Isode

R2.2 Red/Black Evaluation Guide

How to create a Red/Black service monitoring environment.

Contents

Introduction

- This guide details the process to create a Red/Black service monitoring framework environment using Isode's Red/Black product. Authentication and the configuration repository is provided via M-Vault/ OAuth. Additional/related products in the Isode product set are:
- M-Switch SMTP (SMTP Message Transfer Agent)
- M-Box (POP/IMAP Message Store)
- M-Switch X.400 (X.400 Message Transfer Agent)
- M-Store (X.400 Message Store)
- M-Switch MIXER (message gateway providing conversion between X.400 and Internet email according to the MIXER specifications)
- M-Switch User Server (Email Messaging with options for low-bandwidth and/or high-latency networks)
- M-Switch Gateway (Email Messaging for low-bandwidth and/or high-latency networks)
- Harrier Web (web-based email client)
- Icon 5066 (Stanag 5066 server)
- M-Vault (X500 Directory)
- M-Guard (XML Guard)

- Isode products are widely deployed in the Government, Military, Intelligence, Civil Aviation and EDI markets.

***Use of TLS**: Due to UK Export Controls we are unable to provide Evaluation Activations that support TLS to certain geographic regions. This guide is written with the assumption that the reader is not a member of those regions and by default, we will provide a product activation that supports TLS. For customers whose region we have no current export control arrangement, further configuration information may be required and provided separately.*

Objectives

By the end of this guide you will have:

1. Created a Red/Black instance in the Red network.
2. Created a Red/Black instance in the Black network
3. Joined the Red and Black instances via an M-Guard
4. Configured a set of dummy devices to browse with Red/Black
5. Configured a Red/Black guard content rule

You'll use the M-Vault console, Sodium CA, M-Guard administration tool and Cobalt to configure this. M-Vault console is Isode's directory configuration tool. Cobalt is Isode's system configuration tool. Sodium CA is a simple provider of PKI infrastructure.

Network Planning and Virtual Machine Configuration

Three networks are required to implement this evaluation. The following table summarises their configuration:

Host Name	Local Network	Red Network	Black Network
hqred.red.headquarters.net	192.168.56.1	10.178.0.1	None
hqblack.black.headquarters.net	192.168.56.2	None	192.168.106.1
guard.headquarters.net	192.168.56.3 (hn0)	None	None
redblackrtb.headquarters.net	None	10.178.0.2 (hn1)	192.168.106.2 (hn2)
redblackbtr.headquarters.net	None	10.178.0.3 (hn1)	192.168.106.3 (hn2)
Netmask	255.255.255.0	255.255.255.0	255.255.255.0

Within the hypervisor environment:

Create an Internal Virtual Switch called “Red Network”

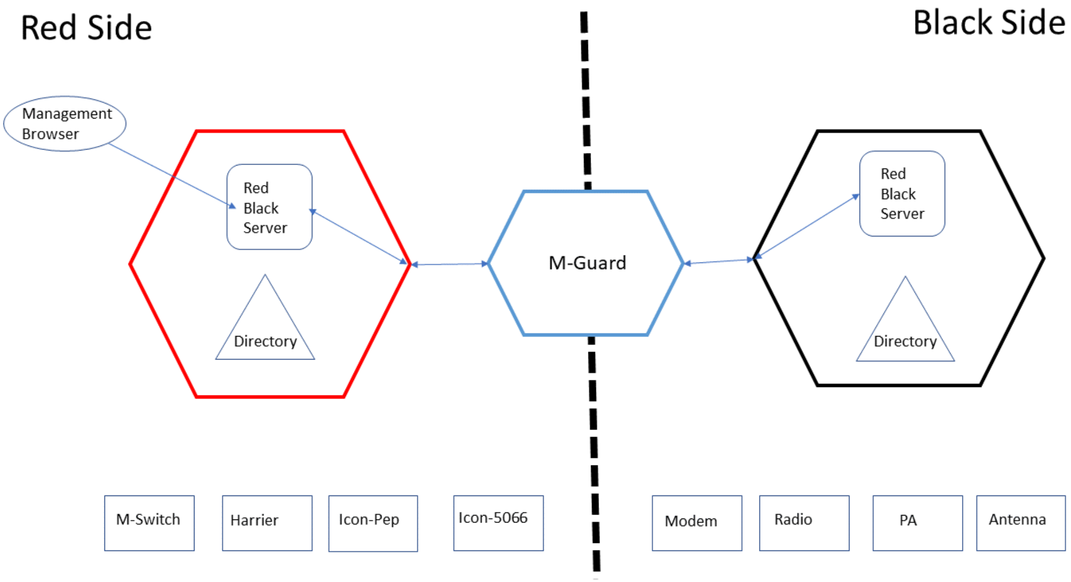
Create an Internal Virtual Switch called “Black Network”

