SAP HANA Point-in-Time Recovery Validation

Recovery Validation — restore a SAP HANA tenant database to a selected recovery point following simulated business data loss and verify successful recovery using Complete Data Backups and Transaction Log Backups.

Overview

This case study demonstrates the complete SAP HANA backup and recovery lifecycle within a sandbox tenant database. Business data was created, backed up, intentionally deleted, and successfully restored using Point-in-Time Recovery. The exercise illustrates how SAP HANA combines a Complete Data Backup with Transaction Log Backups to recover a database to a selected point in time while preserving business data integrity.

Command / Tool

SAP HANA Recovery Wizard

System

SYSTEMDB@HDB → Tenant Database (NBU)

Objective

Demonstrate the complete SAP HANA backup and recovery lifecycle by creating business data, performing a Complete Data Backup, validating the Backup Catalog, simulating accidental data loss, restoring the tenant database using Point-in-Time Recovery, and verifying successful restoration of the original business records.

Operational Scenario

This investigation was performed in a sandbox SAP HANA environment.

In production, database recovery is normally performed during an approved maintenance window because the target database must be offline during recovery. Before recovery begins, SAP Basis administrators validate backup availability, confirm the recovery

strategy, coordinate planned downtime, and perform post-recovery validation before returning the database to service.

Business Impact

Reliable backup and recovery procedures are critical for protecting business data against hardware failures, software issues, and user errors. Regular recovery validation provides confidence that backups are usable, and that business services can be restored within expected recovery objectives.

Business Data Created

↓

Complete Database Backup

↓

Backup Catalog Validation

↓

Simulated Data Loss

↓

Recovery Execution

↓

Post-Recovery Verification

Tools Used

- SAP HANA Studio
- SQL Console
- SAP HANA Recovery Wizard
- M_BACKUP_CATALOG
- SQL Commands

Step-by-Step Execution

01

Business Data Creation & Verification

A sample **EMPLOYEE** table was created and populated with five employee records to establish a known baseline before backup operations began.

SQL — NBU Tenant Database

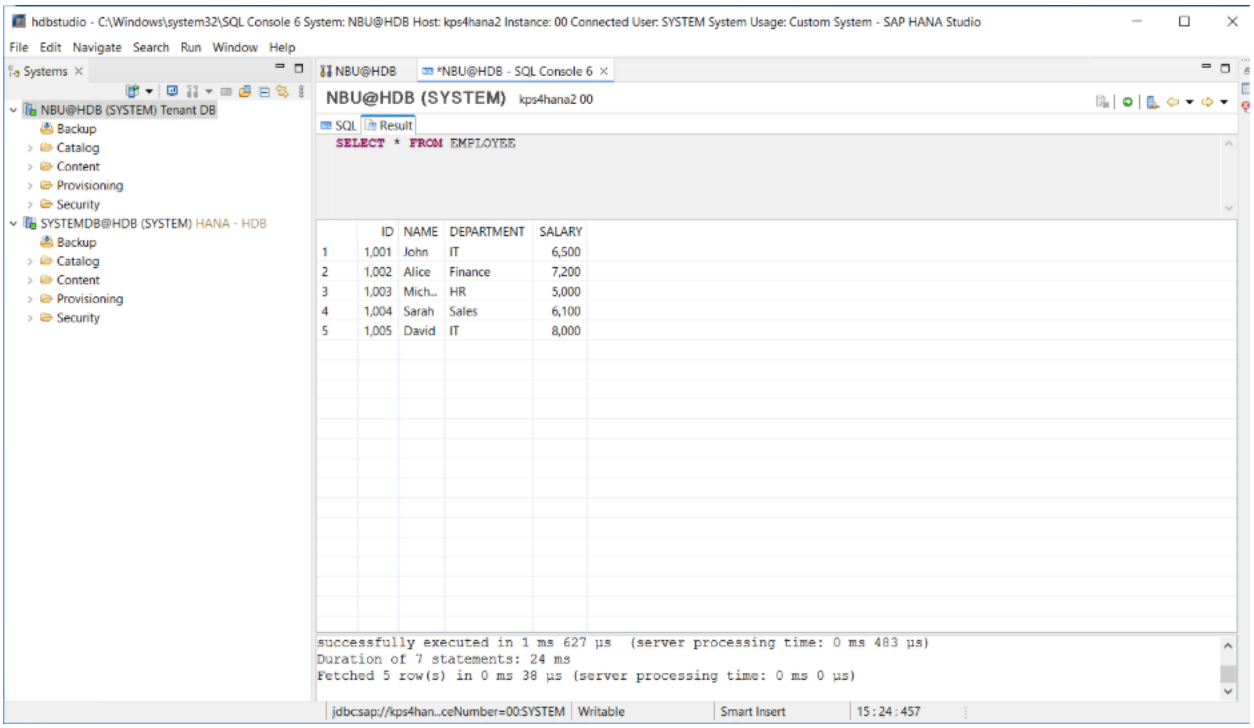
```
CREATE COLUMN TABLE EMPLOYEE (
    EMP_ID INTEGER,
    NAME NVARCHAR(50),
    DEPARTMENT NVARCHAR(50)
);

INSERT INTO EMPLOYEE VALUES
(1,'John Smith','Sales'),
(2,'Sarah Jones','Finance'),
(3,'Michael Brown','IT'),
(4,'Emma Wilson','HR'),
(5,'David Taylor','Operations');

SELECT *
FROM EMPLOYEE;
```

