COBALTADM-1.4

Cobalt Administration Guide

Isode

Table of Contents

1 Software version

This guide is published in support of Cobalt 1.4. It may also be pertinent to later releases. Please consult the release notes for further details.

2 Readership

This guide is intended for two classes of administrator:

- System administrators setting up Cobalt to provision data in an LDAP directory.
- Data administrators using Cobalt to manage data.

3 How to use this guide

It is highly recommended that all administrators start by reading Chapter 1, *Isode Cobalt Overview*. This chapter provides a comprehensive introduction to Cobalt.

Subsequently, system administrators should refer to Chapter 2, *Cobalt for System Administrators*, which is specifically tailored to their role and responsibilities.

For data administrators, it is advisable to proceed to Chapter 3, *Cobalt for Domain Administrators*. Additionally, they should continue reading the remaining chapters as they cover relevant information for their role.

4 Typographical conventions

The text of this manual uses different typefaces to identify different types of objects, such as file names and input to the system. The typeface conventions are shown in the table below.

Object	Example
Applications	Cobalt
File and directory names	*/var/log/isode/cobalt*
Program and macro names	isode.cobalt
GUI elements	**Label**, **Menu**, **Menu Item**, **Sub-Menu**
User input	`hello!`
Cross references	see Section C.1, “RFCs”

Object	Example
Additional information to note, or a warning that the system could be damaged by certain actions.	Notes are additional information; cautions are warnings.

Note: This is an example of a note.

5 File system place holders

Where directory names are given in the text, they are often place holders for the names of actual directories where particular files are stored. The actual directory names used depend on how the software is built and installed. All of these directories can be changed by configuration.

Certain configuration files are searched for first in `(ETCDIR)` and then `(SHAREDIR)`, so local copies can override shared information.

The actual directory defaults vary, depending on whether the platform is *Windows* or *Unix*. The following table provides the platforms-specific defaults.

Name	Place holder for the directory used to store...	Windows	Unix
`(ETCDIR)`	System-specific configuration files	*C:\Isode\Cobalt\etc*	*/etc/isode/cobalt*
`(SHAREDIR)`	Configuration files that may be shared between systems	*C:\Program Files\Isode\Cobalt\share*	*/opt/isode/cobalt/share*
`(BINDIR)`	Programs run by users	*C:\Program Files\Isode\Cobalt\bin*	*/opt/isode/cobalt/bin*
`(SBINDIR)`	Programs run by the system administrators	*C:\Program Files\Isode\Cobalt\bin*	*/opt/isode/cobalt/sbin*
`(LIBDIR)`	Libraries	*C:\Program Files\Isode\Cobalt\bin*	*/opt/isode/cobalt/lib*
`(DATADIR)`	Storing local data	*C:\Isode\Cobalt*	*/var/isode/cobalt*
`(LOGDIR)`	Log files	*C:\Isode\Cobalt\log*	*/var/log/isode/cobalt*

6 Support queries and bug reporting

A number of email addresses are available for contacting Isode. Please use the address relevant to the content of your message.

- For all account-related inquiries and issues: customer-service@isode.com. If customers are unsure of which list to use then they should send to this list. The list is monitored daily, and all messages will be responded to.
- To provide keys necessary to activate products, send the generated string to support@isode.com along with information on what is being evaluated or what has been purchased.

- For all technical inquiries and problem reports, including documentation issues from customers with support contracts: support@isode.com. Customers should include relevant contact details in initial calls to speed processing. Messages which are continuations of an existing call should include the call ID in the subject line. Customers without support contracts should not use this address.
- Customers may also submit support queries through the customer section of the Isode web site using the URL provided. Customers with silver or gold support may also submit support queries by telephone.
- For all sales inquiries and similar communication: sales@isode.com.

Bug reports on software releases are welcomed. These may be sent by any means, but electronic mail to the support address listed above is preferred. Please send proposed fixes with the reports if possible. Any reports will be acknowledged, but further action is not guaranteed. Any changes resulting from bug reports may be included in future releases.

Isode sends release announcements and other information to the Isode News email list, which can be subscribed to from the address: https://www.isode.com/company/contact.html.

7 Export Controls

Cobalt uses *TLS* (Transport Layer Security) to encrypt data in transit. This means that Cobalt is subject to UK Export Controls. For some countries (at the time of shipping this release, these comprise all EU countries, United States of America, Canada, Australia, New Zealand, Switzerland, Norway, Japan) these Export Controls can be handled by administrative process as part of evaluation or purchase. For other countries, a special Export License is required. This can be applied for only in context of a purchase order for Cobalt.

The TLS feature of Cobalt is enabled by a TLS Product Activation feature. This feature may be turned off, and Cobalt without this TLS feature is not export controlled. This can be helpful to support evaluation of Cobalt in countries that need a special export license.

Cobalt is used to administer sensitive data and so Isode strongly recommends that all operational deployments of Cobalt use the export-controlled TLS feature. You must ensure that you comply with these Export Controls where applicable, i.e. if you are licensing or re-selling Isode products. All Isode Software is subject to a license agreement and your attention is also called to the export terms of your Isode license.

Chapter 1 Isode Cobalt Overview

This chapter gives an overview of Isode Cobalt.

1.1 About Cobalt

Cobalt is a server, controlled by a web interface, for provisioning users and roles in an LDAP directory. It enables easy addition and management of information to support directory white pages, XMPP deployments, email deployments and military messaging deployments.

1.2 Information Provisioned by Cobalt

1.2.1 Domains

Cobalt groups information by domains (e.g., “example.com”). The term “domain” is used to mean Internet domains, typically registered in the *Domain Name System*. A Cobalt service can manage one or more domains. Cobalt names entities within domains (e.g., joe.soap@example.com) and ensures entity uniqueness within the domain.

1.2.2 Users: White Pages; XMPP; email; Military Messaging

A core Cobalt service is to provision users. This can be in support of XMPP, email or military messaging services or simply as a generic white pages provisioning to provide directory lookup and support by other applications.

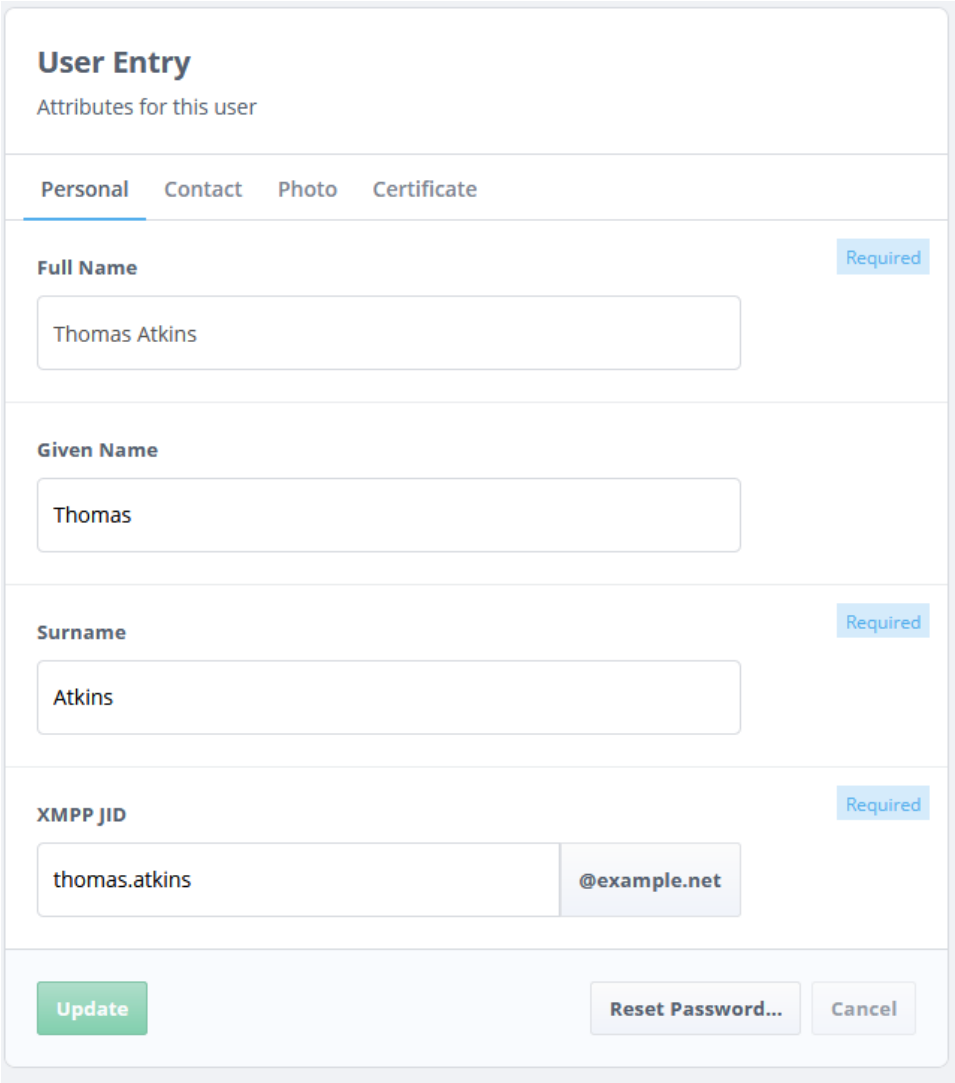
User management capabilities include:

- User creation
- Password assignment and reset
- Delete / Restore / Purge
- Account locking
- White pages information, including contact information and pictures
- X.509 PKI Certificates

1.2.3 XMPP Support

Provisioned users may be configured as XMPP users and a special attribute may be used for JID (Jabber ID). If this is chosen, the administrative UI uses XMPP terminology as shown in the figure below for Figure 1.1, “XMPP User Entry”.

Figure 1.1. XMPP User Entry



1.2.4 Email Support

Provisioned users may have a standard IMAP mailbox to support email service in conjunction with servers such as *M-Box*. Cobalt provides a number of options in support of this:

User management capabilities include:

- Primary email address of the user's mailbox.
- Alternate email addresses can be configured, which will be delivered to the same mailbox.
- IMAP Mailbox quota.
- Redirect option, so that the user's messages can be redirected to another address.
- Ensuring that all email addresses in the domain are unique.

Cobalt also provides provisioning options to be used in conjunction with Isode's *M-Switch* product to provide a full email services:

- **Redirections**- Enables configuration of addresses to point at other email addresses, which may be in the same or different domain. For example postmaster@example.com could be redirected to a user or distribution list.
- **Distribution lists**- Provision of flexible distribution lists. List members can be email addresses (users, redirections or distribution lists) provisioned in Cobalt or any other

email address. Controls are provided on who can submit messages to the list and information header addition following RFC 2369 is supported. There are also controls of military priority on distribution list expansion.

1.2.5 Military Messaging Support

Cobalt provides a range of capabilities to support formal Military Message Handling Systems (MMHS), with capabilities oriented towards support of systems using Isode's *Harrier*, *M-Box* and *M-Switch* products. Capabilities provided include:

- **Role based User Agents**. A key characteristic of MMHS is that mailboxes are role based, with multiple users able to access a role and users able to access multiple mailboxes. Cobalt enables configuration of role based mailboxes (UAs), which have mailbox and white pages information equivalent to the email service described above. A role based UA will also have a list of users that can occupy the role, which may be from the same domain or a different domain. A common approach will be for users to have a different domain, with users provisioned to have an email service and to be able to access an MMHS service.
- **ACP 127 Support**. UAs can be configured with ACP 127 attributes (RI and PLA) and also with line length, character set (ITA2/IA5) and attachment restrictions. Harrier will enforce these restrictions, which is important for messages that are transmitted using ACP 127.
- **Capability Checking**. Configuration of additional message capabilities of maximum message size and control of S/MIME signing/encryption.
- **Redirections**. See above (Section 1.2.4, "Email Support")
- **Military Address Lists**. Military address lists are similar to email address lists, but list members are split into Action and Info recipients, in support of MMHS processing. Recipient configuration follows ACP 133 schema.
- **Profiled Addresses (Organizations)**. MMHS messages flow between organizations. A message sent to a Profiled address will be distributed by a profiler, such as Isode's M-Switch Profiler, to role based mailboxes. Cobalt allows provision of such profiled addresses that represent organizations. It also allows configuration of roles that are allowed to send messages on behalf of an organization, which Harrier picks up and presents valid choices to the role.
- **Draft and Release**. A Draft and Release process is important when formal responsibility must be taken for messages sent. Military commands sent as messages will be approved by an appropriate (usually senior) officer performing the Release function. Messages may be drafted by others, leading to the Draft and Release process.
- **Organization/Role address type**. To facilitate Harrier communication between Roles (for some functions) and Organizations (for released messages), Cobalt enforces User/Role/Organization type on managed entities. This is important, as it enables a distribution list to contain organizations only (or roles only) and then appear in address book as an organization (or role).
- **Routed UAs**. A routed UA is an address that belongs to a domain, but is not processed locally. It can be routed by M-Switch to a channel, domain or routing nexus. This is important to support domains where mailboxes reside at multiple locations – "flat domain" model.

1.3 Directory Support

1.3.1 M-Vault core server

Cobalt works with a primary M-Vault Server, which holds Cobalt's own configuration. Typically, this single directory server will also hold the data for all of the managed domains. For all configurations, this server needs to be present to hold Cobalt configuration information.

1.3.2 Additional Directory Servers

Cobalt can access data in other directory servers, so that domain information can be configured in multiple LDAP directory servers. This allows one Cobalt instance to manage domains with different purposes and in different directories.

In order to manage data in a directory, the schema set out in Appendix A, *Schema used by Cobalt* must be supported. M-Vault supports this schema.

1.3.3 Active Directory Support

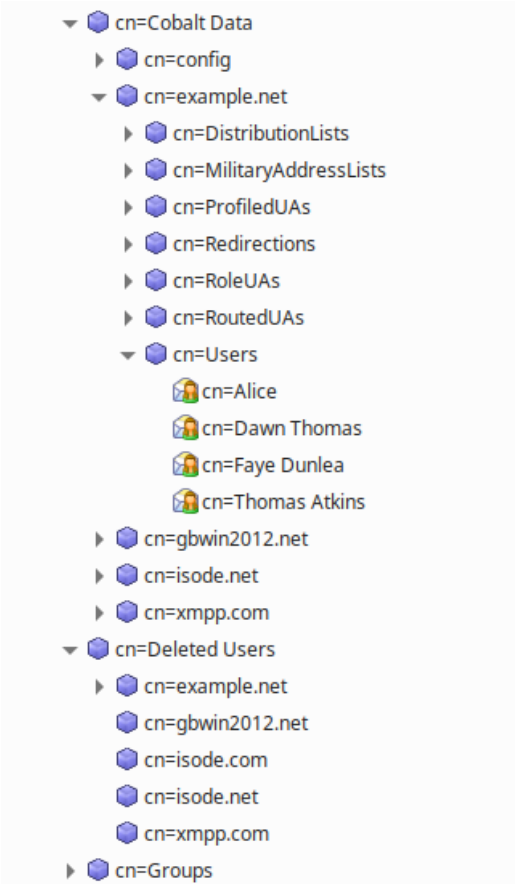
For a domain supporting *Users* only, Cobalt can access *Microsoft Active Directory* with no schema changes. For such a domain, Cobalt cannot add or modify users, but can view the users that are configured in Active Directory.

This setup is important for support of MMHS where users are provisioned in Active Directory. Cobalt can then be used to configure Role Based User Agents, where the role occupants are users configured in Active Directory. This enables use of Cobalt for MMHS configuration, while using Active Directory provisioned users and authentication.

1.3.4 DIT Layout

For each directory used by Cobalt, a selected point (*Cobalt data* in Figure 1.2, “Directory Structure”) in the Directory Information Tree (DIT) is configured to hold the data that Cobalt manages. Cobalt uses DIT structure to separate information for each domain. Different types of information object for each domain are given separate subtrees. This deep hierarchy is chosen to enable easy inspection with a DIT browser and to facilitate migration of selected Cobalt data.

Figure 1.2. Directory Structure



1.3.5 Deleted Users

Deleted Users entries are moved into a separate part of the DIT from active users, which enables deleted users to be restored. It also allows Cobalt to warn when a new user's email or XMPP address conflicts with a deleted user. This allows all Cobalt configured users to be searched from a single point in the DIT which does not include deleted users (as illustrated in the figure above).

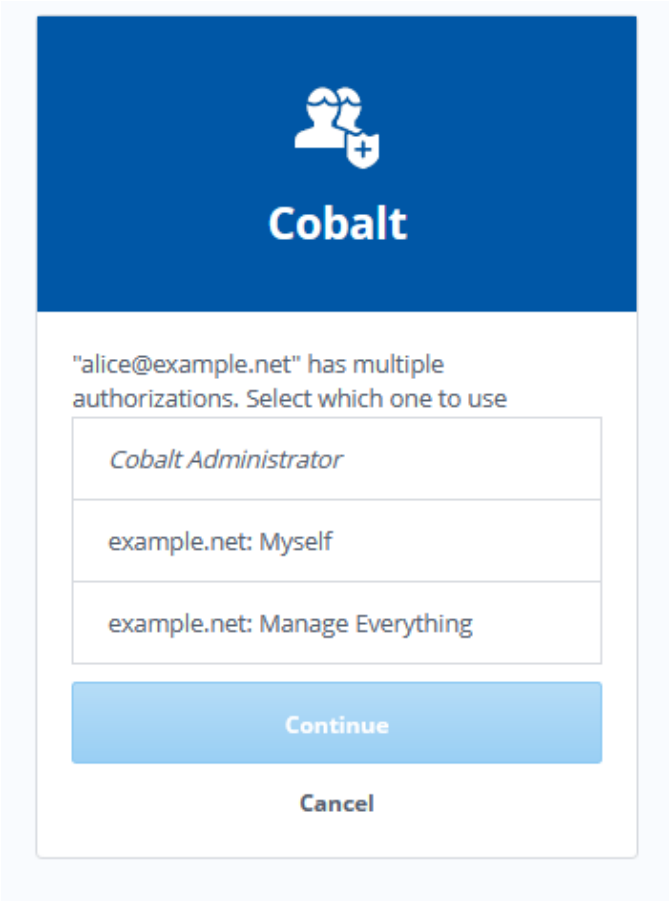
1.4 Roles and Access Control

1.4.1 Cobalt Server Access to Directory

Cobalt server binds to the primary M-Vault server and to other directories as a special privileged user, that is configured as part of setup. Cobalt requires user authentication of any user accessing the Cobalt service.

Cobalt maintains role based access control, recording which roles a given user has access to. When a user authenticates, a user with single role will automatically be made active in that role. A user with rights to multiple roles will be given a choice of roles as shown in Figure 1.3, "Select Authorization Role". A user can be active in only one role for a session.

Figure 1.3. Select Authorization Role

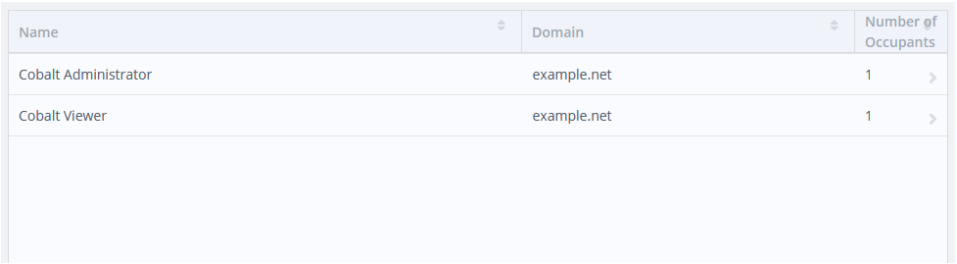


1.4.2 Cobalt Administrator Roles

Cobalt has two role types for its administration (see Figure 1.4, “Administrator Roles”):

- **Cobalt Administrator**. Full access to all Cobalt administrator functions.
- **Cobalt Viewer**. Can see Cobalt configuration, but no rights to modify.

Figure 1.4. Administrator Roles



Name	Domain	Number of Occupants
Cobalt Administrator	example.net	1
Cobalt Viewer	example.net	1

A Cobalt Administrator can assign users from any domain to either of these roles. A user not assigned to one of these roles has no access to Cobalt configuration.

1.4.3 Domain Administrator Roles

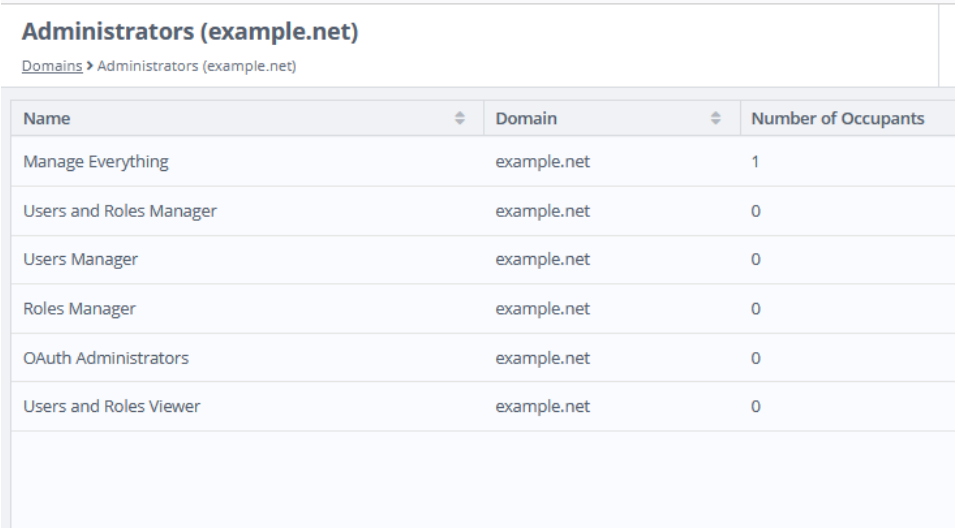
For each domain created by Cobalt, the following role types as shown in figure Figure 1.5, “Domain Administrator Roles” are supported for each domain:

- **Manage Everything**. Full rights for the domain, including management of domain administrators, user password reset and OAuth related configuration.

- **Users Manager**. Can add, delete and modify users and other Cobalt managed information for the domain.
- **Users Manager**. Can add, delete and modify users.
- **Roles Manager**. Can add, delete and modify other Cobalt managed information for the domain.
- **Users and Roles Viewer**. Can view information for the domain.
- **OAuth Administrators**. Can modify OAuth service for the domain, modify OAuth user permissions for domain specific OAuth clients and add, delete and modify OAuth clients for the domain.

Note that a Cobalt Administrator can create and delete domains and manage the domain administrators. No other access to the domain information is granted.

Figure 1.5. Domain Administrator Roles



Name	Domain	Number of Occupants
Manage Everything	example.net	1
Users and Roles Manager	example.net	0
Users Manager	example.net	0
Roles Manager	example.net	0
OAuth Administrators	example.net	0
Users and Roles Viewer	example.net	0

Chapter 2 Cobalt for System Administrators

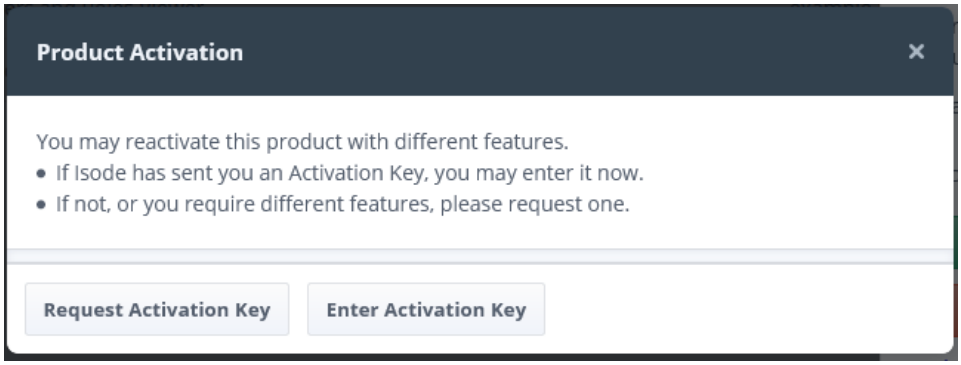
2.1 Cobalt Install and Initial Setup

The Cobalt installation process will lead to the Cobalt server running on port *8001* with access from a Web browser. The HTTP URL for accessing from a local system will be *https://localhost:8001*. The server will bootstrap itself with an auto generated certificate to offer HTTPS services. The browsers will display the page as insecure and give an option to add security exception. You will be able to set it up with a certificate trusted by the browsers and issued by trusted *CA* later (see Section 2.2.2, “TLS Configuration”).

2.1.1 Product Activation

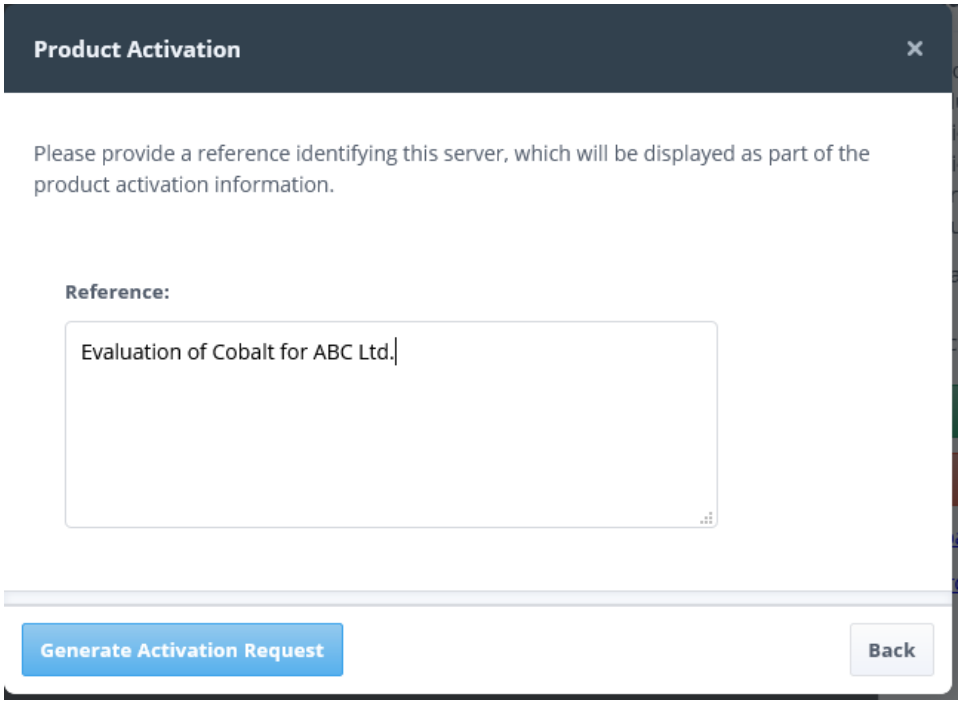
The first interaction with Cobalt is Product Activation (see Figure 2.1, “Product Activation”). A simple dialogue will lead to generation of an activation request string, which should be sent to support@isode.com, along with evaluation or purchase information.

Figure 2.1. Product Activation



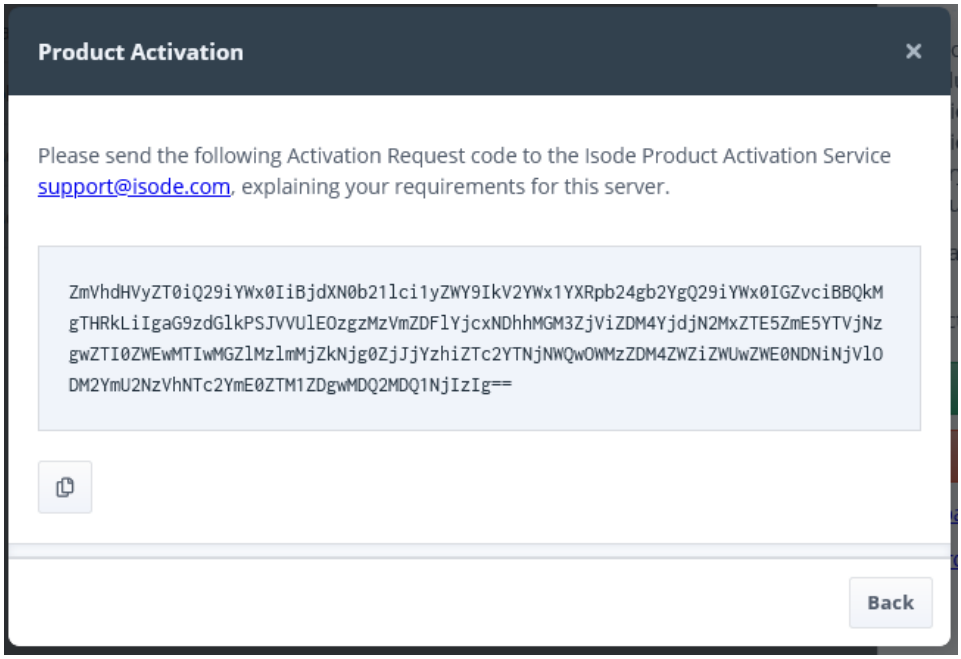
To request a key, you will be prompted to enter a reference for the request as shown in Figure 2.2, “Product Activation Request”. This reference value is a free form string and will be included inside any activation that is issued in response, so that you can use it to identify which server, department, etc. the request was for.

Figure 2.2. Product Activation Request



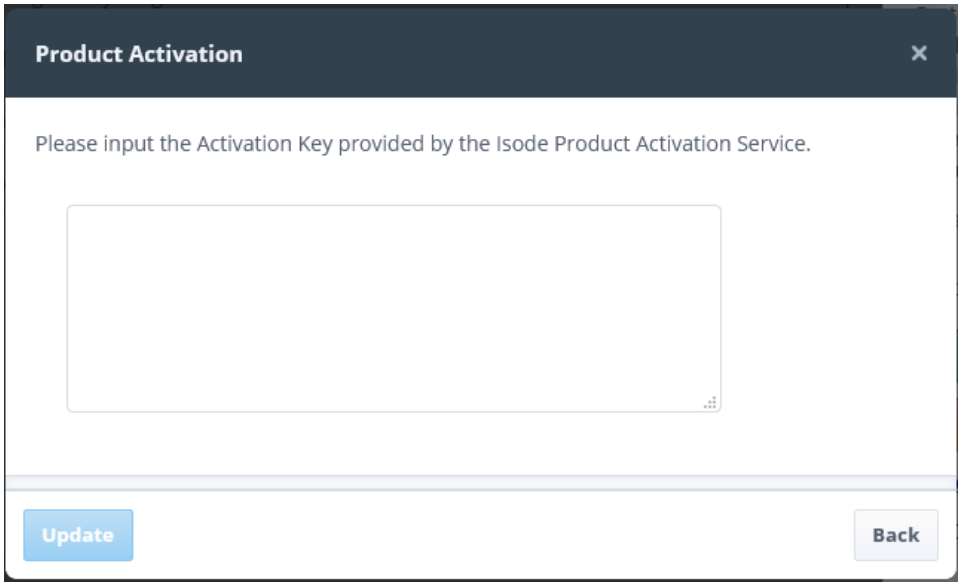
A request will be generated (see Figure 2.3, “Generated Request”) that should be sent to Isode in order to get the activation key.

