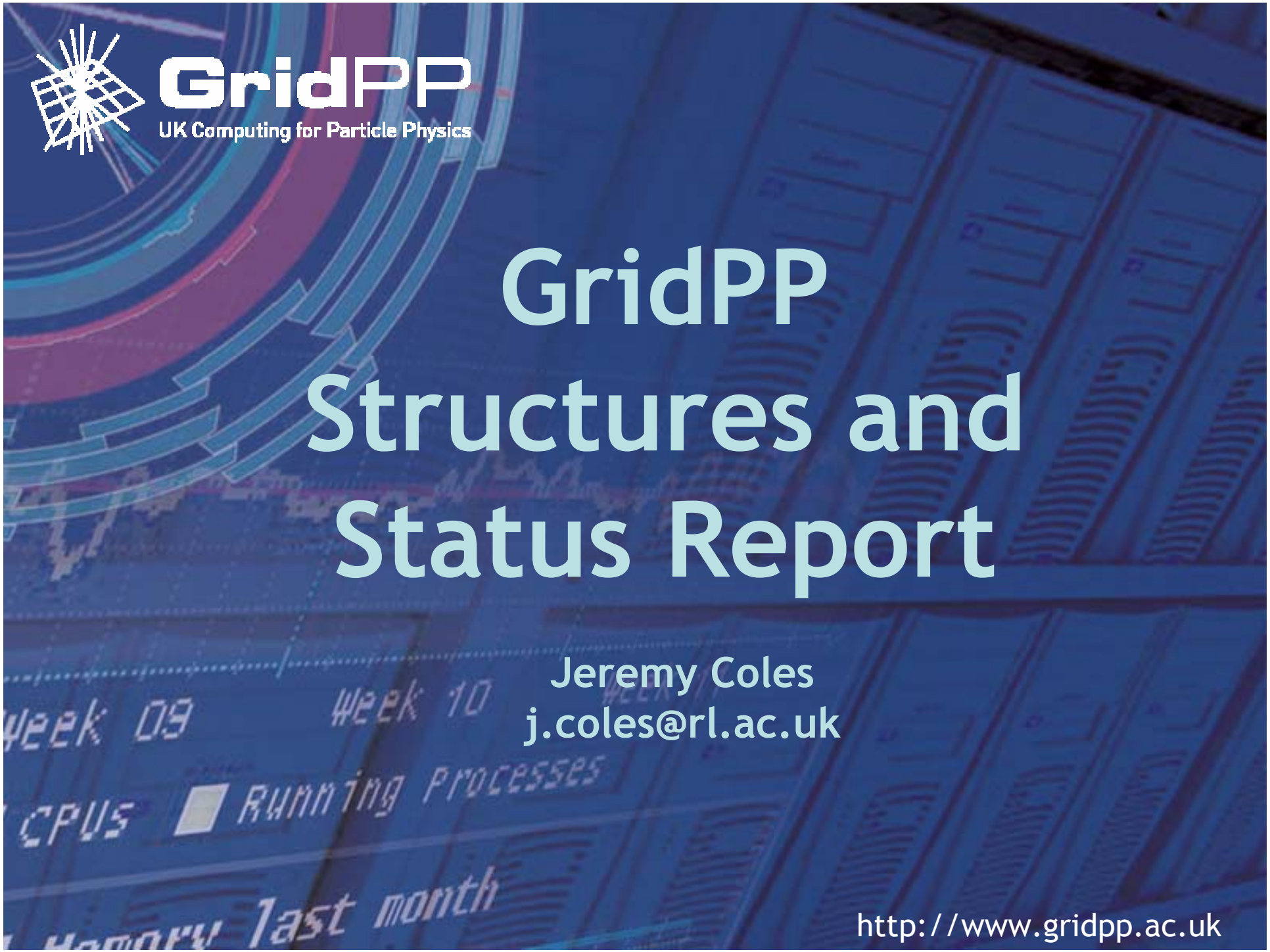
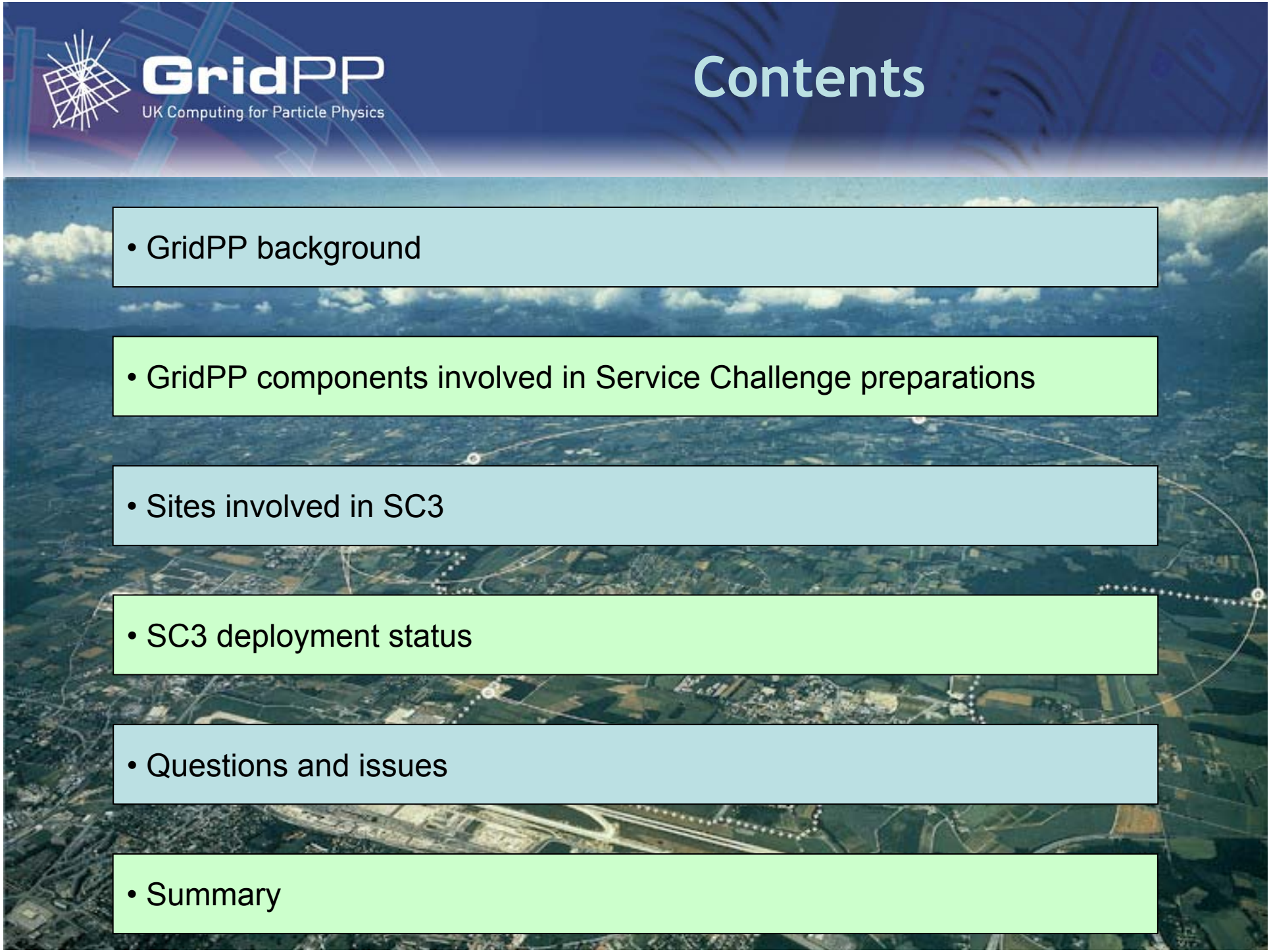


