

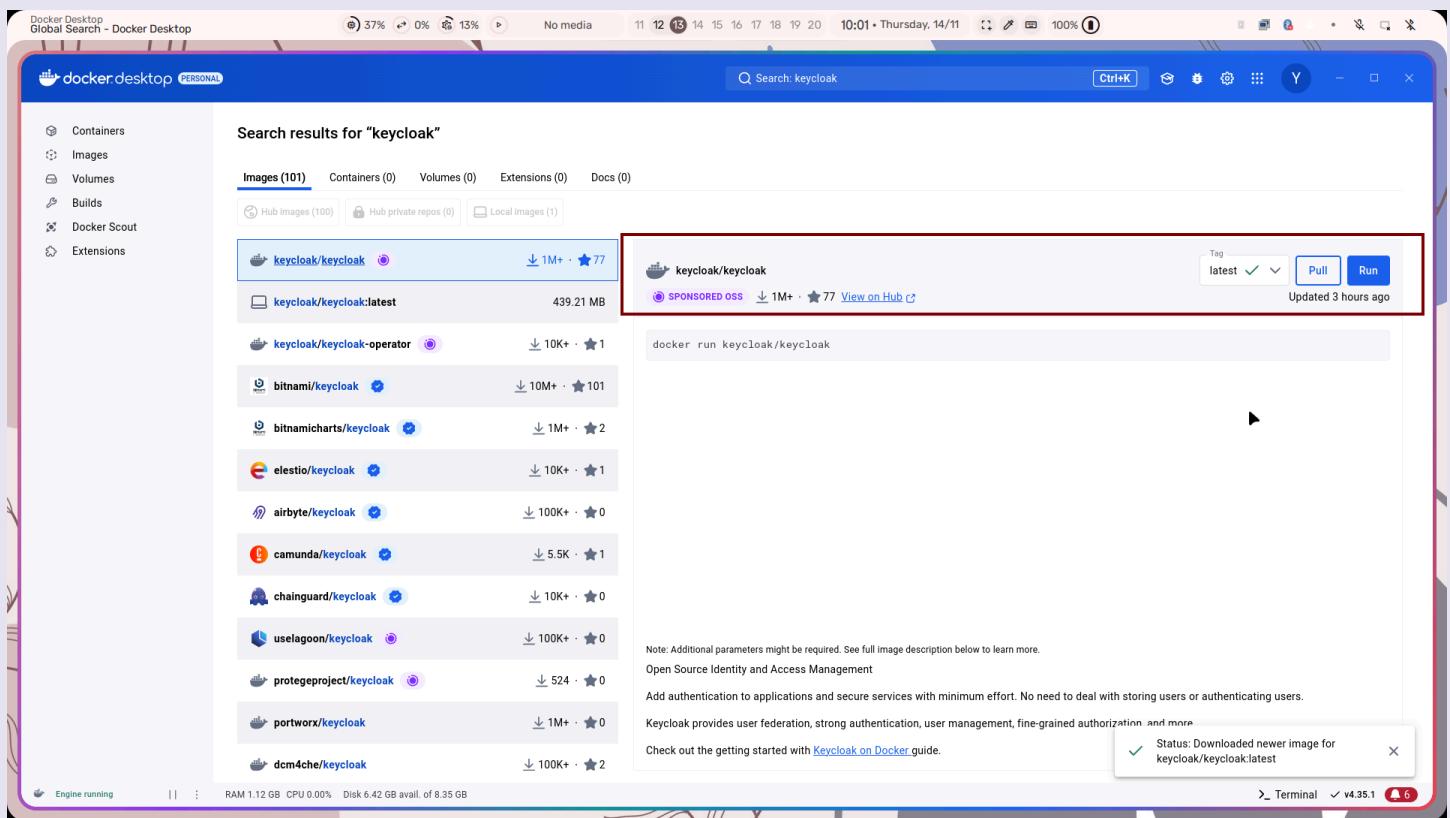
Name - Yash Lakhtariya
Enrollment number - 21162101012
Branch - CBA Batch - 71
CS Practical 14

Aim : You're tasked with securing a new application that requires user authentication, role-based access control, and identity management. To achieve this, you decide to explore for its extensive IAM (Identity and Access Management) capabilities.

Explore the options available in Keycloak that can help you set up and manage user authentication, including features like , , (e.g., social logins), , and (for securing individual applications or APIs).

Steps and Screenshots :

1. Pull docker image of keycloak



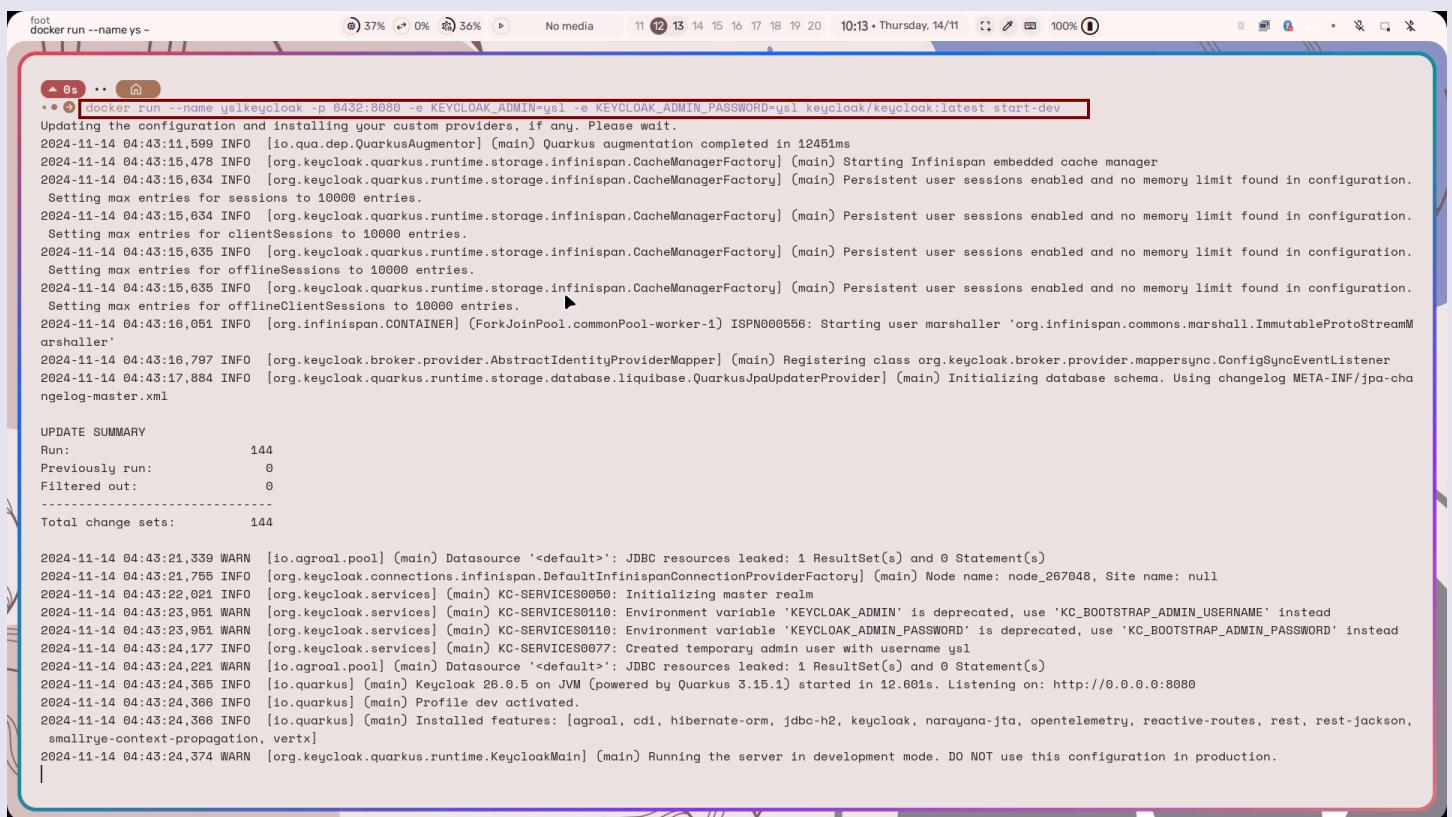
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2. Run keycloak container with admin user and password specified as envs and go to the localhost URL for authentication



```
root@foot:~# docker run --name ys -e KEYCLOAK_ADMIN=yas -e KEYCLOAK_ADMIN_PASSWORD=yas keycloak/keycloak:latest start-dev
Updating the configuration and installing your custom providers, if any. Please wait.
2024-11-14 04:43:11,599 INFO [io.qua.dep.QuarkusAugmentor] (main) Quarkus augmentation completed in 12451ms
2024-11-14 04:43:15,478 INFO [org.keycloak.quarkus.runtime.storage.infinispan.CacheManagerFactory] (main) Starting Infinispan embedded cache manager
2024-11-14 04:43:15,634 INFO [org.keycloak.quarkus.runtime.storage.infinispan.CacheManagerFactory] (main) Persistent user sessions enabled and no memory limit found in configuration.
Setting max entries for sessions to 10000 entries.
2024-11-14 04:43:15,634 INFO [org.keycloak.quarkus.runtime.storage.infinispan.CacheManagerFactory] (main) Persistent user sessions enabled and no memory limit found in configuration.
Setting max entries for clientSessions to 10000 entries.
2024-11-14 04:43:15,635 INFO [org.keycloak.quarkus.runtime.storage.infinispan.CacheManagerFactory] (main) Persistent user sessions enabled and no memory limit found in configuration.
Setting max entries for offlineSessions to 10000 entries.
2024-11-14 04:43:15,635 INFO [org.keycloak.quarkus.runtime.storage.infinispan.CacheManagerFactory] (main) Persistent user sessions enabled and no memory limit found in configuration.
Setting max entries for offlineClientSessions to 10000 entries.
2024-11-14 04:43:16,081 INFO [org.infinispan.CONTAINER] [ForkJoinPool.commonPool-worker-1] ISPN000556: Starting user marshaller 'org.infinispan.commons.marshall.ImmutableProtoStreamMarshaller'
2024-11-14 04:43:16,797 INFO [org.keycloak.broker.provider.AbstractIdentityProviderMapper] (main) Registering class org.keycloak.broker.provider.mappersync.ConfigSyncEventListener
2024-11-14 04:43:17,884 INFO [org.keycloak.quarkus.runtime.storage.database.QuarkusJpaUpdaterProvider] (main) Initializing database schema. Using changelog META-INF/jpa-changelog-master.xml

UPDATE SUMMARY
Run: 144
Previously run: 0
Filtered out: 0
-----
Total change sets: 144

2024-11-14 04:43:21,339 WARN [io.agroal.pool] (main) Datasource '<default>': JDBC resources leaked: 1 ResultSet(s) and 0 Statement(s)
2024-11-14 04:43:21,755 INFO [org.keycloak.connections.infinispan.DefaultInfinispanConnectionProviderFactory] (main) Node name: node_267048, Site name: null
2024-11-14 04:43:22,021 INFO [org.keycloak.services] (main) KC-SERVICES0050: Initializing master realm
2024-11-14 04:43:23,951 WARN [org.keycloak.services] (main) KC-SERVICES0110: Environment variable 'KEYCLOAK_ADMIN' is deprecated, use 'KC_BOOTSTRAP_ADMIN_USERNAME' instead
2024-11-14 04:43:25,951 WARN [org.keycloak.services] (main) KC-SERVICES0110: Environment variable 'KEYCLOAK_ADMIN_PASSWORD' is deprecated, use 'KC_BOOTSTRAP_ADMIN_PASSWORD' instead
2024-11-14 04:43:24,177 INFO [org.keycloak.services] (main) KC-SERVICES0077: Created temporary admin user with username yas
2024-11-14 04:43:24,221 WARN [io.agroal.pool] (main) Datasource '<default>': JDBC resources leaked: 1 ResultSet(s) and 0 Statement(s)
2024-11-14 04:43:24,365 INFO [io.quarkus] (main) Keycloak 28.0.5 on JVM (powered by Quarkus 3.15.1) started in 12.601s. Listening on: http://0.0.0.0:8080
2024-11-14 04:43:24,366 INFO [io.quarkus] (main) Profile dev activated.
