



EUROPEAN MIDDLEWARE INITIATIVE

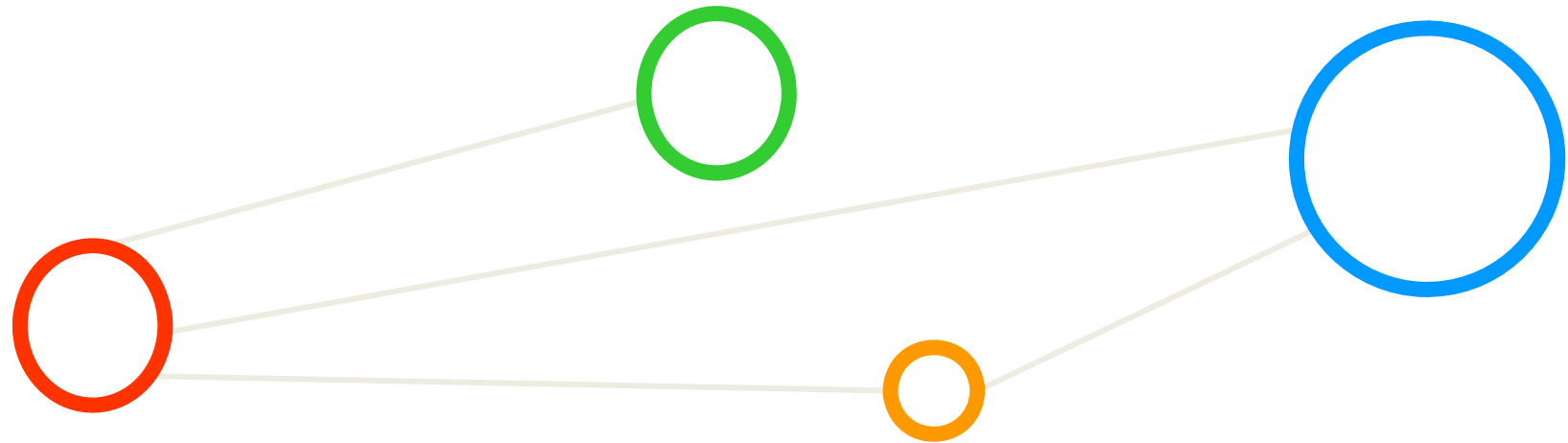
JRA1 Year One WP5 Report

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(JUELICH)

