

Institute of Computer Technology

B. Tech Computer Science and Engineering

Sub: Identity and Access Management (2CSE507)

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Semester - 5

Class - A

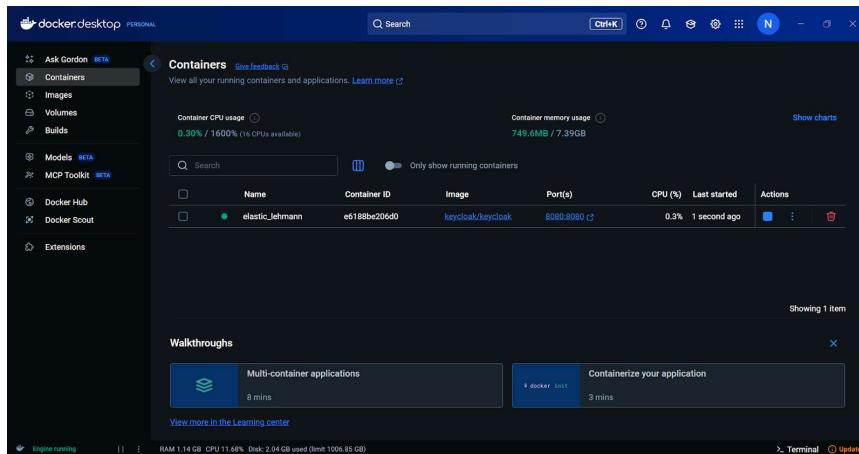
Batch – 52

PRACTICAL NO:- 4

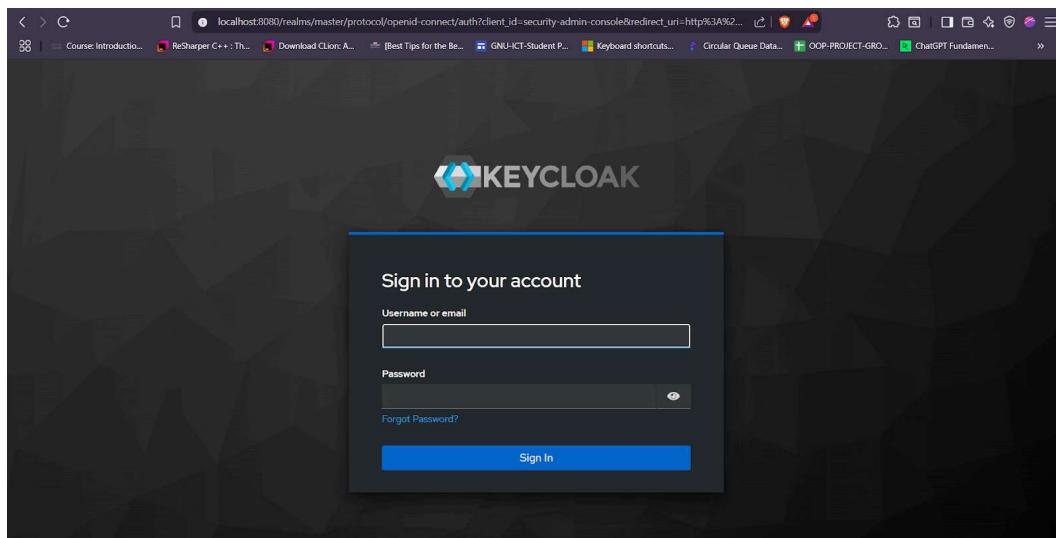
Aim : Creating and assigning Roles to users, Event Logging and Managing Sessions

Starting the Container:

- Open your Docker Desktop.
- In the containers tab, click the start button of the container you want to start.

