**Step-by-Step Guide: Migrate 2-Node Oracle RAC (19c) on ASM to New Servers Using RMAN (Windows)**

**Pre-Migration Preparation**

**1. Verify Source Environment**

cmd

Copy

set ORACLE\_HOME=<current Oracle home>

set ORACLE\_SID=<instance1>

sqlplus / as sysdba

-- Check database information

SELECT name, dbid, open\_mode FROM v$database;

SELECT \* FROM v$version;

SELECT instance\_name, host\_name, status FROM v$instance;

-- Check ASM diskgroups

SELECT name, total\_mb, free\_mb FROM v$asm\_diskgroup;

**2. Prepare Target Servers**

* Install same Oracle version (19c) on new Windows servers
* Configure ASM with same diskgroup names (ensure sufficient space)
* Create same directory structures
* Configure network (listeners, SCAN, etc.)

**3. Create Password File on Target**

cmd

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orapwd file=%ORACLE\_HOME%\database\PWD<ORACLE\_SID>.ora password=<sys\_pwd> entries=10 force=y

**Migration Steps**

**1. Backup Source Database Using RMAN**

cmd

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rman target /

RUN {

ALLOCATE CHANNEL ch1 DEVICE TYPE DISK;

ALLOCATE CHANNEL ch2 DEVICE TYPE DISK;

BACKUP AS COMPRESSED BACKUPSET DATABASE PLUS ARCHIVELOG;

BACKUP CURRENT CONTROLFILE;

BACKUP SPFILE;

}

**2. Transfer Backup Files to Target**

* Copy all backup pieces to new servers (shared location accessible by both nodes)

**3. Restore Controlfile on Target**

cmd

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rman target /

STARTUP NOMOUNT;

RESTORE CONTROLFILE FROM '<backup\_location>\<controlfile\_backup>';

ALTER DATABASE MOUNT;

**4. Catalog Backup Files**

cmd

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CATALOG START WITH '<backup\_location>';

LIST BACKUP SUMMARY;

**5. Restore and Recover Database**

cmd

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RUN {

ALLOCATE CHANNEL ch1 DEVICE TYPE DISK;

ALLOCATE CHANNEL ch2 DEVICE TYPE DISK;

SET NEWNAME FOR DATABASE TO '+NEW\_DG';

RESTORE DATABASE;

SWITCH DATAFILE ALL;

RECOVER DATABASE;

}

**6. Configure RAC Parameters**

sql

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ALTER SYSTEM SET cluster\_database=TRUE SCOPE=spfile;

ALTER SYSTEM SET cluster\_database\_instances=2 SCOPE=spfile;

ALTER SYSTEM SET instance\_number=1 SCOPE=spfile SID='INSTANCE1';

ALTER SYSTEM SET instance\_number=2 SCOPE=spfile SID='INSTANCE2';

ALTER SYSTEM SET thread=1 SCOPE=spfile SID='INSTANCE1';

ALTER SYSTEM SET thread=2 SCOPE=spfile SID='INSTANCE2';

ALTER SYSTEM SET undo\_tablespace='UNDOTBS1' SCOPE=spfile SID='INSTANCE1';

ALTER SYSTEM SET undo\_tablespace='UNDOTBS2' SCOPE=spfile SID='INSTANCE2';

**7. Create Redo Logs for Second Instance**

sql

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ALTER DATABASE ADD LOGFILE THREAD 2 GROUP 3 '+NEW\_DG' SIZE 200M;

ALTER DATABASE ADD LOGFILE THREAD 2 GROUP 4 '+NEW\_DG' SIZE 200M;

ALTER DATABASE ADD LOGFILE THREAD 2 GROUP 5 '+NEW\_DG' SIZE 200M;

ALTER DATABASE ENABLE THREAD 2;

**8. Create Second Instance Service**

cmd

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oradim -NEW -SID INSTANCE2 -STARTMODE manual

**9. Update tnsnames.ora and listener.ora**

* Configure network files on both nodes for both instances

**10. Open Database**

sql

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ALTER DATABASE OPEN RESETLOGS;

**11. Start Second Instance**

cmd

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set ORACLE\_SID=INSTANCE2

sqlplus / as sysdba

STARTUP;