JRA1 Leadership

EMI All-Hands Meeting
Lund, 30 May – 1 June 2011

Content

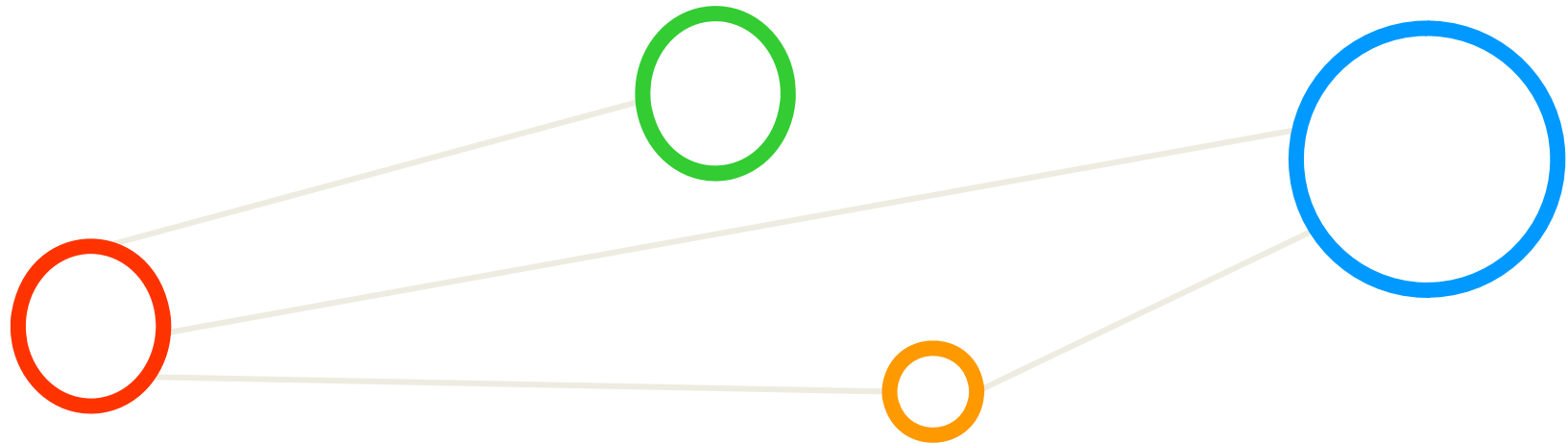


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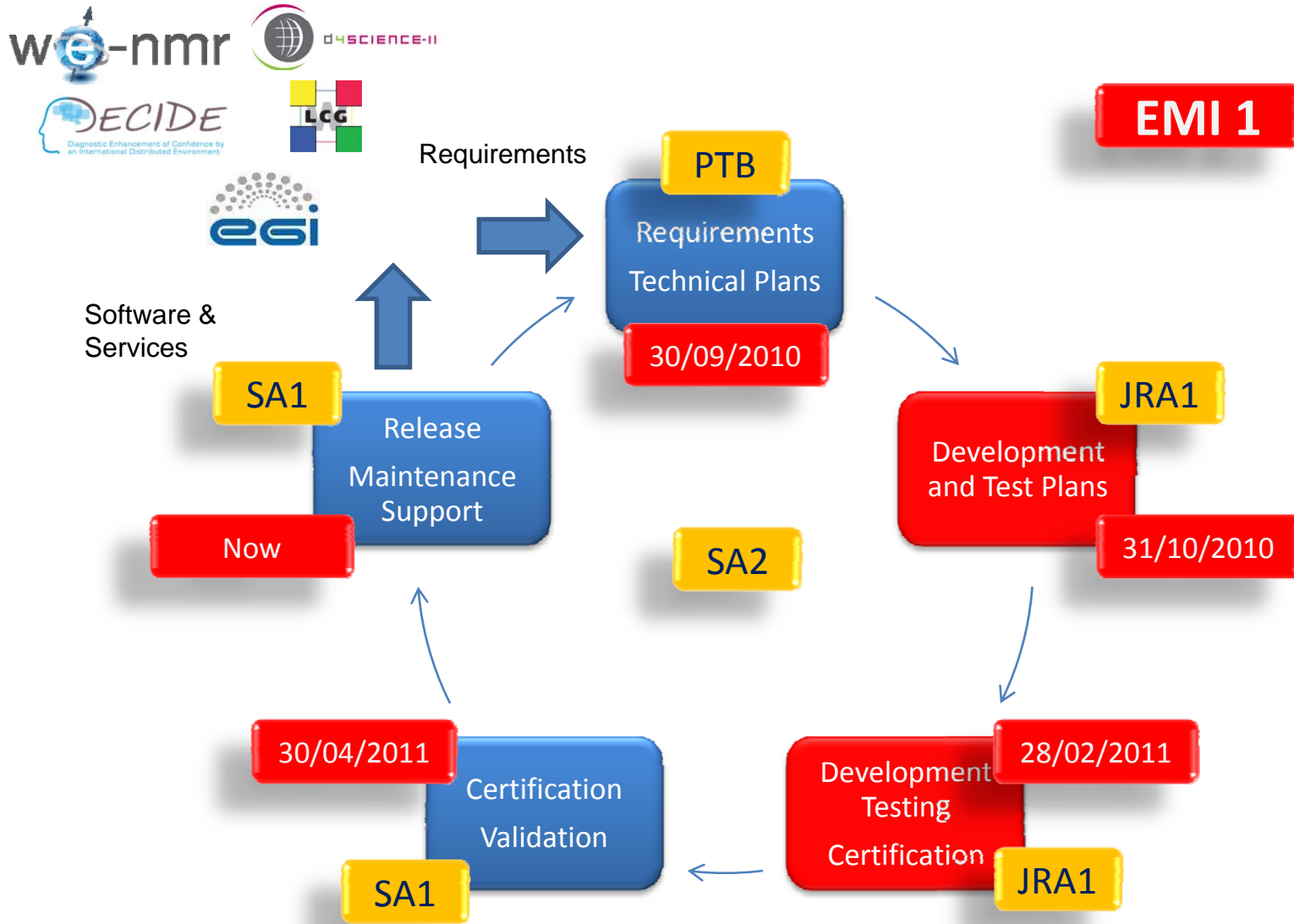


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- Impacts on EMI 1 release
 - New Functionality (Developments)
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 - Standardization
 - Quality Enforcements
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 - EMI Registry & Messaging
 - EMI Cloud approaches
- Lessons Learned and Inter-WP Work