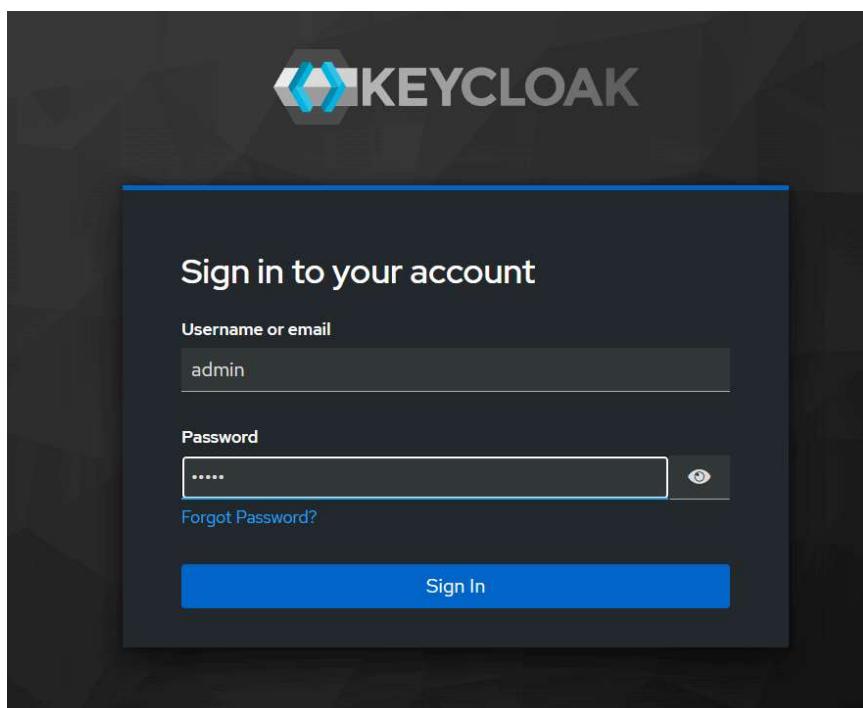


- Now open your browser and go to '<http://localhost:8080>'.



Creating a new Realm role:

- Login as admin.



- Go to the ‘Realm roles’ tab and click on ‘Create role’.

The screenshot shows the Keycloak admin console interface. The left sidebar has a dark theme with white text. The 'Realm roles' tab is currently selected. In the main content area, there is a table titled 'Realm roles' with columns: 'Role name', 'Composite', and 'Description'. The table lists several built-in roles: 'admin', 'create-realm', 'default-roles-master', 'offline_access', and 'uma_authorization'. Each row has a three-dot menu icon on the far right. At the top of the main area, there is a search bar labeled 'Search role by name' and a blue 'Create role' button. Below the table, there are two small dropdown menus showing '1 - 5'.

- Enter role name and role description (optional) and save the role

This screenshot shows the 'Create role' dialog box from the Keycloak admin console. The left sidebar is identical to the previous screenshot. The main area is titled 'Create role'. It contains two input fields: 'Role name *' which is set to 'Developer', and 'Description' which contains the text 'He develops software'. At the bottom of the dialog are two buttons: 'Save' (in blue) and 'Cancel'. The 'Save' button is highlighted with a light blue background.

Role name	Composite	Description
Developer	False	He develops software
admin	True	role_admin
create-realm	False	role_create-realm
default-roles-master	True	role_default-roles
offline_access	False	role_offline-access
uma_authorization	False	role_uma_authorization

Updating Role Details:

- Go to the ‘Realm roles’ tab.
- Click on the role, whose details you want to change.
- You will find following subtabs :
 - Details : Displays and allows editing of the role’s basic information — name, description, and whether it’s a composite role.
 - Associated roles : If the role is composite, this lists other roles included within it. Assigning this role to a user automatically grants all associated roles.
 - Attributes : Lets you add custom key-value metadata for the role (e.g., department, permission scope). Useful for custom logic in applications.
 - Users in role : Lists all users who currently have this role assigned (directly or indirectly through groups or composite roles).
 - Admin events : Shows an audit log of administrative actions related to this role (creation, updates, deletions, assignments).

The screenshot shows the Keycloak admin interface for managing roles. The left sidebar has a 'Realm roles' section selected. The main area displays the 'Developer' role details. The 'Details' tab is active, showing the role name 'Developer' and a description 'He develops software'. At the bottom are 'Save' and 'Cancel' buttons.

