

## Apache Knox Authentication

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# Apache Knox Overview

## Securing Access to Hadoop Cluster: Apache Knox

The Apache Knox Gateway (“Knox”) is a system to extend the reach of Apache™ Hadoop® services to users outside of a Hadoop cluster without reducing Hadoop Security. Knox also simplifies Hadoop security for users who access the cluster data and execute jobs. The Knox Gateway is designed as a reverse proxy.

Establishing user identity with strong authentication is the basis for secure access in Hadoop. Users need to reliably identify themselves and then have that identity propagated throughout the Hadoop cluster to access cluster resources.

### Layers of Defense for a CDP Datacenter Cluster

- Authentication: Kerberos

Cloudera uses Kerberos for authentication. Kerberos is an industry standard used to authenticate users and resources within a Hadoop cluster. CDP also includes Cloudera Manager, which simplifies Kerberos setup, configuration, and maintenance.

- Perimeter Level Security: Apache Knox

Apache Knox Gateway is used to help ensure perimeter security for Cloudera customers. With Knox, enterprises can confidently extend the Hadoop REST API to new users without Kerberos complexities, while also maintaining compliance with enterprise security policies. Knox provides a central gateway for Hadoop REST APIs that have varying degrees of authorization, authentication, SSL, and SSO capabilities to enable a single access point for Hadoop.

- Authorization: Ranger

OS Security: Data Encryption and HDFS

## Apache Knox Gateway Overview

A conceptual overview of the Apache Knox Gateway, a reverse proxy.

### Overview

Knox integrates with Identity Management and SSO systems used in enterprises and allows identity from these systems be used for access to Hadoop clusters.

Knox Gateways provides security for multiple Hadoop clusters, with these advantages:

- Simplifies access: Extends Hadoop’s REST/HTTP services by encapsulating Kerberos to within the Cluster.
- Enhances security: Exposes Hadoop’s REST/HTTP services without revealing network details, providing SSL out of the box.
- Centralized control: Enforces REST API security centrally, routing requests to multiple Hadoop clusters.
- Enterprise integration: Supports LDAP, Active Directory, SSO, SAML and other authentication systems.

### Typical Security Flow: Firewall, Routed Through Knox Gateway

Knox can be used with both unsecured Hadoop clusters, and Kerberos secured clusters. In an enterprise solution that employs Kerberos secured clusters, the Apache Knox Gateway provides an enterprise security solution that:

- Integrates well with enterprise identity management solutions
- Protects the details of the Hadoop cluster deployment (hosts and ports are hidden from end users)
- Simplifies the number of services with which a client needs to interact

## Knox Gateway Deployment Architecture

Users who access Hadoop externally do so either through Knox, via the Apache REST API, or through the Hadoop CLI tools.

## Knox Supported Services Matrix

A support matrix showing which services Apache Knox supports for Proxy and SSO, for both Kerberized and Non-Kerberized clusters.

**Table 1: Knox Supported Components**

| Component                                | UI Proxy (with SSO) | API Proxy |
|--|---------------------|-----------|
| Atlas API                                | #                   | #         |
| Atlas UI                                 | #                   | #         |
| Beacon                                   |                     |           |
| Cloudera Manager API                     | #                   | #         |
| Cloudera Manager UI                      | #                   |           |
| Data Analytics Studio (DAS)              | #                   |           |
| Druid                                    |                     |           |
| Falcon                                   |                     |           |
| Flink                                    |                     |           |
| HBase REST API(aka WebHBase & Stargate)  |                     | #         |
| HBase UI                                 | #                   |           |
| HDFS UI                                  | #                   |           |
| HiveServer2 HTTP JDBC API (HS2 via HTTP) |                     | #         |
| HiveServer2 LLAP JDBC API                |                     |           |
| HiveServer2 LLAP UI                      |                     |           |
| HiveServer2 UI                           |                     |           |
| Hue                                      | #                   |           |
| Impala HTTP JDBC API                     |                     | #         |
| Impala UI                                | #                   |           |
| JobHistory UI                            | #                   |           |
| JobTracker                               |                     | #         |
| Kudu UI                                  | #                   |           |
| Livy API + UI                            | #                   | #         |
| LogSearch                                |                     |           |
| NameNode                                 | #                   | #         |
| NiFi                                     | #                   | #         |
| NiFi Registry                            | #                   | #         |
| Oozie API                                | #                   | #         |
| Oozie UI                                 | #                   |           |
| Phoenix (aka Avatica)                    |                     | #         |

| Component                           | UI Proxy (with SSO) | API Proxy |
|-------------------------------------|---------------------|-----------|
| Profiler                            | #                   |           |
| Ranger API                          | #                   | #         |
| Ranger UI                           | #                   |           |
| ResourceManager API                 | #                   | #         |
| Schema Registry API + UI            | #                   | #         |
| Streams Messaging Manager (SMM) API | #                   | #         |
| Streams Messaging Manager (SMM) UI  | #                   |           |
| Solr                                | #                   | #         |
| Spark3History UI                    | #                   |           |
| SparkHistory UI                     | #                   |           |
| Storm                               |                     |           |
| Storm LogViewer                     |                     |           |
| Superset                            |                     |           |
| WebHCat                             |                     |           |
| WebHDFS                             |                     | #         |
| YARN UI                             | #                   |           |
| YARN UI V2                          | #                   |           |
| Zeppelin UI                         | #                   |           |
| Zeppelin WS                         | #                   |           |

**Note:**

APIs, UIs, and SSO in the Apache Knox project that are not listed above are considered Community Features.

Community Features are developed and tested by the Apache Knox community but are not officially supported by Cloudera. These features are excluded for a variety of reasons, including insufficient reliability or incomplete test case coverage, declaration of non-production readiness by the community at large, and feature deviation from Cloudera best practices. Do not use these features in your production environments.

## Knox Topology Management in Cloudera Manager

In CDP Private Cloud, you can manage Apache Knox topologies via Cloudera Manager using `cdp-proxy` and `cdp-proxy-api`.

### Shared providers

The Cloudera Manager configurations where the `cdp-proxy` and `cdp-proxy-api` topologies can be managed are:

- Knox Simplified Topology Management - `cdp-proxy`
- Knox Simplified Topology Management - `cdp-proxy-api`

- The SSO authentication provider is used by the UIs using the Knox SSO capabilities, such as the Admin and Home Page UIs.
- The API authentication provider is used by predefined topologies, such as admin, metadata or cdp-proxy-api.
- You can add or modify new or existing shared provider configurations.
- You can save aliases using a new Knox Gateway command.

## Services

You can enable or disable known or custom services in Knox proxy via Cloudera Manager.

There are two kinds of services in cdp-proxy:

- Known: officially-supported Knox services. Cloudera Manager provides and manages all the required service definition files.
- Custom: unofficial, tech preview, or community feature Knox services. You must supply the service definition files (service.xml and rewrite.xml) exist in the KNOX\_DATA\_DIR/services folder. These are not recommended for production environments, and not supported by Cloudera.



### Important:

These topologies will be deployed by Cloudera Manager only if Knox's service auto-discovery feature is turned on using the Enable/Disable Service Auto-Discovery checkbox on Cloudera Manager UI:



**Important:** Adding a custom service will only work if you provide the service definition files (service.xml and rewrite.xml) in the KNOX\_DATA\_DIR/services folder.

## Service parameters

You can add, modify, or remove custom service parameters in Knox proxy via Cloudera Manager.

## Proxy Cloudera Manager through Apache Knox

In order to have Cloudera Manager proxied through Knox, there are some steps you must complete.

### Procedure

1. Set the value for `frontend_url`: Cloudera Manager Administration Settings Cloudera Manager Frontend URL :
  - Non-HA value: `https://$Knox_host:$knox_port`
  - HA value: `https://$Knox_loadbalancer_host:$Knox_loadbalancer_port`
2. Set allowed groups, hosts, and users for Knox Proxy: Cloudera Manager Administration Settings External Authentication :
  - Allowed Groups for Knox Proxy: \*
  - Allowed Hosts for Knox Proxy: \*
  - Allowed Users for Knox Proxy: \*
3. Enable Kerberos/SPNEGO authentication for the Admin Console and API: Cloudera Manager Administration Settings External Authentication Enable SPNEGO/Kerberos Authentication for the Admin Console and API: : `true`
4. From Cloudera Manager Administration Settings External Authentication , set Knox Proxy Principal: `knox`.

### What to do next

External authentication must be set up correctly. Cloudera Manager must be configured to use LDAP, following the standard procedure for setting up LDAP. This LDAP server should be the same LDAP that populates local users on Knox hosts (if using PAM authentication with Knox), or the same LDAP that Knox is configured to use (if using LDAP authentication with Knox).

## Installing Apache Knox

This document provides instructions on how to install Apache Knox using the Cloudera Data Platform Data Center installation process.

### About this task

Apache Knox is an application gateway for interacting with the REST APIs and UIs. The Knox Gateway provides a single access point for all REST and HTTP interactions in your Cloudera Data Platform cluster.