JRA1 Y1 Highlights



JRA1 Contributions to EMI 1 Release



JRA1 Y1 Highlights



- All Y1 technical objectives from PTB achieved
 - 12/16 100% achieved, only 4 achieved with 50%-75%
 - Detailed Status in new area work plans as well as DNA1.3.2
 - Product developments are part of the EMI 1 release
 - Within four different technologies in one integrated release
- Important agreements established
 - Replacement of legacy GSI
 - EMI - Execution Services specification
 - Storage Accounting Record Specification
 - Common security attributes & several messaging use cases
- Key Performance Indicator
 - Increased standardization adoption

Technical Objectives DNA1.3.1 (1)

ID	Description	Components / Results	Deadline	Achieved
C1	Glue 2.0 support in job management services and client tools.	A-REX, CREAM, UNICORE Services Environments, UCC, WMS, arc*, arclib_client	M12	3/6 - 50% achieved (not WMS and no arc* client yet), all clients in Y2
D1	All storage elements publishing initial GLUE 2.0 storage information	dCache, DPM, StoRM	M12	3/3 100 % achieved
D2	Using https instead of httpg for the SRM protocol as a prototype implementation in one storage element and client (library)	dCache server and client	M12	2/2 100 % achieved
D3	All storage elements offering support for the http(s) protocol	dCache, DPM, StoRM	M12	3/3 100 % achieved
D4	All storage elements offering at least a prototype-level support for the "file://" access protocol	dCache, DPM, StoRM	M12	3/3 100 % achieved
D5	File Catalogue Access from UNICORE	UNICORE Services Environment	M12	0.75/1 Prototype existing 75% achieved
S1	Agreement on a minimal common set of security attributes to be used in policies	XACML Policy Agreement	M12	1/1 100% achieved
I1	Provide early internal guidelines for integrating messaging into potential EMI target components	Guidelines exists	M10	1/1 100% achieved
I2	Design a common EMI service registry that is required in order to discover all the service endpoints of the different middleware components	EMI Service Registry Design exists	M10	1/1 100% achieved
I3	Investigate possible use cases for a common standard messaging system in the accounting area	Initial Use Case Survey exists	M12	0.75/1 75% achieved
I4	Investigate possible use cases for a common standard messaging system for the service monitoring and management	Only initial studies	M12	0.5/1 50% achieved
I5	Investigate possible use cases for a common standard messaging system for the information services and L&B	Use Case Survey exists	M12	1/1 100% achieved

Technical Objectives DNA1.3.1 (2)

ID	Description	Components / Results	Deadline	Achieved
X1	Define the Information Flow architecture describing messaging and non-messaging based information exchange of the EMI components (e.g. service registry, information system, accounting, monitoring, and instrumentation). A common information exchange between the EMI components is preferable.	Information Flow Architecture exists	M9	1/1 100 % achieved
X2	Investigate possible use cases for a common standard messaging system in the computing area	Use case survey performed	M12	1/1 100 % achieved
X3	Investigate possible use cases for a common standard messaging system in the data area	Plan for catalog and SE synchronization	M12	1/1 100 % achieved
X4	Evaluate integration scenarios with off-the-shelf computing cloud systems to be able to execute grid jobs on those (scaling out to clouds)	Cloud Position paper and report exists	M12	1/1 100 % achieved

Technical Objectives	Overall #	# 100 % achieved	# 75% achieved	# 50 achieved	# 0% achieved
Year 1	16	12	2	2	none

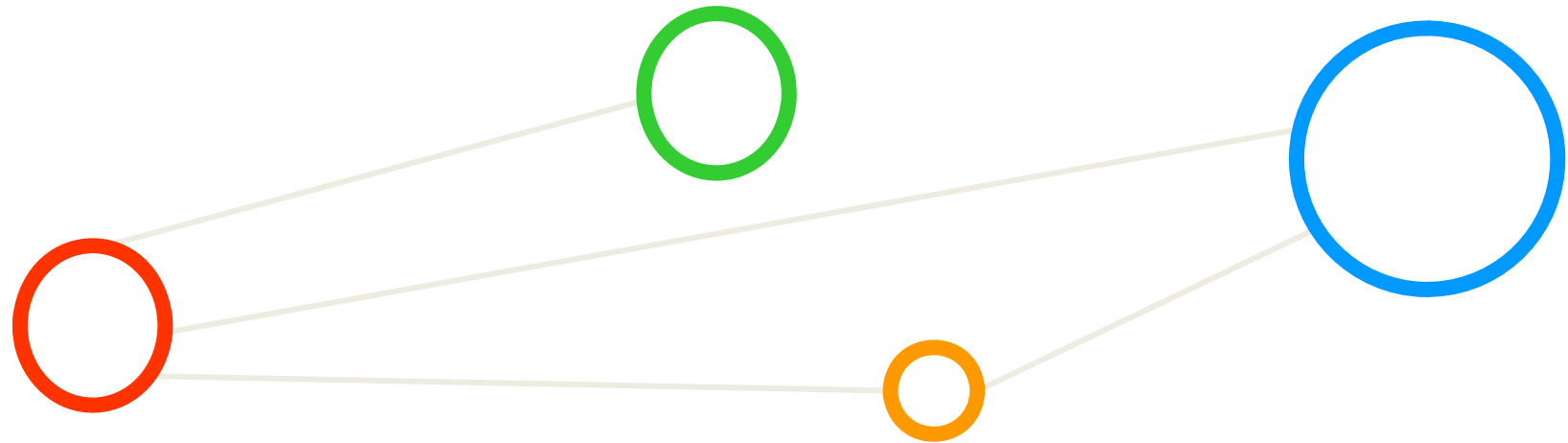
- ... and a lot of work of year two work has been also done already (e.g. time-consuming agreements, detailed specifications, common APIs, etc.)

