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Keycloak SAML Implementation

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<https://bitwarden.com/help/saml-keycloak/>

Keycloak SAML Implementation

This article contains **Keycloak-specific** help for configuring login with SSO via SAML 2.0. For help configuring login with SSO for another IdP, refer to [SAML 2.0 Configuration](#).

Configuration involves working simultaneously with the Bitwarden web app and the Keycloak Portal. As you proceed, we recommend having both readily available and completing steps in the order they are documented.

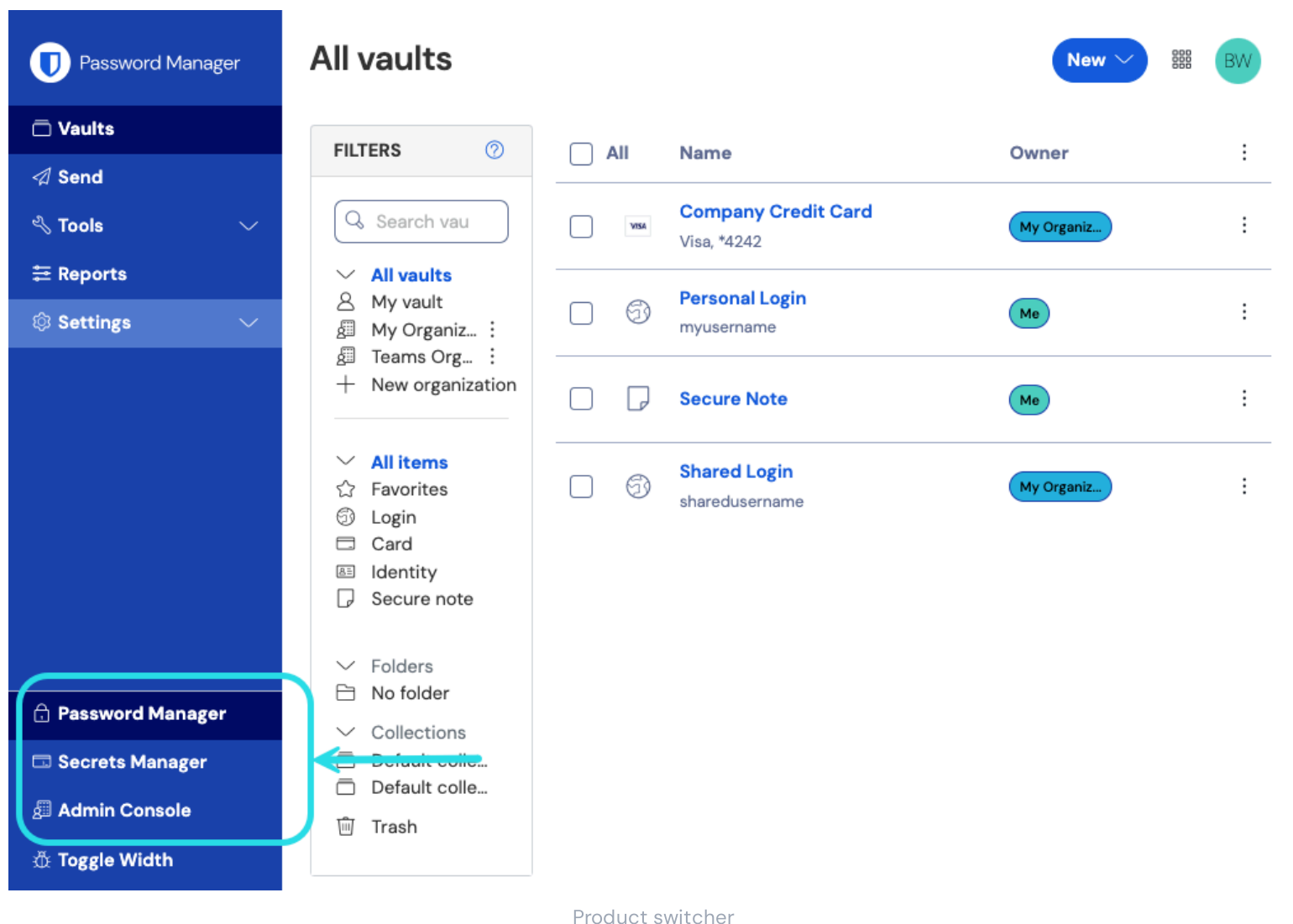


Already an SSO expert? Skip the instructions in this article and download screenshots of sample configurations to compare against your own.

