Technical white paper

Configure High Availability and Disaster Recovery Solutions with HP DMA Using PostgreSQL Database

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Overview

This paper provides examples of how to configure HP DMA in a high availability and disaster recovery solution using PostgreSQL 9.3 database in active-active and active-passive setup to achieve high availability, failover, and recovery in catastrophic failures.

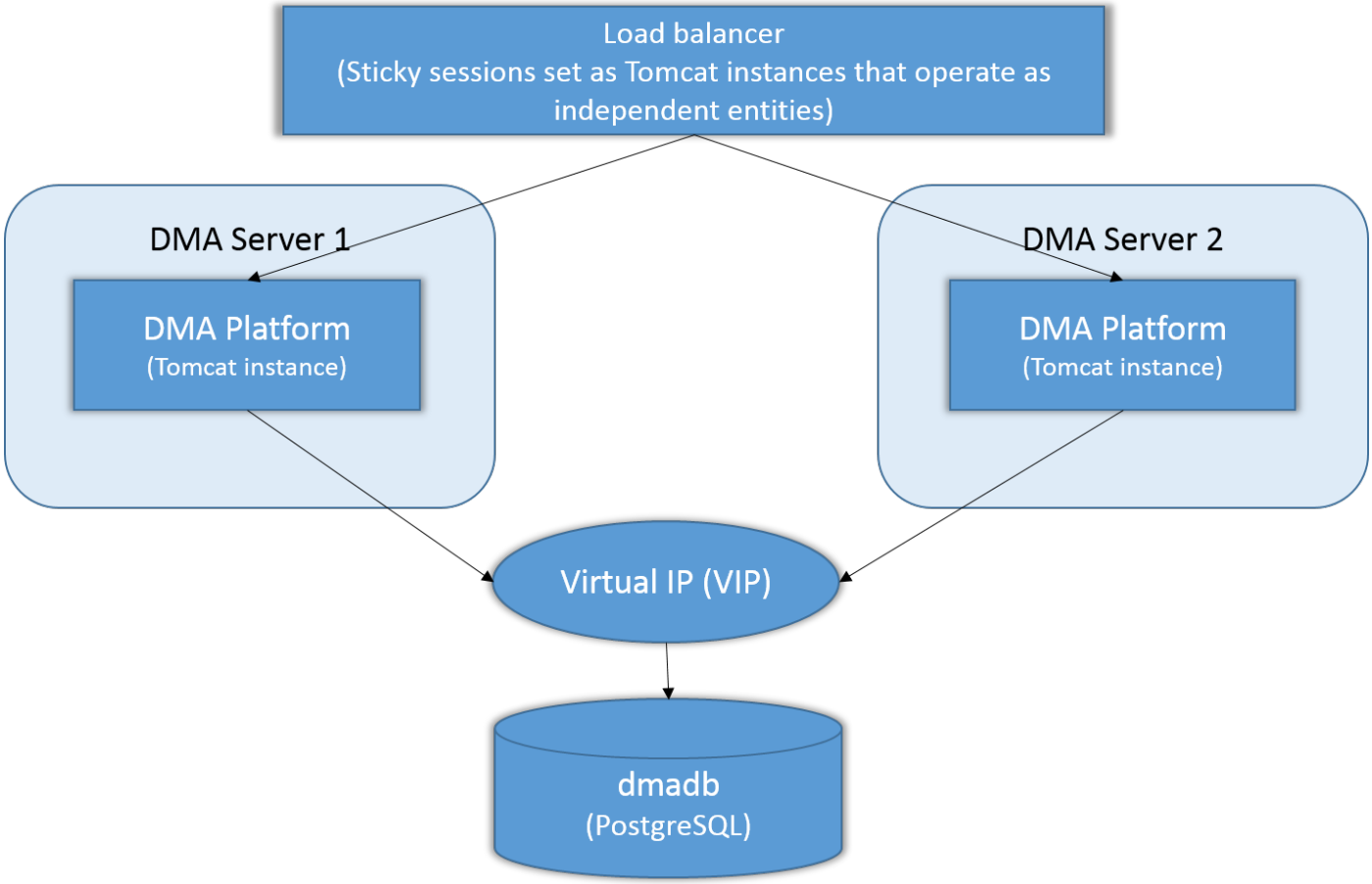
The high availability and disaster recovery solution for HP DMA is implemented using PostgreSQL database. The streaming replication feature of the PostgreSQL database provides the capability to continuously ship and apply the Write-Ahead Logging (WAL) XLOG records to standby servers in order to keep them current.

