Backup and Recovery Configuration

Objectives

- After completing this lesson, you should be able to:
  - Configure the fast recovery area
  - Multiplex the control file
  - Multiplex redo log files
  - Configure ARCHIVELOG mode

Configuring for Recoverability

- Configure your database for maximum recoverability by:
  - Scheduling regular backups
  - Multiplexing control files
  - Multiplexing redo log groups
  - Retaining archived copies of redo logs

Configuring the Fast Recovery Area

- Fast recovery area:
  - Strongly recommended for simplified backup storage management
  - Storage space (separate from working database files)
  - Location specified by the `DB_RECOVERY_FILE_DEST` parameter
  - Size specified by the `DB_RECOVERY_FILE_DEST_SIZE` parameter
  - Large enough for backups, archived logs, flashback logs, multiplexed control files, and multiplexed redo logs
  - Automatically managed according to your retention policy
- Configuration of the fast recovery area includes specifying the location, size, and retention policy.

```
ALTER SYSTEM SET db_recovery_file_dest = directory | disk group
ALTER SYSTEM SET db_recovery_file_destsize = integer [K | M | G]
```

Monitoring the Fast Recovery Area

- Monitor the fast recovery area to ensure that it does not reach its capacity.
- The instance will pause if there isn't enough space in the fast recovery area to create an archived log.
- Query the `V$RECOVERY_FILE_DEST` view to determine the current location, disk quota, space in use, space reclaimable by deleting files, and total number of files in the fast recovery area.
- Query the `V$RECOVERY_AREA_USAGE` view to determine the percentage of the total disk quota used by different types of files.
- You can also use GUI tools such as Enterprise Manager Cloud Control to monitor the space usage.

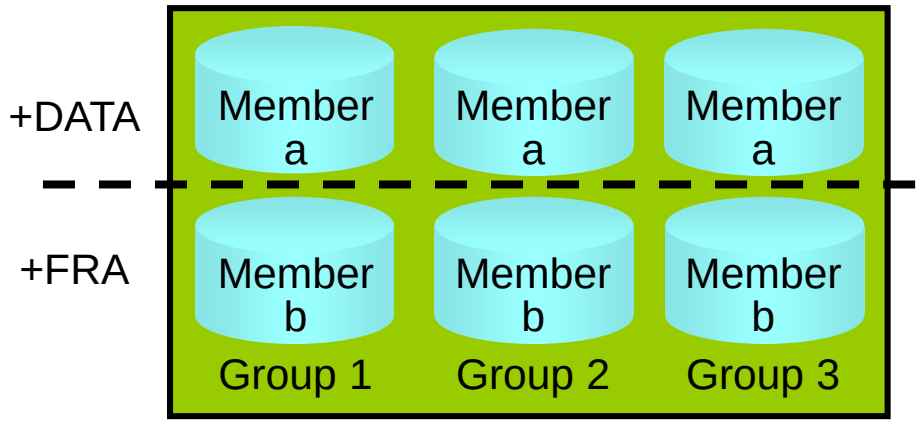
Multiplexing Control Files

- To protect against database failure, your database should have multiple copies of the control file.

	ASM Storage	File System Storage
Best Practice	One copy on each disk group (such as +DATA and +FRA)	At least two copies, each on a separate disk (at least one on a separate disk controller)
Steps to create additional control files	No additional control file copies required	1. Alter the SPFILE with the `ALTER SYSTEM SET control_files` command. 2. Shut down the database. 3. Copy the control file to a new location. 4. Open the database and verify the addition of the new control file.

Redo Log Files

- Multiplex redo log groups to protect against media failure and loss of data. This increases database I/O. It is suggested that redo log groups have:
  - At least two members (files) per group
  - Each member:
    - On a separate disk or controller if using file system storage
    - In a separate disk group (such as +DATA and +FRA) if using ASM



Note: Multiplexing redo logs may impact overall database performance.