Operational Observation

Five employee records were successfully created and verified within the tenant database. This dataset served as the reference point for validating the recovery process.

Screenshot 1

Filename: **01-employee-data-created.png



Caption

EMPLOYEE table containing the original business records.

Highlight

- EMPLOYEE table
- Five employee records
- SQL verification query
- Fetched 5 row(s)

02

Complete Database Backup

A Complete Data Backup was performed to create a consistent recovery point before any changes were made to the business data.

SQL — NBU Tenant Database

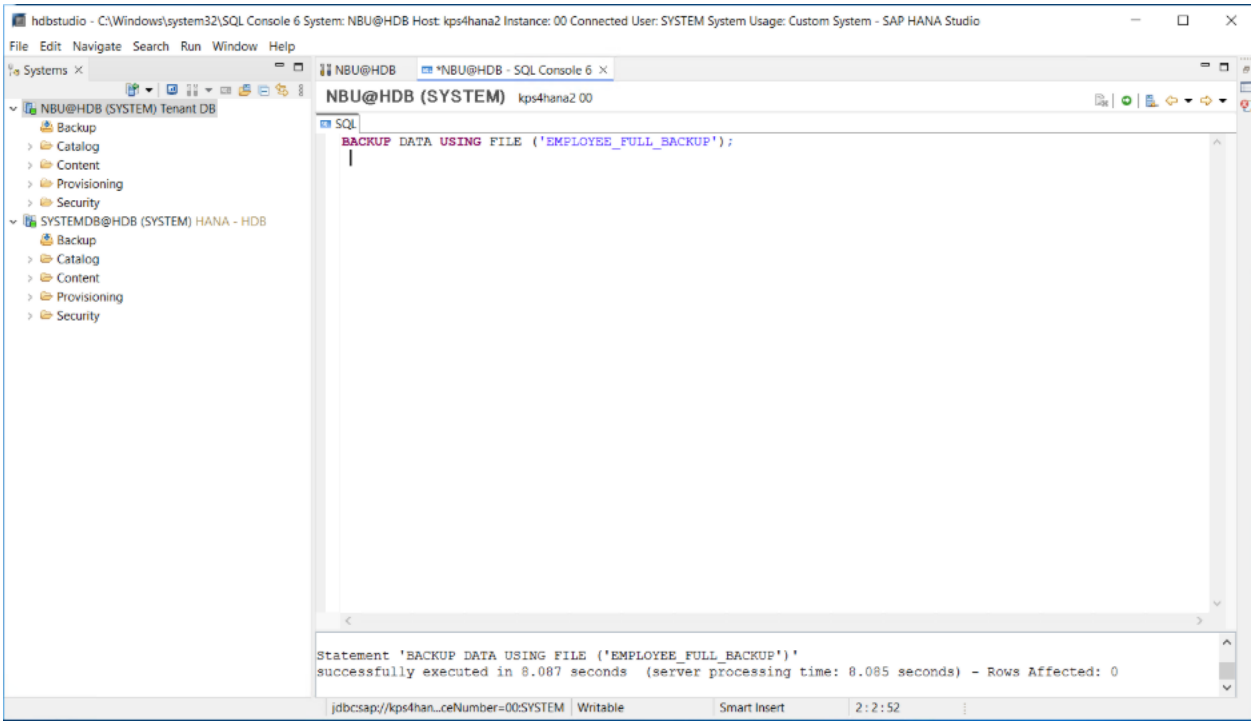
```
BACKUP DATA USING FILE ('EMPLOYEE_FULL_BACKUP');
```

Operational Observation

The Complete Data Backup completed successfully without warnings or errors, establishing a valid recovery point for subsequent recovery operations.

Screenshot 2

Filename: 02-complete-backup.png



Caption

Successful execution of the Complete Data Backup.

Highlight

- BACKUP DATA USING FILE
- EMPLOYEE_FULL_BACKUP
- Statement successfully executed

03

Backup Catalog Validation

Before initiating the database recovery procedure, the SAP HANA Backup Catalog was reviewed to confirm that the Complete Data Backup had been successfully registered and that a valid recovery point was available. This verification ensured that the recovery process could safely proceed using a confirmed backup.

