Streams Service Review

Distributed Database Workshop

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- Announce Interventions
- Tier0 Responsibilities
- Tier1 Responsibilities
- Streams Resynchronization Review
- Recovery Scenarios Review
- Recent Problems or Interventions
- Summary

- Announce interventions
  - schedule new intervention using 3D wiki
  - submit EGEE broadcasts
  - register outages in the CIC portal
  - long interventions: contact Tier0 to analyze if it is necessary to split the Streams setup

- Unplanned downtime: update Tier0
  - problem description, progress and expected duration

- Report regularly

Tier0 Responsibilities

- Initial Streams setup
- Add new schemas to the Streams environment
- Split & Merge – new procedures in place
- Streams resynchronization
- Analyze and test new features and optimizations
- Validate upgrades and patches
- Monitoring

- Announce interventions
- Maintain the 3d OEM operational
  – check agents status
  – configure targets
- After an intervention: check and re-enable Streams processes
  – Use "STRMPROP_<TIER1>" account to connect to the downstream database
    - i.e. STRMPROP_PIC for Tier1 PIC
    - enable the propagation job
    - enable the capture process when site is split
- Streams resynchronization

Tier1 Responsibilities

- ## Service Incident Reports
  - unexpected database downtime > 4 hours
    https://twiki.cern.ch/twiki/bin/view/PDBService/ServiceIncidentReportT1

- ## Recent **service changes**:
  - AMI replication to CERN
    - master: Tier1 Lyon
    - target: ATLAS offline
  - Tier1 Lyon acts as a Tier0 site for the AMI Streams setup

Streams Resynchronization

- Resynchronize a Tier1 site which is out of the Streams recovery window using Transportable Tablespaces

- Tasks are shared between Tier0 and Tier1 sites
  - Tier0:
    - split Tier1 sites
    - Streams operations: configuration, stop and re-start
  - Tier 1:
    - copy tablespaces from the "collaborative" site

- Exercised:
  - Taiwan using collaborative sites:
    - RAL – June 09
    - BNL – October 09

- Recovery is not transparent for the Streams setup
  - notify always to Tier0

- Recovery on destination
  - changes that had already being applied but lost by the recovery must be re-applied
    - split destination
    - configure Streams to re-capture changes from the last SCN applied at the destination
  - if replication is re-enabled without notifying
    - apply aborts, SCN information is updated, last correct SCN applied is lost
    - Streams re-configuration is not longer possible

- ## ASGC (Taiwan)

  - ### February 09: fire incident in ASGC data centre

    - database reallocated after several weeks
    - service unavailable – listener problem?
    - removed from the ATLAS Streams setup after 1 month
    - incomplete recovery due to control file corruption
      - data loss – impossible to re-start Streams
    - complete re-instantiation needed – RAL was volunteer as "collaborative" Tier1 site

  - ### September 09: after an unscheduled intervention, data got corrupted

    - no valid backups found
    - complete re-instantiation needed – BNL was volunteer as "collaborative" Tier1 site
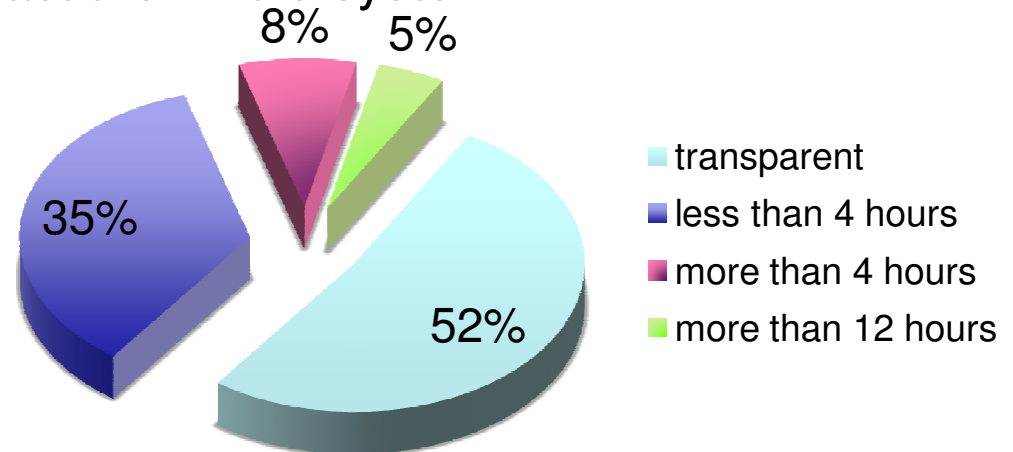
- Hardware problems after migration @RAL
  - caused data corruption
  - point-in-time recovery performed
  - Streams resynchronization for ATLAS and LHCb-LFC

- After 1st node reboot, database could not open @GRIDKA
  - due to high load
  - ATLAS database inaccessible
  - fixed after 2nd node reboot
  - real cause?