GridPP Structures and Status Report

Jeremy Coles
j.coles@rl.ac.uk

http://www.gridpp.ac.uk


GridPP
UK Computing for Particle Physics
Contents
• GridPP background
• GridPP components involved in Service Challenge preparations
• Sites involved in SC3
• SC3 deployment status
• Questions and issues
• Summary

GridPP background

GridPP

GridPP – A UK Computing Grid for Particle Physics

19 UK Universities, CCLRC (RAL & Daresbury) and CERN

Funded by the Particle Physics and Astronomy Research Council (PPARC)

GridPP1 - Sept. 2001-2004
£17m "From Web to Grid"

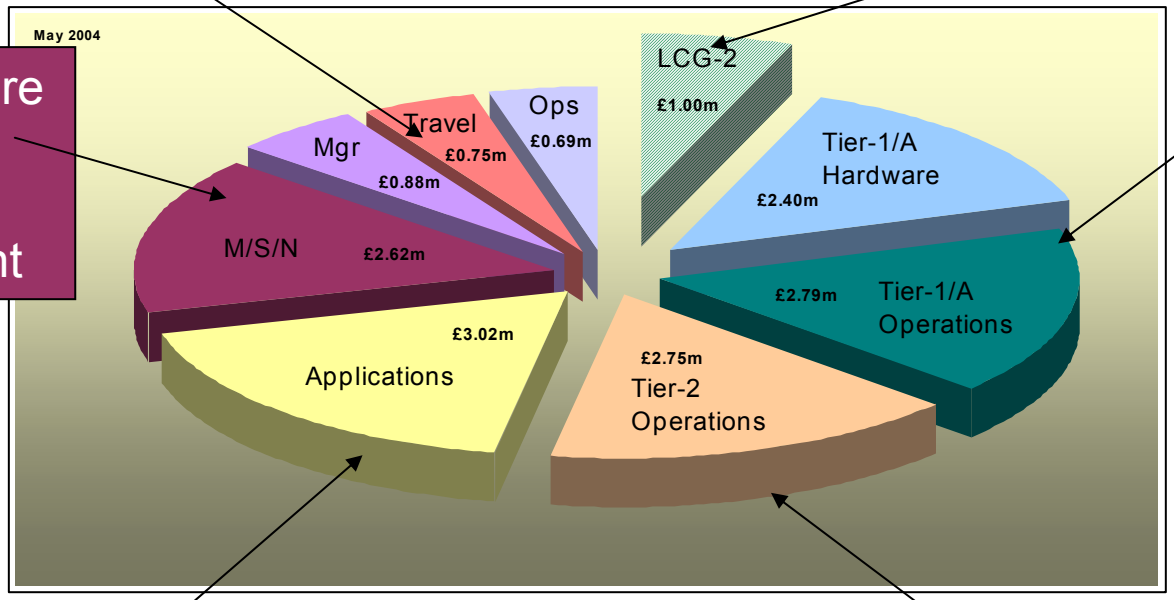
GridPP2 – Sept. 2004-2007
£16(+1)m "From Prototype to Production"

GridPP2 Components

A. Management, Travel, Operations

F. LHC Computing Grid Project (LCG Phase 2) [review]

B. Middleware Security Network Development



E. Tier-1/A Deployment: Hardware, System Management, Experiment Support

C. Grid Application Development LHC and US Experiments + Lattice QCD + Phenomenology

D. Tier-2 Deployment: 4 Regional Centres - M/S/N support and System Management

GridPP2 ProjectMap

GridPP
UK Computing for Particle Physics

GridPP2 Goal: To develop and deploy a large scale production quality grid in the UK for the use of the Particle Physics community

Production Grid Milestones

0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17
0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34
0.35	0.36	0.37	0.38	0.39	0.40	0.41	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.50	0.51
0.52	0.53	0.54	0.55	0.56	0.57											

Production Grid Metrics

0.100	0.101	0.102	0.103	0.104	0.105	0.106	0.107	0.108	0.109	0.110	0.111	0.112	0.113	0.114	0.115	0.116
0.117	0.118	0.119	0.120	0.121	0.122	0.123	0.124	0.125	0.126	0.127	0.128	0.129	0.130	0.131	0.132	0.133
0.134	0.135	0.136	0.137	0.138	0.139	0.140	0.141	0.142	0.143	0.144	0.145	0.146	0.147	0.148	0.149	0.150
0.151	0.152	0.153	0.154	0.155	0.156											

1 LCG

- 1.1 Applications
- 1.2 Computing Fabric
- 1.3 Grid Technology
- 1.4 Grid Deployment

2 M/S/N

Metadata 2.1

2.1.1	2.1.2	2.1.3	2.1.4	2.1.5
2.1.6	2.1.7	2.1.8	2.1.9	2.1.10
2.1.11	2.1.12			

Storage 2.2

2.2.1	2.2.2	2.2.3	2.2.4	2.2.5
2.2.6	2.2.7	2.2.8	2.2.9	2.2.10
2.2.11	2.2.12	2.2.13	2.2.14	2.2.15

Workload 2.3

2.3.1	2.3.2	2.3.3	2.3.4	2.3.5
2.3.6	2.3.7	2.3.8	2.3.9	2.3.10
2.3.11				

Security 2.4

2.4.1	2.4.2	2.4.3	2.4.4	2.4.5
2.4.6	2.4.7	2.4.8	2.4.9	2.4.10
2.4.11	2.4.12	2.4.13	2.4.14	2.4.15