SQL — SYSTEMDB

```
SELECT
    ENTRY_TYPE_NAME,
    STATE_NAME,
    SYS_START_TIME
FROM M_BACKUP_CATALOG
ORDER BY SYS_START_TIME DESC;
```

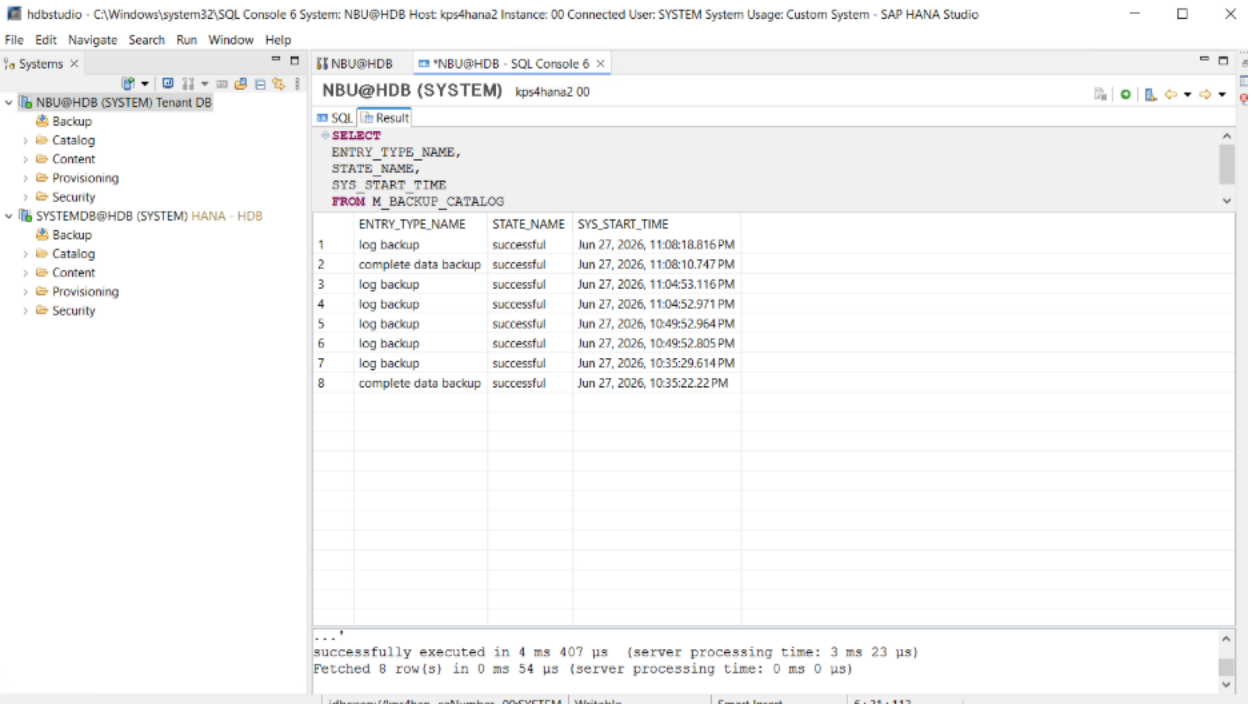
Operational Observation

The Backup Catalog confirmed that the Complete Data Backup completed successfully and was available for recovery. The backup status and timestamp verified that a valid recovery point existed before the recovery procedure was initiated.

Note: A detailed investigation of backup verification using the **M_BACKUP_CATALOG** system view is documented separately in the **Backup Verification (M_BACKUP_CATALOG)** case study. This step was performed to confirm recovery readiness before initiating database recovery.

Screenshot 3

Filename: 03-backup-catalog.png



Caption

Backup Catalog confirming successful registration of the Complete Data Backup.

Highlight

- Complete Data Backup
- Successful status
- Backup timestamp

04

Simulated Business Data Loss

Business records were intentionally deleted from the **EMPLOYEE** table to simulate accidental data loss as part of the recovery validation exercise.