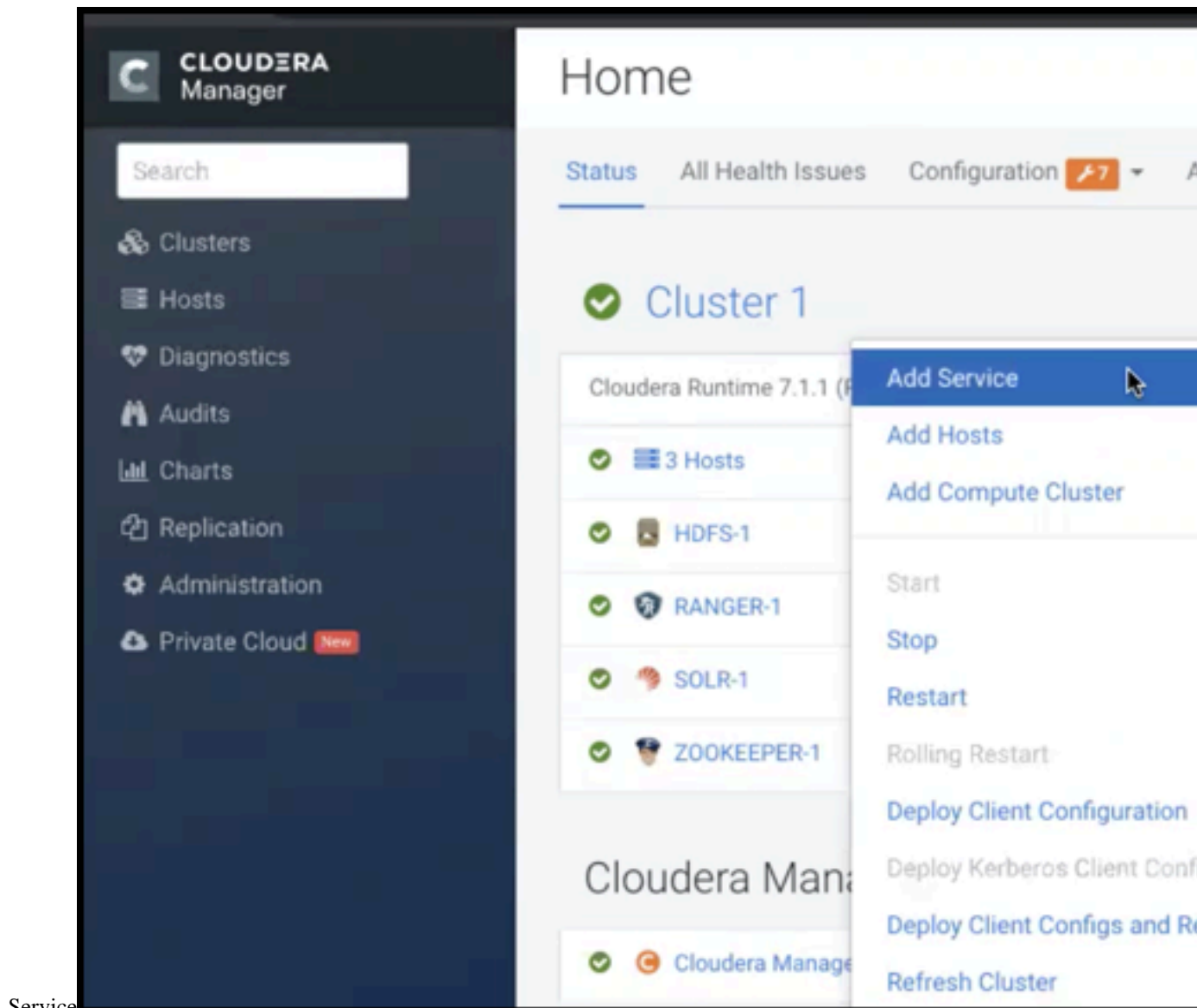
### Before you begin

When installing Knox, you must have Kerberos enabled on your cluster.



## Procedure

1. From your Cloudera Manager homepage, go to Status tab \$Cluster Name ... Add



2. From the list of services, select Knox and click Continue.
3. On the **Select Dependencies** page, choose the dependencies you want Knox to set up:

**HDFS, Ranger, Solr, Zookeeper**

For users that require Apache Ranger for authorization. HDFS with Ranger. HDFS depends on Zookeeper, and Ranger depends on Solr.

**HDFS, Zookeeper**

HDFS depends on Zookeeper.

**No optional dependencies**

For users that do not wish to have Knox integrate with HDFS or Ranger.

4. On the **Assign Roles** page, select role assignments for your dependencies and click Continue:

| Knox service roles | Description   | Required? |
|--------------------|---|-----------|
| Knox Gateway       | If Knox is installed, at least one instance of this role should be installed. This role represents the Knox Gateway which provides a single access point for all REST and HTTP interactions with Apache Hadoop clusters.  | Required  |
| KnoxIDBroker*      | It is strongly recommended that this role is installed on its own dedicated host. As its name suggests this role will allow you to take advantage of Knox's Identity Broker capabilities, an identity federation solution that exchanges cluster authentication for temporary cloud credentials.* | Optional* |
| Gateway            | This role comes with the CSD framework. The gateway structure is used to describe the client configuration of the service on each host where the gateway role is installed.   | Optional  |

\* Note: KnoxIDBroker appears in the Assign Roles page, but it is not currently supported in CDP Private Cloud.

5. On the **Review Changes** page, most of the default values are acceptable, but you must Enable Kerberos Authentication and supply the Knox Master Secret. There are additional parameters you can specify or change, listed in "Knox Install Role Parameters".
- Click Enable Kerberos Authentication  
Kerberos is required where Knox is enabled.
  - Supply the Knox Master Secret, e.g. `knoxsecret`.
  - Click Continue.
6. The **Command Details** page shows the status of your operation. After completion, your system admin can view logs for your installation under `stdout`.

## Apache Knox Install Role Parameters

Reference information on all the parameters available for Knox service roles.

### Service-level parameters

**Table 2: Required service-level parameters**

| Name   | In Wizard | Type    | Default Value                               |
|--|-----------|---------|---|
| <code>kerberos.auth.enabled*</code>                  | Yes       | Boolean | false                                       |
| <code>ranger_knox_plugin_hdfs_audit_directory</code> | No        | Text    | <code>\${ranger_base_audit_url}/knox</code> |
| <code>autorestart_on_stop</code>                     | No        | Boolean | false                                       |
| <code>knox_pam_realm_service</code>                  | No        | Text    | login                                       |
| <code>save_alias_command_input_password</code>       | No        | Text    | -   |

### Knox Gateway role parameters

**Table 3: Required parameters for Knox Gateway role**

| Name                               | In Wizard | Type     | Default Value                           |
|------------------------------------|-----------|----------|---|
| <code>gateway_master_secret</code> | Yes       | Password | -                                       |
| <code>gateway_conf_dir</code>      | Yes       | Path     | <code>/var/lib/knox/gateway/conf</code> |

| Name  | In Wizard | Type   | Default Value                             |
|---|-----------|--------|---|
| gateway_data_dir                                      | Yes       | Path   | /var/lib/knox/gateway/data                |
| gateway_port  | No        | Port   | 8443                                      |
| gateway_path  | No        | Text   | gateway                                   |
| gateway_heap_size                                     | No        | Memory | 1 GB (min = 256 MB; soft min = 512 MB)    |
| gateway_ranger_knox_plugin_conf_path                  | No        | Path   | /var/lib/knox/ranger-knox-plugin          |
| gateway_ranger_knox_plugin_policy_cache_directory     | No        | Path   | /var/lib/ranger/knox/gateway/policy-cache |
| gateway_ranger_knox_plugin_hdfs_audit_spool_directory | No        | Path   | /var/log/knox/gateway/audit/hdfs/spool    |
| gateway_ranger_knox_plugin_solr_audit_spool_directory | No        | Path   | /var/log/knox/gateway/audit/solr/spool    |

**Table 4: Optional parameters for Knox Gateway role**

| Name   | Type       | Default Value   |
|--|------------|---|
| gateway_default_topology_name                                  | Text       | cdp-proxy   |
| gateway_auto_discovery_enabled                                 | Boolean    | true  |
| gateway_cluster_configuration_monitor_interval                 | Time       | 60 seconds (minimum = 30 seconds)   |
| gateway_auto_discovery_advanced_configuration_monitor_interval | Time       | 10 seconds (minimum = 5 seconds)  |
| gateway_cloudera_manager_descriptors_monitor_interval          | Time       | 10 seconds (minimum = 5 seconds)  |
| gateway_auto_discovery_cdp_proxy_enabled_*                     | Boolean    | true  |
| gateway_auto_discovery_cdp_proxy_api_enabled_*                 | Boolean    | true  |
| gateway_descriptor_cdp_proxy                                   | Text Array | Contains the required properties of cdp-proxy topology  |
| gateway_descriptor_cdp_proxy_api                               | Text Array | Contains the required properties of cdp-proxy-api topology  |
| gateway_sso_authentication_provider                            | Text Array | Contains the required properties of the authentication provider used by the UIs using the Knox SSO capabilities (Admin UI and Home Page). Defaults to PAM authentication. |
| gateway_api_authentication_provider                            | Text Array | Contains the required properties of the authentication provider used by pre-defined topologies such as admin, metadata or cdp-proxy-api. Defaults to PAM authentication.  |

## Managing Knox shared providers in Cloudera Manager

Information on CDP Private Cloud topology management for Knox from within Cloudera Manager.

- Modifying the SSO authentication provider used by the UIs using the Knox SSO capabilities, such as the Admin and Home Page UIs.
- Modifying the API authentication provider used by predefined topologies, such as admin, metadata or cdp-proxy-api.
- Adding/modifying new/existing shared provider configurations.
- Saving aliases using a new Knox Gateway command.

## Configure Apache Knox authentication for PAM

Knox authentication configurations for PAM in Cloudera Manager. PAM is the default SSO authentication provider in CDP Private Cloud.

### SSO authentication for PAM

In CDP Private Cloud, Cloudera Manager added a new Knox configuration, called Knox Simplified Topology Management - SSO Authentication Provider, with the following initial configuration:

```
role=authentication
authentication.name=ShiroProvider
authentication.param.sessionTimeout=30
authentication.param.redirectToUrl=/${GATEWAY_PATH}/knoxssso/knoxauth/login.html
authentication.param.restrictedCookies=rememberme,WWW-Authenticate
authentication.param.urls./*=authcBasic
authentication.param.main.pamRealm=org.apache.knox.gateway.shirorealm.KnoxPamRealm
authentication.param.main.pamRealm.service=login
```

The screenshot shows the Cloudera Manager interface for 'Cluster 1'. The 'KNOX-1' service is selected, and the 'Configuration' tab is active. A search bar contains 'SSO Authentication Provider'. The left sidebar shows filters for SCOPE (KNOX-1, Gateway, Knox Gateway, Knox IDBroker) and CATEGORY (Advanced, Logs, Main, Monitoring, Performance, Ports and Addresses, Resource Management, Security, Stacks Collection). The main content area displays the configuration for 'Knox Simplified Topology Management - SSO Authentication Provider' (gateway\_sso\_authentication\_provider). The configuration is organized into a table with two columns: 'Knox Gateway Default Group' and 'Knox Gateway Default Group'. The configuration parameters are as follows:

| Knox Gateway Default Group   | Value  |
|--|--|
| role=authentication  | role=authentication  |
| authentication.name=ShiroProvider  | authentication.name=ShiroProvider  |
| authentication.param.sessionTimeout=30   | authentication.param.sessionTimeout=30   |
| authentication.param.redirectToUrl=/\${GATEWAY_PATH}/knoxssso/knoxauth/login.html  | authentication.param.redirectToUrl=/\${GATEWAY_PATH}/knoxssso/knoxauth/login.html  |
| authentication.param.restrictedCookies=rememberme,WWW-Authenticate                 | authentication.param.restrictedCookies=rememberme,WWW-Authenticate                 |
| authentication.param.main.pamRealm=org.apache.knox.gateway.shirorealm.KnoxPamRealm | authentication.param.main.pamRealm=org.apache.knox.gateway.shirorealm.KnoxPamRealm |
| authentication.param.main.pamRealm.service=login                                   | authentication.param.main.pamRealm.service=login                                   |
| authentication.param.urls./*=authcBasic  | authentication.param.urls./*=authcBasic  |

Every change here goes directly into knoxsso topology that affects manager, homepage and cdp-proxy topologies as they are using the federation provider.

