Standardization Strategies

Of the European Middleware Initiative

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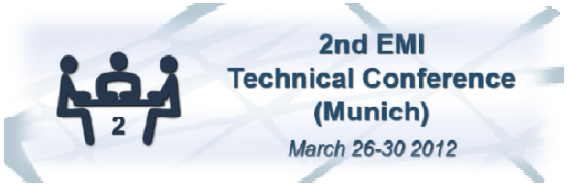
2012-03-29



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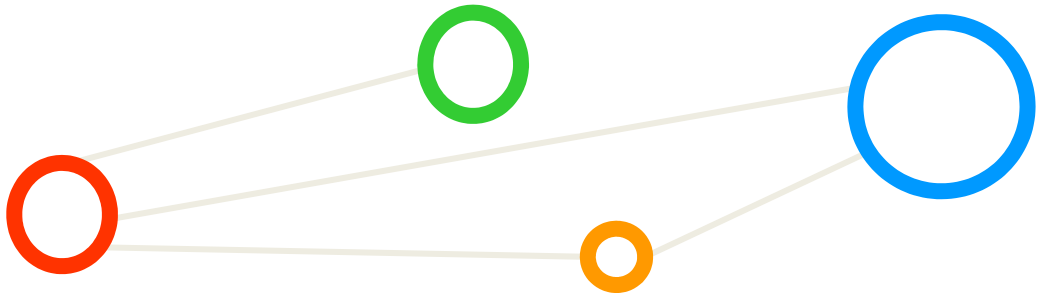
Introduction



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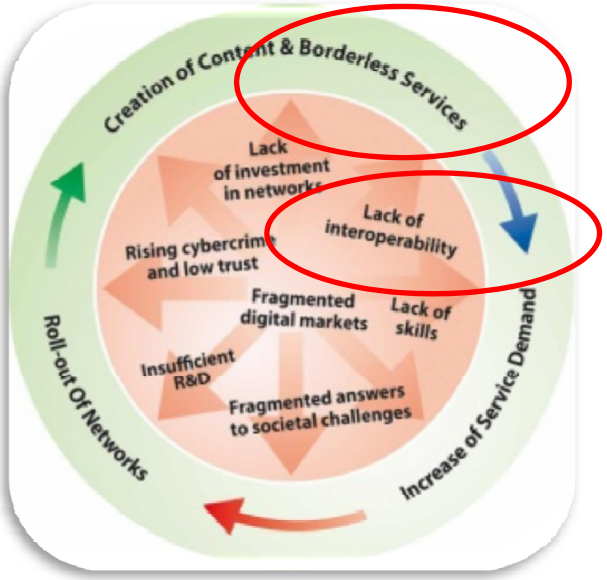
EMI & European Strategies

[1] Digital Agenda for Europe



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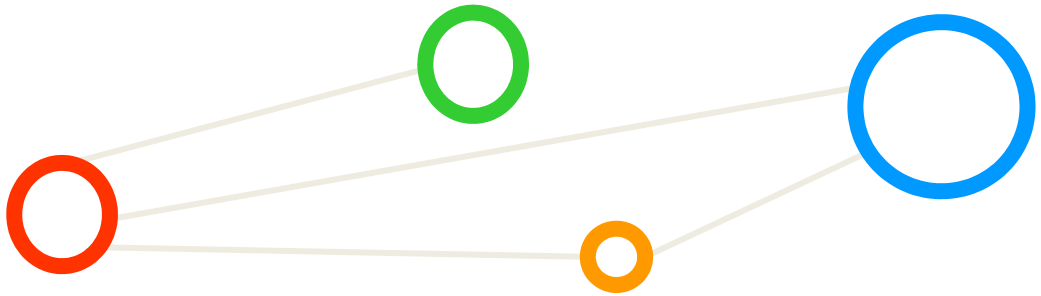
Overall Standardization Strategy