Figure 2.3. Generated Request



An activation key will be returned by Isode, which should be input to Cobalt. Press the **Back** button to return to the landing page (Figure 2.1, “Product Activation”). Press the **Enter Activation Key** button to paste the activation key in the text box as shown below.

Figure 2.4. Paste Product Activation Key



2.1.2 M-Vault Pre-Requisites

Cobalt gives an option to either create a new directory server or use an existing one.

When operating with an existing M-Vault R19.0, the following needs to be set up prior to use of Cobalt.

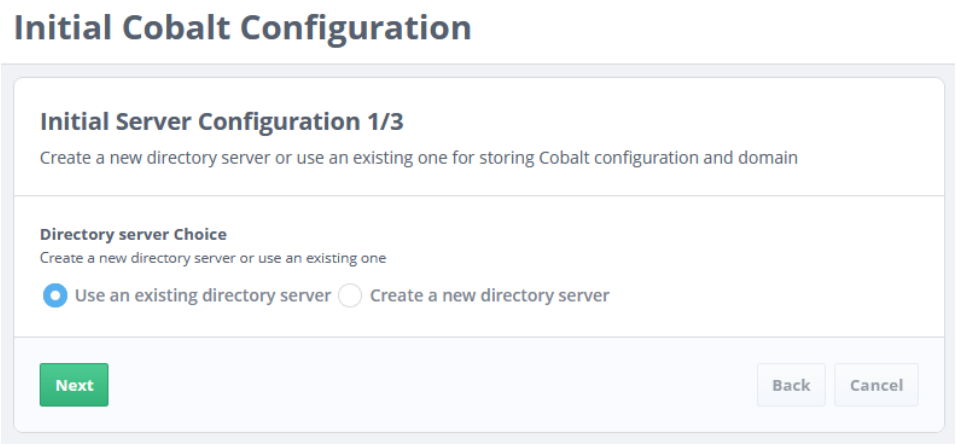
- An entry (which must be a naming context) in the DIT where Cobalt data will be stored. For example, you might have a naming context at o=Cobalt, and a user entry of "cn=Cobalt Server,cn=Users,o=Cobalt" with a suitable password that has read/write/add/delete/modify access to the directory.
- A Cobalt Server user, which has full read/write access to this part of the DIT.

Please contact support@isode.com, if you need help to set this up.

Future releases of M-Vault will install with Cobalt, so that these pre-requisites will be addressed as part of the install.

2.1.3 Directory Server Choice

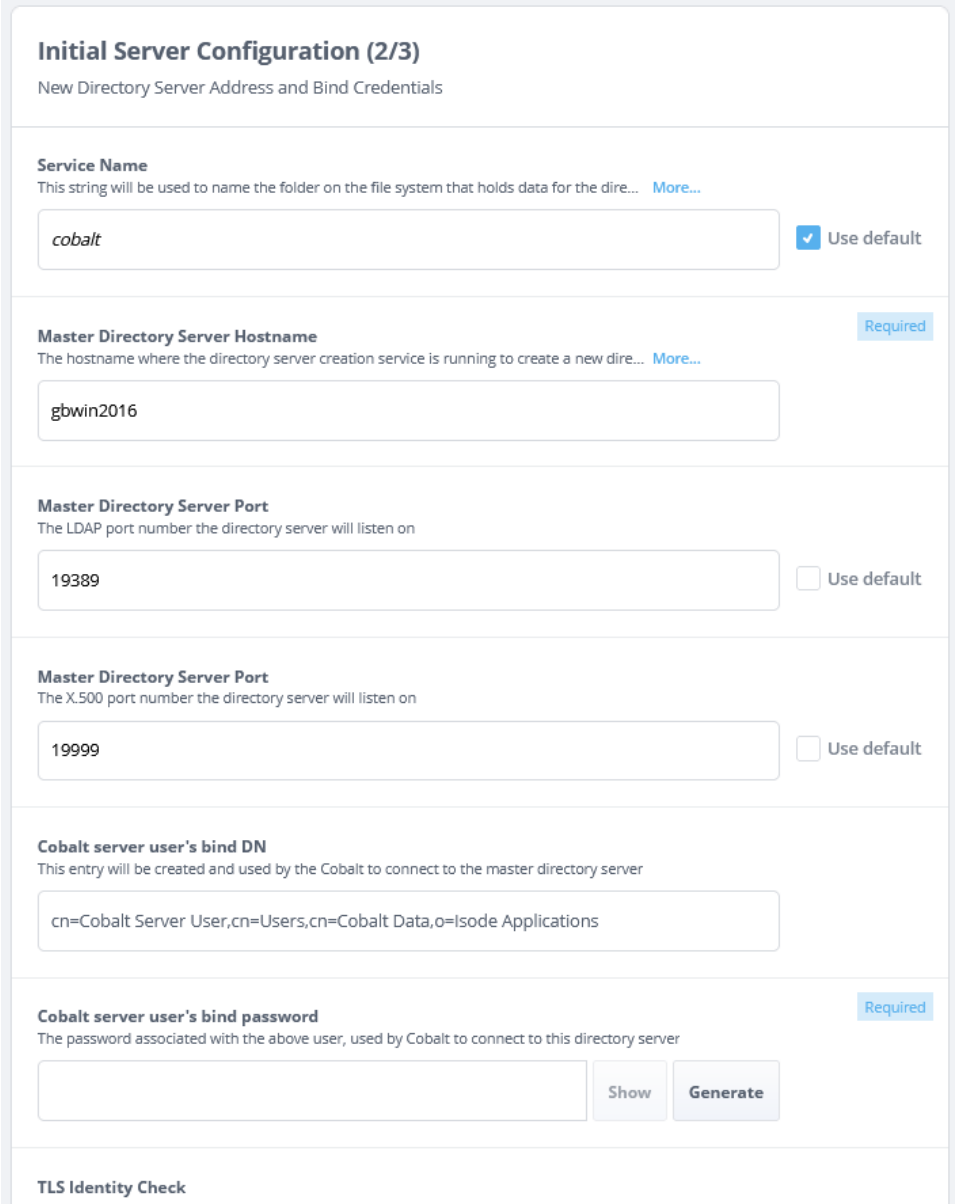
Figure 2.5. Directory Server Choice



A choice is provided to either create a new directory server or use an existing one to store Cobalt data.

2.1.4 Create New Directory Server

Figure 2.6. New Directory Server



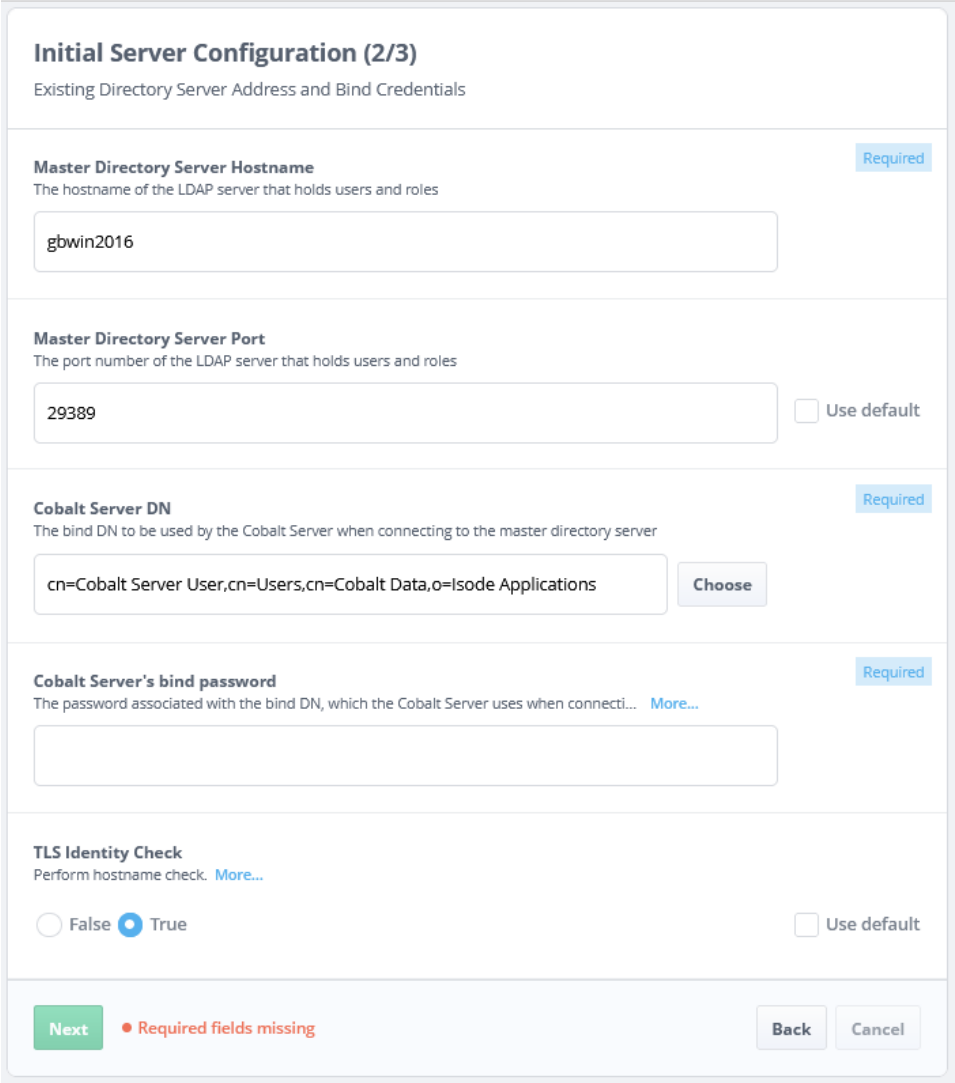
If a new directory server creation is chosen, Cobalt will present the host, port and connection details of the new directory server as shown in above figure. The creation is facilitated by a directory server creation service over HTTP protocol. Enter the host name where this service is running and is also the host where the new directory server will be created along with LDAP and X.500 ports for the new directory server. A password is also required for the default user that will be created and used by Cobalt to connect to the directory server. Service name is used to name the directory server database (created in the DATA directory which is C:\Isode on windows and /var/isode/ on Unix) and the associated windows service.

On pressing **Next** button, the page to set up domain will be presented (see Section 2.1.6, “Default Domain and Initial Users”).

2.1.5 Use Existing Directory Configuration

If an existing directory server is chosen Cobalt will present the following page to get the connection details of the directory server

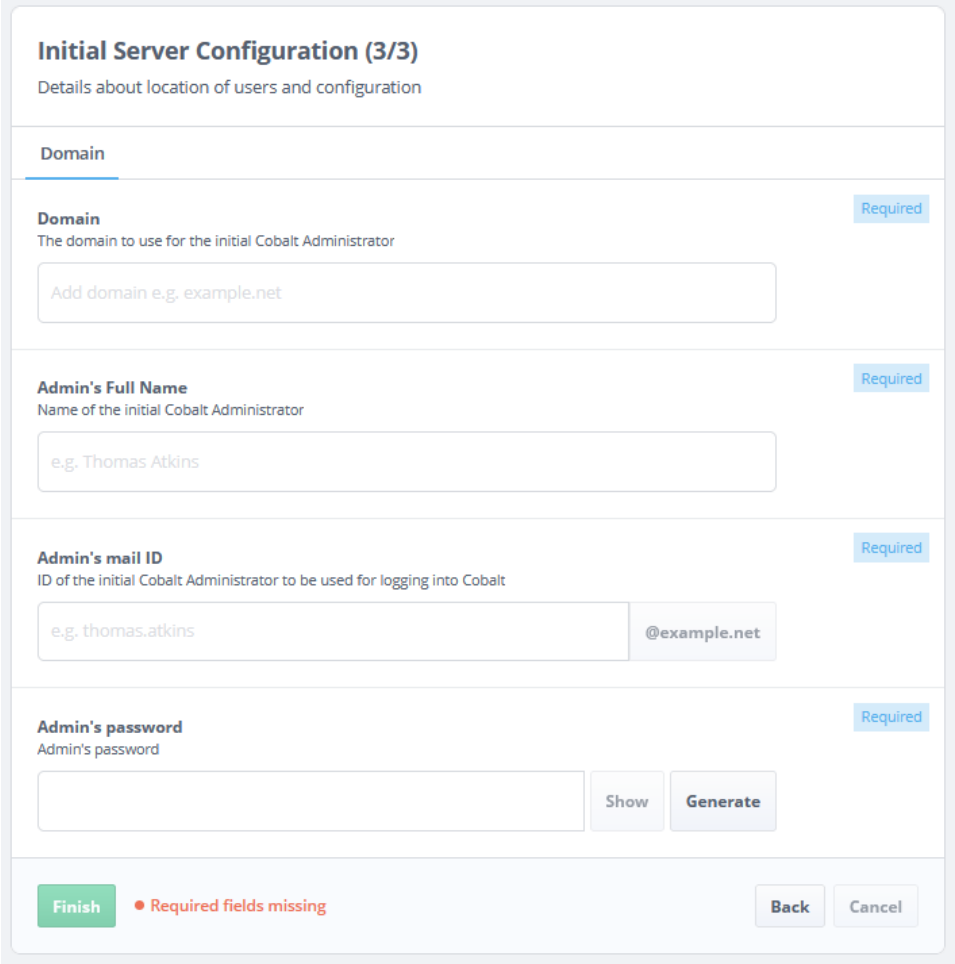
Figure 2.7. Directory Configuration Details



Cobalt will guide the user to configure access to M-Vault, using the pre-requisite information as shown in the screen above (Figure 2.7, “Directory Configuration Details”). The page presented after pressing the **Next** button will be the domain configuration page as described in Section 2.1.6, “Default Domain and Initial Users”.

2.1.6 Default Domain and Initial Users

Figure 2.8. Configure Default Domain and First User



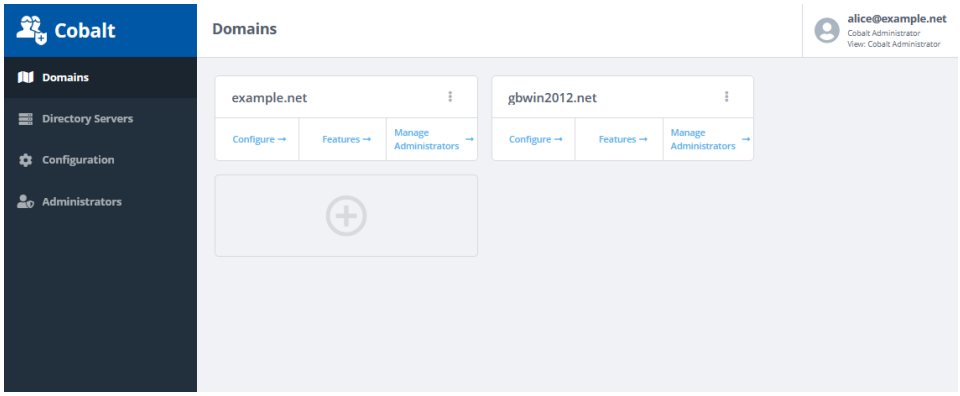
In the second stage of bootstrap (Figure 2.8, “Configure Default Domain and First User”), an initial domain and a single user within that domain are created, with a password for that user. This initial user is configured as a Cobalt Administrator and will have full rights to manage the initial domain.

Cobalt bootstrap is now complete, and the initial user can authenticate to Cobalt, to perform either Cobalt Administration or Domain Administration as described in the following sections.

2.2 Cobalt Administration

Cobalt provides a separate view (Figure 2.9, “Cobalt Administration View”) for its own administration and configuration. This view provides options to manage server configuration parameters (e.g. HTTP port, TLS Identity, etc), domains and Cobalt administrators.

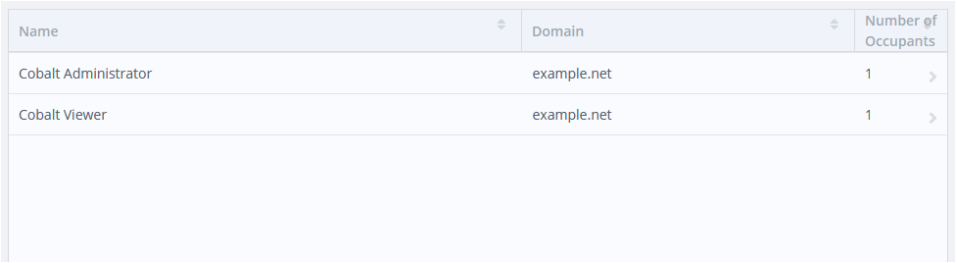
Figure 2.9. Cobalt Administration View



2.2.1 Cobalt Administrative Roles

The following figure displays the Cobalt Administrative Roles as described in Section 1.4.2, "Cobalt Administrator Roles"

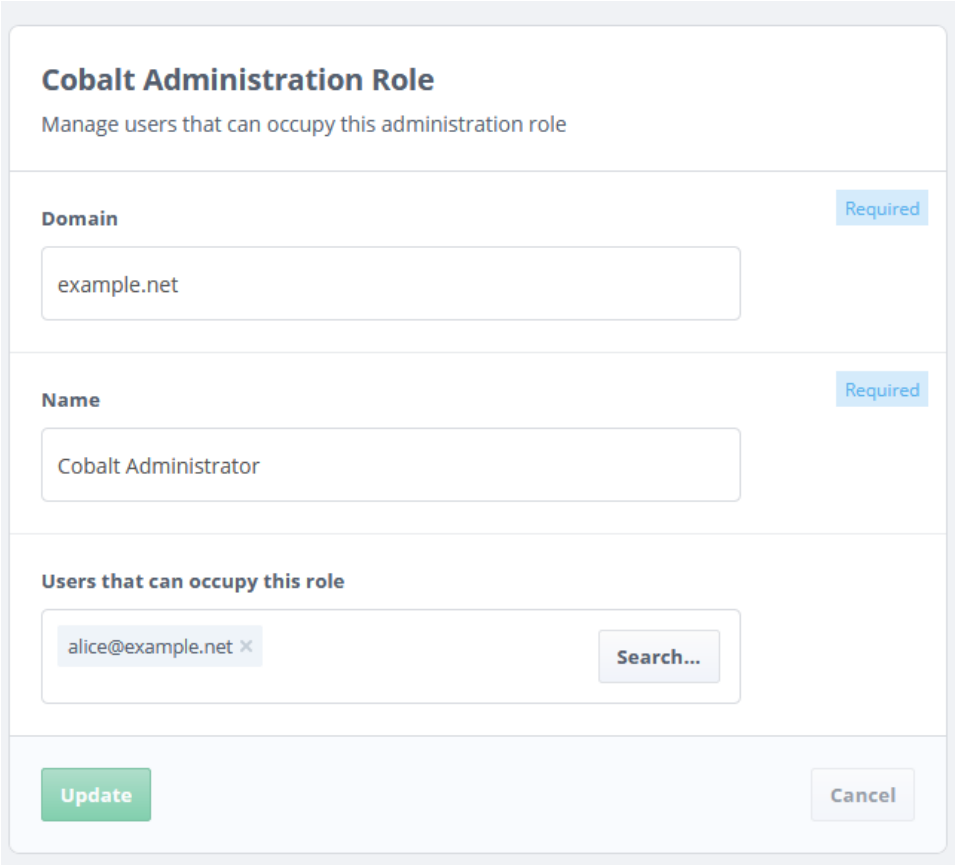
Figure 2.10. Cobalt Administrators



Name	Domain	Number of Occupants
Cobalt Administrator	example.net	1
Cobalt Viewer	example.net	1

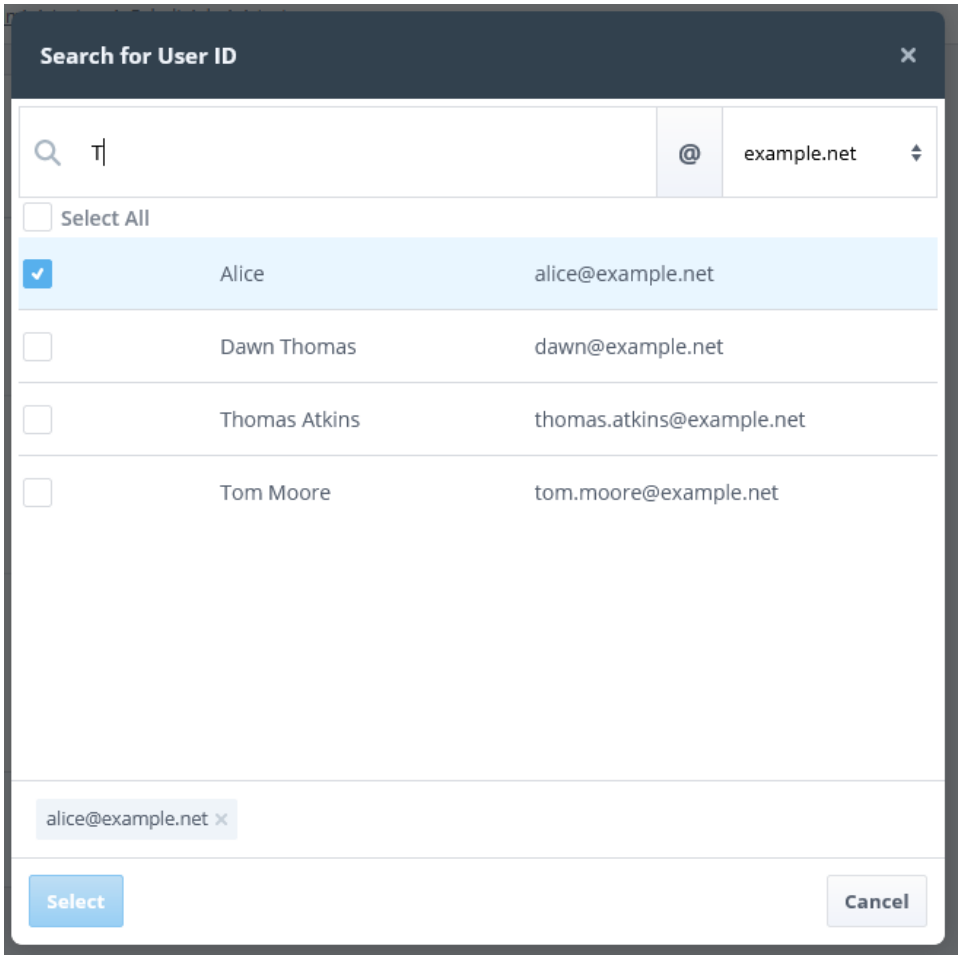
In order to add or remove users from the role, select the role that you wish to edit. The following form will be displayed.

Figure 2.11. Edit Administrators



Click the **Search...** button to display a dialog (Figure 2.12, “Search and Select”) to search and select users from any of the Cobalt configured domain. Select the domain from the dialog and type a few letters to search users in the selected domain. A list of users matching the search string will be presented. Select all users that you wish to add. Repeat this process with another search string and domain for adding more users.

Figure 2.12. Search and Select



Once users have been selected for the role, click the **Select** button to complete the selection and then press the **Update** button to submit changes on the form to update users in the selected role.

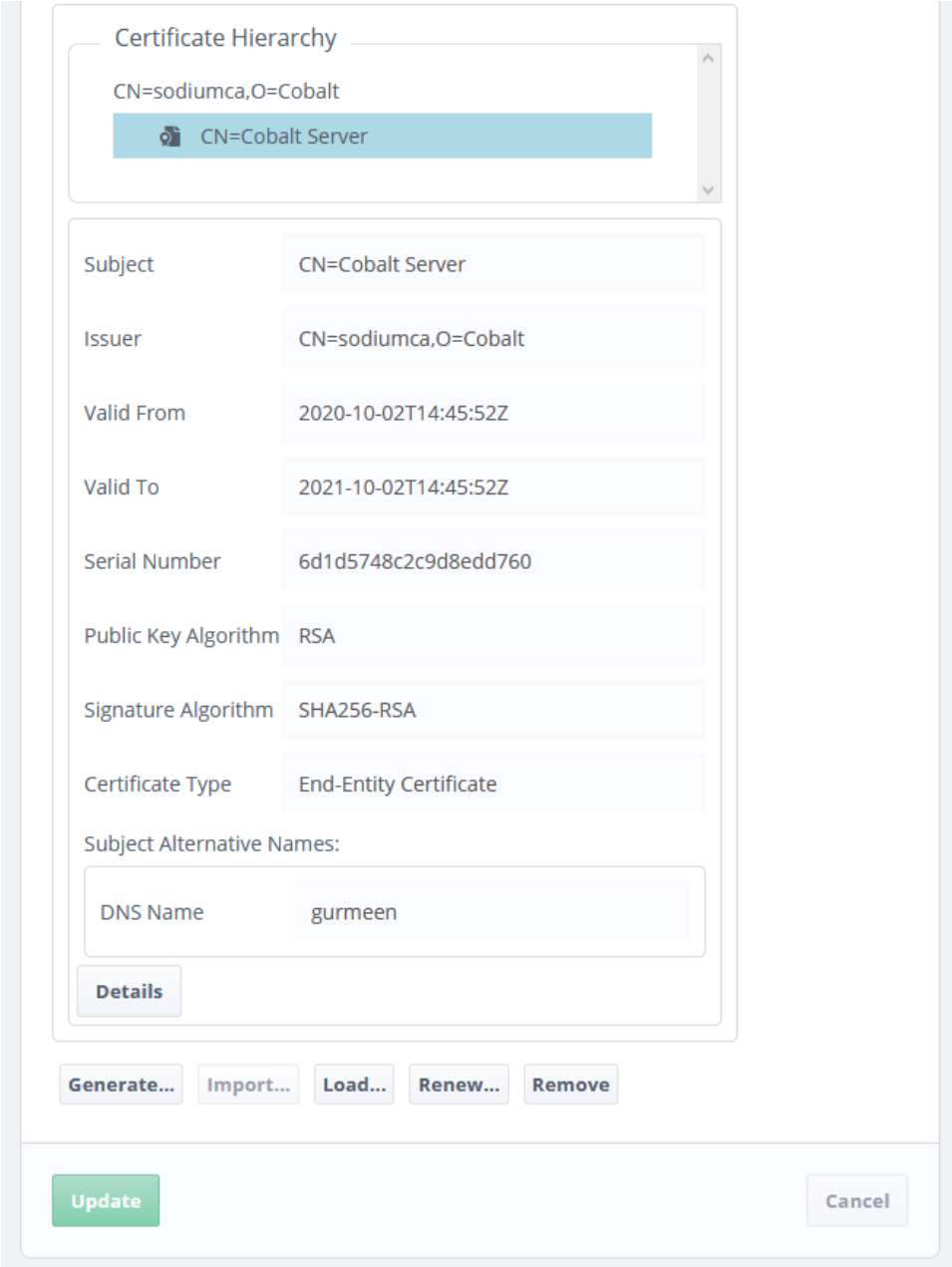
2.2.2 TLS Configuration

The **TLS** tab on the **Configuration** section displays the identity used by Cobalt for its HTTPS configuration (see Figure 2.13, "TLS Configuration Tab"). Use the **Generate...** button to create a new keypair and *CSR* to request a certificate from a *CA*. The *certificate chain* received from the CA can then be imported using the **Import...** button.

Alternatively, use the **Load...** button to load a *PKCS#12* or a concatenated *PEM* form of private key and *certificate chain*.

The **Renew...** button can be used to renew the current server certificate to replace an expired or revoked certificate.

Figure 2.13. TLS Configuration Tab

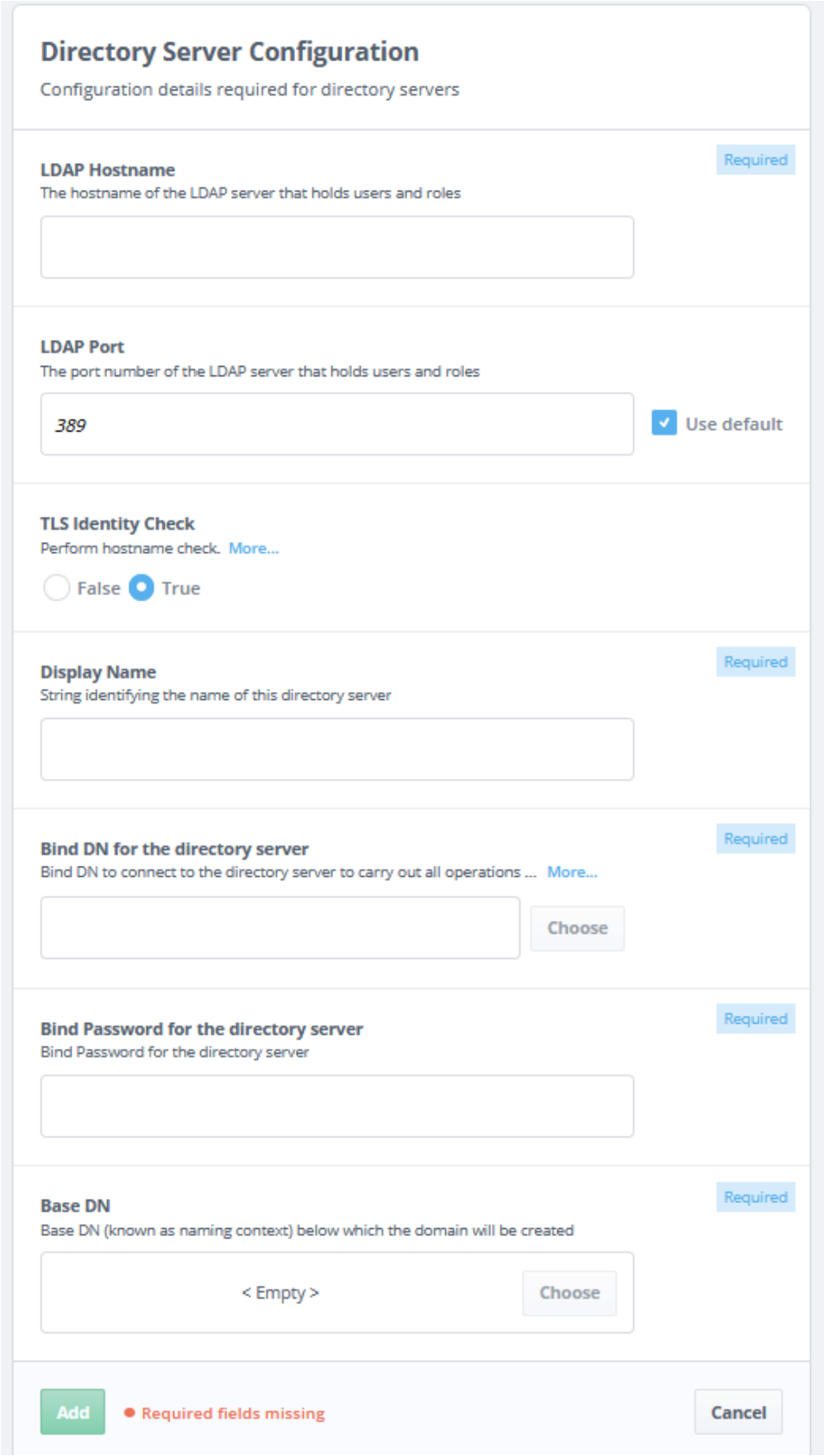


2.2.3 Directory Servers

Cobalt maintains a list of *directory servers* where its domain information is stored. The default directory server is the *M-Vault* server that holds Cobalt's configuration and data for the default domain. A single directory server can hold one or more domains.