It is assumed that a Virtual switch exists for “Local Network”

Associate the first NIC of each machine to the “Local Network” and allocate an IP address. The table above suggests potential addresses.

The following diagram show the high-level overview of what you will be building.

High Level Overview



This guide is not intended to resemble a real-world managed system but to give you a basic environment you can test with and get used to how the Isode products and configuration GUIs work.

Using Isode Support

You will be given access to Isode support resources when carrying out your evaluation. Any queries you have during your evaluation should be sent to isode.support@isode.com. Please note that access to the Self-Service Portal for web-based ticket submission and tracking is not available to evaluators.

Initial Instructions

The setup will be described for the Red side. The instructions should then be repeated, substituting with values from Appendix A to create the Black side. The relevant substitutions are indicated with a number like $^{\text{this}}$
For convenience, passwords are assumed to be “Secret1+”
In Linux environments it is assumed all actions are executed as root

Preparing the Server Environment

Naming the Server

Make the machine name: hqred [1]

Make the primary dns suffix for the server red.headquarters.net [2]

Alternatively, you may use your own names or add dns entries in a dns server or hosts file.

Install the Isode Software

Follow the instructions in the release notes for the appropriate platform for the products. Remember to install an appropriate java runtime engine first (refer to product release notes). The highest version currently supported by M-Guard console is java 11 so use this version. In a Windows environment ensure you install the visual c++ redistributable package.

Messaging Activation Server 1.1v1

M-Vault 19.0v21

Cobalt 1.5v3

Red/Black 2.2v4

The M-Guard appliance version used was 1.5.4

The M-Guard console version used was 1.5.5

The Red/Black Control Profile used was 1.0.0

The Red/Black Status Profile used was 1.0.0

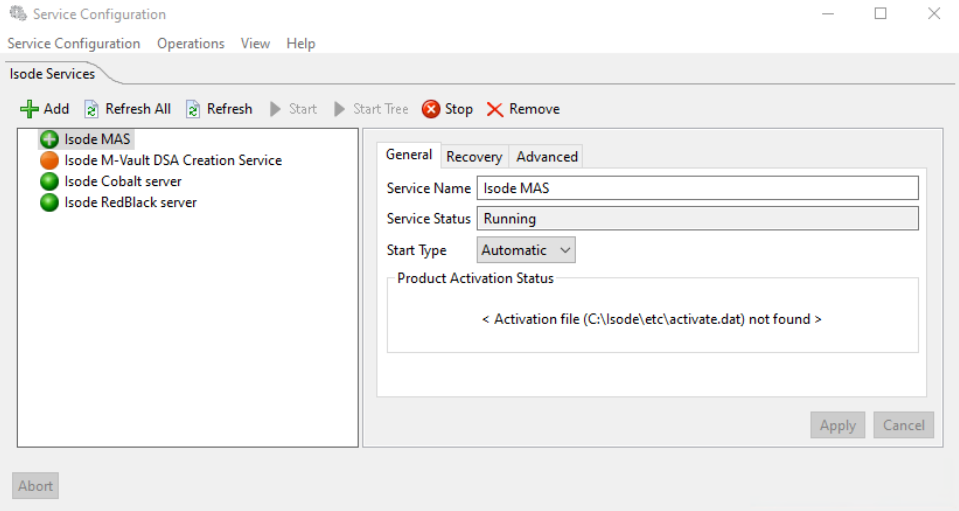
The Red/Black Control Rule catalog used was 2.2v3

Please use a supported web browser as documented in the product release notes.

Activate the Products

Ensure the MAS server has started by using the Isode Service configuration tool.