2024-11-14 04:43:24,366 INFO [io.quarkus] (main) Installed features: [agroal, cdi, hibernate-orm, jdbc-h2, keycloak, narayana-jta, opentelemetry, reactive-routes, rest, rest-jackson, smallrye-context-propagation, vertx]
2024-11-14 04:43:24,374 WARN [org.keycloak.quarkus.runtime.KeycloakMain] (main) Running the server in development mode. DO NOT use this configuration in production.
```

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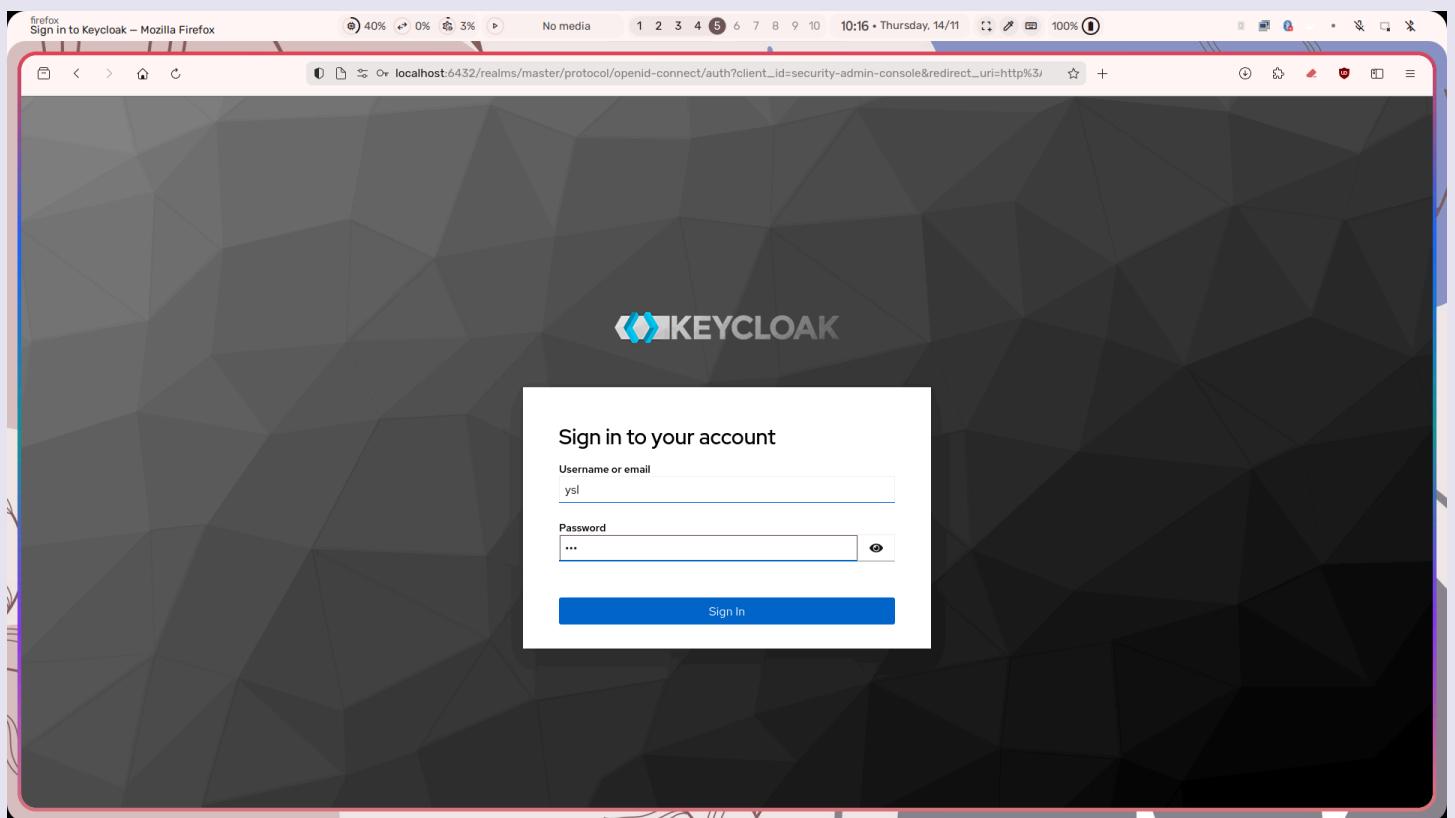
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```
root@foot:~# xdg-open http://localhost:8080
xdg-open http://localhost:8080 -e KEYCLOAK_ADMIN=ysl -e KEYCLOAK_ADMIN_PASSWORD=ysl
● ● docker run --name yslkeycloak -p 6432:8080 -e KEYCLOAK_ADMIN=ysl -e KEYCLOAK_ADMIN_PASSWORD=ysl keycloak/keycloak:latest start-dev
Updating the configuration and installing your custom providers, if any. Please wait.
2024-11-14 04:43:11,599 INFO [io.qua.dep.QuarkusAugmentor] (main) Quarkus augmentation completed in 12451ms
2024-11-14 04:43:15,478 INFO [org.keycloak.quarkus.runtime.storage.infinispan.CacheManagerFactory] (main) Starting Infinispan embedded cache manager
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UPDATE SUMMARY
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2024-11-14 04:43:21,339 WARN [io.agroal.pool] (main) Datasource '<default>': JDBC reso
```



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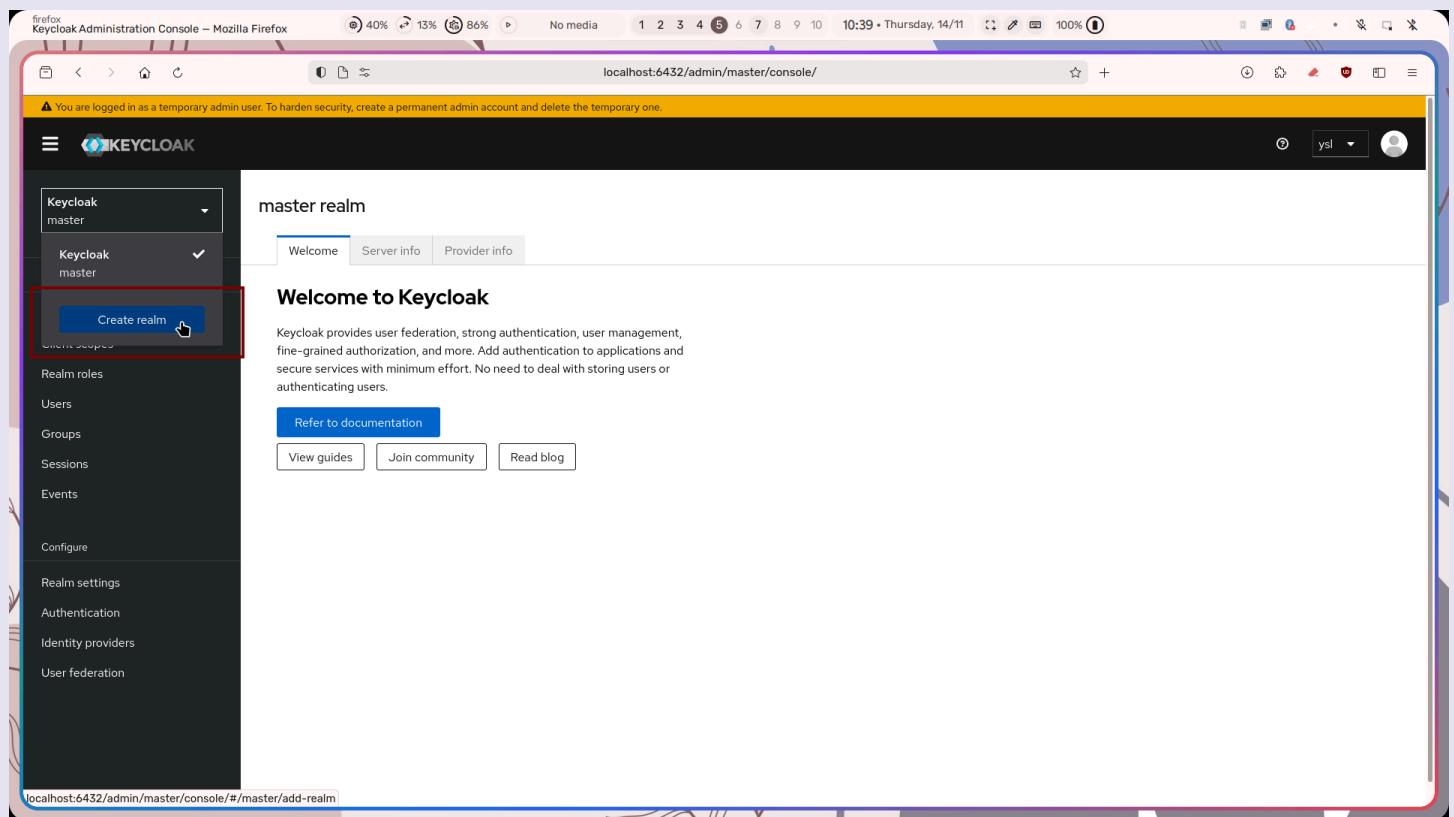
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The screenshot shows the Keycloak Administration Console interface. At the top, there is a banner message: "⚠ You are logged in as a temporary admin user. To harden security, create a permanent admin account and delete the temporary one." Below this, the title "master realm" is displayed. The main content area features a "Welcome to Keycloak" heading and a brief description of the platform's capabilities. A "Refer to documentation" button is prominently displayed, along with three smaller buttons: "View guides", "Join community", and "Read blog". On the left side, a navigation sidebar titled "Keycloak master" contains several sections: Manage (Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events), Configure (Realm settings, Authentication, Identity providers, User federation), and a dropdown menu for "Keycloak master". The URL in the browser bar is "localhost:6432/admin/master/console/". The browser status bar at the bottom indicates the date and time as "Thursday, 14/11 10:16".

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3. Create new realm and try adding a user



The screenshot shows the Keycloak Administration Console interface. The URL in the browser is `localhost:6432/admin/master/console/`. A yellow header bar at the top states: "⚠ You are logged in as a temporary admin user. To harden security, create a permanent admin account and delete the temporary one." Below this, the main content area is titled "master realm". It features a "Welcome" section with a brief introduction to Keycloak's capabilities. On the left side, there is a sidebar menu with the following items: "Keycloak" dropdown (set to "master"), "Client scopes" (highlighted with a red box and a cursor icon), "Realm roles", "Users", "Groups", "Sessions", "Events", "Configure", "Realm settings", "Authentication", "Identity providers", and "User federation". At the bottom of the sidebar, the URL `localhost:6432/admin/master/console/#/master/add-realm` is visible. The main content area also includes tabs for "Welcome", "Server info", and "Provider info".

