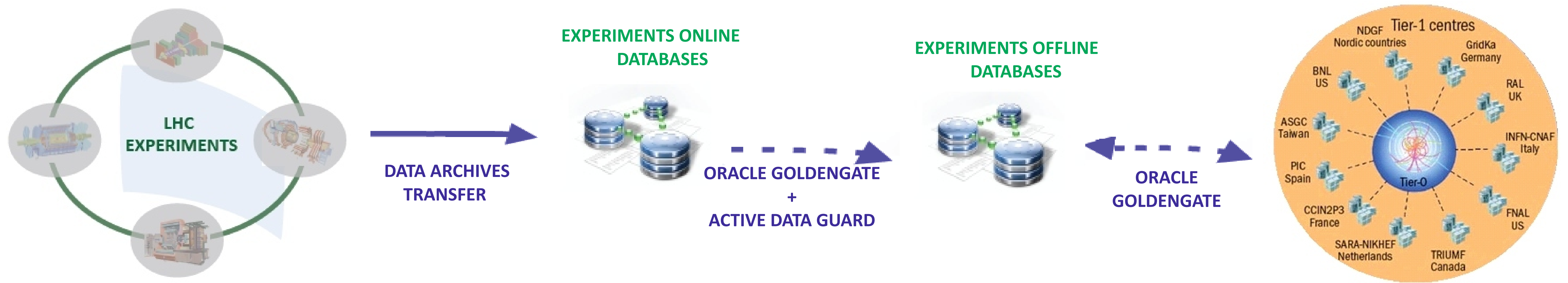


EVOLUTION OF DATABASE REPLICATION TECHNOLOGIES FOR WLCG

L. LOBATO PARDAVILA

REPLICATION TECHNOLOGIES-ENVIRONMENT



WHY DATABASE REPLICATION

- * Key component of **online-offline** DB model for experiments database services
- * World wide distribution for **WLCG**
- * Consolidation of data at T0

WHAT DO WE REPLICATE

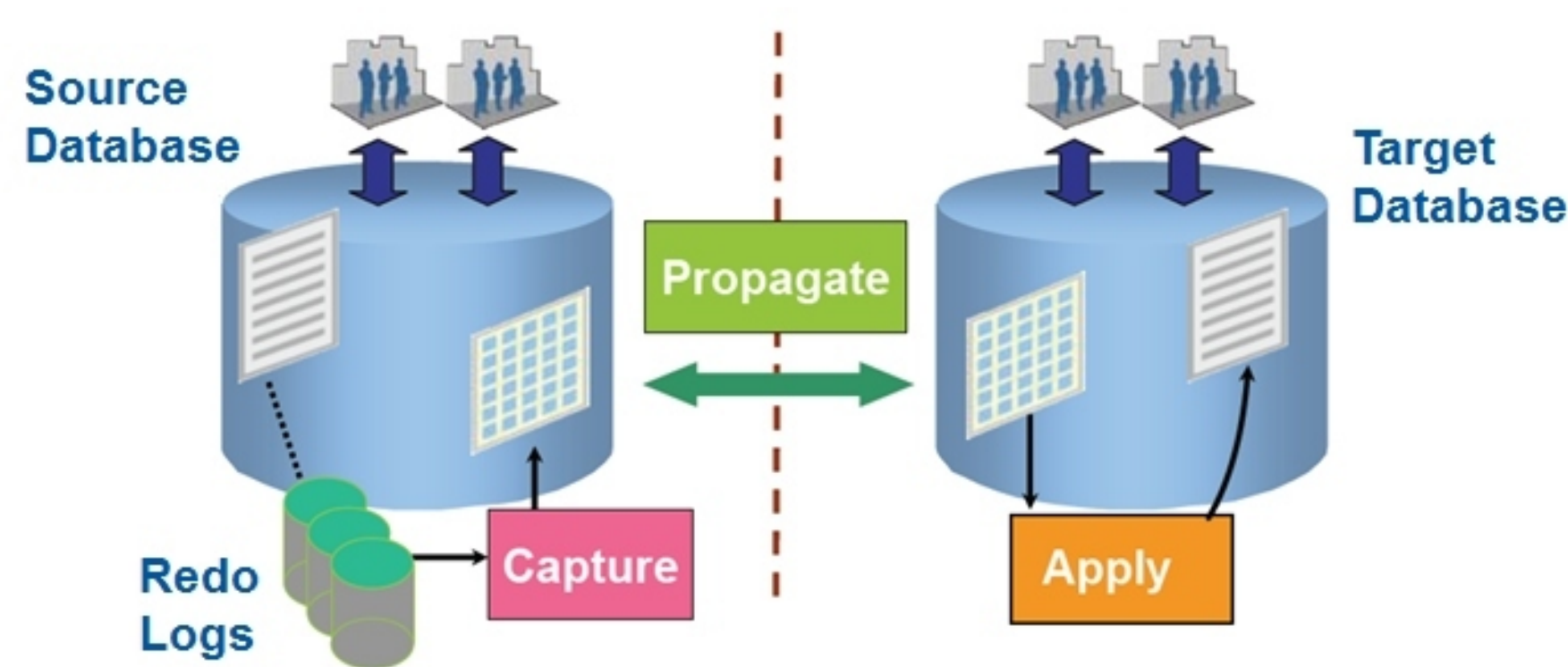
- * **WinCC/PVSS**
 - Supervisory Control and Data Acquisition
- * Experiments **CONDITIONS** data
 - Record the state of the **detector**: calibration, alignment, environmental parameters
- * Other:
 - Muon calibration data
 - **ATLAS Metadata** Interface