InfoMon 2.5

2.5.1	2.5.2	2.5.3	2.5.4	2.5.5
2.5.6	2.5.7	2.5.8	2.5.9	2.5.10
2.5.11				

Network 2.6

2.6.1	2.6.2	2.6.3	2.6.4	2.6.5
2.6.6	2.6.7	2.6.8	2.6.9	2.6.10
2.6.11	2.6.12	2.6.13		

3 LHC Apps

ATLAS 3.1

3.1.1	3.1.2	3.1.3	3.1.4	3.1.5
3.1.6	3.1.7	3.1.8	3.1.9	3.1.10
3.1.11	3.1.12	3.1.13		

GANGA 3.2

3.2.1	3.2.2	3.2.3	3.2.4	3.2.5
3.2.6	3.2.7			

LHCb 3.3

3.3.1	3.3.2	3.3.3	3.3.4	3.3.5
3.3.6	3.3.7	3.3.8	3.3.9	3.3.10
3.3.11	3.3.12	3.3.13		

CMS 3.4

3.4.1	3.4.2	3.4.3	3.4.4	3.4.5
3.4.6	3.4.7	3.4.8	3.4.9	3.4.10
3.4.11	3.4.12	3.4.13	3.4.14	3.4.15

PhenoGrid 3.5

3.5.1	3.5.2	3.5.3	3.5.4	3.5.5
3.5.6	3.5.7	3.5.8	3.5.9	

LHC Deployment 3.6

3.6.1	3.6.2	3.6.3	3.6.4	3.6.5
3.6.6	3.6.7	3.6.8	3.6.9	3.6.10

4 Non-LHC Apps

BaBar 4.1

4.1.1	4.1.2	4.1.3	4.1.4	4.1.5
4.1.6	4.1.7	4.1.8	4.1.9	4.1.10
4.1.11	4.1.12	4.1.13	4.1.14	

SamGrid 4.2

4.2.1	4.2.2	4.2.3	4.2.4	4.2.5
4.2.6	4.2.7	4.2.8	4.2.9	4.2.10
4.2.11	4.2.12	4.2.13	4.2.14	

Portal 4.3

4.3.1	4.3.2	4.3.3	4.3.4	4.3.5
4.3.6	4.3.7	4.3.8	4.3.9	4.3.10
4.3.11	4.3.12	4.3.13		

UKQCD 4.4

4.4.1	4.4.2	4.4.3	4.4.4	4.4.5
4.4.6	4.4.7	4.4.8	4.4.9	

5 Management

Project Planning 5.1

5.1.1	5.1.2	5.1.3	5.1.4	5.1.5
5.1.6	5.1.7	5.1.8	5.1.9	5.1.10
5.1.11	5.1.12			

Project Execution 5.2

5.2.1	5.2.2	5.2.3	5.2.4	5.2.5
5.2.6	5.2.7	5.2.8	5.2.9	5.2.10
5.2.11	5.2.12	5.2.13	5.2.14	5.2.15

6 External

Dissemination 6.1

6.1.1	6.1.2	6.1.3	6.1.4	6.1.5
6.1.6	6.1.7	6.1.8	6.1.9	

Interoperability 6.2

6.2.1	6.2.2	6.2.3	6.2.4	6.2.5
6.2.6	6.2.7	6.2.8	6.2.9	6.2.10
6.2.11	6.2.12	6.2.13		

Engagement 6.3

6.3.1	6.3.2	6.3.3	6.3.4	6.3.5

Knowledge Transfer 6.4

6.4.1	6.4.2	6.4.3	6.4.4	

Navigate down
External link
Other Link

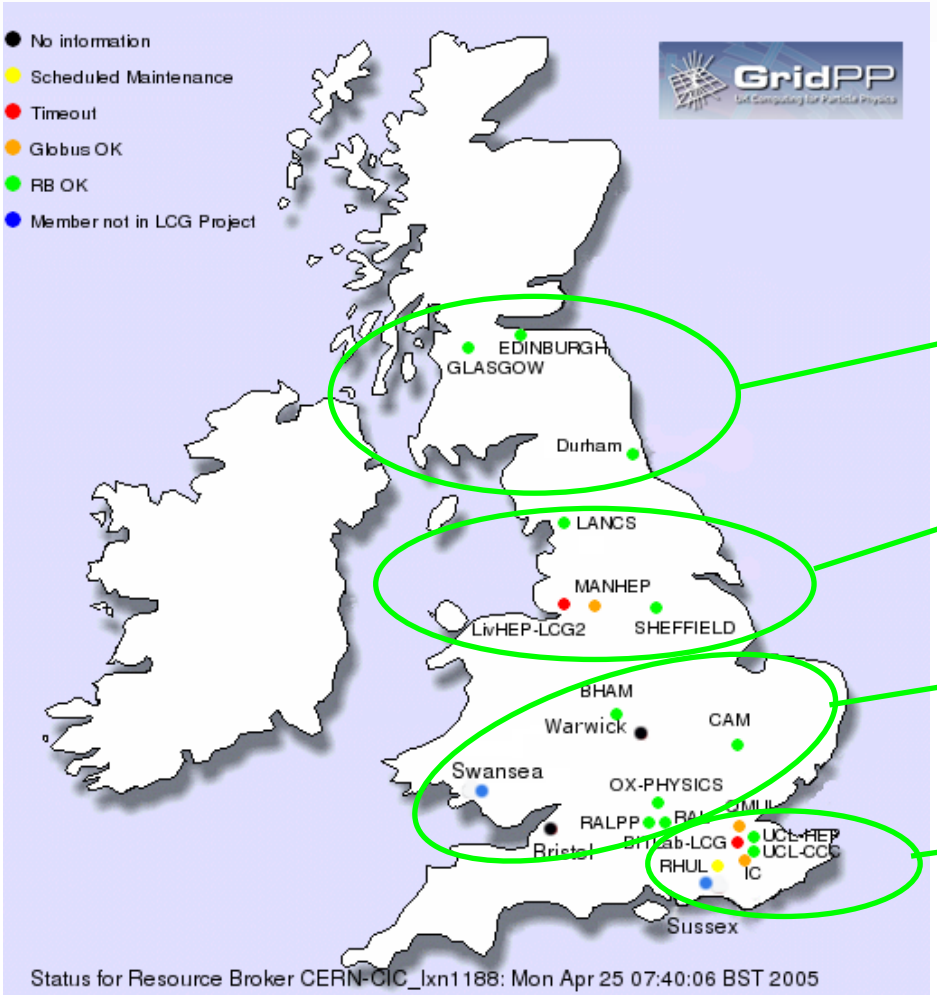
Status Date - 30/Sep/04 + next 60 Days

Monitor OK	1.1.1
Monitor not OK	1.1.1
Milestone complete	1.1.1
Milestone overdue	1.1.1
Milestone due soon	1.1.1
Milestone not due soon	1.1.1
Item not Active	1.1.1