In order to add a domain in another directory server, an entry for the directory server should be created here by clicking the **Add** button to see a form as shown in Figure 2.14, "Add Directory Server Form". Provide host name, port, naming context, bind *DN* and password of a user entry that has suitable access over the directory tree of the DSA.

Figure 2.14. Add Directory Server Form



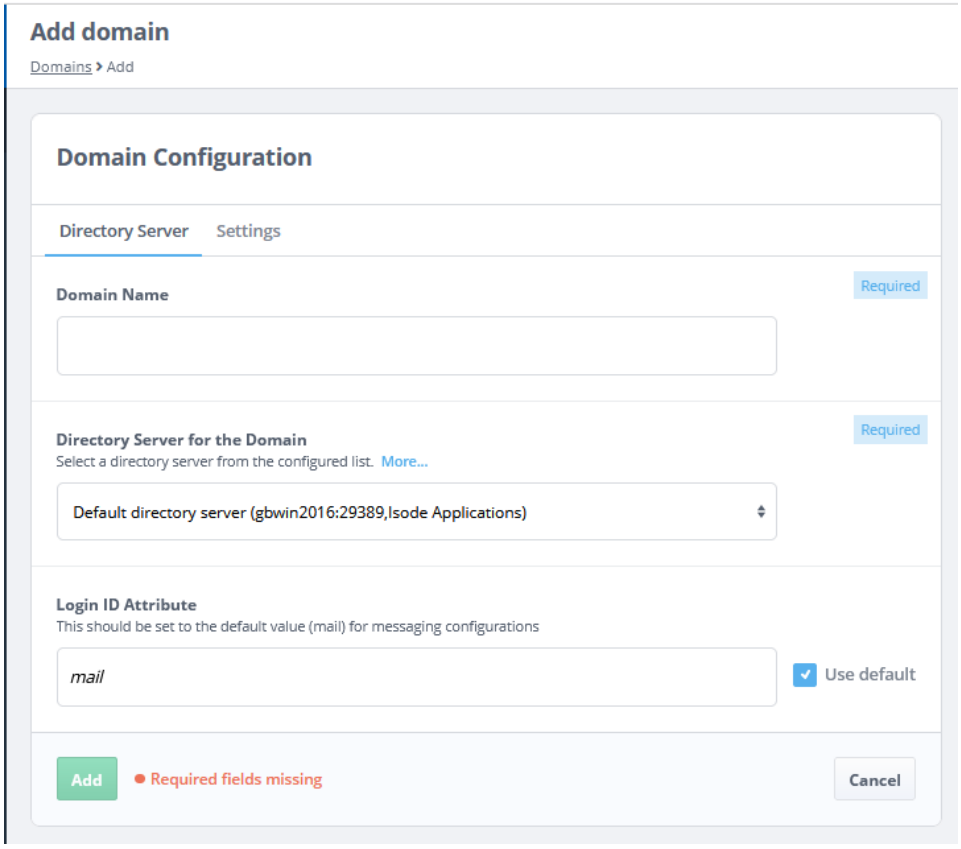
2.3 Setting up Domains

Cobalt manages one or more domains that can be set up and modified in the Cobalt Administrator mode. A domain will be created during the bootstrap process and will be stored in Cobalt's own *directory server*.

2.3.1 Adding a Domain

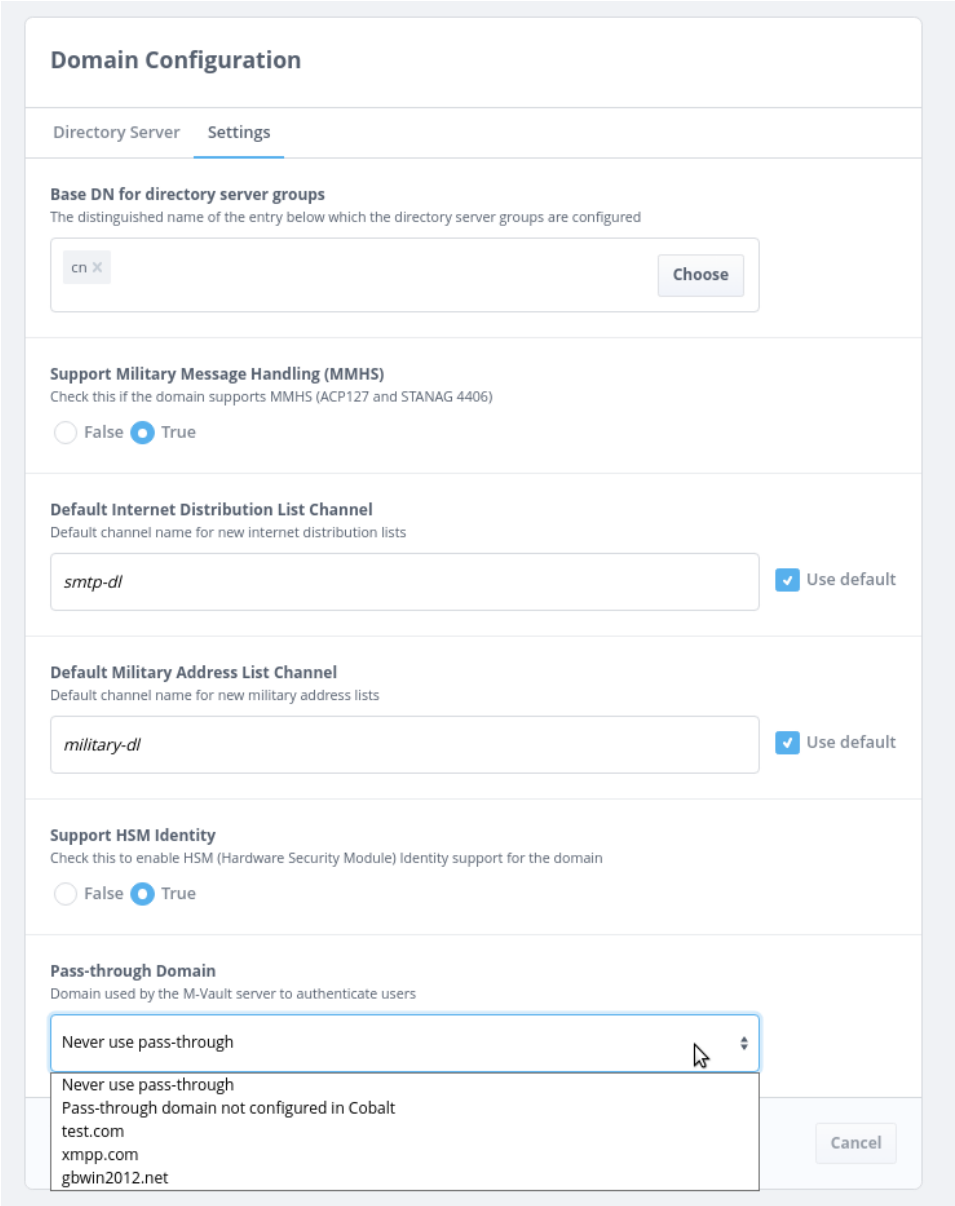
To add a new domain, select the **Domains** item from the sidebar on the left and click the **Add** button. The following form will be displayed. Enter the domain name and the directory server that it belongs to.

Figure 2.15. Add Domain Form



Specify the domain specific settings on the **Settings** tab. The settings define parameters that control information specific to that domain.

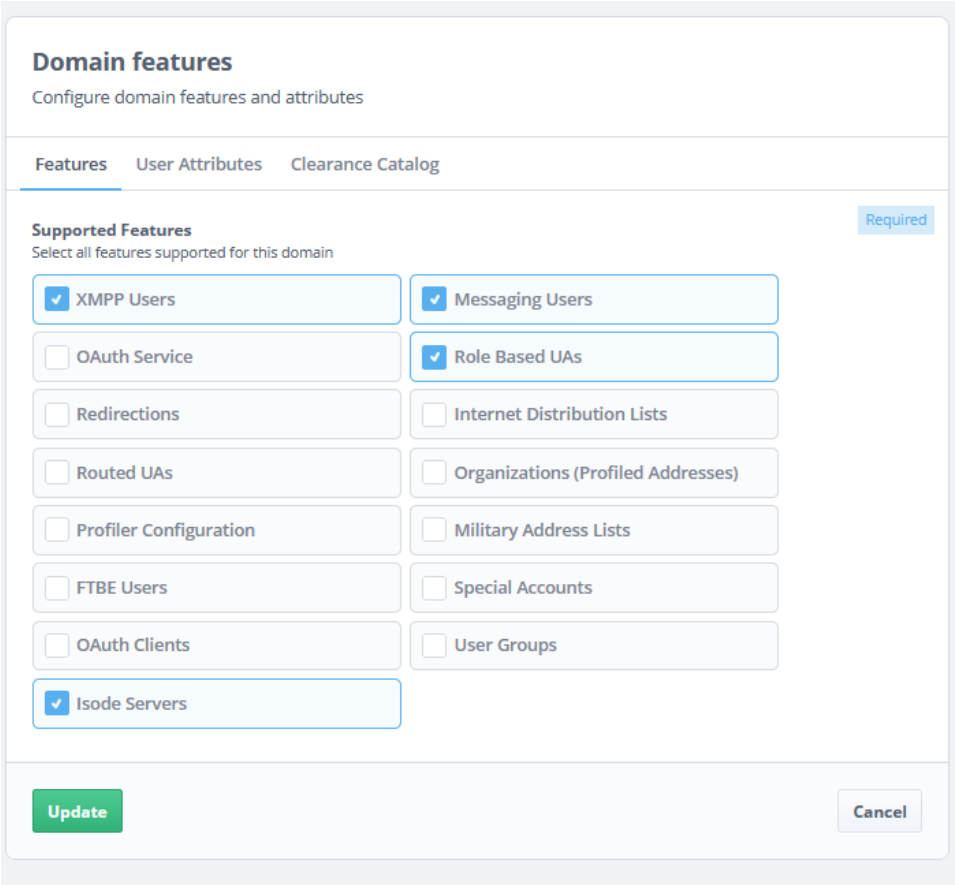
Figure 2.16. Domain Settings



2.3.2 Domain Features

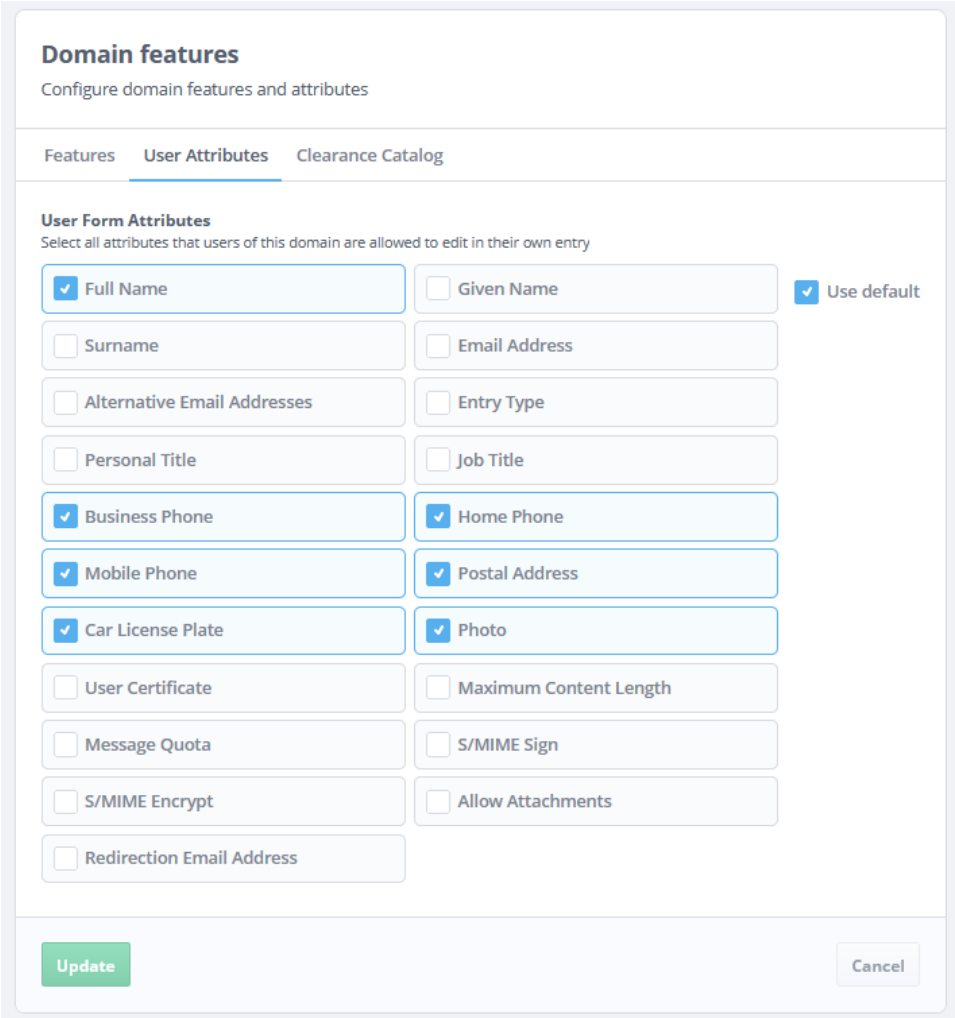
Select the **Features** link on the domain card to specify supported features for that domain. The features control the items that are supported for that domain.

Figure 2.17. Select Domain Features



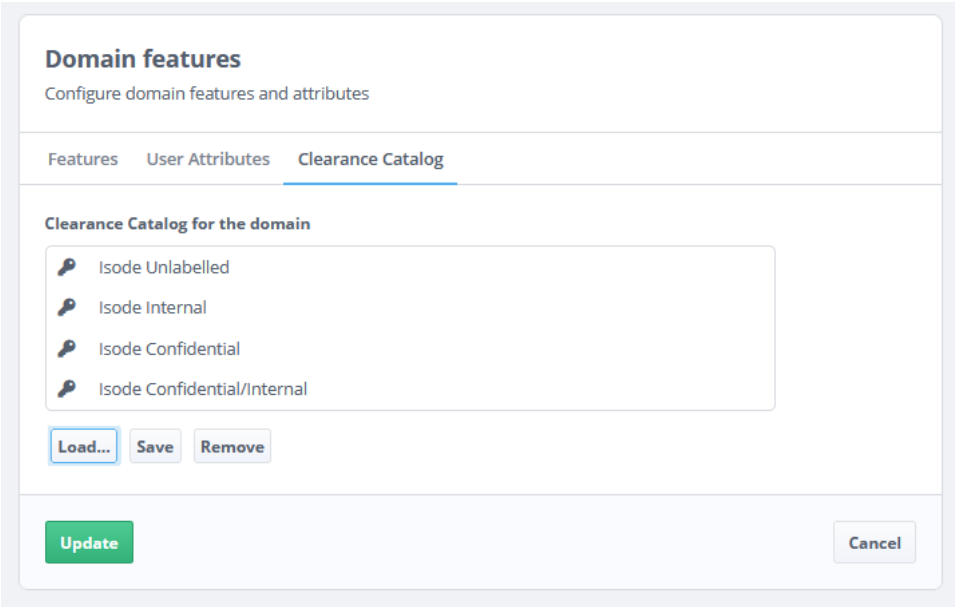
All users of a domain can modify their own entries after authentication. The attributes that are allowed to be modified by the user can be controlled using the **User Attributes** tab as shown below. Tick all the attributes that are allowed to be edited and the rest of them will appear as readonly.

Figure 2.18. Editable Domain User Attributes



A clearance catalog can be configured for a domain on the **Clearance Catalog** tab. Once this is set up, a domain administrator can select one or more clearances for its users from the configured catalog.

Figure 2.19. Domain Clearance Catalog

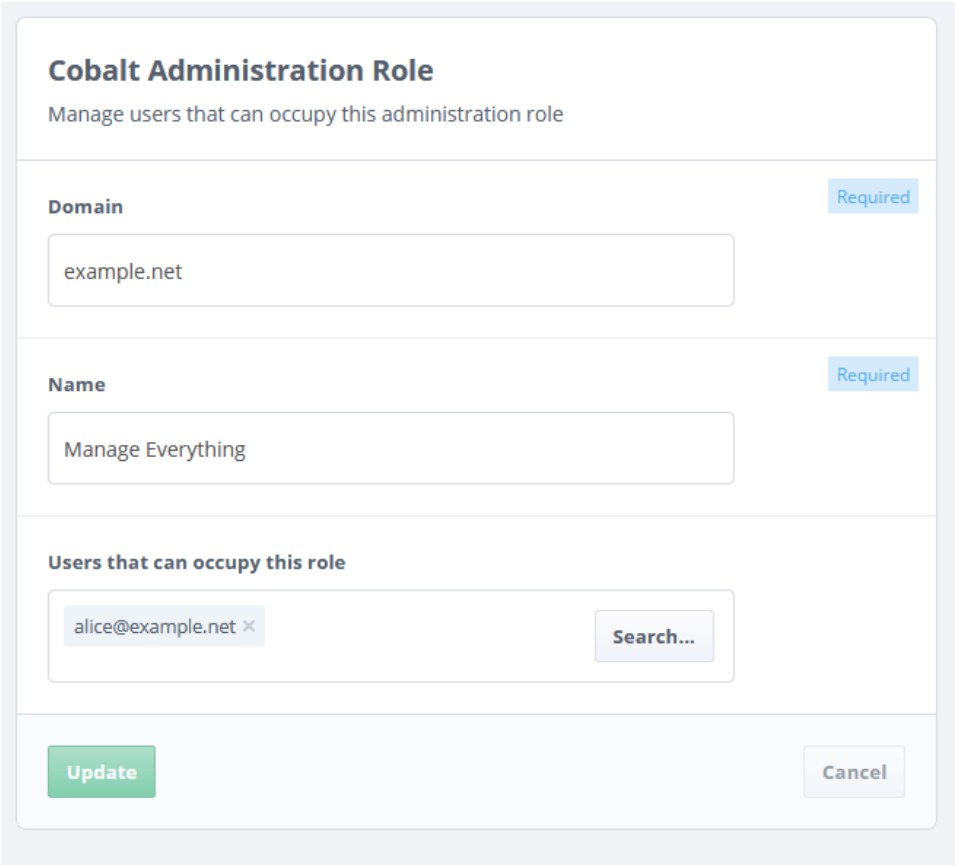


2.3.3 Domain Administrators

Users from any of the Cobalt managed domains can be assigned a role for managing a domain in one or more role types of a domain as described in Section 1.4.3, “Domain Administrator Roles”.

Click the role that you wish to assign a user to. The following form will be presented. Click the **Search** button to search and add users to this role as described in the figure Figure 2.12, “Search and Select”. Click the **Update** button for the change to be submitted to take effect.

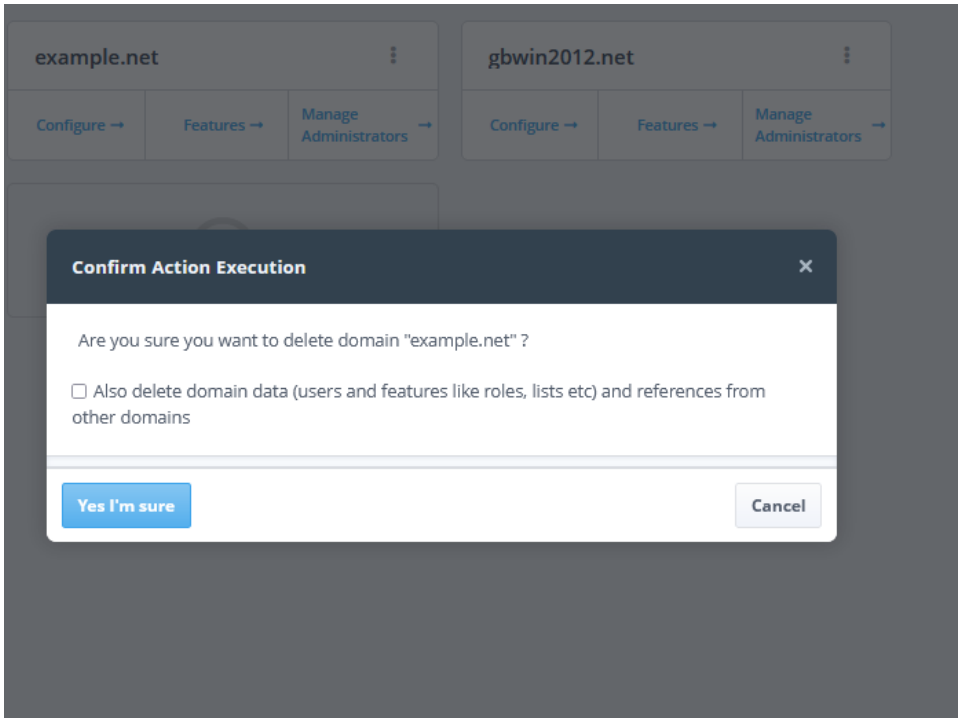
Figure 2.20. Edit Domain Administrators



2.3.4 Deleting Domain

A domain can be deleted by clicking the **Delete** menu item on the domain card. A confirm prompt offers a choice of cleaning up domain data as well. If domain data is chosen to be deleted, all users and domain related features like roles, distribution lists etc will be removed along with Cobalt specific configuration for the domain.

Figure 2.21. Delete Domain Prompt

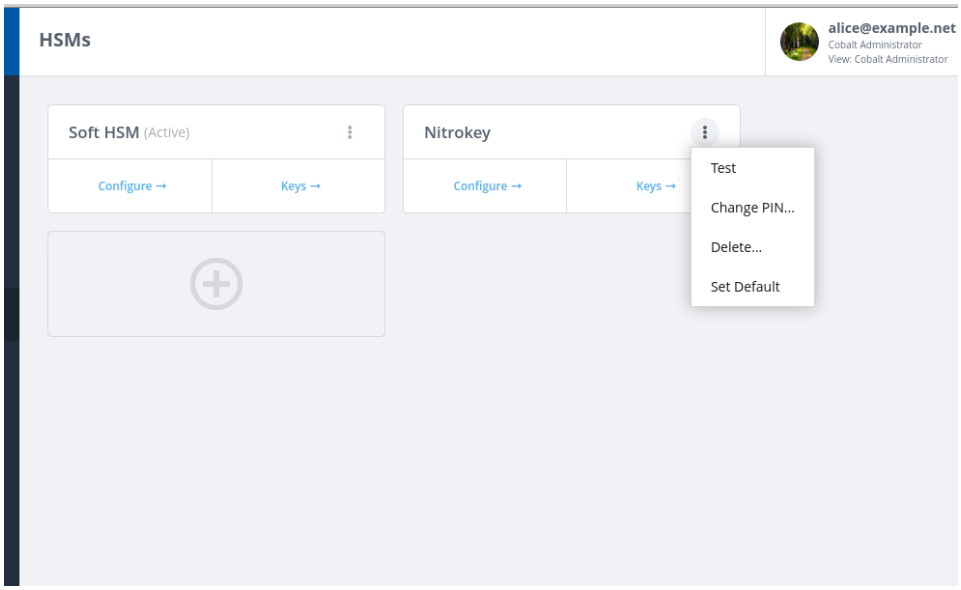


2.4 HSM (Hardware Security Module) Configuration

2.4.1 Setting up HSMs (Hardware Security Module)

In Cobalt, you have the option to configure one or more HSMs in the Cobalt Administrator mode. To ensure proper functionality, you can test the configured HSMs by selecting the **Test** option from the menu. If needed, you can modify the user PIN on the HSM by using the **Change PIN** menu option. Once you have successfully configured one or more HSMs, it is necessary to designate one of them as the active HSM. This can be done by setting it as the default option, which can be found in the menu, as illustrated in the figure below. The active HSM serves as the source of private keys for entities that support HSM identity.

Figure 2.22. HSMs

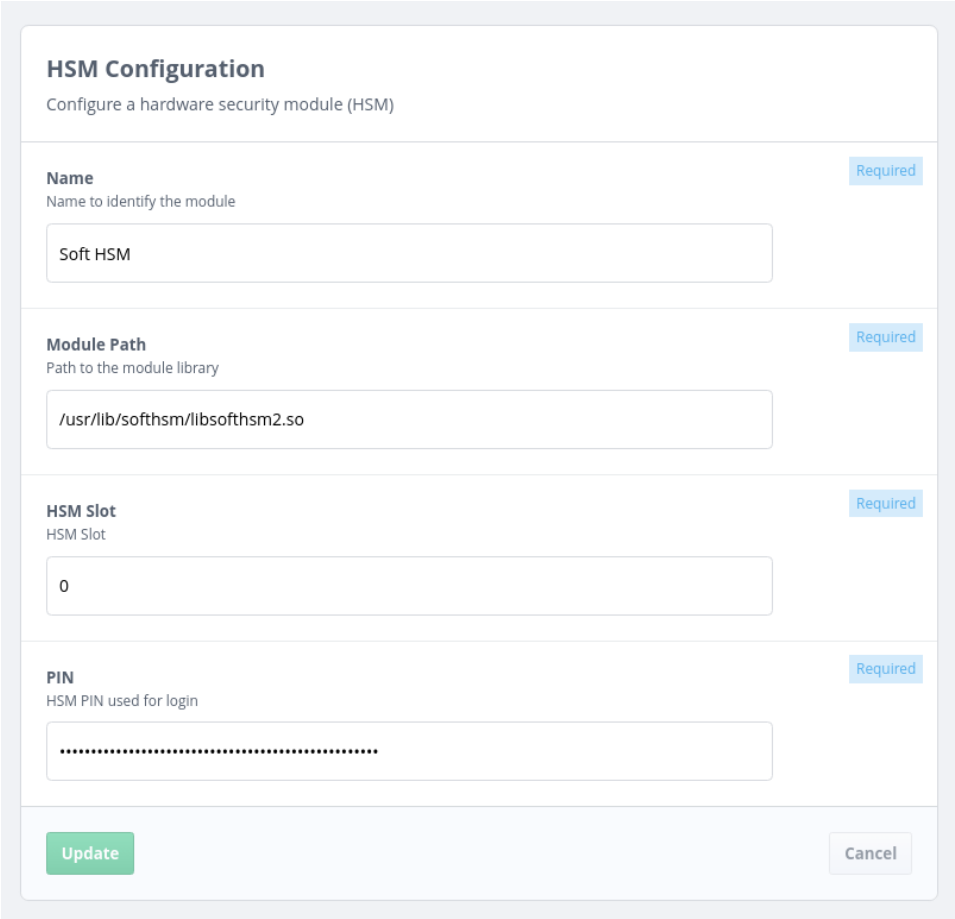


To utilize HSM Identity for a domain, it is essential to enable the corresponding setting for the domain, as depicted in Figure 2.16, “Domain Settings”. Additionally, an HSM must be configured and set as the active option.

2.4.2 HSM Configuration

To add a new HSM configuration, navigate to the sidebar on the left and select **HSMs**. Click on the **Add** button, and a form will appear where you can enter the necessary details for the HSM. If you need to make changes to the HSM's configuration after it has been created, you can utilize the **Configure** link on the HSM's card. The form displayed for the HSM configuration will prompt you to provide a name to identify the HSM, its module path, and the user PIN.

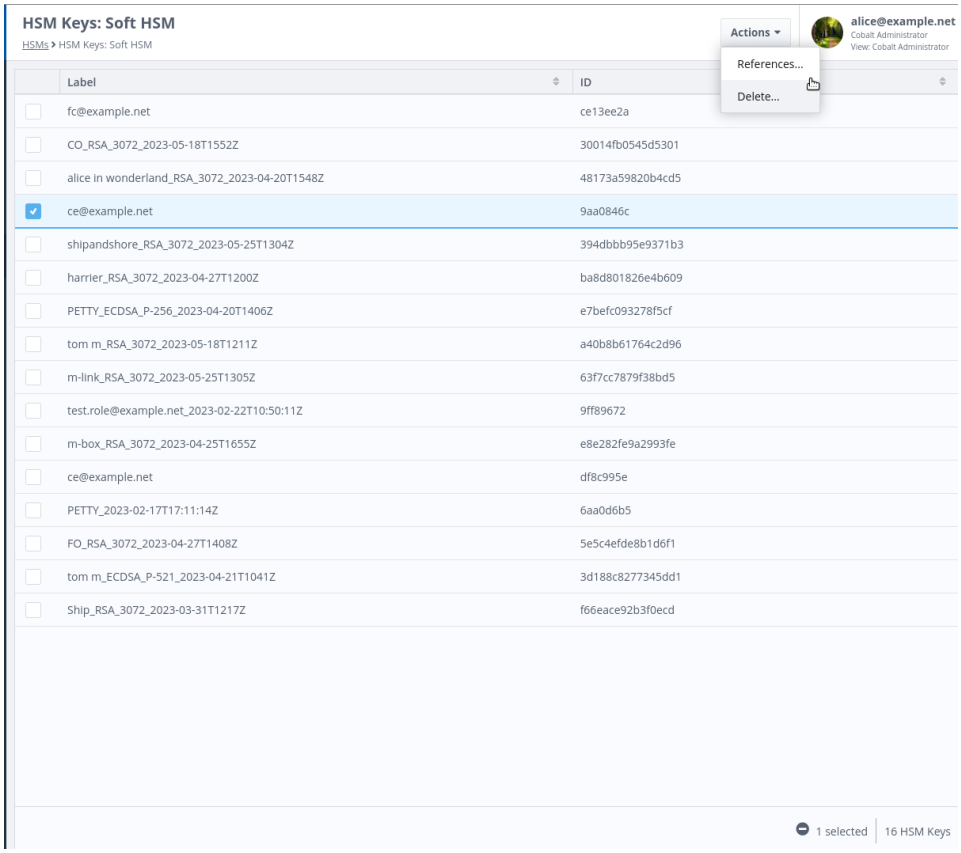
Figure 2.23. Add/Modify HSM



2.4.3 HSM Keys

To view the keys stored on an HSM, click on the **Keys** link on the HSM card. The keys will be presented in a table format, as depicted in the figure below. If you wish to delete one or more keys, simply select them and then access the **Actions** dropdown located at the top right corner. From there, choose the **Delete** option. In case you want to see all the references where a specific HSM is utilized, you can utilize the **References** option. It's important to note that only one HSM should be selected in order to use the **References** option. Additionally, these actions can also be accessed through the right-click context menu.

