Large Systems Update 2014
What's new in replication

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Agenda

What is Data Replication & Who Needs It?

What is InfoSphere Data Replication?

What’s New with InfoSphere Data Replication
A Variety of Ways to Deliver Data to Any System

*Use the optimum delivery approach for varied business requirements*

**High speed bulk data delivery**, including ETL, ELT, and dynamic integration to leverage Hadoop to support information exchange with big data sources.

**Virtualized access** to and delivery from diverse & distributed information allows virtual consolidation of big (and regular) data.

**Real-time integration** provides flexibility for transactional integrity, plus high-volume, low-latency replication for continuous business availability.

**Self-service data integration** allows line of business and other non-technical users to get information when needed to fuel their analytics.
How Is Data Replication Used?

- **Efficient capture and delivery of enterprise data:**
  1. Optimize processor utilization by eliminating massive batch movements
  2. Shorten batch windows by streaming changes out in real time, as they happen

1) Multiple systems with central system and each other. *Data distribution and synchronization*. Billing, Inventory, Financials, Customer data, etc.

2) Two or more data centers for *Continuous Availability, Business Continuity* and Disaster Recovery. Active to Active. *Consolidations / Migrations*.

3) *BI and reporting environments*, Operational Data Stores, Reporting db’s, *Information Server* (ETL/Quality), MDM and DW’s.
System z Availability - The GDPS “Family”

Continuous Availability of Data within a Data Center

GDPS/HyperSwap Mgr

RPO = 0 / RTO = 0

Single Data Center
Applications remain active

Continuous access to data in the event of a storage subsystem outage

GDPS/PPRC

RPO = 0 / RTO <1 hr (>20 km)
RPO = 0 / RTO = 0 (<20 km)

Two Data Centers
Systems remain active

Multi-site workloads can withstand site or storage failures

GDPS/GM & GDPS/XRC

RPO secs / RTO <1 hr

Two Data Centers
Rapid Systems Disaster Recovery with “seconds” of Data Loss

Disaster recovery for out of region interruptions

GDPS/MGM & GDPS/MzGM

RPO = 0 / RTO = 0

Three Data Centers
High availability for site disasters

Disaster recovery for regional disasters

Continuous Availability, Disaster Recovery, and Cross-site Workload Balancing at Extended Distance

GDPS Active-Active Sites

RPO seconds / RTO seconds

All sites active

Components

Tivoli – NetView, SAz
System z, DS8K, PPRC
GDPS control code, Services

Tivoli – NV, SAz, SA-MP, AppMan
System z, DS8K, VTS, PPRC
GDPS control code, Services

Tivoli – NV, SAz
System z, DS8K, Global Mirror, XRC
GDPS control code, Services

Tivoli – NV, SAz
System z, DS8K, MGM, MzGM
GDPS control code, Services

Tivoli – SA, NetView
Multi-site Workload Lifeline
DB2 &IMS replication
System z, DS8K,
Global Copy
GDPS control code, Services
Reducing MIPS Spikes through Replication

Reduce processor utilization - move less data (changes only versus full batch set)

Reduce impact on production systems - capture data from the database logs

Improve the efficiency of MIPS consumption – allow processing during business day

Improve the availability of data - real time versus batch day/week/month latency

Batch - Before

Replication - After
Breakthrough Performance with
*InfoSphere Data Replication for DB2 z/OS 10.2.1*

170,000+

rows per second!

Running workload of large Chinese bank on EC12
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What’s New with InfoSphere Data Replication?
IBM’s Data Replication Model

Efficient Capture and Delivery of Changes to Enterprise Data

- Optimize processor utilization by eliminating massive batch movements
  - Lower costs by saving CPU and network resources

- Shorten batch windows by streaming changes in real time, as they happen
  - Extend application availability

- Reduce data latency with “right time” updating
  - Improve the bottom line with accurate information ... when and where needed
IBM Data Replication Family of Products

- InfoSphere Data Replication
  World class, high speed, multidirectional, heterogeneous data replication

- InfoSphere Data Replication for DB2 for z/OS
  World class, high speed, multidirectional, low impact DB2 z/OS data replication

- InfoSphere Data Replication for IMS for z/OS
  World class, high speed, multidirectional, low impact IMS data replication

- InfoSphere Data Replication for VSAM for z/OS
  World class, high speed, multidirectional, low impact VSAM data replication
IBM InfoSphere Data Replication

Change Data Capture

- Log-based Change Data Capture (CDC) technology, replicates mission-critical data events in real time without impacting system performance

Replication Server

- Two replication models, queue based and SQL-based, providing asynchronous log-based replication that maximizes flexibility and function.