Adding Attribute to a role:

- Go to the ‘Realm roles’ tab.
- Click on the role, whom you want to assign attributes.
- Go to attribute tab and Click on ‘Add attribute’

The screenshot shows the 'Developer' role details again, but the 'Attributes' tab is now selected. A message says 'No attributes have been defined yet. Click the below button to add attributes, key and value are required for a key pair.' Below this is a 'Add attributes' button. The 'Save' and 'Revert' buttons are at the bottom.

- Enter keys and values of attributes you want to assign to a role

The screenshot shows the Keycloak Admin Console interface. On the left, a sidebar lists various management sections like 'Manage realms', 'Clients', 'Realm roles', 'Users', etc. The 'Realm roles' section is currently selected. In the main area, under 'Role details' for the 'Developer' role, the 'Attributes' tab is active. A table shows a single entry: 'Key' (Post) and 'Value' (Junior Dev). Below the table is a link 'Add attributes'. At the bottom are 'Save' and 'Revert' buttons.

- Now, click on save to apply the changes.

Assigning the role to a user:

- Go to the user tab.

The screenshot shows the 'Users' tab in the Keycloak Admin Console. The sidebar shows 'Manage realms' and 'Users' is selected. The main area displays a table of users with columns: Username, Email, Last name, First name. Two users are listed: 'admin' and 'user1'. Each user has a checkbox next to their name. At the top of the table are buttons for 'Default search', 'Search user', 'Add user', 'Delete user', and 'Refresh'. Navigation arrows are at the bottom right of the table.

- Click on the user, to whom you want to assign the role.

The screenshot shows the Keycloak administration interface. On the left, a sidebar lists various management sections like 'Manage realms', 'Clients', 'Groups', etc. The 'Users' section is currently selected. The main area displays the details for a user named 'user1'. The 'Role mapping' tab is not active. Other tabs visible include 'Details', 'Credentials', 'Groups', 'Consents', 'Identity provider links', 'Sessions', and 'Events'. The user's status is 'Enabled'. The 'Email verified' field is set to 'Off'. At the bottom, there are 'Save' and 'Revert' buttons.

- Go to the 'Role mapping' tab.

This screenshot shows the same Keycloak interface as above, but the 'Role mapping' tab is now selected. The main content area displays a table of roles assigned to the user. The table has columns for 'Name', 'Inherited', and 'Description'. One entry is shown: 'default-roles-master' with 'Inherited' set to 'False' and 'Description' as 'role_default-roles'. There are buttons for 'Assign role' (with a dropdown menu), 'Unassign', and 'Refresh' at the top of the table. The table footer shows a page number '1-1'.

Name	Inherited	Description
default-roles-master	False	role_default-roles

- Click on ‘Assign role’, select the role(s) you want to assign to the user and click on ‘Assign’.

The screenshot shows the 'Assign Realm roles to user' dialog box. On the left, a sidebar lists 'Manage realms', 'Clients', 'Client scopes', 'Realm roles', 'Users', 'Groups', 'Sessions', 'Events', 'Configure', 'Realm settings', and 'Authentication'. The 'Users' item is currently selected. The main area displays a table with columns 'Name' and 'Description'. A checkbox next to 'Developer' is checked. Other roles listed include 'admin', 'create-realm', 'offline_access', and 'uma_authorization'. At the bottom of the dialog are 'Assign' and 'Cancel' buttons.

The screenshot shows the 'User details' page for 'user1'. The sidebar on the left is identical to the previous screenshot. The main area has tabs for 'Details', 'Credentials', 'Role mapping', 'Groups', 'Consents', 'Identity provider links', 'Sessions', and 'Events'. The 'Role mapping' tab is active. It shows a table with columns 'Name', 'Inherited', and 'Description'. The 'Developer' role is listed with 'Inherited' set to 'False' and 'Description' 'He develops software'. There are 'Assign role' and 'Unassign' buttons at the top of the table. Below the table, there are pagination controls '1-2' and navigation arrows.

Event Logging:

- Go to the ‘Realm settings’ tab.