**12. Verify RAC Configuration**

sql

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SELECT inst\_id, instance\_name, host\_name, status FROM gv$instance;

SELECT \* FROM gv$asm\_diskgroup;

**Post-Migration Tasks**

1. Register database with clusterware
2. Configure services and TAF settings
3. Update any application connection strings
4. Perform full database backup
5. Test failover scenarios
6. Decommission old servers after verification

**Important Notes:**

* Ensure same Windows version/architecture on new servers
* Verify disk space on target ASM diskgroups
* Test connectivity between nodes before migration
* Consider downtime window for the cutover
* Document all steps and verify at each stage

Would you like me to elaborate on any specific part of this migration process?

2 / 2

can we do this using rman active dup

**Step-by-Step Guide: Migrate 2-Node Oracle RAC (19c) on ASM to New Servers Using RMAN Active Database Duplication (Windows)**

Yes, you can use RMAN Active Database Duplication (ACTIVE DUPLICATE) which eliminates the need for intermediate disk storage. Here's the updated process:

**Pre-Migration Preparation**

**1. Verify Source Environment (Same as before)**

cmd

Copy

set ORACLE\_HOME=<current Oracle home>

set ORACLE\_SID=<instance1>

sqlplus / as sysdba

-- Check database and ASM information

SELECT name, dbid, open\_mode FROM v$database;

SELECT name, total\_mb, free\_mb FROM v$asm\_diskgroup;

**2. Prepare Target Servers**

* Install Oracle 19c RAC software on new Windows servers
* Configure ASM with same diskgroup names (ensure sufficient space)
* Create password files for both instances
* Configure network (listeners, SCAN, etc.)
* Create required directories

**3. Set Up Connectivity**

* Ensure TNS connectivity between source and target
* Verify password file synchronization
* Configure Oracle Net Services on both ends

**Active Duplication Migration Steps**

**1. Create Initialization Parameter File for Auxiliary Instance**

cmd

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-- On target server:

set ORACLE\_SID=+ASM

sqlplus / as sysasm

CREATE PFILE='C:\temp\initDUPLICATE.ora' FROM SPFILE;

Edit the file to include:

ini

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\*.db\_name='<original\_db\_name>'

\*.cluster\_database=FALSE

\*.remote\_login\_passwordfile='EXCLUSIVE'

**2. Start Auxiliary Instance in NOMOUNT State**

cmd

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set ORACLE\_SID=DUPLICATE

sqlplus / as sysdba

STARTUP NOMOUNT PFILE='C:\temp\initDUPLICATE.ora';

**3. Execute RMAN Active Duplication**

cmd

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rman target sys/<password>@SOURCE\_DB auxiliary sys/<password>@DUPLICATE

DUPLICATE DATABASE TO DUPLICATE\_DB

FROM ACTIVE DATABASE

USING COMPRESSED BACKUPSET

SPFILE

SET cluster\_database='FALSE' COMMENT 'Temporary disable for duplication'

SET control\_files='+NEW\_DG' COMMENT 'New controlfile location'

SET db\_create\_file\_dest='+NEW\_DG' COMMENT 'New datafile location'

SET db\_recovery\_file\_dest='+RECO\_DG' COMMENT 'New recovery area'

SET db\_recovery\_file\_dest\_size='100G' COMMENT 'New recovery size'

SET fal\_server='SOURCE\_DB' COMMENT 'For standby if needed'

SET log\_archive\_config='dg\_config=(SOURCE\_DB,DUPLICATE\_DB)'

SET log\_archive\_dest\_1='location=+NEW\_DG' COMMENT 'New archive location'

NOFILENAMECHECK;

**4. Convert to RAC Configuration**

After duplication completes:

sql

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-- Shutdown the auxiliary instance

SHUTDOWN IMMEDIATE;

-- Edit the spfile to add RAC parameters

ALTER SYSTEM SET cluster\_database=TRUE SCOPE=spfile;

ALTER SYSTEM SET cluster\_database\_instances=2 SCOPE=spfile;

ALTER SYSTEM SET instance\_number=1 SCOPE=spfile SID='INSTANCE1';

ALTER SYSTEM SET instance\_number=2 SCOPE=spfile SID='INSTANCE2';

