How do you back up and restore an RDS database?

👉 **Level:**

- **Beginner → "RDS has automated backups & snapshots."**
- **Mid-level → Mentions point-in-time recovery, snapshots kept until deleted.**
- **Senior → Also covers cross-region snapshots, automated backup export to S3, DR strategy.**

Short Interview Version

RDS supports **automated backups** (point-in-time restore, 1–35 days retention) and **manual snapshots** (kept until deleted).
To restore, you select a backup/snapshot and AWS creates a **new DB instance** from it, which you connect to using the new endpoint.

Point-in-Time Recovery (PITR) in Amazon RDS is a feature that enables the restoration of a DB instance to any specific second within its defined backup retention period. This capability is crucial for recovering from accidental data loss, corruption, or other unintended modifications to the database.

✅ **1. Backups in RDS**

RDS provides **two main backup methods**:

1. **Automated Backups** (recommended for production)
    - Enabled by default when creating RDS.
    - You set a **retention period (1–35 days)**.
    - Allows **point-in-time recovery** (e.g., recover DB to 2:15 PM yesterday).
    - Includes **daily snapshots** + **transaction logs**.
2. **Manual Snapshots**
    - Taken anytime, kept until you delete them.
    - Good for **long-term retention** or **before risky changes**.
    - Example: Before applying a schema change, I'd take a manual snapshot.

✅ **2. Restoring in RDS**

1. **From Automated Backups (PITR)**
    - In the RDS console → "Restore to point in time."
    - Select date/time → AWS spins up a **new RDS instance** with data at that point.
2. **From Manual Snapshot**
    - Select snapshot → "Restore snapshot."
    - Creates a **new DB instance** from that snapshot.

👉 Note: You **cannot overwrite an existing DB instance**—AWS always creates a new one, and you switch apps to point to the new endpoint.

🎯 **Example**

My DB got corrupted at **5:05 PM** because of a wrong DELETE query.

- I can restore to **4:55 PM** using **point-in-time recovery** from automated backups.
- A **new RDS instance** is created → I point my app to the new endpoint.
- Downtime is minimized, and I recover lost data.

What is the difference between automated and manual RDS snapshots? Explain snapshot life cycles and point-in-time recovery.

✅ **1. Automated Snapshots (part of Automated Backups)**

- **Enabled by default** when you create an RDS instance.
- Retention: **1–35 days** (you choose).
- AWS takes **daily snapshots + transaction logs**.
- You can do **Point-in-Time Recovery (PITR)** within that retention period.
- **Deleted automatically** when the retention period expires or DB is deleted (unless you copy/export).

👉 Example: If you set 7-day retention, AWS deletes the 8th day backup automatically.

✅ **2. Manual Snapshots**

- **User-initiated** (you click "Take Snapshot" or use CLI).
- **No expiry** → kept until you manually delete them.
- Cannot do **PITR** with them → you can only restore to the snapshot time.
- Useful for **long-term backups** or **before risky operations** (e.g., schema migration).

👉 Example: Before applying a patch or upgrading RDS version, I'd take a manual snapshot to roll back if needed.

✅ **3. Snapshot Lifecycle**

1. **Automated Snapshots** → expire after retention period (auto-managed by AWS).
2. **Manual Snapshots** → never expire, you manage lifecycle.
3. You can **copy snapshots** across **regions/accounts** for disaster recovery.
4. You can **export snapshots to S3** for long-term archival.

✅ **4. Point-in-Time Recovery (PITR)**

- Works only with **automated backups**.
- You can restore DB to **any second** within retention period.
- AWS creates a **new DB instance** at the chosen time.
- **Manual snapshots do not support PITR** (restore = exact snapshot time).

👉 Example:

If a developer accidentally runs DROP TABLE at 3:10 PM:

- With PITR, you can restore to **3:09:59 PM** (just before the drop).
- With manual snapshot from last week, you'd lose all changes since that snapshot.

🎯 **Short Interview Version**

Automated Snapshots: Retained 1–35 days, expire automatically, allow **point-in-time recovery**.