### API authentication for PAM

A new Knox configuration has been added for CDP Private Cloud, called Knox Simplified Topology Management - API Authentication Provider, with the following initial configuration:

```
role=authentication
authentication.name=ShiroProvider
authentication.param.sessionTimeout=30
authentication.param.urls./*=authcBasic
authentication.param.main.pamRealm=org.apache.knox.gateway.shirorealm.KnoxPamRealm
authentication.param.main.pamRealm.service=login
```

Every change here goes directly into admin, metadata, and cdp-proxy-api topologies.

## Configure Apache Knox authentication for AD/LDAP

Knox authentication configurations for LDAP and AD in Cloudera Manager.

### SSO authentication for AD/LDAP

In the following sample you will see how to change the PAM authentication (which comes default with Knox) to LDAP authentication. It is as simple as removing the default PAM related configuration in ShiroProvider and add LDAP related properties (e.g. with demo LDAP server configuration):

```
role=authentication
authentication.name=ShiroProvider
authentication.param.sessionTimeout=30
authentication.param.redirectToUrl=/${GATEWAY_PATH}/knoxssso/knoxauth/login.html
authentication.param.restrictedCookies=rememberme, WWW-Authenticate
authentication.param.urls./**=authcBasic
authentication.param.main.ldapRealm=org.apache.knox.gateway.shirorealm.KnoxLdapRealm
authentication.param.main.ldapContextFactory=org.apache.knox.gateway.shirorealm.KnoxLdapContextFactory
authentication.param.main.ldapRealm.contextFactory=$ldapContextFactory
authentication.param.main.ldapRealm.contextFactory.authenticationMechanism=simple
authentication.param.main.ldapRealm.contextFactory.url=ldap://localhost:33389
authentication.param.main.ldapRealm.contextFactory.systemUsername=uid=guest,ou=people,dc=hadoop,dc=apache,dc=org
authentication.param.main.ldapRealm.contextFactory.systemPassword=${ALIAS=knoxLdapSystemPassword}
authentication.param.main.ldapRealm.userDnTemplate=uid={0},ou=people,dc=hadoop,dc=apache,dc=org
authentication.param.remove=main.pamRealm
authentication.param.remove=main.pamRealm.service
```

After you finished editing the properties you have to save the configuration changes. This will make the Refresh Needed stale configuration indicator appear. Once the cluster refresh finishes, all topologies that are configured to use Knox SSO will be authenticated by the configured LDAP server.

**Filters**

**SCOPE**

|                       |   |
|-----------------------|---|
| KNOX-1 (Service-Wide) | 0 |
| Gateway               | 0 |
| Knox Gateway          | 1 |
| Knox IDBroker         | 0 |

**CATEGORY**

|                     |   |
|---------------------|---|
| Advanced            | 0 |
| Logs                | 0 |
| Main                | 1 |
| Monitoring          | 0 |
| Performance         | 0 |
| Ports and Addresses | 0 |
| Resource Management | 0 |
| Security            | 0 |
| Stacks Collection   | 0 |

**STATUS**

|               |   |
|---------------|---|
| Error         | 0 |
| Warning       | 0 |
| Edited        | 0 |
| Non-default   | 1 |
| Has Overrides | 0 |

**Knox Simplified Topology Management - SSO Authentication Provider**  
gateway\_sso\_authentication\_provider

**Knox Gateway Default Group**

role=authentication

authentication.name=ShiroProvider

authentication.param.sessionTimeout=30

authentication.param.redirectUri=/\${GATEWAY\_PATH}/knoxssso/knoxauth/login.html

authentication.param.restrictedCookies=rememberme,WWW-Authenticate

authentication.param.urls./\*\*=authcBasic

authentication.param.main.LdapRealm=org.apache.knox.gateway.shirorealm.KnoxLdapRealm

authentication.param.main.LdapContextFactory=org.apache.knox.gateway.shirorealm.KnoxLdapContextFactory

authentication.param.main.LdapRealm.contextFactory=\$LdapContextFactory

authentication.param.main.LdapRealm.contextFactory.authenticationMechanism=simple

authentication.param.main.LdapRealm.contextFactory.url=ldap://localhost:33389

authentication.param.main.LdapRealm.contextFactory.systemUsername=uid=guest,ou=people,dc=people,dc=hadoop,dc=apache,dc=org

authentication.param.main.LdapRealm.contextFactory.systemPassword=\${ALIAS=knoxLdapSystem}

authentication.param.main.LdapRealm.userDnTemplate=uid={0},ou=people,dc=hadoop,dc=apache,dc=org

authentication.param.remove=main.pamRealm

authentication.param.remove=main.pamRealm.service

**Note:**

As you can see we used a Knox alias when we declared the system password instead of writing the plain text password there. To make it easier for the end-users a new Knox Gateway command was created that allows them to save aliases on all hosts where a Knox Gateway is running. See [Saving aliases](#).

To verify:

```
$ curl -ku knoxui:knoxui 'https://johndoe-1.abc.cloudera.com:8443/gateway/admin/api/v1/providerconfig/knoxssso'
{
  "role": "authentication",
  "name": "ShiroProvider",
  "enabled": true,
  "params": {
    "main.LdapContextFactory": "org.apache.knox.gateway.shirorealm.KnoxLdapContextFactory",
    "main.LdapRealm": "org.apache.hadoop.gateway.shirorealm.KnoxLdapRealm",
    "main.LdapRealm.contextFactory": "$LdapContextFactory",
    "main.LdapRealm.contextFactory.authenticationMechanism": "simple",
    "main.LdapRealm.contextFactory.systemPassword": "${ALIAS=knoxLdapSystem}",
    "main.LdapRealm.contextFactory.systemUsername": "uid=guest,ou=people,dc=hadoop,dc=apache,dc=org",
    "main.LdapRealm.contextFactory.url": "ldap://localhost:33389",
    "main.LdapRealm.userDnTemplate": "uid={0},ou=people,dc=hadoop,dc=apache,dc=org",
    "redirectUri": "/${GATEWAY_PATH}/knoxssso/knoxauth/login.html",
    "restrictedCookies": "rememberme,WWW-Authenticate",
    "sessionTimeout": "30",
    "urls./**": "authcBasic"
  }
}
```



**Note:** Any change in SSO authentication configuration alters the Knox SSO topology. This affects the manager, homepage, and cdp-proxy topologies because the SSO cookie federation provider is used.

### API authentication for AD/LDAP

In the following sample you will see how to change the PAM authentication (which comes default with Knox) to LDAP authentication:

```
role=authentication
authentication.name=ShiroProvider
authentication.param.sessionTimeout=30
authentication.param.urls./**=authcBasic
authentication.param.main.ldapRealm=org.apache.knox.gateway.shirolealm.KnoxLdapRealm
authentication.param.main.ldapContextFactory=org.apache.knox.gateway.shirolealm.KnoxLdapContextFactory
authentication.param.main.ldapRealm.contextFactory=$ldapContextFactory
authentication.param.main.ldapRealm.contextFactory.authenticationMechanism=simple
authentication.param.main.ldapRealm.contextFactory.url=ldap://localhost:33389
authentication.param.main.ldapRealm.contextFactory.systemUsername=uid=guest,ou=people,dc=hadoop,dc=apache,dc=org
authentication.param.main.ldapRealm.contextFactory.systemPassword=${ALIAS=knoxLdapSystemPassword}
authentication.param.main.ldapRealm.userDnTemplate=uid={0},ou=people,dc=hadoop,dc=apache,dc=org
authentication.param.remove=main.pamRealm
authentication.param.remove=main.pamRealm.service
```

Every change here goes directly into admin, metadata, and cdp-proxy-api topologies.

## Managing existing Apache Knox shared providers

You can add, modify, or disable an existing shared provider configuration in Apache Knox via Cloudera Manager.

The following default shared provider configurations are deployed in CDP Private Cloud with Knox:

**Table 5: Default shared provider configurations**

| Configuration | Used by these topologies         |
|---------------|----------------------------------|
| admin         | admin                            |
| homepage      | homepage                         |
| knoxsso       | homepage<br>cdp-proxy<br>manager |
| manager       | manager                          |
| metadata      | metadata                         |
| pam           | cdp-proxy-api                    |
| sso           | cdp-proxy                        |



**Note:** pam and sso are available only if service auto-discovery is enabled for Knox Gateway role.

The following changes are allowed in any of these shared providers:

- Disable a particular provider
- Modify a particular provider
- Add a new provider

All of these actions can be done via editing the Knox Gateway Advanced Configuration Snippet (Safety Valve) for `conf/cdp-resources.xml` by implementing the following language elements:

- The key of a new entry should be like this: `providerConfigs: providerConfig_1 [providerConfig_2,...,providerConfig_3]`
- The value should contain the following name/value pairs separated by a hash (#) character:

```
role=webappsec|authentication|federation|identity-assertion|authorization|
hostmap|ha
$role.name=ROLE_NAME (e.g. ShiroProvider)
$role.enabled=true|false (optional; defaults to 'true')
$role.param.param_1=value_1 (parameters are optional too)
...
$role.param_N.param1=value_N
```

## Add a new shared provider configuration

An example of how to add new authorization provider in the manager shared provider configuration.