SQL — NBU Tenant Database

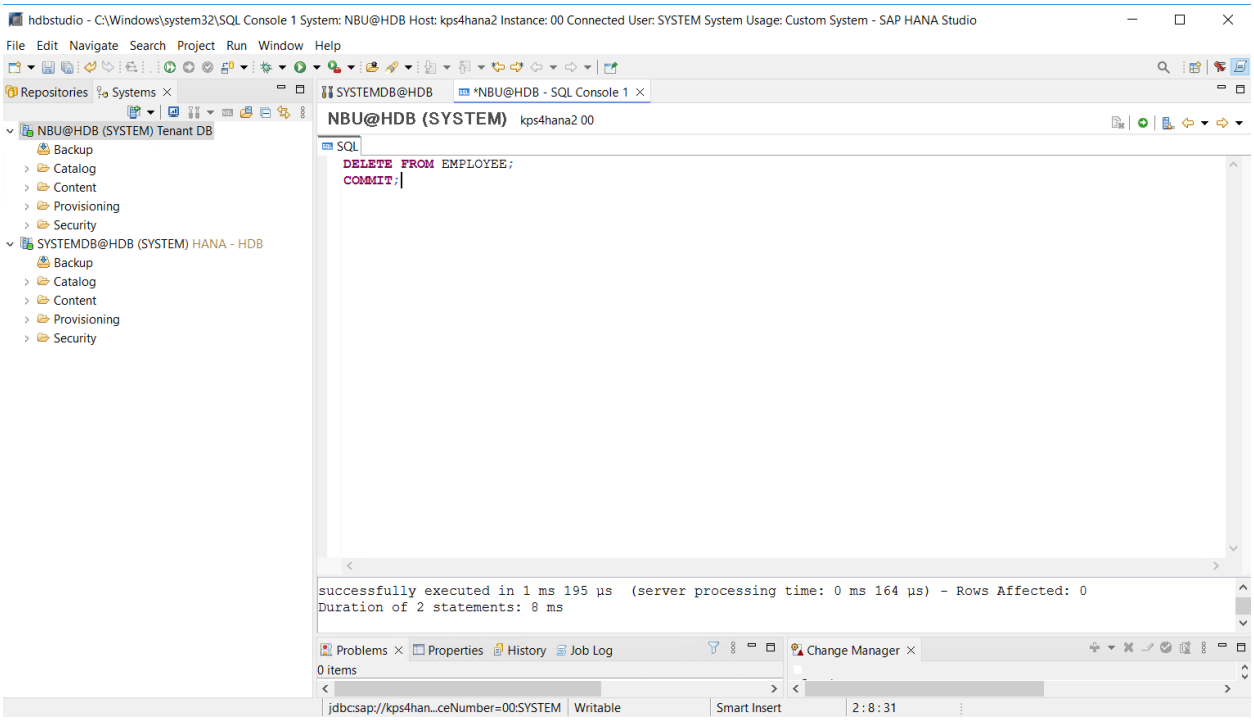
```
DELETE FROM EMPLOYEE;
COMMIT;
```

Operational Observation

The DELETE transaction completed successfully and permanently removed all employee records from the database.

Screenshot 4

Filename: `04-simulated-data-deletion.png`



Caption

DELETE transaction executed against the EMPLOYEE table.

Highlight

- DELETE FROM EMPLOYEE
- COMMIT
- Statement successfully executed

05

Data Loss Verification

A verification query was executed to confirm that the employee records had been deleted before the recovery procedure was initiated.