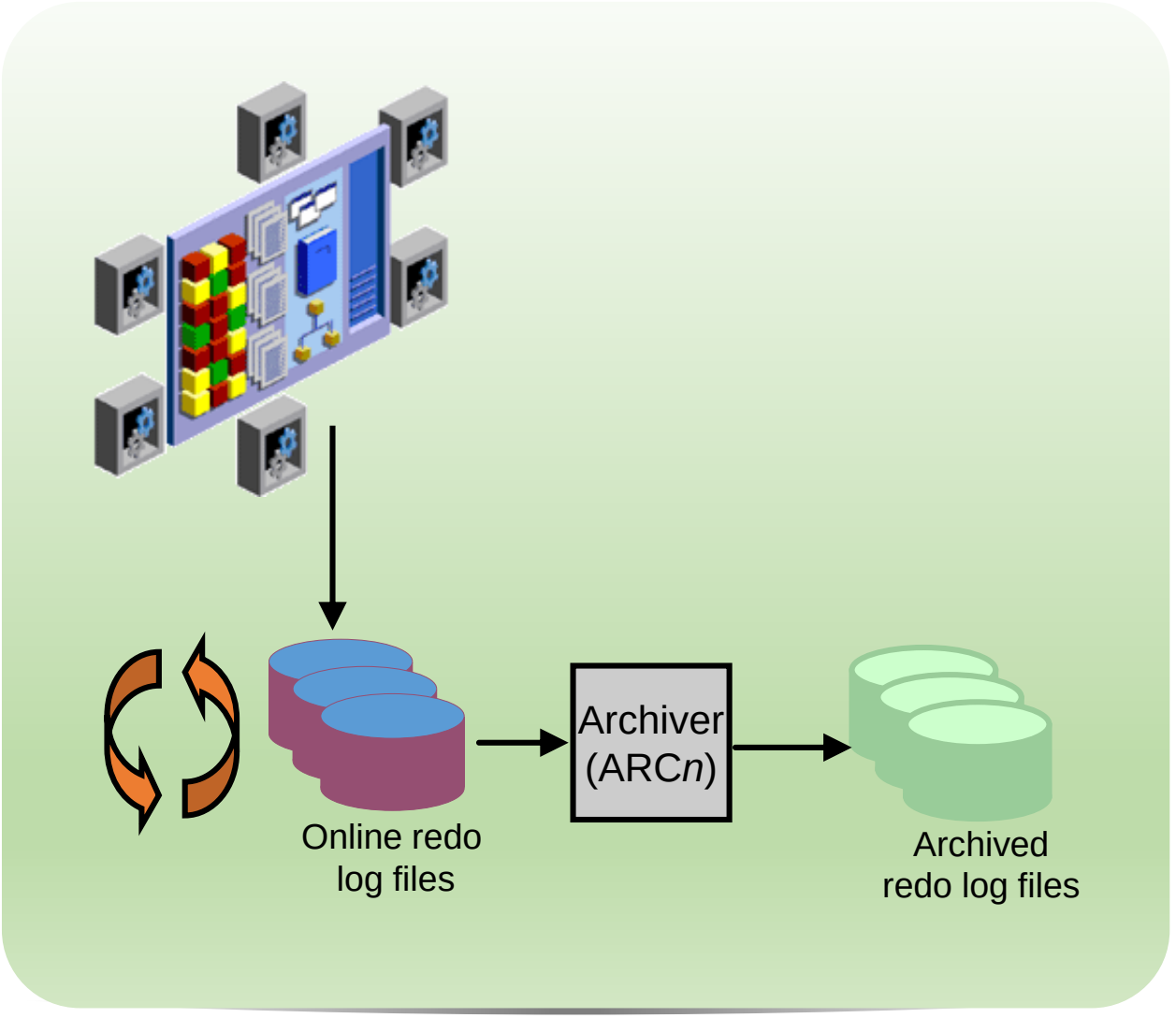
Multiplexing the Redo Log

- Add a member to an existing log group:
  - Navigate to the Redo Log Groups page in Enterprise Manager Database Express
  - Use the `ALTER DATABASE` command

```
SQL> ALTER DATABASE
  2  ADD LOGFILE MEMBER '/u01/app/oracle/oradata/orcl/redo1a.log'
  3  TO GROUP 1;
```