### About this task

It is possible that you add a brand new shared provider configuration. In this example you will see how to create test Providers with the following providers set:

- authentication: ShiroProvider (LDAP) or PAM
- identity-assertion: Default
- authorization: Ranger (XASecurePDPKnox)

This particular authorization provider is set as follows (in its JSON descriptor):

```
{
  "role": "authorization",
  "name": "AclsAuthz",
  "enabled": "true",
  "params": {
    "knox.acl.mode": "OR",
    "knox.acl": "KNOX_ADMIN_USERS;KNOX_ADMIN_GROUPS;*"
  }
}
```

### Procedure

1. From Cloudera Manager Knox Configuration, add the following entry in the Knox Gateway Advanced Configuration Snippet (Safety Valve) for `conf/cdp-descriptors.xml`:

- name = `providerConfigs:testProviders`
- value = `role=authentication#authentication.name=ShiroProvider#authentication.param.main.pamRealm=org.apache.knox.gateway.shiorealm.KnoxPamRealm#authentication.param.main.pamRealm.service=login#ro`



le=identity-assertion#identity-assertion.name=Default#role=authorization#authorization.name=XASecurePDPKnox

The screenshot shows the Cloudera Manager interface for Knox Gateway configuration. The left sidebar contains filters for SCOPE, CATEGORY, and STATUS. The main area displays two configuration snippets under the heading 'Knox Gateway Advanced Configuration Snippet (Safety Valve) for conf/cdp-descriptors.xml'.

| Filter                | Count |
|-----------------------|-------|
| <b>SCOPE</b>          |       |
| KNOX-1 (Service-Wide) | 0     |
| Gateway               | 0     |
| Knox Gateway          | 1     |
| Knox IDBroker         | 0     |
| <b>CATEGORY</b>       |       |
| Advanced              | 1     |
| Logs                  | 0     |
| Main                  | 0     |
| Monitoring            | 0     |
| Performance           | 0     |
| Ports and Addresses   | 0     |
| Resource Management   | 0     |
| Security              | 0     |
| Stacks Collection     | 0     |
| <b>STATUS</b>         |       |
| Error                 | 0     |
| Warning               | 0     |

**Configuration Snippets:**

- providerConfigs:manager**
  - Value: `role=authorization#authorization.name=AclsAuthz#authorization.enabled=false#z`
  - Description: [Empty]
  - Final: ☐
- providerConfigs:testProviders**
  - Value: `role=authentication#authentication.name=ShiroProvider#authentication.param.m`
  - Description: [Empty]
  - Final: ☐

2. Save your changes.
3. Refresh the cluster.
4. Validate:

```
$ curl -ku knoxui:knoxui 'https://johndoe-1.abc.cloudera.com:8443/gateway/admin/api/v1/providerconfig/testProviders'
{
  "providers" : [ {
    "role" : "authentication",
    "name" : "ShiroProvider",
    "enabled" : true,
    "params" : {
      "main.pamRealm" : "org.apache.knox.gateway.shiorealm.KnoxPamRealm",
      "main.pamRealm.service" : "login"
    }
  }, {
    "role" : "identity-assertion",
    "name" : "Default",
    "enabled" : true,
    "params" : { }
  }, {
    "role" : "authorization",
    "name" : "XASecurePDPKnox",
    "enabled" : true,
    "params" : { }
  } ]
}
```

## Add a new provider in an existing provider configuration

An example of how to add a new provider to the authorization provider in the manager shared provider configuration.

## About this task

In this example you will see how to add a new HA provider (this time only the ATLAS service will be configured for high availability) in the manager shared provider configuration . This particular authorization provider is set as follows (in its JSON descriptor):

```
{
  "role": "authorization",
  "name": "AclsAuthz",
  "enabled": "true",
  "params": {
    "knox.acl.mode": "OR",
    "knox.acl": "KNOX_ADMIN_USERS;KNOX_ADMIN_GROUPS;*"
  }
}
```

## Procedure

1. From Cloudera Manager Knox Configuration , add the following entry in the Knox Gateway Advanced Configuration Snippet (Safety Valve) for conf/cdp-descriptors.xml:

- name = providerConfigs:manager
- value = role=authorization#authorization.name=AclsAuthz#authorization.enabled=false#authorization.param.knox.acl=myTestUser;KNOX\_ADMIN\_GROUPS;\*#authorization.param.knox.acl.mode=OR#role=ha#ha.name=HaProvider#ha.param.ATLAS=enabled=true;maxFailoverAttempts=3;failoverSleep=1000;maxRet

The screenshot shows the Cloudera Manager interface for Knox Gateway configuration. The 'Configuration' tab is active, displaying a search bar and filters. The 'Knox Gateway Advanced Configuration Snippet (Safety Valve) for conf/cdp-descriptors.xml' is selected. The 'Name' field is set to 'providerConfigs:manager' and the 'Value' field contains the configuration snippet: 'role=authorization#authorization.name=AclsAuthz#authorization.enabled=false#authorization.param.knox.acl=myTestUser;KNOX\_ADMIN\_GROUPS;\*#authorization.param.knox.acl.mode=OR#role=ha#ha.name=HaProvider#ha.param.ATLAS=enabled=true;maxFailoverAttempts=3;failoverSleep=1000;maxRet'. The 'Description' field is empty. The 'Final' checkbox is unchecked.

The screenshot shows the Cloudera Manager interface for Knox Gateway configuration. The 'Configuration' tab is active, displaying a search bar and filters. The 'Knox Gateway Advanced Configuration Snippet (Safety Valve) for conf/cdp-descriptors.xml' is selected. The 'Name' field is set to 'providerConfigs:manager' and the 'Value' field contains the configuration snippet: 'role=authorization#authorization.name=AclsAuthz#authorization.enabled=false#authorization.param.knox.acl=myTestUser;KNOX\_ADMIN\_GROUPS;\*#authorization.param.knox.acl.mode=OR#role=ha#ha.name=HaProvider#ha.param.ATLAS=enabled=true;maxFailoverAttempts=3;failoverSleep=1000;maxRet'. The 'Description' field is empty. The 'Final' checkbox is unchecked. The 'View Editor' button is visible, and the XML view is shown, displaying the configuration snippet in XML format: <property><name>providerConfigs:manager</name><value>role=authorization#authorization.name=AclsAuthz#authorization.enabled=false#authorization.param.knox.acl=myTestUser;KNOX\_ADMIN\_GROUPS;\*#authorization.param.knox.acl.mode=OR#role=ha#ha.name=HaProvider#ha.param.ATLAS=enabled=true;maxFailoverAttempts=3;failoverSleep=1000;maxRet</value></property>

2. Save your changes.
3. Refresh the cluster.

**4. Validate:**

```
$ curl -ku knoxui:knoxui 'https://johndoe-1.abc.cloudera.com:8443/gateway/
admin/api/v1/providerconfig/manager'
{
  "providers" : [
    ...
  ], {
    "role" : "authorization",
    "name" : "AclsAuthz",
    "enabled" : false,
    "params" : {
      "knox.acl" : "myTestUser;KNOX_ADMIN_GROUPS;*",
      "knox.acl.mode" : "OR"
    }
  }, {
    "role" : "ha",
    "name" : "HaProvider",
    "enabled" : true,
    "params" : {
      "ATLAS" : "enabled=true;maxFailoverAttempts=3;failoverSleep=1000;m
axRetryAttempts=300;retrySleep=1000"
    }
  } ]
}
```

**Modify a provider in an existing provider configuration**

An example of how to modify the authorization provider in the manager shared provider configuration.

**About this task**

In this example you will see how to modify the authorization provider in the manager shared provider configuration. This particular authorization provider is set as follows (in its JSON descriptor):

```
{
  "role": "authorization",
  "name": "AclsAuthz",
  "enabled": "true",
  "params": {
    "knox.acl.mode": "OR",
    "knox.acl": "KNOX_ADMIN_USERS;KNOX_ADMIN_GROUPS;*"
  }
}
```

## Procedure

- From Cloudera Manager Knox Configuration, add the following entry in the Knox Gateway Advanced Configuration Snippet (Safety Valve) for conf/cdp-descriptors.xml:
  - name = providerConfigs:manager
  - value = role=authorization#authorization.name=AclsAuthz#authorization.enabled=false#authorization.param.knox.acl=myTestUser;KNOX\_ADMIN\_GROUPS;\*#authorization.param.knox.acl.mode=OR

The screenshot shows the Cloudera Manager interface for configuring the Knox Gateway. The 'Knox Gateway Advanced Configuration Snippet (Safety Valve) for conf/cdp-descriptors.xml' is being edited. The 'Name' field is 'providerConfigs:manager' and the 'Value' field contains the configuration string: 'role=authorization#authorization.name=AclsAuthz#authorization.enabled=false#authorization.param.knox.acl=myTestUser;KNOX\_ADMIN\_GROUPS;\*#authorization.param.knox.acl.mode=OR'. The 'Description' field is empty. The 'Filters' section on the left shows a list of filters with counts: KNOX-1 (Service-Wide) 0, Gateway 0, Knox Gateway 1, Knox IDBroker 0. The 'CATEGORY' section shows: Advanced 1, Logs 0, Main 0, Monitoring 0, Performance 0, Ports and Addresses 0.

With this change you are authorizing a user called myTestUser to login and execute administrative actions on the Knox Admin UI.

- Save your changes.
- Refresh the cluster.
- Validate:

```
$ curl -ku KnoxUI:knoxui 'https://johndoe-1.abc.cloudera.com:8443/gateway/admin/api/v1/providerconfig/manager'
{
  "providers" : [
    ...
  ], {
    "role" : "authorization",
    "name" : "AclsAuthz",
    "enabled" : false,
    "params" : {
      "knox.acl" : "myTestUser;KNOX_ADMIN_GROUPS;*",
      "knox.acl.mode" : "OR"
    }
  }, {
    "role" : "ha",
    "name" : "HaProvider",
    "enabled" : true,
    "params" : {
      "ATLAS" : "enabled=true;maxFailoverAttempts=3;failoverSleep=1000;maxRetryAttempts=300;retrySleep=1000"
    }
  }
]
```

## Disable a provider in an existing provider configuration

An example of how to disable the authorization provider in the manager shared provider configuration.

## About this task

In this example you will see how to disable the authorization provider in the manager shared provider configuration. This particular authorization provider is set as follows (in its JSON descriptor):

```
{
  "role": "authorization",
  "name": "AclsAuthz",
  "enabled": "true",
  "params": {
    "knox.acl.mode": "OR",
    "knox.acl": "KNOX_ADMIN_USERS;KNOX_ADMIN_GROUPS;*"
  }
}
```

## Procedure

1. From Cloudera Manager Knox Configuration, add the following entry in the Knox Gateway Advanced Configuration Snippet (Safety Valve) for conf/cdp-resources.xml:

- name = providerConfigs:manager
- value = role=authorization#authorization.name=AclsAuthz#authorization.enabled=false#authorization.param.knox.acl=KNOX\_ADMIN\_USERS;KNOX\_ADMIN\_GROUPS;\*#authorization.param.knox.acl.mode=OR

2. Save your changes.
3. Refresh the cluster.
4. Validate:

```
$ curl -ku knoxui:knoxui 'https://johndoe-1.abc.cloudera.com:8443/gateway/admin/api/v1/providerconfig/manager'
{
  "providers" : [
    ...
  ], {
    "role" : "authorization",
    "name" : "AclsAuthz",
    "enabled" : false,
    "params" : {
      "knox.acl" : "myTestUser;KNOX_ADMIN_GROUPS;*",
      "knox.acl.mode" : "OR"
    }
  }, {
    "role" : "ha",
    "name" : "HaProvider",
```

```

    "enabled" : true,
    "params" : {
      "ATLAS" : "enabled=true;maxFailoverAttempts=3;failoverSleep=1000;maxRetryAttempts=300;retrySleep=1000"
    }
  }
}

```

### What to do next

The only change is that the enabled flag was changed to false.

## Saving aliases

There is a new command available for the Knox Gateway role which allows end-users to save an alias=password pair to an arbitrary number of topologies on each host where an instance of the Knox Gateway is installed without the need of running the Knox CLI tool manually.