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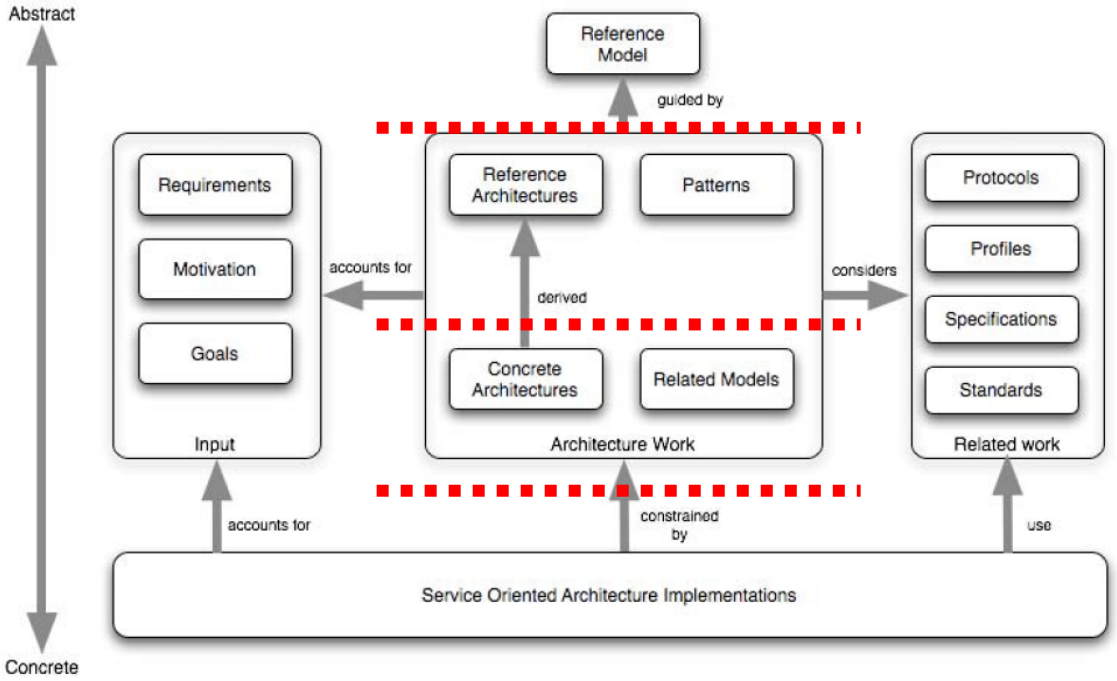
Reference Model & Architectures



[3] OASIS SOA Reference Model Technical Committee

Lessons Learned from ISO/OSI

Not much experience on the subject
'However the downside of ISO/OSI is worth mentioning, as the designers did not have much experience with the subject and did not have a good idea of which functionality to put in which layer [2].'

[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

Difference between theory and practice
'…things did not turn out that way' … it appears that the standard OSI protocols got crushed [2].'

[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

Don't neglect existing work in the field
'When OSI came around, they did not want to support a second protocol stack until they forced to, so there were no initial offerings ... OSI never happened [2].'

[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

Too broad and too complex
'the choice of seven layers was more political than technical ... The OSI model, along with the associated service definitions and protocols, is extraordinary complex [2].'

[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

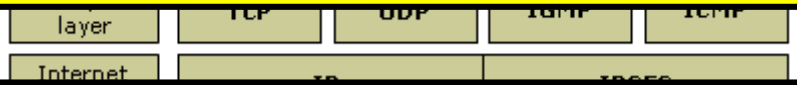
Lessons Learned from TCP/IP

Use of established protocols
'The protocols came first, and the model was essentially just a description of the existing protocols [2].'

[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

Improve existing protocols – not create completely new ones
'…first implementations of TCP/IP was part of Berkeley UNIX and was quite good (not to mention, free). People began using it quickly, which led to a large user community, which led to improvements, which led to an even larger community [2].'

[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms



But focusing on practice and production brings some critics: not usable for many other setups

"*TCP/IP model is not at all general and is poorly suited to describing any protocol stack other than TCP/IP' *[2].'

