

The dummies guide to controlling your changes

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What is a Change Control?

- The purpose of the CC is to systematically manage modifications to products, processes, or service to **minimize risks** and **maintain quality and integrity**.
- It ensures changes are identified, evaluated, approved, implemented, and reviewed in a controlled manner, which helps mitigate errors, ensure regulatory compliance, maintain consistent quality, optimize costs, improve stakeholder communication, enhance decision-making.
- It includes identifying necessary changes, evaluating their potential impacts, obtaining required approvals, implementing the changes in a controlled manner, and reviewing the outcomes to ensure they meet desired objectives without introducing new issues.
- The scope of the current CC process encompasses all modifications to a production service within Systems Division.

Objectives of Change Control

- The objectives of Change Control are to:
 - Minimize risks associated with changes.
 - Maintain the quality and integrity of products, processes, and systems.
 - Ensure compliance with regulatory and industry standards.
 - Provide a structured process for evaluating and approving changes.
 - Optimize the use of resources during the implementation of changes.
 - Enhance communication and coordination among stakeholders.
 - Support informed decision-making by assessing the impact of changes.

Key Elements of Change Control

The CC is a structured approach to managing changes to a system, process, or project. Its key elements typically include:

- **Change Request:** This is the formal documentation of the proposed change. It should include details such as the reason for the change, the impact it will have, and any associated risks.
- **Change Evaluation:** A thorough evaluation of the proposed change is conducted to assess its potential impact on the project or system. This evaluation considers factors like cost, time, resources, and potential residual risks.
- **Change Approval:** Once the change has been evaluated, it needs to be approved by the relevant stakeholders, such as project sponsors, managers, or subject matter experts. Approval ensures that the change aligns with services objectives and doesn't introduce unnecessary risks.

Key Elements of Change Control

- **Change Review:** Once the change has been implemented, it's important to review its impact and effectiveness. This may involve collecting feedback from stakeholders, analysing metrics or performance data, and identifying any areas for improvement.

By following these key elements, organizations can effectively manage changes and minimize the risks associated with them, ensuring that services and systems remain on track and aligned with their objectives.

How to CC

- How do I get a CC? (e.g. forms, tickets and process).
 - Complete a CC document under Confluence [1]
 - Create a ticket under Jira to allow the tracking of the change.
 - Mail the Tier-1 Production Team (well me or Brian to be exact)
 - Your CC will be on the next available Thursday afternoon at 1500.
 - The CC will be reviewed here
 - You need to get your CC completed and ready for review by close of play on the Wednesday before.
 - After your CC has been completed, we have a 'lessons learnt' review.

[1] <https://stfc.atlassian.net/wiki/spaces/GRIDPP/pages/116949273/GridPP+Change+Control+Form>

Basic Information

1. Basic Information

Title	
Submitted by	
Requested by	
Summary	
Urgency	
Impact of successfully implementing the change	
Consultation	
Type of Change	
Link to Change Control master ticket (RT or JSM)	

Likelihood of Problems

2. Likelihood of Problems Occurring

Details of testing carried out	
Further tests required prior to implementation	
Deployed/tested at other WLCG/EGEE site?	
Can be phased in stages?	
Implementation plan	
Post implementation testing	
Reversion plan in case of problems	
Has this been successfully reviewed with production team against new service ticklist. <i>(This should be done for significant changes to services too).</i>	

Residual Risk

3. Residual risks

Residual risk 1	
Residual risk 2	
Residual risk 3	

Impact of problems

4. Impact of problems if they occur

Taking into account the risks described above:

Affected components	
VOs likely to be affected	
Impact on existing data	
Impact on subsequent data	

New Service Check-list (1 of ∞)

(Also includes removal of old service/system at the end)

Name / Description for System/Service Being Added (or, if indicated, removed).

Monitoring - Nagios tests in place for

Host check	<input type="checkbox"/>
Service Checks – Fabric layer	<input type="checkbox"/>
Service Checks – Service layer (Castor, Grid services)	<input type="checkbox"/>

Monitoring - Call-out

Should the service call-out?	<input type="checkbox"/>
Is documentation provided on the call-outs?	<input type="checkbox"/>

Monitoring – Grafana

Grafana/InfluxDB monitoring needed/in-place?	<input type="checkbox"/>
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New Service Check-list (2 of ∞)

Documentation & Support

Is there any description of the system and recovery procedures?	<input type="checkbox"/>
Do at least two people know enough about the system to resolve issues in the absence of one of those responsible for it?	<input type="checkbox"/>
Does the system need an entry in the GOC DB?	<input type="checkbox"/>

Quattor

Have all the relevant Quattor templates been independently reviewed?	<input type="checkbox"/>
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Set-up & Security

Is IPv4/IPv6 dual-stack enabled? (If not, please justify why IPv6 cannot be enabled).	<input type="checkbox"/>
Does the system have the appropriate name?	<input type="checkbox"/>
Are any DNS entries (e.g. aliases) needed?	<input type="checkbox"/>
Has an audit been done of security requirements for the service/system?	<input type="checkbox"/>
Have any resulting security issues been addressed (e.g. configuring iptables, restricting certain access)?	<input type="checkbox"/>
Is a firewall hole needed / enabled?	<input type="checkbox"/>
Have you checked there are no unexpected firewall holes left from a previous system at this IP address?	<input type="checkbox"/>
If the service requires passwords: Have these been set-up and noted securely?	<input type="checkbox"/>
Is there a process to monitor for password expiry and/or update as required?	<input type="checkbox"/>
Log rotations / copying to central loggers of all appropriate log files configured?	<input type="checkbox"/>
Remote console access set-up. (IPMI or VM solution)	<input type="checkbox"/>
Is Pakiti set-up on the machine?	<input type="checkbox"/>
E-mail: Is the machine configured to send mail to csf-mail.rl.ac.uk ?	<input type="checkbox"/>

