



The European Middleware Initiative

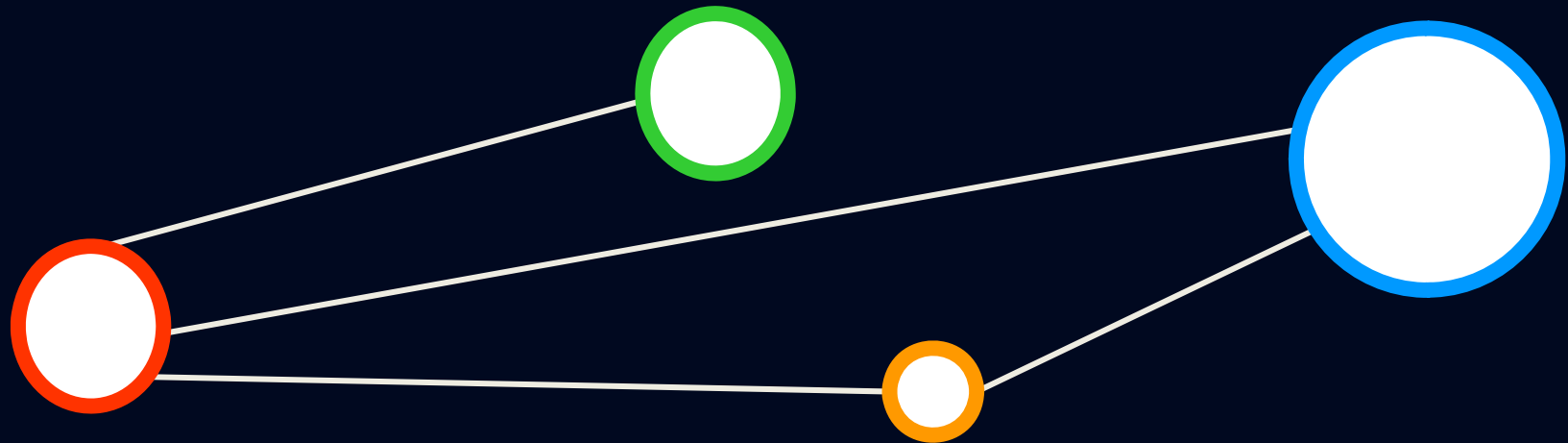
Delivering Key Technologies to Distributed Computing Infrastructures

Morris Riedel et al.

Juelich Supercomputing Centre

EMI Deputy Technical Director

Outline

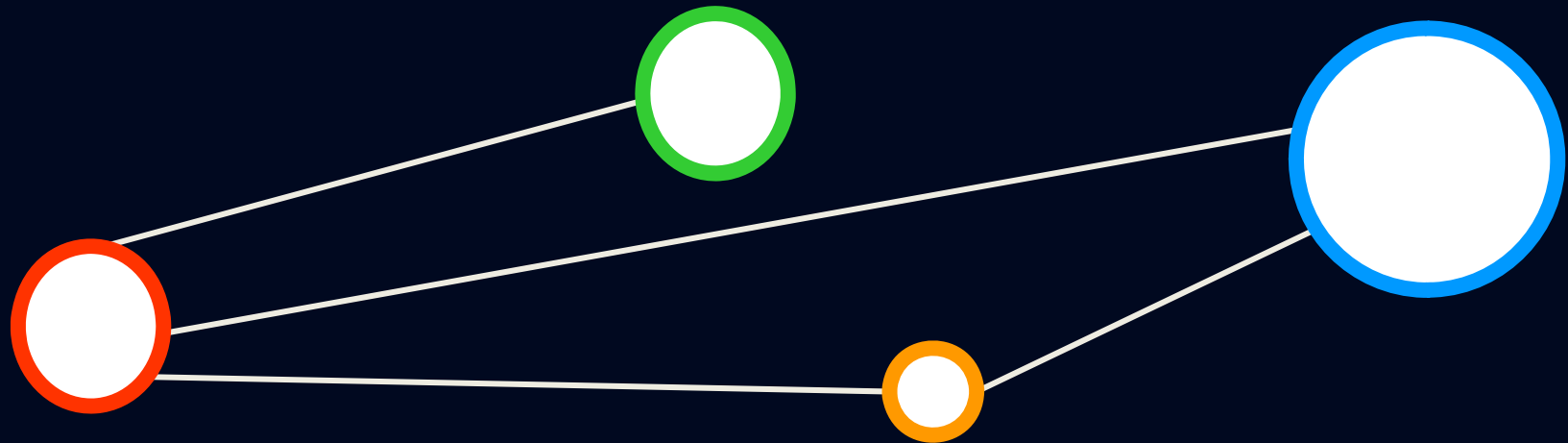


Outline

- A European Vision & Background
- EMI Project Info & Vision
- Project Structure
- Collaborations
- Workplan
- AOB



A European Vision



A European Vision



European Vision

- One of the major complaints of research users about the middleware is about its **limited “userfriendliness”**
 - Deployment, configuration, service management, interoperability, security mechanisms, flexibility, etc.
- **Unnecessary duplication of services and libraries**
- **User requirements (ESFRI, VRCs)**
 - EMI is requirement driven and will actively participate to the definition of user requirements with the major user communities and infrastructures
 - European Strategy Forum on Research Infrastructures (ESFRI)
 - Virtual Research Communities (VRCs) – upcoming EU calls...