This paper includes the following solutions:

- HP DMA HA Standard Architecture Solution
- HP DMA HA and DR Architecture Solution (Active-Passive)
- HP DMA HA and DR Architecture Solution (Active-Active Tomcat and Active-Passive Database)

HP DMA HA Standard Architecture Solution

This example is for HA architecture without DR:



How to Run the Baseline Command on PostgreSQL

To set up the primary active environment, use these examples to modify the HP DMA installation baseline command. How to use the baseline command is described in "Install the HP DMA Server" section in the HP DMA Installation Guide available at http://h20230.www2.hp.com/selfsolve/manuals. To see the full list of baseline options, see HP DMA Baseline Options.

1. Change your directory:

   ```
   cd /opt/hp/dma/server/tomcat/webapps/dma/WEB-INF
   ```

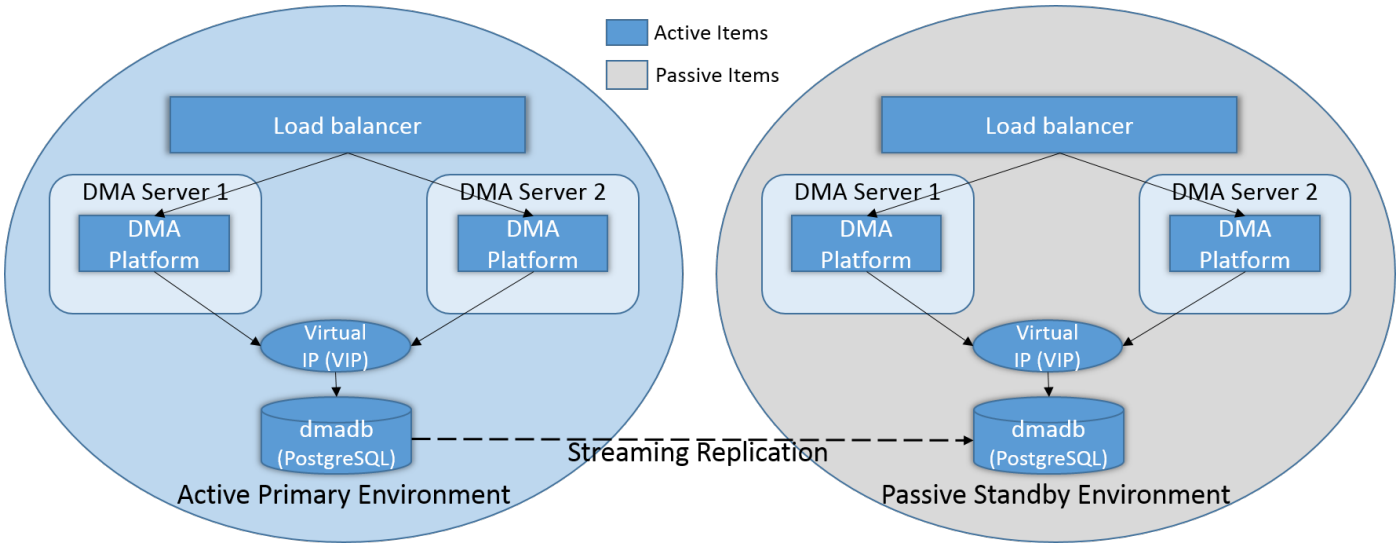
2. Run the baseline command on the primary node of PostGRESQL:

   ```
   sh dmaBaselineData.sh --create-tables --database-type  postgres --database-username postgres --
   database-password postgres --jdbc-connection-string jdbc:postgresql://<ipaddress>:5432/dma --
   dma-hostname <ipaddress>
   ```

The standby nodes are automatically synced as streaming replication continuously ships and applies Write-Ahead Logging (WAL) XLOG records.

HP DMA HA and DR Architecture Solution (Active-Passive)

This example is for HA architecture with DR (active-passive).



