



WLCG – Worldwide LHC Computing Grid

Grid Operations: The Current Model

WLCG Service Reliability
Workshop
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Grid Operations



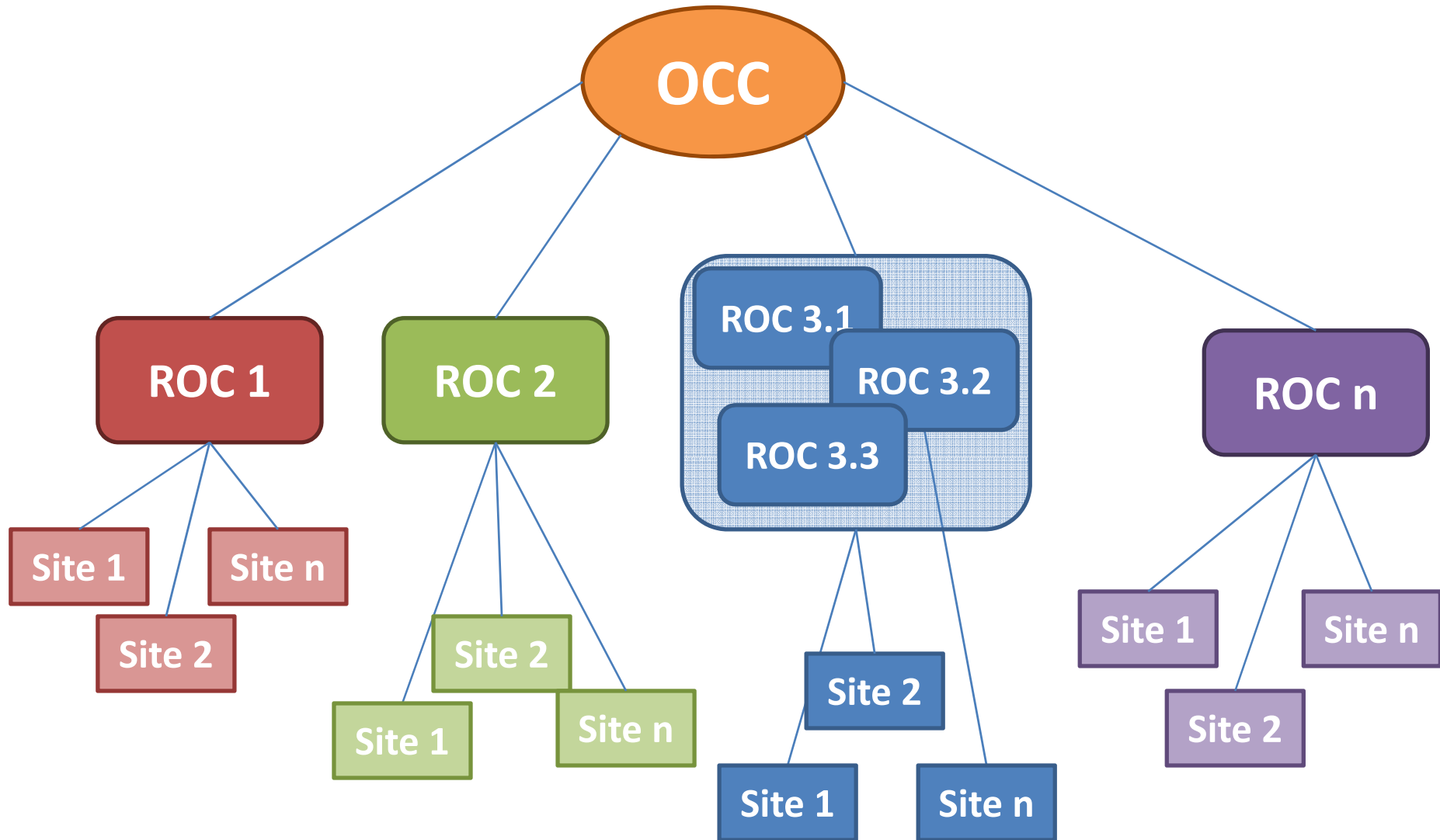


What is Grid Operations? Well...