ESFRI List 101

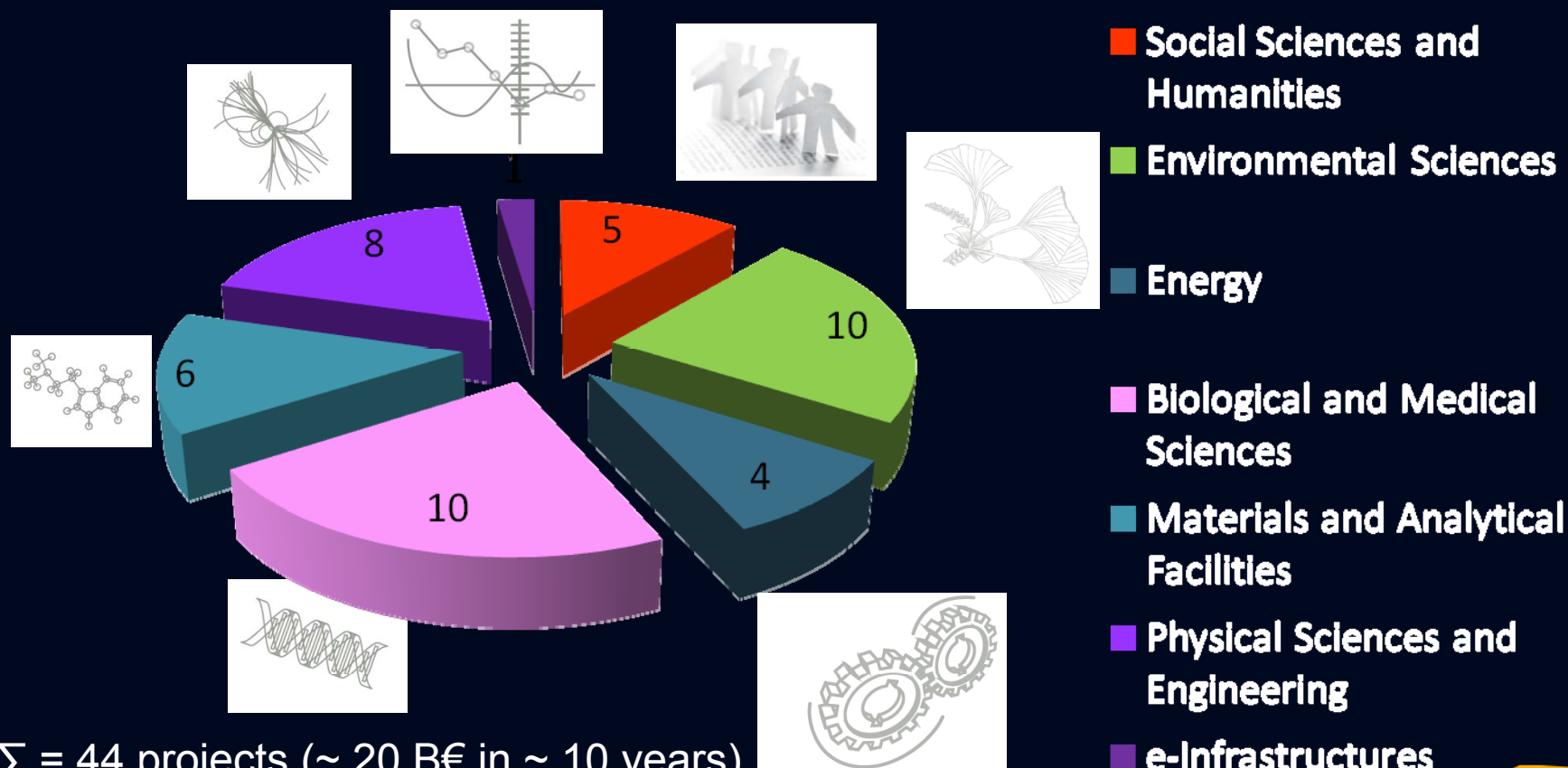
- Historically well-organized communities rarely existed
 - e.g. Large Hadron Collider Computing Grid (LCG) community
- European Strategy Forum on Research Infrastructures
 - Roadmap for pan-European research infrastructures (2006, update in 2008)
 - ~ 44 projects from all different scientific areas
 - Includes physical devices like telescopes, antennas, ships, etc.
- Note: Those communities think different than we do
 - Infrastructures not directly in terms of computing but science
 - Only 'the use of' computing of PRACE or EGI for processing

ESFRI List of Projects & Roadmap

- ESFRI = European Strategy Forum on Research Infrastructures
- A huge set of potential customers of infrastructures (and technologies)
- Costly resources for geographically dispersed user communities