SQL Verification 1

```
SELECT *
FROM EMPLOYEE;
```

SQL Verification 2

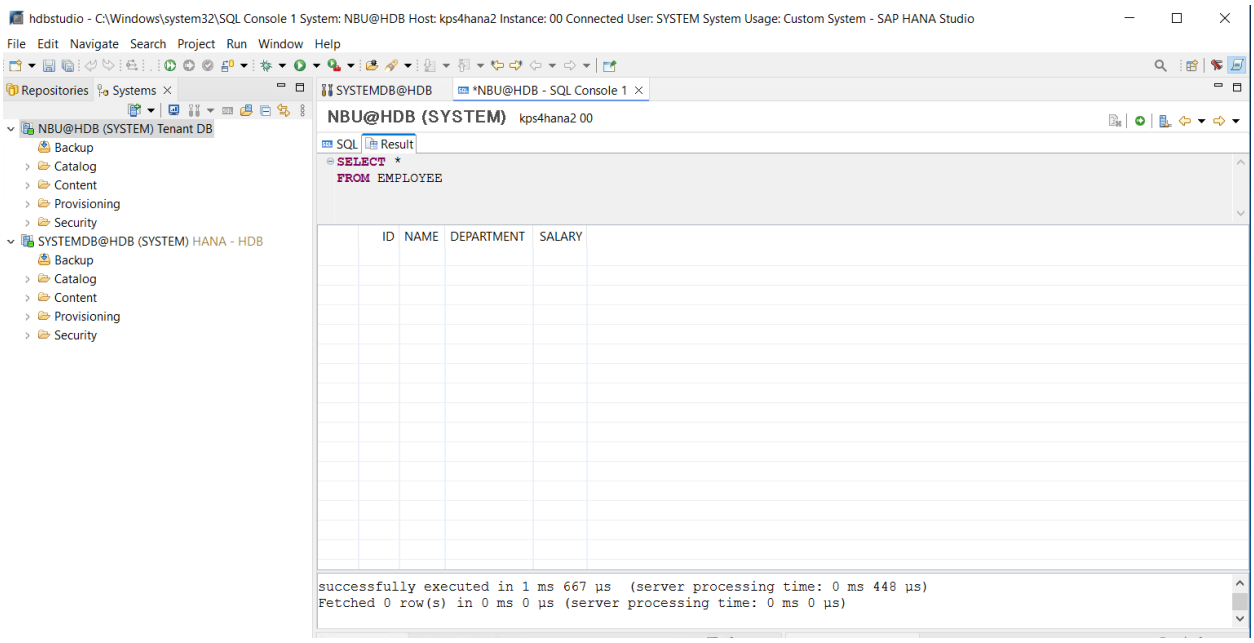
```
SELECT COUNT (*) AS TOTAL_ROWS
FROM EMPLOYEE;
```

Operational Observation

Two verification queries were executed following the DELETE transaction. The first confirmed that no employee records were returned, while the second verified that the table contained **0** rows. Together, these results confirmed that the business data had been successfully removed while the EMPLOYEE table remained available for recovery validation.

Screenshot 5A

Filename: 05A-empty-employee-table.png



Caption

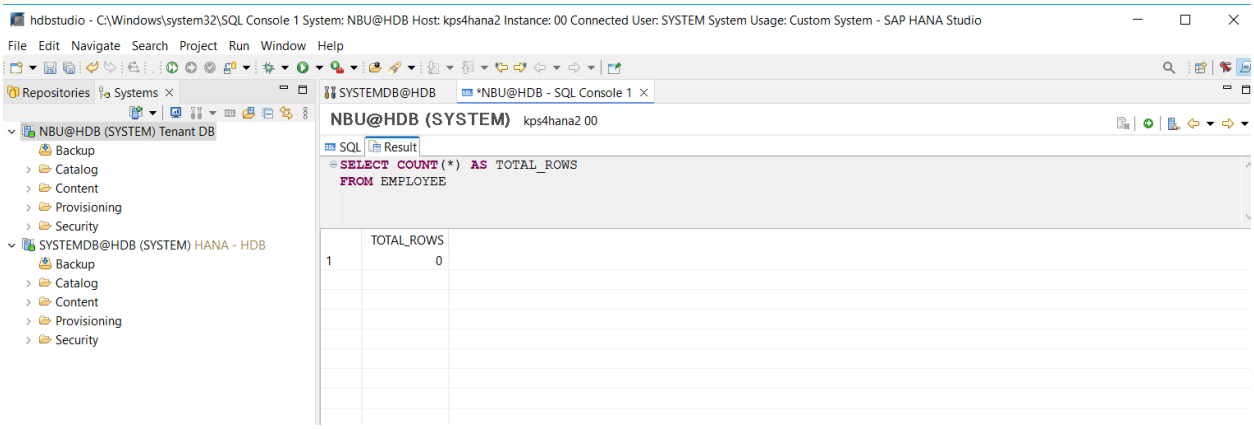
EMPLOYEE table after simulated data loss.

Highlight

- SELECT * FROM EMPLOYEE
- Fetched 0 row(s)

Screenshot 5B

Filename: 05B-row-count-verification.png



Caption

Row count verification confirming that no business records remained.

Highlight

- SELECT COUNT(*) AS TOTAL_ROWS
- TOTAL_ROWS = 0

06

Recovery Wizard Initialization

The SAP HANA Recovery Wizard was launched and the NBU tenant database selected as the recovery target.