- Infrastructures
 - Production service
 - Pre-production service (PPS)
- Processes
 - Middleware release process
 - Site registration
 - VO registration
- Communications
 - Weekly, monthly, bi-annual meetings for all stakeholders
- Interoperations with other grids (OSG)
- Grid security
- User + Operations support
- Operations tools
 - CIC Portal
 - Broadcast tool
 - VO ID cards
 - GOC database
 - Monitoring
 - Trouble ticketing system (GGUS)
- ... among other things!



Grid Operations Management: Logical Structure

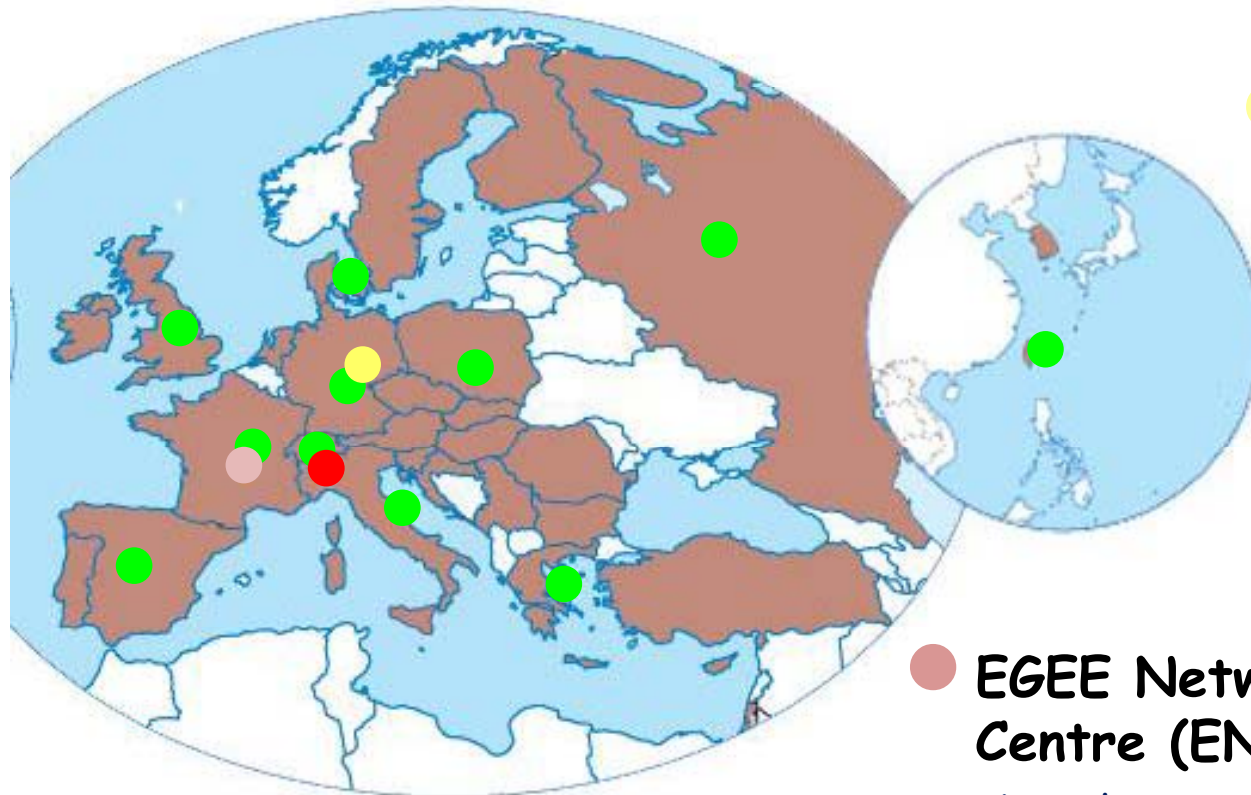




Grid Operations Management: Physical Structure

● Operations Coordination Centre
Management, oversight, coordination

● Regional Operations Centres
Core support infrastructure



● Grid User Support (GGUS)
Coordination, management of user support

● EGEE Network Operations Centre (ENOC)
Coordination with NRENs & GEANT2



Day-to-day Grid Operations

- Everyone contributes (or should): OCC, ROCs, sites
- However, day-to-day "grid level" operations carried out by the COD teams, using COD dashboard
(COD = "CIC-on-duty", CIC = "Core Infrastructure Centre" ??)
- 10 teams - 1 from each ROC. 2 teams on shift per week.
- Handover at the weekly grid operations meeting
- CODs are currently responsible for monitoring the grid, spotting the major problems, raising tickets and chasing resolution
- But this needs to change (not scalable). Need to move more responsibility to the ROCs and sites
 - *Pro-activity!*



User Support

- Organized in a similar way to grid operations:
 - Coordinated by the ESC (executive support committee)
 - Teams of TPMs (Ticket Processing Managers) handle tickets coming into the GGUS system
 - TPM teams hand over each week
 - A significant difference is that some (all?) of the LHC VOs act as 1st level support and only pass tickets to GGUS when can't be answered "in house"
- Again, a significant amount of effort goes into this activity - including from the LHC experiments!