-- Add other RAC-specific parameters

**5. Create Second Instance**

cmd

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oradim -NEW -SID INSTANCE2 -STARTMODE manual

**6. Start RAC Instances**

cmd

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-- On node 1:

set ORACLE\_SID=INSTANCE1

sqlplus / as sysdba

STARTUP;

-- On node 2:

set ORACLE\_SID=INSTANCE2

sqlplus / as sysdba

STARTUP;

**7. Add Redo Threads for Second Instance**

sql

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ALTER DATABASE ADD LOGFILE THREAD 2 GROUP 3 '+NEW\_DG' SIZE 200M;

ALTER DATABASE ADD LOGFILE THREAD 2 GROUP 4 '+NEW\_DG' SIZE 200M;

ALTER DATABASE ENABLE PUBLIC THREAD 2;

**Post-Migration Tasks**

1. Register services with clusterware:

cmd

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srvctl add database -db DUPLICATE\_DB -oraclehome %ORACLE\_HOME%

srvctl add instance -db DUPLICATE\_DB -instance INSTANCE1 -node NEW\_NODE1

srvctl add instance -db DUPLICATE\_DB -instance INSTANCE2 -node NEW\_NODE2

1. Verify RAC operation:

sql

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SELECT inst\_id, instance\_name, host\_name, status FROM gv$instance;

1. Configure TAF and services as needed

**Advantages of Active Duplication:**

* No intermediate storage required
* Reduced downtime compared to backup/restore
* Direct network transfer of data
* Automatic conversion to new storage

**Important Notes:**

* Ensure sufficient network bandwidth between servers
* The source database remains available during duplication (though performance may be impacted)
* Temporary space is needed on target for RMAN work areas
* Consider using SECTION SIZE parameter for large databases
* Test the process in a non-production environment first

Would you like me to provide more details about any specific part of this active duplication process?

do we need to create db services using oradim in target server

**Oracle RAC Service Creation Using ORADIM in Windows Migration**

For migrating a 2-node Oracle RAC database to new Windows servers using RMAN Active Duplication, you **do need to create database services using ORADIM**, but with some important RAC-specific considerations:

**Service Creation Requirements for RAC Migration**

**1. Initial Auxiliary Instance (During Duplication)**

Yes, you need to create a temporary single-instance service for the duplication process:

cmd

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oradim -NEW -SID DUPLICATE -STARTMODE manual -PFILE C:\temp\initDUPLICATE.ora

**2. For the Actual RAC Instances (Post-Duplication)**

After duplication completes, you must create services for each RAC instance:

**On Node 1:**

cmd

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oradim -NEW -SID INSTANCE1 -STARTMODE manual

**On Node 2:**

cmd

Copy

oradim -NEW -SID INSTANCE2 -STARTMODE manual

**Important RAC-Specific Considerations**

1. **Service Creation Order**:
   * Create services with ORADIM first
   * Then register with Clusterware using SRVCTL
2. **Password Files**:

cmd

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orapwd file=%ORACLE\_HOME%\database\PWDINSTANCE1.ora password=<sys\_pwd> entries=10 force=y

orapwd file=%ORACLE\_HOME%\database\PWDINSTANCE2.ora password=<sys\_pwd> entries=10 force=y

1. **Clusterware Registration** (After ORADIM):

cmd

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srvctl add database -db NEWDB -oraclehome %ORACLE\_HOME% -spfile +DATA/NEWDB/spfileNEWDB.ora

srvctl add instance -db NEWDB -instance INSTANCE1 -node NEWNODE1

srvctl add instance -db NEWDB -instance INSTANCE2 -node NEWNODE2

**Why ORADIM is Still Needed in RAC**

1. Windows requires the service for instance startup mechanics
2. The service acts as an interface between Windows Service Control Manager and Oracle
3. Even in RAC, each instance runs as a separate Windows service

**Post-Creation Verification**

1. Check services exist:

cmd

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sc query | find "Oracle"

1. Verify Clusterware registration:

cmd

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srvctl config database -db NEWDB

srvctl status database -db NEWDB

**Key Differences from Single-Instance Migration**

1. You must create services on **both nodes**
2. Services must be **identical except for SID name**
3. The services will be managed by both:
   * Windows Service Control Manager (basic start/stop)
   * Oracle Clusterware (for RAC operations)

Would you like me to provide the complete sequence of service-related commands in chronological order as part of the migration workflow?

yes please

**Complete Step-by-Step Service Creation Sequence for Oracle RAC Migration on Windows**

This guide provides the **chronological order** of all service-related operations when migrating a 2-node Oracle RAC database using RMAN Active Duplication on Windows.