Update
Clear

17th May 2005 Service Challenge Meeting Jeremy Coles - RAL

GridPP sites



Tier-2s

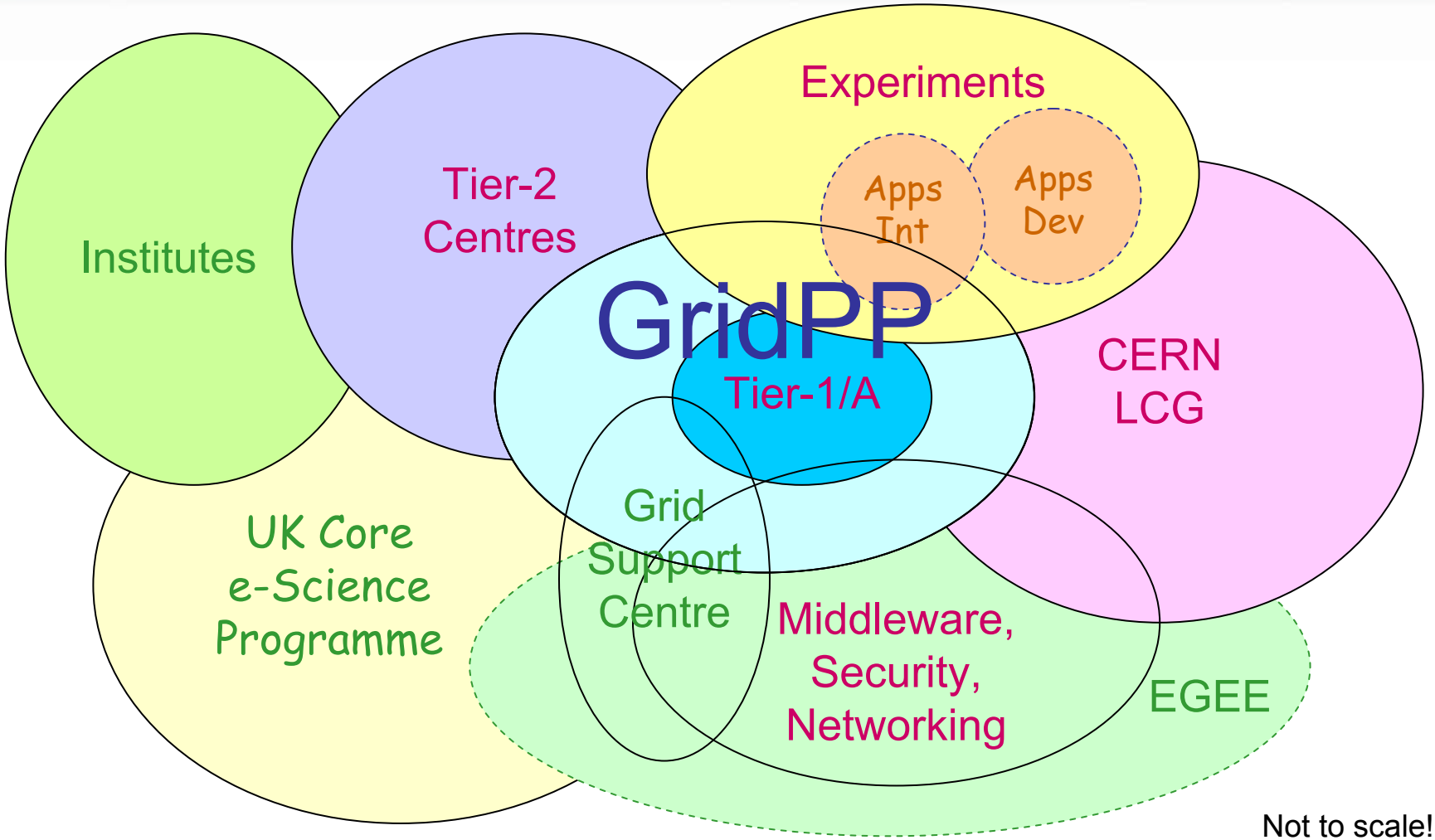
ScotGrid

NorthGrid

SouthGrid

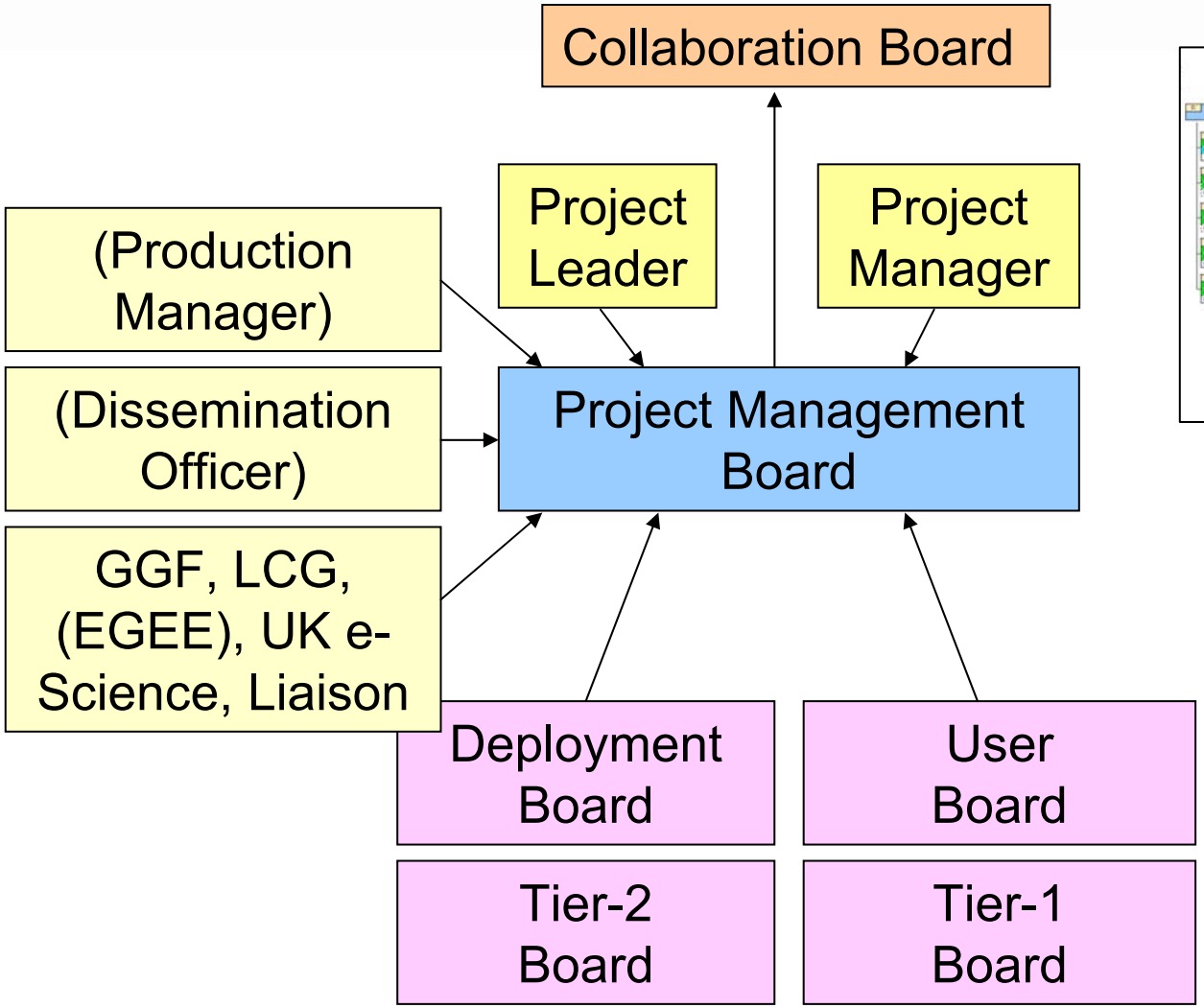
London Tier-2

GridPP in Context

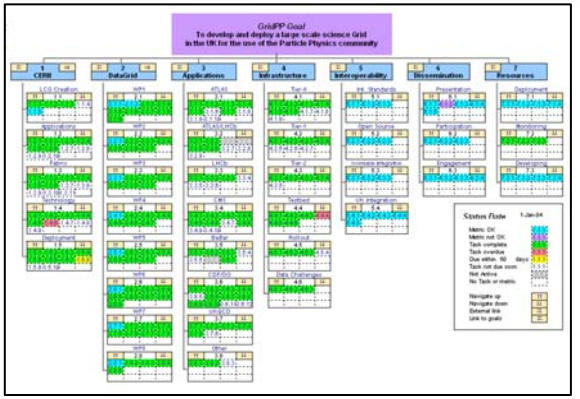


Not to scale!