[Download Sample](#)

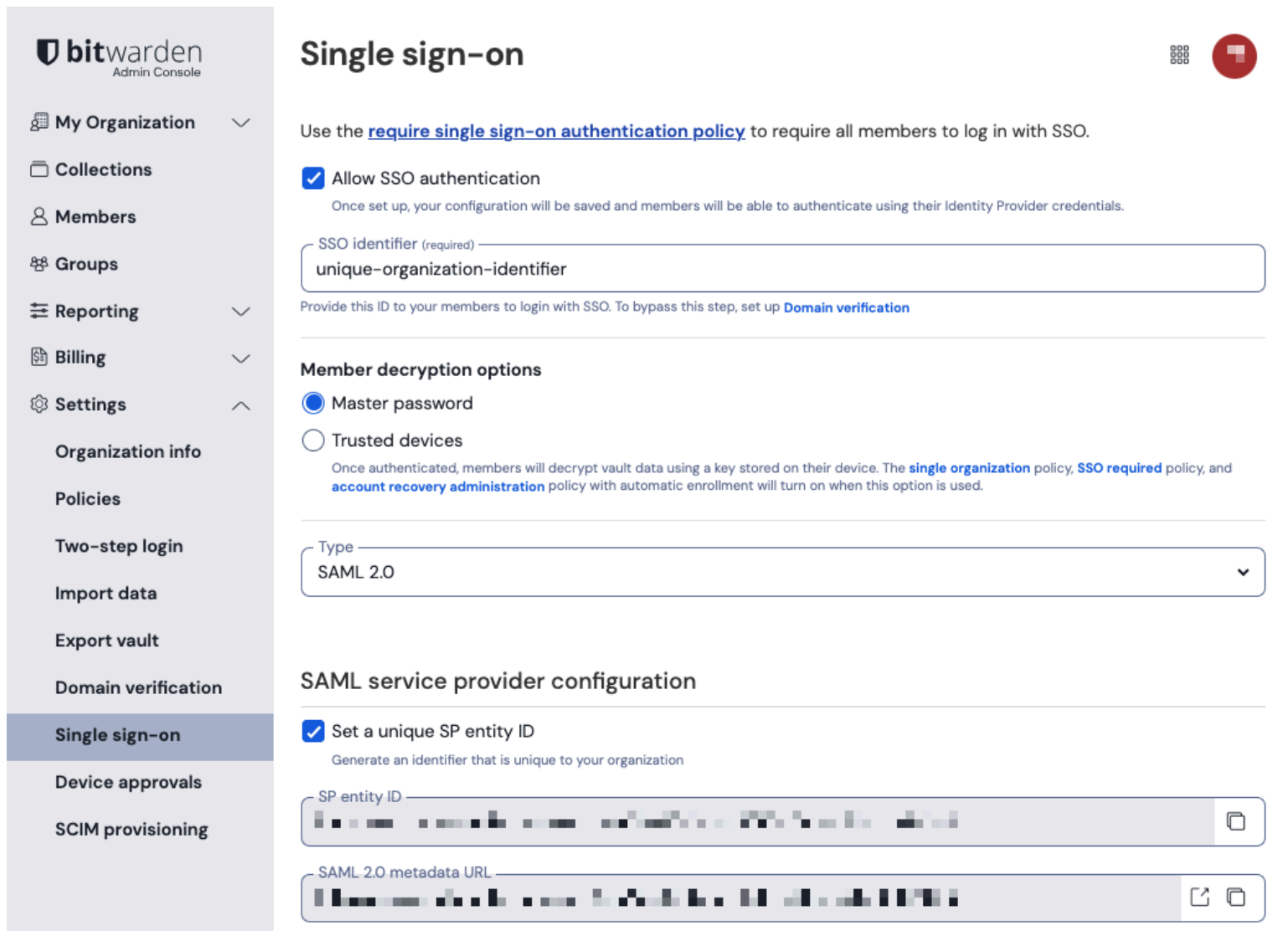
Open SSO in the web app

Log in to the Bitwarden web app and open the Admin Console using the product switcher:



The screenshot displays the Bitwarden web app interface. On the left is a dark blue sidebar with navigation options: Password Manager, Vaults, Send, Tools, Reports, and Settings. A red box highlights the bottom section of the sidebar, which includes Password Manager, Secrets Manager, Admin Console, and Toggle Width. A red arrow points from the Admin Console option to the 'All vaults' section of the main content area. The 'All vaults' section features a 'FILTERS' sidebar with a search bar and a list of categories: All vaults, My vault, My Organiz..., Teams Org..., New organization, All items, Favorites, Login, Card, Identity, Secure note, Folders, No folder, Collections, Default colle..., Default colle..., and Trash. The main content area shows a table of vaults with columns for Name and Owner. The table lists four vaults: Company Credit Card (Owner: My Organiz...), Personal Login (Owner: Me), Secure Note (Owner: Me), and Shared Login (Owner: My Organiz...). In the top right corner, there is a 'New' button, a grid icon, and a circular 'Product switcher' button labeled 'BW'.

Open your organization's **Settings** → **Single sign-on** screen:



The screenshot shows the Bitwarden Admin Console interface. On the left is a sidebar with navigation links: My Organization, Collections, Members, Groups, Reporting, Billing, Settings (expanded), Organization info, Policies, Two-step login, Import data, Export vault, Domain verification, Single sign-on (selected), Device approvals, and SCIM provisioning. The main content area is titled 'Single sign-on' and includes a sub-header 'Use the [require single sign-on authentication policy](#) to require all members to log in with SSO.' Below this is a checkbox 'Allow SSO authentication' which is checked, with a note: 'Once set up, your configuration will be saved and members will be able to authenticate using their Identity Provider credentials.' There is a text input field for 'SSO identifier (required)' containing 'unique-organization-identifier'. Below this is a note: 'Provide this ID to your members to login with SSO. To bypass this step, set up [Domain verification](#)'.

Under 'Member decryption options', there are two radio buttons: 'Master password' (selected) and 'Trusted devices'. A note below states: 'Once authenticated, members will decrypt vault data using a key stored on their device. The [single organization](#) policy, [SSO required](#) policy, and [account recovery administration](#) policy with automatic enrollment will turn on when this option is used.'

There is a dropdown menu for 'Type' with 'SAML 2.0' selected. Below this is the 'SAML service provider configuration' section, which includes a checkbox 'Set a unique SP entity ID' (checked) with a note: 'Generate an identifier that is unique to your organization'. There are two text input fields: 'SP entity ID' and 'SAML 2.0 metadata URL', both containing masked text and having copy icons.

SAML 2.0 configuration

If you haven't already, create a unique **SSO identifier** for your organization and select **SAML** from the the **Type** dropdown. Keep this screen open for easy reference.

You can turn off the **Set a unique SP entity ID** option at this stage if you wish. Doing so will remove your organization ID from your SP entity ID value, however in almost all cases it is recommended to leave this option on.



There are alternative **Member decryption options**. Learn how to get started using [SSO with trusted devices](#) or [Key Connector](#).

Keycloak setup

Login to Keycloak and select **Clients** → **Create Client**.

KEYCLOAK

master

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Clients

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

Clients listInitial access tokenClient registration

Search for client→Create clientImport client1-6

| Client ID | Name | Type | Description | Home URL |
|------------------------|-------------------------------|----------------|-------------|----------|
| account | \${client_account} | OpenID Connect | — | |
| account-console | \${client_account-console} | OpenID Connect | — | |
| admin-cli | \${client_admin-cli} | OpenID Connect | — | — |
| broker | \${client_broker} | OpenID Connect | — | — |
| master-realm | master Realm | OpenID Connect | — | — |
| security-admin-console | \${client_security-admin-...} | OpenID Connect | — | |

Create a Client

On the Create client screen fill in the following fields:

| Field | Description |
|-------------|--|
| Client type | Select SAML. |
| Client ID | Set this field to the pre-generated SP Entity ID . This automatically-generated value can be copied from the organization's Settings → Single sign-on screen and will vary based on your setup. |
| Name | Enter a name of your choice for the Keycloak client. |