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firefox Keycloak Administration Console – Mozilla Firefox 41% 13% 54% No media 1 2 3 4 5 6 7 8 9 10 10:39 • Thursday, 14/11 100% 1 2 3 4 5 6 7 8 9 10 10:39 • Thursday, 14/11 100% 1 2 3 4 5 6 7 8 9 10 10:39 • Thursday, 14/11 100%

localhost:6432/admin/master/console/#/master/add-realm

Create realm

A realm manages a set of users, credentials, roles, and groups. A user belongs to and logs into a realm. Realms are isolated from one another and can only manage and authenticate the users that they control.

Resource file

Drag a file here or browse to upload

Browse... Clear

Upload a JSON file

1

Realm name *

yashlanu-realm

Enabled

On

Create Cancel

localhost:6432/admin/master/console/#/master/add-realm

firefox Keycloak Administration Console – Mozilla Firefox 38% 14% 5% No media 1 2 3 4 5 6 7 8 9 10 10:43 • Thursday, 14/11 100% 1 2 3 4 5 6 7 8 9 10 10:43 • Thursday, 14/11 100% 1 2 3 4 5 6 7 8 9 10 10:43 • Thursday, 14/11 100%

localhost:6432/admin/master/console/#/yashlanu-realm/users/add-user

⚠ You are logged in as a temporary admin user. To harden security, create a permanent admin account and delete the temporary one.

Users > Create user

Create user

Required user actions

Update Password Select action

Email verified On

General

Username *

yashlo

Email

yashlo@ysl.com

First name

Yashlo

Last name

Last name

Groups

Join Groups

Create Cancel

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and contains the following navigation items: Manage, Clients, Client scopes, Realm roles, **Users**, Groups, Sessions, Events, Configure, Realm settings, Authentication, Identity providers, and User federation. The 'Users' item is currently selected.

The main content area shows the 'User details' for a user named 'yashlo'. The top navigation bar for this page includes 'Users > User details' and tabs for Details, Credentials, Role mapping, Groups, Consents, Identity provider links, and Sessions. A success message 'The user has been created' is displayed in a green box.

Form fields for the user 'yashlo' include:

- ID: 4145009a-6d76-46e0-afla-4f65474e44dc
- Created at: 11/14/2024, 10:43:53 AM
- Required user actions: Update Password (disabled), Select action
- Email verified: On

The 'General' section contains the following user information:

- Username: yashlo
- Email: yashlo@ysl.com
- First name: Yashlo
- Last name: Last name

At the bottom of the form are two buttons: 'Save' (highlighted in blue) and 'Revert'.

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4. Password must have to be created for new user if not set policy and permissions

The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled "yashlanu-realm" and contains the following navigation items: Manage, Clients, Client scopes, Realm roles, **Users**, Groups, Sessions, Events, Configure, Realm settings, Authentication, Identity providers, and User federation. The main content area is titled "User details" for a user named "yashlo". The "Credentials" tab is selected, showing a "No credentials" message with a note: "This user does not have any credentials. You can set password for this user." Below this message are two buttons: "Set password" (highlighted with a mouse cursor) and "Credential Reset". At the top right of the main area, there is an "Enabled" toggle switch which is turned on, and an "Action" dropdown menu.

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A screenshot of the Keycloak Administration Console in Mozilla Firefox. The URL is `localhost:6432/admin/master/console/#/yashlanu-realm/users/4145009a-6d76-46e0-a1fa-4f65474e44dc/credentials`. The left sidebar shows navigation options like Manage, Clients, Client scopes, Realm roles, Users (selected), Groups, Sessions, Events, Configure, Realm settings, Authentication, Identity providers, and User federation. The main area shows user details for 'yashlo'. A modal dialog titled 'Set password for yashlo' is open, prompting for a new password ('Password') and its confirmation ('Password confirmation'). A 'Temporary' toggle switch is set to 'On'. At the bottom of the dialog are 'Save' and 'Cancel' buttons. The status bar at the top indicates the browser version, battery level (42%), signal strength (14%), and network speed (3%).

A screenshot of the Keycloak Administration Console in Mozilla Firefox, showing the same URL as the previous screenshot. The 'Credentials' tab is selected in the user details view for 'yashlo'. A success message 'The password has been set successfully.' is displayed in a toast notification. The table below shows the credential data: Type (Password), User label (My password), and Created at (11/14/2024, 10:44:49 AM). There are buttons for 'Show data' and 'Reset password'. The left sidebar and overall interface are identical to the first screenshot.

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5. With newly created realm and user, test if they work

The image shows a dual-monitor setup. The left monitor displays the Keycloak administration interface at <http://localhost:6432/admin>. A user named 'yashlo' is selected, and the 'Role mapping' tab is active. The table shows one role assignment:

Name	Inherited	Description
default-roles-yashlanu-realm	False	role_default-roles

The right monitor shows a terminal window with the command `xdg-open http://localhost:6432/realms/yashlanu-realm/account` entered and executed. The output shows the user's account page.

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The left window shows the Keycloak Admin UI for a user named "yashlo". The "Role mapping" tab is selected. The table below shows one role assignment:

Name	Inherited	Description
default-roles-yashlanu-realm	False	role_default-roles

The right window shows the "YASHLANU-REALM" sign-in page. A red box highlights the password input field.

The left window shows the Keycloak Admin UI for the same user "yashlo", with the "Role mapping" tab selected. The table shows the same role assignment.

The right window shows the "YASHLANU-REALM" "Update password" page. A red box highlights the "New Password" and "Confirm password" fields, as well as the "Submit" button.

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The image shows two side-by-side screenshots of the Keycloak Admin UI. The left screenshot displays the 'User details' page for a user named 'yashlo'. The right screenshot shows the 'Personal info' edit screen for the same user.

User Details (Left Screenshot):

- Enabled status: Enabled
- Action dropdown menu open.
- Role mapping tab selected.
- Search bar: Search by name (yashlo).
- Assign role button.
- Unassign button.
- Table view:
 - Column headers: Name, Inherited, Description.
 - Data row: default-roles-yashlanu-realm, False, role_default-roles.

Personal Info (Right Screenshot):

- Section title: Personal info
- Subtitle: Manage your basic information
- General section:
 - Username: yashlo
 - Email: yashlo@ysl.com
 - First name: Yashlo
 - Last name: 10102002
- Save and Cancel buttons.

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6. Explore other options like session are visible

The screenshot shows two tabs open in a Firefox browser window. Both tabs are for the Keycloak Administration Console, specifically for the realm 'yashlu-real'.

Left Tab: Sessions

This tab displays a list of sessions for the user 'yashlo'. The table has columns: User, Type, Started, Last access, IP address, and Clients. One session is listed:

User	Type	Started	Last access	IP address	Clients
yashlo	REGULAR	11/14/2024, 10:49:53 AM	11/14/2024, 10:53:07 AM	172.17.0.1	account-console

Right Tab: Device activity

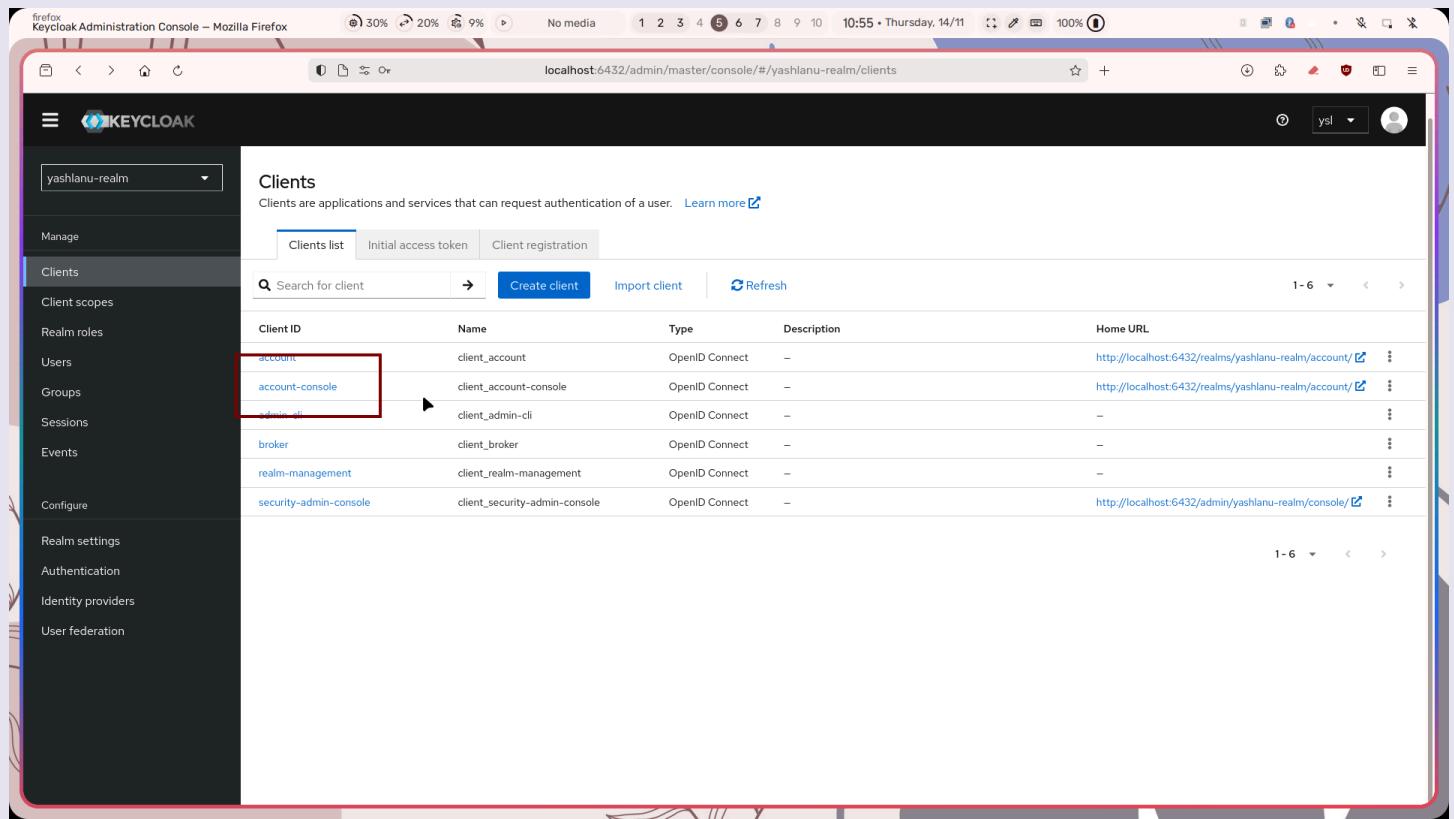
This tab shows the device activity for the user 'Yashlo 10102002'. It lists a single signed-in device:

Device	IP address	Last accessed
Linux / Firefox/132.0	172.17.0.1	November 14, 2024 at 10:53 AM

Details for the device include the client 'Account Console' and an expiration date of 'November 14, 2024 at 8:49 PM'.

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7. With admin user, explore client settings



The screenshot shows the Keycloak Administration Console interface. The left sidebar is dark with white text, showing a navigation menu. The main area has a light background. A red box highlights the 'Clients' section in the sidebar and the 'account-console' client in the list.