A new password-type input field is added, called `save_alias_command_input_password`. The format of an entry in this input field should be: `topology_name_1[:topology_name_2[:...:topology_name_N]].alias_name=password`

Example: `cdp-proxy-api:admin:metadata.knoxLdapSystemPassword=guest-password`.

After the end-user entered a meaningful and valid value and saved the configuration changes he/she can run the command from Knox's action list: Actions/Save Alias.



**Tip:** If you need to add a Gateway level alias, please use `__gateway` as topology name. For instance: `__gateway.knoxLdapSystemPassword=admin-password`.

Cluster 1

KNOX-1

Configuration

Save Alias

Filters

SCOPE

- KNOX-1 (Service-Wide) 1
- Gateway 0
- Knox Gateway 0
- Knox IDBroker 0

Save Alias Command Input

save\_alias\_command\_input\_password

KNOX-1 (Service-Wide)

.....

Per Page 25 1 - 25 of 216

Cluster 1

KNOX-1

Instances

Search

Filters

STATUS

- Good Health 3

COMMISSION STATE

MAINTENANCE MODE

RACK ID

Actions for Selected

|                          | Status      | Role Type    | State   | Hostname     | Commission State | Role Group                 |
|--------------------------|-------------|--------------|---------|--------------|------------------|----------------------------|
| <input type="checkbox"/> | Good Health | Knox Gateway | Started | cloudera.com | Commissioned     | Knox Gateway Default Group |
| <input type="checkbox"/> | Good Health | Knox Gateway | Started | cloudera.com | Commissioned     | Knox Gateway Default Group |
| <input type="checkbox"/> | Good Health | Knox Gateway | Started | cloudera.com | Commissioned     | Knox Gateway Default Group |

Last Updated: Apr 2, 3:05:30 AM PDT

1 - 3 of 3

Cluster 1

✓ K

KNOX-1

Status

Instances

Config

Actions

Start

Restart

Rolling Restart

Save Alias

Stop

Health Tests

✓ Knox Gateway Health

Actions

Save Alias

Are you sure you want to run the **Save Alias** command on the service **KNOX-1**?

Cancel

Save Alias

Save Alias

Status ✓ Finished Context [KNOX-1](#) Apr 2, 3:06:24 AM 29.99s

Command Save Alias finished successfully on service KNOX-1.

Completed 1 of 1 step(s).

Show All Steps

Show Only Failed Steps

Show Only Running Steps

Execute 3 steps in parallel

Successfully completed 3 steps.

Execute command Save Alias on role Knox Gateway

Knox Gateway

Apr 2, 3:06:24 AM

24.37s

Execute command Save Alias on role Knox Gateway

Knox Gateway

Apr 2, 3:06:25 AM

28.97s

Execute command Save Alias on role Knox Gateway

Knox Gateway

Apr 2, 3:06:26 AM

22.24s

Close

23

Save Alias

Execute command Save Alias on role Knox Gateway

Knox Gateway

Apr 2, 3:06:24 AM

24.37s

Execute command Save Alias on role Knox Gateway

Knox Gateway

Apr 2, 3:06:25 AM

28.97s

Execute command Save Alias on role Knox Gateway

Knox Gateway

Apr 2, 3:06:26 AM

22.24s

Command (Save Alias (590)) has completed successfully

Save Alias

Save Alias finished successfully on Knox Gateway

Knox Gateway

Apr 2, 3:06:26 AM

22.21s

\$> csd/csd.sh []

stdout stderr Role Log

```

Thu Apr  2 03:06:35 PDT 2020
JAVA_HOME=/usr/java/jdk1.8.0_232-cloudera
Using -XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=/tmp/KNOX-1-KNOX_GATEWAY-...hprof -
XX:OnOutOfMemoryError=/opt/cloudera/cm-agent/service/common/killparent.sh as CSD_JAVA_OPTS
Using /var/run/cloudera-scm-agent/process/119-knox-KNOX_GATEWAY-SaveAliasCommand as conf dir
Using scripts/saveAliasCommand.sh as process script
CONF_DIR=/var/run/cloudera-scm-agent/process/119-knox-KNOX_GATEWAY-SaveAliasCommand
CMF_CONF_DIR=
Creating alias knoxLdapSystemPassword for topology cdp-proxy-api...
knoxLdapSystemPassword has been successfully created.
Creating alias knoxLdapSystemPassword for topology admin...
knoxLdapSystemPassword has been successfully created.
Creating alias knoxLdapSystemPassword for topology metadata...
knoxLdapSystemPassword has been successfully created.

```

Close

## Configure Kerberos authentication in Apache Knox shared providers

An example of how to add the kerberos-auth configuration provider from Cloudera Manager.

### Procedure

- From Cloudera Manager Knox Configuration, add the following entry in the Knox Gateway Advanced Configuration Snippet (Safety Valve) for conf/cdp-resources.xml:

- name = providerConfigs:kerberos-auth
- value =

```

role=authentication#
authentication.name=HadoopAuth#
authentication.param.sessionTimeout=30#
authentication.param.config.prefix=hadoop.auth.config#
authentication.param.hadoop.auth.config.type=kerberos#
authentication.param.hadoop.auth.config.signature.secret=${ALIAS=AUTH_CONFIG_SIGNATURE_SECRET}
authentication.param.hadoop.auth.config.token.validity=1800#
authentication.param.hadoop.auth.config.cookie.path=/#
authentication.param.hadoop.auth.config.simple.anonymous.allowed=false#
authentication.param.hadoop.auth.config.kerberos.principal=AUTH_CONFIG_KERBEROS_PRINCIPAL#
authentication.param.hadoop.auth.config.kerberos.keytab=AUTH_CONFIG_KERBEROS_KEYTAB#

```



```
authentication.param.hadoop.auth.config.kerberos.name.rules=DEFAULT
```



**Note:** Note: Paste the value = code as a single line, for e.g. `role=authentication#authentication.name=HadoopAuth#authentication.param.sessionTimeout=30[...].#authentication.param.hadoop.auth.config.hadoop.proxyuser.impala.groups=*`

Where:

- `AUTH_CONFIG_KERBEROS_PRINCIPAL` is the actual SPNEGO principal generated for the given host (see Administration -> Security -> Kerberos Principals / HTTP).
- `AUTH_CONFIG_KERBEROS_KEYTAB` is the Cloudera Manager-generated keytab file of the current Knox process. It is located in Cloudera Manager's `CONF_DIR` which can be found on the Processes tab of the Knox Gateway instance.
- `ALIAS=AUTH_CONFIG_SIGNATURE_SECRET` must not be stored as a plain text password, so use Knox's alias service. This means that whatever topology will reference that shared provider configuration, the `AUTH_CONFIG_SIGNATURE_SECRET` must be created for it (see "Saving aliases" for details).

2. Save your changes.
3. Refresh the cluster.
4. Validate:

```
$ curl -ku knoxui:knoxui https://johndoe-1.abc.cloudera.com:8443/gateway/admin/api/v1/providerconfig/kerberos-auth
{
  "providers" : [ {
    "role" : "authentication",
    "name" : "HadoopAuth",
    "enabled" : true,
    "params" : {
      "config.prefix" : "hadoop.auth.config",
      "hadoop.auth.config.cookie.path" : "/",
      "hadoop.auth.config.hadoop.proxyuser.hive.groups" : "*",
      "hadoop.auth.config.hadoop.proxyuser.hive.hosts" : "*",
      "hadoop.auth.config.hadoop.proxyuser.httpfs.groups" : "*",
      "hadoop.auth.config.hadoop.proxyuser.httpfs.hosts" : "*",
      "hadoop.auth.config.hadoop.proxyuser.hue.groups" : "*",
      "hadoop.auth.config.hadoop.proxyuser.hue.hosts" : "*",
      "hadoop.auth.config.hadoop.proxyuser.impala.groups" : "*",
      "hadoop.auth.config.hadoop.proxyuser.impala.hosts" : "*",
      "hadoop.auth.config.hadoop.proxyuser.livy.groups" : "*",
      "hadoop.auth.config.hadoop.proxyuser.livy.hosts" : "*",
      "hadoop.auth.config.hadoop.proxyuser.oozie.groups" : "*"
    }
  } ]
}
```

```

    "hadoop.auth.config.hadoop.proxyuser.oozie.hosts" : "*",
    "hadoop.auth.config.kerberos.keytab" : "/var/run/cloudera-scm-agent/
process/163-knox-IDBROKER/knox.keytab",
    "hadoop.auth.config.kerberos.name.rules" : "DEFAULT",
    "hadoop.auth.config.kerberos.principal" : "HTTP/sampleHost@ABC.CLOUD
ERA.COM",
    "hadoop.auth.config.signature.secret" : "${ALIAS=AUTH_CONFIG_SIGNATU
RE_SECRET}",
    "hadoop.auth.config.simple.anonymous.allowed" : "false",
    "hadoop.auth.config.token.validity" : "1800",
    "hadoop.auth.config.type" : "kerberos",
    "sessionTimeout" : "30"
  }
} ],
"readOnly" : true
}

```

Stale Configurations

Filters [Clear All](#)

FILE

- Client configuration 1
- File: conf/cdp-resources.xml 1
- File: hadoop-conf/core-site.xml 1
- File: hbase-conf/core-site.xml 0
- File: hive-conf/core-site.xml 0
- File: Knox-conf/knox-idbroker... 1
- File: yarn-conf/core-site.xml 0

Client configuration KNOX-1(1) [Show](#)

No files deployed.

File: conf/cdp-resources.xml KNOX-1(1) [Show](#)

```

... 17 17 <property>
18 18 <name>providerConfigs:admin, metadata, pam</name>
19 19 <value>role=authentication#authentication.name=ShiroProvider#authentication.param.sessionTimeout=30#authentication.param.main.pamRealm=or
20 20 </property>
21 21 <property>
22 22 + <name>providerConfigs:kerberos-auth</name>
23 23 + <value>role=authentication#authentication.name=HadoopAuth#authentication.param.sessionTimeout=30#authentication.param.config.prefix=hadoc
24 24 + </property>
25 25 </configuration>
26 26

```

## Related Information

[Saving aliases](#)

# Managing services for Apache Knox via Cloudera Manager

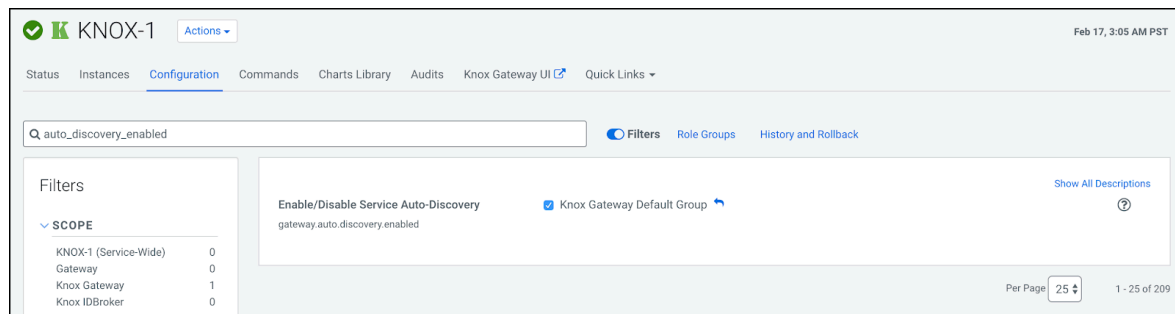
You can enable or disable known or custom services in Knox proxy via Cloudera Manager.

