

SNOWPRO™ ADVANCED: ARCHITECT EXAM STUDY GUIDE

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SNOWPRO™ STUDY GUIDE OVERVIEW

This study guide highlights concepts that may be covered on Snowflake's SnowPro™ Advanced: Architect Certification exam.

This document introduces relevant information that may appear on the SnowPro Advanced: Architect Exam. This document should serve as an introduction to the knowledge and skills required to guide your preparation. The material contained within this study guide is not intended to guarantee a passing score on any Snowflake certification exam.

For an overview and more information on the SnowPro™ Core Certification exam or SnowPro™ Advanced Certification series, please navigate here.

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SNOWPRO™ ADVANCED: ARCHITECT CERTIFICATION OVERVIEW

The **SnowPro™ Advanced: Architect** will validate advanced knowledge and skills to apply comprehensive architect solutions using Snowflake.

This certification will test the ability to:

- Design an end-to-end data flow from source to consumption using the Snowflake data platform.
- Design and deploy a data architecture that meets business, security, and compliance requirements.
- Select appropriate Snowflake and third-party tools to optimize architecture performance.
- Design and deploy a shared data set using the Snowflake Data Marketplace and Data Exchange.

Target Audience:

- Solution Architects
- Database Architects
- System Architects

SNOWPRO™ ADVANCED: ARCHITECT SUBJECT AREA BREAKDOWN

This exam guide includes test domains, weightings, and objectives. It is not a comprehensive listing of all the content that will be presented on this examination. The table below lists the main content domains and their weighting ranges.

Domain	Estimated Percentage Range
1.0 Accounts and Security	25 - 30%
2.0 Snowflake Architecture	20 - 25%
3.0 Data Engineering	15 - 20%
4.0 Performance Optimization	20 - 25%

SNOWPRO™ ADVANCED: ARHITECT PREREQUISITE

Eligible individuals must hold an active SnowPro Core Certified credential. If you feel you need more guidance on the fundamentals, please see the SnowPro Core Study guide.

Recommended for examinees to have at least 2 years of hands-on practical Snowflake implementation experience prior to attempting the SnowPro Advanced: Architect Certification exam.

RECOMMENDATIONS AND USING THE GUIDE

This guide will show the Snowflake topics and subtopics covered on the exam. Following the topics will be additional resources consisting of videos, documentation, blogs, and/or exercises to help you understand architecting on Snowflake.

Estimated length of study guide: 10 – 13 hours

STEPS TO SUCCESS

1. Review Exam Guide
    - Go through Lab Guides
    - Review recommended Snowflake Documentation
2. For additional training, attend Snowflake's Instructor Led Advanced Course
3. Review and study applicable white papers and documentation
4. Get hands-on practical experience with relevant business requirements using Snowflake
5. Attend Snowflake Webinars
6. Attend Snowflake Virtual Hands-on Labs for more hands-on practical experience
7. Schedule your exam
8. Take your exam!

SNOWPRO™ ADVANCED: ARCHITECT DOMAINS & OBJECTIVES

1.0 Domain: Account and Security

1.1 Design a Snowflake account and database strategy, based on business requirements.

- Create and configure Snowflake parameters based on a central account and any additional accounts.
- List the benefits and limitations of one Snowflake account as compared to multiple Snowflake accounts.

1.2 Design an architecture that meets data security, privacy, compliance, and governance requirements.

- Configure Role Based Access Control (RBAC) hierarchy
- System roles and associated best practices
- Data Access
- Data Security
- Compliance

1.3 Outline Snowflake security principles and identify use cases where they should be applied.

- Encryption
- Network security
- User, Role, Grants provisioning
- Authentication

Account and Security Study Resources:

Reading Assets
Cloud Data Platform Security: How Snowflake Sets the Standard (Whitepaper)

Snowflake Documentation
Parameters — Snowflake Documentation
Understanding & Using Time Travel — Snowflake Documentation
Replicating Databases Across Multiple Accounts — Snowflake Documentation
Data Consumers — Snowflake Documentation
Working with Shares — Snowflake Documentation
Introduction to Secure Data Sharing — Snowflake Documentation
Database Replication and Failover/Failback — Snowflake Documentation
ALTER ACCOUNT — Snowflake Documentation
Introduction to Secure Data Sharing — Snowflake Documentation
Working with Secure Views — Snowflake Documentation
ENCRYPT — Snowflake Documentation