How to Setup the HP DMA Server on the Passive Standby Environment

After you have set up your primary active environment, perform these steps in the passive standby environment (right side of the diagram) to set up the active-passive architecture:

> **Note:** Perform this after you run baseline commands to set up your primary active environment. You only need to modify the `dma.xml` files for the standby environment. For more information on the dma.xml file, see HP DMA Installation Guide available at http://h20230.www2.hp.com/selfsolve/manuals.

1. Copy the dma.xml file from primary node from primary environment to the standby nodes. The file is located at:

   `/opt/hp/dma/server/tomcat/conf/Catalina/localhost/dma.xml`

2. On each node, edit the webServiceUrl parameter and the JDBC/DMA resource in the dma.xml file to match the Standby environment, for example, as highlighted in **bold**:

```
<Parameter name="com.hp.dma.core.webServiceUrl" value="https://dmaserver(3/4):8443/dma"/>
<Resource name="jdbc/dma" auth="container" type="javax.sql.DataSource" maxActive="20"
maxIdle="20" maxWait="20000" username="“dma" password="{AES}
80c54c58279cb66cb879d432cd33be4fc53bc95a30d510dffdb55fd121be4d44"
driverClassName="postgres.jdbc.PostgreSQLDriver"url="jdbc:postgresql:thin:@standby-
vip.company.com:1522/DRdmadb.servicename" factory="com.hp.dma.util.DmaTomcatContextHandler"/>
```

How to Handle Failover for an Active Standby Environment

In the event of a failover, perform the following:

1. Cancel the workflows that were running when the failure occurred by running the following script on any of the Standby HP DMA servers:

   `/opt/hp/dma/server/tomcat/webapps/dma/WEB-INF/cancelWorkflow.sh`

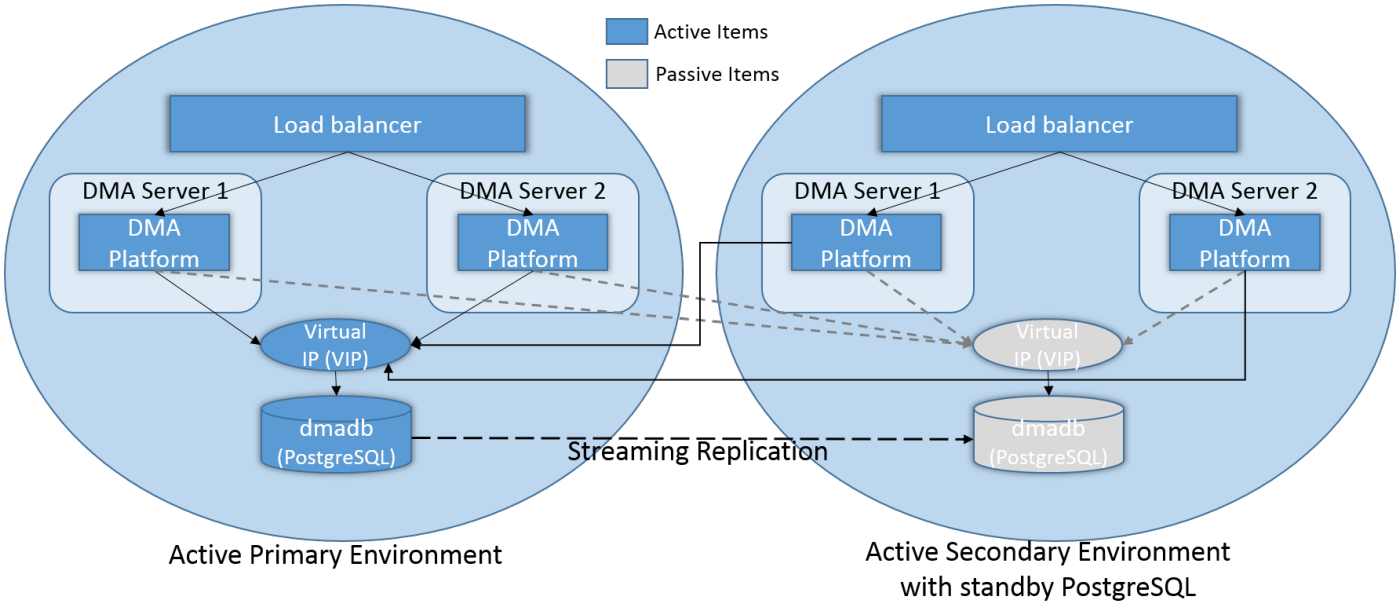
2. Clean up any targets that may have had workflows running against them.