There are two kinds of services in cdp-proxy:

- **Known:** officially-supported Knox services. Cloudera Manager provides and manages all the required service definition files.
- **Custom:** unofficial, tech preview, or community feature Knox services. You must supply the service definition files (service.xml and rewrite.xml) exist in the KNOX\_DATA\_DIR/services folder. These are not recommended for production environments, and not supported by Cloudera.

**Important:**

These topologies will be deployed by Cloudera Manager only if Knox's service auto-discovery feature is turned on using the Enable/Disable Service Auto-Discovery checkbox on Cloudera Manager UI:



For a comprehensive list of known services that can be enabled, see “Knox Supported Services Matrix”.

**Related Information**

[Knox Supported Services Matrix](#)

## Enable proxy for a known service in Apache Knox

How to enable auto-discovery for a known service in Knox proxy via Cloudera Manager.

**About this task**

“Known” services are officially-supported Knox services (like Apache Atlas, Ranger, Solr, etc.) Cloudera Manager provides and manages all the required service definition files.

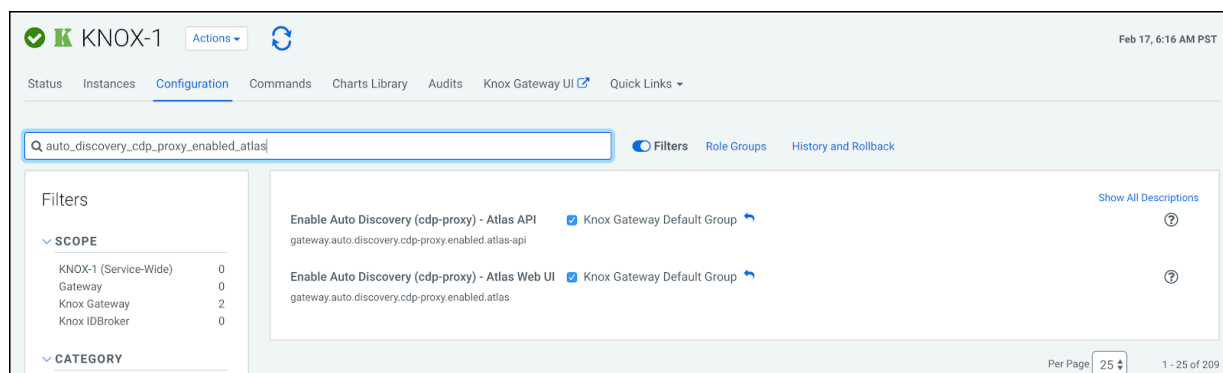
For the purposes of this example, we add ATLAS and ATLAS UI to cdp-proxy. You can add more services; for a comprehensive list of knoxn services that can be enabled, see “Knox Supported Services Matrix”.

**Procedure**

1. From Cloudera Manager Knox Configuration, check the Gateway Auto Discovery (cdp-proxy) - \$Component boxes.

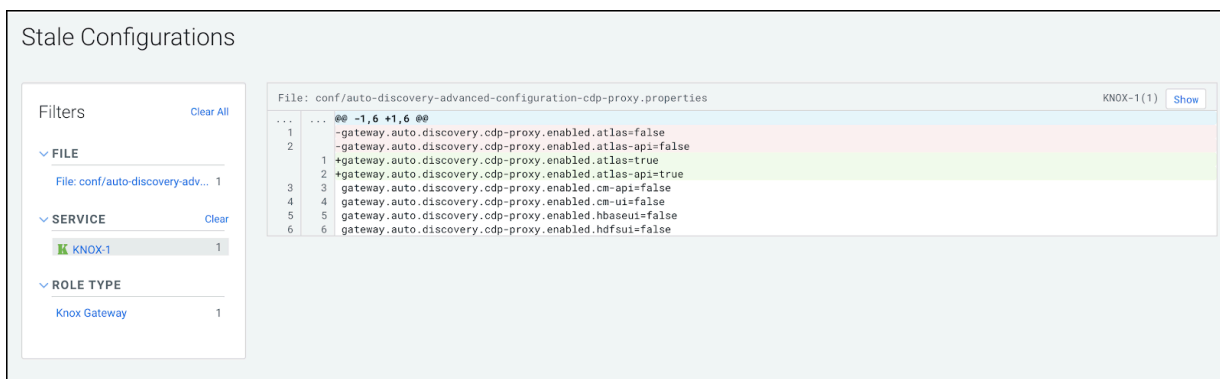
In this example, we enable:

- gateway\_auto\_discovery\_cdp\_proxy\_enabled\_atlas
- gateway\_auto\_discovery\_cdp\_proxy\_enabled\_atlas\_ui

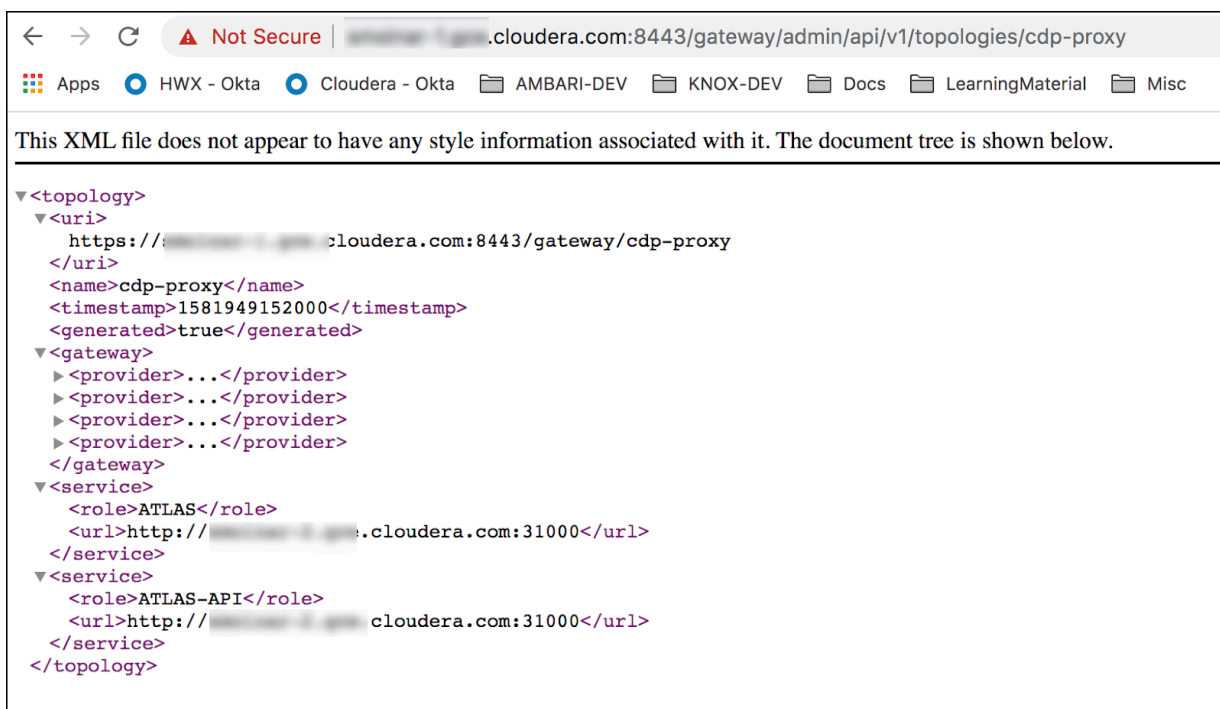


2. Save your changes.

- The 'Refresh needed' stale configuration indicator appears; click it and wait until the refresh process finishes.



- Validate that ATLAS in cdp-proxy was added by going to the following URL: `http s://$KNOX_GATEWAY_HOST:$PORT/$GATEWAY_PATH/admin/api/v1/topologies/cdp-proxy`.



### Related Information

[Add custom service parameter to descriptor](#)

[Knox Supported Services Matrix](#)

## Disable proxy for a known service in Apache Knox

How to remove auto-discovery for a known service in Knox proxy via Cloudera Manager.

### About this task

“Known” services are officially-supported Knox services (like Apache Atlas, Ranger, Solr, etc.) Cloudera Manager provides and manages all the required service definition files.

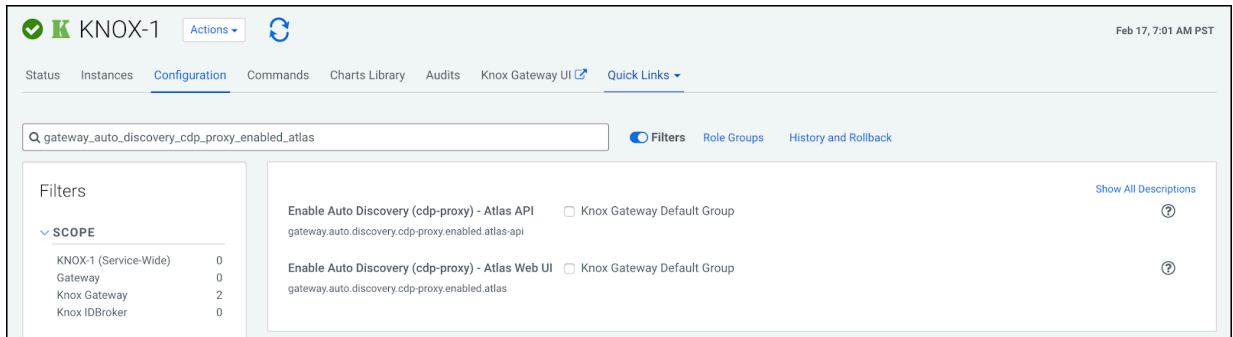
In this example, we are going to remove the previously added ATLAS and ATLAS-UI services from cdp-proxy. We disable the `gateway_auto_discovery_cdp_proxy_enabled_atlas` and `gateway_auto_discovery_cdp_proxy_enabled_atlas_ui` checkboxes on Knox’s Configuration page in CM, save the changes and refresh the cluster.