Figure 2.24. HSM Keys



Chapter 3 Cobalt for Domain Administrators

3.1 Accessing Cobalt

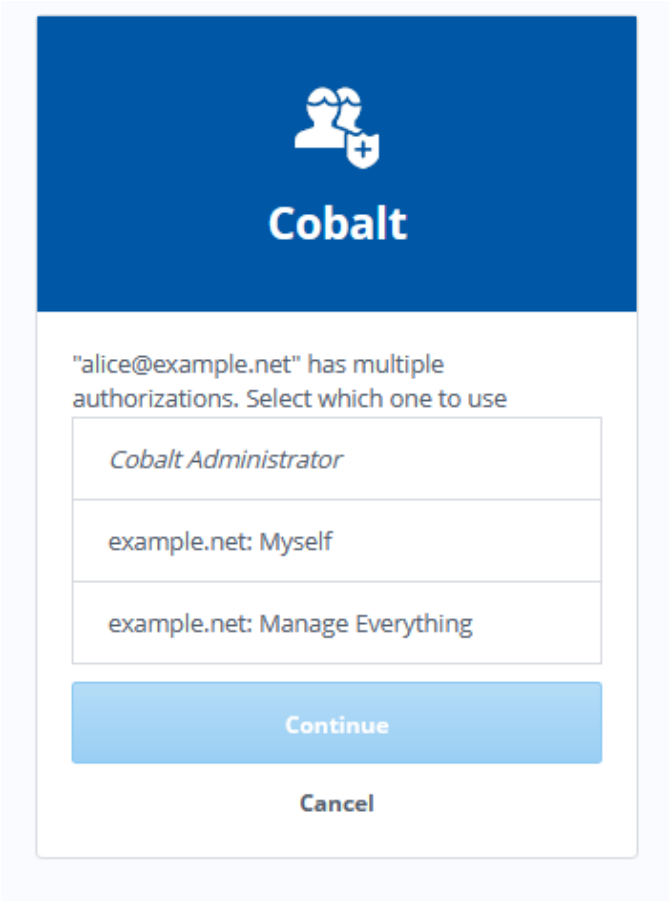
After providing a valid username and password, Cobalt will show the user which roles they are authorized to use (unless the user is only assigned to one role). A user can only be active in one role at any given instance. A user with multiple authorizations can switch role by clicking the top right user ID icon and selecting **Switch View** button.

Note that this view will not be presented for a domain user that is not assigned any of Cobalt or domain administrator roles.

The following figure illustrates the page presented to a user with multiple Cobalt roles.

3.1.1 Selecting and Switching View

Figure 3.1. Select View

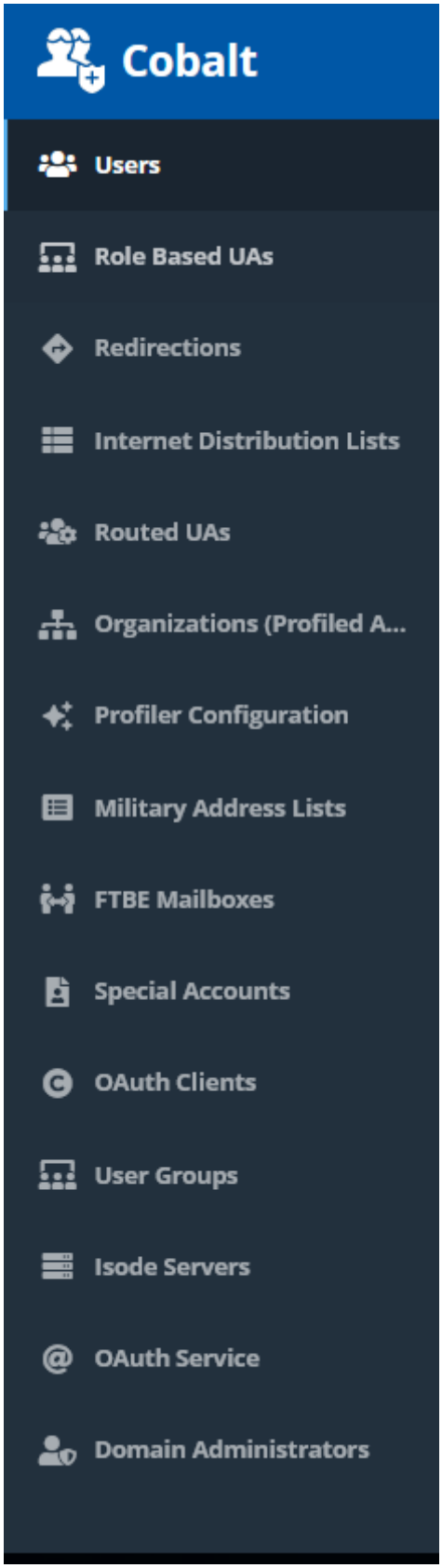


Once a role to manage a domain is selected, Cobalt will present a filtered view based on selected authorization. A *Users Manager* for a domain will be presented with a view that displays a list of users whereas a *Roles Manager* will be presented with a list of configured roles for that domain. A user in *Manage Everything* role will be able to see users, OAuth service and clients, configured features and domain managers for the domain. A user in *Users and Roles Manager* role will be able to see users and configured features for the domain. *OAuth Administrators* will display OAuth Service and clients for the domain.

Myself is a view that will allow the logged in users to modify their own entry (see Figure 2.18, “Editable Domain User Attributes” and Chapter 7, *Managing Authenticated User Entry*).

The Left Hand Side (LHS) sidebar as shown below will display all resources as items that can be managed for a domain after view is selected.

Figure 3.2. LHS Sidebar



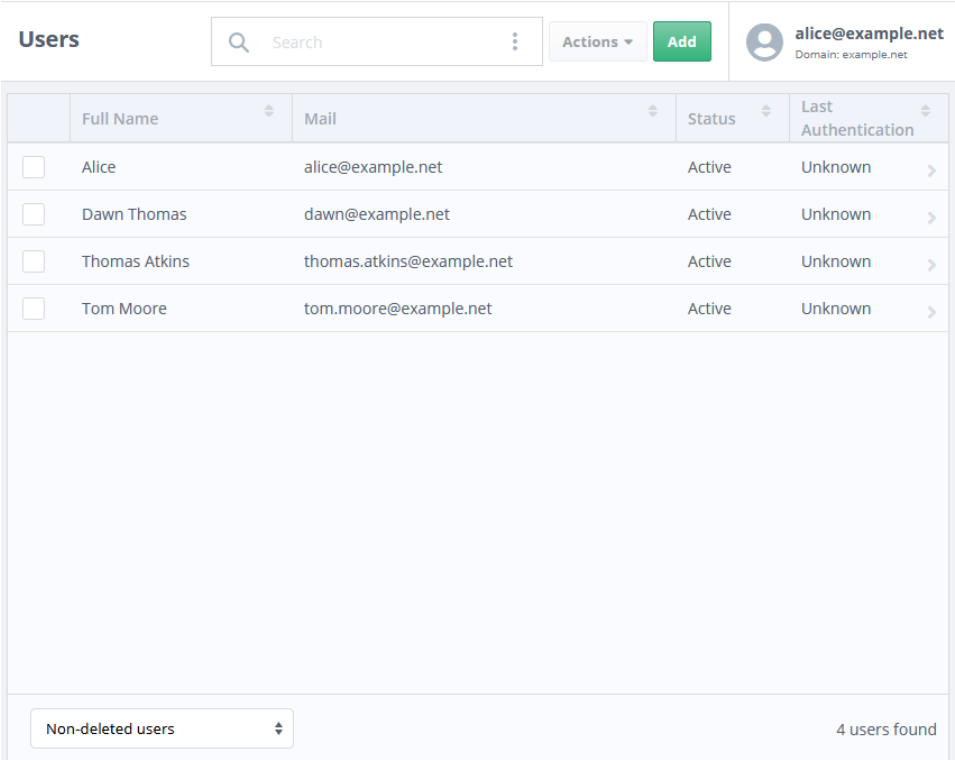
3.2 Users

Cobalt presents a list of users (as shown in Figure 3.3, “Users View”) configured in a domain that supports users. The search box can be used to make the list only show users matching a specific string.

The **Actions** dropdown provides a range of operations that can be performed on selected users.

The filter box at the bottom of the page is used to only show users matching a specific status (all users, deleted users, etc).

Figure 3.3. Users View

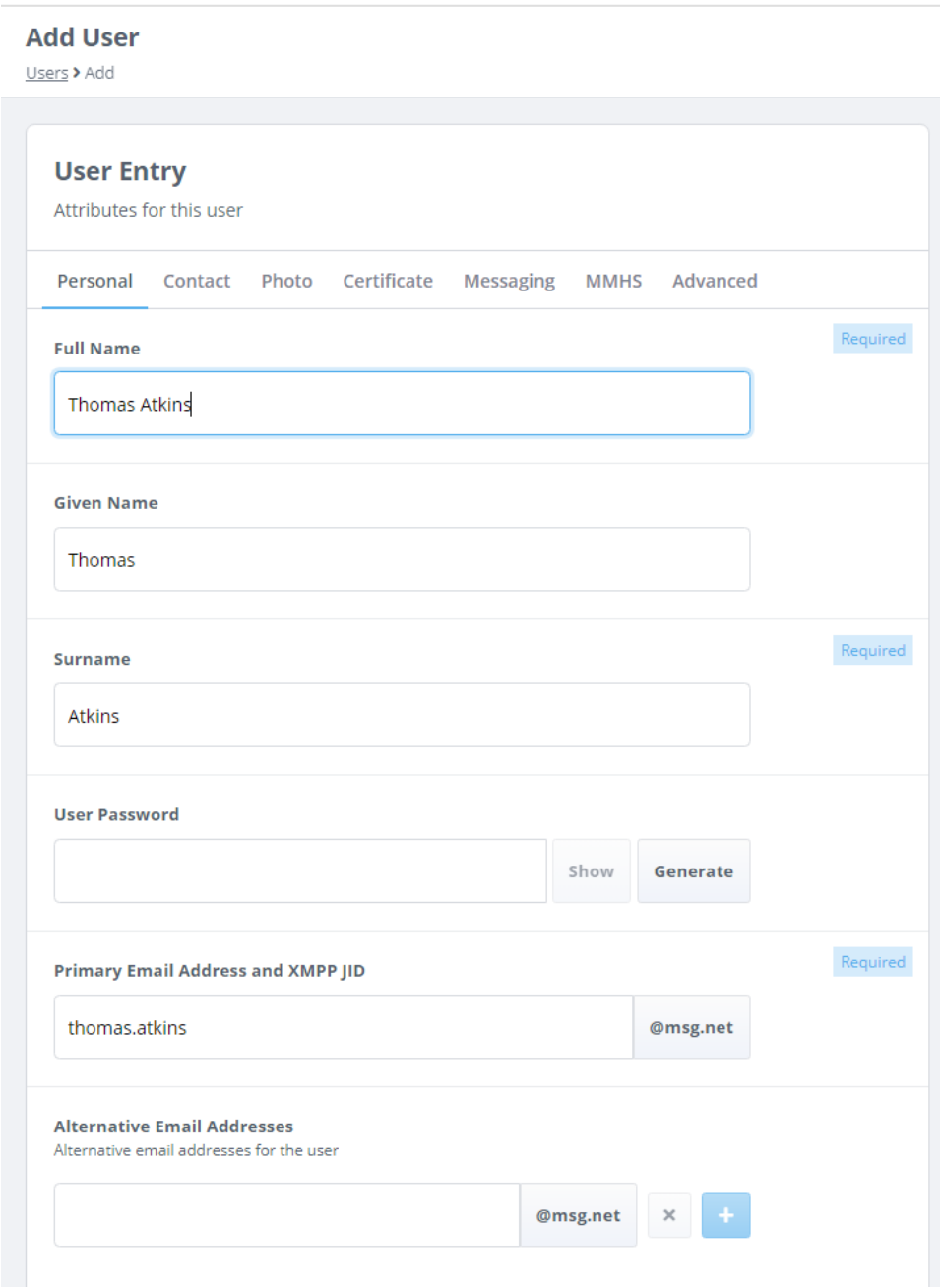


In order to delete a user, check the box next to the username, and then select **Delete** action from the **Actions** dropdown. Alternatively, use the right click context menu to select an action. When Cobalt deletes a user, the user's entry is moved to the *Deleted* section of the DIT (see Section 1.3.4, “DIT Layout”). A *Deleted* user can be restored by selecting the **Restore** action from the **Actions** dropdown menu. A user entry can be removed from the directory altogether by using the **Purge** action. Note that a purged user cannot be restored, and Cobalt will not prevent any new user with the same name as the purged user from being added.

A user can be a locked either as a result of password policy or manually by the administrator by selecting the **Lock** action from the **Actions** dropdown menu. Use the **Unlock** action to unlock the user.

To view details for a user, click on the appropriate row. The details will be displayed, with attributes grouped into tabs. A new user can be added using the **Add** button. The following form will be displayed for adding a user in a domain.

Figure 3.4. Add User



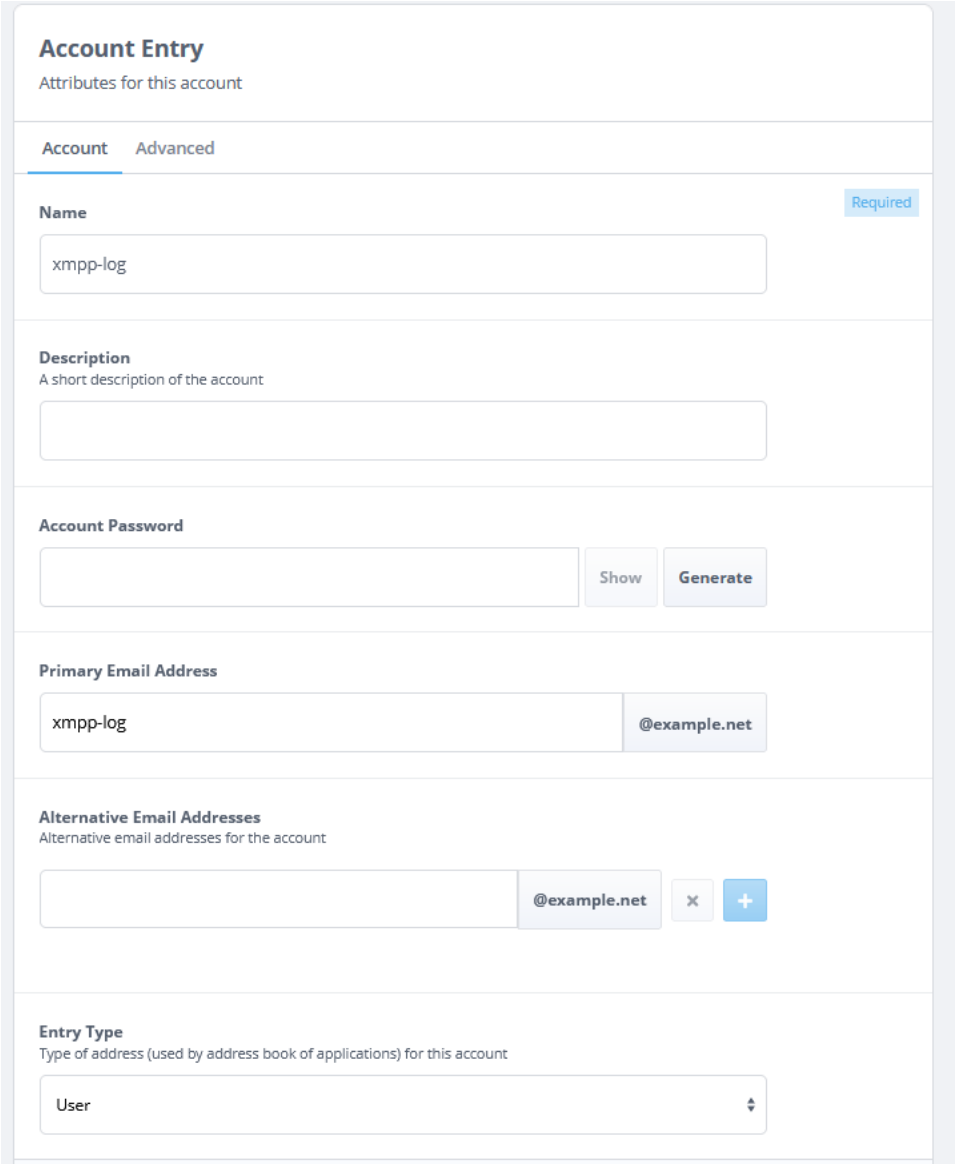
A drop-down labelled **Options** appears at the top right corner of the user form. It provides options to reset user's password and to view user's distribution list membership.

3.3 Special Accounts

Some entries do not fall under any user or feature but may be required for special purposes like accounts for in-house services like release, test, etc. These entries can be created under the **Special Accounts** category.

The following figure displays a special account entry.

Figure 3.5. Account Form

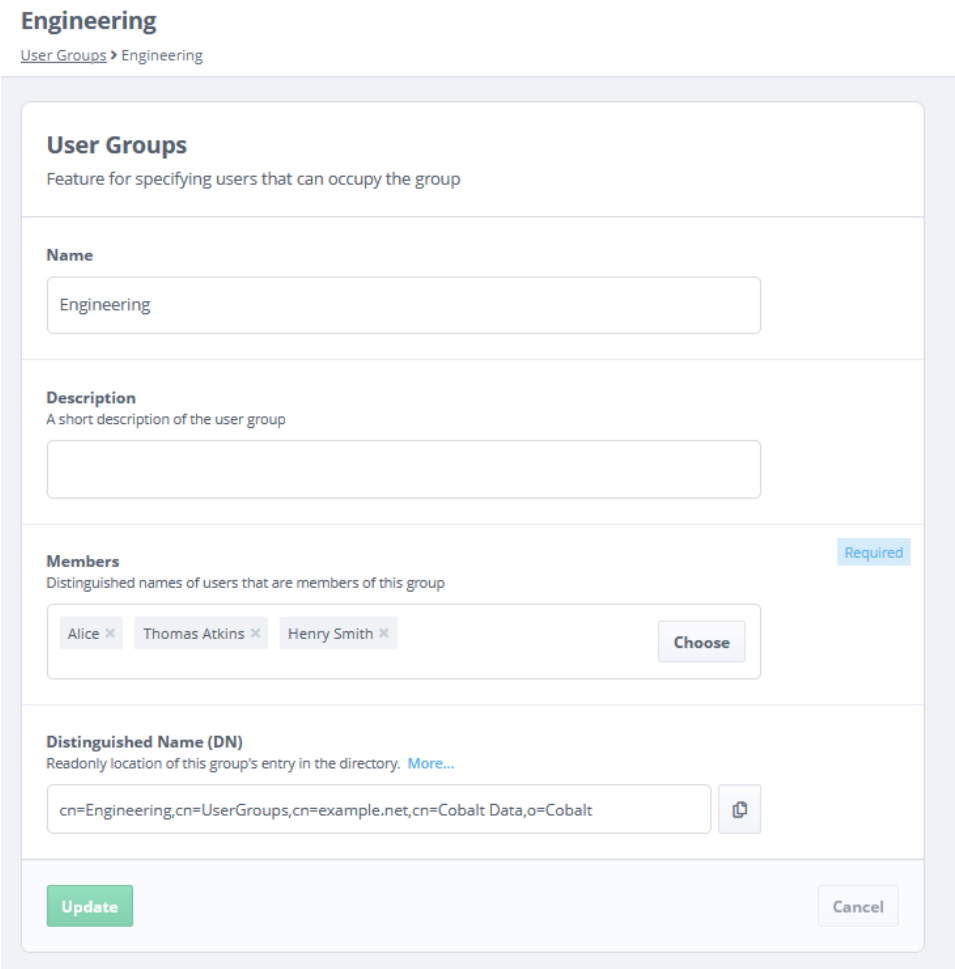


3.4 User Groups

A user group consists of a group of users. User groups can be configured and managed with Cobalt by enabling support for them in the domain features (Section 2.3.2, "Domain Features"). Create a group with one or more members from the configured domains by selecting the **Choose** button.

The following figure displays a form for a user group with members.

Figure 3.6. User Group Form

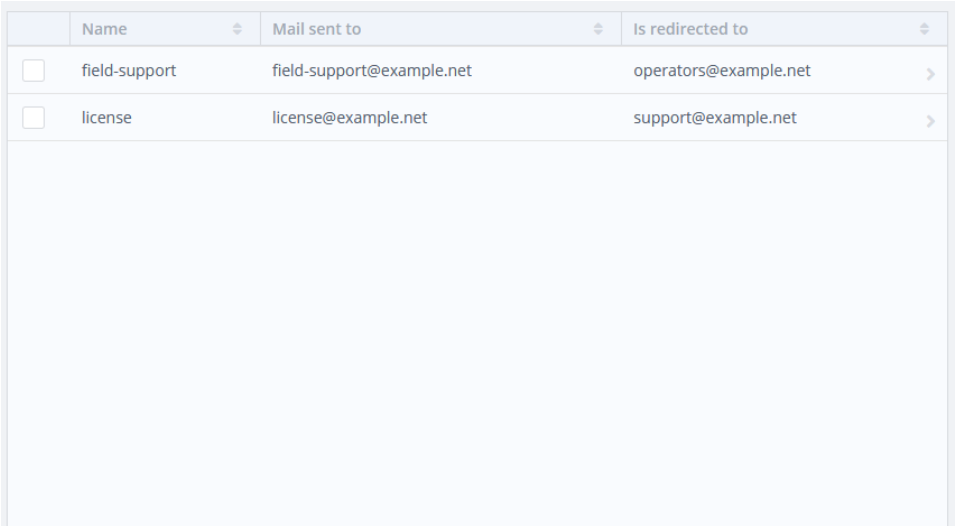


3.5 Redirections

A **Redirection** role provides the functionality to specify a redirection for one or more email addresses to a given email address. See Section 1.2.4, “Email Support”.

Select the **Redirections** item from the left sidebar (Figure 3.2, “LHS Sidebar”) to display the configured redirections for the domain as shown in figure below.

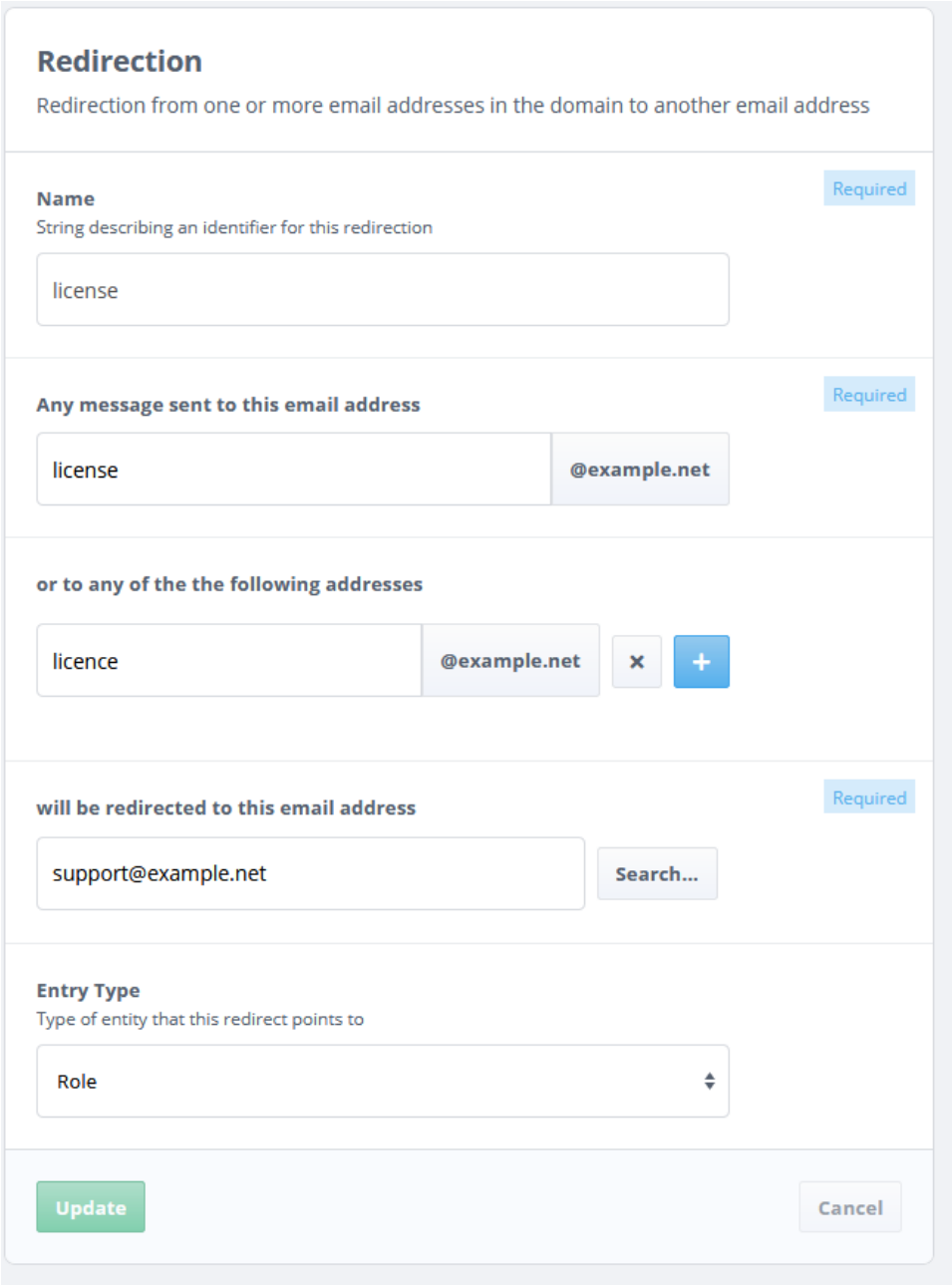
Figure 3.7. Redirections



Name	Mail sent to	Is redirected to
field-support	field-support@example.net	operators@example.net
license	license@example.net	support@example.net

Use **Add** to add a new entry and click in a row to view it. The following form will be displayed.

Figure 3.8. Redirection Form



The **Entry Type** attribute describes the type of entity that this redirection points to and can take one of the following values:

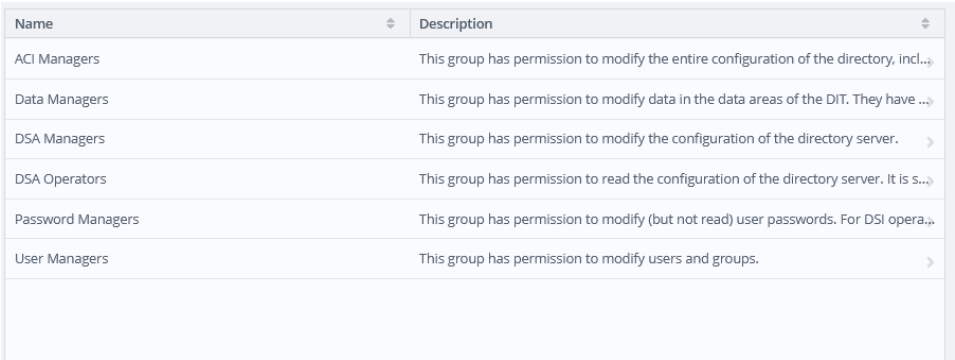
- User
- Role
- Organization

3.6 Directory Access Rights

Cobalt will allow modifying the list of users in the directory server groups if the base DN for the directory server groups has been configured for the domain by the Cobalt

administrator (see Figure 2.16, “Domain Settings”). Select the **Directory Access Rights** item from the LHS sidebar to view the directory server groups as shown below.

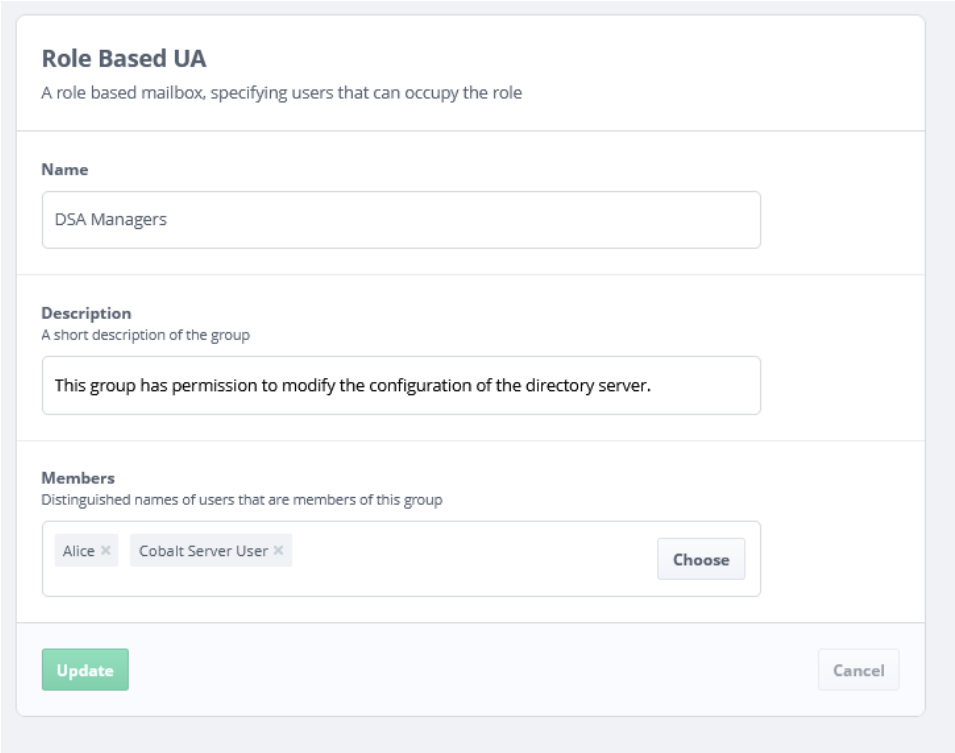
Figure 3.9. Directory Server Groups



Name	Description
ACI Managers	This group has permission to modify the entire configuration of the directory, incl...
Data Managers	This group has permission to modify data in the data areas of the DIT. They have ...
DSA Managers	This group has permission to modify the configuration of the directory server.
DSA Operators	This group has permission to read the configuration of the directory server. It is s...
Password Managers	This group has permission to modify (but not read) user passwords. For DSI opera...
User Managers	This group has permission to modify users and groups.