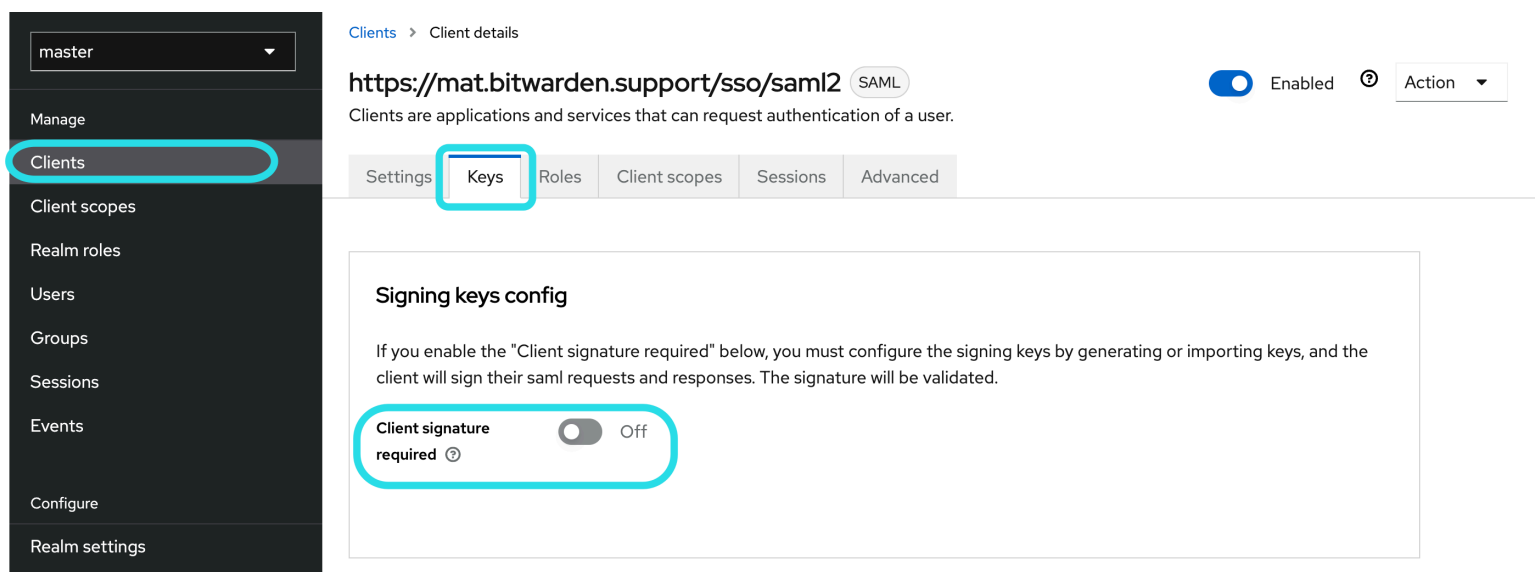
Once you have filled in the required fields on the **General Settings** page, click **Next**.

On the **Login settings** screen, fill in the following field:

| Field | Description |
|---------------------|--|
| Valid redirect URIs | <p>Set this field to the pre-generated Assertion Consumer Service (ACS) URL.</p> <p>This automatically-generated value can be copied from the organization's Settings → Single sign-on screen and will vary based on your setup.</p> |

Select **Save**.

Select the Keys tab and toggle the **Client signature required** option to **Off**.



The screenshot shows the Keycloak Admin Console interface. On the left, the 'Clients' menu item is highlighted. The main content area shows the 'Client details' for a client named 'mat.bitwarden.support/sso/saml2'. The 'Keys' tab is selected in the top navigation bar. In the 'Signing keys config' section, the 'Client signature required' toggle is set to 'Off'.

Keycloak Keys Config

Lastly, on the Keycloak main navigation, select **Realm settings** and then the **Keys** tab. Locate the **RS256** Certificate and select **Certificate**.

master

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<GeneralLoginEmailThemesKeysEventsLocalizationSecurity defensesSessionsTokensCli>

Keys listProviders

Active keysSearch key1 - 4

| Algorithm | Type | Kid | Use | Provider | Public keys |
|-----------|------|---|-----|-------------------|-----------------------|
| AES | OCT | a3282835-06db-42cc-b29a-ff969226eca9 | ENC | aes-generated | |
| HS256 | OCT | be68f437-88a6-4c3b-b92f-bf3b114beeb6 | SIG | hmac-generated | |
| RSA-OAEP | RSA | zXKBNvtriZQU7MbyXJlIf60wGotgDbZwpG8_x7wE1QQ | ENC | rsa-enc-generated | Public keyCertificate |
| RS256 | RSA | T3IREov-EMgD0EnJ5AsHsv0GX-Z0s89jCyloy6fmlsE | SIG | rsa-generated | Public keyCertificate |

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Keycloak RS256 Certificate

The value for the certificate will be required for the following [section](#).