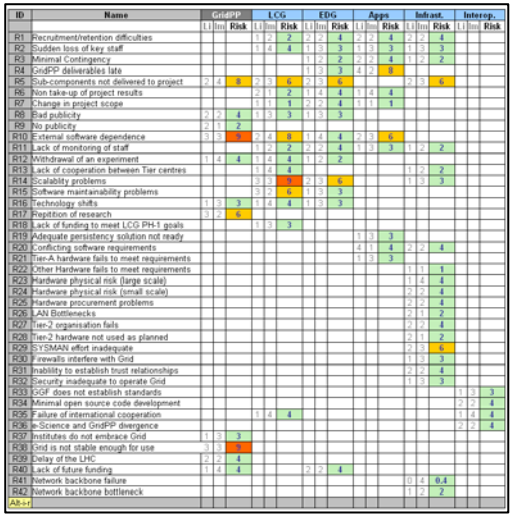
GridPP Management



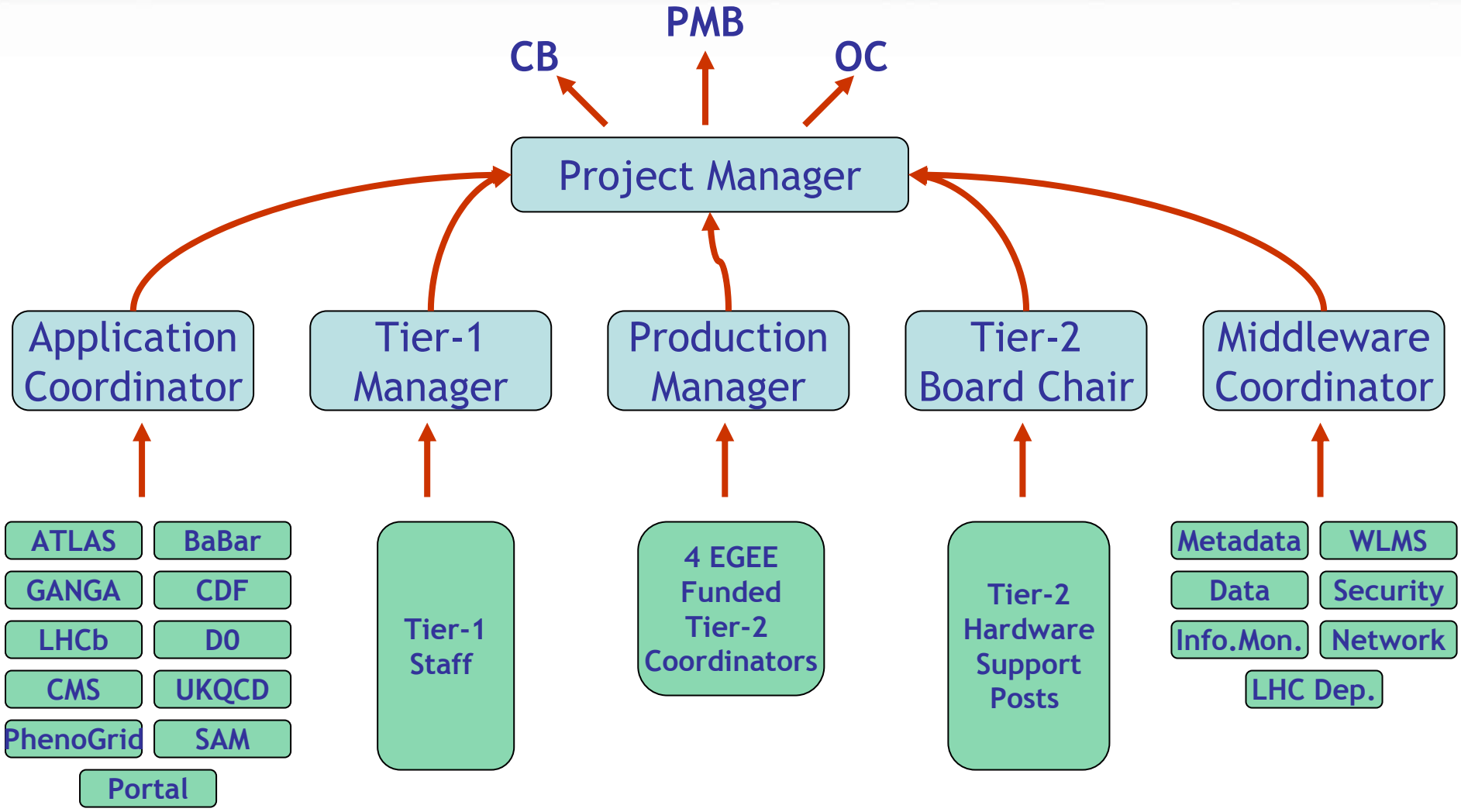
Project Map



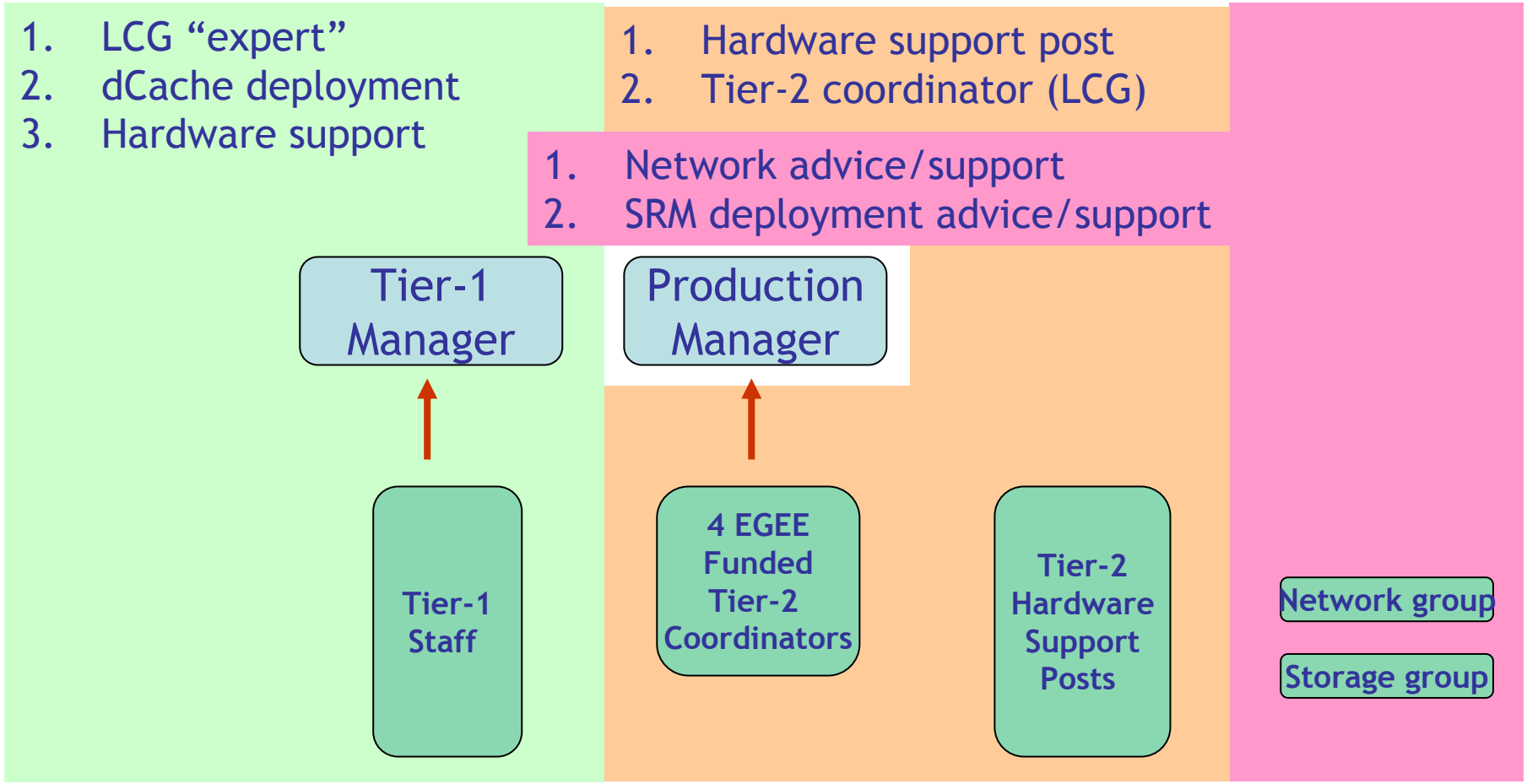
Risk Register



Reporting Lines



Service Challenge coordination



Activities to help deployment

- RAL storage workshop – review of dCache model, deployment and issues
- Biweekly network teleconferences
- Biweekly storage group teleconferences. GridPP storage group members available to visit sites.
- UK SC3 teleconferences – to cover site problems and updates
- SC3 “tutorial” last week for grounding in FTS, LFC and review of DPM and dCache

Agendas for most of these can be found here:
http://agenda.cern.ch/displayLevel.php?fid=338