Isode Service Configuration tool



Isode MAS
Isode M-Vault DSA Creation Service
Isode Cobalt server
Isode RedBlack server

Service Name: Isode MAS
Service Status: Running
Start Type: Automatic

Product Activation Status

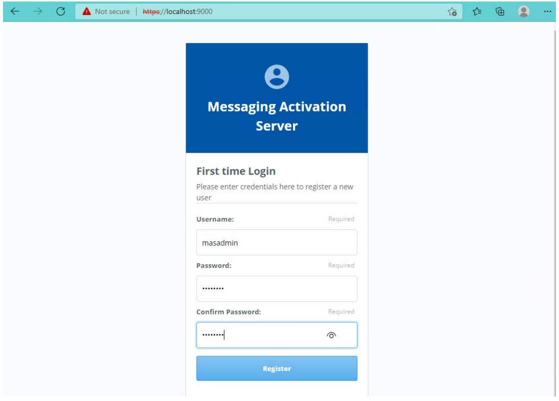
< Activation file (C:\Isode\etc\activate.dat) not found >

```
(Linux: "systemctl status mas")
```

Browse to “https://localhost:9000”

The browser will provide a security warning. Choose an option to override the warning.

Register MAS administrator



Messaging Activation Server

First time Login

Please enter credentials here to register a new user

Username: Required
masadmin

Password: Required
········

Confirm Password: Required
········

In “Username” type “masadmin”

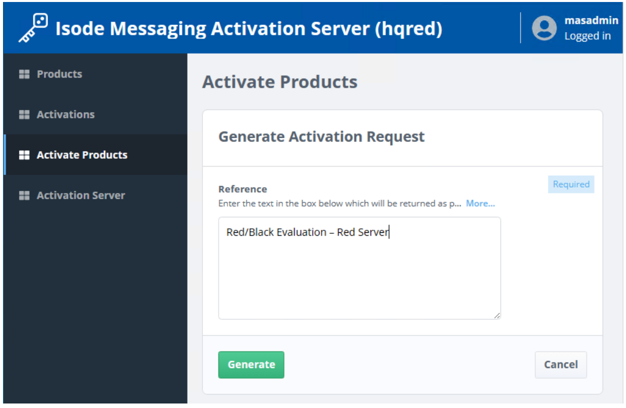
In “Password” type “Secret1+”

In “Confirm Password” type “Secret1+”

Press “Register”

Select “Activate Products”

Submit activation request



Activate Products

Generate Activation Request

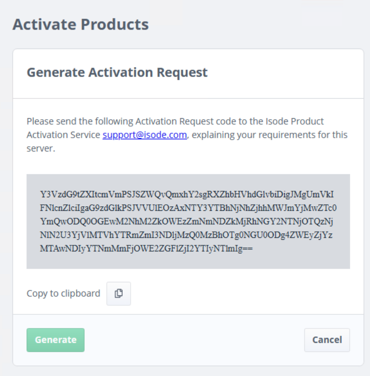
Reference
Enter the text in the box below which will be returned as p...

Red/Black Evaluation – Red Server

In “Reference” type “Red/Black Evaluation – Red Server” [3]

Press “Generate”

copy activation request



Activate Products

Generate Activation Request

Please send the following Activation Request code to the Isode Product Activation Service support@isode.com, explaining your requirements for this server.

```
Y3VzdG9tZXItcmVmPSJSZWQvQmxhY2sgRXZhbHVhdGlvbiDigJMgUmVkI
FNlcnZlciIgaG9zdGlkPSJVVUlEOzAxNTY3YTBhNjNhZjhhMWJmYjMwZTc0
YmQwODQ0OGEwM2NhM2ZkOWEzZmNmNDZkMjRhNGY2NTNjOTQzNj
NlN2U3YjViMTVhYTRmZmI3NDljMzQ0MzBhOTg0NGU0ODg4ZWEyZjYz
MTAwNDIyYTNmMmFjOWE2ZGFlZjI2YTIyNTlmIg==
```

Copy the activation request code to your clipboard.

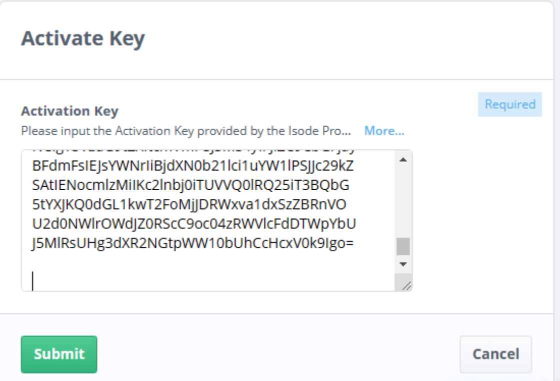
Send an email to Isode support asking for an activation for M-Vault, Cobalt and Red/Black for a Red/Black evaluation. Include the activation request code.