- ATLDSC and LHCBDSC downstream databases migration to new hw
  – smoothly

- Tier1 database migrations to new hw
  – RAL, SARA and NDGF
  – using **Data Guard** technology (see talk later)
  – transparent for RAL and NDGF
  – some problems at SARA, related to the connection string change

- Fatal Logminer error reported by ATLDSC capture
  - caused by ORA-07445: [ksfdetch()+622]
  - when restarting capture, after logminer checkpoint table shrink
  - patch suggested by Oracle support included in PSU 10.2.0.4.2
  - re-try capture re-start
- Apply dequeues but not applies LCRs
  - several Tier1 sites affected for LHCb and LFC
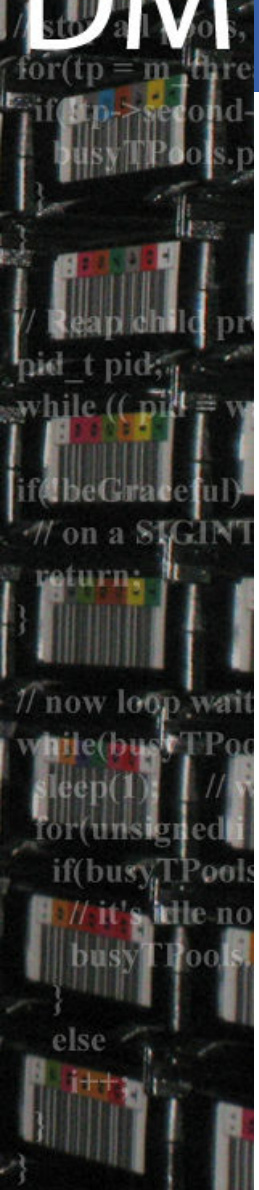 - under investigation

- 3d wiki – Streams operations manual

  https://twiki.cern.ch/twiki/bin/view/PSSGroup/ServiceDocs

- Overview for Troubleshooting Streams Performance Issues (metalink note 730036.1)

- Streams monitoring

  https://oms3d.cern.ch:1159/streams/main

- Streams health check report
  - metalink note 273674.1

- 3d OEM

  http://oms3d.cern.ch:4889/em/console/

- Keep the monitoring operational
  - spot problems quickly, understand bottlenecks, ...

- Coordination with Tier0
  - complex streams environments where the activity at one point might impact the whole system
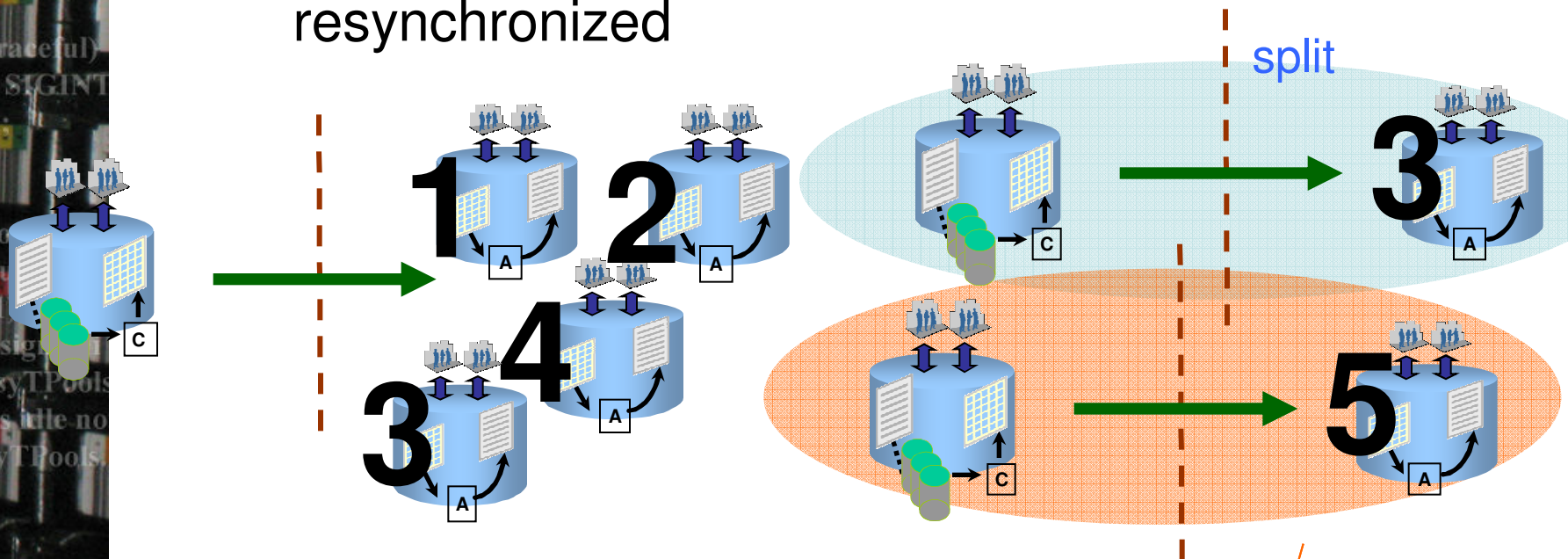

Pie chart:
- 8% (more than 4 hours)
- 5% (more than 12 hours)
- 52% transparent
- 35% less than 4 hours

Legend:
- transparent
- less than 4 hours
- more than 4 hours
- more than 12 hours

- Feedback!!!
  - and collaboration to improve the documentation and the service

- ## Steps at Tier0

  - split "collaborative" Tier1 site

  - temporary Streams setup for Tier1 site to be resynchronized

- new dictionary
- clone capture process
- include apply rule set to avoid LCRs to be applied
- (only one "test" schema is replicated)

- Steps at Tier1
  - coordination between "collaborative" and "resynchronized" Tier1s
    - share connection strings
    - share streams administrator account **!**
    - create database links between databases
    - create directories pointing to datafiles and grant access
  - ask Tier0 to stop replication for both sites
  - "collaborative": ensure tablespaces are read-only
    - alter tablespace … read only;
  - "resynchronized": remove tablespaces and datafiles

- Steps at Tier1
  - transfer datafiles from "collaborative" to "resynchronized"
    - dbms_file_transfer
    - parallel sessions
  - "resynchronized": import tablespaces metadata
  - change tablespaces back to read-write
  - ask Tier0 to re-enable Streams
    - apply rules must be dropped first!
- Streams will recover the backlog produced during the operation automatically
  - merge all streaming to be done by Tier0