JRA1 Y1 KPIs at a glance

	BDII	ARC Info System	ARGUS	DPM	FTS	A-REX	dCache	CREAM	WMS	VOMS	UNICORE	SToRM
SRM				X			X					X
GridFTP					X		X					
OGSA-BES						X					X	
JSDL						X		X			X	
WS-RF						X					X	
GLUE2	N	N		N	N	N	N	N	N		N	N
XACML			N					N			X	
SAML			N							N	X	
POSIX IO							N					N
NFS4.1/ pNFS				N			N					N
WebDAV							N					

Table 1: Standard adoptions (X) and achieved new standard adoptions (marked as 'N') of EMI 1.

JRA1 Y1 New Functionality



New Functionality: GLUE2



Enable effective and efficient operations of the DCIs like EGI and PRACE by improving the existing middleware services with new required functionality focusing on usability, manageability and service operations... [DOW]

- Consistent information ecosystem in EMI 1
 - Avoids adapter-based transformations & semantic loss across EMI components; easier operations in EGI
 - Decision to use standard-based information model GLUE2
 - LDAP and XML renderings
 - GLUE2 support in job management services
 - CREAM CE, ARC CE, and UNICORE
 - SEs publishing initial GLUE2 storage information
 - dCache, DPM, and StoRM
 - (Production support for GLUE1.3 kept where available)

New Functionality: File:// Access



Enable effective and efficient operations of the DCIs like EGI and PRACE by improving the existing middleware services with new required functionality focusing on usability, manageability and service operations... [DOW]

- Storage elements with file:// access in EMI 1
 - NFS clients are able to use EMI SEs in an easy manner
 - Support for NFS4.1/pNFS makes SEs industry competitors
 - dCache supports NFS4.1/pNFS (production)
 - DPM supports NFS4.1/pNFS (experimentally)
 - StoRM supports this functionality via the corresponding underlying file system if available
 - To be released with next EMI update

New Functionality: HTTP & WebDAV SEs



Enable effective and efficient operations of the DCIs like EGI and PRACE by improving the existing middleware services with new required functionality focusing on usability, manageability and service operations... [DOW]

- EMI 1 Storage elements support HTTP(S) (+ WebDAV)
 - HTTP(S) as most widely used standards in the Web & DCIs
 - Adoption of WebDAV makes EMI SEs ‘fit for business’
 - dCache offers HTTP(S) (and additionally WebDAV) in EMI 1
 - DPM offers HTTP(S) in EMI 1