Cloning Considerations — Snowflake Documentation
CREATE STORAGE INTEGRATION — Snowflake Documentation
Understanding Column-level Security — Snowflake Documentation
Managing/Using Federated Authentication — Snowflake Documentation
Overview of Access Control — Snowflake Documentation
Azure Private Link & Snowflake — Snowflake Documentation
Multi-Factor Authentication (MFA) — Snowflake Documentation

2.0 Domain: Snowflake Architecture

2.1 Outline the benefits and limitations of various data models in a Snowflake environment.

- Data Models

2.2 Design data sharing solutions, based on different use cases.

- Use Cases
  - Sharing within the same organization/same Snowflake account
  - Sharing within a cloud region
  - Sharing across cloud regions
  - Sharing between different Snowflake accounts
  - Sharing to a non-Snowflake customer
  - Sharing across platforms
- Data Marketplace
- Data Exchange
- Data Sharing Methods

2.3 Create architecture solutions that support Development Lifecycles as well as workload requirements.

- Data Lake and Environments
- Workloads
- Development Lifecycle Support

2.4 Given a scenario, outline how objects exist within the Snowflake Object hierarchy and how the hierarchy impacts an architecture.

- Roles
- Warehouses
- Object hierarchy
- Database

2.5 Determine the appropriate data recovery solution in Snowflake and how data can be restored.

- Backup/Recovery
- Disaster Recovery

Snowflake Architecture Study Resources:

Lab Guides
Building an application on Snowflake with data from Snowflake Data Marketplace (Lab Guide)
Getting Started with Time Travel (Lab Guide)
Snowflake and Data Modeling (Workload guide)

Reading Assets
IOT Reference Architecture (Use Case)
Application Health and Security Analytics Reference Architecture (Use Case)
Multiple Data Modeling Approaches with Snowflake (blog)
Data Modeling in the Age of JSON and Schema-on-Read (blog)
Different Types of Objects in Snowflake (blog)
Undrop object dropped or replaced multiple times (blog)

Snowflake Documentation
Sharing Data Securely Across Regions and Cloud Platforms — Snowflake Documentation
Integrating Apache Hive Metastores with Snowflake — Snowflake Documentation
Introduction to External Tables — Snowflake Documentation
Overview of Access Control — Snowflake Documentation
Understanding & Using Time Travel — Snowflake Documentation
Introduction to Database Replication Across Multiple Accounts — Snowflake Documentation
CREATE USER — Snowflake Documentation
Database Replication and Failover/Failback — Snowflake Documentation
Cloning Considerations — Snowflake Documentation

3.0 Domain: Data Engineering

3.1 Determine the appropriate data loading or data unloading solution to meet business needs.

- Data sources
- Ingestion of the data
- Architecture Changes
- Data unloading

3.2 Outline key tools in Snowflake's ecosystem and how they interact with Snowflake.

- Connectors

    - Kafka
    - Spark
    - Python
- Drivers
    - JDBC
    - ODBC
- API endpoints
- SnowSQL

3.3 Determine the appropriate data transformation solution to meet business needs.

- Materialized Views, Views and Secure Views
- Staging layers and tables
- Querying semi-structured data
- Data processing
- Stored Procedures
- Streams and Tasks
- Functions
    - External Functions
    - User-Defined Functions

Data Engineering Study Resources:

Lab Guides
Building a Real-Time Data Vault in Snowflake (Lab Guide)
Enrich Salesforce data with Snowflake to deliver your Customer 360 (Lab Guide)
Auto-Ingest Twitter Data into Snowflake (Lab Guide)
Build a Recommendation Engine with AWS SageMaker (Lab Guide)
Getting Started with Snowpipe (Lab Guide)
Accelerating Data Engineering with Snowflake & dbt (Lab Guide)
Getting Started With User-Defined Functions (Lab Guide)
Getting Started with Python (Lab Guide)
Getting Started with SnowSQL (Lab Guide)

Reading Assets
Snowflake for Data Engineering- Easily Ingest, Transform, and Deliver Data for Up-To-The Moment Insights (Whitepaper)
Using Streams and Tasks in Snowflake (Blog)
Masking Semi-Structured Data with Snowflake (blog)
Easy Continuous Data Pipelines with GA of Streams and Tasks (blog)

Snowflake Documentation
Loading Data Into Snowflake -- Snowflake Documentation
Unloading Data -- Snowflake Documentation

COPY INTO <table> — Snowflake Documentation
CREATE STREAM — Snowflake Documentation
Continuous Data Pipelines -- Snowflake Documentation
Connectors & Drivers — Snowflake Documentation
Using the Python Connector — Snowflake Documentation
SYSTEM$WHITELIST_PRIVATELINK --- Snowflake Documentation
Understanding Caller's Rights and Owner's Rights Stored Procedures --- Snowflake Documentation
Semi-Structured Data -- Snowflake Documentation
Querying Semi-Structured Data -- Snowflake Documentation
Semi-Structured Data Types -- Snowflake Documentation