New Service Check-list (3 of ∞)

Architecture System Configuration	
Is the service run on a system that is powerful enough?	<input type="checkbox"/>
Do all the disk partitions have sufficient space (e.g. allowing for log files to grow when system busy etc.)	<input type="checkbox"/>
Is the service run on a system that has disk resilience if needed?	<input type="checkbox"/>
Does it need UPS and/or a dual power supply?	<input type="checkbox"/>
Is ACPI enabled so can Power Down over IPMI?	<input type="checkbox"/>
If the service is on multiple servers, if possible or appropriate are these placed on different	
Network switches?	<input type="checkbox"/>
Power phases	<input type="checkbox"/>
PDU's	<input type="checkbox"/>
Additional Questions for Virtual Machines	
System requirements appropriate for VM	
OK for brief outage	<input type="checkbox"/>
Does not require persistent storage	<input type="checkbox"/>
No excessive I/O etc.	<input type="checkbox"/>

New Service Check-list (4 of ∞)

Configuration	
Correct option set for action on hyper-visor restart (N/A for VMWare VMs).	<input type="checkbox"/>
System requirements (e.g. RAM, Number of CPUs) are documented so that if a new VM has to be set-up the relevant parameters are known.	<input type="checkbox"/>
Check the system has the VMWare tools installed.	<input type="checkbox"/>
Check naming of the VM and its ownership in the hyper-visor is appropriate.	<input type="checkbox"/>
Live migration tested?	<input type="checkbox"/>
Verified a second person can re-instance the server from scratch.	<input type="checkbox"/>
Architecture Resilience	
Multiple instances needed?	<input type="checkbox"/>
Automatic Fail-over / hot standby needed?	<input type="checkbox"/>
Fail-over to equipment in Atlas building needed/configured?	<input type="checkbox"/>
Backup	
Is a backup needed, and if so at what frequency?	<input type="checkbox"/>
What Backup system is in use (Amanda/Atlasbackup)?	
Has the backup been tested?	<input type="checkbox"/>
Communications	
Has the VO been informed (if appropriate)?	<input type="checkbox"/>

New Service Check-list (5 of ∞)

Configuration	
Correct option set for action on hyper-visor restart (N/A for VMWare VMs).	<input type="checkbox"/>
System requirements (e.g. RAM, Number of CPUs) are documented so that if a new VM has to be set-up the relevant parameters are known.	<input type="checkbox"/>
Check the system has the VMWare tools installed.	<input type="checkbox"/>
Check naming of the VM and its ownership in the hyper-visor is appropriate.	<input type="checkbox"/>
Live migration tested?	<input type="checkbox"/>
Verified a second person can re-instance the server from scratch.	<input type="checkbox"/>
Architecture Resilience	
Multiple instances needed?	<input type="checkbox"/>
Automatic Fail-over / hot standby needed?	<input type="checkbox"/>
Fail-over to equipment in Atlas building needed/configured?	<input type="checkbox"/>
Backup	
Is a backup needed, and if so at what frequency?	<input type="checkbox"/>
What Backup system is in use (Amanda/Atlasbackup)?	
Has the backup been tested?	<input type="checkbox"/>
Communications	
Has the VO been informed (if appropriate)?	<input type="checkbox"/>

New Service Check-list (6 of ∞)

Procedures

Has a Change Control Request been put in for the new service?	<input type="checkbox"/>
Are there any changes to standard procedures that result? (E.g. POD/POC needing to be informed.)	

Clean-up of old systems

Is this a replacement for a service / system that can be retired?	<input type="checkbox"/>
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Final Checks

Has the system been rebooted in its final configuration to ensure all services start up OK?	<input type="checkbox"/>
Does the machine have the latest kernel and other relevant updates?	<input type="checkbox"/>

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New Service Check-list (7 of 7)

Old System Removal Check-list.

Closely linked to the setting up of a new system are task relating to the removal of an old one.

Clean-up of old systems:

Removal of Nagios checks (service and fabric layer) and clean up of event handlers.	<input type="checkbox"/>
Removal from CACTI & Ganglia.	<input type="checkbox"/>
Check if it's a Ganglia collector node.	<input type="checkbox"/>
Does any documentation need updating to replace or remove the 'old' system/service? E.g. removal from Call-out docs.	<input type="checkbox"/>
Have any appropriate firewall holes closed?	<input type="checkbox"/>
Are any DNS entries (e.g. aliases) no longer needed?	<input type="checkbox"/>
Have VOs been informed (if appropriate)?	<input type="checkbox"/>
Has a Change Control Request been put in for the removal of the service (if appropriate)?	<input type="checkbox"/>
Does the system need to be removed from the GOC DB?	<input type="checkbox"/>

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Final steps

Service owner stops their services from starting up on server (chkconfig off) & set this in Quattor if appropriate.	<input type="checkbox"/>
Request Fabric to power off (in rack).	<input type="checkbox"/>
Once appropriate time elapsed hand back to Fabric for decommissioning.	<input type="checkbox"/>

Any Questions?