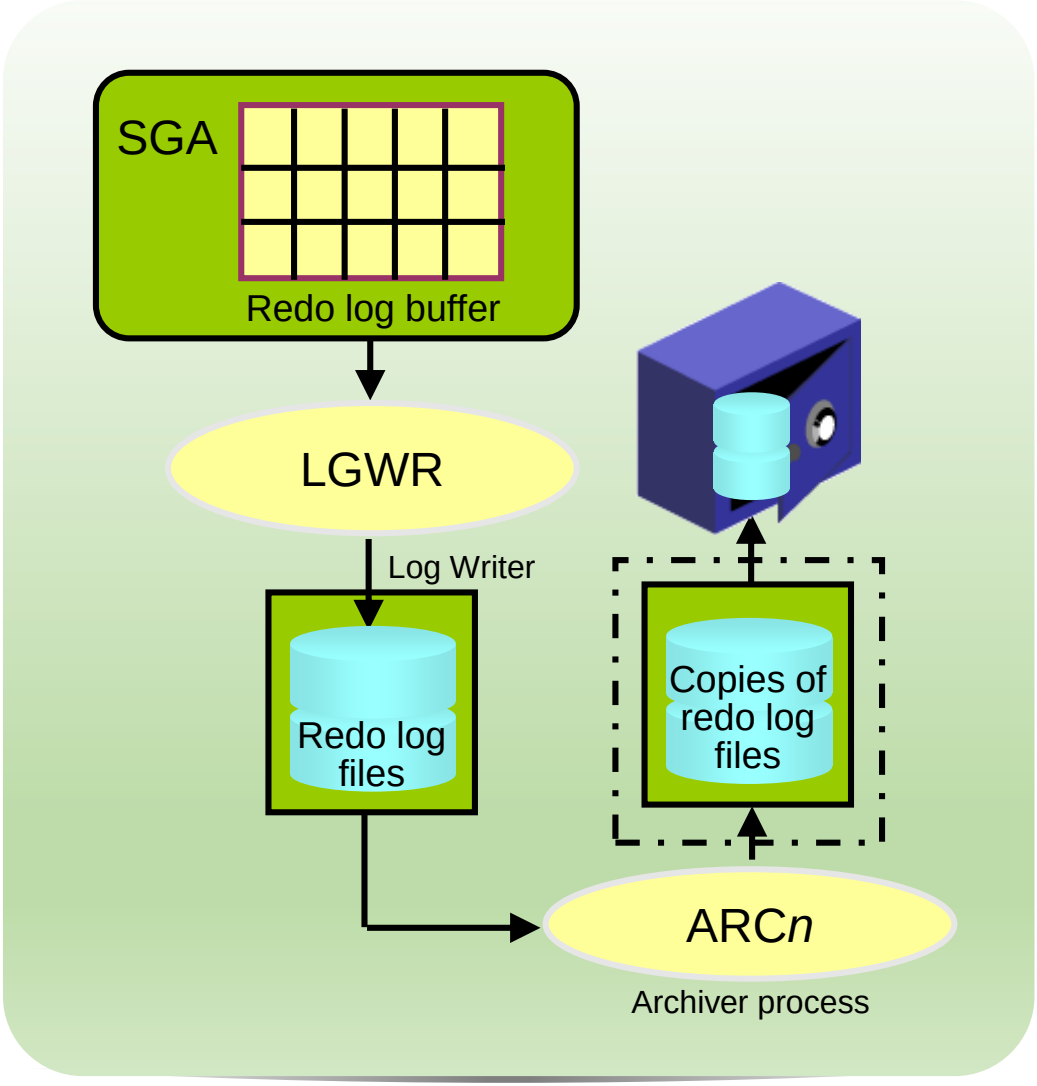
Creating Archived Redo Log Files

- To preserve redo information, create archived copies of redo log files by performing the following steps:
  1. Specify the archived redo log file-naming convention.
  2. Specify one or more archived redo log file locations.
  3. Place the database in `ARCHIVELOG` mode.



Archiver (ARC*n*) Process

- Archiver (ARC*n*):
  - Automatically archives online redo log files when the database is in `ARCHIVELOG` mode
  - Preserves a record of all changes made to the database



Archived Redo Log Files: Naming and Destinations

- Use the `LOG_ARCHIVE_DEST` initialization parameter to specify a single destination.
- Use the `LOG_ARCHIVE_DEST_n` initialization parameters to archive to two or more locations.
- If you are using file system storage, it is recommended that you add multiple locations across different disks.
- If the fast recovery area is enabled, `USE_DB_RECOVERY_FILE_DEST` is specified by default as an archived redo log file destination.

Configuring ARCHIVELOG Mode

- You can use SQL commands as follows:
  1. Shut down the database instance if it is open.
  2. Mount the database.
  3. Issue the ALTER DATABASE ARCHIVELOG command.

```
SQL> shutdown immediate
SQL> startup mount
SQL> alter database archivelog;
SQL> alter database open;
```

- You can also use Enterprise Manager Cloud Control to place the database in ARCHIVELOG mode.

Summary

- In this lesson, you should have learned how to:
  - Configure the Fast Recovery Area
  - Multiplex the control file
  - Multiplex redo log files
  - Configure ARCHIVELOG mode

Practice 17: Overview

- 17-1: Verifying that the Control File is Multiplexed
- 17-2: Checking Storage Availability
- 17-3: Configuring the Size of the Fast Recovery Area
- 17-4: Verifying that the Redo Log File is Multiplexed
- 17-5: Verifying that ARCHIVELOG Mode is Configured