outcome	Current directory has changed
Pass/Fail Criteria	Pass if users can manage directories in the server.	
Related Information	gLite AMGA [R 7]	

Revision Log	

Entry Management	
ID	**METADATA_AMGA_FUNC_2**
Description	AMGA Metadata Catalogue Appliances must allow users to manage the entries in the server.
Mandatory	YES
Applicability	AMGA Metadata Catalogue Appliances

Input from Technology Provider	Support for the entry management operations of AMGA.	
Test Description	**Pre-condition**	Valid user credentials. Available AMGA server.
	Test	Create a new entry. List entry's attributes
	Expected Outcome	Entry is created. The attributes are listed correctly.
	Pre-condition	Valid user credentials. Available AMGA server.
	Test	Create a new set of entries. List entries' attributes
	Expected Outcome	Entries are created. The attributes are listed correctly.
	Pre-condition	Valid user credentials. Available AMGA server. Existing entry.
	Test	Remove existing entry. List entry's attributes
	Expected Outcome	Entry is removed. The list command exits with an error.
Pass/Fail Criteria	Pass if users can manage entries in the server.	
Related Information	gLite AMGA [R 7]	
Revision Log		

Attribute Management	
ID	**METADATA_AMGA_FUNC_3**
Description	AMGA Metadata Catalogue Appliances must allow users to manage the attributes in the server.
Mandatory	YES
Applicability	AMGA Metadata Catalogue Appliances

Input from Technology Provider	Support for the attribute management operations of AMGA.	
Test Description	**Pre-condition**	Valid user credentials. Available AMGA server.
	Test	Add new attribute to directory. List directory attributes
	Expected Outcome	Attribute is added. List returns all attributes of directory.
	Pre-condition	Valid user credentials. Available AMGA server. Existing attributes for dir/entry
	Test	Remove attribute to from dir/entry. List dir/entry attributes
	Expected Outcome	Attribute is removed. List does not return removed attribute.
	Pre-condition	Valid user credentials. Available AMGA server. Existing attribute list for file
	Test	Clear attribute list for a file. Get file's attributes.
	Expected Outcome	All file's attributes are set to NULL. Attributes values are shown.
	Pre-condition	Valid user credentials. Available AMGA server. Entry with attribute list.
	Test	Clear attribute list for a file. List file's attributes
	Expected Outcome	Attribute list file. They are listed correctly.
Pass/Fail Criteria	Pass if users can manage the attributes for the entries in the server.	
Related Information	gLite AMGA [R 7]	
Revision Log		

Metadata Queries	
ID	**METADATA_AMGA_FUNC_4**
Description	AMGA Metadata Catalogue Appliances must allow users to find and update entries based on their metadata.
Mandatory	YES
Applicability	AMGA Metadata Catalogue Appliances

Input from Technology Provider	Support for the metadata queries in AMGA.	
Test Description	**Pre-condition**	Valid user credentials. Available AMGA server.
	Test	Test the complete functionality (find, update, select) of the metadata queries in AMGA. Test available functions
	Expected Outcome	Queries work as expected.
Pass/Fail Criteria	Pass if the metadata queries are supported as documented.	
Related Information	gLite AMGA [R 7] AMGA Metadata Queries [R 10]	
Revision Log		

Attribute Management	
ID	**METADATA_AMGA_FUNC_5**
Description	AMGA Metadata Catalogue Appliances must allow users to set permissions on the entries.
Mandatory	YES
Applicability	AMGA Metadata Catalogue Appliances

Input from Technology Provider	Support for ACL related operations of AMGA.	
Test Description	**Pre-condition**	Valid user credentials. Available AMGA server.
	Test	Get current user.
	Expected Outcome	Current user is returned.
	Pre-condition	Valid user credentials. Available AMGA server. Existing entry/dir
	Test	Show entry/dir owner and permission
	Expected Outcome	Entry/dir owner and permission are returned.
	Pre-condition	Valid user credentials. Available AMGA server. Existing entry/dir
	Test	Change owner of entry/dir. Show entry/dir owner.
	Expected Outcome	Owner of entry/dir is changed and returned.
	Pre-condition	Valid user credentials. Available AMGA server. Existing entry/dir
	Test	Change entry/dir permissions. Check the permission is enforced.
	Expected Outcome	The permissions of entry/dir are changed and correctly enforced.
Pass/Fail Criteria	Pass if users can manage the ACLs of the entries in the server.	
Related Information	gLite AMGA [R 7]	
Revision Log		