 - StoRM offers support very soon

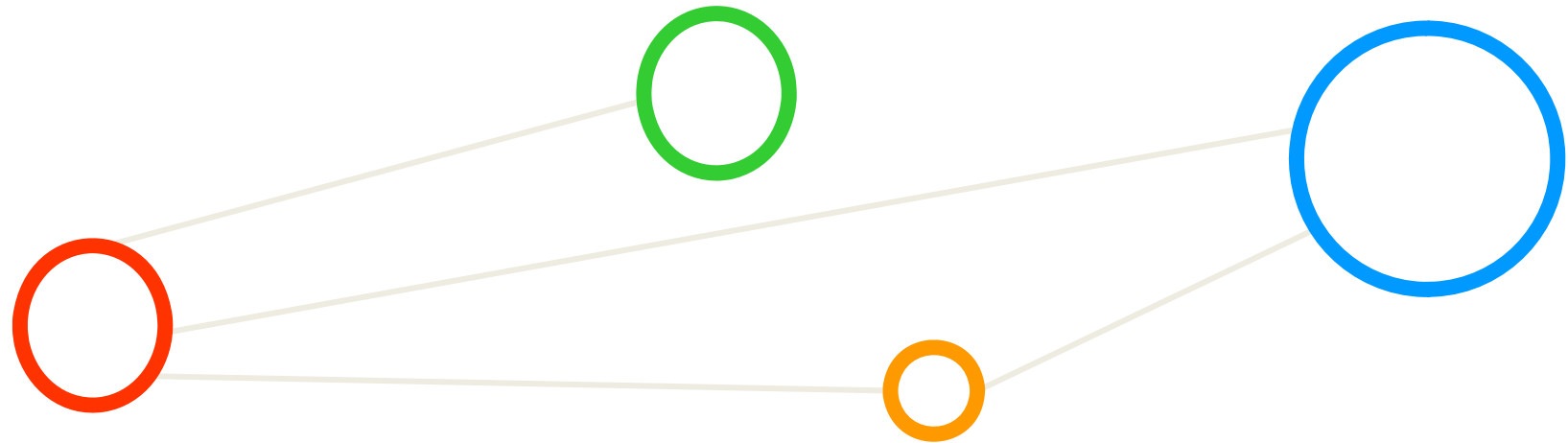
New Security Developments



Enable effective and efficient operations of the DCIs like EGI and PRACE by improving the existing middleware services with new required functionality focusing on usability, manageability and service operations... [DOW]

- VOMS 2.0 / VOMS-Admin
 - SAML-based access (VOMS-admin)
 - RESTful interface to obtain attributes
 - GSI removal
 - Good progress with VOMRS convergance
- ARGUS 1.2
 - CREAM CE works together ARGUS
 - UNICORE can work together wih ARGUS
 - ARGUS PDP handler prototype for ARC service container

JRA1 Y1 Integration



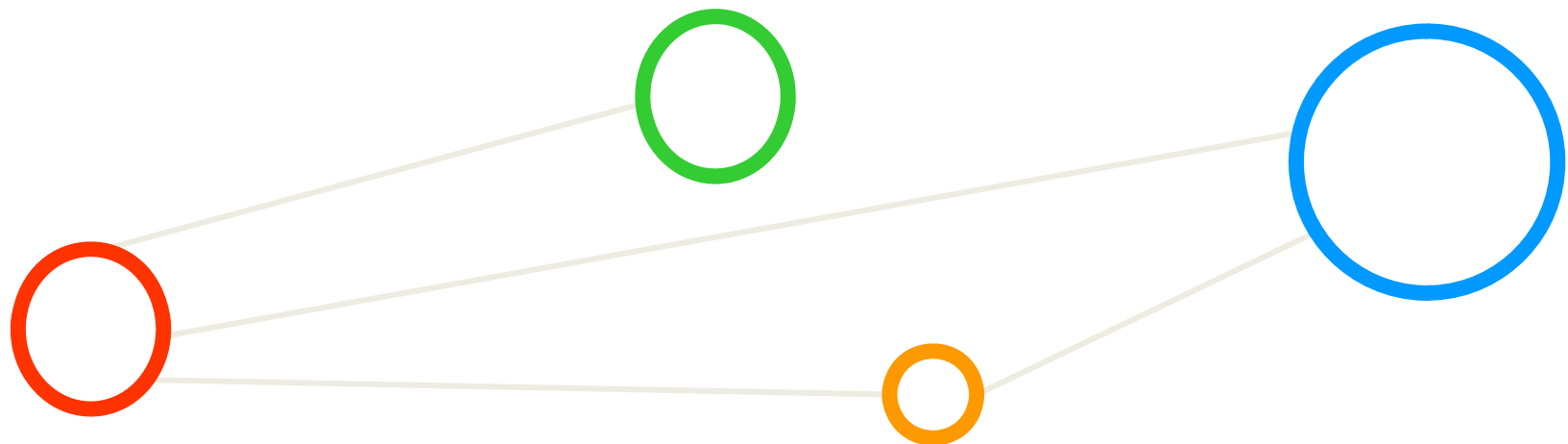
JRA1 Y1 Integration



Integrate emerging components into the broader EMI component ecosystem in order to avoid incompatibilities as well as to ensure that the components can be used together ... [DOW]

- JRA1 Delivered a consolidated and streamlined set of services and components from ARC, gLite, UNICORE, and dCache as integrated release for EMI 1
 - Compliant to EMI 1 production release criteria
 - Including many re-factoring of existing components
 - Phasing out duplicate and obsolete components from the original middleware stacks as planned by PTB
 - One central Globus toolkit version avoids incompatibles among the different EMI components in the EMI 1 release
 - OS Integration: SL5/64bit as reference platform in collaboration with SA1 release management