Oracle GoldenGate evaluation as part of openlab program

- * Since 2010, **GoldenGate** is the recommended log-based replication technology by Oracle
 - **Oracle Streams** is supported but no enhanced
 - Reduces the number of incidents and replica downtime
 - Improves replication throughput

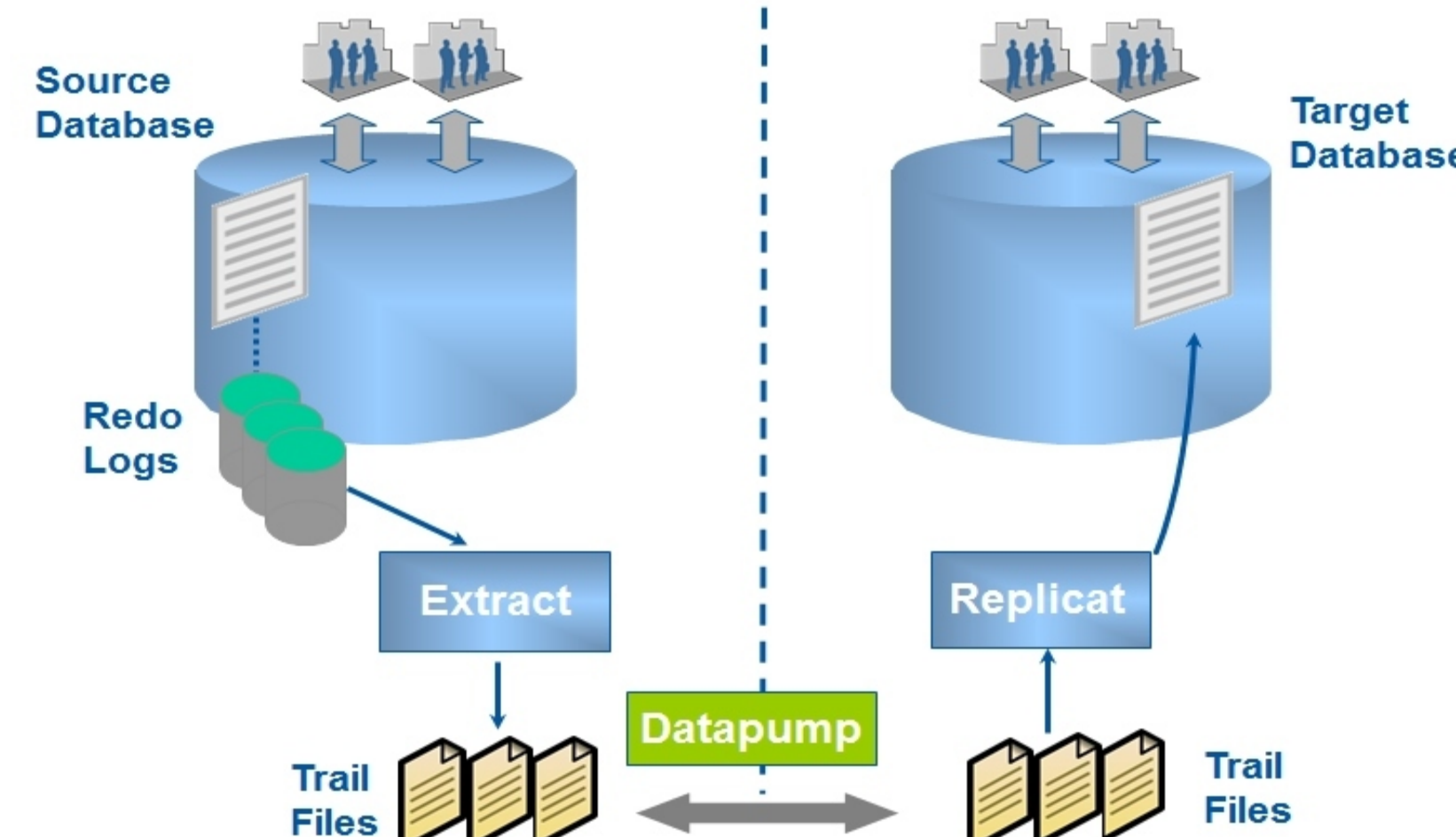
ORACLE STREAMS

- Vendor-provided solution
 - Support and evolution provided by Oracle
- Data filtering during extraction
 - No high bandwidth network needed