Clients
Clients are applications and services that can request authentication of a user. [Learn more](#)

Client ID	Name	Type	Description	Home URL
account	client_account	OpenID Connect	—	http://localhost:6432/realm/yashlanu-realm/account/
account-console	client_account-console	OpenID Connect	—	http://localhost:6432/realm/yashlanu-realm/account/
admin-cli	client_admin-cli	OpenID Connect	—	—
broker	client_broker	OpenID Connect	—	—
realm-management	client_realm-management	OpenID Connect	—	—
security-admin-console	client_security-admin-console	OpenID Connect	—	http://localhost:6432/admin/yashlanu-realm/console/

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and includes links for Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, Configure, Realm settings, Authentication, Identity providers, and User federation. The 'Clients' link is currently selected.

The main content area displays the 'Client details' for the 'account-console' client, which is an OpenID Connect client. The 'Enabled' toggle switch is turned on. The 'General settings' tab is active, showing the following configuration:

- Client ID:** account-console
- Name:** \${client_account-console}
- Description:** (empty)
- Always display in UI:** Off

The 'Access settings' tab is also visible, showing:

- Root URL:** \${authBaseUrl}
- Home URL:** /realms/yashlanu-realm/account/
- Valid redirect URIs:** /realms/yashlanu-realm/account/*
+ Add valid redirect URIs
- Valid post logout:** (empty)

At the bottom of the form are 'Save' and 'Revert' buttons. To the right of the form, there is a sidebar with a 'Jump to section' header and links to General settings, Access settings, Capability config, Login settings, and Logout settings.

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8. Create group and add user to it, assign roles and explore

The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and contains the following navigation items: Manage, Clients, Client scopes, Realm roles, Users, Groups (which is currently selected), Sessions, Events, Configure, Realm settings, Authentication, Identity providers, and User federation. The main content area is titled 'Groups' and includes a search bar ('Search group') and an 'Exact search' checkbox. A message states '0 - 0 groups in this realm'. A modal dialog box is open in the center, titled 'Create a group'. It has a 'Name *' field containing 'grp1', a 'Create' button, and a 'Cancel' button. To the right of the modal, there is a large '+' icon and another message: 'No groups in this realm. Create a group to get started.' The browser's address bar shows the URL <http://localhost:6432/admin/master/console/#/yashlanu-realm/groups>.

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is collapsed, and the main area displays the 'Groups' section. A modal window titled 'Add member' is open, showing a table with one row of data. The table has columns for 'Username', 'Email', 'Last name', and 'First name'. A single row is present with the values: 'yashlo', 'yashlo@ysl.com', '10102002', and 'Yashlo'. Both the 'Username' and 'Email' fields have checkboxes checked. At the bottom of the modal are 'Add' and 'Cancel' buttons.

The screenshot shows the Keycloak Administration Console interface. The left sidebar is collapsed, and the main area displays the 'Groups' section. A modal window titled 'Assign roles to grp1' is open, showing a table of roles. The table has two columns: 'Name' and 'Description'. Several roles are listed, each with a checkbox next to it. Some checkboxes are checked, such as 'account view-groups' and 'account view-profile'. At the bottom of the modal are 'Assign' and 'Cancel' buttons.

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and includes options like Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, Configure, Realm settings, Authentication, Identity providers, and User federation. The 'Groups' option is selected. The main panel shows a list of groups under 'yashlanu-realm'. One group, 'grp1', is selected and its details are shown in the center. A success message 'Role mapping updated' is displayed at the top right. The 'Role mapping' tab is active, showing two entries:

Name	Inherited	Description
account view-profile	False	role_view-profile
account view-groups	False	role_view-groups

The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and includes options like Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, Configure, Realm settings, Authentication, Identity providers, and User federation. The 'Users' option is selected. The main panel shows a list of users under 'yashlanu-realm'. One user, 'yashlo', is selected and its details are shown in the center. The 'Sessions' tab is active, showing one session:

Started	Last access	IP address	Clients
11/18/2024, 10:24:56 AM	11/18/2024, 10:24:56 AM	172.17.0.1	account-console

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9. Setup authenticator application

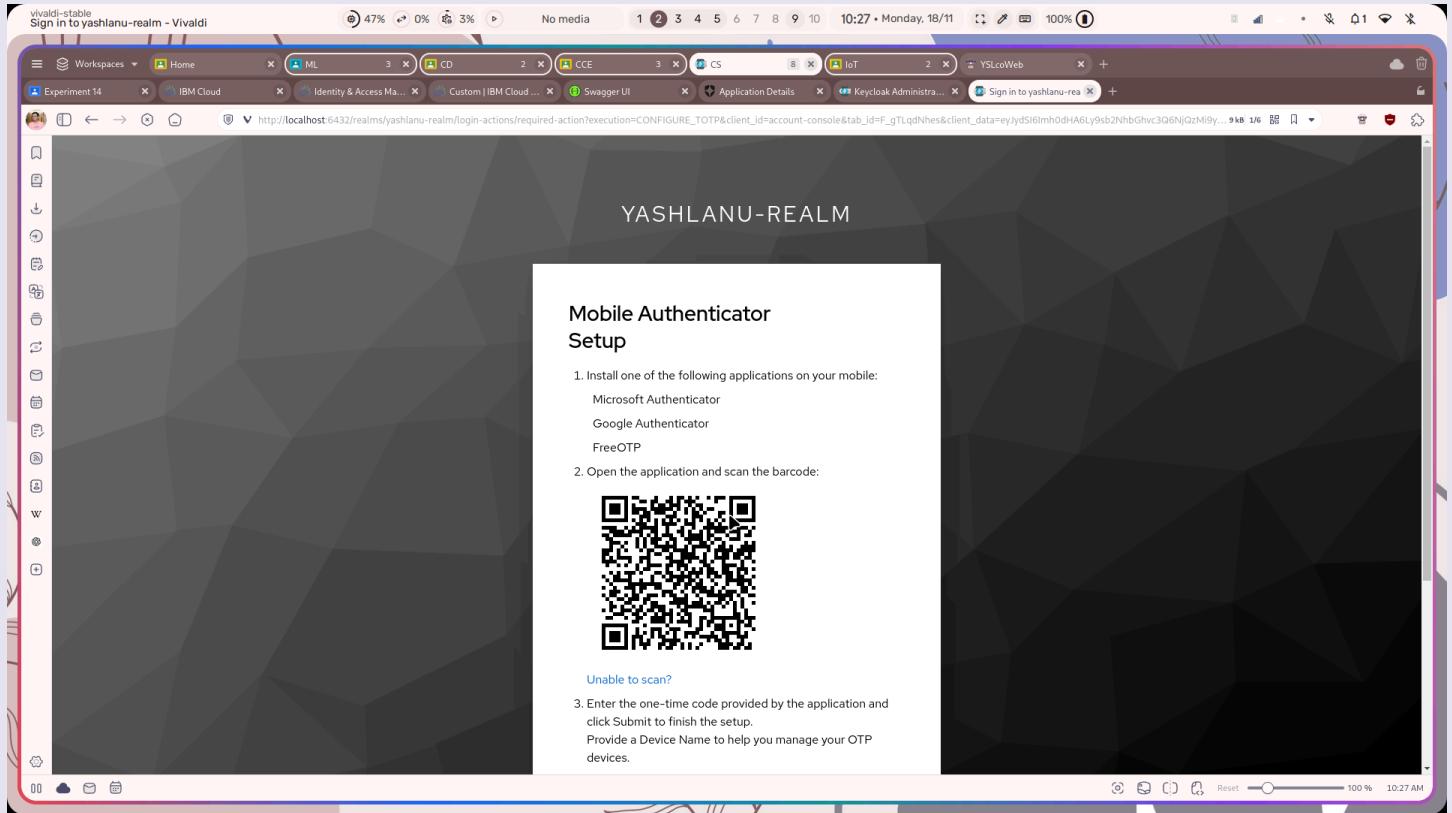
The screenshot shows a Vivaldi browser window with multiple tabs open. The active tab is 'Account Management' at the URL <http://localhost:6432/realm/yashlalu/realm/account/account-security/signing-in>. The page displays the 'Signing in' configuration for a user named 'Yashlo 10102002'. The left sidebar shows navigation options like Personal info, Account security (which is selected), Signing in, Device activity, Applications, and Groups. The main content area is divided into 'Basic authentication' and 'Two-factor authentication' sections. Under 'Basic authentication', there is a 'Password' field with the placeholder 'Sign in by entering your password.' and a note indicating it was created on November 14, 2024, at 10:49 AM. An 'Update' button is visible next to the password field. Under 'Two-factor authentication', there is a section for 'Authenticator application' with the instruction 'Enter a verification code from authenticator application.' A note states 'Authenticator application is not set up.' A red box highlights the 'Set up Authenticator application' link.

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10. Try event configuration settings and add logging

The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and contains the following navigation items: Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events (which is selected and highlighted in blue), Configure, Realm settings, Authentication, Identity providers, and User federation. The main content area is titled 'Events' and displays a message: 'Events are records of user and admin events in this realm. To configure the tracking of these events, go to Event configs.' Below this, there are two tabs: 'User events' (selected) and 'Admin events'. A red box highlights the 'Event configs.' link. Further down, there is a large plus sign icon and the text 'No user events'. A note below states, 'There are no user events in this realm.' The browser's address bar shows the URL: <http://localhost:6432/admin/master/console/#/yashlanu-realm/events/user-events>.

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled "yashlanu-realm" and includes options like Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, and Configure. Under Configure, "Realm settings" is selected. The main content area is titled "yashlanu-realm" and "Realm settings are settings that control the options for users, applications, roles, and groups in the current realm." A yellow banner at the top says, "⚠ You are logged in as a temporary admin user. To harden security, create a permanent admin account and delete the temporary one." Below this, there are tabs for General, Login, Email, Themes, Keys, Events, Localization, Security defenses, Sessions, Tokens, Client policies, User profile, and User registration. The "Events" tab is currently active. It displays "Event listeners" with a dropdown menu showing "jboss-logging". At the bottom are "Save" and "Revert" buttons.