JRA1 Y1 Standardization



JRA1 Y1 Standardization (1)



Guide and validate the open standard adoption process in EMI and participate in standardization bodies in order to promote and drive standards that are relevant to the EMI project ... [DOW]

- Wide adoption of GLUE2 within EMI products
 - Whole 'EMI information ecosystem' based on GLUE2
- Replacement of legacy (proprietary) GSI
 - https instead of httpg for the SRM protocol as prototype
 - Implemented in dCache server & client (w/o delegation yet)
 - Implemented with new version VOMS 2.0
 - (security delegation group formed to investigate solution)
- Agreement on common profiles
 - Agreement on SAML profile for common attributes
 - Agreement on XACML profile for attribute-based policies

JRA1 Y1 Standardization (2)



Guide and validate the open standard adoption process in EMI and participate in standardization bodies in order to promote and drive standards that are relevant to the EMI project ... [DOW]

- Standardization pre-studies
 - Agreements within the EMI project on paths towards standardization
 - Change that EMI speaks with one voice to the community
- Job execution and management
 - Agreement on EMI Execution Service Specification (ES)
 - [<https://twiki.cern.ch/twiki/bin/view/EMI/EmiExecutionService>]
- Storage accounting
 - Agreement on Usage Record Specification (StAR)
 - [<https://twiki.cern.ch/twiki/pub/EMI/StorageAccounting/StAR-EMI-tech-doc-v7.pdf>]

JRA1 Y1 Standardization (3)

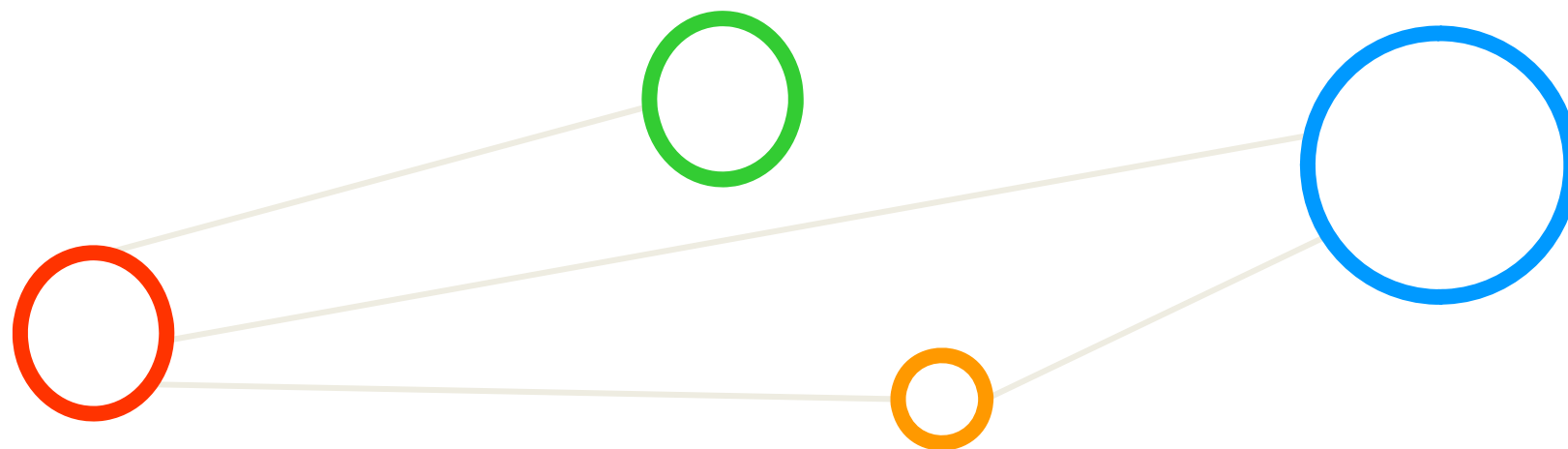


Guide and validate the open standard adoption process in EMI and participate in standardization bodies in order to promote and drive standards that are relevant to the EMI project ... [DOW]

- Active contributions to OGF Working Groups
 - Grid Interoperation Now (GIN) CG
 - EMI chair position; EMI and international Grid interoperability
 - Production Grid Infrastructure (PGI) WG
 - EMI chair position; EMI input via EMI ES around job management
 - GLUE2 WG
 - EMI chair position; EMI implements specs & pushes XML rendering
 - Usage Record (UR) WG
 - EMI chair position; EMI input via storage accounting StAR spec.
 - Storage Resource Manager (SRM) WG
 - EMI provides implementation feedback & production experience