- **Manual Snapshots**: Kept until deleted, no PITR, only restore to snapshot time. Together, they form your **backup lifecycle**—automated for recent recovery, manual for long-term archival.

What are the **two main types of backups** supported by Amazon RDS?

A. Incremental and Full Backups
B. Daily Backups and Weekly Backups
C. Automated Backups and Manual Snapshots
D. S3 Backups and Glacier Archives

✅ **Correct Answer: C. Automated Backups and Manual Snapshots**

💡 **Explanation:** RDS automatically performs **automated backups** and also allows **user-initiated manual snapshots**.

If you create a **manual snapshot**, how long does AWS retain it?

A. 7 days
B. 35 days
C. Until the DB instance is deleted
D. Until you manually delete it

✅ **Correct Answer: D. Until you manually delete it**

💡 **Explanation:** Manual snapshots **never expire** — they remain until **you delete them**.

Which type of RDS backup allows **point-in-time recovery (PITR)**?

A. Manual Snapshots
B. Automated Backups
C. Both A and B
D. Cross-region snapshots

✅ **Correct Answer: B. Automated Backups**

💡 **Explanation:** Only **automated backups** store **daily snapshots + transaction logs**, enabling you to **restore to any second** within the retention window.

When restoring from an automated backup or snapshot, what does RDS do?

A. Overwrites the existing database
B. Creates a new RDS instance from the backup
C. Restores data to the same endpoint automatically
D. Requires you to manually install the database software first
✅ **Correct Answer: B. Creates a new RDS instance from the backup**
💡 **Explanation:** You **cannot overwrite** an existing DB; AWS creates a **new instance** with a **new endpoint**.

What is the **maximum retention period** you can set for automated RDS backups?
A. 7 days
B. 15 days
C. 30 days
D. 35 days
✅ **Correct Answer: D. 35 days**
💡 **Explanation:** Automated backups can be retained from **1 to 35 days**.

What happens to **automated backups** when you **delete an RDS instance** (and don't create a final snapshot)?
A. They are retained indefinitely
B. They are automatically deleted
C. They are converted into manual snapshots
D. They are exported to S3 automatically
✅ **Correct Answer: B. They are automatically deleted**
💡 **Explanation: Automated backups** are tied to the lifecycle of the RDS instance and **deleted** with it, unless you choose to **create a final snapshot**.

Which feature allows you to **copy or store RDS snapshots across AWS regions** for disaster recovery?
A. Multi-AZ Deployment
B. Cross-Region Snapshot Copy
C. CloudFormation StackSets
D. AWS Backup Vault
✅ **Correct Answer: B. Cross-Region Snapshot Copy**
💡 **Explanation:** You can **copy manual snapshots** across **regions/accounts** for **DR or compliance**.

How can you **export an RDS snapshot** for **long-term archival or analytics**?
A. By converting it into a manual backup file
B. By exporting snapshot data to S3
C. By enabling Multi-AZ replication
D. By creating an Aurora clone
✅ **Correct Answer: B. By exporting snapshot data to S3**
💡 **Explanation:** RDS lets you **export snapshots to Amazon S3** in **Parquet format**, enabling **analytics or archival**.

A developer accidentally deleted data at **5:10 PM**. You have automated backups with a **7-day retention**.
How can you **recover the database to 5:05 PM**?

A. Restore from a manual snapshot
B. Use point-in-time recovery (PITR) from automated backups
C. Use Multi-AZ failover
D. Use CloudWatch logs to recreate data

✅ **Correct Answer: B. Use point-in-time recovery (PITR)**

💡 **Explanation:** PITR allows restoring the DB to **any specific second** within the retention period (e.g., 5:05 PM).

Which of the following statements is **TRUE** about RDS backup lifecycle?

A. Manual snapshots expire after 35 days
B. Automated backups are deleted when the DB instance is deleted
C. PITR works for both automated and manual backups
D. You can overwrite existing DB during restore

✅ **Correct Answer: B. Automated backups are deleted when the DB instance is deleted**

💡 **Explanation:** Automated backups are **auto-managed** by AWS and tied to the instance lifecycle; manual ones **persist** until deleted manually.