This screenshot shows the "User events settings" tab from the previous screen. A red box highlights the "Save events" section, which has a toggle switch set to "On" and an "Expiration" field set to "2 Minutes". Below this are "Save" and "Revert" buttons. Further down, there are "Clear user events" buttons (one blue, one red). At the bottom, there's a search bar for "Event saved type" and a table with two rows:

Event saved type	Description
Send reset password	Send reset password

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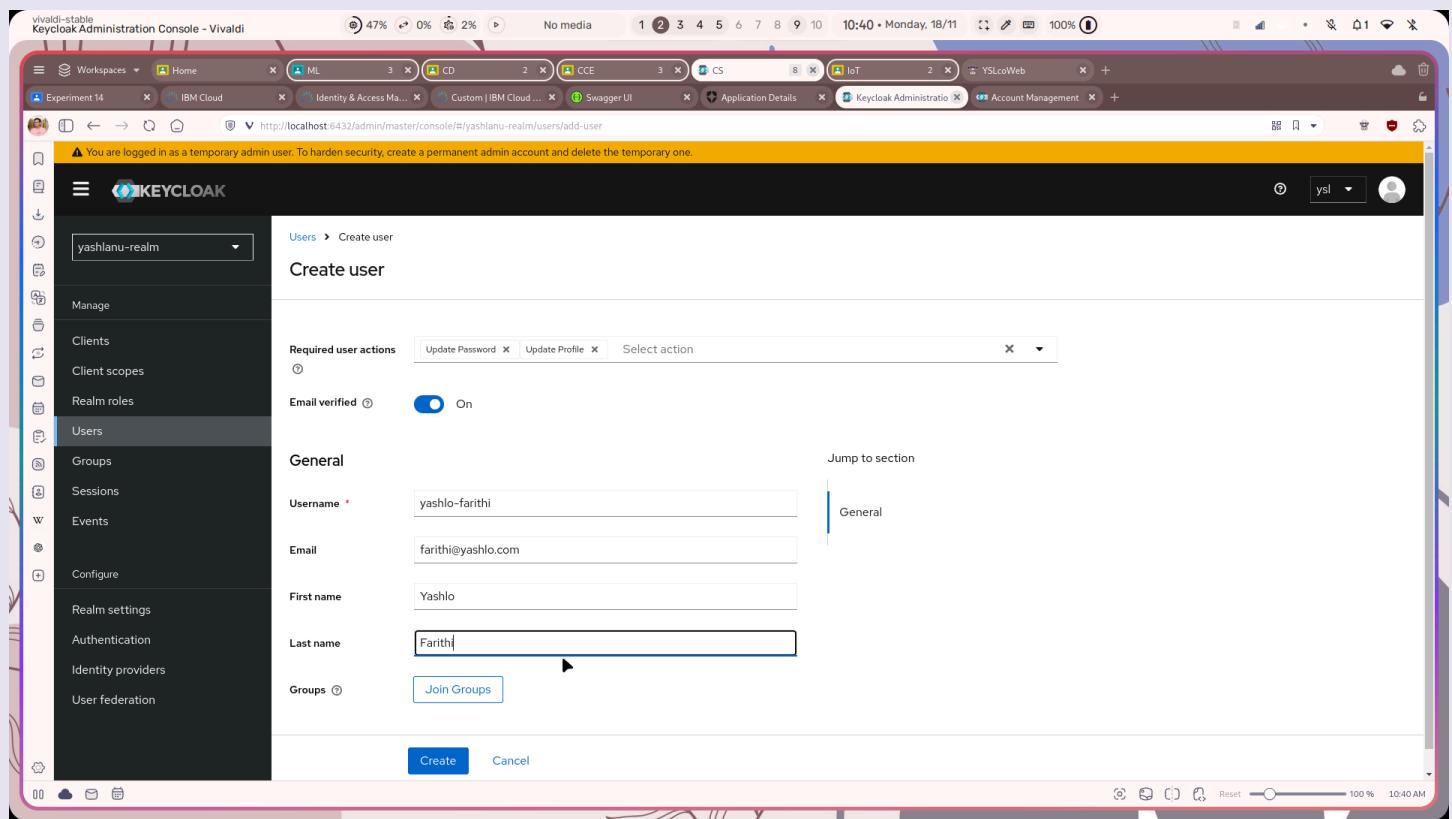
The screenshot shows the Keycloak Administration Console interface for the 'yashlanu-realm'. The left sidebar has a 'Events' section selected. The main content area is titled 'yashlanu-realm' and shows 'Realm settings are settings that control the options for users, applications, roles, and groups in the current realm.' A red box highlights the 'Events' tab in the top navigation bar and the configuration section below it. The configuration section includes 'Save events' (On), 'Include representation' (Off), and an 'Expiration' field set to 2 minutes. Buttons for 'Save' and 'Revert' are at the bottom.

The screenshot shows the 'Events' page for the 'yashlanu-realm'. The left sidebar has an 'Events' section selected. The main content area is titled 'Events' and shows 'Events are records of user and admin events in this realm. To configure the tracking of these events, go to Event config.' A red box highlights the 'User events' tab in the top navigation bar. Below it, a table lists recent events:

Time	User	Event saved type	IP address	Client
November 18, 2024 at 10:39 AM	4145009a-6d76-46e0-afla-4f65474e44dc	CODE_TO_TOKEN	172.17.0.1	account-console
November 18, 2024 at 10:39 AM	4145009a-6d76-46e0-afla-4f65474e44dc	LOGIN	172.17.0.1	account-console
November 18, 2024 at 10:39 AM	4145009a-6d76-46e0-afla-4f65474e44dc	LOGOUT	172.17.0.1	account-console
November 18, 2024 at 10:39 AM	4145009a-6d76-46e0-afla-4f65474e44dc	CODE_TO_TOKEN	172.17.0.1	account-console
November 18, 2024 at 10:39 AM	4145009a-6d76-46e0-afla-4f65474e44dc	LOGIN	172.17.0.1	account-console

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11. Create new user with some permissions and check logs



The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and includes options like Manage, Clients, Client scopes, Realm roles, Groups, Sessions, Events, Configure, Realm settings, Authentication, Identity providers, and User federation. The 'Users' option is selected. The main content area is titled 'Create user' and shows a 'General' section. The 'Username' field contains 'yashlo-farithi'. The 'Email' field contains 'faritho@yashlo.com'. The 'First name' field contains 'Yashlo' and the 'Last name' field contains 'Farithi'. A 'Groups' section has a 'Join Groups' button. At the bottom are 'Create' and 'Cancel' buttons. A top navigation bar shows tabs for Workspaces, Home, ML, CD, CCE, CS, IoT, YSLcoWeb, and Account Management. A message at the top of the page says, '⚠ You are logged in as a temporary admin user. To harden security, create a permanent admin account and delete the temporary one.'

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is dark-themed and includes options like Workspaces, Home, ML, CD, CCE, CS, IoT, YSLCoWeb, Application Details, Keycloak Administration, and Account Management. The main content area has a light background and displays the 'Events' page for the realm 'yashlanu-realm'. A yellow banner at the top says, '⚠ You are logged in as a temporary admin user. To harden security, create a permanent admin account and delete the temporary one.' A green success message 'The user has been created' is shown in the top right. The 'Admin events' tab is selected. The table lists four events:

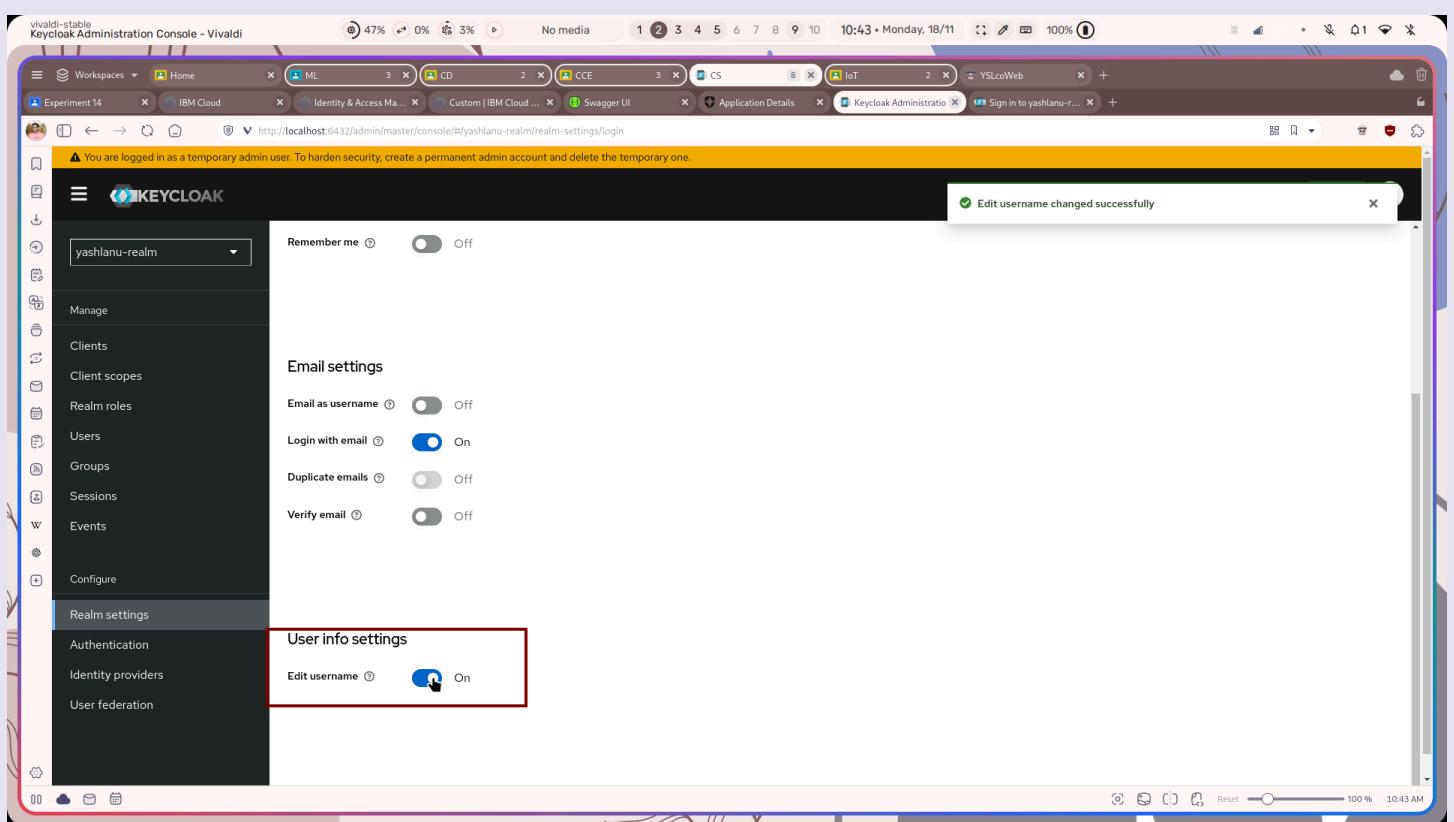
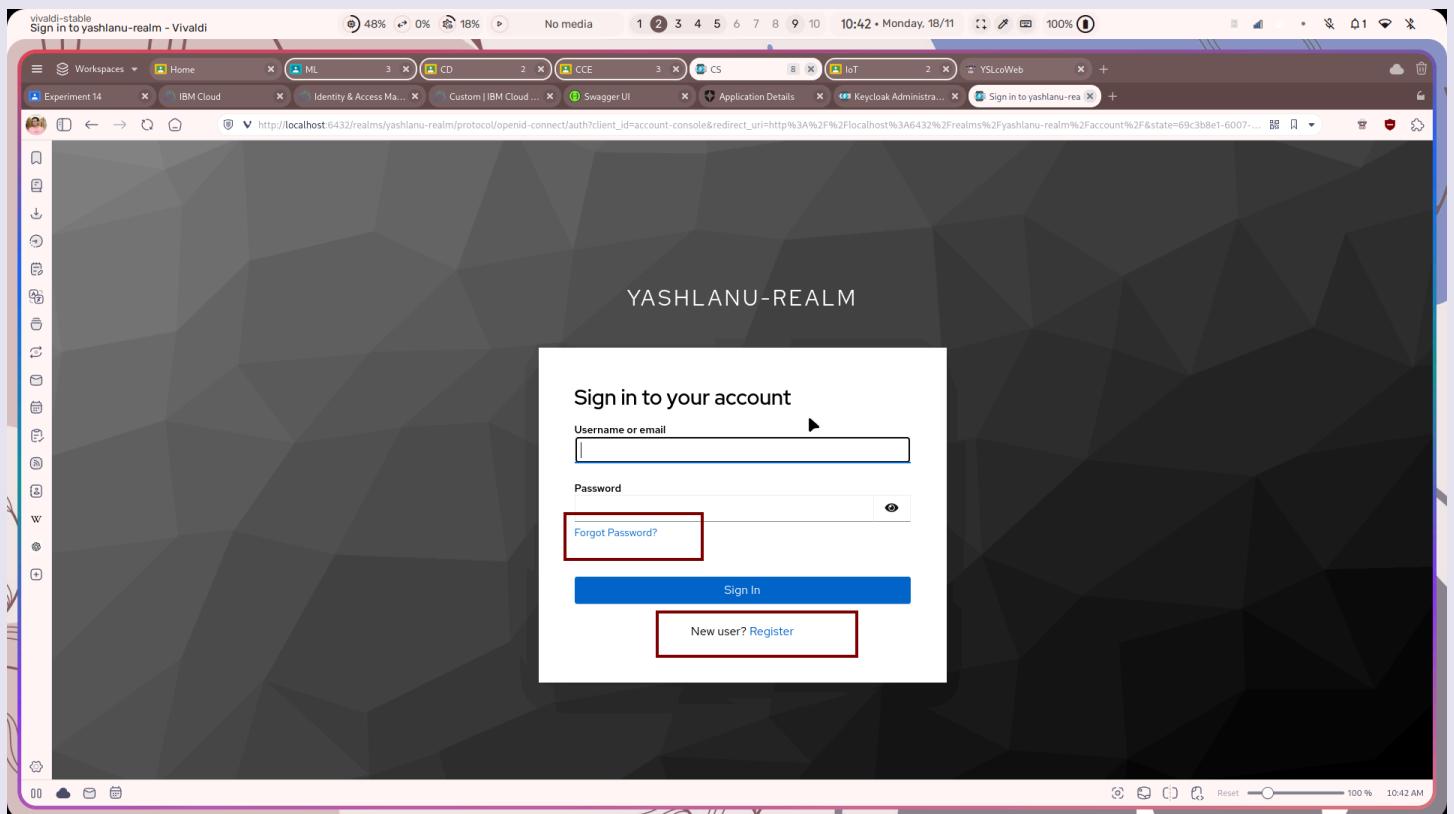
Time	Resource path	Resource t...	Operation type	User
November 18, 2024 at 10:40 AM	users/544347fa-f2b9-43e6-92e2-ae2ccf3e...	USER	CREATE	b98c256a-0735-43a5-8e94-8f2688a73947
November 18, 2024 at 10:39 AM	events/config	REALM	UPDATE	b98c256a-0735-43a5-8e94-8f2688a73947
November 18, 2024 at 10:39 AM	events/config	REALM	UPDATE	b98c256a-0735-43a5-8e94-8f2688a73947

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12. Explore other realm settings like adding option of forgot password, registration, etc.

