Creating a Realm in Keycloak

A **realm** in Keycloak is the top-level container for managing users, roles, groups, identity providers, and applications. It provides complete logical isolation, making it ideal for multi-tenant systems or staging/production splits. This guide explains different ways to create a realm via the Admin Console, REST API, and Docker CLI while covering permissions, best practices, and troubleshooting.

Creating a Realm via Keycloak Admin Console

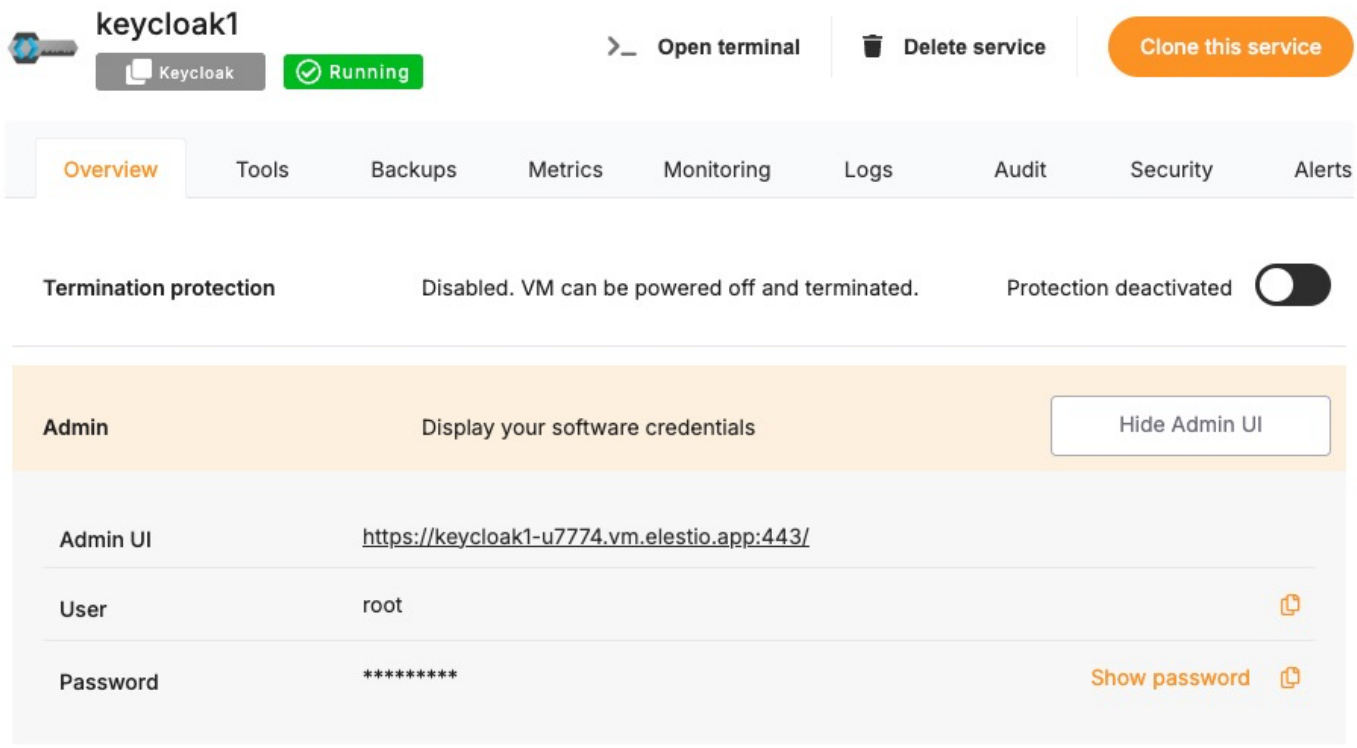
The Admin Console is the most straightforward way to create and manage realms using a web-based UI.

Access the Admin Console

Log in to your Keycloak Admin Console:

```
http://<your-keycloak-domain>/admin/
```

Use the **admin** account created during setup or one with realm management privileges.



Create a New Realm

1. Click the realm dropdown in the top-left corner (default is master).
2. Click **Create Realm**.
3. Enter the following details:

    - **Realm Name**: A unique name like customer-portal or internal-tools.
    - **Display Name**: Optional friendly name shown on login screens.

4. Click **Create**.

Configure Realm Settings

Once created, you can adjust behavior by navigating to

- **Realm Settings > Login**: Enable email verification, OTP, remember-me, etc.
- **Realm Settings > Themes**: Set custom themes for login and account pages

Creating a Realm via Keycloak REST API

For automation and CI/CD pipelines, use the Admin REST API.

Get Access Token

Use the master realm or a privileged realm with an admin user.

```
curl -X POST "https://<keycloak-domain>/realms/master/protocol/openid-connect/token" \
  -H "Content-Type: application/x-www-form-urlencoded" \
  -d "username=admin" \
  -d "password=admin-password" \
  -d "grant_type=password" \
  -d "client_id=admin-cli"
```

Save the access_token from the response.

Create the Realm

```
curl -X POST "https://<keycloak-domain>/admin/realms" \
  -H "Content-Type: application/json" \
  -H "Authorization: Bearer <access_token>" \
  -d '{
    "realm": "newrealm",
    "enabled": true,
    "displayName": "New Realm"
  }'
```

This creates a new realm called newrealm with default settings.

Creating a Realm via Docker CLI

If Keycloak is running inside a Docker container:

Access the Container

```
docker exec -it keycloak bash
```

Create Realm Using Import File

1. Create a JSON realm file (e.g., myrealm.json):

```
{
  "realm": "myrealm",
  "enabled": true
}
```

2. Run Keycloak with the import flag:

```
kc.sh import --file /opt/keycloak/data/import/myrealm.json
```

Or via Docker:

```
docker run -v $PWD:/opt/keycloak/data/import \
  quay.io/keycloak/keycloak:latest \
  import --file /opt/keycloak/data/import/myrealm.json
```

Required Permissions for Realm Creation

- Users must have manage-realm or admin roles in the master realm.
- If using the REST API, token must be obtained using admin-cli.

To grant permissions:

```
# From master realm
Users > admin > Role Mappings > Realm Roles > Assign 'admin'
```

Best Practices for Creating Realms

- **Use Descriptive Realm Names:** Avoid generic names like test or default. Use environment- or tenant-specific names like dev-project-x, production-client123.
- **Enable Login Hardening Features:** Under **Realm Settings > Login**:
  - Enable email verification
  - Disable user registration (unless required)
  - Enable OTP for 2FA
- **Use Theme Branding:** Upload and assign a custom login theme under **Themes** to reflect client or environment branding.
- **Automate via REST or Terraform:** For CI/CD deployments, automate realm provisioning using REST API or tools like Terraform (mrparkers/keycloak provider).

Common Issues and Troubleshooting

Issue	Possible Cause	Solution
403 Forbidden when creating via API	Access token lacks permission	Ensure token is generated from a user with admin role in master realm
Realm already exists	Attempting to recreate an existing realm	Use a different realm name or delete existing one before re-creating
Realm not listed in dropdown	Misconfiguration or missing role	Refresh UI or check admin user’s permissions
Docker import doesn’t create realm	File format error or wrong path	Ensure JSON is valid and mounted correctly in /opt/keycloak/data/import
Login page shows default theme	Custom theme not set	Go to **Realm Settings > Themes** and set your theme manually

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