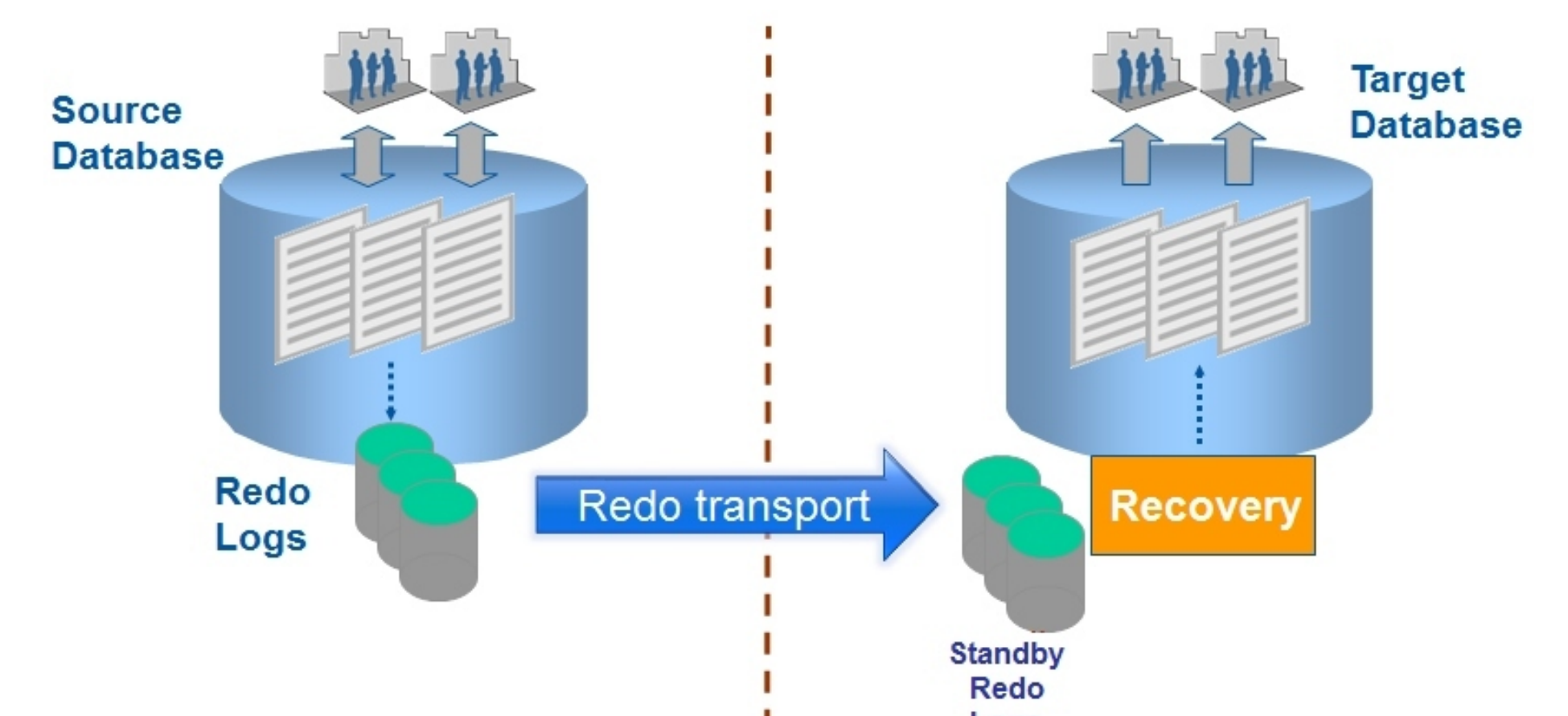
ORACLE GOLDENGATE

- Improved version of Streams
 - Better Performance
 - Lower footprint on the source database
 - More functionalities, data types and features
- Installation can be centralized

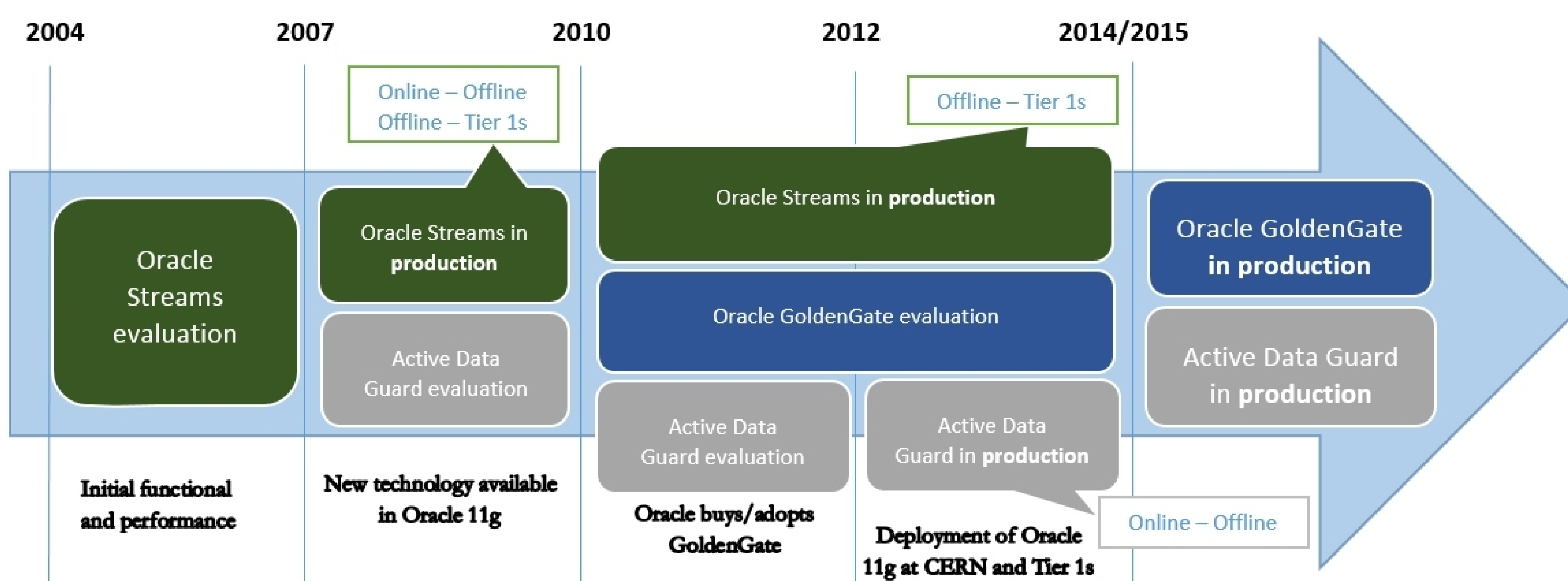


ACTIVE DATA GUARD

- Data consistency guaranteed
- Little maintenance effort
- Fast switchover/failover solution



REPLICATION TECHNOLOGIES - TIMELINE



SUMMARY

- * Database replication is **key technology** to enable distribution of conditions data across T0 (and T1s)
 - Complex: different requirements, different topologies
- * **Technology evolution**: Oracle Streams (initial solution) was replaced by Active Data Guard (T0) and Oracle GoldenGate (T0 and T1s)
- * The change improved **availability** and **performance** of the data replication services