Select a group in order to modify the members in the group. The following figure displays the form for viewing and modifying members in the group.

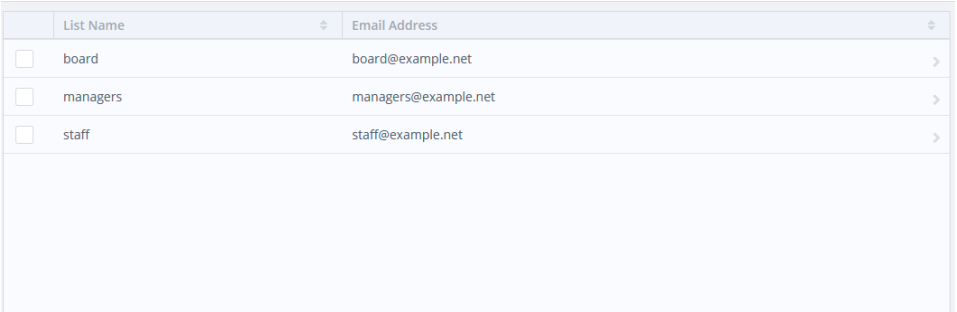
Figure 3.10. Directory Server Group Form



3.7 Internet Distribution Lists

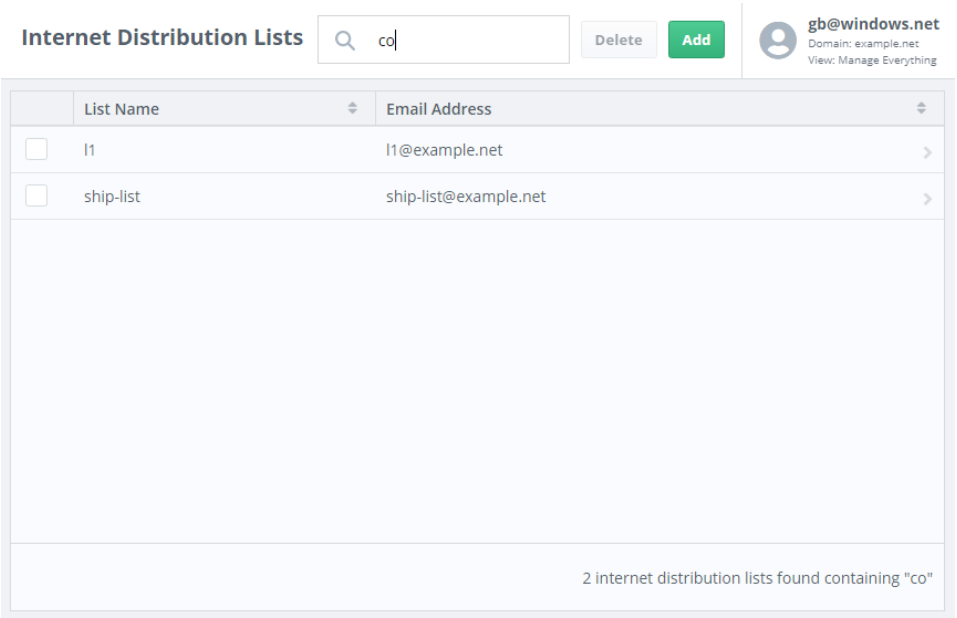
Cobalt provides the functionality to manage Internet Distribution Lists for a domain (see Section 1.2.4, “Email Support”). Select **Internet Distribution Lists** item from the left sidebar (Figure 3.2, “LHS Sidebar”) to view them as shown in the figure below.

Figure 3.11. Internet Distribution Lists



The search box can be used to filter and show lists containing members that match a specified string.

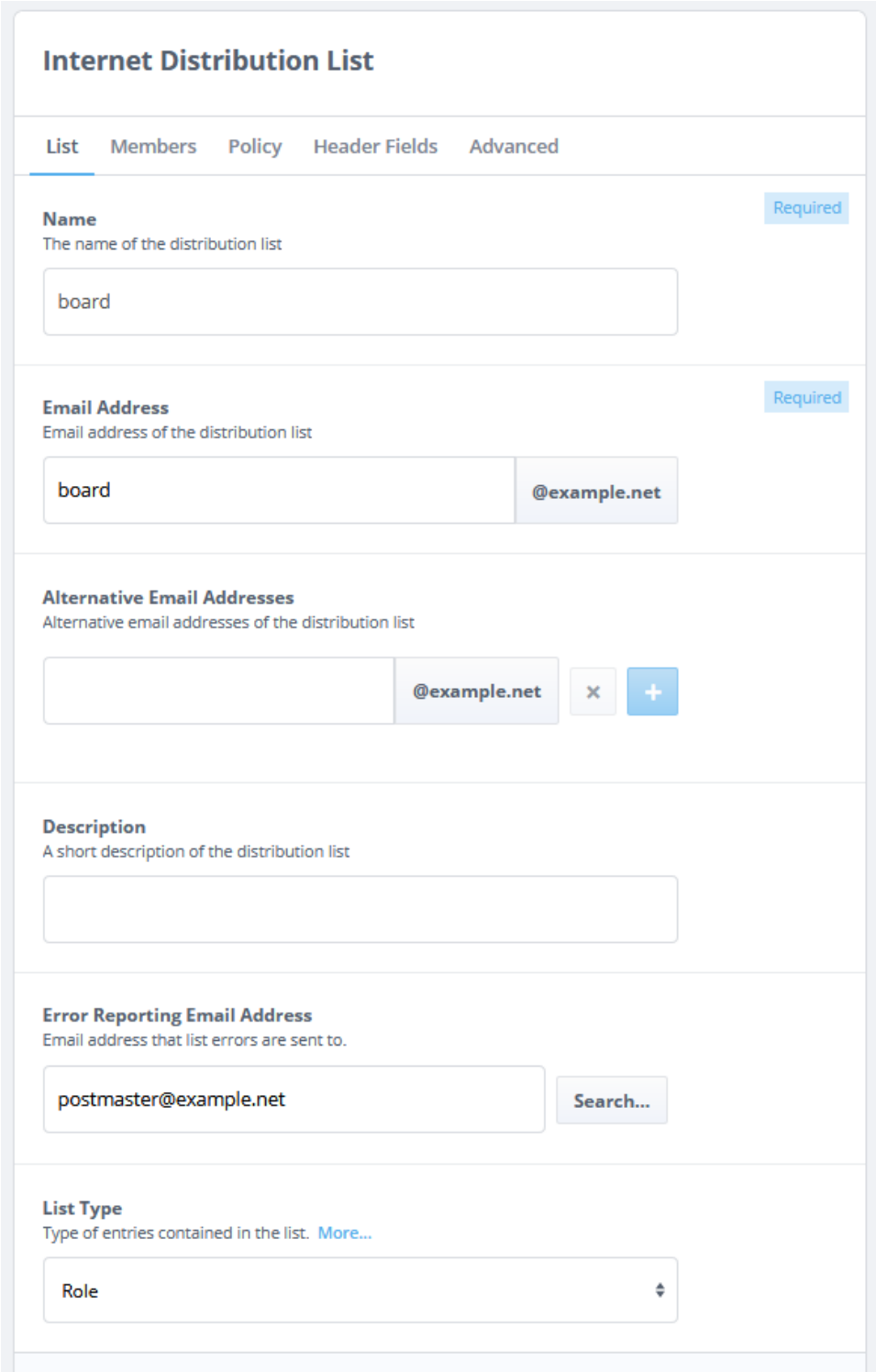
Figure 3.12. Search members in Internet Distribution Lists



Click in a row in the table to view a list and its attributes (see Figure 3.13, “Internet Distribution List Form”).

Add button is used to set up a new distribution list.

Figure 3.13. Internet Distribution List Form



A list requires an email address and can have one or more member email addresses (see Figure 3.14, "Internet Distribution List Members"). There are a number of attributes for a distribution list that are grouped in tabs on the form. The email addresses of the members, submitters and error-reporting can be searched and selected using the **Search...** button (see Figure 2.12, "Search and Select").

The information header addition as per RFC 2369 can be set on the **Header Fields** tab. A *policy* can be specified to control how the list behaves, and who is allowed to submit messages to it (see Figure 3.15, "Distribution List Policy").

Figure 3.14. Internet Distribution List Members

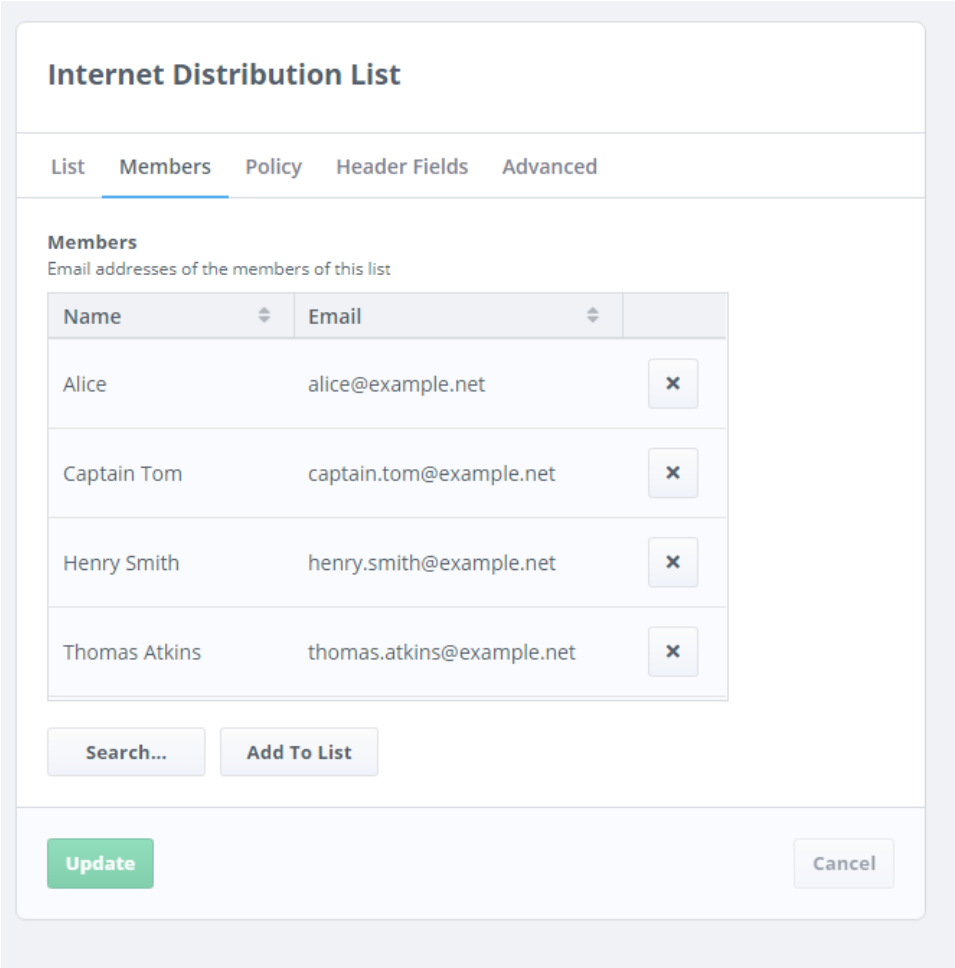
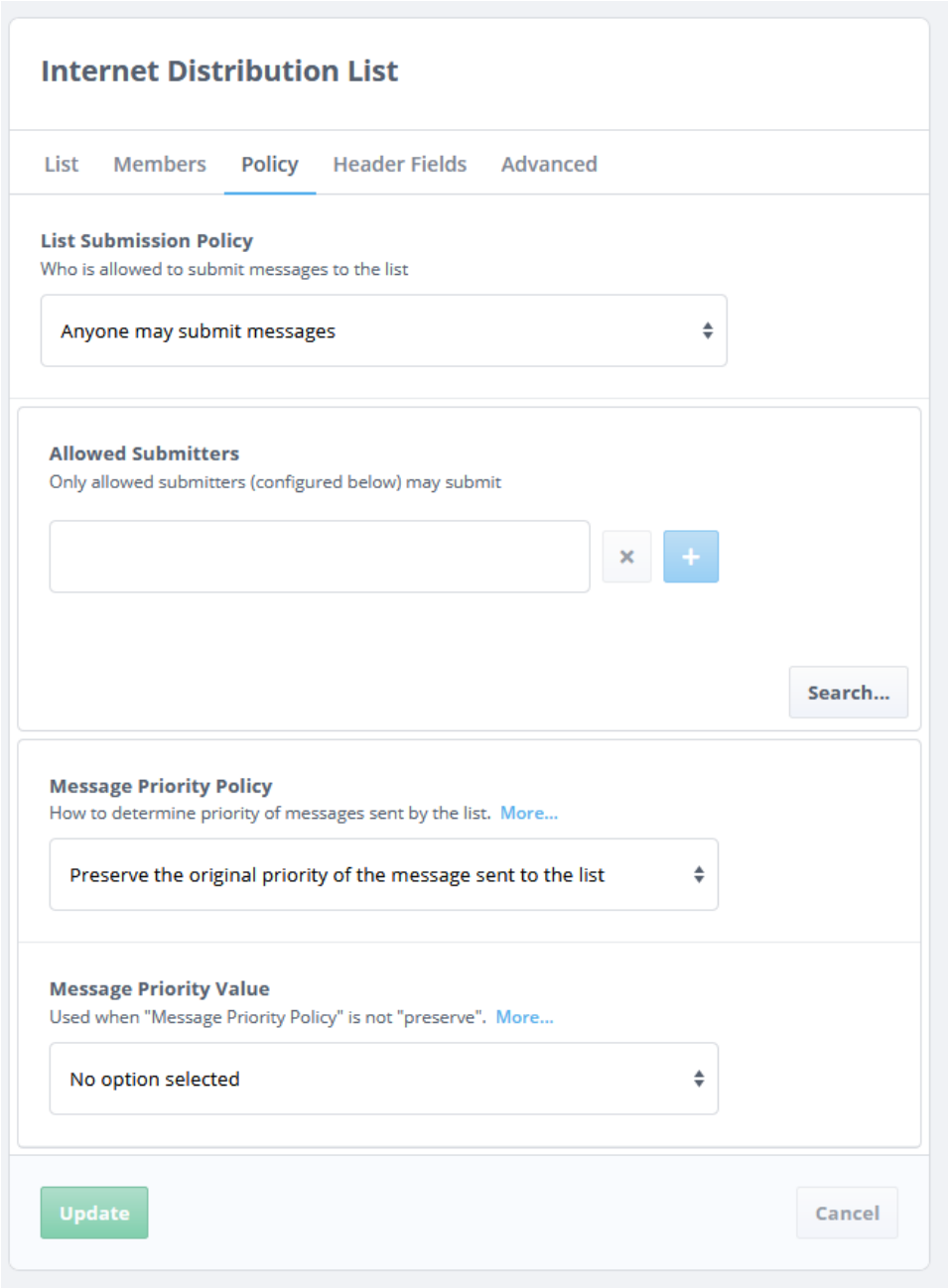


Figure 3.15. Distribution List Policy

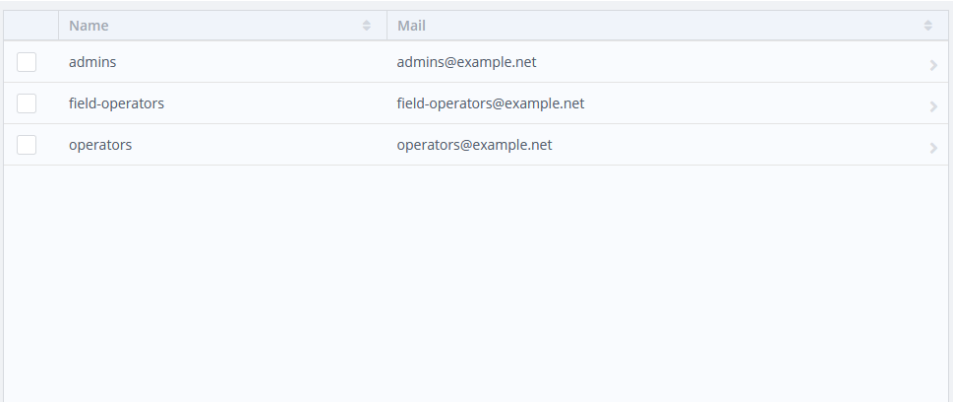


3.8 Role Based User Agents

A Role Based User Agent (see Section 1.2.5, “Military Messaging Support”) can be created and managed by selecting the **Role Based User Agents** item from the left sidebar (Figure 2.12, “Search and Select”).

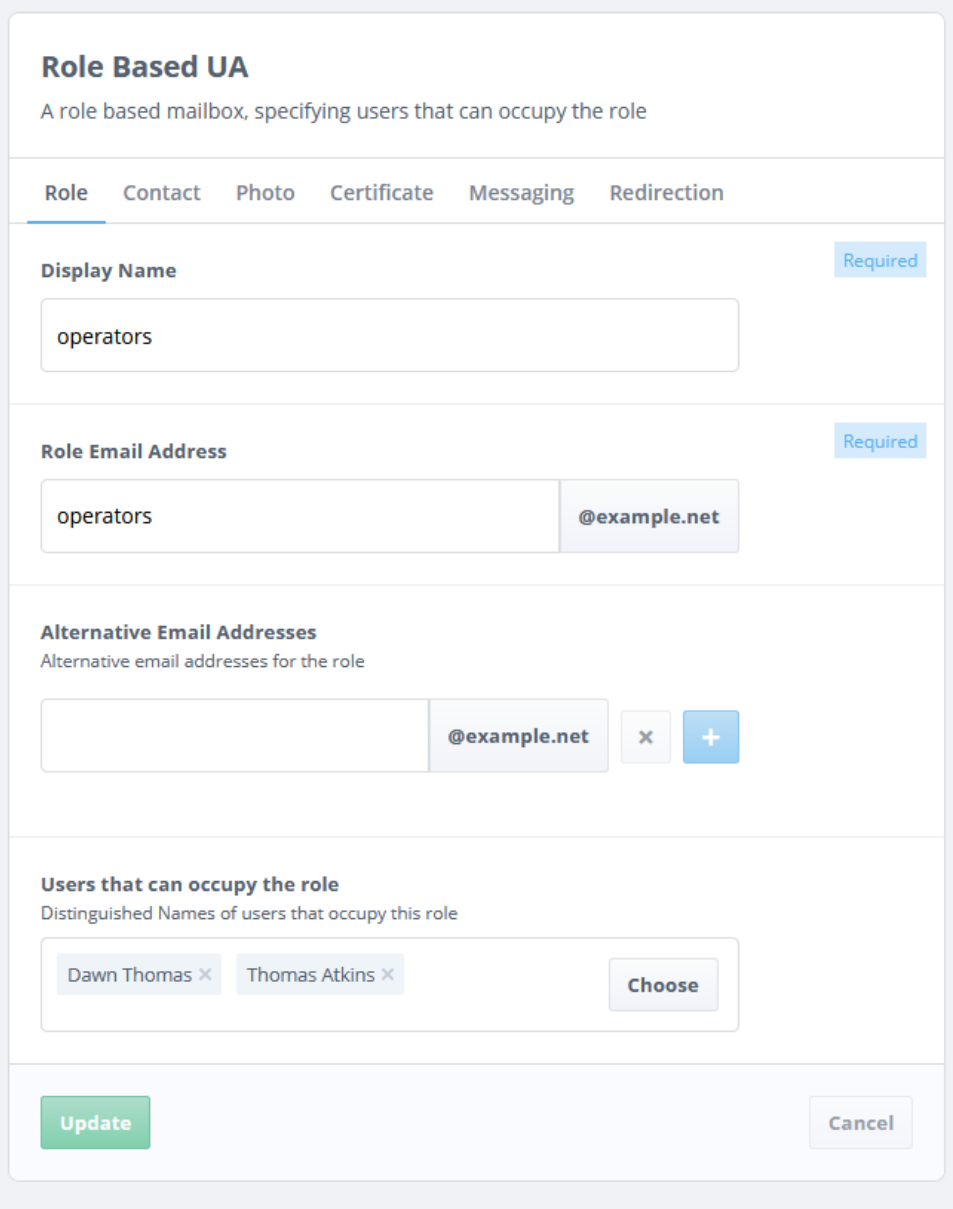
A table as shown in figure below will be displayed.

Figure 3.16. Role Based User Agents



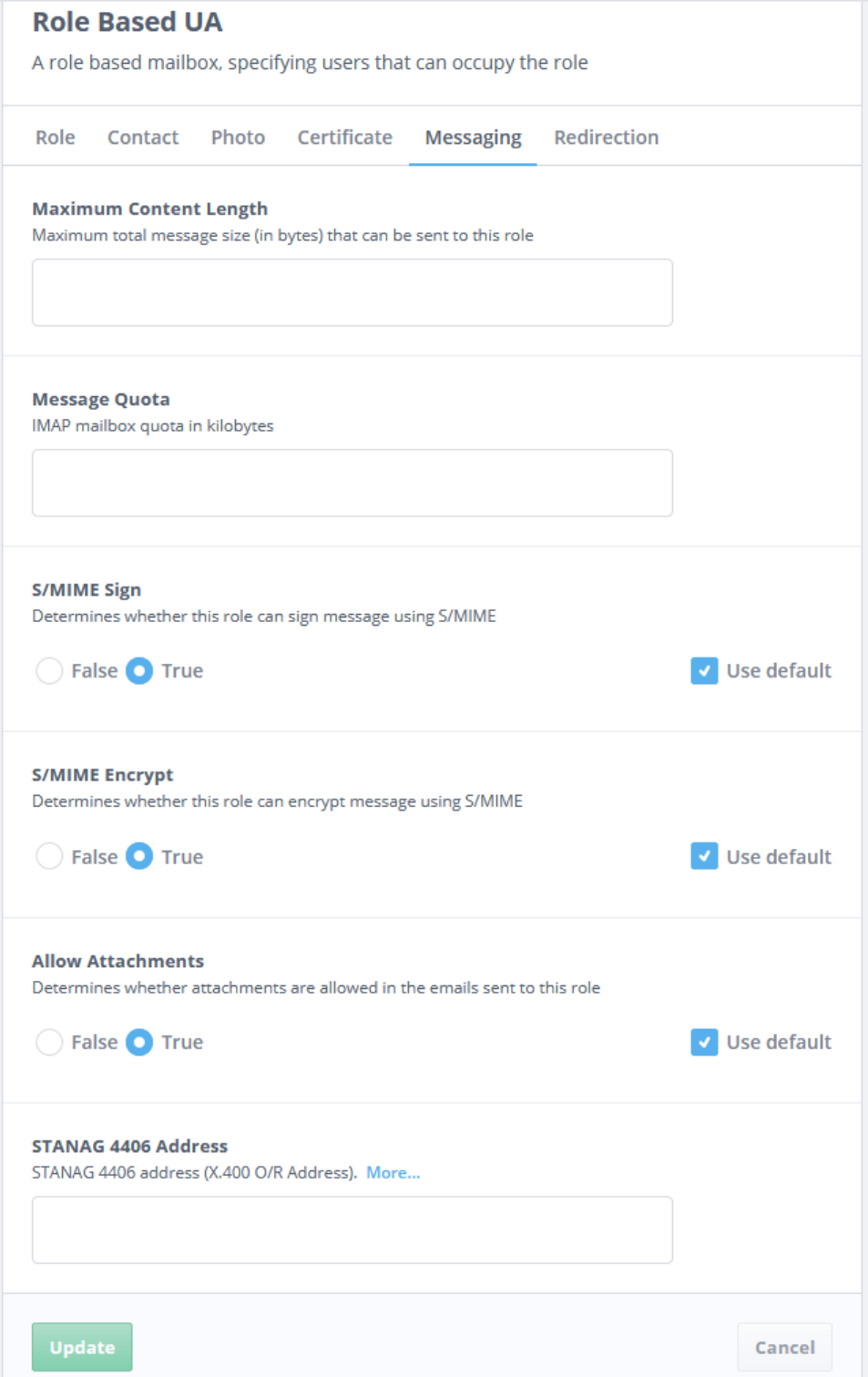
In order to add a Role Based User Agent, select **Add** and fill in the form as shown below to specify the email address for the mailbox. Search and select (Figure 2.12, "Search and Select") one or more users that can occupy this role.

Figure 3.17. Role Based User Agent Form



Contact tab contains the contact information like address and phone number. **Messaging** tab (see Figure 3.18, "Role Based User Agent Messaging Tab") specifies the information related to the role's mailbox. Other attributes (photo, certificate, redirection) associated with this role can be found on the respective tabs.

Figure 3.18. Role Based User Agent Messaging Tab

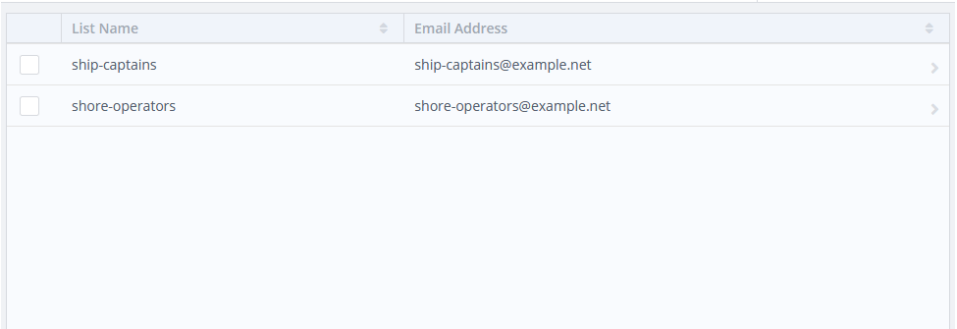


3.9 Military Address Lists

Military Address Lists (see Section 1.2.5, “Military Messaging Support”) can be created and managed by selecting the **Military Address Lists** item from the left sidebar (Figure 3.2, “LHS Sidebar”).

A list of **Military Address Lists** will be displayed as shown below.

Figure 3.19. Military Address Lists

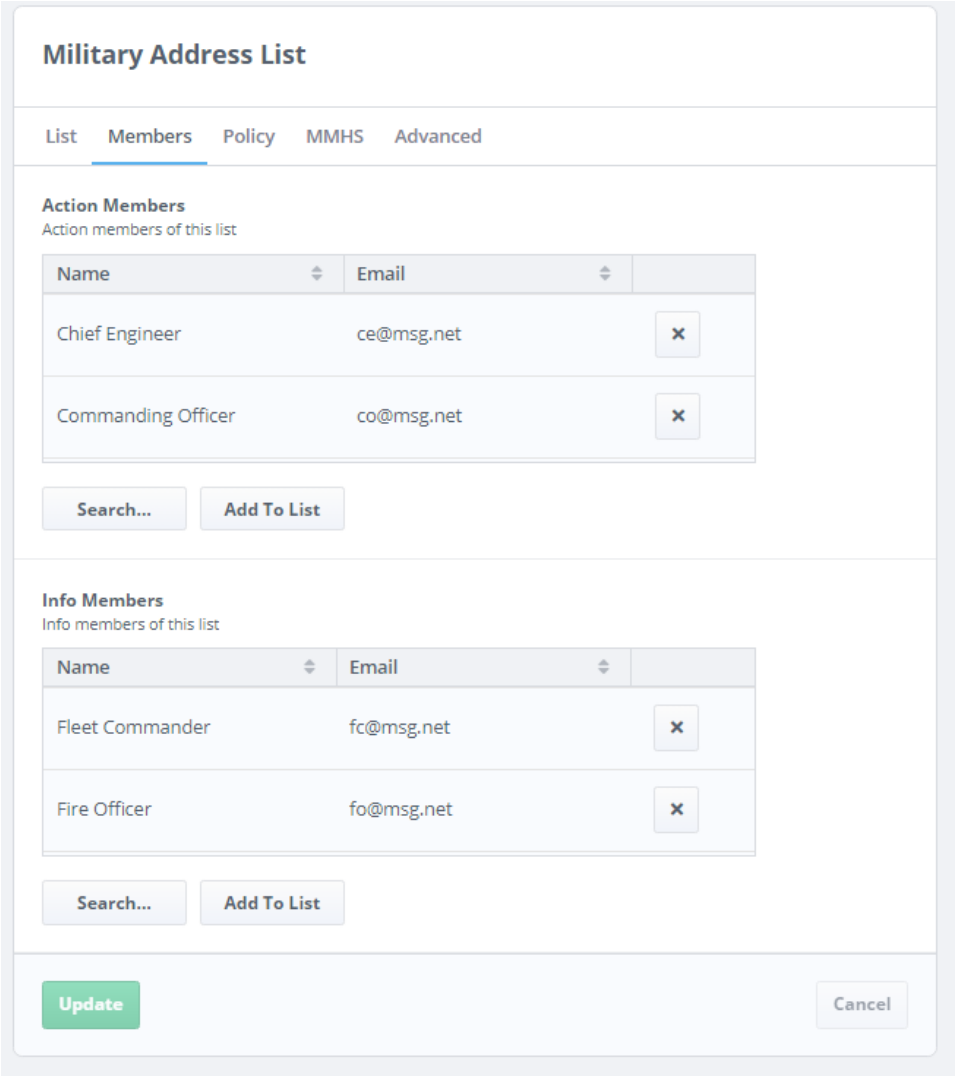


Military Address Lists can be set up like Internet Distribution Lists by specifying an email address and *Action* and *Info* members.

