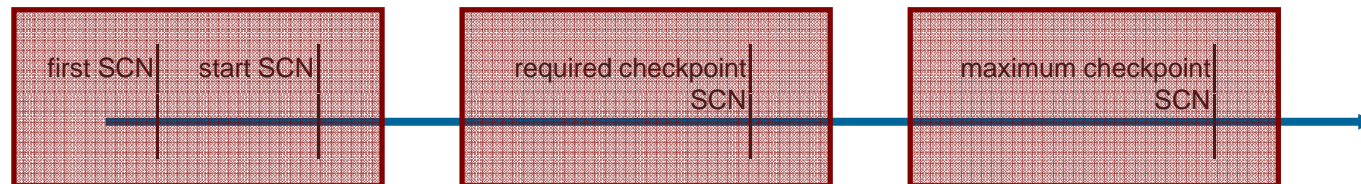# STREAMS failover and resynchronization

LCG 3D - Database Administrator Meeting @ CNAF

12 June 2007

Eva Dafonte Perez (CERN)

Agenda

- SCN numbers Overview
- Recovery on a destination Database
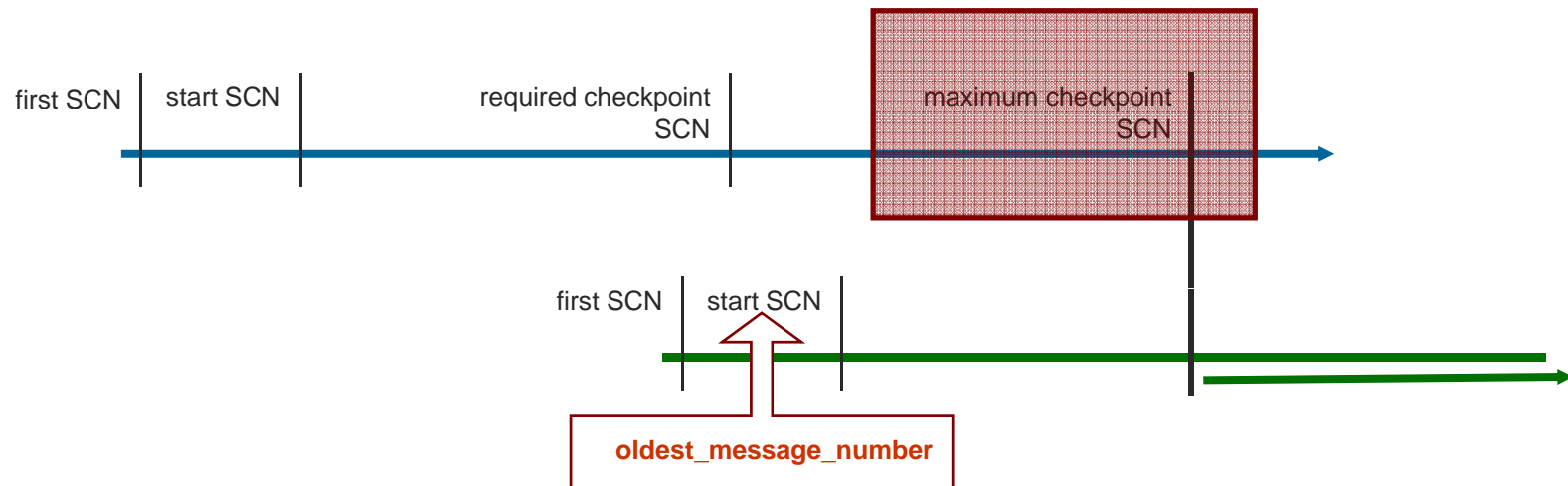- Streams synchronization example

SCN numbers Overview

- **SCN = System Change Number**
- **FIRST_SCN:** lowest SCN in the redo log from which a capture process can capture changes
- **START_SCN:** SCN from which the capture process will start to capture changes
- **REQUIRED_CHECKPOINT_SCN:** Lowest checkpoint SCN for which the capture process requires redo information
- **MAX_CHECKPOINT_SCN:** SCN at which the last checkpoint was taken by the capture process

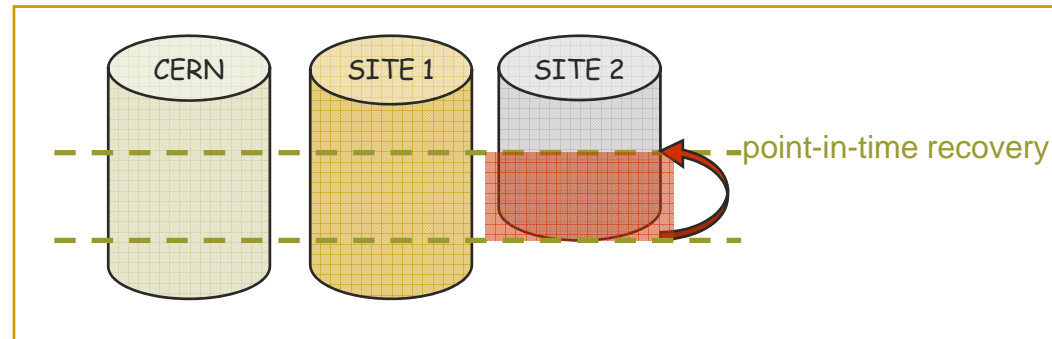| first SCN | start SCN | required checkpoint SCN | maximum checkpoint SCN |

- **CAPTURED_SCN:** most recent change scanned in the redo log
- **OLDEST_MESSAGE_NUMBER:** earliest SCN that might need to be re-applied
  - used for the synchronization