Sites involved in SC3

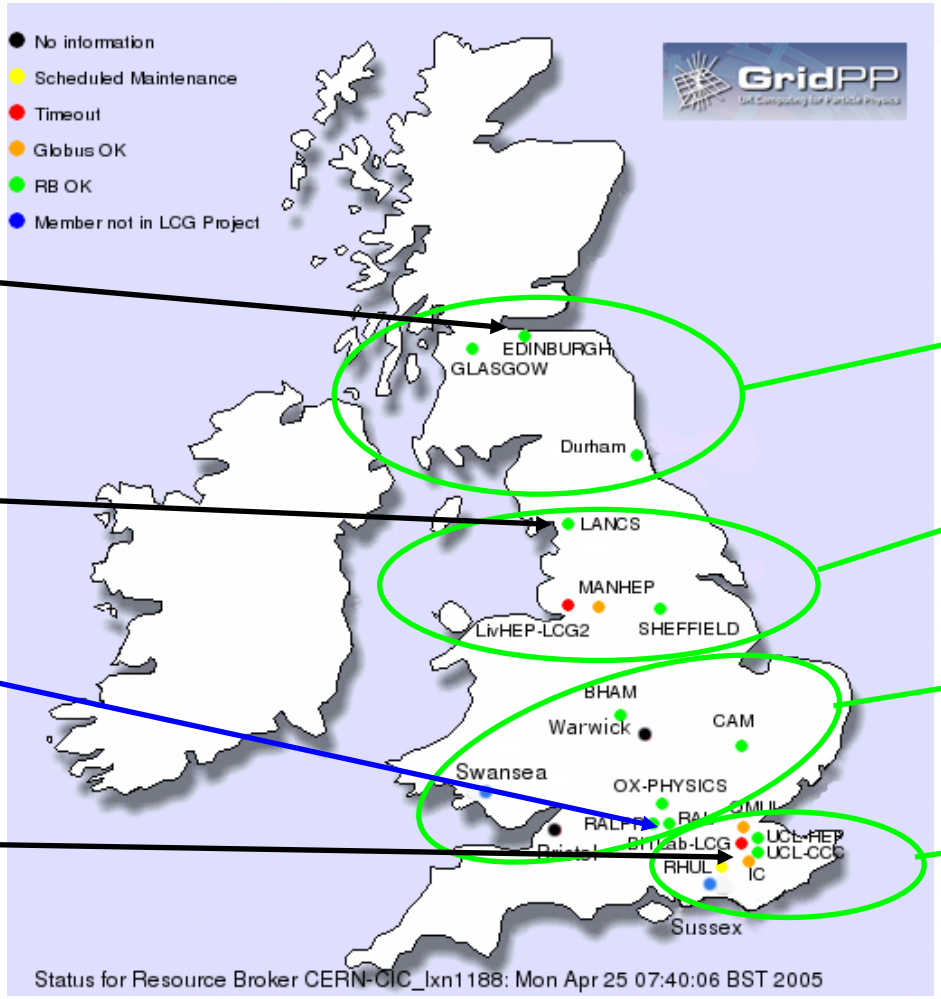
SC3 sites

LHCb

ATLAS

Tier-1

CMS



Tier-2s

ScotGrid

NorthGrid

SouthGrid

London Tier-2

Networks status

Connectivity

- RAL to CERN — 2*1 Gbits/s via UKLight and Netherlight
- Lancaster to RAL — 1*1 Gbits/s via UKLight (fallback: SuperJanet 4 production network)
- Imperial to RAL — SuperJanet 4 production network
- Edinburgh to RAL — SuperJanet 4 production network

Status

1) Lancaster to RAL UKLight connection requested 6th May 2005
2) UKLight access to Lancaster available now
3) Additional 2*1 Gbit/s interface card required at RAL

Issues

- Awaiting timescale from UKERNA on 1 & 3
- IP level configuration discussions (Lancaster-RAL) just started
- Merging SC3 production traffic and UKLight traffic raises several new problems
- Underlying network provision WILL change between now and LHC start-up

Tier-1

- Currently merging SC3 dCache with production dCache
  - Not yet clear how to extend production dCache to allow good bandwidth to UKLIGHT, the farms and SJ4
  - dCache expected to be available for Tier-2 site tests around 3rd June
- Had problems with dual attachment of SC2 dCache. A fix has been released but we have not yet tried it.
  - Implications for site network setup
- CERN link undergoing “health check” this week. During SC2 the performance of the link was not great
- Need to work on scheduling (assistance/attention) transfer tests with T2 sites. Tests should complete by 17th June.
- Still unclear on exactly what services need to be deployed – there is increasing concern that we will not be able to deploy in time!