A *policy* can be specified to control how the list behaves, and who is allowed to submit messages to it (see Figure 3.15, “Distribution List Policy”).

The figure below displays the form that appears on selecting a **Military Address List** entry.

Figure 3.20. Military Address List

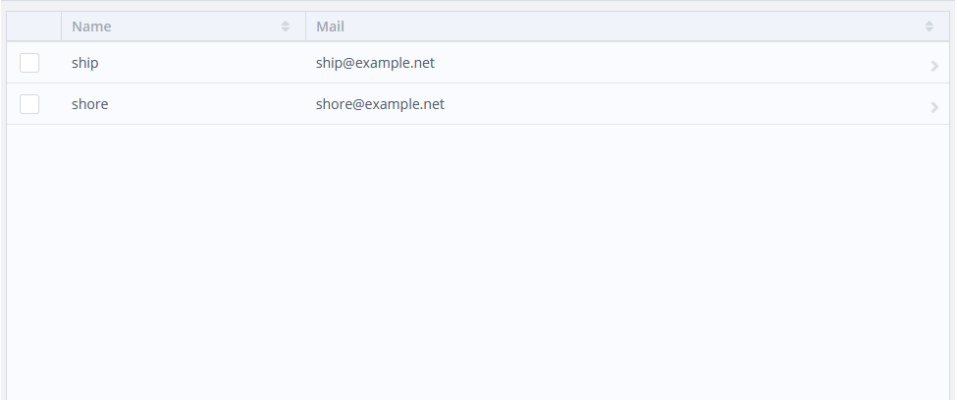


3.10 Profiled Addresses (Organizations)

Profiled Addresses (see Section 1.2.5, “Military Messaging Support”) can be managed by selecting the **Profiled Addresses** item from the left sidebar (Figure 3.2, “LHS Sidebar”).

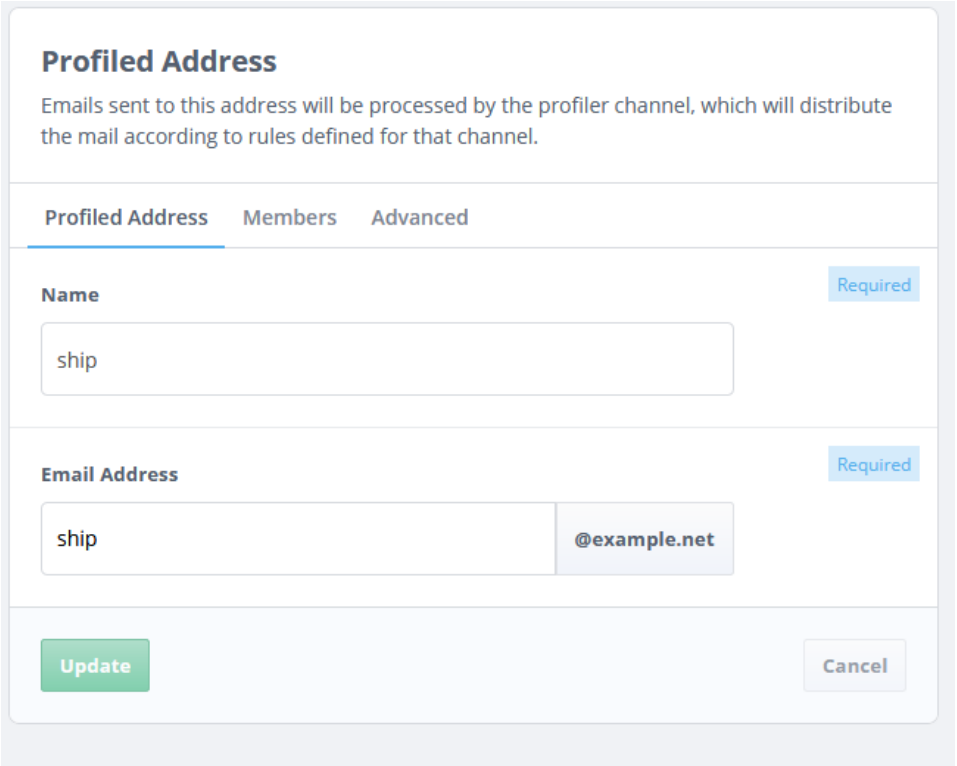
The figure below displays a list of **Profiled Addresses** for a domain.

Figure 3.21. Profiled Addresses



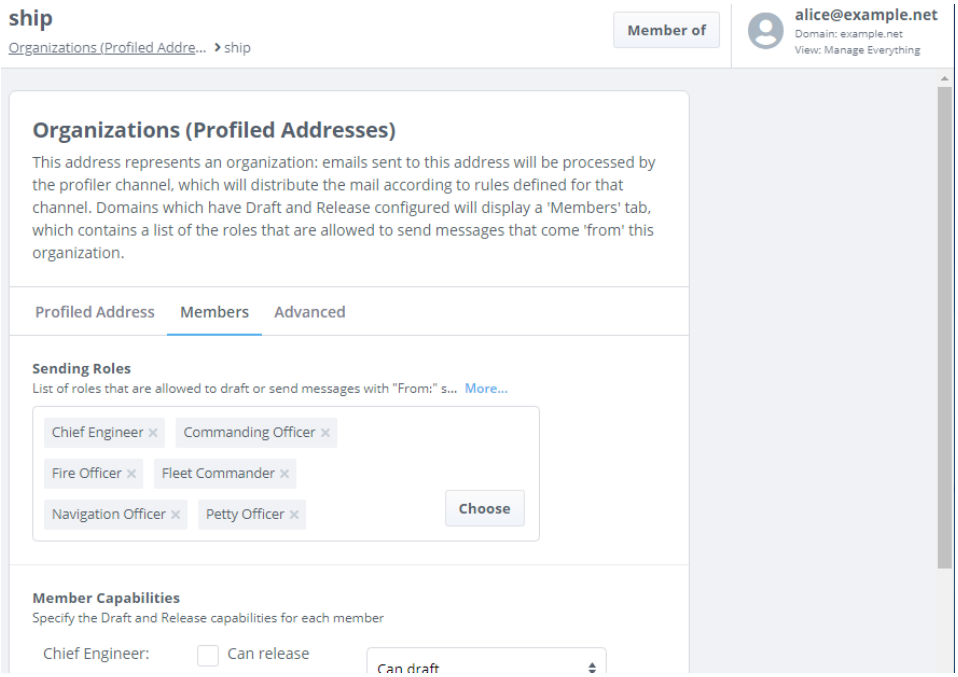
A profiled address requires an email address for creation. The figure below displays the form for a **Profiled Address**.

Figure 3.22. Profiled Address Form



One or more roles can be selected as *members* by using the select dialog that appears by clicking the **Choose** button (see figure below).

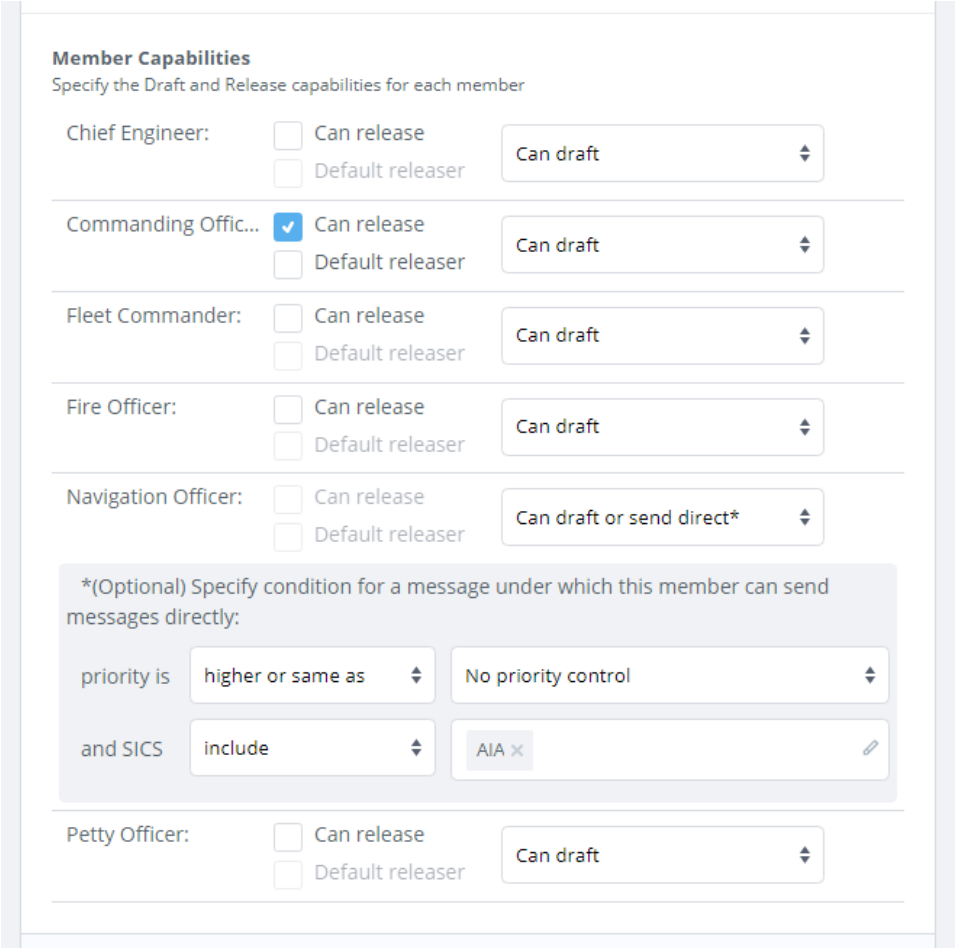
Figure 3.23. Profiled Address Members



3.10.1 Configuring Draft and Release

Configuration of Draft and Release is shown by example in the screenshot below. Cobalt manages the configuration of Organizations, which will be handled by a Profiler on delivery. For each organization, Cobalt allows configuration of a set of members, each of which represents an organizational role within that organisation (e.g., "Chief Engineer", "Fire Officer"). For Military Messaging, each role is associated with a mailbox, with (human) user assigned to one or more roles dependent on responsibility. Any role can be occupied by multiple users, for example covering shifts.

Figure 3.24. Draft and Release Configuration



Each member of an organisation is conferred rights that determine what draft and release rights they have (all members can review messages). For a releaser there are two choices of function:

- **Can Draft**. This allows a releaser to also act as drafter.
- **Always Send Directly**. This prevents releaser from acting as a drafter.

Then there are three choices of function for roles that cannot release.

- **Can Draft**. This role can only draft.
- **Always Send Directly**. This role can send any message directly and never drafts.
- **Draft or Send Direct**. This role can always draft and can send messages directly that meet certain (optional) criteria:
  - **Priority**. Limits the highest or lowest priority message that can be send directly.
  - **Require SICs**. Can send directly for a list of SICs. This allows a role to send directly messages on specific topics.
  - **Exclude SICs**. This allows a role to send directly, unless certain SICs are used. This can be used to exclude use of certain general and sensitive SICs.

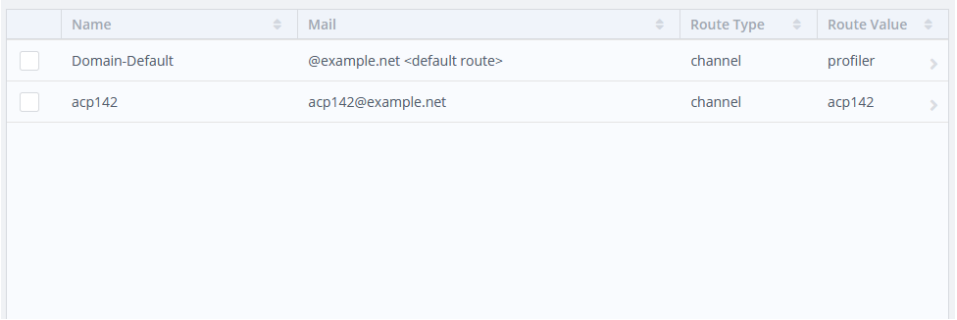
The source of SICs offered by the UI is an XML file. A sample file called *sics.sample.xml* is located in `(SHAREDIR)` directory. This file can be used as a template to provide an alternate source for SICs and should be named as *sics.xml* and placed in the `(ETCDIR)` directory.

3.11 Routed User Agents

A Routed User Agent (see Section 1.2.5, “Military Messaging Support”) can be created and managed by selecting the **Routed User Agents** item from the left sidebar (Figure 3.2, “LHS Sidebar”).

The figure below displays a list of **Routed User Agents** for a domain.

Figure 3.25. Routed User Agents

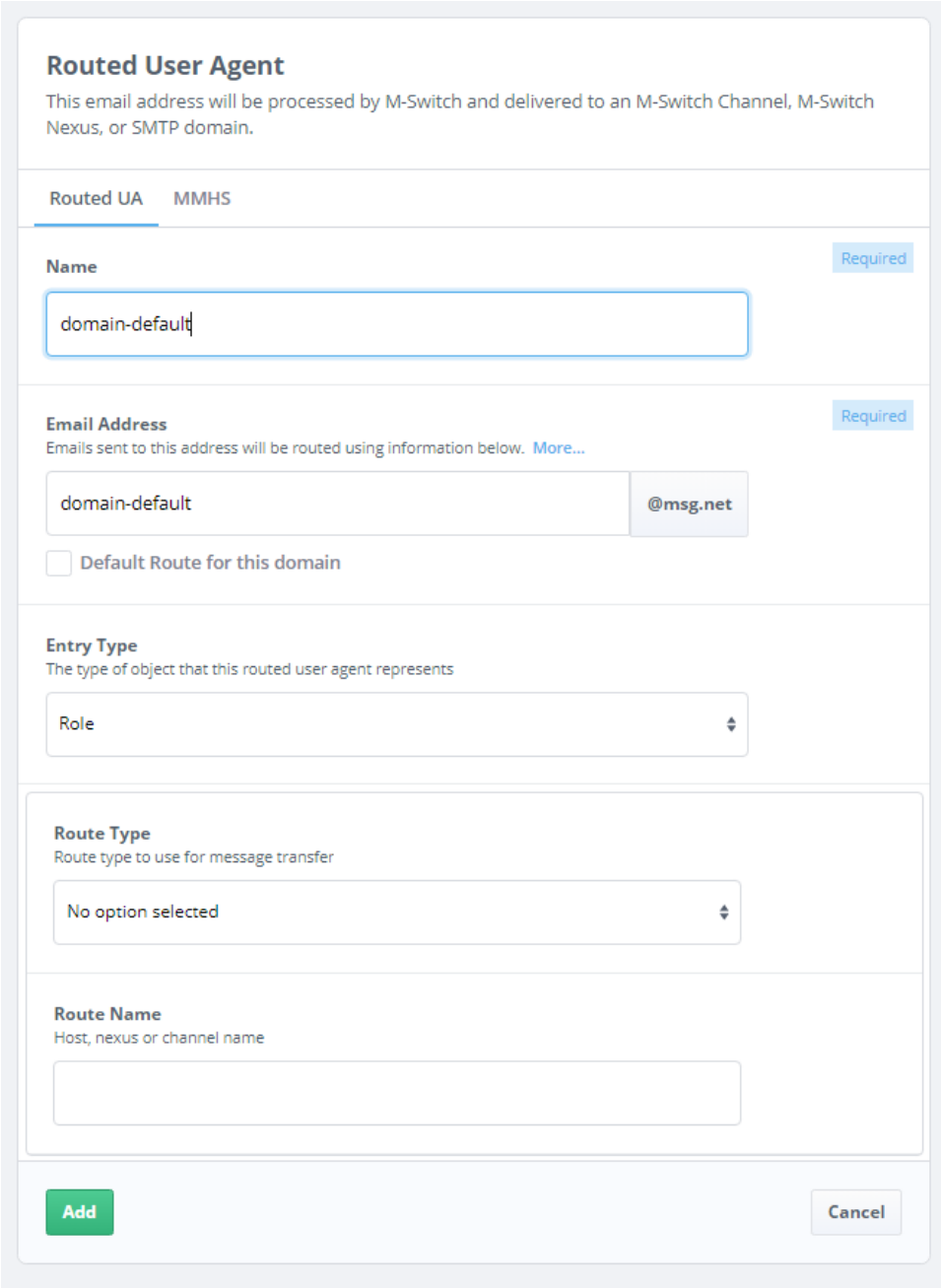


Name	Mail	Route Type	Route Value
Domain-Default	@example.net <default route>	channel	profiler
acp142	acp142@example.net	channel	acp142

In order to create a new Routed User Agent an address and a route is required. Specify an email address or select **Default Route for this domain** and set a route value. A route value can be set by selecting a route type and setting its value.

The figure below displays the form for a **Routed User Agent**.

Figure 3.26. Routed User Agent Form



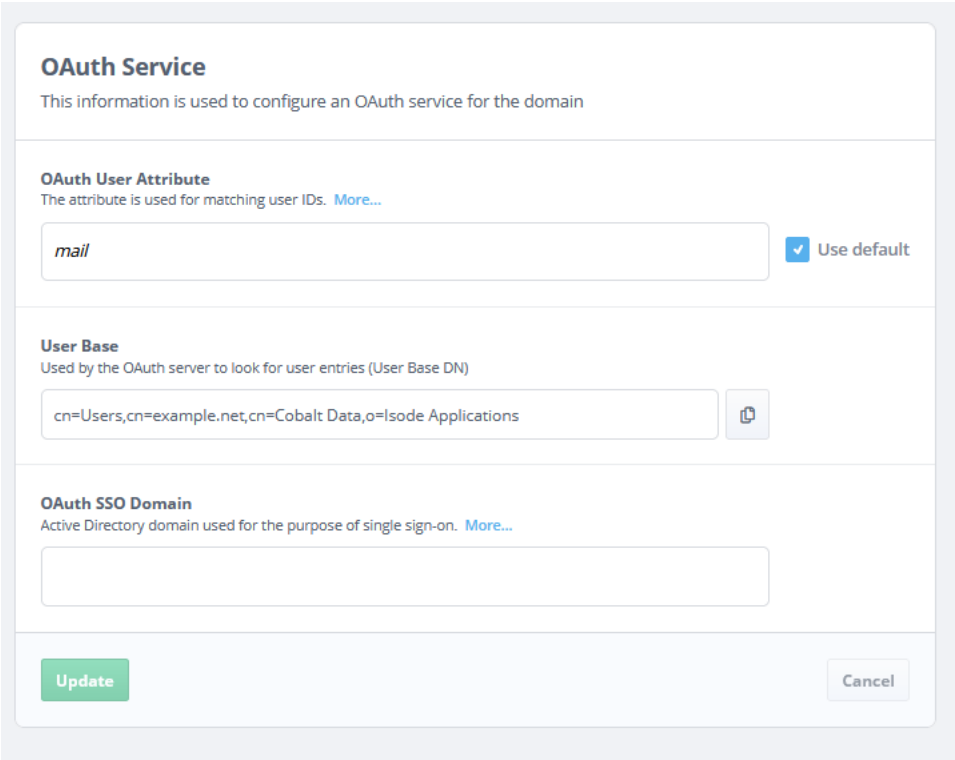
3.12 OAuth Service

OAuth is a widely used service in support of authentication and authorization of web applications. Isode's OAuth server is a part of M-Vault that reads its own configuration and information about OAuth clients (Isode web applications) from the directory. It also reads information on users and their permissions from the directory.

Cobalt provides a user-friendly UI to configure Isode OAuth servers. In order to support OAuth service configuration, the feature should be enabled in the domain (see Figure 2.17, “Select Domain Features”).

Select the **OAuth Service** from the sidebar to view or modify OAuth configuration for the domain. The following form will be displayed.

Figure 3.27. OAuth Server Form (Tokens)

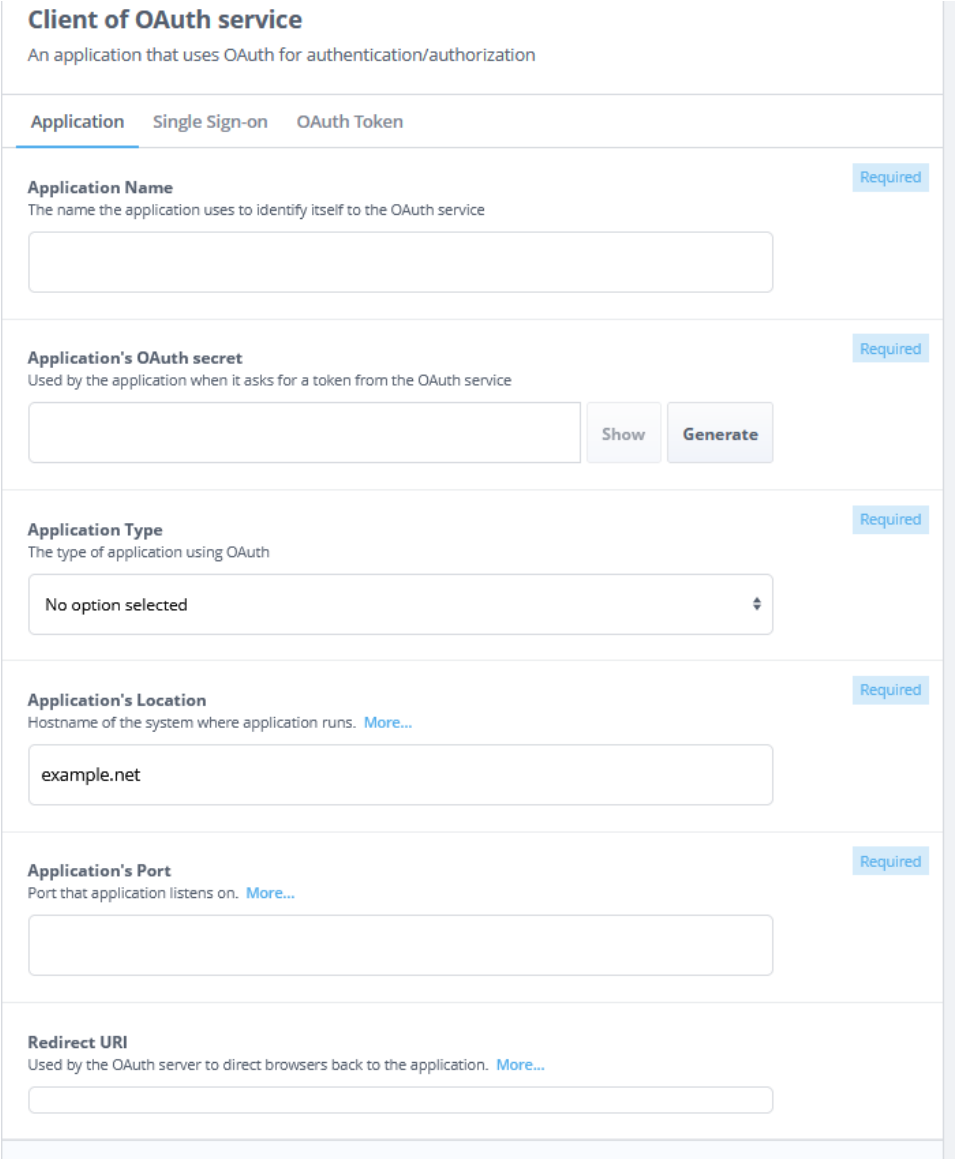


The figure above displays configuration related to the OAuth service. It configures the location (base DN) for searching users, attribute to search for matching user ID to a user in the directory and single sign-on domain.

3.13 OAuth Clients

The configuration for an OAuth client can be stored in the directory when this feature has been enabled for the domain. The following figure displays the form for configuring an OAuth client, i.e., a web application that uses OAuth for authentication/authorization.

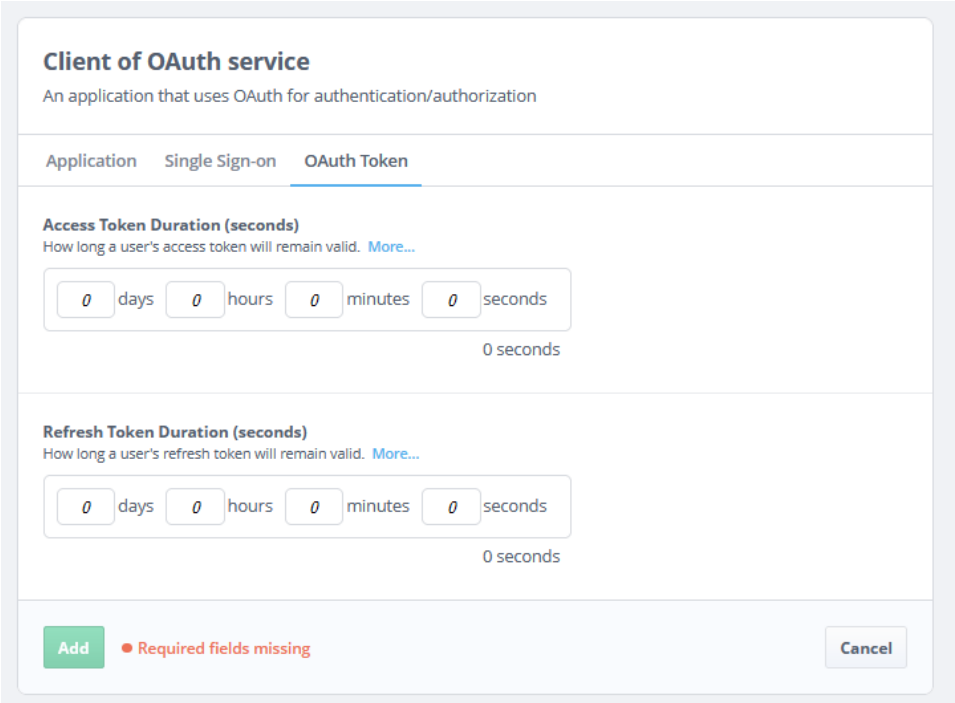
Figure 3.28. OAuth Client Form



Note that any value you enter as a *client secret* will be hashed by the directory server, and you will only see that hashed value if you subsequently look at it in Cobalt.

The form below is used to configure the OAuth clients's default timeouts for its access and refresh tokens. After successful authentication, an *Access Token* is issued, and the OAuth client will assume that a user can continue to use the service so long as that access token has not expired. Once the access token expires, the OAuth client will go back to the OAuth service to request an updated access token: so long as the *Refresh Token* has not expired, a new access token will be issued.

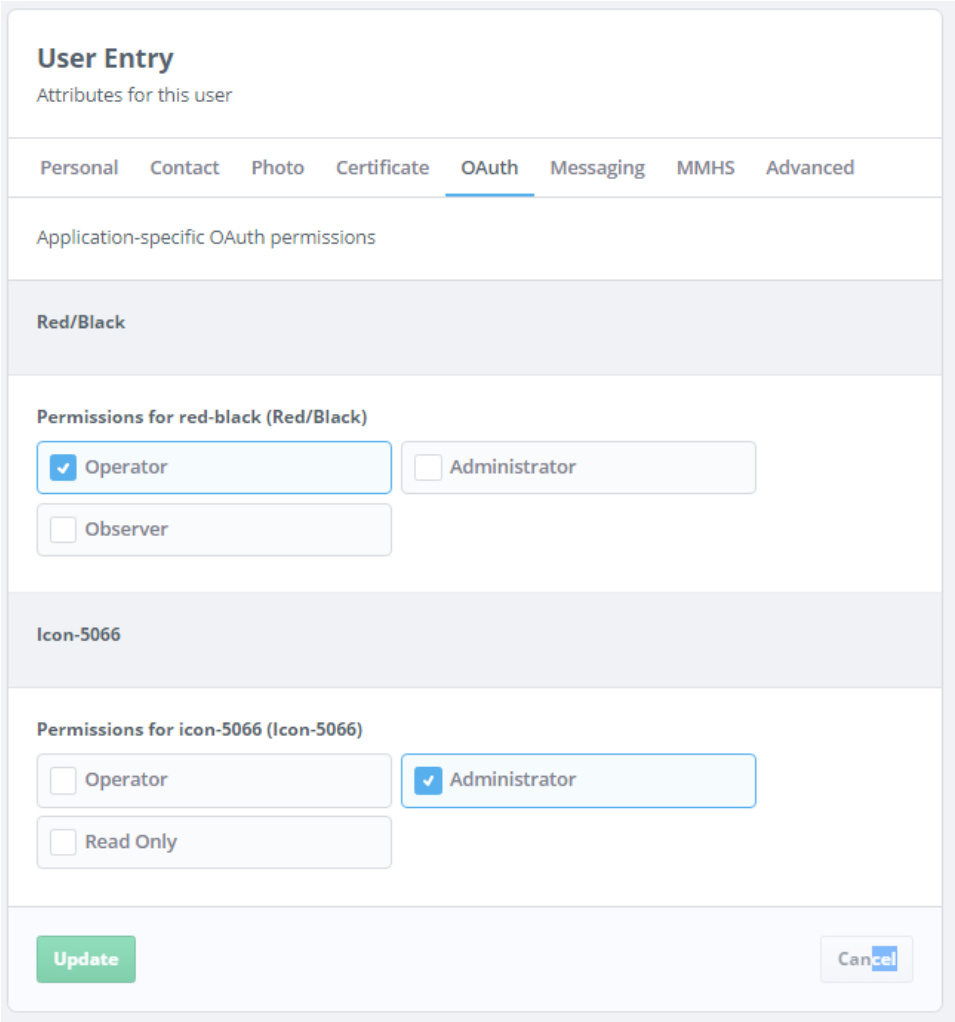
Figure 3.29. OAuth Tokens



3.13.1 OAuth User Provisioning

OAuth permissions for a user can be configured on the **OAuth** tab of the user form as shown below.

Figure 3.30. OAuth User Permissions



The above figure displays two Isode applications configured – Red/Black server and Icon-5066 server. Cobalt allows one or more (application-specific) permissions to be configured for each application instance. These permissions reflect roles (permission groups) that the user is allowed to adopt.

