

Cloudera Runtime 1.5.5

Securing Apache Hive

Date published: 2020-11-30

Date modified: 2025-06-06

CLOUdera

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Hive access authorization

As administrator, you need to understand that the Hive default authorization for running Hive queries is insecure and what you need to do to secure your data. You need to set up Apache Ranger.

To limit Apache Hive access to approved users, Cloudera recommends and supports only Ranger. Authorization is the process that checks user permissions to perform select operations, such as creating, reading, and writing data, as well as editing table metadata. Apache Ranger provides centralized authorization for all Cloudera Runtime Services.

You can set up Ranger to protect managed, ACID tables or external tables using a Hadoop SQL policy. You can protect external table data on the file system by using an HDFS policy in Ranger.

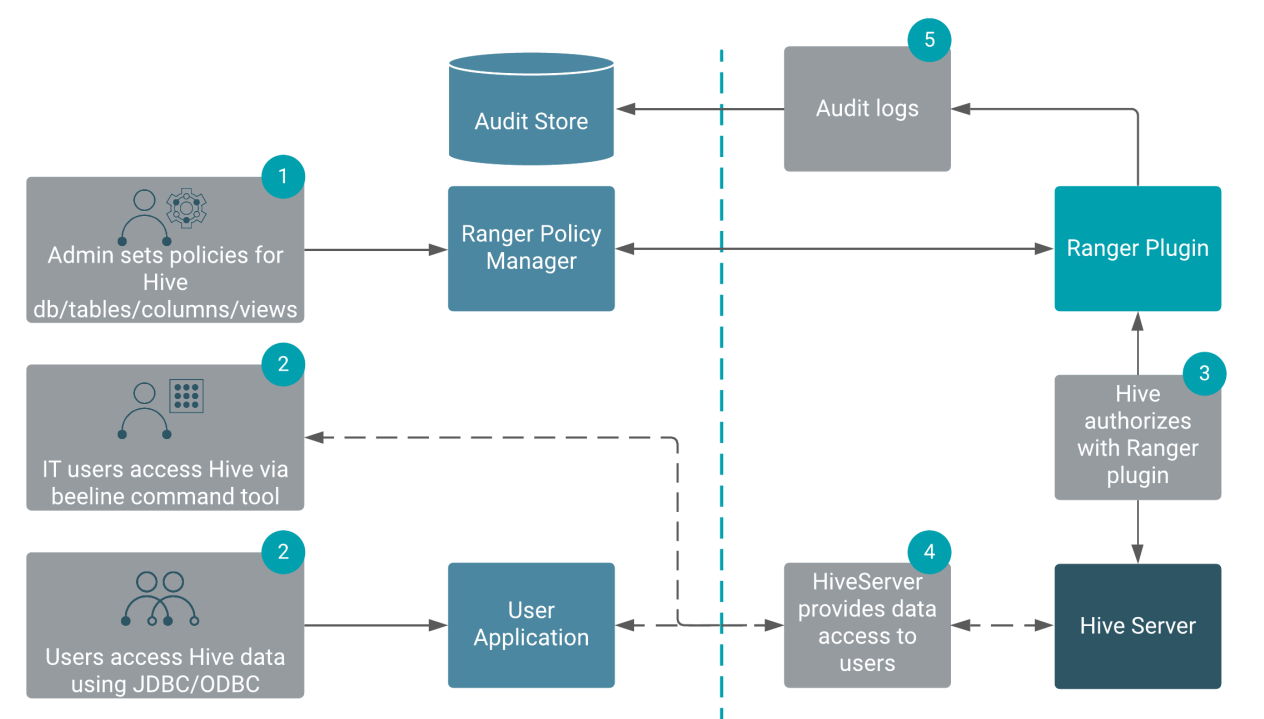
Preloaded Ranger Policies

In Ranger, preloaded Hive policies are available by default. Users covered by these policies can perform Hive operations. All users need to use the default database, perform basic operations such as listing database names, and query the information schema. To provide this access, preloaded default database tables columns and information_ schema database policies are enabled for group public (all users). Keeping these policies enabled for group public is recommended. For example, if the default database tables columns policy is disabled preventing use of the default database, the following error appears:

```
hive> USE default;  
Error: Error while compiling statement: FAILED: HiveAccessControlException  
Permission denied: user [hive] does not have [USE] privilege on [default]
```

Apache Ranger policy authorization

Apache Ranger provides centralized policy management for authorization and auditing of all Cloudera Runtime services, including Hive. All Cloudera Runtime services are installed with a Ranger plugin used to intercept authorization requests for that service, as shown in the following illustration.



The following table compares authorization models:

| Authorization model | Secure? | Fine-grained authorization (column, row level) | Privilege management using GRANT/REVOKE statements | Centralized management GUI |
|---------------------|--|--|--|----------------------------|
| Apache Ranger | Secure | Yes | Yes | Yes |
| Hive default | Not secure. No restriction on which users can run GRANT statements | Yes | Yes | No |

When you run grant/revoke commands and Apache Ranger is enabled, a Ranger policy is created/removed.

Transactional table access

As administrator, you must enable the Apache Ranger service to authorize users who want to work with transactional tables. These types of tables are the default, ACID-compliant tables in Hive 3 and later.

ACID tables reside by default in `/warehouse/tablespace/managed/hive`. Only the Hive service can own and interact with files in this directory. Ranger is the only available authorization mechanism that Cloudera recommends for ACID tables.

External table access

As administrator, you must set up Apache Ranger to allow users to access external tables.

External tables reside by default in `/warehouse/tablespace/external` on your object store. To specify some other location of the external table, you need to include the specification in the table creation statement as shown in the following example:

```
CREATE EXTERNAL TABLE my_external_table (a string, b string)
LOCATION '/users/andrena';
```

Hive assigns a default permission of 777 to the hive user, sets a umask to restrict subdirectories, and provides a default ACL to give Hive read and write access to all subdirectories. External tables must be secured using Ranger.

Token-based authentication for Cloudera Data Warehouse integrations

Using a token, you can sign on to use Hive and Impala in Cloudera Data Warehouse for a period of time instead of entering your single-sign on (SSO) credentials every time you need to run a query. This feature is in a technical preview state. Contact your account team for more information.