Recovery on destination

- **Point-in-time recovery on the destination database**
  - re-apply captured changes that had already being applied
  - split the streams setup for the recovered destination
    - create new capture process and new propagation that propagates changes only to the recovered destination
    - apply changes from the last SCN applied
  - other destination databases not impacted
  - old archived logs may be needed

Recovery on destination

- This method cannot be used if any of the following conditions are true:
  - the archived log files that contain the start SCN are not longer available
  - the oldest message number is lower than the ~~first SCN~~ Maximum checkpoint SCN

first SCN   start SCN   required checkpoint SCN   maximum checkpoint SCN

first SCN   start SCN

oldest_message_number

Resynchronization example

Dropped a datafile and recorded the time

09:40:12 datafile dropped
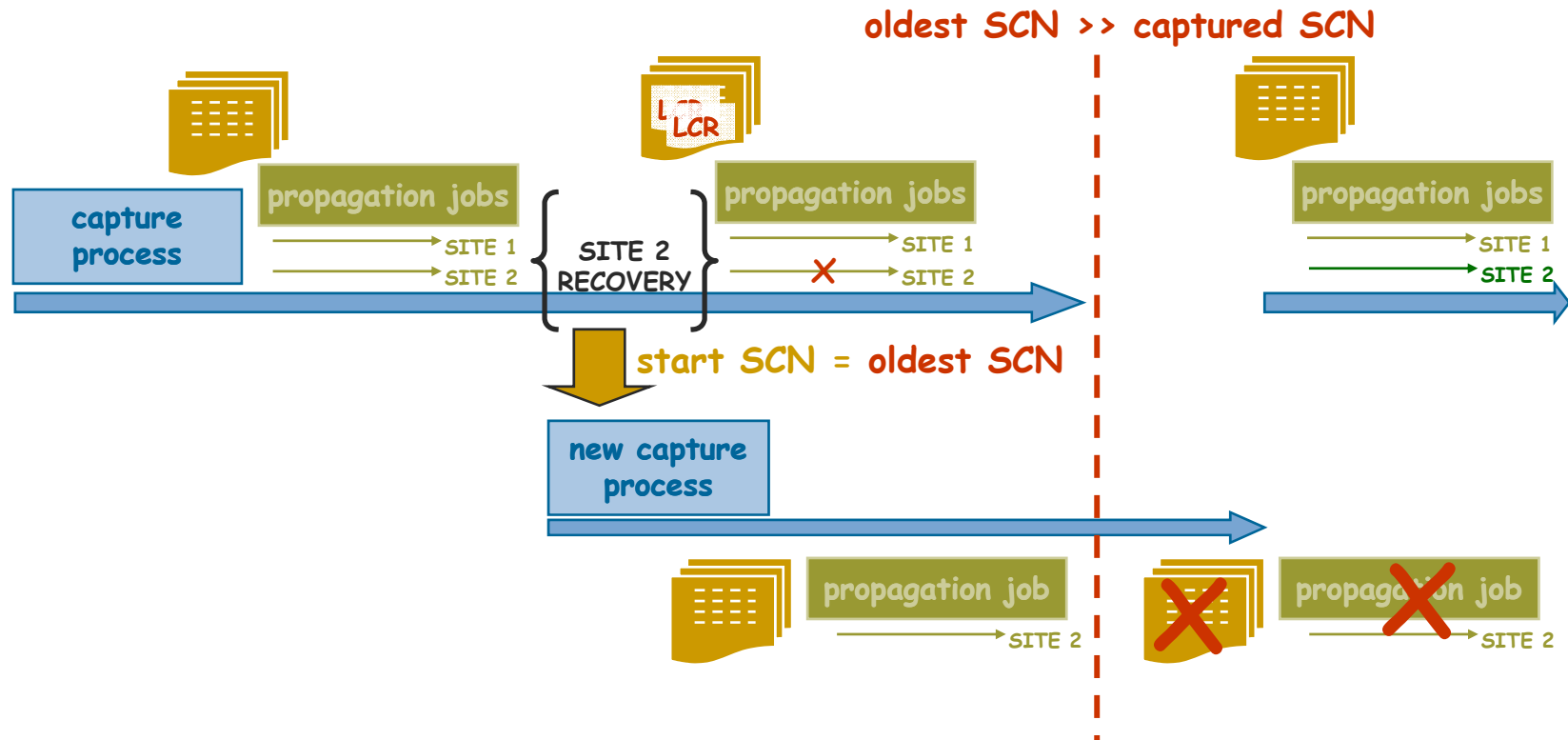
Stopped the database
09:40:18 SQL> shutdown immediate;

Connected to RMAN, recovery catalogue and target database
RMAN> RESTORE DATABASE UNTIL TIME "TO_DATE(**'30-AUG-2006 09:30','DD-MON-YYYY HH24:MI'**)";
RMAN> RECOVER DATABASE UNTIL TIME "TO_DATE(**'30-AUG-2006 09:30','DD-MON-YYYY HH24:MI'**)";

Restart database to make sure OK

select oldest_message_number from dba_apply_progress:

5985270908207   oldest SCN

oldest SCN >> captured SCN

capture process

propagation jobs
→ SITE 1
→ SITE 2

SITE 2 RECOVERY

propagation jobs
✗ → SITE 1
→ SITE 2

propagation jobs
→ SITE 1
→ SITE 2

start SCN = oldest SCN

new capture process

propagation job
→ SITE 2

propagation job
✗
→ SITE 2

Questions & Answers

PSS

- **Streams Replication Administrator's Guide**
  - 9 Managing Capture, Propagation, and Apply
    - Performing Database Point-in-Time Recovery in a Streams Environment

- https://uimon.cern.ch/twiki/bin/view/PSSGroup/3DStreamsRecovery