Isode support will supply a set of Product Activation keys.

It is likely that by the time you receive the activations, the MAS login will have timed out. Press the browser refresh button and log back into MAS.

Paste the keys into the “Activate Key” field.

submit product activation key



Activate Key

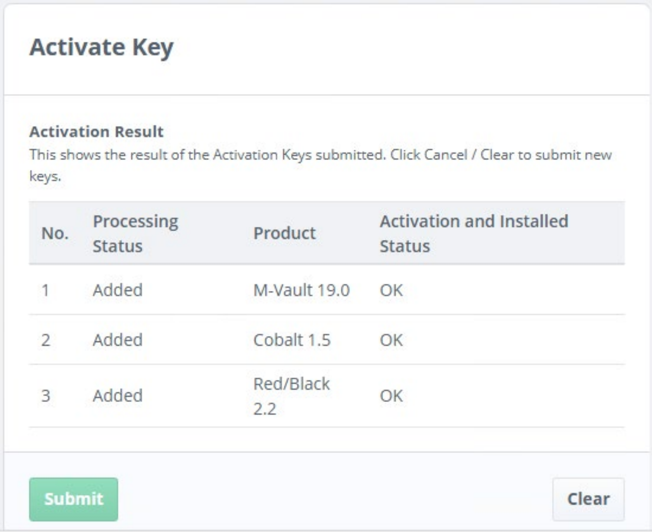
Activation Key
Please input the Activation Key provided by the Isode Pro...

```
BFdmFsIEJsYWNrIiBjdXN0b21lci1uYW1lPSJJc29kZ
SAtIENocmlzMiIKc2lnbj0iTUVVQ0lRQ25iT3BQbG
5tYXJKQ0dGL1kwT2FoMjJDRWxva1dxSzZBRnVO
U2d0NWlrOWdJZ0RScC9oc04zRWVlcFdDTWpYbU
J5MlRsUHg3dXR2NGtpWW10bUhCcHcxV0k9Igo=
```

Press “Submit”.

You will receive an “Activation Result”:

Activation result



Activate Key

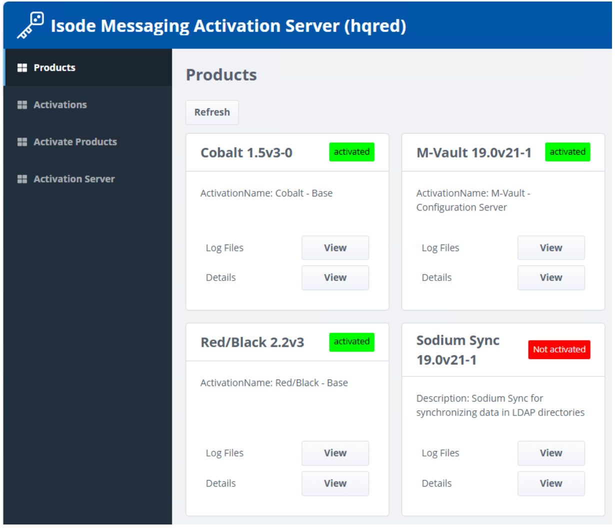
Activation Result

This shows the result of the Activation Keys submitted. Click Cancel / Clear to submit new keys.

No.	Processing Status	Product	Activation and Installed Status
1	Added	M-Vault 19.0	OK
2	Added	Cobalt 1.5	OK
3	Added	Red/Black 2.2	OK

Select “Products”

activated products



Isode Messaging Activation Server (hqred)

