

# Operations procedures

## CERN Site Report

Grid operations workshop  
Stockholm 13 June 2007

- Tools used in daily operations
- Features missing
- Examples of the most frequent scheduled interventions at CERN
- Examples of the most frequent unscheduled interventions at CERN
- Points to improve in communication with ROC, other sites, VOs, rest of the world...
- Plan for deployment of updates/new versions in continuous operation
- Communication with users
- Correlation of cross-site issues
- Percentage of real site problems are detected and reported by the COD before we know about them
- Usefulness of operations bodies/meetings

- CERN fabric by numbers
  - CE (DNS loadbalanced clusters)
    - 17 LCG CE
    - 5 gLite CE
  - WNs: ~2800 WNs, 7000 CPUs
  - SE
    - SRM – 20 nodes (v11, v22)
    - Storage system: CASTOR version 2
      - ~1.5PB disk cache (LHC VOs only)
      - 3PB tape used, ~140 tape drives (T10K, 3592B, 9940B)
- Service not covered in this presentation
  - FTS
  - gLite WMS
  - VOMS
  - Database services

- ELFms toolsuite (<http://cern.ch/elfms>)
  - Monitoring, exceptions & alarms
  - System installation and configuration
  - Hardware and state management
  - Service display
- Operational strategy
  - Automate where possible
    - Lemon actuators
    - Automated state changes upon declared exceptions
  - If not, document the procedure, if possible for non service-expert use (sysadmin, operators)
- Operation and support workflows
  - Remedy
  - GGUS tickets are fed into local Remedy



Lemon  
alarmsUser/experiment  
problemsCC  
operatorsSysadmin  
teamService  
managersService  
experts

- 24 x 7 coverage
  - 1<sup>st</sup> level alarm handling
  - Driven by procedures
  - 2<sup>nd</sup> level alarms
  - System installation
  - Manage hardware configuration
  - 24 x 7 coverage through procedures
  - Service responsible
  - Applies s/w upgrades, configuration changes, provides
  - May end up in bug to developers
  - Entry point for support lines
  - SMod, GMod — person on rota
- Problem reports come to the Service Managers via many different flows, using many different tools, directly and indirectly.**
- This still needs some tuning**
- Piquet Working Group looking into the possibility to establish piquet services for critical services**

- Support for scheduled upgrades (ongoing)
  - Needed for partitioning of clusters into “prod” / “new” / “test” areas
  - Moving from 1-2 linux upgrade/week to ‘scheduled upgrades’ where we only apply software updates between LHC runs
  - Aim to validate the complete software stack (OS + middleware + applications). Need experiment help!
  - Planned for ~end summer
- Lemon GUI service views (ongoing)
  - Allows to tailor Lemon GUI to show service specific metrics (e.g. castor request rate)
  - Planned for July
- Alarm SAM failures for CERN-PROD

- Upgrades to storage system
  - Intrusive oracle intervention on the castor name server database (e.g. moving to new hardware, quarterly patches)
    - Affects all VOs
    - Batch normally paused during the intervention
  - New castor stager version, intrusive oracle interventions
    - Usually only one VO at a time
  - Tape library interventions
    - Degradation (long wait time for tape recalls) for all VOs
- Router/switch upgrades or changes
- Changes to the CE cluster
  - Draining of nodes for h/w intervention
  - Only degradation, no service interruption



- Power cuts / cooling failures
- CASTOR stager meltdowns
  - Usually only one VO
  - If left for longer period (e.g. over a Weekend) it can result in global degradation of the SRM service affecting all VOs
- CE overload



- Weekly site reports
  - Need to streamline better local reporting to fit the grid
    - Content
      - Consistency
      - Avoid duplication where possible
      - Flag relevance (grid/non-grid)
    - Synchronization in time
    - Avoid duplication
  - Site availability
    - Test categories can be confusing (CE – SE correlations)
- VO communication: when to use broadcast?
  - Currently using a mixture of mailing lists, hn, broadcasts
  - Trying to move to use broadcast more consistently but today this is not sufficient
- Weekly GGUS ticket review with ROC is very useful!

- We plan to only apply software updates between LHC runs
- This means that we will prepare updates during LHC runs
- Aim to validate the complete software stack (OS + middleware + applications). Need experiment help!
- To be done in 2007: make a test cluster available to validate upcoming releases
- Hope to move to this mode in ~September

- Channels for service announcements agreed with each experiment VO managers individually
  - [XXX-support@cern.ch](mailto:XXX-support@cern.ch), [hn-YYY@cern.ch](mailto:hn-YYY@cern.ch)
  - List of named people
  - Broadcasts
  - + combinations of above
- Support: power-users know the shortcuts but we are trying to insist on use of support flows

- Particularly relevant for data transfers problems
  - Who owns the problem from start?
  - Who determines what site/component is at fault?
  - Successful problem determination usually depends on a coordinated investigations between the involved sites
  - Access to log files and other relevant information
  - Login access to remote hosts for 'bare' transfer tests

- Have not gathered any statistics but most probably <50%
- What is a 'real site problem'?
  - Degradation
    - Failure of one CE node out of a loadbalanced cluster of 10
  - Partial outage
    - SE for one VO is unavailable due to CASTOR problems
  - Full outage
- Even if the problem is known, the COD reports are in general useful for us
  - Probing can detect configuration problems that we can't see ourselves
    - Recent case with groups.conf file on the CEs

- Weekly grid operations meeting is of little / no use for CERN-PROD service mgrs
  - Prefer expanding our weekly meeting with ROC mgrs (ticket review) to include
    - Review site availability
    - Weekly service reports
    - Coordination of scheduled interventions
    - Review GGUS tickets
- Operations bodies
  - User support
    - Good filtering but sometimes slow escalation
  - Operation
    - COD reports are in general useful

FIO

The Baltic Sea COD is delicious,  
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CERN IT  
Department