The screenshot shows the Keycloak Administration Console interface. The left sidebar lists various management sections: Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, and Configure. Under Configure, 'Realm settings' is currently selected. The main content area has tabs for General, Login, Email, Themes, Keys, Events, Localization, Security defenses, and Sessions. The 'Login' tab is active. In the 'Login screen customization' section, two options are highlighted with a red box: 'User registration' (status: On) and 'Forgot password' (status: On). Below these, a 'Remember me' toggle is set to Off. To the right, two success messages are displayed: 'Forgot password changed successfully' and 'User registration changed successfully'. The browser's address bar shows the URL: http://localhost:8432/admin/master/console/#/yashlanu-realm/realm-settings/login.

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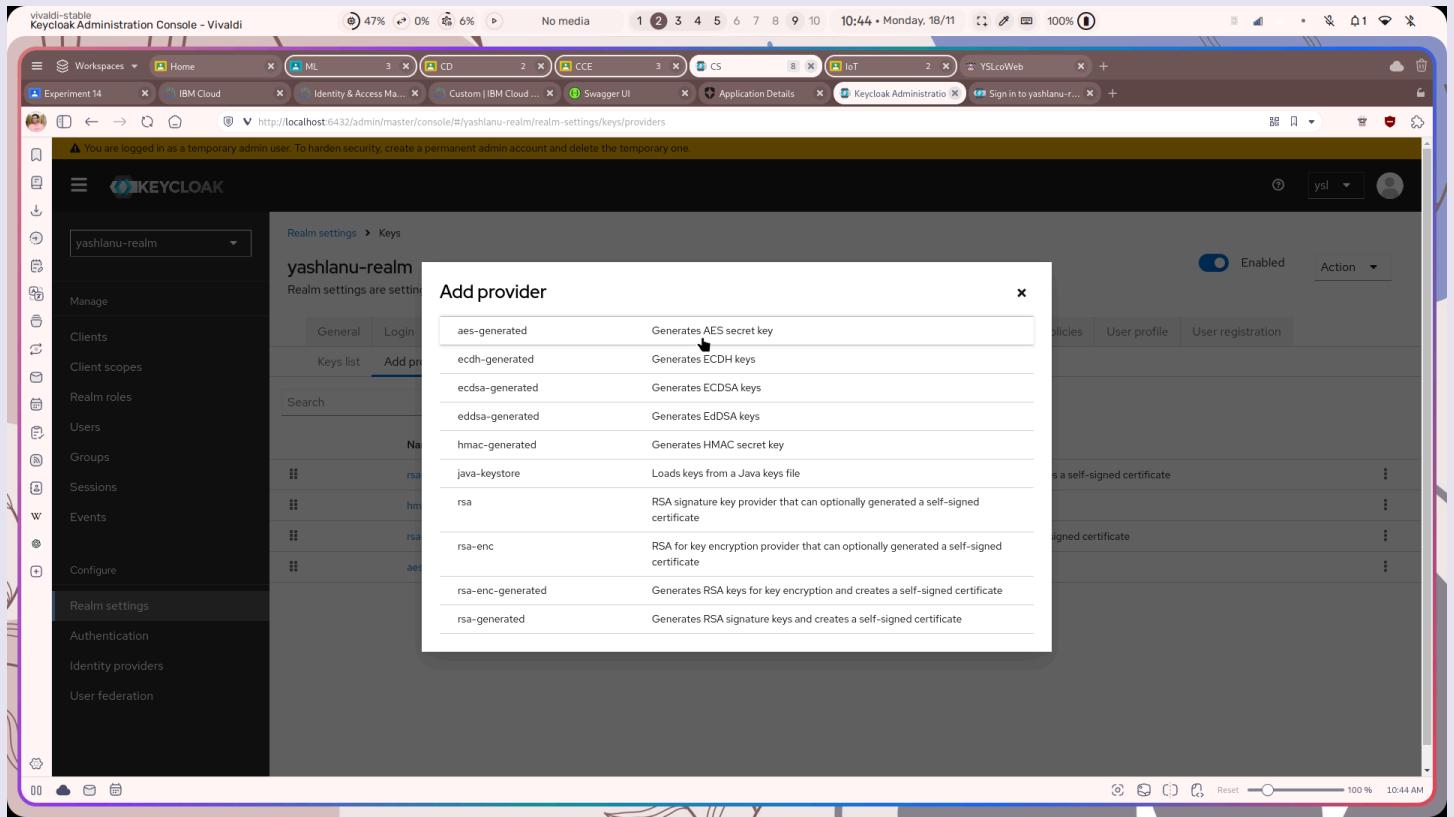
The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled "yashlanu-realm" and includes options like Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, Configure, Realm settings (which is selected), Authentication, Identity providers, and User federation. The main content area is titled "yashlanu-realm" and "Realm settings are settings that control the options for users, applications, roles, and groups in the current realm." A "Keys" tab is selected, showing a table of active keys. The table has columns: Algorithm, Type, Kid, Use, Provider, Valid to, and Public keys. There are four entries:

Algorithm	Type	Kid	Use	Provider	Valid to	Public keys
AES	OCT	70908047-4e71-4584-b9d0-ae1ef5ble8b9	ENC	aes-generated	-	<button>Public key</button> <button>Certificate</button>
HS512	OCT	c0071f13-76b9-4672-b5d1-698cace97251	SIG	hmac-generated-hs512	-	<button>Public key</button> <button>Certificate</button>
RSA-OAEP	RSA	MqT9ohG_SqnYWCISGUpOupy_COEeDLzTLEYPpfF_gsO	ENC	rsa-enc-generated	11/14/2034, 10:39:48 AM	<button>Public key</button> <button>Certificate</button>
RS256	RSA	NTZXWhazt2-s2EhgbJdpVKhWelWAIOE_mE75WtdHA	SIG	rsa-generated	11/14/2034, 10:39:47 AM	<button>Public key</button> <button>Certificate</button>

The screenshot shows the Keycloak Administration Console interface. The left sidebar is identical to the previous screenshot. The main content area is titled "yashlanu-realm" and "Realm settings > Keys". A "Keys" tab is selected, showing a table with a search bar and an "Add provider" button. The table has columns: Name, Provider, and Provider description. There are four entries:

Name	Provider	Provider description
rsa-enc-generated	rsa-enc-generated	Generates RSA keys for key encryption and creates a self-signed certificate
hmac-generated-hs512	hmac-generated	Generates HMAC secret key
rsa-generated	rsa-generated	Generates RSA signature keys and creates a self-signed certificate
aes-generated	aes-generated	Generates AES secret key

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is collapsed, and the main area displays the 'yashlanu-realm' settings under 'Realm settings'. A modal window titled 'Add provider' is open, listing various key generation options:

Provider Type	Description
aes-generated	Generates AES secret key
ecdh-generated	Generates ECDH keys
ecdsa-generated	Generates ECDSA keys
edssa-generated	Generates EdDSA keys
hmac-generated	Generates HMAC secret key
java-keystore	Loads keys from a Java keystore
rsa	RSA signature key provider that can optionally generate a self-signed certificate
rsa-enc	RSA for key encryption provider that can optionally generate a self-signed certificate
rsa-enc-generated	Generates RSA keys for key encryption and creates a self-signed certificate
rsa-generated	Generates RSA signature keys and creates a self-signed certificate

(These are options available for key creation and management)

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and includes options like Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, and Configure. Under Configure, 'Realm settings' is selected. In the main content area, the 'Keys' tab is active under 'Realm settings'. A modal dialog titled 'Add provider' is open, prompting for configuration details:

- Name:** aes-generated
- Priority:** 0
- Enabled:** On
- Active:** On
- AES Key size:** 16

At the bottom of the dialog are 'Save' and 'Cancel' buttons.

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13. Explore other options and settings like sessions, tokens, etc.

The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and includes sections for Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, Configure, Realm settings (which is selected), Authentication, Identity providers, and User federation. The main content area is titled 'yashlanu-realm' and contains tabs for General, Login, Email, Themes, Keys, Events, Localization, Security defenses, Sessions (which is selected), Tokens, Client policies, User profile, and User registration. The 'Sessions' tab is active, showing 'SSO Session Settings' and 'Client session settings'. A red box highlights the 'SSO Session Idle' field, which is set to 35 Minutes. Below it, the 'SSO Session Max' field is set to 8 Hours. In the 'Client session settings' section, the 'Client Session Idle' field is shown but has no value entered. The top right corner shows a user profile for 'ysl' and an 'Enabled' toggle switch.