Recovery Tool

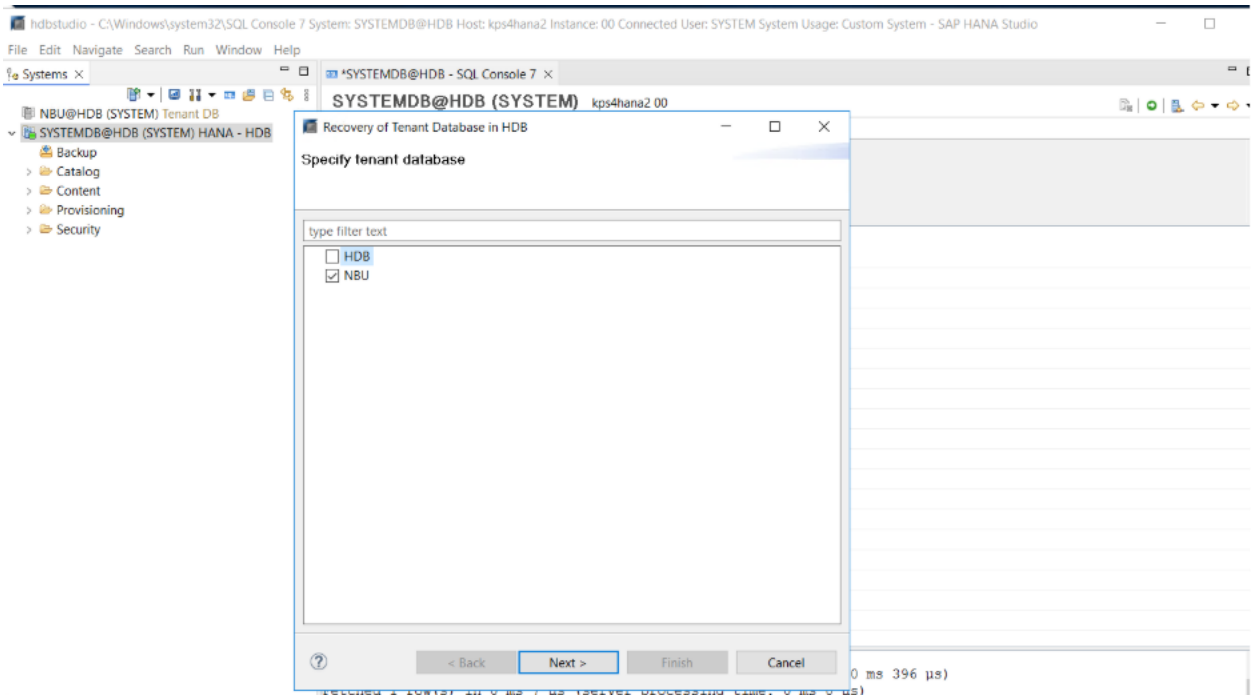
SAP HANA Recovery Wizard

Operational Observation

The recovery workflow successfully identified the tenant database and prepared the recovery environment for configuration.

Screenshot 6

Filename: 06-recovery-wizard.png



Caption

Recovery Wizard selecting the target tenant database.

Highlight

- NBU Tenant Database
- Recovery Wizard

07

Point-in-Time Recovery Configuration

Point-in-Time Recovery was configured by selecting a recovery timestamp immediately before the DELETE transaction occurred.

Recovery Configuration

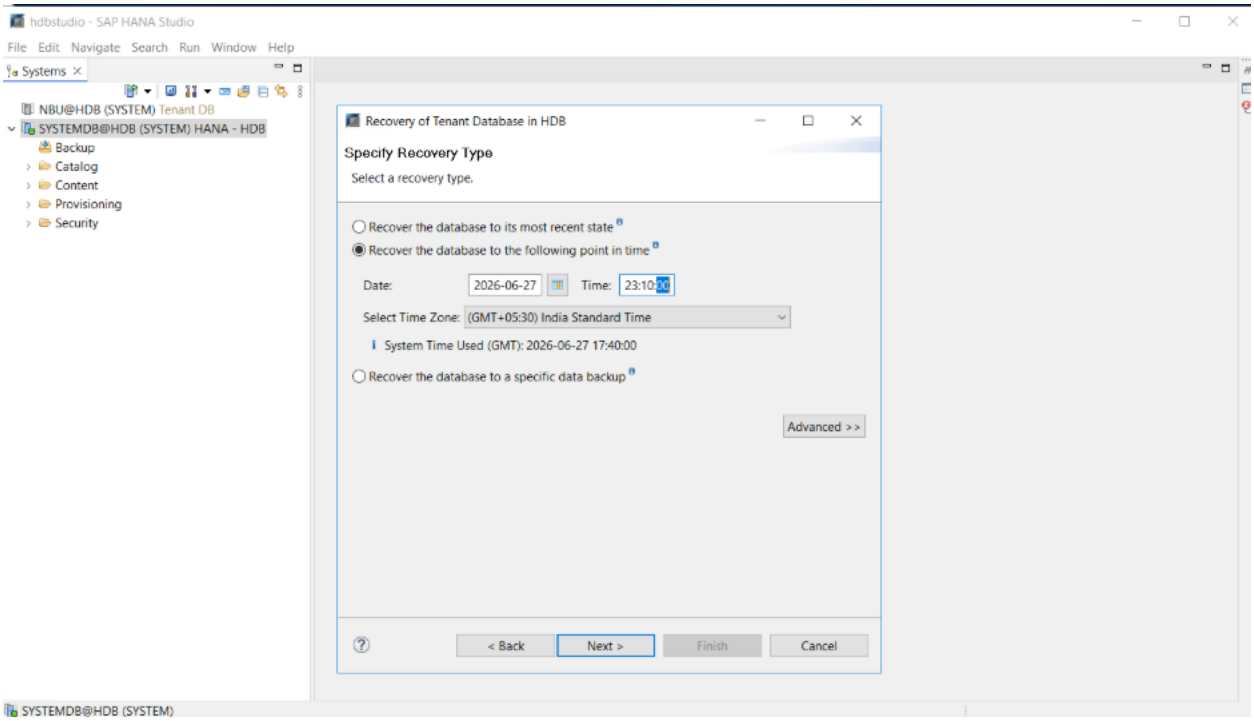
- Recovery Type: Recover the database to the following point in time
- Backup Used: EMPLOYEE_FULL_BACKUP
- Recovery Point: Immediately before the DELETE transaction