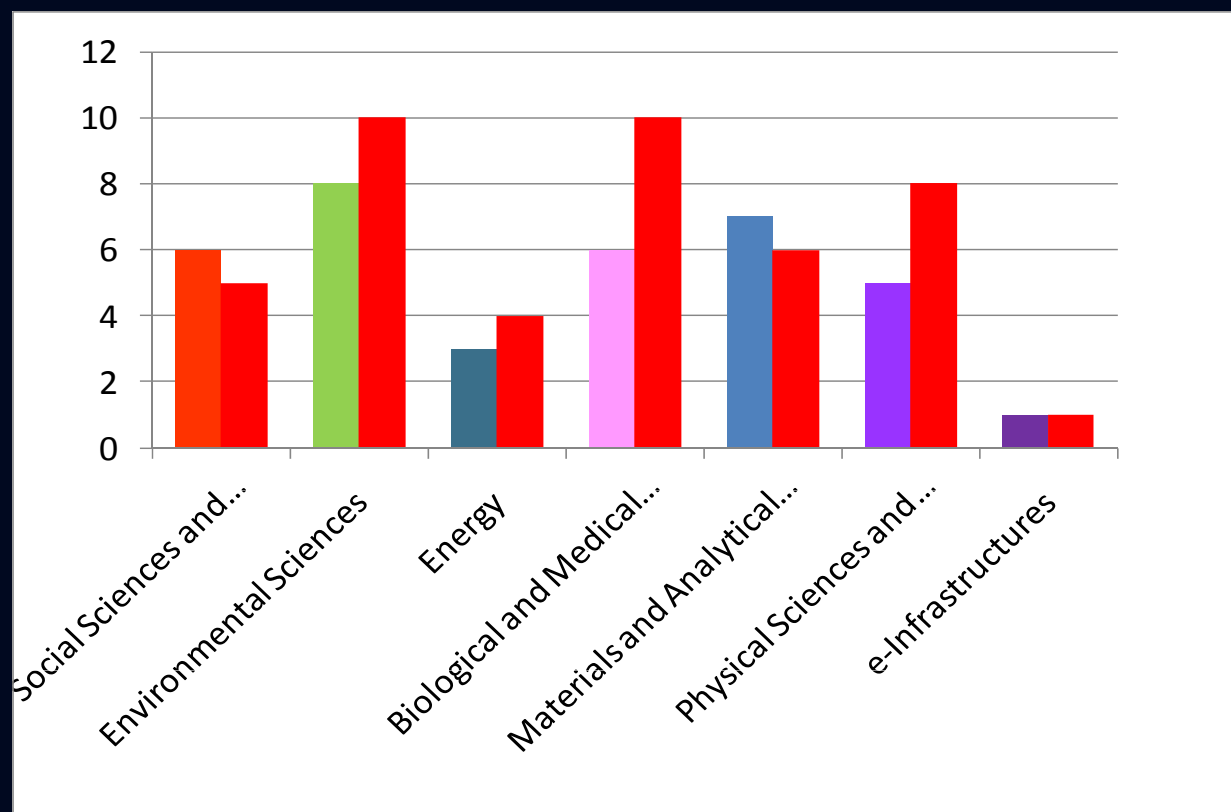
Number / Research Area Statistics




out of ~ 240 proposals



Evolution / Research Area Statistics



 Update: 10 more projects





ESFRI List Projects (1)

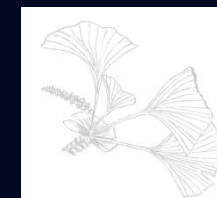
	PROJECTS	construction costs (M€)	Operations costs (M€/year)	first possible operations or upgrade
Social Sciences and Humanities	CESSDA	30	3	2013
	CLARIN	104	7.6	2014
	DARIAH	12	4	2013
	European Social Survey	54**	9**	2008
	SHARE	11.6	0.3	2008
Environmental Sciences	AURORA BOREALIS	635	32.5	2014
	COPAL (ex EUFAR)	50	3 (+6000€/hour)	2012
	<i>EISCAT_3D Upgrade</i>	60-250	4-10	2015
	EMSO	160	32	2013
	<i>EPOS</i>	500	80	2018
	EURO-ARGO (GLOBAL)	80	7.3	2011
	IAGOS	15	0.5-1	2012
	ICOS	128	14	2012
	LIFEWATCH	370	71	2019
	<i>SIAEOS</i>	50	9.5	2012
Energy	<i>ECCSEL</i>	81	6	2011
	HiPER	800	under discussion	2020+
	IFMIF (GLOBAL)	1000	150-80	2020
	JHR	500	24-33	2014



ESFRI List Projects (2)

Biological and Medical Sciences	BBMRI	170	15	2013
	EATRIS	255	50	2013
	ECRIN	50	5	2014
	ELIXIR (GLOBAL)	470	100	2012
	EMBRIC	100	60	2018
	EU-OPENSOURCE	40	40	2012
	EuroBioImaging	370	160	2012
	High Security BLS4 Laboratory	174	24	2018
	Infrafrontier	270	36	2010
	INSTRUCT	300	25	2012
Materials and Analytical Facilities	EMFL	120	8***	2015
	ESRF Upgrade	238	83	2009-2014
	EuroFel (ex-IRUV-FEL)	1200-1600	120-160	2007-2020
	European Spallation Source	1300	110	2019-2020
	European XFEL	1043	84	2014
	ILL20/20 Upgrade	171	5***	2007-2017
Physical Sciences and Engineering	CTA	150	10	2013
	E-ELT	950	30	2018
	ELI	400	50	2015
	FAIR	1187	120	2016
	KM3NeT	200	5	2016
	PRINS	1400	300	2009-2015
	SKA (GLOBAL)	1500	100-150	2016
	SPIRAL2	196	6.6	2014
e-Infrastructures	PRACE (ex EU-HPC)	200-400*	50-100	2009-2010

Environmental Sciences



Aurora Borealis



COPAL (ex EUFAR)