World Class Real-time Heterogeneous Replication

Unparalleled DB2 to DB2 System z Replication

2 world-class data replication technologies 1 single offering
Breakthrough Performance with
InfoSphere Data Replication for DB2 z/OS 10.2.1

- 55% Reduction in CPU
- 60% Increase in throughput
- 740x Faster

IFI Filtering  Multi-row inserts  Parallel TDIFF
IBM’s Data Replication Breadth of Coverage

**SOURCES**
- DB2 (z/OS, i, LUW)
- Informix
- Oracle
- MS SQL Server
- Sybase

**TARGETS**
- DB2 (z/OS, i, LUW)
- Informix
- Oracle
- MS SQL Server
- Sybase
- PDA (Netezza)
- Teradata
- Information Server
- HDFS/Hive
- Message Queues
- Files
- Customized Apply

**ESB, Cognos Now, …**
**MySQL, GreenPlum, …**
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What’s New with InfoSphere Data Replication?
Current versions (as of Oct 29)

- Infosphere Data Replication V11.3 (distributed)
  - 5725-E30 - Announced June 26, 2014
- Infosphere Data Replication for DB2 for z/OS V10.2.1
  - 5655-DRP – Announced Oct 1, 2013
- Infosphere Data Replication for IMS for z/OS V11.1.0
  - 5655-IM1 – Announced Oct 25, 2013
- Infosphere Data Replication for VSAM for z/OS V11.1.0
  - 5655-Y18 – Announced Oct 25, 2013
What’s new with “Classic” Data Integration?

New VSAM Replication, Performance, Features, ...

- High speed, low latency VSAM to VSAM data replication
  - Spanning unlimited distances for VSAM Continuous Availability
  - Stand-alone for “home grown” stand-by environments
  - Integrated with GDPS Active-Active Sites for automated solution
  - Support for VSAM KSDS, ESDS, and RRDS datasets

- Enhanced IMS support for Access and Data Synchronization
  - Exploitation of extended log data set (IMS 12 and IMS 13)
  - Performance improvements

- Enhanced Classic Catalog
  - Scalability to tens of thousands of logical tables/views
  - Improved performance and usability across all “Classic” products
  - Metadata Catalog enhancements

- IMS and VSAM Replication integration with GDPS Active-Active v2.1
  - Enabled to the Event Integration Framework
  - Support for both Active-Standby and Active-Query configurations
What’s new with InfoSphere Data Replication for DB2 for z/OS 10.2.1 – Q Replication technology

- **Performance** - Higher Volumes, Lower Latency, Less CPU
  - IFI Filtering Exploitation
  - Multi-row Inserts
  - Capture Performance Enhancements

- **Scalability** – More Tables and More Workload
  - Multiple Consistency Groups
  - Parallel Send Queues

- **Continuity** – Keeping Mission Critical Data Available
  - DB2 for z/OS v11 Support
    - No DB2 11 capture support in 10.2.0 or earlier!
    - DB2 11 apply supported in 10.1 and later
  - Full Temporal Table Support
  - Alter Key, Drop Column and Rename Column Support
  - Compare tables without an outage
  - DB2 for z/OS Replication integration with GDPS Active-Active

*DB2 11 for z/OS*

The Enterprise Data Server for Business Critical Transactions and Analytics.
What’s new with InfoSphere Data Replication for DB2 for z/OS 10.2.1 – CDC technology

- **Consumability**
  - New Configuration Review Report
  - Automated Mitigation of Decompression errors
  - Enhancements to Bookmark Management Utilities
- **Performance**
  - IFI Filtering
  - Sending Keys & Changes Only
  - Sending Changed LOB Only
  - Journal Control Field Optimization
  - Enhanced SMF Data
- **Database Currency**
  - DB2 v11 Support
    - DB2 11 capture need 10.2.1
    - DB2 11 apply in 10.1 or later
  - DDL Awareness for ALTER TABLE Drop Column
InfoSphere Data Replication 11.3 @ a glance

- **Agile Integration**
  - **Oracle 12c** – Support for replication to and from Oracle 12c tables
  - **Oracle 12c pluggable database support** – Support for replication to and from Oracle pluggable databases
  - **DB2 for iSeries** - Multi-byte Character Set support
  - **DB2 for iSeries** – Simple scripting support (CHCCLP)
  - **DB2 for iSeries** – Active Refresh+
  - **Windows Server 2012** support

- **Confidence in Big Data**
  - **FlexRep** – IIDR will replicate to any target that supports JDBC. First tested targets are EnterpriseDB and MySQL.
  - **Oracle Exadata** – Declared support as source and target*

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*Excluding Hybrid columnar compression and ASM*
Confidence in Big Data: EnterpriseDB and MySQL

▪ **In a nutshell**
  – New FlexRep engine delivers high volumes of (big) data with very low latency to new targets.

▪ **Top 3 Benefits**
  ✓ Deliver real-time information to EnterpriseDB
  ✓ Deliver real-time information to MySQL
  ✓ Experiment with any JDBC-compliant target
Simple Integration: Replication Definition Support in the Dashboard

- **In a nutshell**
  - Beginning in IIDR 11.3, Replication Center is deprecated. Some replication definitions can now be created for Q Replication in the IIDR dashboard.

- **Top 2 Benefits**
  - ✔ Lightweight web-based UI for definition creation
  - ✔ Monitor and create replication definitions in a single place

Further information

- SQL + Q Rep community on developerWorks: https://ibm.biz/BdE2Bm

- CDC community on developerWorks: https://ibm.biz/BdE2BK

- Manuals at IBM KnowledgeCenter:
  - Infosphere Data Replication (LUW and dist): https://ibm.biz/BdE2Ba
  - VSAM: https://ibm.biz/BdE2B8
  - IMS: https://ibm.biz/BdE2Bg