The screenshot shows the Keycloak admin interface for the 'master' realm. The left sidebar is titled 'Manage realms' and includes 'Clients', 'Client scopes', 'Realm roles', 'Users', 'Groups', 'Sessions', 'Events', 'Configure', 'Realm settings' (which is selected and highlighted in blue), 'Authentication', 'Identity providers', and 'User federation'. The main content area has tabs at the top: General, Login, Email, Themes, Keys, Events, Localization, Security defenses, Sessions, Tokens, Client policies, and User profile. The 'Events' tab is currently selected. The 'General' subtab displays fields for 'Realm name' (master), 'Display name' (Keycloak), 'HTML Display name' (<div class="kc-logo-text">Keycloak</div>), 'Frontend URL' (empty), 'Require SSL' (set to 'External requests'), and 'ACR to LoA Mapping' (a note stating 'No ACR to LoA Mapping have been defined yet. Click the below button to add ACR to LoA Mapping, key and value are required for a key pair.' with a 'Add ACR to LoA Mapping' button). At the bottom are 'Save' and 'Revert' buttons.

- Go to the ‘Events’ subtab.

The screenshot shows the 'Events' subtab of the 'Realm settings' page. The left sidebar and tabs are identical to the previous screenshot. The 'Events' subtab is selected. It displays a list of 'Event listeners' with one entry: 'jboss-logging'. Below the list are 'Save' and 'Revert' buttons.

- In ‘user events settings’ turn on ‘Save events’ and same in ‘admin events settings’.

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

master

Realm settings are settings that control the options for users, applications, roles, and groups in the current realm. [Learn more](#)

Enabled [Action](#)

Event listeners [User events settings](#) [Admin events settings](#)

Save events On

Expiration Minutes [Minutes](#)

[Save](#) [Revert](#)

Clear user events [Clear user events](#)

[Add saved types](#) [Remove](#) [Refresh](#)

1-50 < >

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

master

Realm settings are settings that control the options for users, applications, roles, and groups in the current realm. [Learn more](#)

Enabled [Action](#)

Event listeners [User events settings](#) [Admin events settings](#)

Save events On

Include representation Off

Expiration Minutes [Minutes](#)

[Save](#) [Revert](#)

Clear admin events [Clear admin events](#)

[Add saved types](#) [Remove](#) [Refresh](#)

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- Checking User Events:
 - Updating User data as the user

Personal info

Manage your basic information

General

Jump to section

Username * user1

Email abc@gmail.com

First name

Last name

Save Cancel

Personal info

Manage your basic information

General

Jump to section

Username * user1

Email abc@gmail.com

First name AB

Last name CD

Save Cancel

Your account has been updated.

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

Keycloak Current realm

Events

Events are records of user and admin events in this realm. To configure the tracking of these events, go to [Event config](#). Learn more

Time	User ID	Event saved type	IP address	Client
> August 16, 2025 at 3:30 PM	3c9bcd80-6786-4ebf-90e3-e220a9a47a41	CODE_TO_TOKEN	172.17.0.1	security-admin-console
> August 16, 2025 at 3:30 PM	3c9bcd80-6786-4ebf-90e3-e220a9a47a41	LOGIN	172.17.0.1	security-admin-console
> August 16, 2025 at 3:30 PM	6aecbf1-9b0-4c6f-90dc-3b9b6c488455	LOGOUT	172.17.0.1	security-admin-console
> August 16, 2025 at 3:30 PM	6aecbf1-9b0-4c6f-90dc-3b9b6c488455	CODE_TO_TOKEN	172.17.0.1	security-admin-console
> August 16, 2025 at 3:30 PM	6aecbf1-9b0-4c6f-90dc-3b9b6c488455	LOGIN	172.17.0.1	security-admin-console
> August 16, 2025 at 3:00 PM	6aecbf1-9b0-4c6f-90dc-3b9b6c488455	UPDATE_PROFILE	172.17.0.1	account
> August 16, 2025 at 3:00 PM	6aecbf1-9b0-4c6f-90dc-3b9b6c488455	CODE_TO_TOKEN	172.17.0.1	account-console
> August 16, 2025 at 3:00 PM	6aecbf1-9b0-4c6f-90dc-3b9b6c488455	LOGIN	172.17.0.1	account-console
> August 16, 2025 at 3:00 PM	6aecbf1-9b0-4c6f-90dc-3b9b6c488455	IMPERSONATE	172.17.0.1	account-console

- Checking Admin Events:
 - Updating User data as an admin

The screenshot shows the Keycloak Admin UI for updating a user. The user ID is Glaecbf-16b0-4c6f-90dc-3b9b6c488455, created at 7/28/2025, 11:40:05 AM. The 'Required user actions' dropdown is set to 'Select action'. The 'Email verified' toggle is off. The 'General' tab is selected, showing the user's details: Username (user1), Email (abc@gmail.com), First name, and Last name. A success message 'The user has been saved' is displayed in the top right corner.