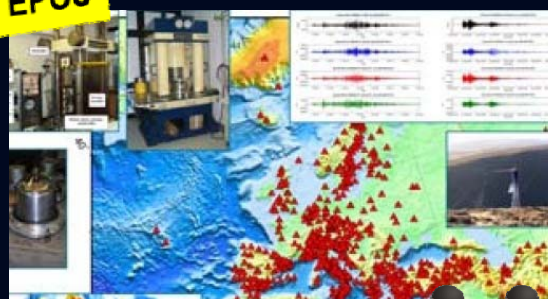
EISCAT_3D



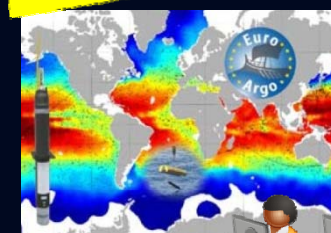
EMSO



EPOS



EURO ARGO



IAGOS



LIFEWATCH



ICOS



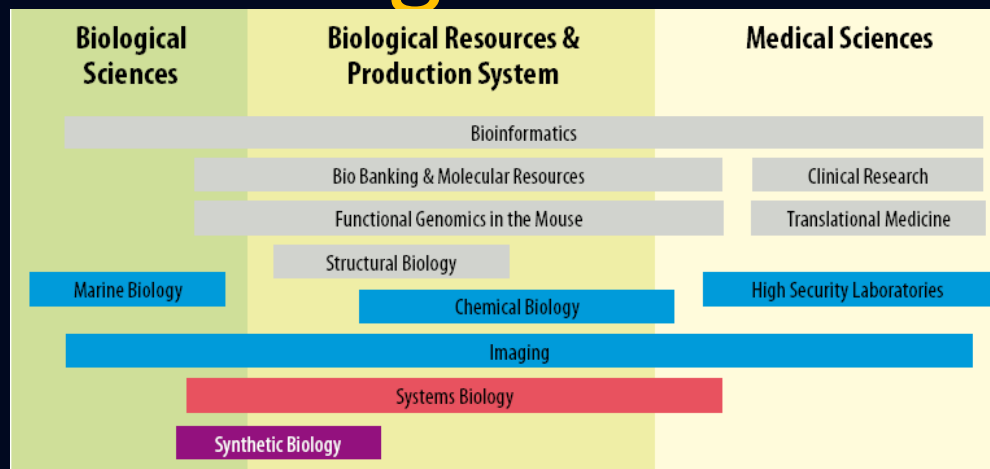
SIAEOS



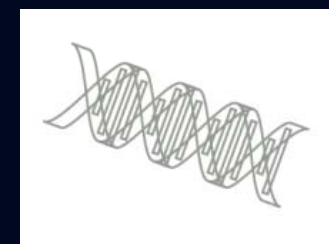
EMI 1611



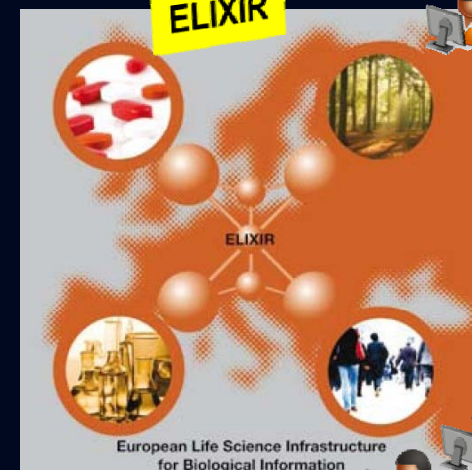
Biological and Medical Sciences



BBMRI



ELIXIR



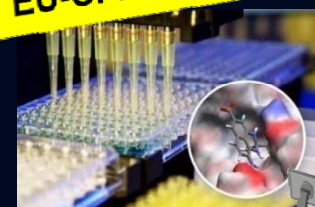
ECRIN



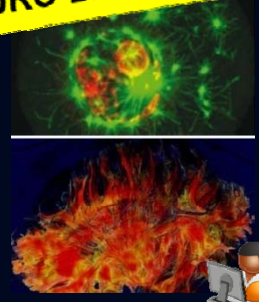
EMBR



EU-OPENSOURCE



EURO-Biolmaging



BSL4 Laboratories



INFRAFRONTIER



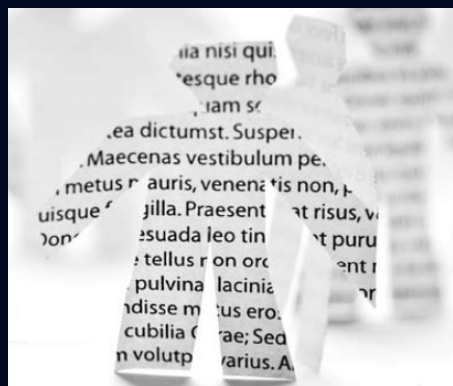
INSTRUCT



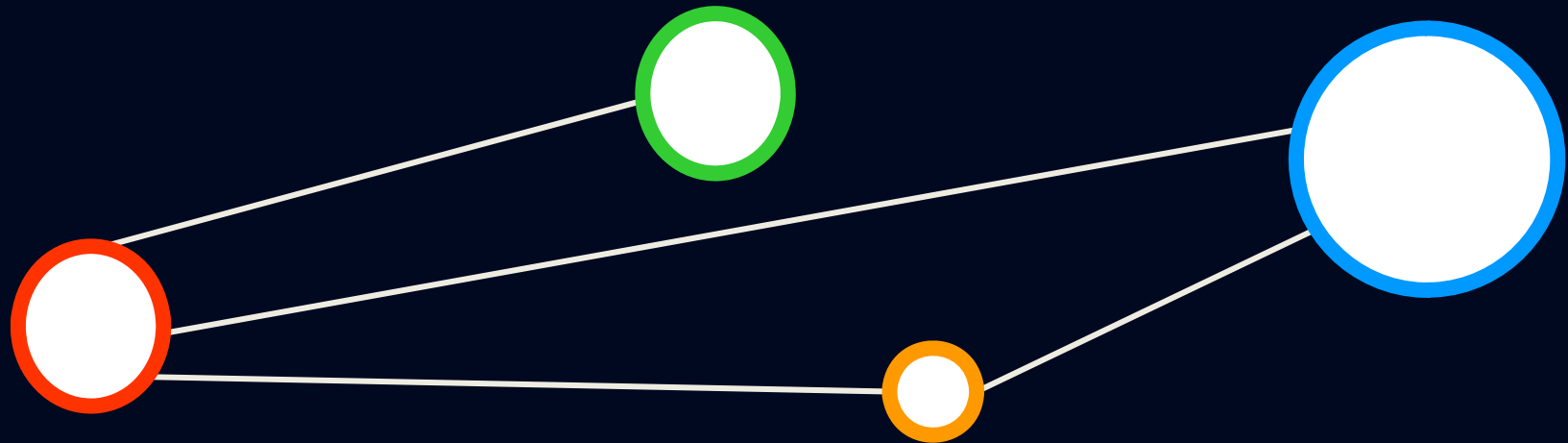
EATRIS



Social Sciences and Humanities



EMI Project Info & Vision



EMI Mission Statement

The European Middleware Initiative (EMI) project represents a close collaboration of the major European middleware providers - ARC, gLite, UNICORE and dCache - to establish a sustainable model to support, harmonise and evolve the grid middleware for deployment in EGI and other distributed e-Infrastructures