## Procedure

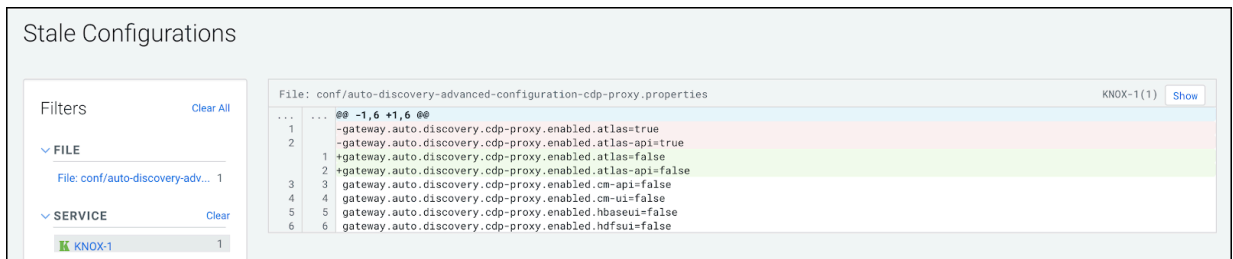
1. From Cloudera Manager Knox Configuration , uncheck the Gateway Auto Discovery (cdp-proxy) - \$Component boxes.

In this example, we disable:

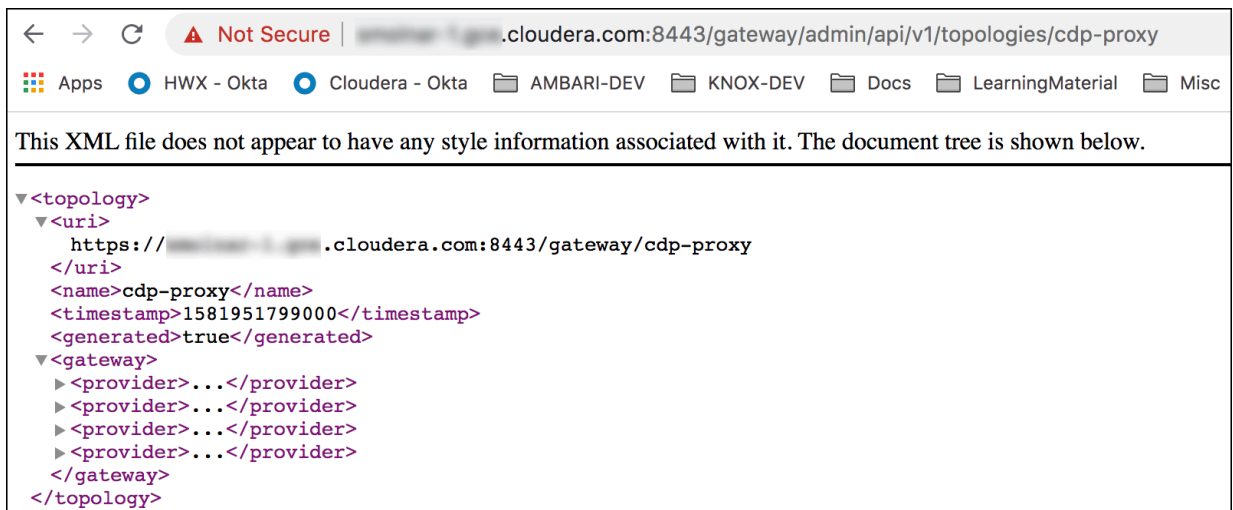
- gateway\_auto\_discovery\_cdp\_proxy\_enabled\_atlas
- gateway\_auto\_discovery\_cdp\_proxy\_enabled\_atlas\_ui



2. Save your changes.
3. The 'Refresh needed' stale configuration indicator appears; click it and wait until the refresh process finishes.



4. Validate that custom service got removed by going to the following URL: `http s://$KNOX_GATEWAY_HOST:$PORT/$GATEWAY_PATH/admin/api/v1/topologies/cdp-proxy`.



## Add custom service to existing descriptor in Apache Knox Proxy

## How to add a custom service to an existing descriptor in Knox proxy using Cloudera Manager.

## About this task

“Custom” services are unofficial, tech preview, or community feature Knox services. You must supply the service definition files (service.xml and rewrite.xml) which exist in the KNOX\_DATA\_DIR/services folder. These are not recommended for production environments, and not supported by Cloudera.

In this example, a custom service (*MY\_SERVICE*) is added in cdp-proxy with the following attributes:

- Version : the service’s version, for example, 1.0.0.
- URL: the service URL, for example, https://sampleHost:1234.
- Service parameter: a sample service parameter, for example, myValue.



**Important:** Adding a custom service only works if you provide the service definition files (service.xml and rewrite.xml) in the KNOX\_DATA\_DIR/services folder.

To achieve the goals you need to add three new entries with the above-listed parameters in Knox Simplified Topology Management - cdp-proxy. Then you save the changes, refresh the cluster and check if the newly added custom service is available in cdp-proxy.

## Procedure

1. From Cloudera Manager Knox Configuration , add the three new entries with the above-listed parameters.

```
MY_SERVICE:version=1.0.0
MY_SERVICE:url=https://sampleHost:1234
MY_SERVICE:customServiceParameter=myValue
```

2. Save your changes.
3. The ‘Refresh needed’ stale configuration indicator appears; click it and wait until the refresh process completes.

4. Validate that MY\_SERVICE in cdp-proxy is added by navigating to the following URL: `https://$KNOX_GATEWAY_HOST:$PORT/$GATEWAY_PATH/admin/api/v1/topologies/cdp-proxy`.

## Add custom descriptor to Apache Knox

How to add a custom descriptor to Apache Knox using Cloudera Manager.

### About this task

In this example, you add a custom descriptor (MY\_SERVICE) in custom-topology with the following attributes:

- ProviderConfigRef: a string representing a reference of an existing share-provider. You must use the pre-configured pam provider.
- Version: the service's version, for example, 1.0.0.
- URL: the service URL, for example, `https://sampleHost:1234`.
- Service parameter: a sample service parameter, for example, myValue.

### Procedure

1. From Cloudera Manager Knox Configuration, add a new entry in Knox Gateway Advanced Configuration Snippet (Safety Valve) for `conf/cdp-resources.xml` as follows:

```
Name = custom-topology //This name is customisable and is used to create a topology file.
Value =providerConfigRef=pam#
MY_SERVICE:version=1.0.0#
MY_SERVICE:url=https://sampleHost:1234#
MY_SERVICE:myCustomServiceParameter=myValue
Description = This is a custom descriptor with one service called MY_SERVICE
```

2. Save your changes.

3. The ‘Refresh needed’ stale configuration indicator appears; click it and wait until the refresh process completes.

Stale Configurations

Filters

Clear All

FILE

Client Configs Metadata

0

Client configuration

0

Environment

0

File: cloudera-monitor.proper...

0

File: cloudera-stack-monitor....

0

File: conf/cdp-resources.xml

1

File: log4j2.properties

0

File: solr-conf/solr-env.sh

0

File: zoo.cfg

0

System Resources

0

File: conf/cdp-resources.xml

KNOX-1(1)

Show

... @@ -3,9 +3,9 @@

3 <!--Autogenerated by Cloudera Manager-->

4 <configuration>

5 <property>

6 <name>cdp-proxy</name>

7 <value>providerConfigRef=sso</value>

8 </property>

9 <property>

10 <name>cdp-proxy-api</name>

11 <value>providerConfigRef=pam</value>

KNOX-1

Actions

Refresh

Oct 19, 1:00 AM PDT

Status

Instances

Configuration

Commands

Charts Library

Audits

Knox Gateway Home

Quick Links

Q Knox descriptor block

Filters

Role Groups

History and Rollback

Filters

SCOPE

KNOX-1 (Service-Wide)

0

Gateway

0

Knox Gateway

2

Knox IDBroker

0

CATEGORY

Advanced

0

Logs

0

Main

2

Monitoring

0

Performance

0

Ports and Addresses

0

Resource Management

0

Security

0

Stacks Collection

0

Knox Simplified Topology Management - cdp-proxy

cdp-proxy

Knox Gateway Default Group

providerConfigRef=sso

MY\_SERVICE=version=1.0.0

MY\_SERVICE:url=https://sampleHost:1234

MY\_SERVICE:customServiceParameter=myValue

Knox Simplified Topology Management - cdp-proxy-api

cdp-proxy-api

Knox Gateway Default Group

providerConfigRef=pam

Per Page

25

1 - 25 of 220



4. Validate that the operation was successful by navigating to the following URL: `http://$KNOX_GATEWAY_HOST:$PORT/$GATEWAY_PATH/admin/api/v1/topologies/cdp-proxy`.

← → ↻ ▲ Not Secure | cloudera.com:8443/gateway/admin/api/v1/topologies/cdp-proxy

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```

▼ <topology>
  <uri>https://cloudera.com:8443/gateway/cdp-proxy</uri>
  <name>cdp-proxy</name>
  <timestamp>1603094727000</timestamp>
  <generated>true</generated>
  ► <gateway>
    ...
  </gateway>
  ► <service>
    ...
  </service>
  ► <service>
    ...
  </service>
  ► <service>
    ...
  </service>
  ► <service>
    ...
  </service>
  ► <service>
    ...
  </service>
  ► <service>
    ...
  </service>
  ▼ <service>
    <role>MY_SERVICE</role>
    <version>1.0.0</version>
    ▼ <param>
      <name>customServiceParameter</name>
      <value>myValue</value>
    </param>
    <url>https://sampleHost:1234</url>
  </service>
  ► <service>
    ...
  </service>
  ► <service>
    ...
  </service>
  ► <service>
    ...
  </service>
</topology>

```

## Managing Service Parameters for Apache Knox via Cloudera Manager

You can add, modify, or remove custom service parameters in Knox proxy via Cloudera Manager.

### Add custom service parameter to descriptor

How to add a custom service parameter to a descriptor using Cloudera Manager..

**Before you begin**

The descriptor you wish to add a custom service parameter to must be enabled. See “Add a known service to cdp-proxy”.

**About this task**

In this example, you are adding a custom service parameter with a custom value (myCustomServiceParameter=myValue) to ATLAS in cdp-proxy.

**Procedure**

1. From Cloudera Manager Knox Configuration, add a new line in the Knox Simplified Topology Management - cdp-proxy panel in the following format:  
`$SERVICE_NAME[:$PARAMETER_NAME=$PARAMETER_VALUE].`  
 ATLAS:myCustomServiceParameter=myValue

The url and version parameter names are preserved keywords to set the given service's URL and version. Valid declarations:

```
ATLAS:url=http://localhost:123
ATLAS:version:3.0.0
ATLAS:test.parameter.name=test.parameter.value
```

2. Save your changes.
3. The ‘Refresh needed’ stale configuration indicator appears; click it and wait until the refresh process completes.

4. Validate that ATLAS in cdp-proxy got updated with the new service parameter by navigating to the following URL: `https://$KNOX_GATEWAY_HOST:$PORT/$GATEWAY_PATH/admin/api/v1/topologies/cdp-proxy`.

The screenshot shows a web browser window with the address bar displaying `cloudera.com:8443/gateway/admin/api/v1/topologies/cdp-proxy`. The page content indicates that the XML file does not have any style information, and the document tree is shown below. The XML tree is as follows:

```
<?xml version="1.0"?>
<topology>
  <uri>https://[redacted].cloudera.com:8443/gateway/cdp-proxy</uri>
  <name>cdp-proxy</name>
  <timestamp>1603092694000</timestamp>
  <generated>true</generated>
  <gateway>
    ...
  </gateway>
  <service>
    <role>ATLAS</role>
    <param>
      <name>myCustomServiceParameter</name>
      <value>myValue</value>
    </param>
  </service>
  <service>
    ...
  </service>
  <service>
    ...
  </service>
  <service>
    ...
  </service>
  <service>
    ...
  </service>
  <service>
    ...
  </service>
</topology>
```

## Modify custom service parameter in descriptor

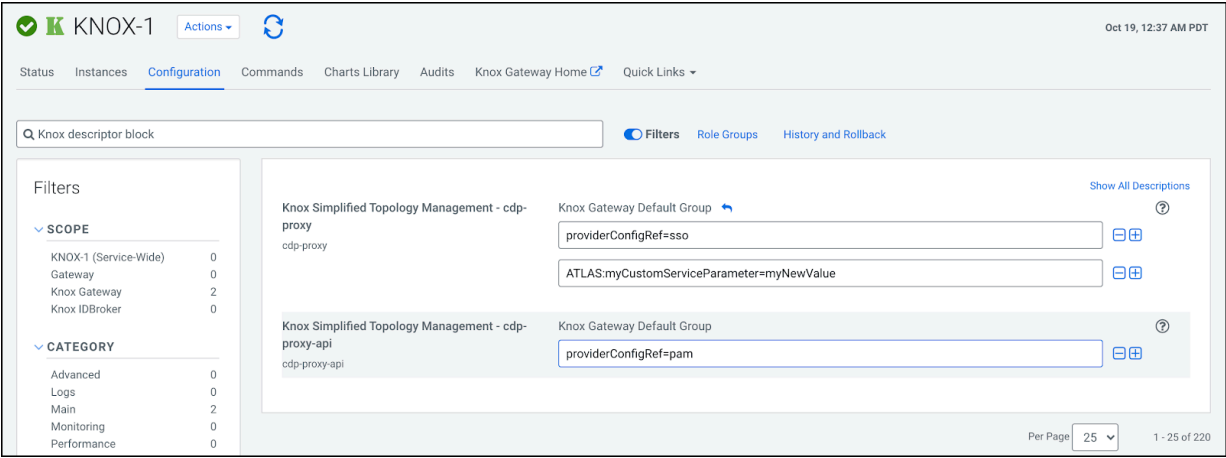
How to edit a custom service parameter in a descriptor using Cloudera Manager.

### About this task

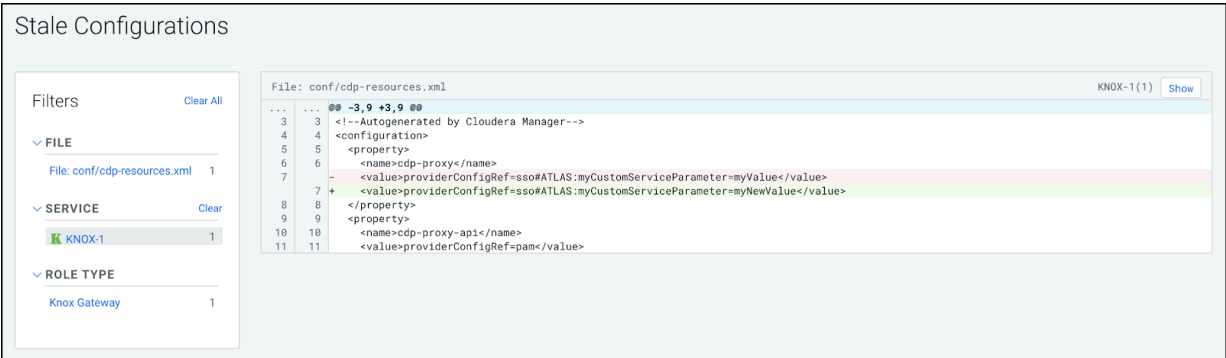
In this sample, you are going to update a previously entered service parameter - `myCustomServiceParameter=myValue` to `myNewValue`- for ATLAS in cdp-proxy. You change that entry, save the changes, and refresh the cluster.

Procedure

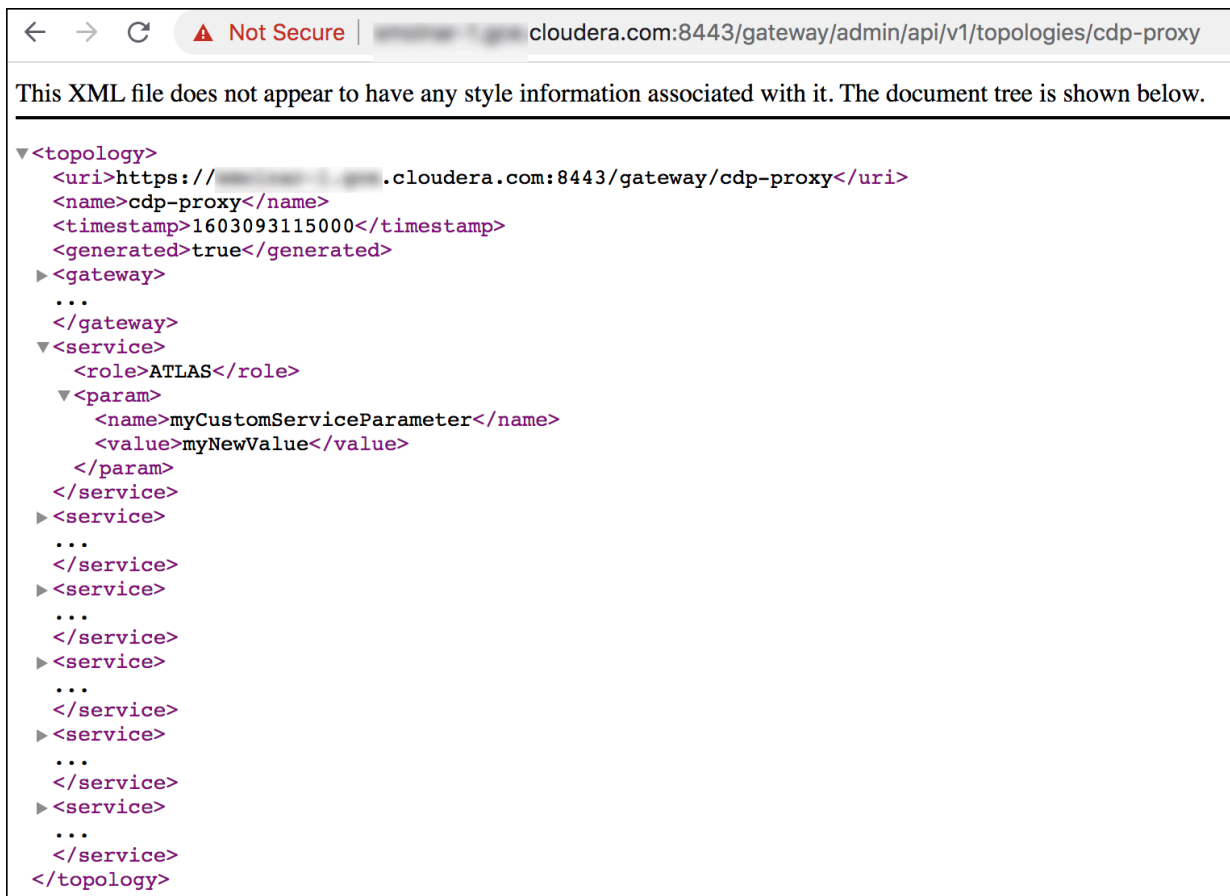
- 1. From Cloudera Manager Knox Configuration , change the service parameter in the Knox Simplified Topology Management - cdp-proxy panel. Change ATLAS:myCustomServiceParameter=myValue to Atlas:myCustomServiceParameter=myNewValue



- 2. Save your changes.
- 3. The 'Refresh needed' stale configuration indicator appears; click it and wait until the refresh process completes.



4. Validate that custom service parameter got updated with the changes by navigating to the following URL: `http s://$KNOX_GATEWAY_HOST:$PORT/$GATEWAY_PATH/admin/api/v1/topologies/cdp-proxy`.



## Remove custom service parameter from descriptor

## How to remove a custom service parameter from a descriptor using Cloudera Manager.

## About this task

In this sample, you are going to remove a previously entered service parameter - `myCustomServiceParameter=myNewValue` - from ATLAS in `cdp-proxy`. You remove that entry, save the changes, and refresh the cluster.

## Procedure

- From Cloudera Manager Knox Configuration, remove the service parameter in the Knox Simplified Topology Management - cdp-proxy panel. Click the minus (–) sign next to ATLAS:myCustomServiceParameter=myNewValue.

The screenshot shows the Cloudera Manager interface for Knox configuration. The left sidebar contains filters for SCOPE and CATEGORY. The main content area displays two configuration panels. The top panel, 'Knox Simplified Topology Management - cdp-proxy', shows a list of parameters. The parameter 'ATLAS:myCustomServiceParameter=myNewValue' is highlighted with a red box, and a minus sign icon is visible next to it, indicating it is being removed. The bottom panel, 'Knox Simplified Topology Management - cdp-proxy-api', shows a single parameter 'providerConfigRef=pam'.

This screenshot is identical to the one above, showing the same Knox configuration page. The parameter 'ATLAS:myCustomServiceParameter=myNewValue' is still highlighted with a red box, and the minus sign icon is visible next to it.

- Save your changes.
- The 'Refresh needed' stale configuration indicator appears; click it and wait until the refresh process completes.

The screenshot shows the 'Stale Configurations' page in Cloudera Manager. The left sidebar contains filters for FILE, SERVICE, and ROLE TYPE. The main content area displays a list of stale configurations. The configuration 'File: conf/cdp-resources.xml' is highlighted. The XML content for this file is shown, and the parameter 'ATLAS:myCustomServiceParameter=myNewValue' is highlighted with a red box, indicating it is the source of the stale configuration.

4. Validate that custom service parameter got removed with the changes by navigating to the following URL: `https://$KNOX_GATEWAY_HOST:$PORT/$GATEWAY_PATH/admin/api/v1/topologies/cdp-proxy`.