Events related to an user

The screenshot shows the Keycloak Admin UI for viewing events related to a user named 'user1'. The 'User events' tab is selected. An event is listed: Time (August 16, 2025 at 3:05 PM), Resource path (users/Glaecbf-16b0-4c6f-90dc-3b9b6c48...), Resource type (USER), Operation type (UPDATE), and User (3c9bc8c0-6786-4eb-90e3-e220a9a47a41). The 'Enabled' switch is turned on, and the 'Action' dropdown is set to 'Enabled'.

All events performed in the realm

The screenshot shows the Keycloak Admin UI for viewing all events in the realm. The 'Admin events' tab is selected. Six events are listed, all occurring on August 16, 2025, at 3:05 PM, involving the creation of client-role mappings and updates to a user. The events are: 1. CLIENT_ROLE_MAPPING CREATE, 2. CLIENT_ROLE_MAPPING CREATE, 3. CLIENT_ROLE_MAPPING CREATE, 4. CLIENT_ROLE_MAPPING CREATE, 5. CLIENT_ROLE_MAPPING CREATE, and 6. USER UPDATE. The user ID for the update event is 3c9bc8c0-6786-4eb-90e3-e220a9a47a41.

- Creating and Deleting an user

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

Create user

Required user actions: Select action

Email verified: Off

General

Username: user2

Email:

First name:

Last name:

Groups: Join Groups

Create Cancel

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

Users

Users are the users in the current realm. [Learn more](#)

Username	Email	Last name	First name	⋮
admin	-	-	-	⋮
user1	abc@gmail.com	CD	AB	⋮
user2	-	-	-	⋮

Add user Delete Refresh

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

Events

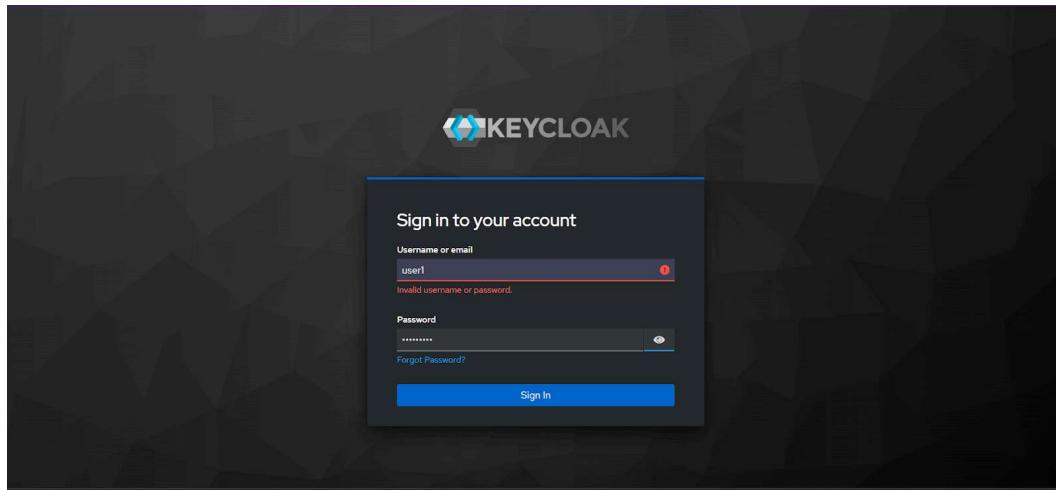
Events are records of user and admin events in this realm. To configure the tracking of these events, go to [Event configs](#). [Learn more](#)