[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

Comparison: OGSA & ISO/OSI

Not much experience on the subject
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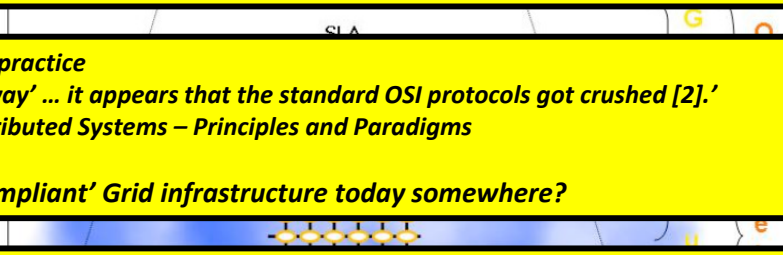
OGSA Concepts started with the Grid computing time around 1999… did we had much experience?



Difference between theory and practice
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[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

Do we have a fully 'OGSA-compliant' Grid infrastructure today somewhere?

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[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

Looks OGSA too broad and abstract? SLA services, Monitoring & Analytics services, License & sensor services,... Where are concrete details about key areas data, security, information, and compute?

[4] Foster et al, Open Grid Services Architecture

Comparison: IIRM & TCP/IP

Use of established protocols
'The protocols came first, and the model was essentially just a description of the existing protocols [2].'
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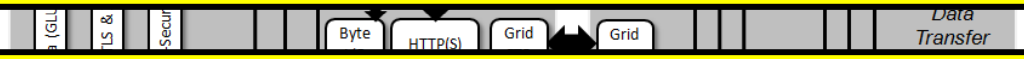
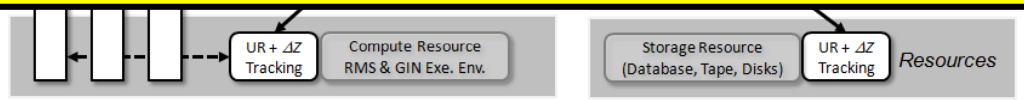
SRM, GLUE2, UR, WS-DAI, OGSA-BES, JSDL, SAML, XACML, X.509, GridFTP, ByteIO, HTTP … have been all around since many years and used in different e-Science infrastructures (DEISA/PRACE, EGEE/EGI, TeraGrid/XSEDE, OSG, …) when EMI came to existence



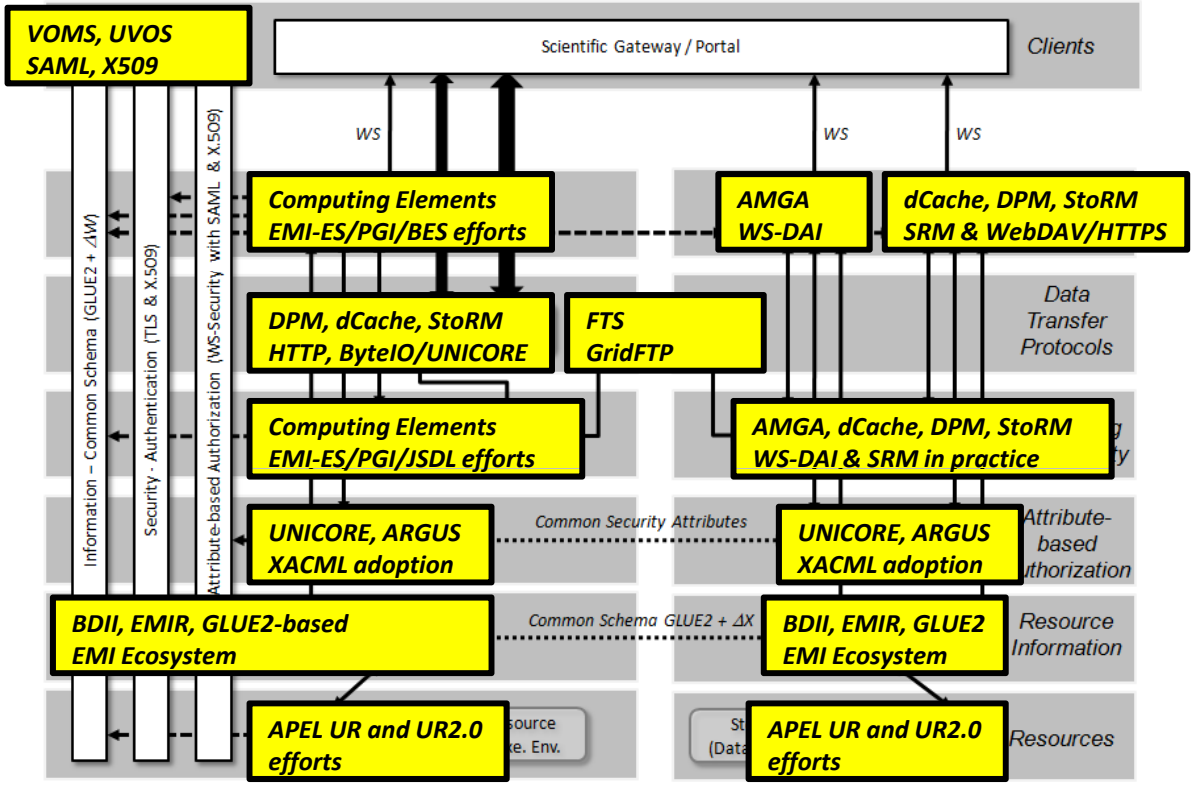
Improve existing protocols – not create completely new ones
'…first implementations of TCP/IP was part of Berkeley UNIX and was quite good (not to mention, free). People began using it quickly, which led to a large user community, which led to improvements, which led to an even larger community [2].'
[2] A.S. Tanenbaum et al. - Distributed Systems – Principles and Paradigms