Back to the web app

At this point, you have configured everything you need within the context of the Keycloak Portal. Return to the Bitwarden web app and select **Settings** → **Single sign-on** from the navigation.

The Single sign-on screen separates configuration into two sections:

- **SAML service provider configuration** will determine the format of SAML requests.
- **SAML identity provider configuration** will determine the format to expect for SAML responses.

Complete the following fields in the **SAML service provider configuration** section:

| Field | Description |
|----------------------------|---|
| Name ID format | Select Email . |
| Outbound Signing Algorithm | The algorithm Bitwarden will use to sign SAML requests. |

| Field | Description |
|------------------------------------|--|
| Signing Behavior | Whether/when SAML requests will be signed. |
| Minimum Incoming Signing Algorithm | Select the algorithm the Keycloak client is configured to use to sign SAML documents or assertions. |
| Want Assertions Signed | Whether Bitwarden expects SAML assertions to be signed. If toggled on, make sure you configure the Keycloak client to sign assertions . |
| Validate Certificates | Check this box when using trusted and valid certificates from your IdP through a trusted CA. Self-signed certificates may fail unless proper trust chains are configured with the Bitwarden login with SSO docker image. |

Complete the following fields in the **SAML identity provider configuration** section:

| Field | Description |
|----------------------------|--|
| Entity ID | Enter the URL of the Keycloak realm on which the client was created, for example https://<keycloak_domain>/realms/<realm_name> . This field is case sensitive. |
| Binding type | Select Redirect . |
| Single sign-on service URL | Enter your master SAML processing URL, for example https://<keycloak_domain>/realms/<realm_name>/protocol/saml . |
| Single Log Out Service URL | Login with SSO currently does not support SLO. This option is planned for future development, however you may preconfigure it with your Logout URL if you wish. |

| Field | Description |
|-------------------------------------|---|
| X509 public certificate | <p>Enter the RS256 certificate that was copied in the previous step.</p> <p>The certificate value is case sensitive, extra spaces, carriage returns, and other extraneous characters will cause certificate validation to fail.</p> |
| Outbound Signing Algorithm | Select the algorithm the Keycloak client is configured to use to sign SAML documents or assertions. |
| Disable Outbound Logout Requests | Login with SSO currently does not support SLO. This option is planned for future development. |
| Want Authentication Requests Signed | Whether Keycloak expects SAML requests to be signed. |

Note

When completing the X509 certificate, take note of the expiration date. Certificates will have to be renewed in order to prevent any disruptions in service to SSO end users. If a certificate has expired, Admin and Owner accounts will always be able to log in with email address and master password.

When you're done with the identity provider configuration, **Save** your work.

Tip

You can require users to log in with SSO by activating the single sign-on authentication policy. Please note, this will require activating the single organization policy as well. [Learn more](#).

Additional Keycloak settings

On the Keycloak Client **Settings** tab, additional configuration options are available:

| Field | Description |
|----------------|--|
| Sign Documents | Specify whether SAML documents should be signed by the Keycloak realm. |

| Field | Description |
|---------------------|--|
| Sign Assertions | Specify whether SAML assertions should be signed by the Keycloak realm. |
| Signature Algorithm | If Sign Assertions is enabled, select what algorithm to sign with (sha-256 by default). |
| Name ID Format | Select the Name ID Format for Keycloak to use in SAML responses. |

Once you have completed the form, select **Save**.