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The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and contains a navigation menu with options like Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, and Configure. Under 'Configure', 'Realm settings' is selected. The main content area is titled 'yashlanu-realm' and describes 'Realm settings are settings that control the options for users, applications, roles, and groups in the current realm'. A 'Learn more' link is present. The 'Tokens' tab is active. The 'General' section contains the following configuration:

- Default Signature Algorithm: RS256
- OAuth 2.0 Device Code Lifespan: 10 Minutes
- OAuth 2.0 Device Polling Interval: 5
- Short verification_uri in Device Authorization flow: Short verification_uri in Device Authorization flow
- Lifetime of the Request URI for Pushed Authorization Request: 1 Minutes

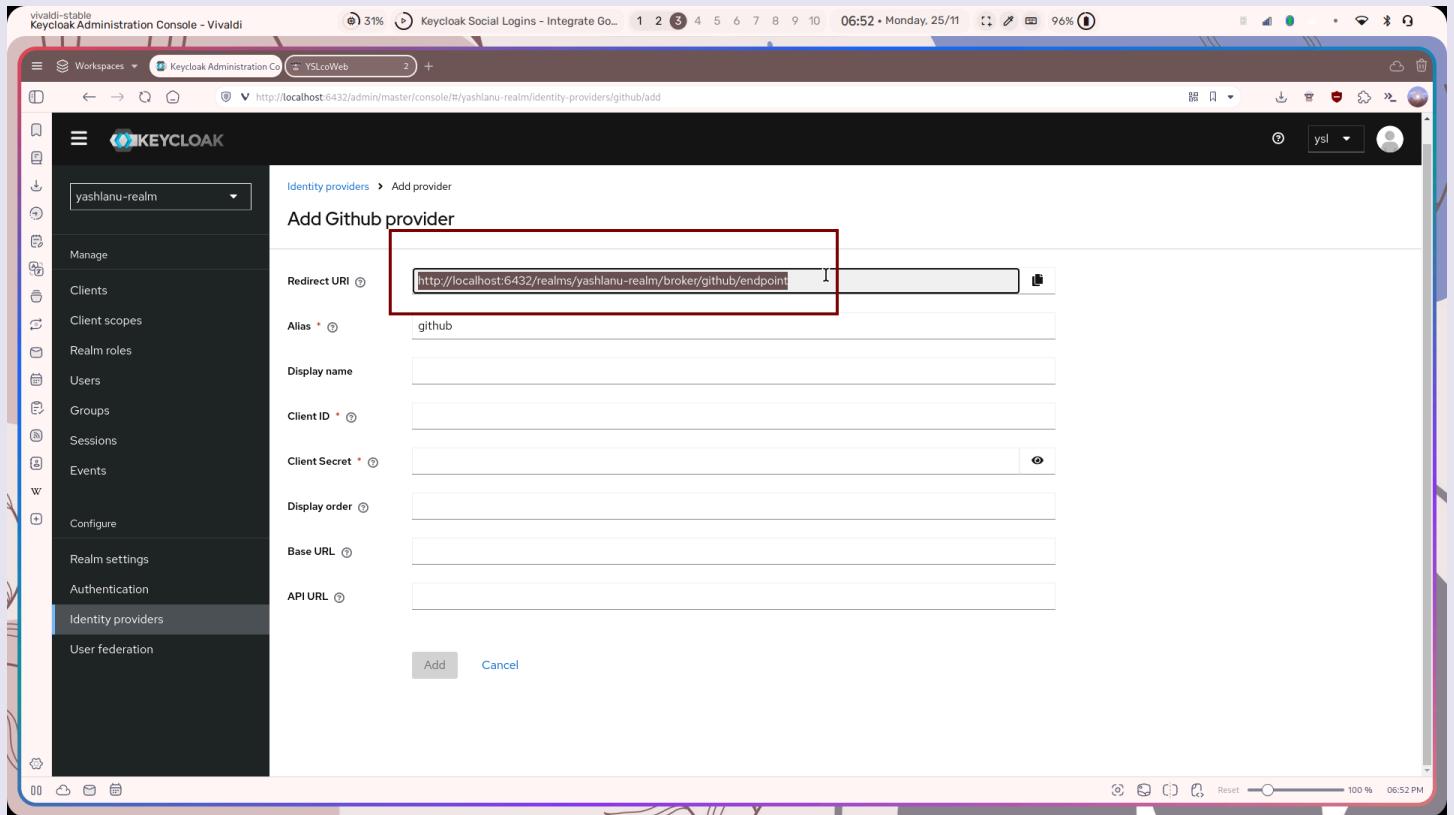
The top of the browser window shows the URL <http://localhost:6432/admin/master/console/#/yashlanu-realm/realm-settings/tokens>. The status bar at the bottom indicates it's Monday, 25/11, 06:26 PM.

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14. Try adding an identity provider to login/signup using external accounts

The screenshot shows the Keycloak Administration Console interface. The left sidebar is titled 'yashlanu-realm' and contains the following navigation items: Manage, Clients, Client scopes, Realm roles, Users, Groups, Sessions, Events, Configure, Realm settings, Authentication, **Identity providers**, and User federation. The 'Identity providers' item is currently selected. The main content area is titled 'Identity providers' and contains the following text: 'Identity providers are social networks or identity brokers that allow users to authenticate to Keycloak.' with a 'Learn more' link. Below this, there are two sections: 'User-defined:' and 'Social:'. In the 'User-defined:' section, three options are listed: 'Keycloak OpenID Connect', 'OpenID Connect v1.0', and 'SAML v2.0'. In the 'Social:' section, several social media and identity providers are listed in a grid: BitBucket, Facebook, GitHub (highlighted with a red box), GitLab, Google, Instagram, LinkedIn, Microsoft, Openshift v3, Openshift v4, PayPal, StackOverflow, and Twitter.

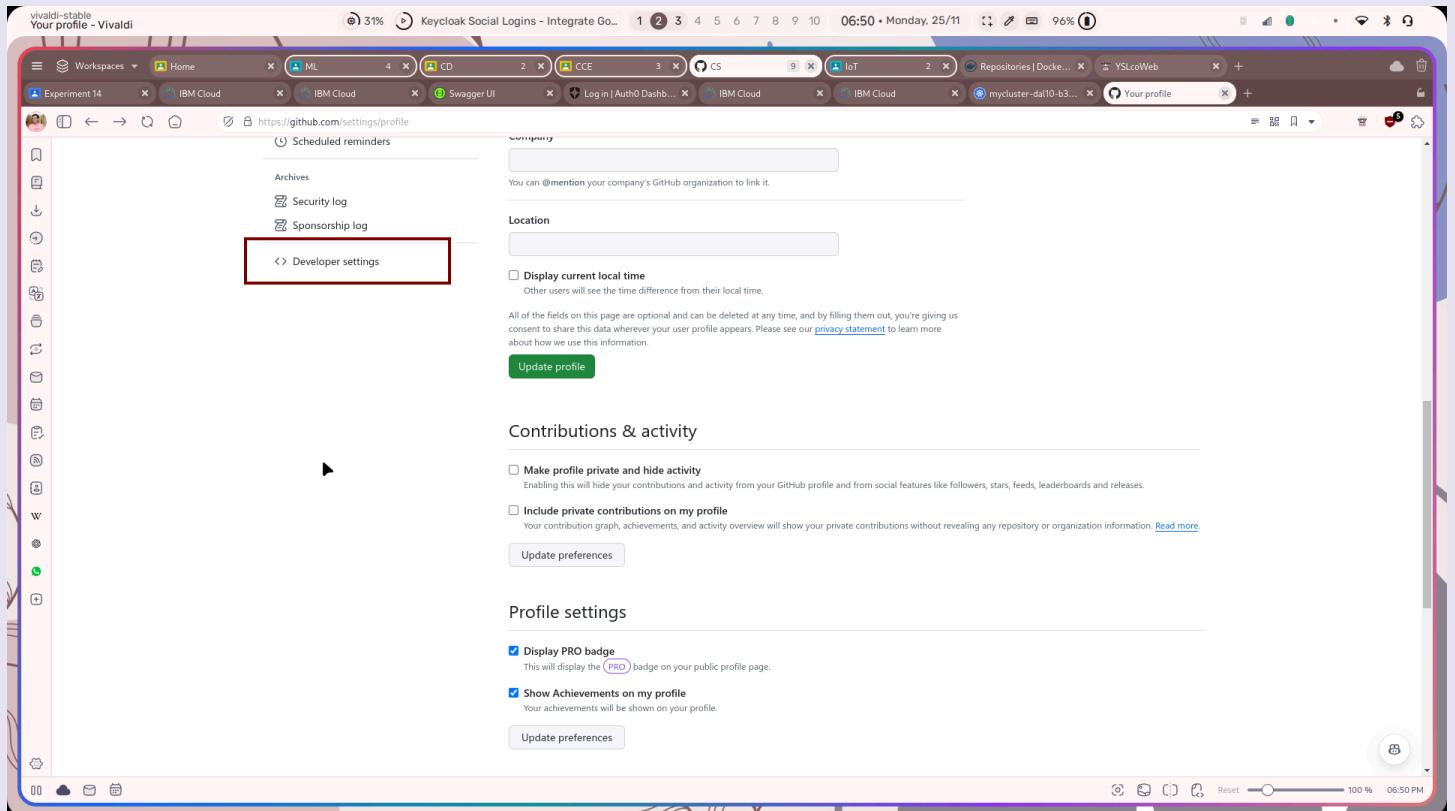
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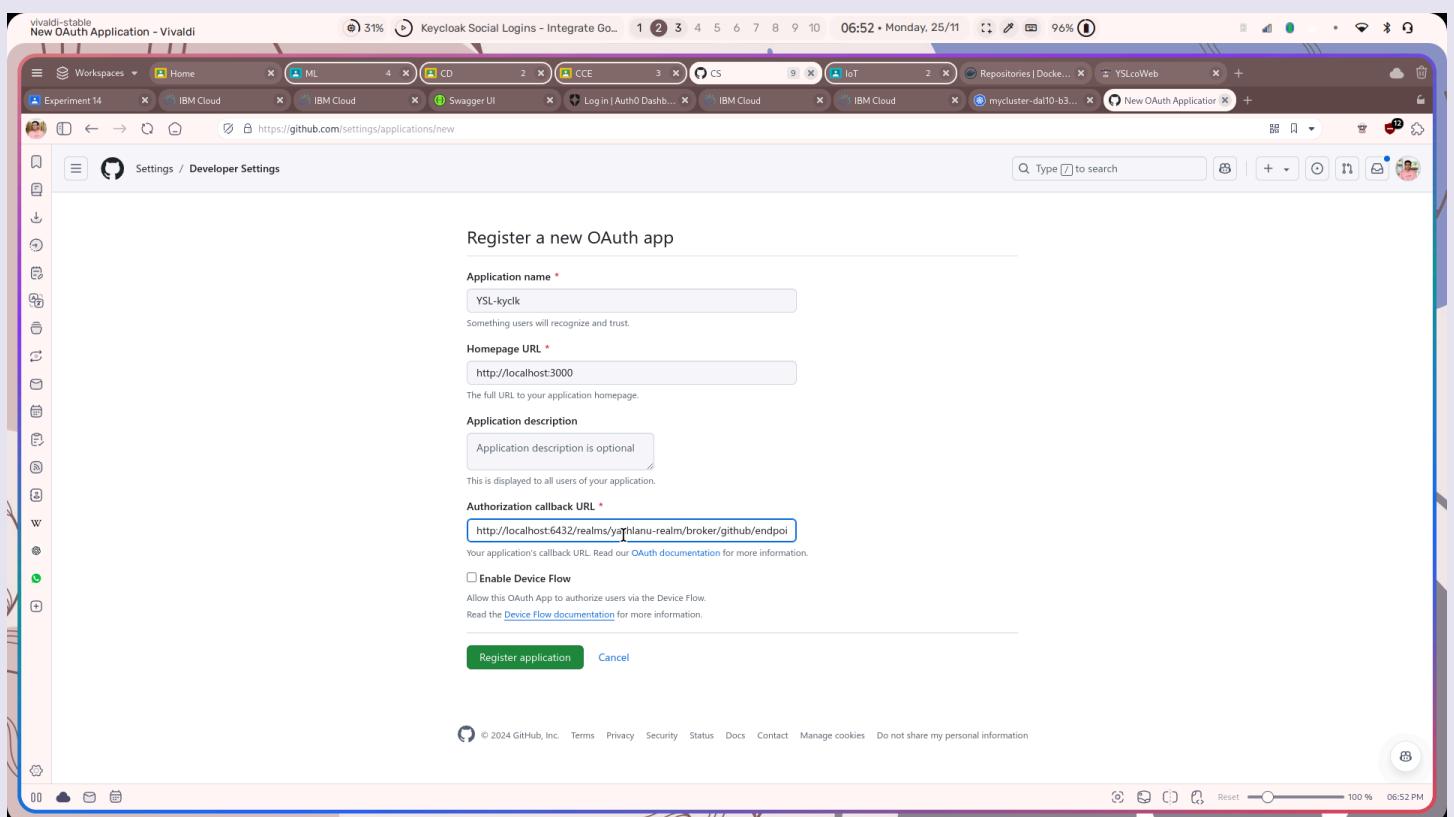