FP7 Program

FP7 Capacities Work Programme 2010: Infrastructures

Call **FP7-INFRASTRUCTURES-2010-2**

Sub-topic: 1.2.1.3 – Middleware and repositories

Develop middleware that strengthens European presence by consolidating or even going beyond existing DCIs (e.g. exploiting emerging developments like virtualisation), while improving their stability, reliability, usability, functionality, interoperability, security, management, monitoring and accounting, measurable quality of service, and energy efficiency

Starting date: May 1st

Duration: 3 years

Total budget: 23M € (12M € from EC + 11M € from partners)

Effort: 64 FTEs/year (88% for technical activities)

Primary Objectives

Consolidate

Consolidate the existing middleware distribution simplifying services and components to make them more sustainable (including use of off-the-shelf and commercial components whenever possible)

Evolve

Evolve the middleware services/functionality following the requirement of infrastructure and communities, mainly focusing on operational, standardization and interoperability aspects

Support

Reactively and proactively **maintain the middleware** distribution to keep it in line with the growing infrastructure usage

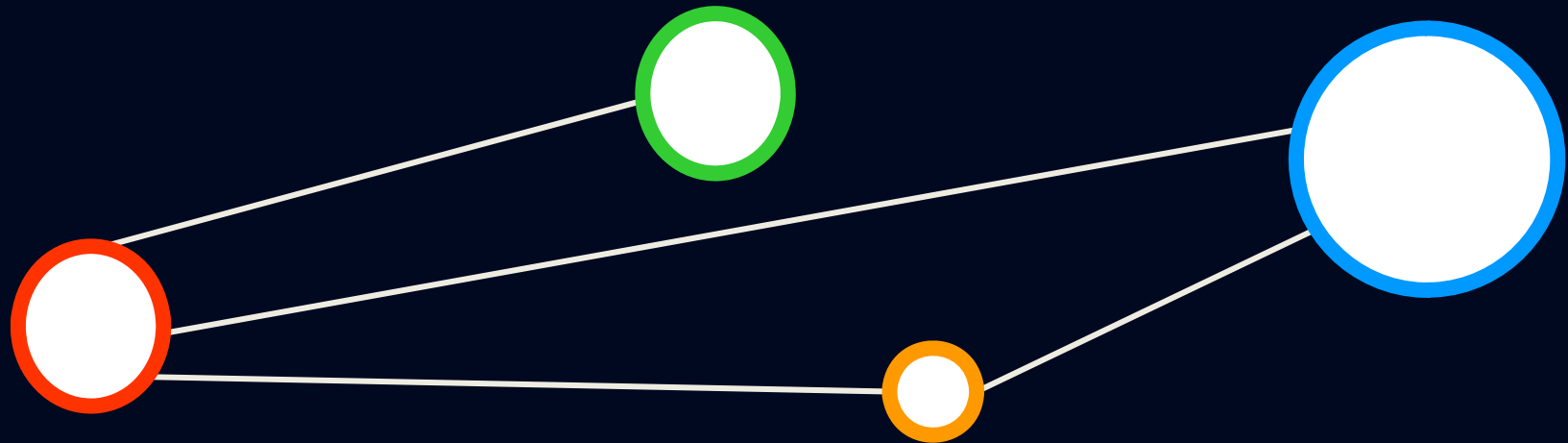
Partners (24)