Software engineering shows: no protocol is set in stone, so some changes to protocols always happen: the many Deltas in the model explains this: e.g. UR + DELTA Z meaning the extensions of UR towards storage and revisions on compute.



[5] Riedel et al, e-Science Infrastructure Interoperability Reference Model (IIRM)

EMI: Implementation along IIRM



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Grid Standard Strategy overviews

- History in computer science shows:
  - Complex architectures less used (Examples: ISO/OSI, SGML, OGSA)
  - Trimmed down versions do (Examples: TCP/IP, XML, IIRM)
- EMI follows this strategy alongside a trimmed down version of OGSA: pragmatic + changes!
- But also contributes to standardization activities and improving existing standards where possible – observing trends…

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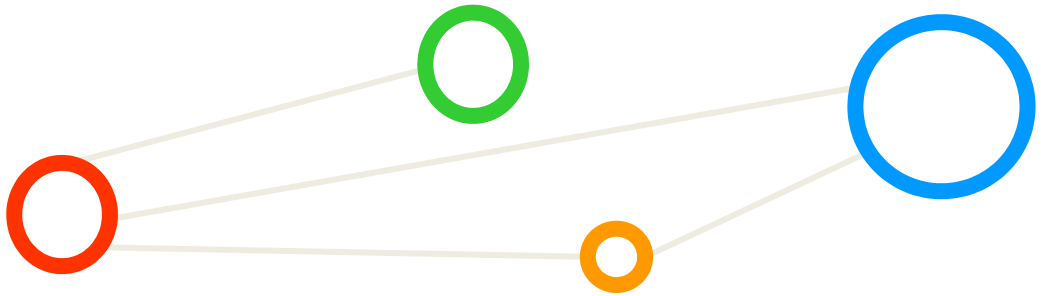
Cloud Standardization Strategy?

- EMI focuses on Grid end-user's demand
- EGI is an infrastructures that deploys EMI components moving to a Cloud-based design
- Overall Cloud Strategy still 'work in progress'!

References and More Information



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EMI References

- EMI Website
  http://www.eu-emi.eu/
- ‘ScienceSoft’ Web site (concept phase)
  http://www.sciencesoft.org

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General References

[1] Digital Agenda for Europe

http://ec.europa.eu/information_society/digital-agenda/index_en.htm

[2] A.S. Tanenbaum et al. - Distributed Systems

Principles and Paradigms, ISBN 013-613553-6

[3] OASIS SOA Reference Model Technical Committee

http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=soa-rm

[4] Foster et al., Open Grid Services Architecture (OGSA), Version 1.5

http://www.ogf.org/documents/GFD.80.pdf

[5] Riedel et al., Infrastructure Interoperability Reference Model (IIRM), e-Science Infrastructure Interoperability Guide - The Seven Steps towards Interoperability for e-Science, 'Guide to e-Science' Book chapter, Springer, 2011