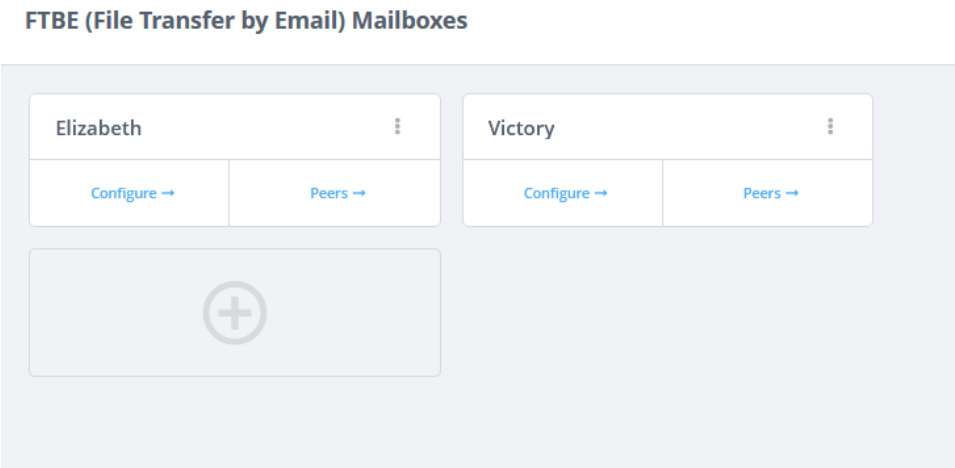
3.14 Configuration for FTBE (File Transfer By Email)

The File Transfer by Email Channel allows arbitrary files to be transferred between two systems which are running M-Switch. Cobalt provides the UI for configuring FTBE users and peers for a messaging domain.

Select the **FTBE** item from the left sidebar (Figure 3.2, “LHS Sidebar”) to display the configured FTBE users for the domain. Click the + button to add a user.

Once an FTBE user has been added, it can be modified using the **Configure** link on the card. Click on the **Peers** link to display or edit the FTBE peers for the selected FTBE user. The below figure displays a configuration with FTBE users.

Figure 3.31. FTBE Users



Select **Peers** link to view or modify the peers for an FTBE user. Click on the **Add** button to add an FTBE peer. Once peers have been added, click on a peer row to view or edit it.

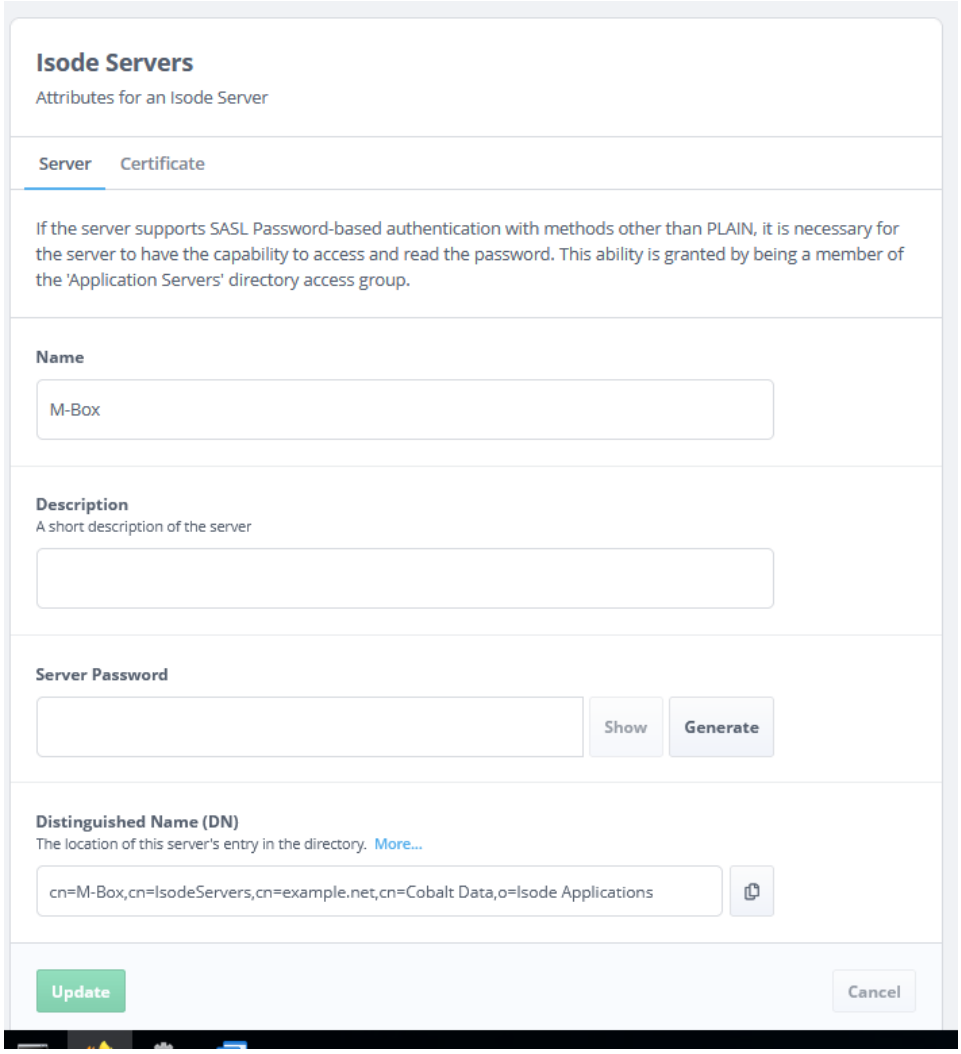
3.15 Configuration of Isode Servers

Cobalt provides a user interface (UI) for configuring Isode servers for a domain. The server entry acts as a placeholder for storing various attributes, such as certificates and signing identity.

To access the configured server entries for the domain, navigate to the Isode Servers item in the left sidebar (Figure 3.2, “LHS Sidebar”). To add a new server entry, click on the **Add** button.

Once a server entry has been added, you can view or modify it at a later time by selecting it from the table. Below is a figure depicting the configuration form for an Isode server.

Figure 3.32. Isode Server



Chapter 4 Pass-through Authentication Configuration

4.1 Configure Pass-through References

Pass-through authentication is a mechanism by which an authentication operation to a local directory server is passed-through to a different directory server. Thus the local directory server does not need to contain credential information, such as passwords.

Cobalt provides a straightforward method for setting up pass-through references in a local M-Vault directory server domain to an external directory server domain. Assuming a local domain has already been created the next steps are:

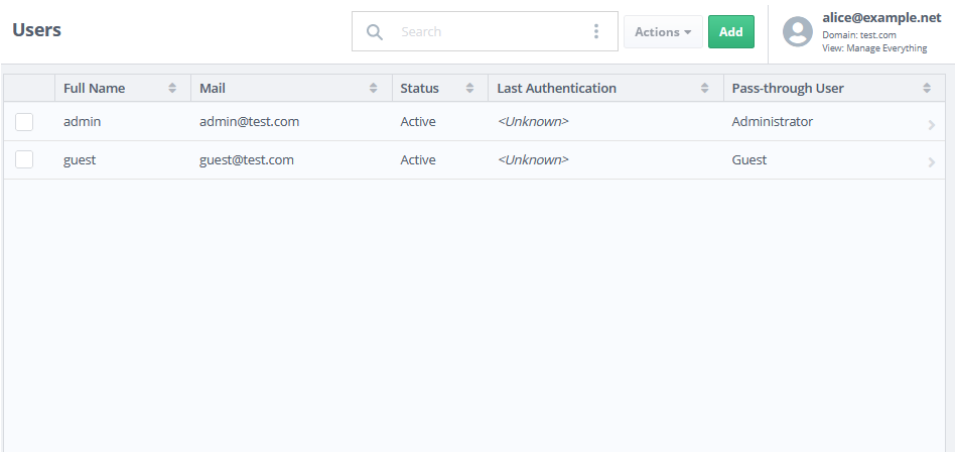
1. Create a directory server profiles for the remote directory server. See Section 2.2.3, “Directory Servers” in the Cobalt administrator view.
2. Create a corresponding domain for the remote directory server as described in Section 2.3, “Setting up Domains”.
3. Select the **Domains** item from the left-hand sidebar, then select the domain for the internal directory server and click the **Configure** link to select the **Settings** tab. In the **Pass-through Domain** field, select the domain corresponding to the external directory server (see Figure 2.16, “Domain Settings”) and submit the changes.

Once these steps have been completed Cobalt can be used to manage pass-through references for the domain as stored in the local directory server using the domain management view.

> **Note:** Pass-through must also be enabled on the local M-Vault directory server using M-Vault Console.

The user table for internal domains that have pass-through configured will display a column listing the reference (a DN) of the pass-through user entry in the external directory server as shown below.

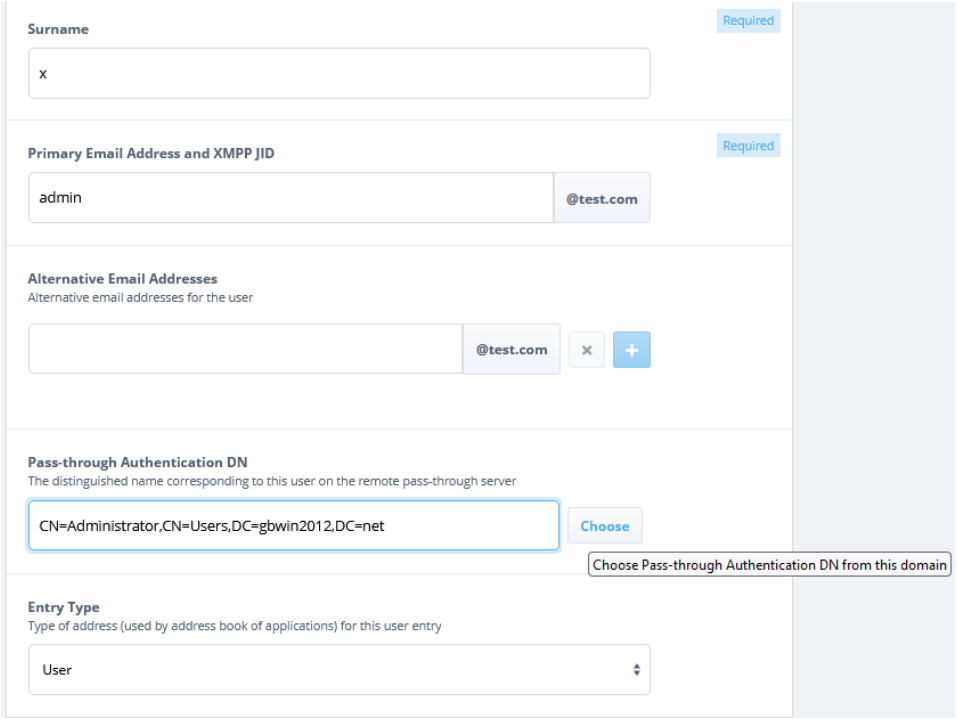
Figure 4.1. Pass-through Users



In order to set up a pass-through user mapping for a given user, select the user entry and specify the corresponding user in the external directory server domain by selecting the

Choose button for the **Pass-through Authentication DN** field as shown in the figure below. Submit the form for the changes to take effect.

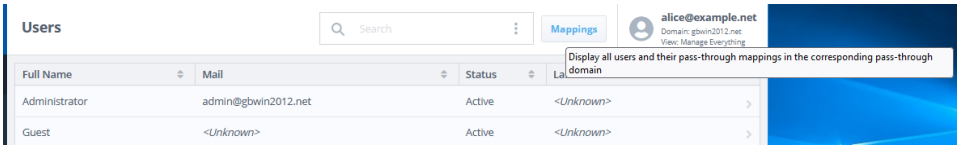
Figure 4.2. Pass-through User Entry



4.2 Pass-through Mappings

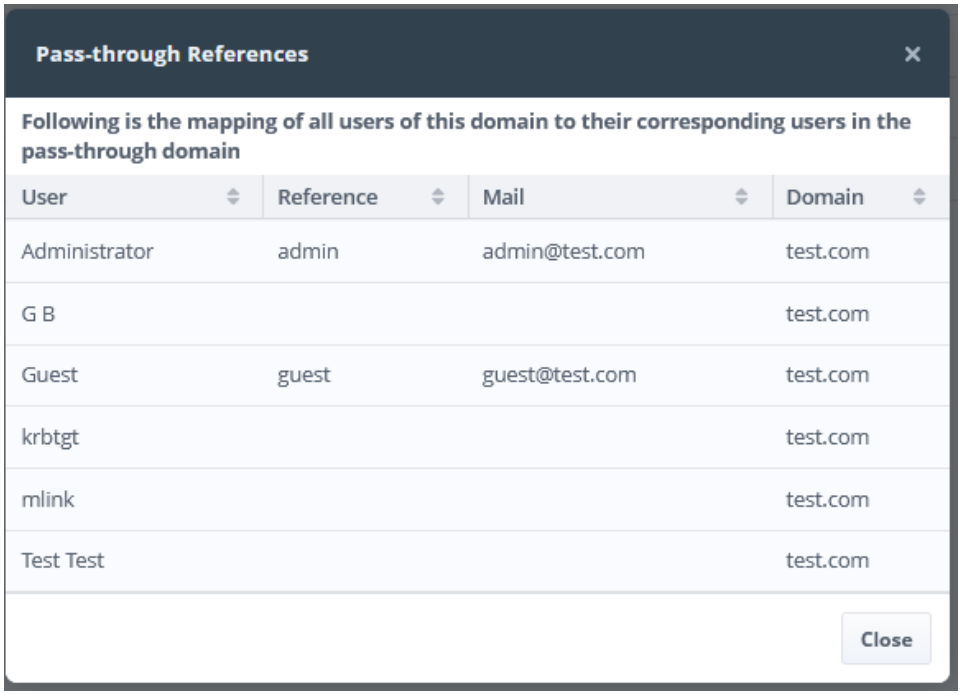
On switching to the view that manages the external directory server domain, Cobalt provides an option to view pass-through mappings for all users. On the **Users** page, click the **Mappings** button (see figure below) to view them.

Figure 4.3. Mappings Button



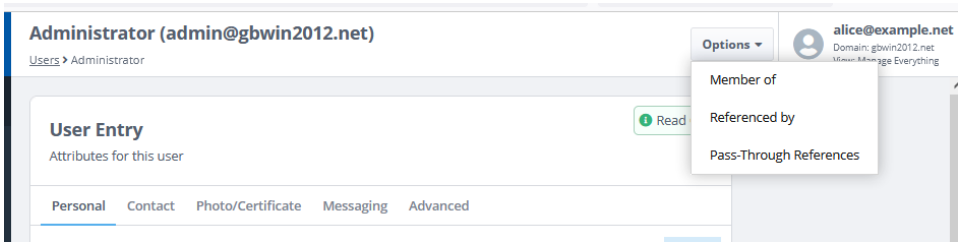
On clicking the **Mappings** button, a dialog displaying mapping for each user to the internal M-Vault directory server domain user will be displayed (see figure below).

Figure 4.4. Pass-through Mappings Summary



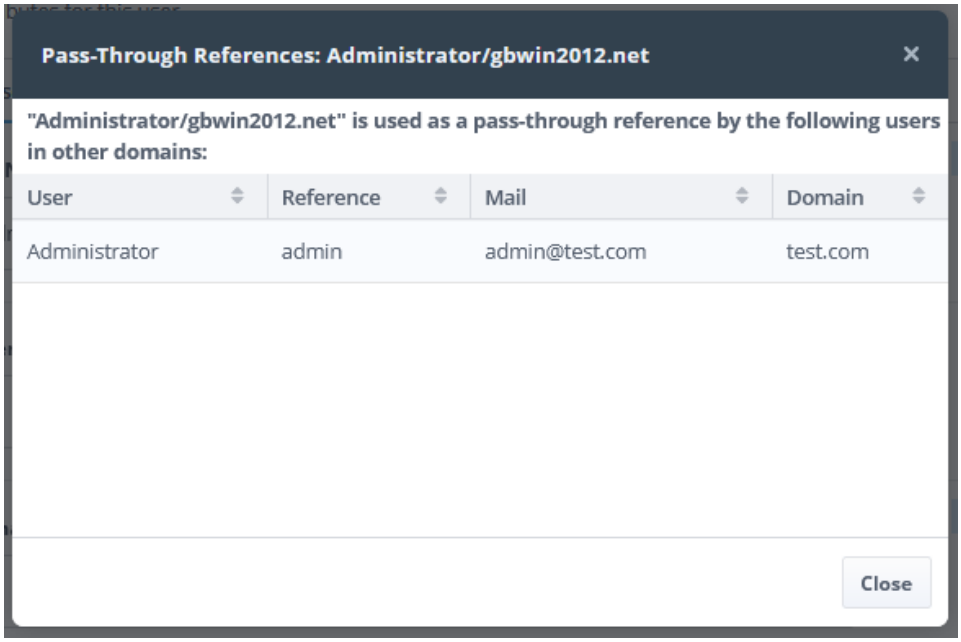
Mapping summary for a given user can also be displayed by clicking the **Pass-Through References** item on the **Options** menu of the user entry page.

Figure 4.5. Pass-through References Option



The following table will be presented to display the mappings for the given user.

Figure 4.6. User Pass-through References



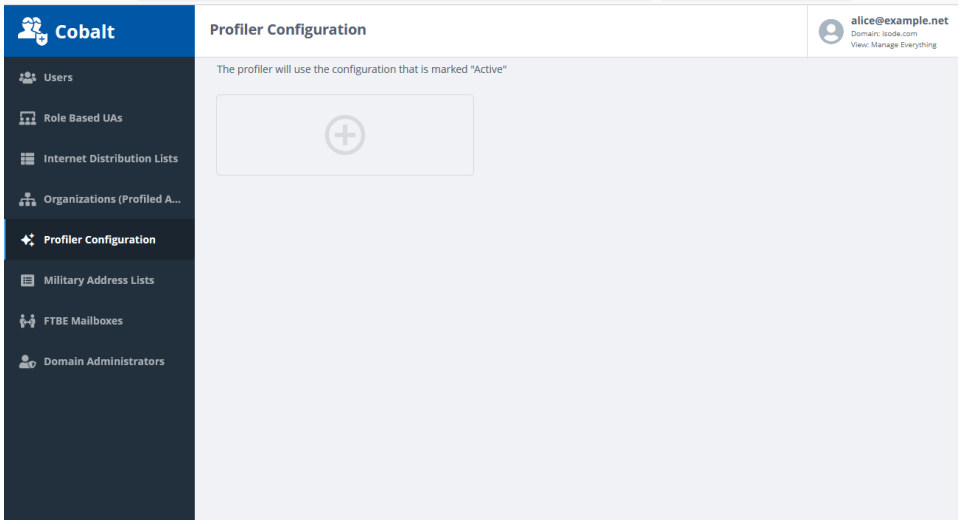
Chapter 5 Profiler Configuration

5.1 Setting up profiles

Cobalt provides the functionality to create, edit and manage M-Switch profiler channel's configuration. A Profiler is a messaging component that takes an input message and distributes the message to new recipients based on the information in the message. This distribution is controlled by the configuration that can be managed by Cobalt. In order to manage profiler configuration for a domain, the feature for profiler configuration should be enabled in the Cobalt administrator mode (see Figure 2.17, “Select Domain Features”).

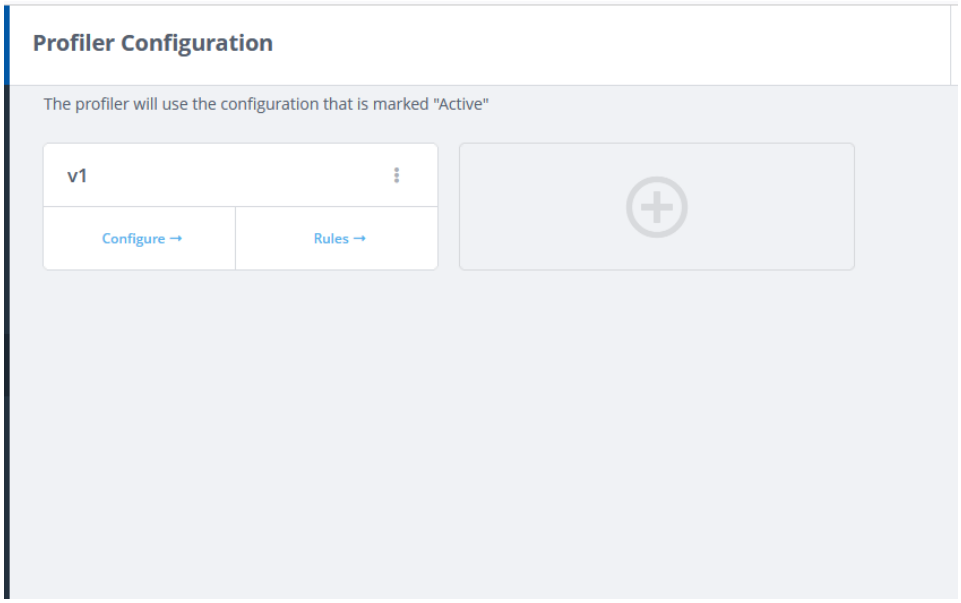
Select the **Profiler Configuration** from the sidebar to manage profiler configuration for the domain. Select the + button as shown below to create a new profiler configuration with name and description.

Figure 5.1. Add Profile



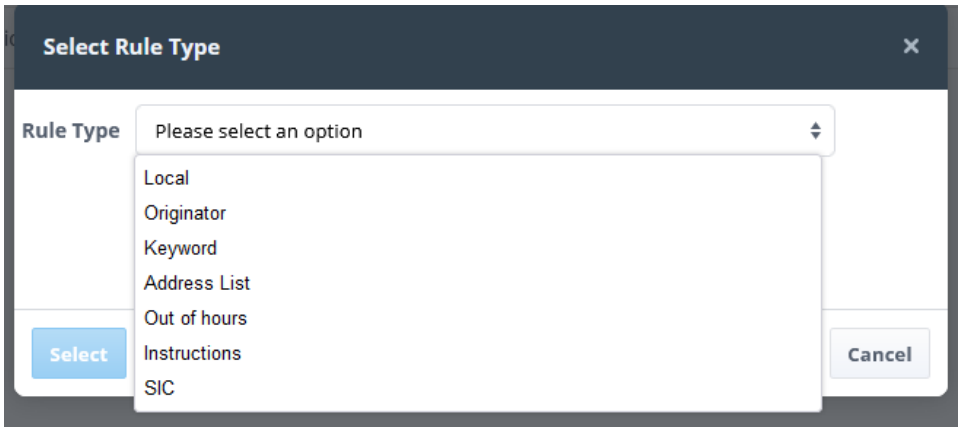
Once a profile has been created, it will appear as a card on the RHS as shown below.

Figure 5.2. Profiler Rule Form



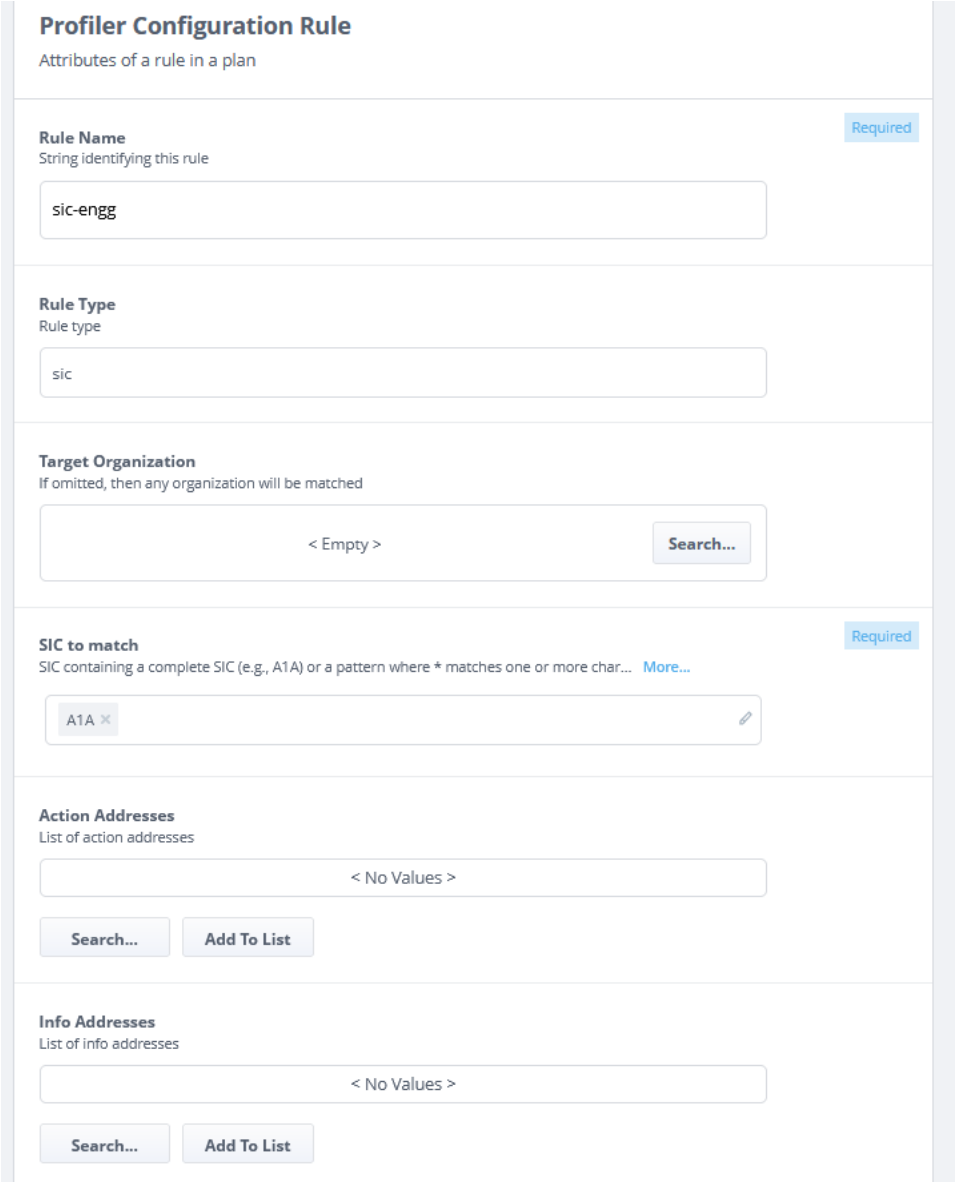
A configuration consists of a set of rules of various types. Click the **Rules** link on the configuration card to manage and view the rules. On selecting the **Add** button, a dialog to select the rule type will be presented as shown below.

Figure 5.3. Profiler Rule Types



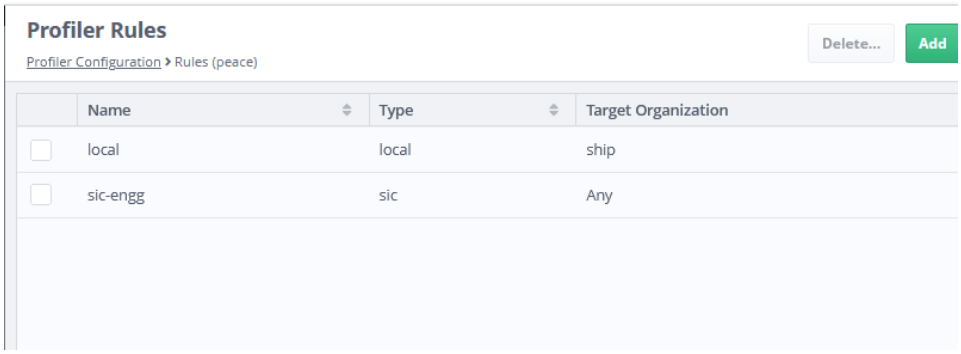
Based on the selected rule type, a form to create a new rule will be presented. The following figure shows a form for adding a rule of SIC type.

Figure 5.4. Profiler Rule Form



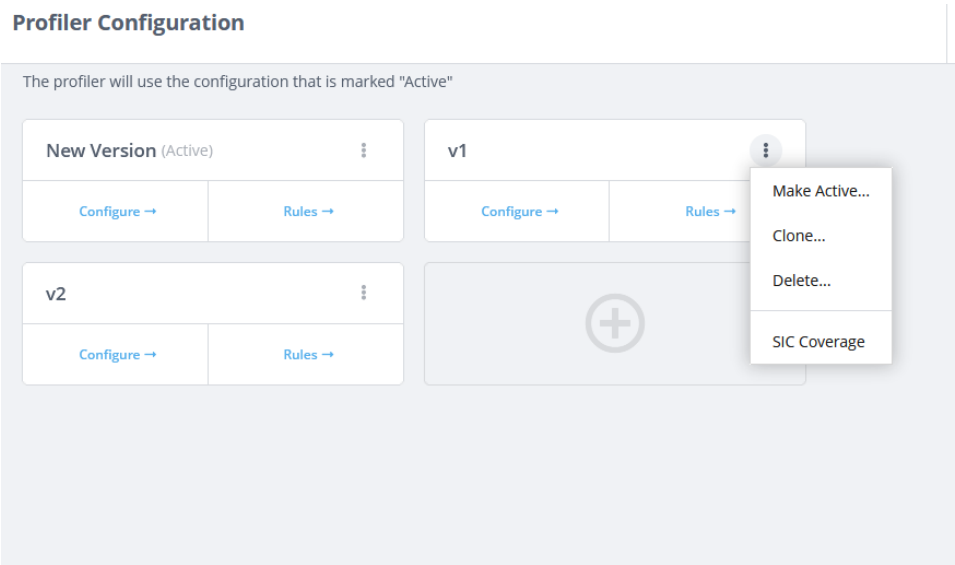
The rules of the profiler configuration will be listed in a table as shown below. A rule can be selected for viewing or modification.

Figure 5.5. Profiler Rules



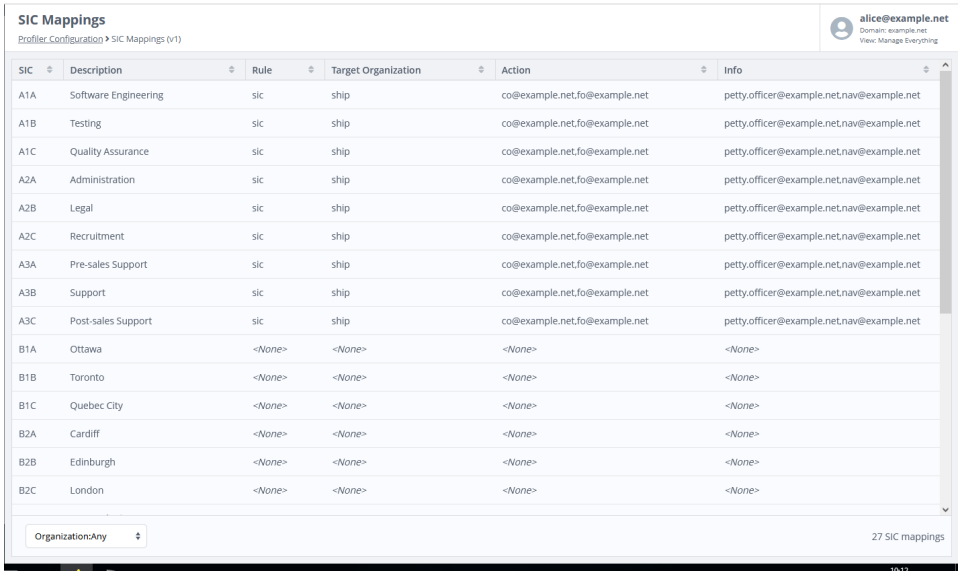
Cobalt allows creation of one or more profiles with one active profile at any given time. This allows creation of multiple profiles for different scenarios and activating one of them at any given time based on the scenario. A given profile can be marked as active by selecting **Make Active** from the menu of the selected profile as shown in figure below.