3. Change the values for the following parameters in the dma.xml file:
   - testOnBorrow="true"
   - removeAbandoned="true"
   - timeBetweenEvictionRunsMillis="5000"
   - minEvictableIdleTimeMillis="5000"
   - minIdle="0"

   The application attempts to reconnect to the datasource after restart of the database.

HP DMA HA and DR Architecture Solution (Active-Active Tomcat and Active-Passive Database)

This example is for HA architecture with DR (Active-Active Tomcat and Active-Passive database).



How to Setup the HP DMA Server on the Active Standby Environment

After you have set up your primary active environment, perform these steps in the active secondary environment with standby PostgreSQL to set up the Active-Active Tomcat and Active-Passive database architecture:

Note: Perform this after you run baseline commands to set up your primary active environment. You only need to modify the `dma.xml` files for the standby environment. For more information on the dma.xml file, see HP DMA Installation Guide available at http://h20230.www2.hp.com/selfsolve/manuals.

1. Copy the dma.xml file from primary node from primary environment to the standby nodes. The file is located at:

   `/opt/hp/dma/server/tomcat/conf/Catalina/localhost/dma.xml`

2. On each node, edit the webServiceUrl parameter in the dma.xml file to match the standby environment:

   <Parameter name="com.hp.dma.core.webServiceUrl" value="https://dmaserver(3/4):8443/dma" />

How to Configure Failover when the Primary Database is Lost

If the primary database is lost, perform a failover operation:

1. Promote the Standby database as the Active database by triggering recovery.conf file:
2. Cancel the workflows that were running when the failure occurred by running the following script on the Standby HP DMA server:

   /opt/hp/dma/server/tomcat/webapps/dma/WEB-INF/cancelWorkflow.sh

3. Change the values for the following parameters in the dma.xml file:
   - testOnBorrow="true"
   - removeAbandoned="true"
   - timeBetweenEvictionRunsMillis="5000"

- minEvictableIdleTimeMillis="5000"
- minIdle="0"

The application attempts to reconnect to the datasource after restart of the database.

Additional Resources

HP DMA Documentation

The *HP DMA Installation Guide* contains complete instructions for installing HP DMA and additional information about the baseline command and the dma.xml file. It is available on the HP Software Product Manuals website: http://h20230.www2.hp.com/selfsolve/manuals.

PostgreSQL Documentation

For more information about PostgreSQL database, refer to its documentation at http://www.postgresql.org/docs/.

HP DMA Baseline Options

The following table gives a complete list of all the dmaBaselineData.sh options:

Baseline Option	Example Value	Description
-?,--help		Print this usage message.
-c,--create-tables		Create tables for database.
-cc,--create-context		Create a context file with the specified settings.
-context,--deployed-context-file <dma.xml>	dma.xml	Fully qualified path to the deployed context file to get database connection settings.
-dbh,--database-hostname <arg>	postgres.mycompany.com	The database host name for the Java Database Connectivity (JDBC) connection.
-dbp,--database-port <arg>	1521	The database port for the Java Database Connectivity (JDBC) connection.
-dbpw,--database-password <dbpasswordValue>	dbpassword	The password used to connect to the database.
-dbs,--database-sid <arg>	dma	The database SID for the Java Database Connectivity (JDBC) connection.
-dbts,--database-tablespace <arg>	/u01/app/postgres/dma	The base directory for the database tablespace creation.
-dbtype,--database-type <arg>	postgres	(optional) The underlying database type. The default is postgres.
-dbu,--database-username <dbusernameValue>		The username used to connect to the database.
-dmah,--dma-hostname <dmahostnameValue>	dma.mycompany.com	Set the fully qualified host name of the HP DMA server. If this value is not specified, the default is the server where the script is running.
-e,--erase		Erase existing data and add baseline data. Do not do this unless instructed to by HP Support.

To learn more about HP Database and Middleware Automation visit

hp.com/go/dma

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