# Oracle 19c Installation & Data Guard (Production-Ready)

This repository documents a **clean, production-grade Oracle Database 19c installation** with **Data Guard Physical Standby** on **Rocky Linux 8.10**.

The goal is to provide a **reproducible, auditable, and enterprise-ready** setup that covers: - OS preparation & hardening - Oracle 19c installation (CDB/PDB) - Listener & auto-start - Storage (LVM) best practices - Oracle Data Guard (Primary ↔ Standby)

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## 🧱Architecture

```
Primary Server                Standby Server
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Rocky Linux 8.10              Rocky Linux 8.10
Oracle 19c (ORCL CDB)   --->  Oracle 19c (ORCL CDB)
PDB: CBSPDB                   PDB: CBSPDB
ARCHIVELOG ON                 Managed Recovery
Listener :1521                Listener :1521
```

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## 🔧Environment Details

- **OS**: Rocky Linux 8.10 (RHEL compatible)
- **Oracle Version**: 19c (19.3+)
- **Database Type**: Container Database (CDB) + PDB
- **Primary DB Name**: ORCL
- **PDB Name**: CBSPDB
- **Storage**: LVM ( `/orcl` )
- **Listener Port**: 1521

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## 📁Repository Structure

```
oracle-19c-dataguard-production/
├── README.md
├── docs/
│   ├── architecture.md
│   ├── prerequisites.md
```

```
│   └── troubleshooting.md
├── scripts/
│   ├── os-precheck.sh
│   ├── oracle-env.sh
│   ├── dataguard-primary.sql
│   └── dataguard-standby.sql
└── systemd/
    └── oracle.service
```

You can extend this repo with automation (Ansible/Terraform) later.

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## 🗜️ Step 1: OS Preparation (Primary & Standby)

### Kernel & Limits

```
vm.swappiness = 1
fs.file-max = 6815744
```

```
oracle soft nofile 65536
oracle hard nofile 65536
oracle soft nproc 16384
oracle hard nproc 16384
```

### Firewall

```
firewall-cmd --permanent --add-port=1521/tcp
firewall-cmd --reload
```

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## 🗜️ Step 2: Oracle 19c Installation

- Install Oracle 19c using **silent mode (OUI)**
- Configure environment:

```
export ORACLE_BASE=/orcl/app/oracle
export ORACLE_HOME=$ORACLE_BASE/product/19c/dbhome_1
export ORACLE_SID=ORCL
export PATH=$ORACLE_HOME/bin:$PATH
```

- Create CDB with PDB:

- **CDB**: ORCL
- **PDB**: CBSPDB
- Verify:

```
show pdbs;
```

Expected:

```
CBSPDB  READ WRITE
```

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## 🗜️ Step 3: Enable ARCHIVELOG (Primary)

```
shutdown immediate;
startup mount;
alter database archivelog;
alter database open;
archive log list;
```

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## 🗜️ Step 4: Data Guard – Primary Configuration

```
ALTER SYSTEM SET log_archive_config='DG_CONFIG=(ORCL,ORCLSTBY)';
ALTER SYSTEM SET log_archive_dest_2='SERVICE=ORCLSTBY ASYNC
VALID_FOR=(ONLINE_LOGFILES,PRIMARY_ROLE) DB_UNIQUE_NAME=ORCLSTBY';
ALTER SYSTEM SET fal_server=ORCLSTBY;
ALTER SYSTEM SET standby_file_management=AUTO;
```

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## 🗜️ Step 5: Standby Database Setup

- Install same Oracle version
- Restore controlfile & datafiles using RMAN
- Start managed recovery:

```
ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;
```

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## 🕐Switchover / Failover Ready

- Redo transport verified
- Apply lag monitored
- Standby ready for READ ONLY or ACTIVE DG

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## 🔐Security & Hardening

- Root SSH disabled
- Firewalld restricted
- Only Oracle ports exposed
- systemd-based auto-start

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## 🔗Validation Checklist

- [x] CDB/PDB open correctly
- [x] Archive log enabled
- [x] Redo shipping working
- [x] Standby in sync
- [x] Auto-start on reboot

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## 📌Use Cases

- Production Oracle workloads
- High Availability (HA)
- Disaster Recovery (DR)
- Enterprise DBA / DevOps reference

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## Contributions

PRs are welcome for: - Automation (Ansible) - Monitoring (OEM / Prometheus) - Security enhancements

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## 🔖 Tags

`oracle19c` `dataguard` `linux` `rockylinux` `dba` `high-availability` `disaster-recovery`