Operational Observation

The selected recovery point ensured that SAP HANA restored the Complete Data Backup while excluding the committed DELETE transaction.

Screenshot 7

Filename: 07-point-in-time-recovery.png



Caption

Point-in-Time Recovery configuration.

Highlight

- Recover the database to the following point in time
- Selected recovery timestamp
- Backup selected

08

Database Recovery Execution

The tenant database was restored using the selected Complete Data Backup together with the required transaction log backups to the selected recovery point.

Recovery Tool

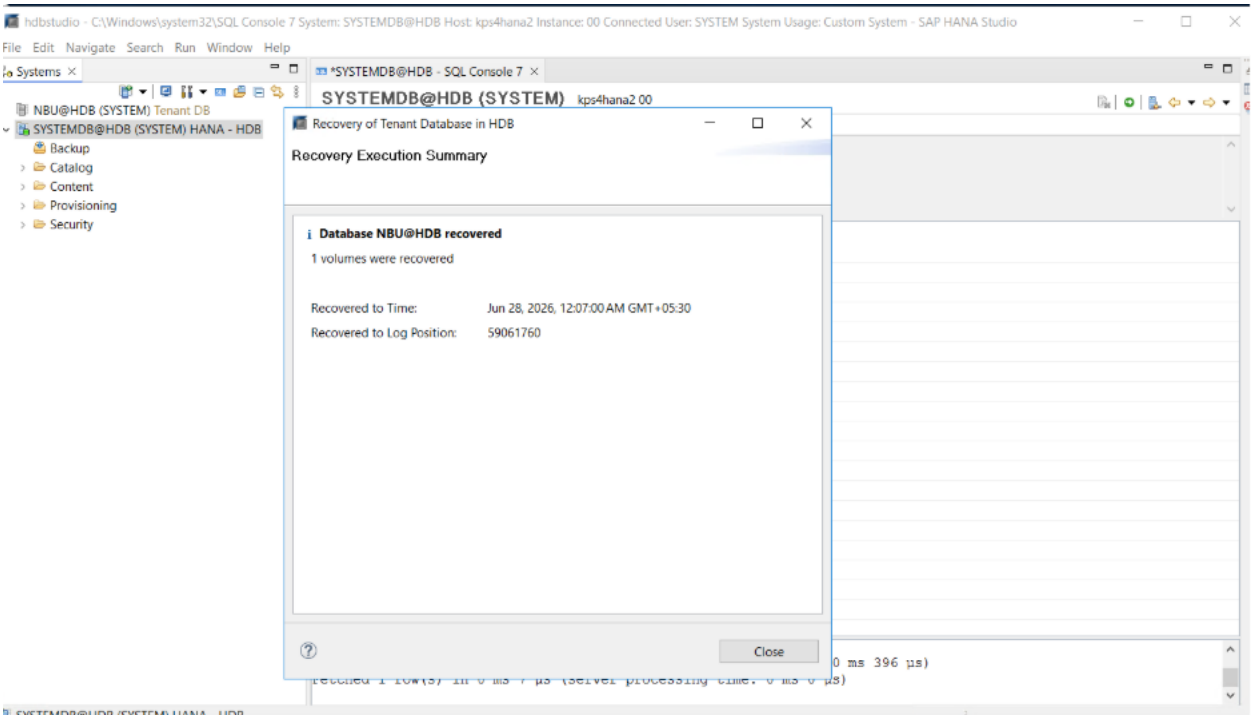
SAP HANA Recovery Wizard

Operational Observation

The recovery completed successfully without errors, and the tenant database returned to an operational state.

Screenshot 8

Filename: 08-recovery-successful.png



Caption

Successful completion of the database recovery.

Highlight

- Recovery Successful
- Recovery completed message

09

Post-Recovery Data Verification

A final SQL verification was performed to confirm that the original employee records had been successfully restored.

