

Fabric Infrastructure and Operations



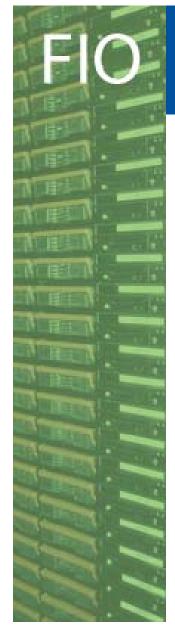
Operations procedures

CERN Site Report

Grid operations workshop Stockholm 13 June 2007

CERN - IT Department CH-1211 Genève 23 Switzerland www.cern.ch/it





Many questions to answer in 15'!



- 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







Overview



- 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







Tools used in daily operations CERN

- CERN T Department
- ELFms toolsuite (<u>http://cern.ch/el</u>fms)
 - Monitoring, exceptions & alarms
 - System installation and configuratiom quattor
 - Hardware and state management
- **V**leaf

- 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



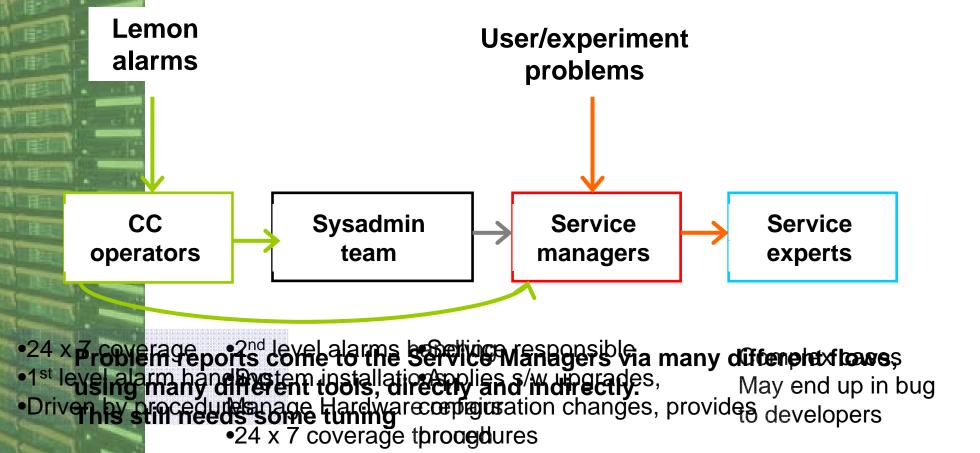


Grid services support flow

Piquet Working & FOUT POOK IN THE TOUR SHEET FOR SHEET F

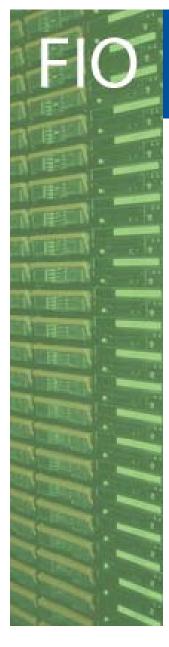
establish piquet services for SMACa GMAN cegerson on rota





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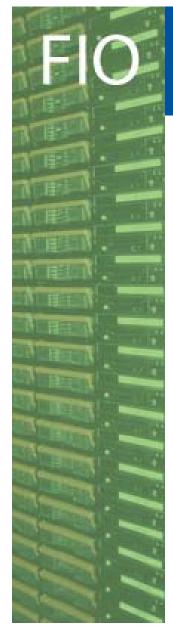
Features missing



- 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







Examples of the most frequent scheduled interventions at CERN



- 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







Examples of the most frequent unscheduled interventions at CERN



- 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







Points to improve in communication with ROC, CERN To other sites, VOs, rest of the world... Department

- 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!







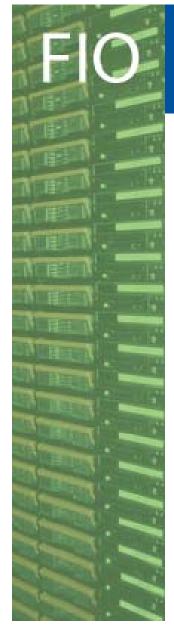
Plan for deployment of updates/new versions in continuous operation



- 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







Communication with users



- Channels for service announcements agreed with each experiment VO managers individually
 - XXX-support@cern.ch, 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







Correlation of cross-site issues



- 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







Percentage of real site problems are detected and reported by the COD before we know about them



- 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







Usefulness of operations bodies/meetings



- 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







The Baltic Sea COD is delicious, try it while you're in Stockholm





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