Products

Cobalt 1.5v3-0 activated

ActivationName: Cobalt - Base

Log Files View

Details View

M-Vault 19.0v21-1 activated

ActivationName: M-Vault - Configuration Server

Log Files View

Details View

Red/Black 2.2v3 activated

ActivationName: Red/Black - Base

Log Files View

Details View

Sodium Sync 19.0v21-1 Not activated

Description: Sodium Sync for synchronizing data in LDAP directories

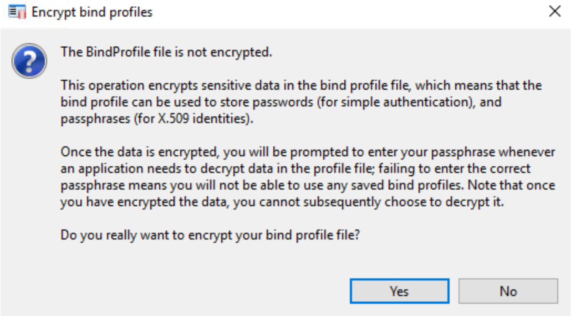
Log Files View

Details View

Configure M-Vault

Run “M-Vault Console” from the Windows Start menu (Linux: “/opt/isode/sbin/mvc”)

encrypt bind profile



The BindProfile file is not encrypted.

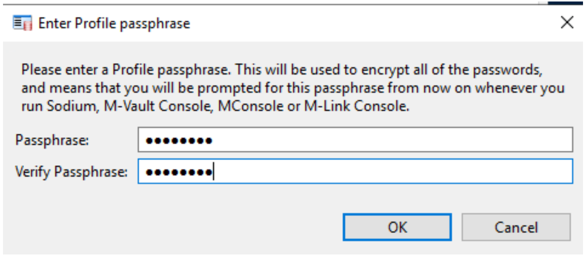
This operation encrypts sensitive data in the bind profile file, which means that the bind profile can be used to store passwords (for simple authentication), and passphrases (for X.509 identities).

Once the data is encrypted, you will be prompted to enter your passphrase whenever an application needs to decrypt data in the profile file; failing to enter the correct passphrase means you will not be able to use any saved bind profiles. Note that once you have encrypted the data, you cannot subsequently choose to decrypt it.

Do you really want to encrypt your bind profile file?

Press “Yes”

enter profile passphrase



Please enter a Profile passphrase. This will be used to encrypt all of the passwords, and means that you will be prompted for this passphrase from now on whenever you run Sodium, M-Vault Console, MConsole or M-Link Console.

Passphrase: ••••••••

Verify Passphrase: ••••••••

On “Enter Profile passphrase” type “Secret1+” in “Passphrase” and “Verify Passphrase”

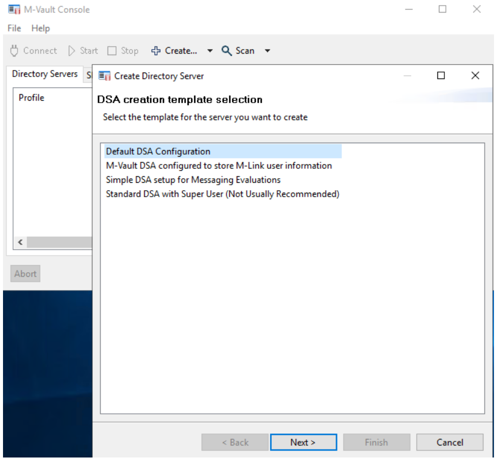
Click “OK”

On “The Bind Profile has been encrypted” press “OK”

On “No Managed DSA’s Configured” press “OK”

Press “Create/Directory Server”

create directory server



DSA creation template selection

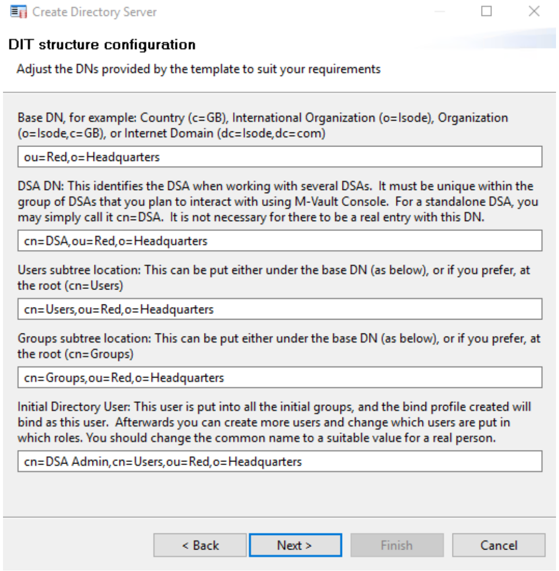
Select the template for the server you want to create