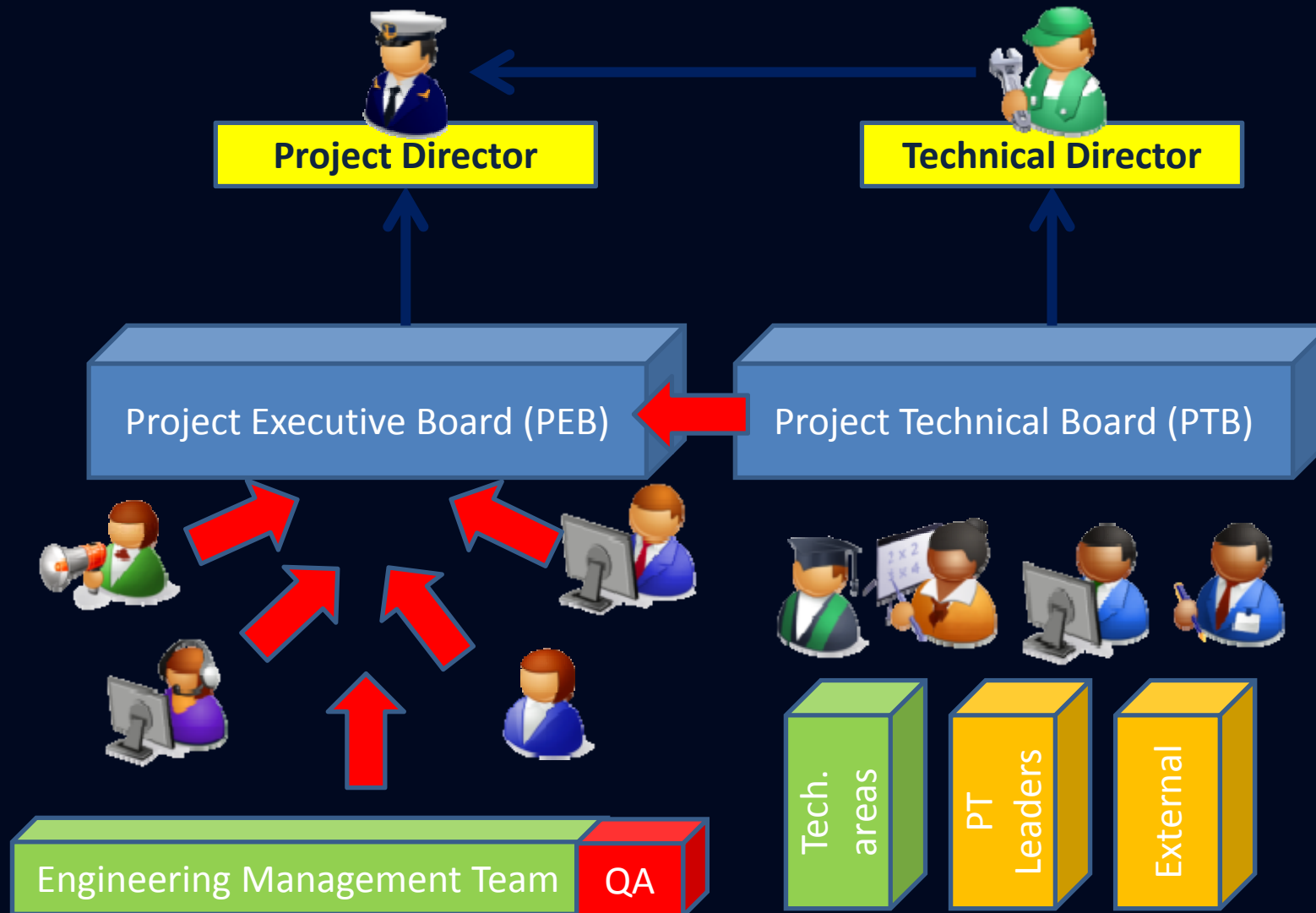
06/06/2010

PARA2010, Reykjavik, Iceland

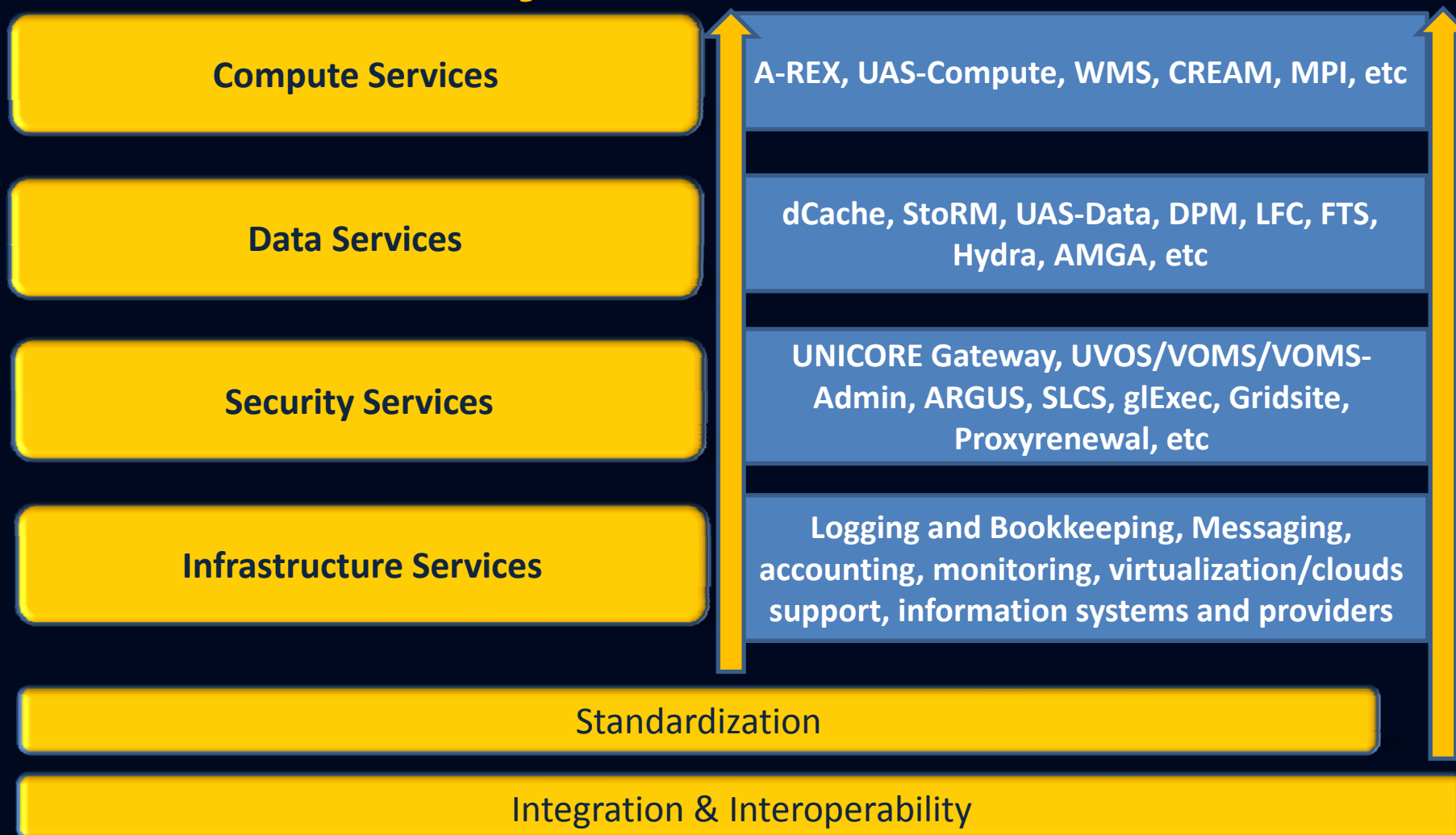
Project Structure



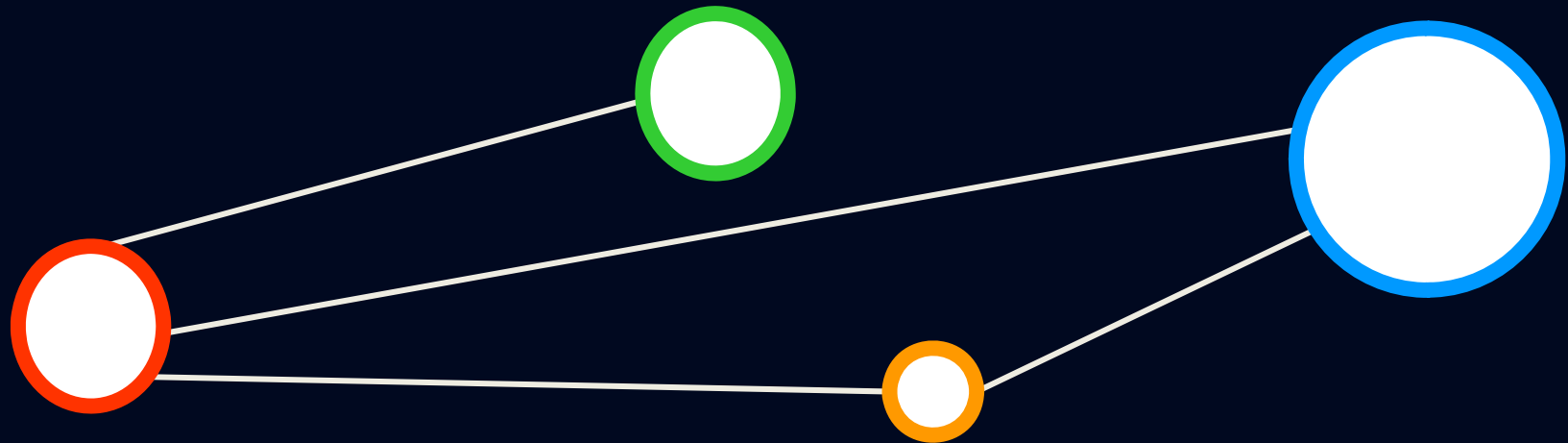
Project Execution



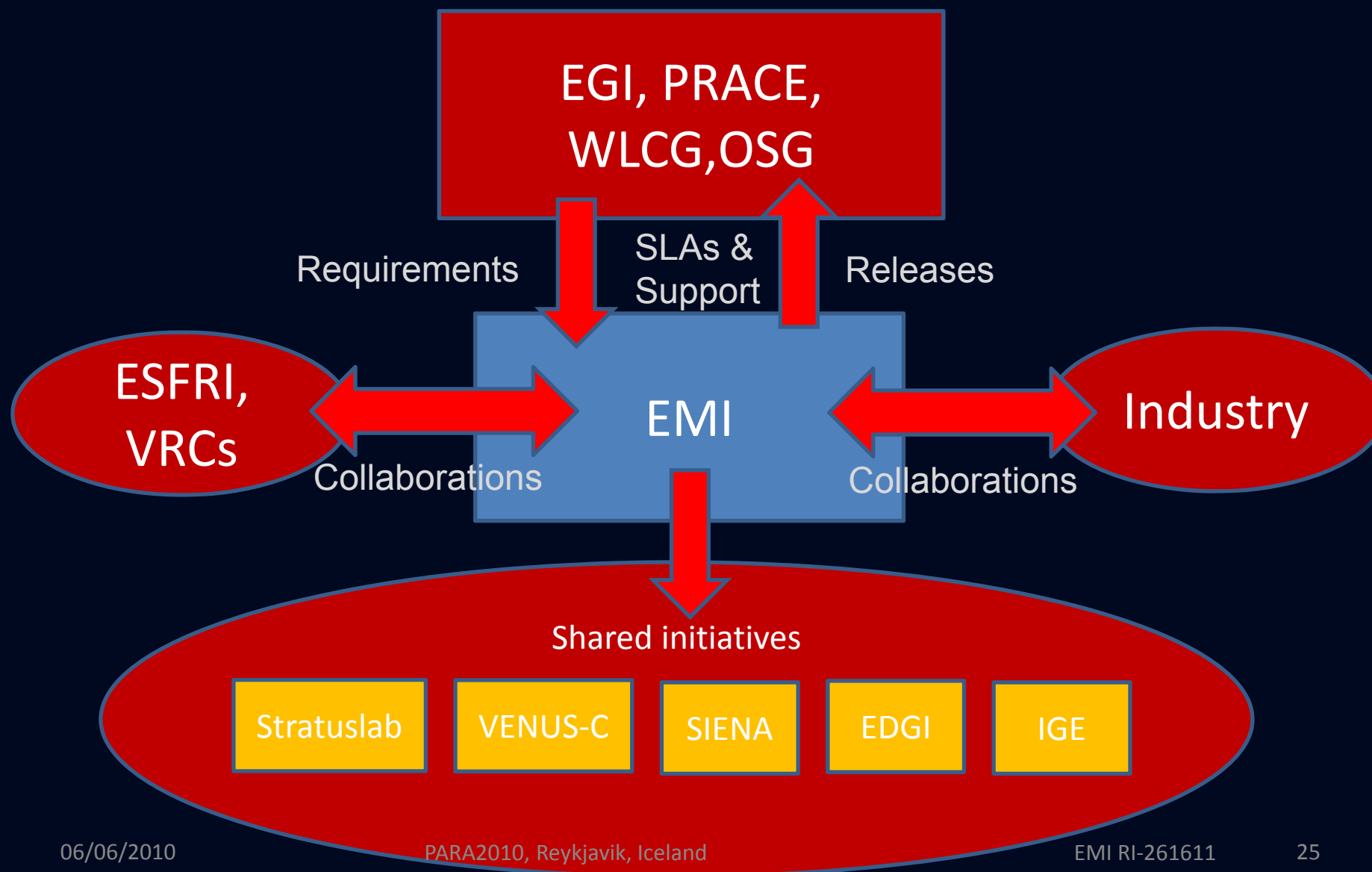
Four major Technical Areas



Collaborations



Collaborations



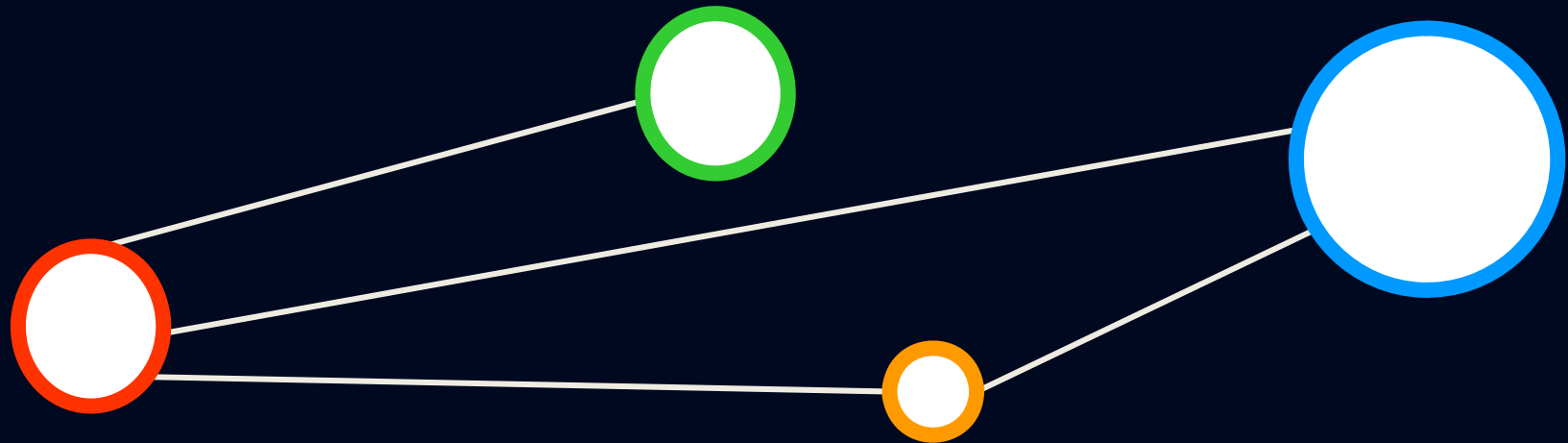
Shared Initiatives

- Many projects will deliver technologies
 - European Middleware Initiative (EMI)
 - Initiative for Globus in Europe (IGE)
 - Enabling Desktop Grid Initiative (EDGI)
 - SIENA → Cross-project work & standardization