Figure 5.6. Profile Menu



The **Clone** option provides an option to create a new configuration from an existing profile. The **Copy DN** option can be used to copy the distinguished name of the active profile to use it in the M-Switch configuration. The **SIC Coverage** option displays a table listing all SICs and the rules that cater to each of them. This provides an overview of the SICs that have been covered or missed by the rules. The following table will appear for displaying SIC coverage.

Figure 5.7. Profiler SIC Coverage



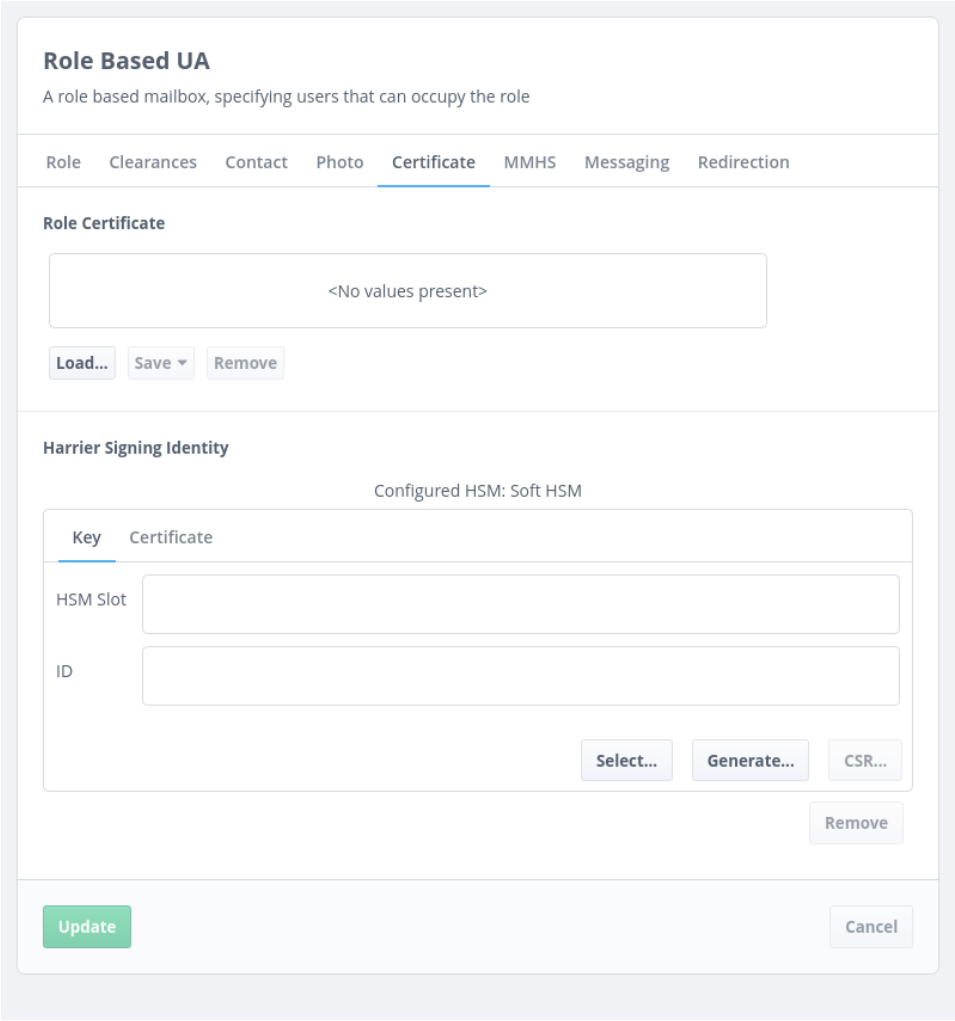
SIC	Description	Rule	Target Organization	Action	Info
A1A	Software Engineering	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
A1B	Testing	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
A1C	Quality Assurance	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
A2A	Administration	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
A2B	Legal	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
A2C	Recruitment	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
A3A	Pre-sales Support	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
A3B	Support	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
A3C	Post-sales Support	sic	ship	co@example.net.fo@example.net	petty.officer@example.net.nav@example.net
B1A	Ottawa	<None>	<None>	<None>	<None>
B1B	Toronto	<None>	<None>	<None>	<None>
B1C	Quebec City	<None>	<None>	<None>	<None>
B2A	Cardiff	<None>	<None>	<None>	<None>
B2B	Edinburgh	<None>	<None>	<None>	<None>
B2C	London	<None>	<None>	<None>	<None>

Chapter 6 HSM Identity

6.1 HSM Identity

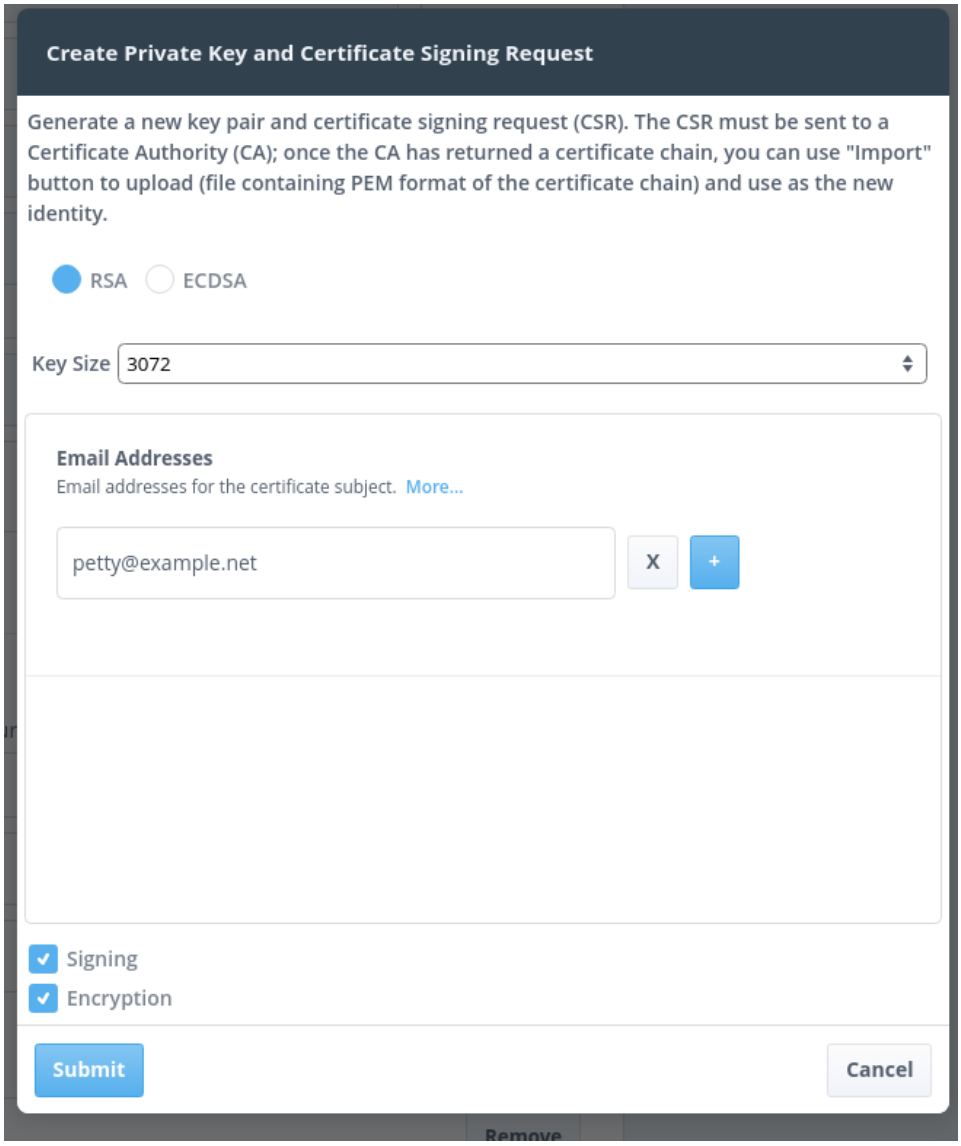
To enable a signing identity for an entity (user, role, or organization), it must be configured accordingly. For the purpose of using the signing identity editor in the domain's entry, the necessary configuration should be available in the admin mode (refer to Section 2.4, “HSM (Hardware Security Module) Configuration”). The editor for the identity can be accessed through the **Certificate** tab, as illustrated below.

Figure 6.1. HSM Identity



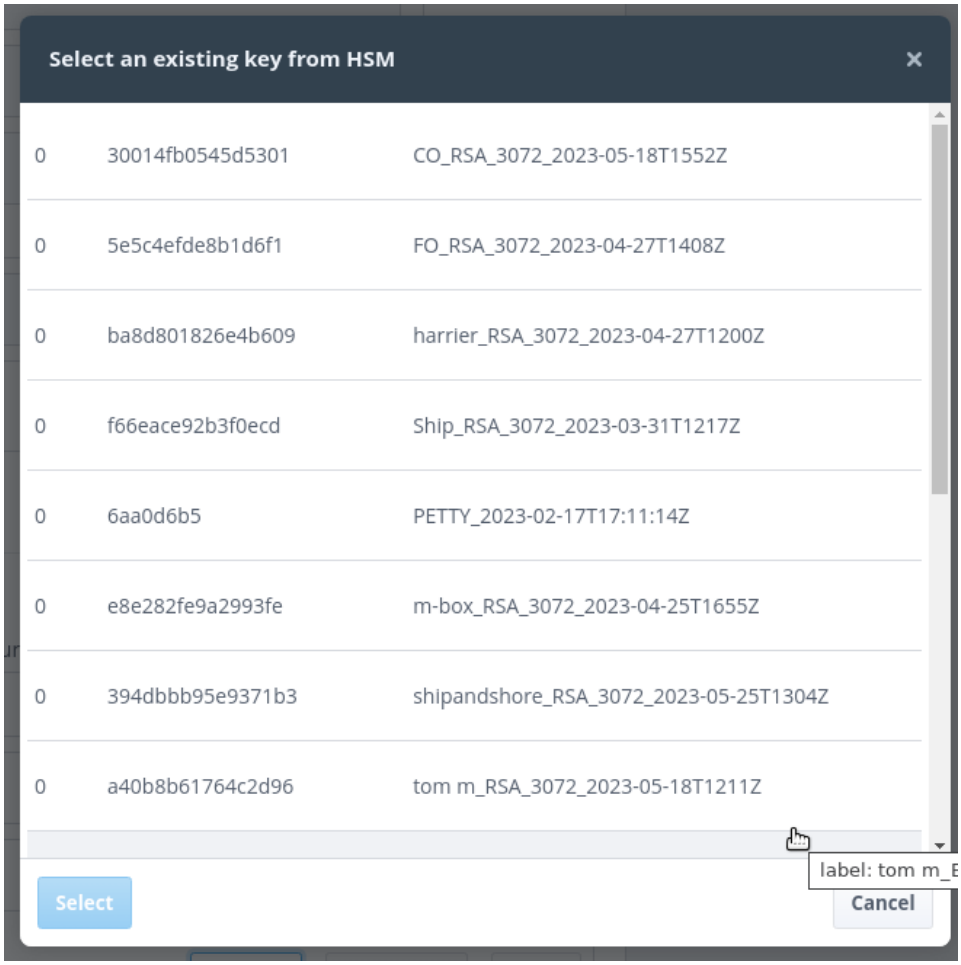
HSM Identity consists of a key and a certificate. The **Generate** option can be utilized to create a new key on the HSM, which will be used for the HSM Identity. Upon generating the key, a CSR (Certificate Signing Request) will be automatically generated and downloaded. This CSR can be used to request an X.509 certificate from a certificate authority (CA). In the editor, you can use the **CSR** button to generate a CSR specifically for the selected key.

Figure 6.2. Generate Key/CSR



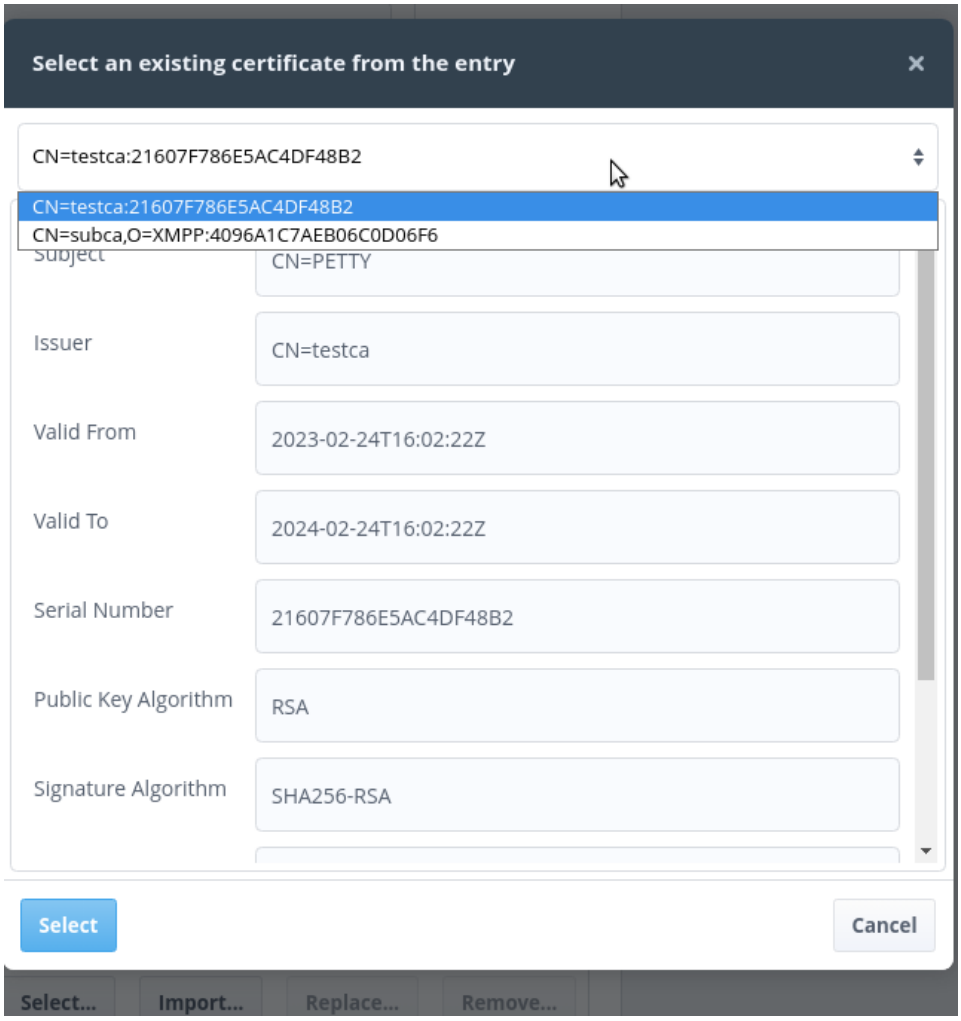
To utilize an existing key from the HSM, simply click on the **Select** button, which will prompt a dialog displaying a list of all the keys available on the HSM (refer to the figure below). From this dialog, you can choose the desired key to use.

Figure 6.3. Select Key



After acquiring a certificate from the certificate authority (CA), you can import it to the Identity by utilizing the **Certificate** button found on the Certificate tab. To select an existing certificate from the entity's entry, you can click on the **Select** button within this tab (see figure below). It's important to note that the public key within the certificate must correspond to the specified private key on the **Key** tab of the Identity.

Figure 6.4. Select Certificate



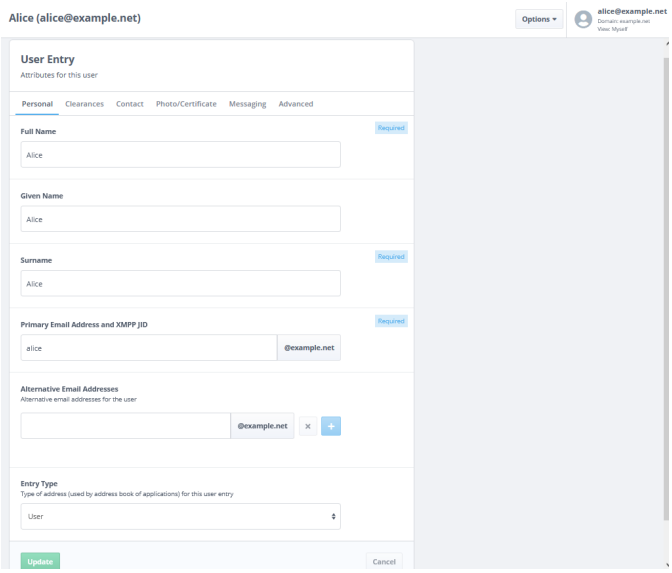
Chapter 7 Managing Authenticated User Entry

7.1 Modifying User's Own Entry

Users of any of Cobalt managed domains can modify their own entry after authentication. For users belonging to one or more of Cobalt or domain administrator roles, a choice of views will be offered as shown in Figure 1.3, “Select Authorization Role”. On selecting **Domain:Myself** users can view and modify their own entry. A user with no Cobalt specific roles, will land directly to this view for managing user entry after authentication.

The following figure displays the view for managing user's own entry.

Figure 7.1. User Entry



The fields that cannot be modified will appear as read-only. The fields that are allowed to be modified are configurable for a domain as described in Figure 2.18, “Editable Domain User Attributes”.

Appendix A Schema used by Cobalt

This appendix sets out the directory schema used by Cobalt. This schema is fully supported by M-Vault R19.0 and will be supported by future M-Vault releases. Cobalt can fully manage data in an LDAP directory that supports this schema. This schema is provided to facilitate configuration of an LDAP directory to use it.

A.1 Object Classes

A.1.1 Cobalt domain

```
Name: isodeCobaltDomain
SUP: top
Syntax: 1.3.6.1.4.1.453.16.8.2
Kind: Structural
MUST: (cobaltDomain, cobaltDsaAddress,
       cobaltDomainNamingContext)
MAY: (cobaltDomainRoleTypes, cobaltDomainUid,
      cobaltDomainDSAType, cobaltDomainSettings,
            cobaltDomainUserAttrTypes)
```

A.1.2 Cobalt role

```
Name: isodeCobaltRole
SUP: top
Syntax: 1.3.6.1.4.1.453.16.8.1
Kind: Structural
MUST: (cn, cobaltDomain)
MAY: (cobaltRoleids, cobaltAccess)
```

A.1.3 Cobalt entity type

```
Name: isodeCobaltObjectTypeOC
SUP: top
Syntax: 1.3.6.1.4.1.453.16.8.4
Kind: Auxiliary
MAY: (cobaltObjectType)
```

A.2 Attributes

A.2.1 cobaltRoleids

This attribute describes the user IDs that can occupy a Cobalt or domain administrator role. Each ID is one value of this multi-valued attribute.

```
Name: cobaltRoleids
Syntax: 1.3.6.1.4.1.453.16.9.2.1
Type: CaseIgnoreIA5String
Multi-value
```

Examples: *alice@example.net*

A.2.2 cobaltAccess

This attribute describes the Cobalt specific access controls defining read/write access for various resources.

```
Name: cobaltAccess
Syntax: 1.3.6.1.4.1.453.16.9.2.2
Type: BitString
Single-value
```

Example: *'00001000000010000000000000000000'B*

A.2.3 cobaltDomain

This attribute contains the value of domain.

```
Name: cobaltDomain
Syntax: 1.3.6.1.4.1.453.16.9.1.1
Type: CaseIgnoreIA5String
Single-value
```

Example: *example.net*

A.2.4 cobaltDsaAddress

This attribute contains the value of an LDAP address.

```
Name: cobaltDsaAddress
Syntax: 1.3.6.1.4.1.453.16.9.1.2
Type: CaseIgnoreString
Multi-value
```

Example: *ldap://gbwin2012.net:389*

A.2.5 cobaltDomainUid

This attribute describes an attribute value to be used for user id. Cobalt will use the value of this attribute to search in order to get the DN of the user for a given user ID.

```
Name: cobaltDomainUid
Syntax: 1.3.6.1.4.1.453.16.9.1.3
Type: CaseIgnoreIA5String
Single-value
```

Example: *mail*

A.2.6 cobaltDomainNamingContext

This attribute contains the value of naming context that holds Cobalt specific information.

```
Name: cobaltDomainNamingContext
Syntax: 1.3.6.1.4.1.453.16.9.1.4
Type: CaseIgnoreIA5String
Single-value
```

Example: *o=Cobalt*

A.2.7 cobaltDomainRoleTypes

This attribute contains the value of features (role types) supported for a Cobalt domain.

```
Name: cobaltDomainRoleTypes
Syntax: 1.3.6.1.4.1.453.16.9.1.5
Type: CaseIgnoreIA5String
Single-value
```

Examples: *routedua,dlist,profiledua,mlist,xmpp-users,roleua,redi, msg-users,accounts,profiler,usergroups,oauthc,oauths,ftbeuser*

A.2.8 cobaltDomainDSAType

This attribute describes the type of directory server that holds domain information. It can have one of 2 values:

- 0 - M-Vault (default)
- 1 - Active Directory (default)

```
Name: cobaltDomainDSAType
Syntax: 1.3.6.1.4.1.453.16.9.1.6
Type: Integer
Single-value
```

A.2.9 cobaltDomainSettings

This attribute contains the values of domain specific settings.

```
Name: cobaltDomainSettings
Syntax: 1.3.6.1.4.1.453.16.9.1.7
Type: CaseIgnoreString
Multi-value
```

Example: *acp127=true*

A.2.10 cobaltDomainUserAttrTypes

This attribute contains the values of attributes a user can modify.

```
Name: cobaltDomainUserAttrTypes
Syntax: 1.3.6.1.4.1.453.16.9.1.8
Type: CaseIgnoreIA5Stringg
Multi-value
```

Example: *[carLicense,jpegPhoto,homePhone,mobile,postalAddress,telephoneNumber]*

A.2.11 cobaltObjectType

This attribute describes the type of entity that an entry represents. It can have one of 3 values.

- 0 - User
- 1 - Role
- 2 - Organization

```
Name: cobaltObjectType
Syntax: 1.3.6.1.4.1.453.16.9.4.1
Type: Integer
Single-value
```

Appendix B Glossary

This appendix provides a glossary of terms.

Technical Terms used

Active Directory (AD)
A *Directory service* developed by Microsoft for the *Windows* networks. AD is a key component of *Windows Integrated Single Sign-On* solution. AD can act as *LDAP server*.

Authentication
The process of determining the identity of a communications partner.
See Also Authorization.

Authorization
A security service aimed at preventing unauthorized access to a service or capability. Once an identity has been established (see *Authentication*), authorization determines what services, data, and operations may be accessed by that identity.

Cobalt Server
Isode's Cobalt Server for provisioning users and roles in an *LDAP Server*.

Certificate Authority (CA)
An issuer of *certificates*. Also typically a publisher of certificate revocation information, commonly in the form of *CRL*, for the certificates it have issued. See [X.509] and and [RFC5280]. Sodium CA is a GUI tool for performing CA functions.
See Also Root Certificate Authority (Root CA), Root Certificate Authority (Root CA).

Certificate
A data object providing identity information for a subject entity (e.g., a person or computer system) securely bound to a public key by the certificate issuer, a *certificate authority*. See [X.509] and [RFC5280].

Certificate Chain
A certificate chain is a bundle of *certificates* which consists of an entity's certificate and, if the certificate is not *self-signed*, a sequence of certificates, each the issuer of the previous one, usually finishing at a *root*.

Certificate Revocation List (CRL)
A list of certificates which a *certificate authority* has revoked. See [X.509] and [RFC5280].

Certificate Signing Request (CSR)
A data object representing an entity's request for a *certificate authority* to issue a *certificate*. See [X.509] and [RFC2986]. Isode provides a number of tools to produce CSRs, such as Sodium

Directory
When referred to as *the Directory*, it is a distributed database built to *X.500* standards [X.509] and, in the context of Cobalt, accessed using *LDAP*
Alternatively, a container which holds files and other containers in a filesystem. Also referred to as a folder.

Directory Entry
A unit in *the Directory* representing one object and identified by its *Distinguished Name*. See [RFC4512].

Directory Service
The service provided by *the Directory* to its users.

Directory System Agent (DSA)
A server process which maintains and provides access to *the Directory*. In the context of Isode Cobalt, an *LDAP Server*.

Distinguished Name (DN)
The name for a *directory entry*. Cobalt uses the LDAP DN string format to represent DNs. See [RFC4514].

Domain Name
A name within the *Domain Name System*. See [RFC1035].

Domain Name System (DNS)
A service for providing a mapping between *domain names* (for example, `example.com`) and *IP addresses*. See [RFC1035].

IP address
An address which identifies a host machine on an Internet network. For IPv4, it is 32-bit number commonly written in dotted number notation of the form `192.0.1.100`. For IPv6, it is a 128-bit number commonly written in a notation of the form `2001:db8::100`.

Kerberos
An *authentication* protocol which relies on a *trusted third party* to issue *tickets* used to mutually authenticate clients and servers. See [RFC4120].

LDAP Client
A program which accesses *Directory* using *LDAP*. Examples: *Sodium*, *Cobalt*.

LDAP Server
A server process which provides *LDAP* access to *Directory*. Example: *M-Vault Server*.

Lightweight Directory Access Protocol (LDAP)
An Internet protocol used to provide access to the *Directory*. See [RFC4510].
See Also X.500.

M-Vault Server
Isode's Directory System Agent, an *LDAP server*.

M-Switch Server
M-Switch is Isode's Message Transfer Agent (MTA) that serves as the main component in a messaging system and supports Internet, X.400 and ACP127 messaging.

M-Box Server
The Isode IMAP (Internet Message Access Protocol) and POP (Post Office Protocol) server.

Public Key Infrastructure (PKI)
A collection of systems which support provisioning and use of *certificates*.

PEM
A format for representing *certificates*, keys, and other cryptographic objects. PEM stands for Privacy Enhanced Mail, a defunct standard for securing email. See [RFC1422].
See Also PKCS#12.

PKCS#12
An archive file format for bundling together a set of *certificates*, keys, and other cryptographic objects. See [RFC7292].
See Also PEM.

Root Certificate Authority (Root CA)
A *certificate authority* which utilizes a *self-signed* CA certificate when issuing *certificates*.

Self-Signed Certificate
A *certificate* which is signed by same entity which the certificate provide identity for.

Single sign-on (SSO)
Describes an access control system which allows a user, by authenticating to a system, to access multiple independent systems and/or services.
See Also Windows Integrated Single Sign-On (Windows SSO).

Sodium
Isode's directory data administration tool, an *LDAP client*. Though always written as "Sodium", Sodium is acronym standing for Secure Open Data, Identity and User Manager. Sodium is used for provisioning of users in *M-Vault Server*. deployments.

Transport Layer Security (TLS)
A protocol used by application protocols, such as HTTP, to provide communications security. It is formally known as Secure Socket Layer (SSL). See [RFC8446].

Trust Anchor (TA)
A certificate of a certificate authority trusted to issue (directly or indirectly) certificates for entities a party wishes to authenticate.

Trusted Third Party
An entity trusted by two parties, such as a client and a server, to facility *authentication* of one of the parties to the other or both parties to each other. In *public key infrastructures*, *certificate authorities*, when trusted, are trusted third parties.

Unix
Any operating system which complies with the *Single UNIX Specification*, such as the Linux and Solaris operating systems.
See Also Windows.

Windows
A family of operating system produced by Microsoft known as Microsoft Windows or simply Windows.
See Also Unix.

Windows Integrated Single Sign-On (Windows SSO)
Microsoft's *Kerberos* based *single sign-on* solution.

X.500
A set of standards devised for *the Directory*, developed jointly by the ITU-T and ISO/IEC. See [X.500].
See Also Lightweight Directory Access Protocol (LDAP).

Extensible Messaging and Presence Protocol (XMPP)
A collection of open standards for real-time communication, including those for instant messaging, presence, and multi-user chat. See [RFC6120].

Appendix C References

The documents listed in this appendix provide references to the appropriate standards and other sources of information.

If documents can be obtained electronically, the location is stated as part of the reference.

C.1 RFCs

RFC 4510
Lightweight Directory Access Protocol (LDAP): Technical Specification Road Map [https://tools.ietf.org/html/rfc4510].

RFC 4512
Lightweight Directory Access Protocol (LDAP): Directory Information Models [https://tools.ietf.org/html/rfc4512]. K. Zeilenga. June 2006.

RFC 4514
Lightweight Directory Access Protocol (LDAP): String Representation of Distinguished Names [https://tools.ietf.org/html/rfc4514].

RFC 5280
Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile [https://tools.ietf.org/html/rfc5280].

RFC 2986
Certification Request Syntax Specification [https://tools.ietf.org/html/rfc2986].

RFC 7292
Personal Information Exchange Syntax v1.1 [https://tools.ietf.org/html/rfc7292].

RFC 1422
Privacy Enhancement for Internet Electronic Mail: Part II: Certificate-Based Key Management [https://tools.ietf.org/html/rfc1422].

RFC 8446
The Transport Layer Security (TLS) Protocol Version 1.3 [https://tools.ietf.org/html/rfc8446].

RFC 8259
The JavaScript Object Notation (JSON) Data Interchange Format [https://tools.ietf.org/html/rfc8259]. T. Bray, December 2017

RFC 6120
Extensible Messaging and Presence Protocol (XMPP): Core [https://tools.ietf.org/html/rfc6120].

RFC 1035
Domain names - implementation and specification [https://tools.ietf.org/html/rfc1035].