3 REFERENCES

R 1	UMD roadmap: https://documents.egi.eu/public/ShowDocument?docid=100
R 2	QC Test Notes: https://wiki.egi.eu/w/index.php?title=EGI_Quality_Criteria_Testing
R 3	Web Services Data Access and Integration – The Relational Realisation (WS-DAIR) Specification, Version 1.0
R 4	Web Services Data Access and Integration – The XML Realization (WS-DAIX) Specification, Version 1.0
R 5	OGSA-DAI: http://www.ogsadai.org.uk/
R 6	gLite LFC: https://twiki.cern.ch/twiki/bin/view/EGEE/GliteLFC
R 7	AMGA: http://amga.web.cern.ch/amga/
R 8	AMGA WSDL: http://amga.web.cern.ch/amga/soap_wsdair.html
R 9	AMGA streaming API: http://amga.web.cern.ch/amga/protocol.html
R 10	AMGA Metadata Queries: http://amga.web.cern.ch/amga/queries.html
R 11	A. Konstantinov, ARC Computational Job Management Component – A-REX, NORDUGRID-TECH-14
R 12	CREAM: http://grid.pd.infn.it/cream/
R 13	EMI-ES: https://twiki.cern.ch/twiki/bin/view/EMI/EmiExecutionService
R 14	GRAM5: http://www.globus.org/toolkit/docs/latest-stable/execution/gram5/
R 15	OGF DRMAA: http://www.drmaa.org/
R 16	OGSA Basic Execution Service v1.0: http://www.ogf.org/documents/GFD.108.pdf
R 17	UNICORE UAS: http://www.unicore.eu/unicore/architecture/service-layer.php#anchor_uas
R 18	gLite WMS: http://web.infn.it/gLiteWMS/
R 19	SAGA-CORE-WG: A Simple API for Grid Applications (SAGA) v1.0 (GFD.90)
R 20	SAGA (A Simple API for Grid Applications): http://saga.cct.lsu.edu/
R 21	Instrument Element: http://www.dorii.eu/resources:adaptation:middleware:IE
R 22	DORII (Deployment of Remote Instrumentation Infrastructure) Project: http://www.dorii.eu/

R 23	GlueSchema Specification v1.3: http://glueschema.forge.cnaf.infn.it/Spec/V13
R 24	GlueSchema Specification v2.0: http://www.ogf.org/documents/GFD.147.pdf
R 25	Glue Validator: https://tomtools.cern.ch/confluence/display/IS/GLUEValidator
R 26	JMS (Java Message Service Specification) 1.1: http://www.oracle.com/technetwork/java/jms/index.html
R 27	AMQP (Advanced Message Queuing Protocol): http://www.amqp.org/confluence/display/AMQP/Advanced+Message+Queuing+Protocol
R 28	Nagios Config Generator: https://tomtools.cern.ch/confluence/display/SAM/NCG
R 29	My EGI portal: https://tomtools.cern.ch/confluence/display/SAM/MyEGI
R 30	SAM Probes Documentation: https://tomtools.cern.ch/confluence/display/SAM/Probes
R 31	Accounting Portal: http://accounting.egi.eu/
R 32	GridSite Delegation Protocol: http://www.gridsite.org/wiki/Delegation_protocol
R 33	Globus Delegation Service: http://www.globus.org/toolkit/docs/4.0/security/delegation/
R 34	European Policy Management Authority for Grid Authentication (EuGridPMA): http://www.eugridpma.org/
R 35	ARGUS Authorization Service: https://twiki.cern.ch/twiki/bin/view/EGEE/AuthorizationFramework
R 36	XACML: http://docs.oasis-open.org/xacml/2.0/access_control-xacml-2.0-core-spec-os.pdf
R 37	Hydra encrypted file storage: https://twiki.cern.ch/twiki/bin/view/EGEE/DMEDS
R 38	gLite FTS: https://twiki.cern.ch/twiki/bin/view/EGEE/GLiteFTS
R 39	SRM v2.2: http://www.ggf.org/documents/GFD.129.pdf
R 40	S2 Test: http://s-2.sourceforge.net/
R 41	SRM-Tester: https://sdm.lbl.gov/twiki/bin/view/Software/SRMTester/WebHome
R 42	Lcg-utils: http://grid-deployment.web.cern.ch/grid-deployment/documentation/LFC_DPM/lcg_util/
R 43	Lcg-utils test suite: http://glite.cvs.cern.ch/cgi-bin/glite.cgi/org.glite.testsuites.ctb/UI/tests/test-lcg-utils.sh?view=markup
R 44	Open Cloud Computing Interface WG, OGF, http://www.ggf.org/gf/group_info/view.php?group=occi-wg

R 45	Virtualization Management (VMAN), DMTF http://www.dmtf.org/standards/vman
R 46	StratusLab http://stratuslab.eu/
R 47	StratusLab MarketPlace Technical Note TN-Marketplace (V3.0)