JRA1 Y1 Quality Enforcements



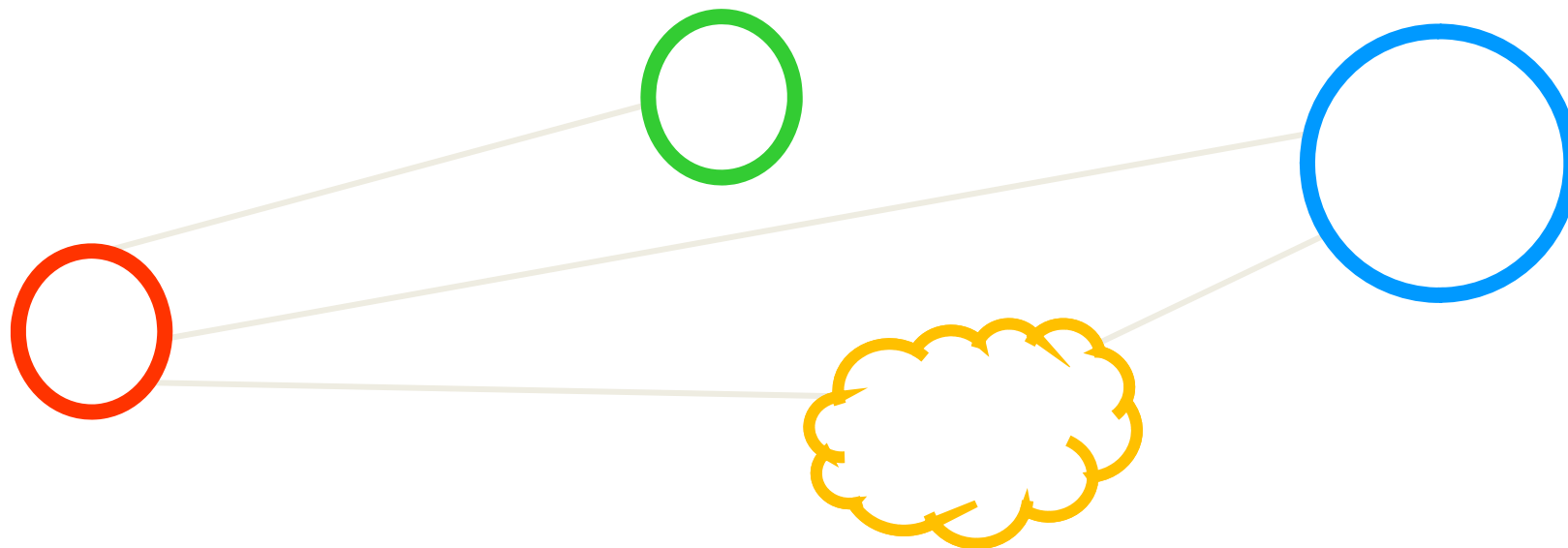
JRA1 Y1 Quality Enforcements



Continuously improve the quality of the grid services by implementing standard Quality Control activities with particular focus on standard compliance and conformance tests, unit and functional tests... [DOW]

- A lot of general EMI „quality work“ has already been discussed before in the last session...
- Important: JRA1 needs to take quality assurance work much more seriously
 - Dedicated Short Update on JRA1 perspective by Andrea (Quality Control JRA1 Task Leader) later...

Responding to DCI Evolutions



EMI Registry and Messaging



Follow and anticipate the needs of the growing infrastructure usage by investigating and adopting technologies to improve scalability, reliability and performance of the grid services... [DOW]

- Provide DCIs with a common EMI registry
 - Required in order to discover all the service endpoints of the four different middleware services in a flexible way
 - Design is available and early implementation plan exists
 - [\[https://twiki.cern.ch/twiki/pub/EMI/EMIRegistry/EMIRegistryDesign-v0.2.doc\]](https://twiki.cern.ch/twiki/pub/EMI/EMIRegistry/EMIRegistryDesign-v0.2.doc)
- EMI supports the use of messaging technologies
 - Early prototype for File Catalogues and SE synchronization
 - Use cases in the accounting area investigated: shipping usage records via a messaging system
 - Internal guidelines for messaging & EMI products
 - [\[https://twiki.cern.ch/twiki/bin/view/EMI/EMIMessagingGuidelines \]](https://twiki.cern.ch/twiki/bin/view/EMI/EMIMessagingGuidelines)