SQL — NBU Tenant Database

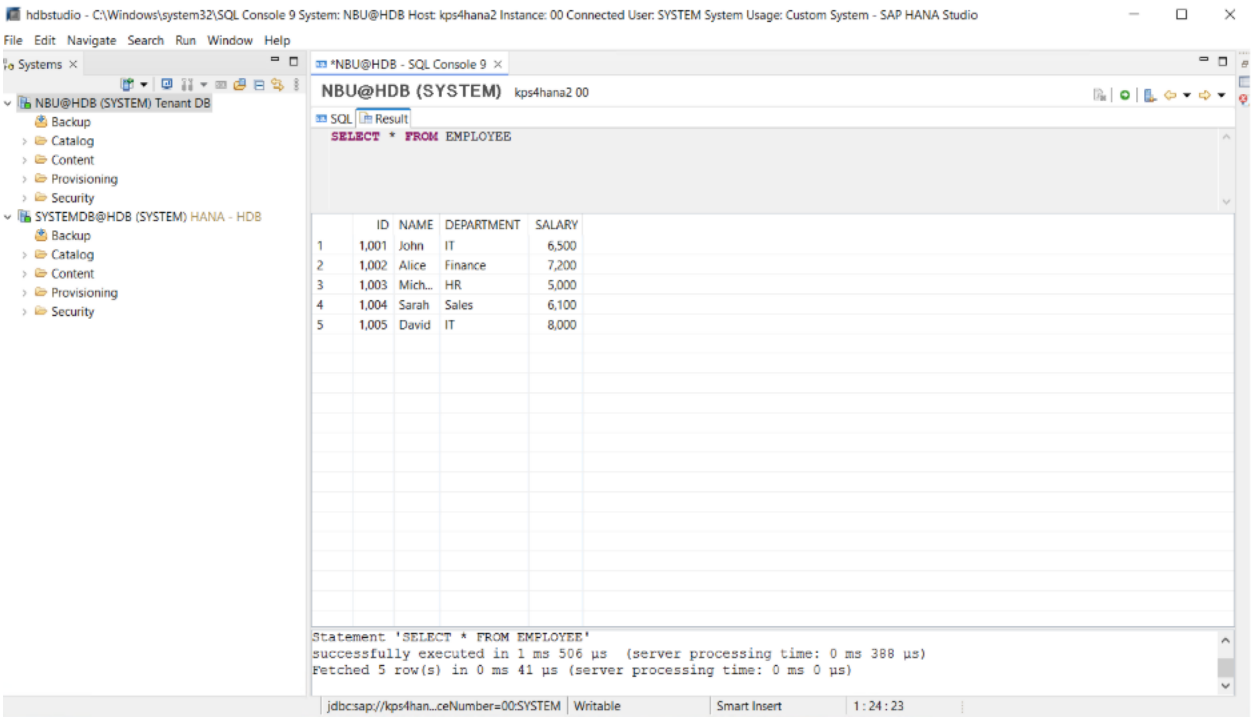
```
SELECT *
FROM EMPLOYEE;
```

Operational Observation

The verification query returned all five employee records, confirming successful Point-in-Time Recovery and restoration of the original business data.

Screenshot 9

Filename: 09-restored-employee-data.png



Caption

Business records successfully restored following Point-in-Time Recovery.

Highlight

- SELECT * FROM EMPLOYEE
- Five restored records
- Fetched 5 row(s)

Technical Evidence Collected

Validation	Result	Status
Business Data Created	Five records	✓
Complete Backup	Successful	✓
Backup Catalog	Registered	✓
Data Deletion	Successful	✓
Data Verification	0 rows	✓
Recovery	Successful	✓
Data Restored	Five rows	✓

Assessment

The recovery validation successfully demonstrated the complete SAP HANA backup and recovery lifecycle. The investigation confirmed that a valid Complete Data Backup was available within the Backup Catalog, and that Point-in-Time Recovery restored the tenant database to the selected recovery point. The exercise also highlighted the operational difference between **Recover to Most Recent State**, which replays all committed transactions, and **Point-in-Time Recovery**, which allows recovery to a precise moment before unwanted changes occurred.

Project Outcome

The recovery exercise successfully restored the original business records following simulated data loss. All recovery objectives were achieved, confirming that the backup strategy, transaction log processing, and recovery procedure functioned as expected. The investigation provided practical experience in SAP HANA backup administration, disaster recovery planning, recovery execution, and post-recovery validation.

Lessons Learned

1. Complete Data Backups provide the baseline required for database recovery.
2. Transaction Log Backups enable recovery to a precise point in time.
3. Recover to Most Recent State replays all committed transactions, including unwanted deletions.
4. Point-in-Time Recovery allows administrators to recover data before accidental changes occur.
5. Post-recovery validation is essential before returning a database to production.

Skills Demonstrated

- SAP HANA Backup Administration
- Point-in-Time Recovery
- SAP HANA Recovery Wizard
- Backup Validation
- Transaction Log Recovery
- SQL Administration
- Disaster Recovery Planning
- Database Recovery Testing