Best Practices for Deploying the Microservices Architecture

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Together we'll go far

EDM / DVE at Wells Fargo

Introduction to Enterprise Database Management (EDM) – Database Virtualization and Engineering (DVE)

- Long history of managing Oracle RAC-hosted consolidation environments

- Establishes standards for multiple database products

- Sets infrastructure standards for Oracle hosting

- Responsible for database product certifications

- Manages multiple Oracle Exadata Engineered Systems

- Manages multiple Dedicated GoldenGate Replication Hubs

GoldenGate Replication Hub Environment

- Shared Consolidated and Geographically Dispersed

- Consists of multiple 4-Way Oracle RAC Clusters

- XAG Cluster Integration for HA Management and ACFS

- Monitoring – GG Monitor Agent thru Oracle GoldenGate Plug-In

- GoldenGate 12.2 for Oracle 12c and 11g RDBMS (MT and Non-Container)

- GoldenGate 12.2/12.3 Java Adapters to downstream JMS

- GoldenGate 12.2 for Sybase 16

- GoldenGate 12.2 Replicats for Oracle 12c From SQL Server

- GoldenGate 12.3 Classic for 12c RDBMS version only

- Currently In Development for early 2019 production deployment
  - GoldenGate 12.3 For BigData
  - GoldenGate 12.3 For DB2 (Waiting on Oracle's DB2 12 Certification)
  - **GoldenGate 12.3 Microservices Architecture**

GoldenGate Replication Hub Environment
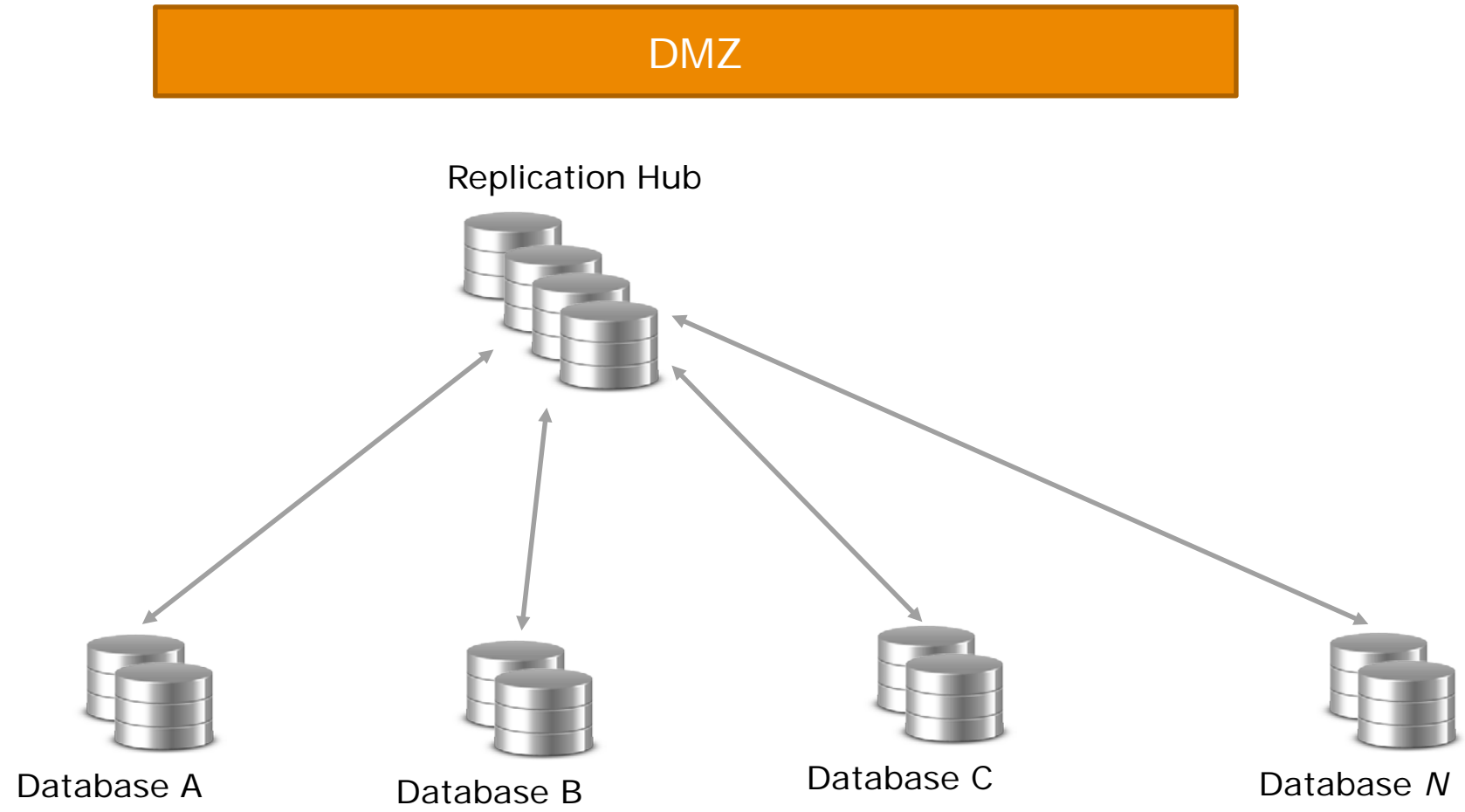
GoldenGate Phased Deployment Process
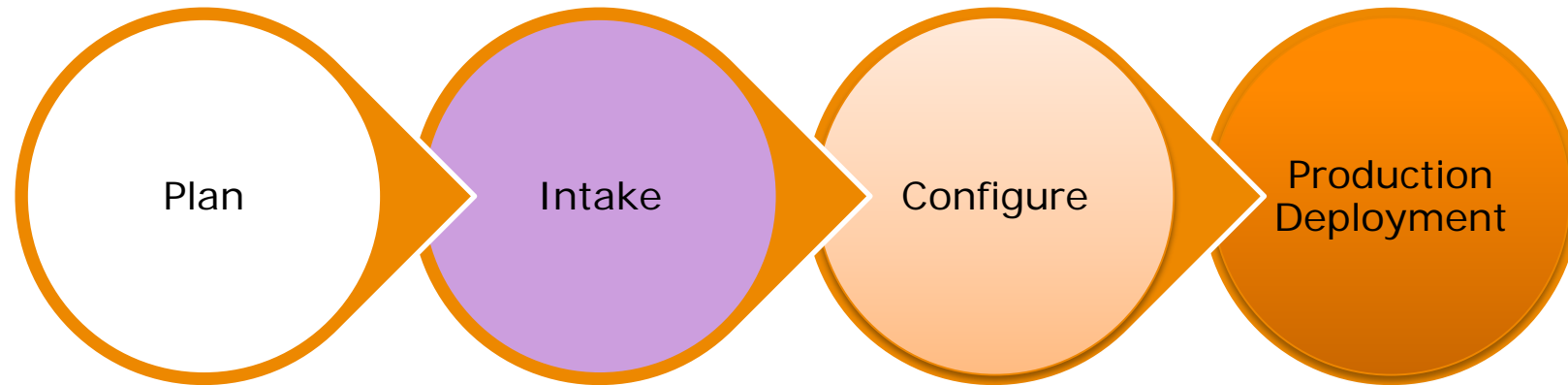
Identify Replication Candidates