- Default DSA Configuration
- M-Vault DSA configured to store M-Link user information
- Simple DSA setup for Messaging Evaluations
- Standard DSA with Super User (Not Usually Recommended)

Select “Default DSA Configuration “

Click “Next >”

DIT Structure Configuration



DIT structure configuration

Adjust the DNs provided by the template to suit your requirements

Base DN, for example: Country (c=GB), International Organization (o=Isode), Organization (o=Isode,c=GB), or Internet Domain (dc=Isode,dc=com)

ou=Red,o=Headquarters

DSA DN: This identifies the DSA when working with several DSAs. It must be unique within the group of DSAs that you plan to interact with using M-Vault Console. For a standalone DSA, you may simply call it cn=DSA. It is not necessary for there to be a real entry with this DN.

cn=DSA,ou=Red,o=Headquarters

Users subtree location: This can be put either under the base DN (as below), or if you prefer, at the root (cn=Users)

cn=Users,ou=Red,o=Headquarters

Groups subtree location: This can be put either under the base DN (as below), or if you prefer, at the root (cn=Groups)

cn=Groups,ou=Red,o=Headquarters

Initial Directory User: This user is put into all the initial groups, and the bind profile created will bind as this user. Afterwards you can create more users and change which users are put in which roles. You should change the common name to a suitable value for a real person.

cn=DSA Admin,cn=Users,ou=Red,o=Headquarters

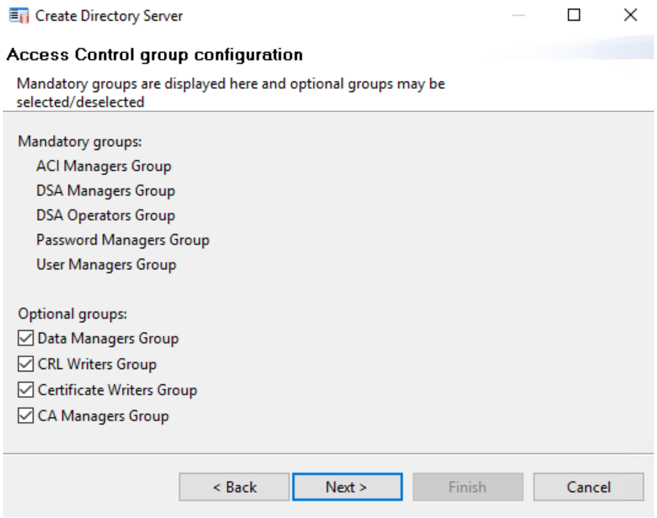
In “Base DN” type “ou=Red,o=Headquarters” [4]

In “Initial directory user” replace “Thomas Atkins” with “DSA Admin”

Click “Next >”

On “Access control rule selection” leave defaults and click “Next >”

access control group configuration



Access Control group configuration

Mandatory groups are displayed here and optional groups may be selected/deselected

Mandatory groups:

ACI Managers Group
DSA Managers Group
DSA Operators Group
Password Managers Group
User Managers Group

Optional groups:

☑ Data Managers Group
☑ CRL Writers Group
☑ Certificate Writers Group
☑ CA Managers Group

On “Access Control group configuration” select additional optional groups:

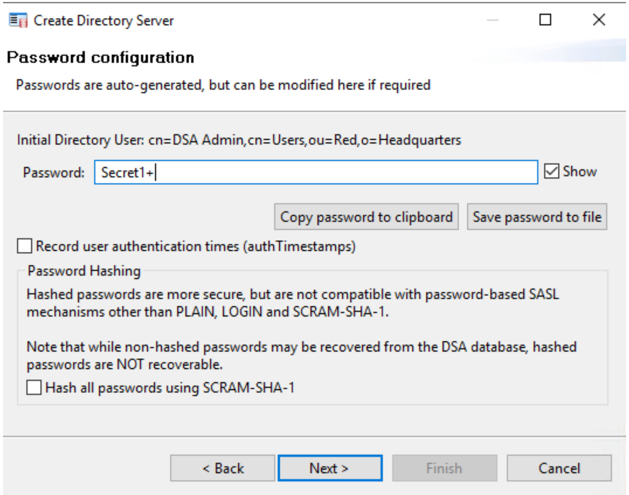
CRL Writers Group

Certificate Writers Group

CA Managers Group

Click “Next >”

password configuration



Create Directory Server

Password configuration

Passwords are auto-generated, but can be modified here if required

Initial Directory User: cn=DSA Admin,cn=Users,ou=Red,o=Headquarters

Password: Secret1+ ☑ Show

☐ Record user authentication times (authTimestamps)

Password Hashing

Hashed passwords are more secure, but are not compatible with password-based SASL mechanisms other than PLAIN, LOGIN and SCRAM-SHA-1.