Time	Resource path	Resource type	Operation type	User	⋮
August 16, 2025 at 3:12 PM	users/7835078a-f68a-4b75-942e-0d78e4a2...	USER	DELETE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮
August 16, 2025 at 3:22 PM	users/7835078a-f68a-4b75-942e-0d78e4a2...	USER	CREATE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮
August 16, 2025 at 3:11 PM	users/f1556391-6fc4-4b0b-8eb8-7b448fb4...	USER	DELETE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮
August 16, 2025 at 3:11 PM	users/f1556391-6fc4-4b0b-8eb8-7b448fb4...	USER	UPDATE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮
August 16, 2025 at 3:11 PM	users/f1556391-6fc4-4b0b-8eb8-7b448fb4...	USER	CREATE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮
August 16, 2025 at 3:06 PM	users/6laecbf1-9b20-4cf-90dc-3b9b6c48...	CLIENT_ROLE_MAPPING	CREATE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮
August 16, 2025 at 3:06 PM	users/6laecbf1-9b20-4cf-90dc-3b9b6c48...	CLIENT_ROLE_MAPPING	CREATE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮
August 16, 2025 at 3:06 PM	users/6laecbf1-9b20-4cf-90dc-3b9b6c48...	CLIENT_ROLE_MAPPING	CREATE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮
August 16, 2025 at 3:05 PM	users/6laecbf1-9b20-4cf-90dc-3b9b6c48...	USER	UPDATE	3c9bc8c0-6786-4eb-90e3-e220a9a47a41	⋮

User events Admin events Search admin event Refresh

Viewing Session:

- Login as the user in another browser.



- Go to device activity tab in Account activity, You will be able to see all current ongoing sessions of the user.

A screenshot of the 'Account Management' interface in a web browser. The URL is 'localhost:8080/realm/master/account/account-security/device-activity?referrer=security-admin-console&referrer_uri=http%3A%2F%2Flocalhost...'. The left sidebar has a 'Device activity' tab selected under 'Account security'. The main content area shows a table for 'Signed in devices'. There is one entry: 'Windows 10 / Chrome/139.0.0' (Current session). It includes details: IP address (172.17.0.1), Last accessed (August 16, 2025 at 3:23 PM), Started (August 16, 2025 at 3:22 PM), Expires (August 17, 2025 at 1:22 AM), and Clients (Account Console, Security Admin Console). A 'Refresh the page' link is at the top right of the table.

- Now go back to the other browser and impersonate the user and go to device activity. Now you will see the current session added in the list.

The screenshot shows the 'Device activity' section of the Keycloak Security Admin Console. On the left, there's a sidebar with 'Personal info', 'Account security' (selected), 'Signing in', 'Device activity' (selected), 'Applications', and 'Groups'. The main area is titled 'Device activity' with the sub-section 'Signed in devices'. It lists two sessions:

Device	Client	IP address	Last accessed	Expires	Clients
Windows 10 / Chrome/139.0.0	Current session	172.17.0.1	August 16, 2025 at 3:27 PM	August 17, 2025 at 1:22 AM	Account Console, Security Admin Console
Windows 10 / Edge/139.0.0		172.17.0.1	August 16, 2025 at 3:26 PM	August 17, 2025 at 1:26 AM	Security Admin Console

Buttons at the top right include 'Refresh the page' and 'Sign out all devices'.

- As admin, you can also see all current active session of any user from session tab in the user details page

The screenshot shows the 'User details' page for 'user1' in the Keycloak Security Admin Console. The left sidebar has 'Manage realms', 'Clients', 'Client scopes', 'Realm roles', 'Users' (selected), 'Groups', 'Sessions', 'Events', 'Configure', 'Realm settings', 'Authentication', 'Identity providers', and 'User federation'. The main area shows the user's details and a 'Sessions' tab selected. It displays two sessions:

Started	Last access	IP address	Clients
8/16/2025, 3:22:59 PM	8/16/2025, 3:27:07 PM	172.17.0.1	account-console security-admin-console
8/16/2025, 3:26:48 PM	8/16/2025, 3:26:48 PM	172.17.0.1	security-admin-console

Buttons at the top right include 'Logout all sessions' and 'Refresh'.