- Enterprise replication inventory is vital!

    - Required for all patching and maintenance activities

    - Ability to define replication to an ecosystem for communications

    - Required for metrics reporting

    - Chargeback and labor

    - Drives the decommission list

Application ID	Application mnemonic (2 char)
Replication Type	Business Unit
Trail file space amount	Current Configuration (OS, CPU, storage)
Replication Category	Maintenance Window
Isolation Requirements	Physical Location
Monitor/Support Groups	DDL/STREAMS_POOL_SIZE/MINKEEPDAYS

Highly Standardized

- Select a uniform hardware platform
  - GG installs are standardized (same filesystem location, same patch level, no-drift environments)
  - Consistent Naming Standards: Evars, service managers, homes, ACFS filesystems all managed by engineering
  - Provides a consistent user experience on each cluster
  - Clearly define support roles and responsibilities between groups
  - Checks and balances – Engineering defines standards, Container DBAs enforces standards, Application DBA supports replication according to standards
  - Mandatory two character mnemonic guarantees unique checkpoint file naming
  - All replication MUST employ credential stores and trail file encryption
- Be firm; limit exceptions, enforce standards to the defined stack.

Highly Consolidated Replication Hubs

- Segment By Business Unit and Monitoring Group

    - 4-way RAC allows for two, 2-node Allocation Units For each manager

    - Requested trail space limits the dedicated ACFS resource to the ask

    - Service manager is assigned to only two nodes of 4-way replication hub cluster

    - GG VIP is assigned to manager

    - Support Groups alerting assigned to service manager in OEM

    - Service manager home ➔ Dedicated ACFS ➔ Service manager Business Unit

    Example:

    OGG_HOME: /app/ora/software/ogg/12c

    ACFS Name: /ggacfs_bizunit01

    XAG 9.1 Cluster Resource: xag.ggbizunit01.oracle

Install 12.3 MA

- MA Software install is different than classic

- Software homes are separate from deployments

- Utilize response file method to automate your install

- Patched homes now can be preinstalled without disrupting operations

- Install simplification allow us easily meet our compliance requirements

Patching

- Peak Enterprise GoldenGate reached ~1400 GoldenGate Homes

- Highly Standardized Hub consolidation ~500 GoldenGate Homes

- 12.3 MA, expected home count levels ~250 GoldenGate Homes

- Current pathing is rolling (failover,patch,failback,patch)

- Patched MA software home will be auto-deployed in advance using the response file install

- ServiceManager will be stopped, repoint, and restarted

- Extremely efficient model operating on far less homes.

Planning and Intake

- Establish enterprise replication use cases

- Hold periodic intake meetings to review new replication

- Create a standardized questionnaire to gather necessary info for configuration and deployment

- Identify two character application mnemonic for each application

- Have published replication standards document for configuration and deployment

- Obtain signoff before deployment

User Management

- Expect LDAP Integration in future GA release

- Standardize C## container replication database user

- Standardize non-container replication database user

- Develop role separation document

- Establish clear ownership of tasks based on role

- Have a plan to manage users manually anticipating future LDAP support

SSL Setup

- EM 13c, 12c: How to Configure the Enterprise Manager Cloud Control Management Agent for Secure Socket Layer (SSL) Certificates (Doc ID 2213661.1)

- Subject Alternative Name (SAN) necessary for Cluster HA

- GoldenGate Virtual IP will be Service Manager URL for HA

  - https://lab01ga.wellsfargo.com:18000/

- SAN setup with orapki

  - $OGG_HOME/bin/orapki wallet add -wallet $GG_WALLET_LOC/lab01 -dn "CN=lab01.acme.com, OU=EDM, O=Acme, L=San Francisco, ST=California, C=US" -keysize 2048 -addext_san DNS:lab01,DNS:lab02.acme.com,DNS:lab02,DNS:lab01ga.acme.com,DNS:lab01ga,DNS:lab01gb.acme.com,DNS:lab01gb -pwd abc123

- Auto login wallet will need to be staged

- XAG relocation testing is working well using Virtual IP

Software Install

- Software is now separate from the deployment

- Software version is variable

- One software install per server for all SMs on the cluster

- Standardized response file

  - INSTALL_OPTION=ORA12c

  - SOFTWARE_LOCATION=/app/ora/software/ogg/12c

  - START_MANAGER=false

  - INVENTORY_LOCATION=/app/orainv/inv

  - UNIX_GROUP_NAME=orainst

- Limit the database version to 12c

- Keep master response file in known location or software repository

- Only do silent installs

- Automate install and response file generation

Software Install - Evars

- **Standard environment variables**

  - **OGG Software Install Location**

    - export OGG_HOME="/app/ora/software/ogg/12c"

  - **Service Manager deployment home**

    - export SM_DEPLOYMENT_HOME="/ggapp_<BU name><BU Number>/sm"

  - **Service Manager registry location**

    - export SM_REGISTRY_LOCATION="${SM_DEPLOYMENT_HOME}/etc/conf"

  - **Service Manager registry filename**

    - export SM_REGISTRY_FILE="${SM_REGISTRY_LOCATION}/deploymentRegistry.dat"

  - **OGG registry location**

    - export OGG_CONF_HOME="${SM_REGISTRY_LOCATION}"

  - **ORACLE_HOME**

    - export ORACLE_HOME=/app/ora/software/db/18c

  - **LD_LIBRARY_PATH**

    - export LD_LIBRARY_PATH=$ORACLE_HOME/lib:$LD_LIBRARY_PATH

Deployment – Best Practice Guidelines

- Separate Service Managers by business unit or funding source

- Divide RAC cluster into allocation units

- Use ACFS to enforce budgeted resource limits

- Multiple deployments within the same SM should be part of the same replication ecosystem

GG Deployment – Best Practice

- There should be a well documented standard to manage a deployment

- Keep master SM response file in known location or software repository

- Automate install and response file generation

- Initial deployment will require a minimum of ~24 parameter values

- Subsequent deployments in the same Service Manager will require ~10 parameter values

- Naming standards, Ports, Service Managers, Deployment configuration should be managed and enforced by a central authority

- Actual replication should be managed by users according to the published standards

Deployment – Shared

Thank you for attending

GoldenGate Microservices

Questions and Answers