4.0 Domain: Performance Optimization

4.1 Outline performance tools, best practices, and appropriate scenarios where they should be applied.

- Query profiling
- Virtual Warehouse configuration
- Clustering
- Search Optimization
- Caching
- Query rewrite

4.2 Troubleshoot performance issues with existing architectures.

- JOIN explosions
- Warehouse selection (scaling up as compared to scaling out)
- Best practices and optimization techniques
- Duplication of data
- Monitoring and Alerting
    - Statistics
    - Resource Monitoring
    - Account Usage and Information schema

Performance Optimization Study Resources:

Lab Guides
Resource Optimization: Performance (Lab Guide)
Resource Optimization: Billing Metrics (Lab Guide)
Resource Optimization: Setup & Configuration (Lab Guide)
Resource Optimization: Usage Monitoring (Lab Guide)
Automating Data Pipeline to Drive Marketing Analytics with Snowflake & Fivetran (Lab Guide)
Building a Data Application (Lab Guide)
DevOps: Database Change Management with schemachange and GitHub (Lab Guide)

Reading Assets

Customer 360 Reference Architecture (Use Case)
The Rise of Data Exchanges Frictionless Integration of Third-Party Data (Whitepaper)

Snowflake Documentation

Sharing Data Securely in Snowflake --- Snowflake Documentation
Micro-partitions & Data Clustering — Snowflake Documentation
Monitoring Warehouse Load — Snowflake Documentation
Reclustering --- Snowflake Documentation
Introduction to Snowpipe — Snowflake Documentation
Using Persisted Query Results — Snowflake Documentation
Account Usage — Snowflake Documentation
MERGE — Snowflake Documentation
How the Query Optimizer Uses Materialized Views -- Snowflake Documentation

Ready to register for an exam? Navigate here to get started.

SNOWPRO™ ADVANCED: ARCHITECT SAMPLE QUESTIONS

1. Which of the following ALTER commands will impact a column's availability in Time Travel?

   A. `ALTER TABLE … SET DATA TYPE …`

   B. `ALTER TABLE … RENAME COLUMN …`

   C. `ALTER TABLE … SET NOT NULL …`

   D. `ALTER TABLE … DROP COLUMN …`

2. A user has a table named `CURRENT_EMPLOYEE` and would like to create a new table named `CURRENT_EMPLOYEE_COPY_DATA`, copying only the table structure from the `CURRENT_EMPLOYEE` table.

   Which query should be run?

   A.
   ```
   CREATE TABLE current_employee_copy_data COPY
   current_employee;
   ```

   B.
   ```
   CREATE TABLE current_employee_copy_data LIKE
   current_employee;
   ```

   C.
   ```
   CREATE TABLE current_employee_copy_data CLONE
   current_employee;
   ```

   D.
   ```
   CREATE TABLE current_employee_copy_data as SELECT *
   from current_employee;
   ```

3. Person1 is using the role `SECURITYADMIN`. Person 1 creates a role named `DBA_ROLE` that will manage the warehouses in the Snowflake account. Person1 now needs to switch to that role.

   What command(s) are needed to be executed in order to switch the context of this worksheet?

   A. `USE ROLE DBA_ROLE;`

   B. `GRANT ROLE DBA_ROLE TO ROLE SECURITYADMIN;`

   C. `SECURITYADMIN ROLE` is not allowed to `GRANT` permissions to a role.

   D. `GRANT ROLE DBA_ROLE TO USER PERSON1; USE ROLE DBA_ROLE;`

4. A table is created using the following syntax:

```
CREATE TABLE MY_TABLE (NAME STRING(100));
```

What would the command `DESC TABLE MY_TABLE;` display as the column type?

A. String

B. Char

C. Text

D. Varchar

5. How can data sharing be used across regions and cloud platforms?

Choose 2 answers

A. Data can be shared across regions using database replication, but not across different cloud providers.

B. Data can be replicated to a different region and a share can be created on that replica.

C. A share cannot be created on a replica, so sharing across regions and cloud platforms is not possible.

D. Data can be cloned across regions and a share can be created on the clone.

E. Data can be replicated to a different cloud provider and a share can be created on the replica.

Keys for sample questions:

1: a, 2: b, 3: d, 4: d, 5: b & e

The information provided in this study guide is provided for your purposes only and may not be provided to third parties.

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