**Phase 1: Pre-Migration (Target Server Setup)**

**1. Create Password Files on Both Nodes**

Run **on each target RAC node**:

cmd

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orapwd file=%ORACLE\_HOME%\database\PWD<ORACLE\_SID>.ora password=<sys\_password> entries=10 force=y

Example (Node 1):

cmd

Copy

orapwd file=C:\app\oracle\product\19c\dbhome\_1\database\PWDORCL1.ora password=MySysPwd123 entries=10 force=y

Example (Node 2):

cmd

Copy

orapwd file=C:\app\oracle\product\19c\dbhome\_1\database\PWDORCL2.ora password=MySysPwd123 entries=10 force=y

**2. Create a Temporary Auxiliary Instance (For RMAN Duplication)**

Run **on the first target node**:

cmd

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oradim -NEW -SID AUXDB -STARTMODE manual -PFILE C:\temp\initAUXDB.ora

(We will delete this later after duplication completes.)

**Phase 2: Post-Duplication (RAC Setup)**

**3. Shut Down the Temporary Auxiliary Instance**

cmd

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set ORACLE\_SID=AUXDB

sqlplus / as sysdba

SHUTDOWN IMMEDIATE;

**4. Create Permanent RAC Services on Both Nodes**

**On Node 1:**

cmd

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oradim -NEW -SID ORCL1 -STARTMODE auto -PFILE C:\app\oracle\product\19c\dbhome\_1\database\initORCL1.ora

**On Node 2:**

cmd

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oradim -NEW -SID ORCL2 -STARTMODE auto -PFILE C:\app\oracle\product\19c\dbhome\_1\database\initORCL2.ora

**5. Register the Database with Oracle Clusterware**

Run **from any node** (requires admin privileges):

cmd

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srvctl add database -db ORCL -oraclehome %ORACLE\_HOME% -spfile +DATA/ORCL/spfileORCL.ora

srvctl add instance -db ORCL -instance ORCL1 -node WIN-RAC1

srvctl add instance -db ORCL -instance ORCL2 -node WIN-RAC2

**6. Remove the Temporary Auxiliary Service**

cmd

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oradim -DELETE -SID AUXDB

**Phase 3: Verification**

**7. Check Windows Services**

cmd

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sc query | find "Oracle"

Expected output:

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SERVICE\_NAME: OracleServiceORCL1

SERVICE\_NAME: OracleServiceORCL2

**8. Verify Clusterware Registration**

cmd

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srvctl config database -db ORCL

srvctl status database -db ORCL

**9. Start RAC Database**

cmd

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srvctl start database -db ORCL

**10. Confirm Both Instances Are Running**

sql

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sqlplus / as sysdba

SELECT inst\_id, instance\_name, status FROM gv$instance;

Expected output:

Copy

INST\_ID | INSTANCE\_NAME | STATUS

--------|--------------|--------

1 | ORCL1 | OPEN

2 | ORCL2 | OPEN

**Summary of Key Commands in Order**

| **Step** | **Command** | **Purpose** |
| --- | --- | --- |
| 1 | orapwd | Create password files on both nodes |
| 2 | oradim -NEW -SID AUXDB | Temporary service for RMAN duplication |
| 3 | oradim -NEW -SID ORCL1 | Permanent service for Node 1 |
| 4 | oradim -NEW -SID ORCL2 | Permanent service for Node 2 |
| 5 | srvctl add database | Register with Clusterware |
| 6 | oradim -DELETE -SID AUXDB | Clean up temporary service |
| 7 | srvctl start database | Start RAC database |

**Final Notes**

* **ORADIM is mandatory** for Windows Oracle services, even in RAC.
* **SRVCTL is required** for proper RAC management.
* **Delete the temporary AUXDB service** after duplication.
* **Always verify** services in both Windows and Clusterware.

Would you like any modifications or additional checks included?