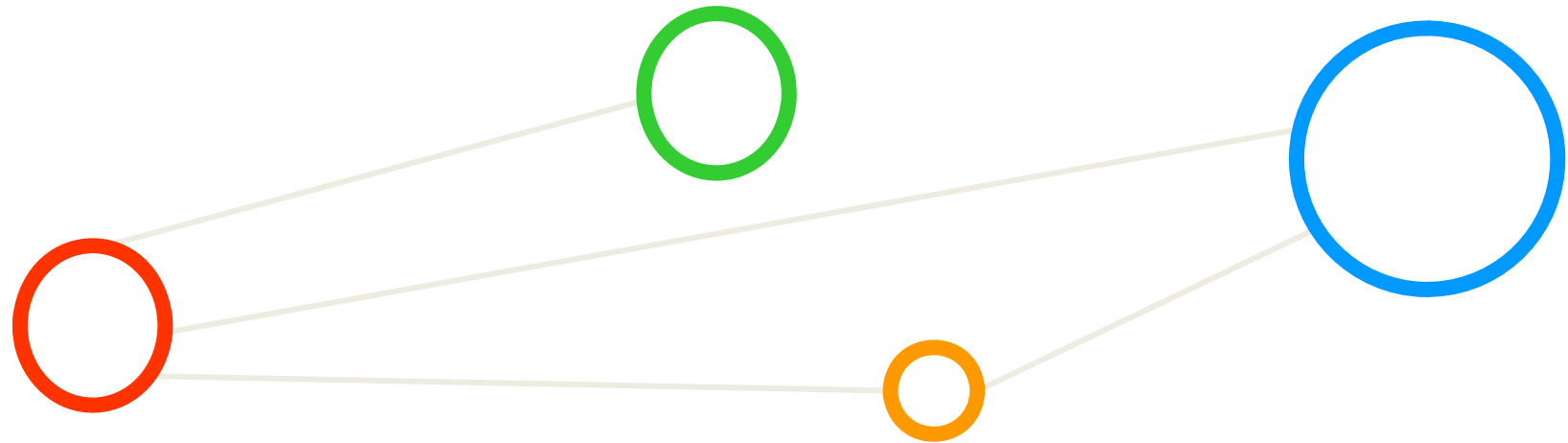
EMI Cloud Approaches



Increase the relevance and usability of the EMI grid middleware by actively managing user requirements in collaboration with infrastructure and community projects and initiatives... [DOW]

- DCIs and related projects evolution is towards clouds
 - EMI Cloud Working group has been established
 - Goals: Integration scenarios with off-the-shelf computing cloud systems to be able to execute grid jobs on those (scaling out to clouds) evaluated, but also beyond that
 - EMI and cloud approaches have been researched and several documents are available (report, paper, etc.)
 - [\[https://twiki.cern.ch/twiki/pub/EMI/EmiJra1T5TaskForceCloudandVirtualization/EMIVirtCloudReport-v0.7.doc\]](https://twiki.cern.ch/twiki/pub/EMI/EmiJra1T5TaskForceCloudandVirtualization/EMIVirtCloudReport-v0.7.doc)
 - Standardization approaches observed (OCCI, CDMI, etc.)
 - Existing work is baseline for setting up an EMI cloud strategy in the next months collaboratively with EGI

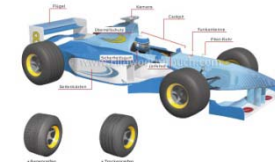
Lessons Learned and Inter-WP Work



Lessons Learned

- Quality Control PT work needs to be strengthened
 - Alignment of JRA1 QC and SA1 QC makes sense
 - More time for testing towards EMI 2 release required
- Inter-product/-middleware work and strategies
 - Plan inter-product work and tests across middlewares/PTs
- Better definition of Year 2 development tasks
 - PEB agreement to use development tracker in year 2/3
 - Development Tasks need to be at end of July defined
- More forward-planning and strategic thoughts
 - Know when to expect new versions of policies, decisions,...
 - Avoid short deadlines where possible and ,plan peaks‘
 - *JRA1 folks: Talk with me!*

- Initially challenging since EMI is a big project...
 - Gradually improving understanding...
- Policy work as one example...
 - “JRA1 needed a bicycle”
 - „SA2 provided a formula one racing car“
- In-reach and managerial reflections
 - “Got a driving license for a helicopter from NA2”
 - “Missed some passenger stops for NA1 in between... missing time plans or being already late at start...”
- In the end we delivered the ‚parcel‘ to SA1
 - Including all the (hopefully) nice “gifts” for DCI end-users
- *Enjoy the football game...w/o breaking bones!*





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