Tier-1 high-level plan

Date	Status
Friday 20th May	Network provisioned in final configuration
Friday 3rd June	Network confirmed to be stable and able to deliver at full capacity. SRM ready for use
Friday 17th June	Tier-1 SRM tested end-to-end with CERN. Full data rate capability demonstrated. Load balancing and tuning completed to Tier-1 satisfaction
Friday 1st July	Completed integration tests with CERN using FTS. Certification complete. Tier-1 ready for SC3

Edinburgh (LHCb)

HARDWARE

- GridPP frontend machines upgraded to 2.4.0. Limited CPU available (3 machines – 5CPUs). Still waiting for more details about requirements from LHCb
- 22TB datastore deployed but a raid array problem leads to half the storage being currently unavailable – IBM investigating
- Disk server: IBM xSeries 440 with eight 1.9 GHz Xeon processors, 32Gb RAM
- GB copper Ethernet to GB 3com switch

SOFTWARE

- dCache head and pool nodes rebuilt with Scientific Linux 3.0.4. dCache now installed on admin node using apt-get. Partial install on pool node. On advice will restart using YAIM method.
- What software does LHCb need to be installed?

Imperial (CMS)

HARDWARE

- 1.5TB CMS dedicated storage available for SC3
- 1.5TB (shared) shared storage can be made partially available
- May purchase more if needed – what is required!?

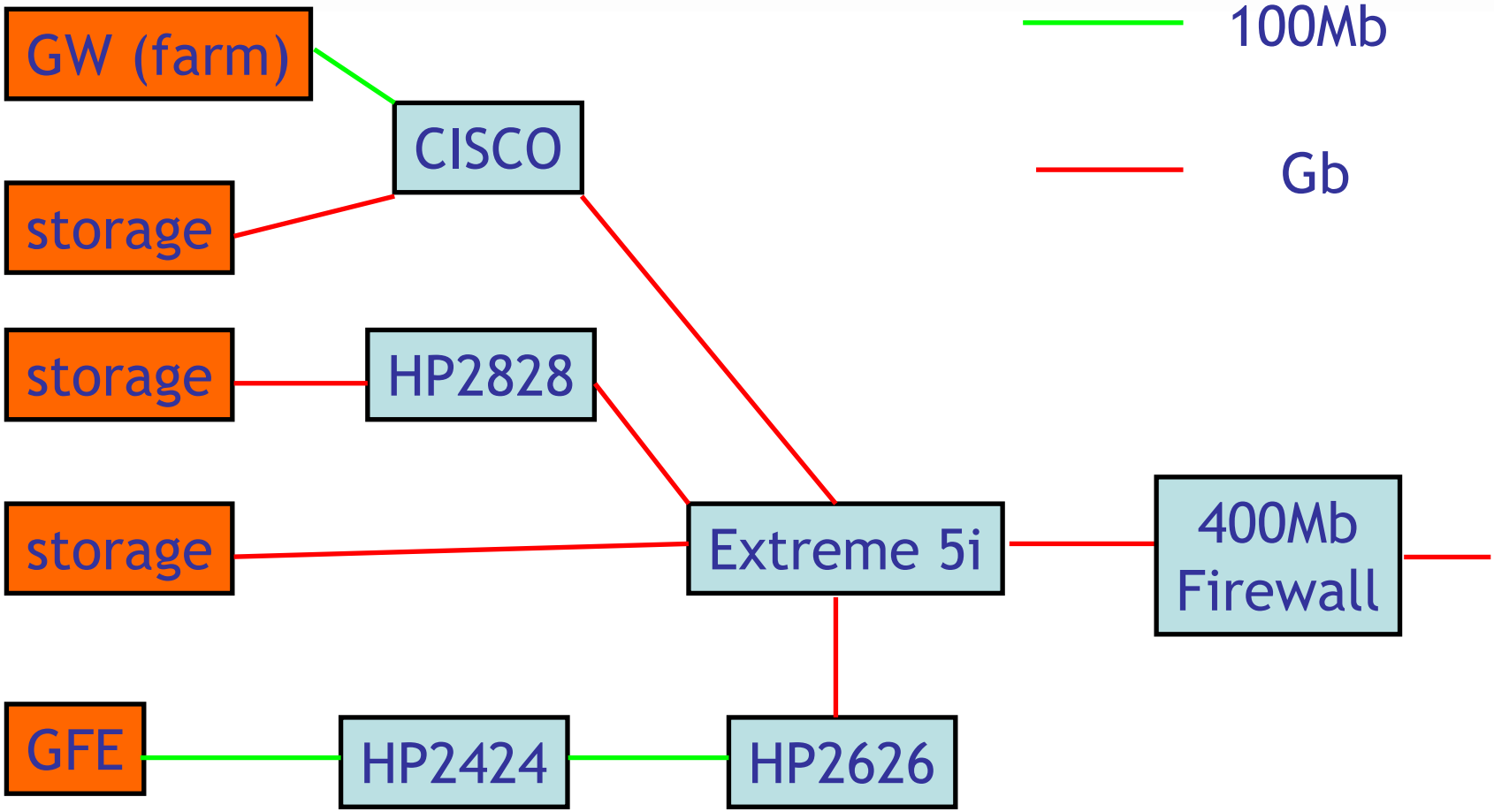
- Farm on 100Mb connection.1Gb connection to all servers.
  - 400Mb firewall may be a bottleneck.
  - Two separate firewall boxes available
  - Could upgrade to 1Gb firewall – what is needed?