 - StratusLab → Cloud project around OpenNebula
 - VENUS-C → Cloud project around MS Azure
 - ...
 - Communities will have their own software as well

Infrastructures & Communities

- Many Infrastructures exist
 - European Grid Initiative (EGI)
 - World-wide LHC Computing Grid (WLCG)
 - Partnership for Advanced Computing in Europe (PRACE)
 - Open Science Grid (OSG)
- Research communities
 - ESFRI
 - VRCs

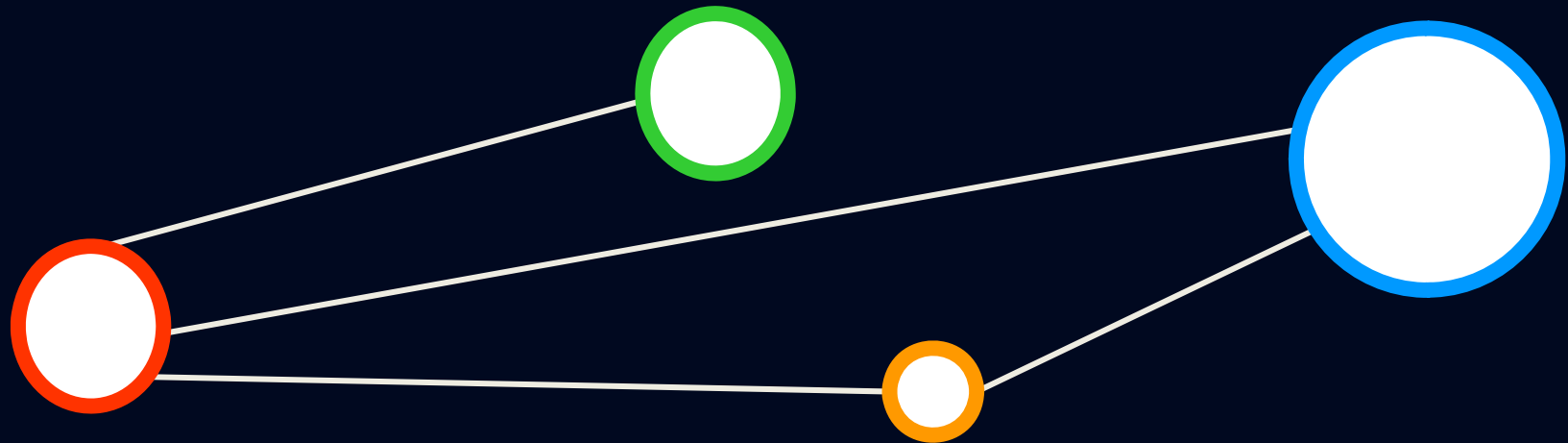
Workplan



Workplan

- Year 1
 - Mostly **focused on security, consolidation of services** and libraries, usability. First major release at the end of the year (technical preview around PM6)
- Year 2
 - Mostly focused on **messaging** services, integration of **virtualization** technology and standardization of interfaces. Second major release at the end of the year
- Year 3
 - **New requirements**, revision or business and exploitation plans
- (Year 4) → out of EMI run-time, but ‘kind of a goal’
 - **User-friendly, standard-based middleware is deployed through mainstream OS distributions and supported also by commercial companies**

AOB



Questions & Answers

- ?



Thank you

EMI is partially funded by the European Commission under Grant Agreement RI-261611