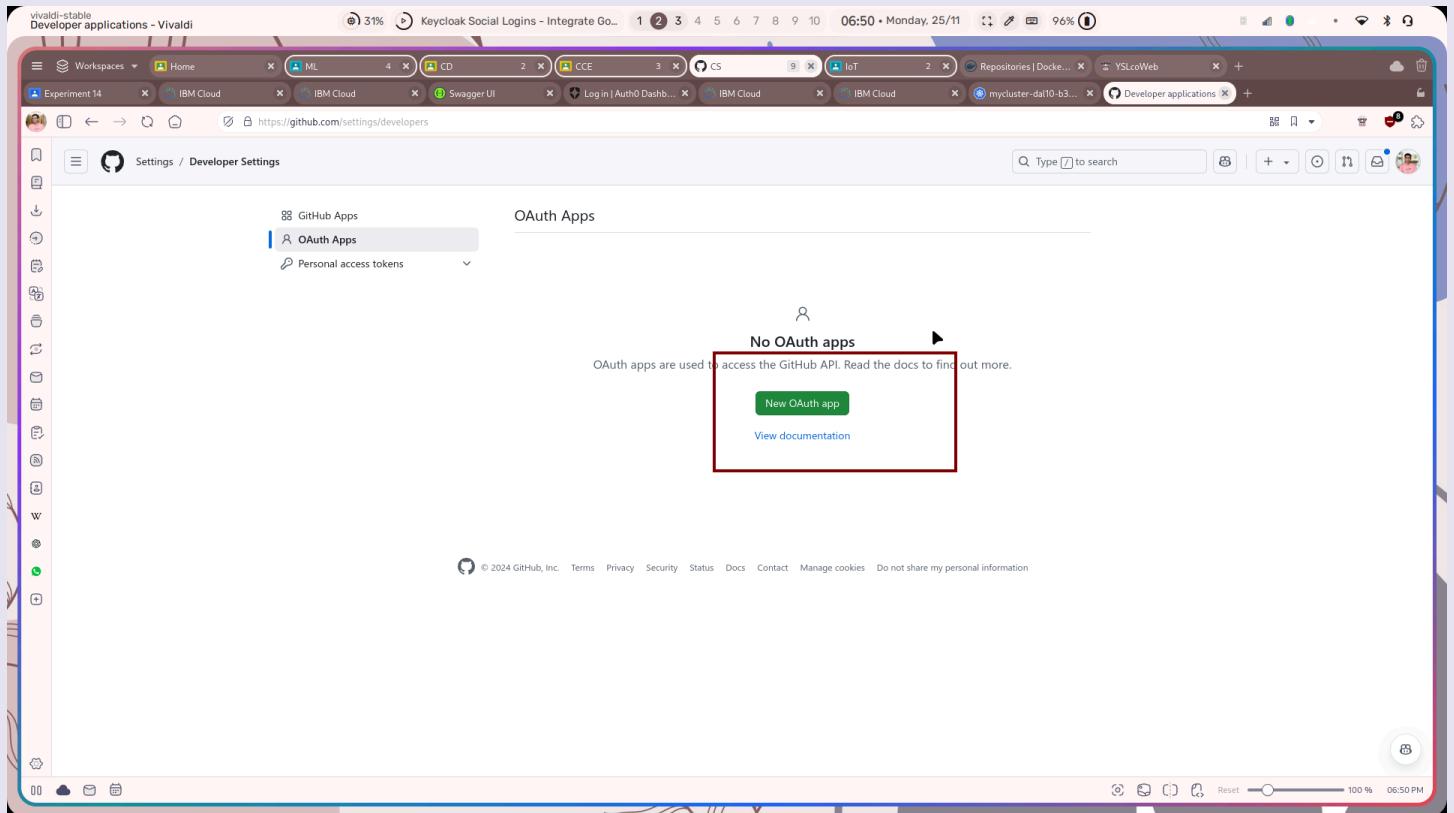
(copy the redirect URI to use it later in Github OAuth setup)

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15. Visit Github > Settings > Developer Settings and setup OAuth app



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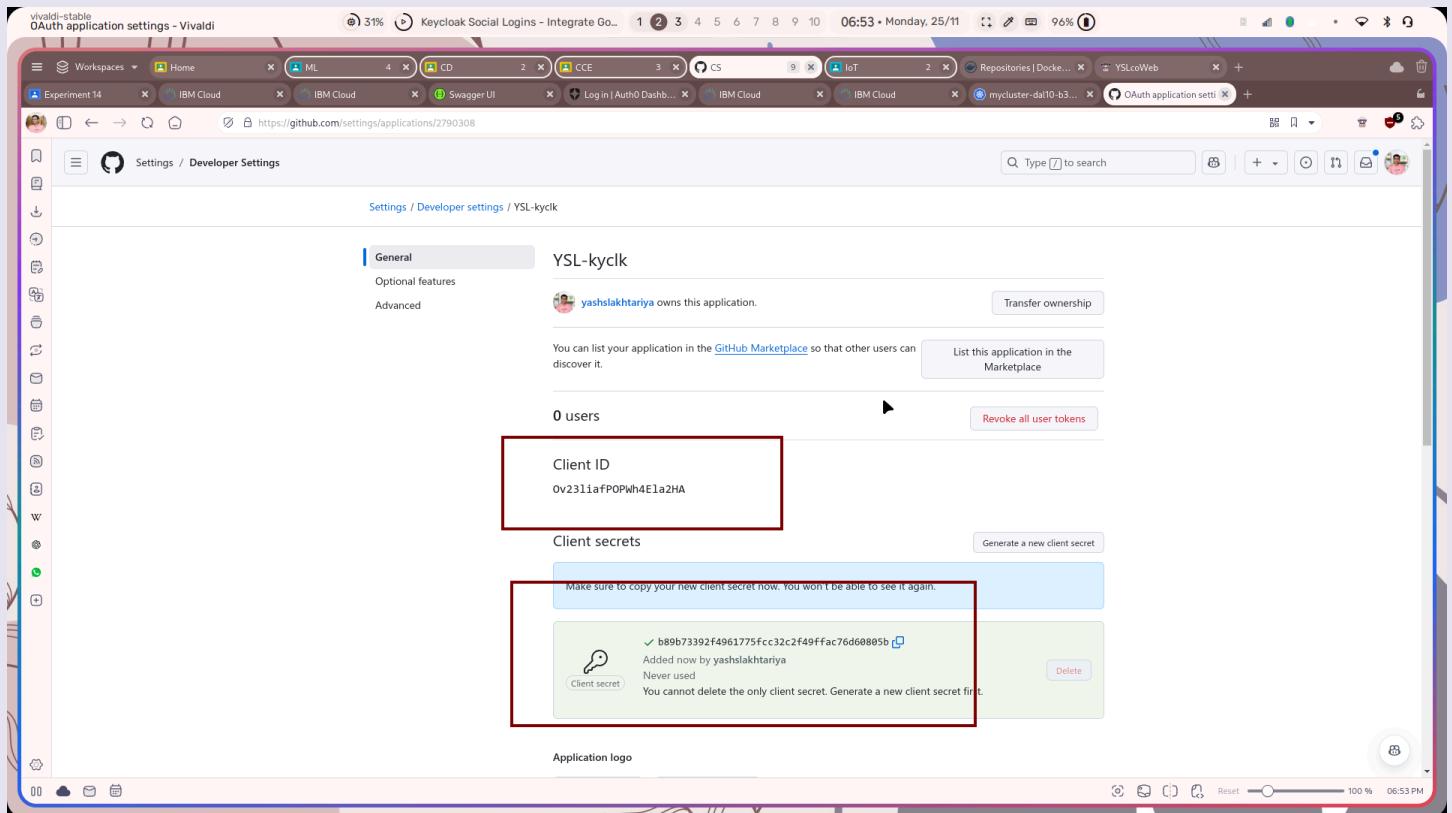
The screenshot shows the 'OAuth application settings' page for 'YSL-kyclk' in the Vivaldi browser. The 'General' tab is selected. Key details include:

- Owner: yashslakhtariya
- Client ID: 0v231iafPOPWh4El2HA
- Client secrets: A redacted secret is shown, with a button to 'Generate a new client secret'.
- Application logo: A small thumbnail of the YSL logo is displayed.
- Optional features and Advanced tabs are also visible.

The screenshot shows the same 'OAuth application settings' page after the update. A message at the top states 'Application updated successfully'. The 'Generate a new client secret' button is highlighted with a red box and a cursor is hovering over it.

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16. Copy and paste the generated client ID and secret to keycloak identity provider setup



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The screenshot shows the Keycloak Administration Console interface. On the left, a sidebar menu is open under the 'yashlanu-realm' dropdown, with 'Identity providers' selected. The main content area is titled 'Add Github provider'. The form fields are as follows:

- Redirect URI: `http://localhost:6432/realm/yashlanu-realm/broker/github/endpoint`
- Alias: `github`
- Display name: `Github thi laugin`
- Client ID: `Ov23liafPOPWh4Ela2HA`
- Client Secret: `.....`
- Display order: `1`
- Base URL: `http://localhost:6432/realm/yashlanu-realm/protocol/openid-connect/auth?client_id=account-console&redirect_uri=http%3A%2F%2Flocalhost%3A6432%2Frealm%2Fyashlanu-realm%2Faccount&state=542...`
- API URL: `http://localhost:6432/realm/yashlanu-realm/protocol/openid-connect/token`

At the bottom right of the dialog are 'Add' and 'Cancel' buttons.

The screenshot shows the 'Sign in to yashlanu-realm' page. The URL in the address bar is highlighted with a red box. The page title is 'YASHLANU-REALM'. The sign-in form has a red box around the 'Or sign in with' section, which contains a GitHub icon.

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