Tools for the job

- CIC Portal := Grid Operations Portal (IN2P3)
 - Central portal for grid operations
- GOC DB := Grid Operations Centre database (RAL)
 - Contains contact and security information for all sites + contains a “steady state” view of the sites and the services which they provide
- GGUS := Global Grid User Support (FZK)
- FCR := Freedom of Choice of Resources (CERN)
 - Allows VOs to select sites according either to SAM results or to VO maintained whitelist / blacklist
- SAM := Service Availability Monitoring (CERN)
- Gstat : displays + validates the information published to the grid Information System by the sites
- Accounting Enforcement Portal: show which sites are not publishing accounting data



Tools for the job

- CIC Portal : <http://cic.gridops.org/>
- GOC DB : <https://goc.gridops.org/>
- GGUS : www.ggus.org
- FCR : <https://lcg-fcr.cern.ch:8443/fcr/fcr.cgi>
- SAM : <https://lcg-sam.cern.ch:8443/sam/sam.py>
- Gstat : <http://goc.grid.sinica.edu.tw/gstat/>
- Accounting Enforcement Portal : www3.egee.cesga.es/acctenfor



Interoperations: We are not alone

- And not to forget interoperations with other grids around the world. Currently only OSG but NorduGrid and other will come along soon.
- More than just interoperability (which is the easy bit :o)
 - Cross grid trouble tickets
 - Interoperability testing
 - Dependency analysis
- Interoperations effectively adds another dimension to the complexity matrix



Meetings, meetings

- WLCG/OSG/EGEE weekly grid operations meeting
 - Conference call every Monday at 16:00 Swiss local time (agendas: <http://indico.cern.ch/categoryDisplay.py?categId=258>)
 - Attendees:
 - Tier 0/1 sites (mandatory), Other sites (optional), WLCG coordination, VOs (LHC VOs mandatory), ROCs, EGEE operations team, OSG operations team, GGUS representative, Security representative
 - Efficacy has improved enormously over last 2 years
 - Further improvements in the pipeline - suggestions always welcome 😊
- Bi-weekly ROC Managers meeting
 - Handle longer term issues, strategic decision making for operations, tactical planning, etc.
- Bi-annual (roughly) operations workshops
- Sessions at WLCG collaboration workshops



Processes & Procedures

- **Middleware release process**
 - Formalized process to move middleware updates and new services through pre-production testing and into the production service (more on this later)
 - Speed of release vs testing (reliability)
 - Soon to include interoperability testing with OSG
- **Security Incident Response Procedure**
 - https://edms.cern.ch/file/867454/1/EGEE_Incident_Response_Procedure.pdf
- **Site registration**
 - <https://edms.cern.ch/document/503198/>
- **VO registration**
 - <http://edms.cern.ch/document/503245>
- **Grid operations procedures manual**



Information Overload

- *Many sources of information on all aspects of operations (some better maintained than others). A smattering...*
 - GOC wiki: <http://goc.grid.sinica.edu.tw/gocwiki/FrontPage>
 - GGUS documentation for site administrators: <https://gus.fzk.de/pages/docu.php#3>
 - GridPP Admin Area: <http://www.gridpp.ac.uk/deployment/admin/admin.html>
 - System Management Working Group (SMWG) wiki: http://www.sysadmin.hep.ac.uk/wiki/Main_Page
 - LCG directory: <http://lcg.web.cern.ch/LCG/Sites/the-LCG-directory.html>
 - EGEE SA1 Wiki: <https://twiki.cern.ch/twiki/bin/view/EGEE/SA1>



As clear as mud?

*Questions
(and hopefully answers)*



How can/should grid operations interact with the LHC experiments in the future?