Imperial (CMS)

SOFTWARE

- dCache SRM now installed on test nodes
  - 2 main problems both related to installation scripts
- This week starting installation on a dedicated production server
  - Issues: Which ports need to be open through the firewall, use of pools as VO filespace quotas and optimisation of local network topology
- CMS software
  - Phedex deployed, but not tested
  - PubDB in process of deployment
  - Some reconfiguration of farm was needed to install CMS analysis software
  - What else is necessary? More details from CMS needed!

Imperial Network



Lancaster

HARDWARE

- Farm now at LCG 2.4.0.
- 6 I/O servers with 2x6TB RAID5 arrays each currently has 100 Mb/s connectivity
- Request submitted to UKERNA for dedicated lightpath to RAL. Currently expect to use production network.
- T2 Designing system so that no changes needed for transition from throughput phase to service phase.
  - Except possible IPerf and/or transfers of “fake data” as backup of connection and bandwidth tests in throughput phase

SOFTWARE

- dCache deployed onto test machines. Current plans have production dCache available in early July!
- Currently evaluating what ATLAS software and services needed overall and their deployment
- Waiting for FTS release.

Lancs/ATLAS SC3 Plan

GridPP
UK Computing for Particle Physics

Task	Start Date	End Date	Resource
Optimisation of network	Mon 18/09/06	Fri 13/10/06	BD,MD,BG,NP, RAL
Test of data transfer rates (CERN-UK)	Mon 16/10/06	Fri 01/12/06	BD,MD, ATLAS, RAL
Provision of end-to-end conn. (T1-T2)			
Integrate Don Quixote tools into SC infrastructure at LAN	Mon 19/09/05	Fri 30/09/05	BD
Provision of memory-to-memory conn. (RAL-LAN)	Tue 29/03/05	Fri 13/05/05	UKERNA,BD,BG,NP, RAL
Provision and Commission of LAN h/w	Tue 29/03/05	Fri 10/06/05	BD,BG,NP
Installation of LAN dCache SRM	Mon 13/06/05	Fri 01/07/05	MD,BD
Test basic data movement (RAL-LAN)	Mon 04/07/05	Fri 29/07/05	BD,MD,ATLAS, RAL
Review of bottlenecks and required actions	Mon 01/08/05	Fri 16/09/05	BD
[SC3 – Service Phase]			
Review of bottlenecks and required actions	Mon 21/11/05	Fri 27/01/06	BD
Optimisation of network	Mon 30/01/06	Fri 31/03/06	BD,MD,BG,NP
Test of data transfer rates (RAL-LAN)	Mon 03/04/06	Fri 28/04/06	BD,MD,
Review of bottlenecks and required actions	Mon 01/05/06	Fri 26/05/06	BD

What we know!

Task	Start Date	End Date
Tier-1 network in final configuration	Started	20/5/05
Tier-1 Network confirmed ready. SRM ready.	Started	1/6/05
Tier-1 – test dCache dual attachment?		
Production dCache installation at Edinburgh	Started	30/05/05
Production dCache installation at Lancaster		TBC
Production dCache installation at Imperial	Started	30/05/05
T1-T2 dCache testing		17/06/05
Tier-1 SRM tested end-to-end with CERN. Load balanced and tuned.		17/06/05
Install local LFC at T1		15/06/05
Install local LFC at T2s		15/06/05
FTS server and client installed at T1	ASAP?	??
FTS client installed at Lancaster, Edinburgh and Imperial	ASAP?	??

What we know!

Task	Start Date	End Date
CERN-T1-T2 tests	24/07/05	
Experiment required catalogues installed??	WHAT???	
Integration tests with CERN FTS		1/07/05
Integration tests T1-T2 completed with FTS		
Light-path to Lancaster provisioned	6/05/05	??
Additional 2*1Gb/s interface card in place at RAL	6/05/05	TBC
Experiment software (agents and daemons)		
3D	01/10/05?	

What we do not know!

- How much storage is required at each site?
- How many CPUs should sites provide?
- Which additional experiment specific services need deploying for September? E.g. Databases (COOL – ATLAS)
- What additional grid middleware is needed and when will it need to be available (FTS, LFC)
- What are the full set of pre-requisites before SC3 can start (perhaps SC3 is now SC3-I and SC3-II)
  - Monte Carlo generation and pre-distribution
  - Metadata catalogue preparation
- What defines success for the Tier-1, Tier-2s, the experiments and LCG!

Summary

- UK participating sites have continued to make progress for SC3
- Lack of clear requirements is still causing some problems in planning and thus deployment
- Engagement with the experiments varies between sites
- Friday's "tutorial" day was considered very useful but we need more!
- We do not have enough information to plan an effective deployment (dates, components, testing schedule etc.) and there is growing concern as to whether we will be able to meet SC3 needs if they are defined late
- The clash of the LCG 2.5.0 release and start of the Service Challenge has been noted as a potential problem.