Test the configuration

Once your configuration is complete, test it by navigating to <https://vault.bitwarden.com>, entering your email address and selecting the **Use single sign-on** button:



Log in to Bitwarden

Email address (required)

☒ Remember email

Continue

or

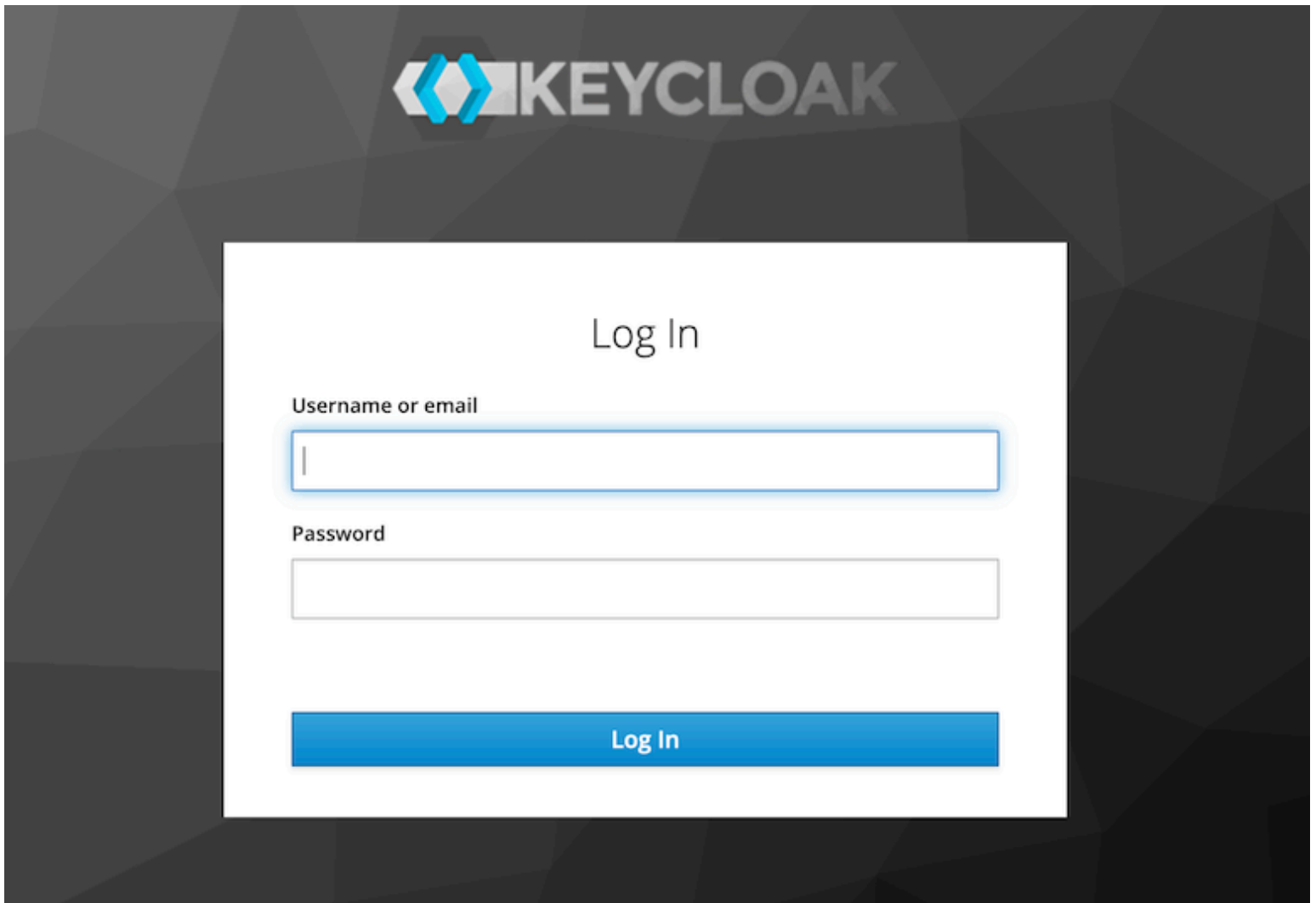
 Log in with passkey

 Use single sign-on

New to Bitwarden? [Create account](#)

Log in options screen

Enter the [configured organization identifier](#) and select **Log In**. If your implementation is successfully configured, you will be redirected to the Keycloak login screen:



Keycloak Login Screen

After you authenticate with your Keycloak credentials, enter your Bitwarden master password to decrypt your vault!

Note

Bitwarden does not support unsolicited responses, so initiating login from your IdP will result in an error. The SSO login flow must be initiated from Bitwarden.