Note that while non-hashed passwords may be recovered from the DSA database, hashed passwords are NOT recoverable.

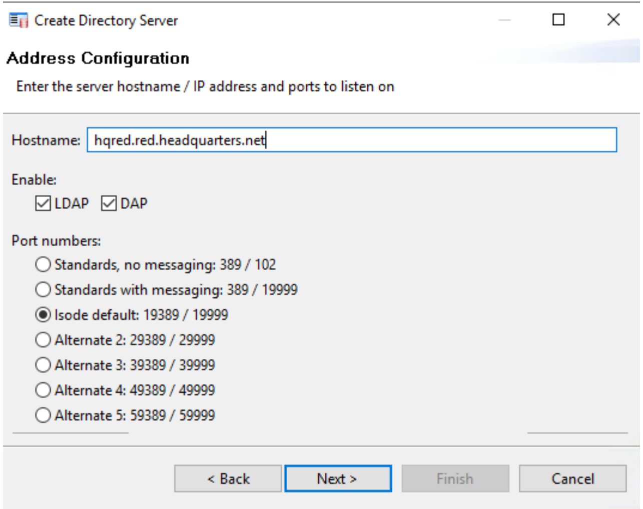
☐ Hash all passwords using SCRAM-SHA-1

On “Password configuration” change the password to “Secret1+”

Click “Next >”

On “Bind Profile Names and Filesystem Location” leave Defaults and click “Next >”

address configuration



Create Directory Server

Address Configuration

Enter the server hostname / IP address and ports to listen on

Hostname: hqred.red.headquarters.net

Enable:

☑ LDAP ☑ DAP

Port numbers:

○ Standards, no messaging: 389 / 102
○ Standards with messaging: 389 / 19999
● Isode default: 19389 / 19999
○ Alternate 2: 29389 / 29999
○ Alternate 3: 39389 / 39999
○ Alternate 4: 49389 / 49999
○ Alternate 5: 59389 / 59999

On “Address Configuration” change “Hostname” to “hqred.red.headquarters.net” [5]

Click “Next >”

On “Confirm Details” click “Finish”

On “Directory Server Created Successfully” click “Yes”

The next 4 steps are for Windows only:

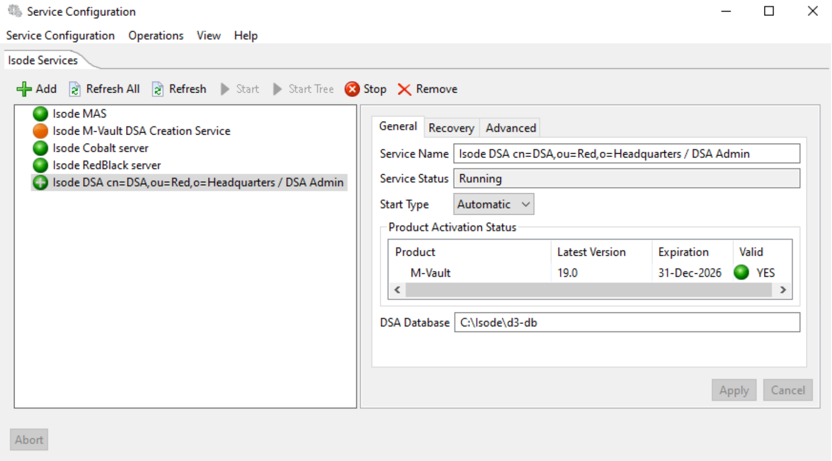
Open “Isode Service Configuration” from the start menu

Select “Isode DSA …”

Change “Start Type” to “Automatic”

Press “Apply”

configure dsa to start automatically



- Isode MAS
- Isode M-Vault DSA Creation Service
- Isode Cobalt server
- Isode RedBlack server
- Isode DSA cn=DSA,ou=Red,o=Headquarters / DSA Admin

Service Name: Isode DSA cn=DSA,ou=Red,o=Headquarters / DSA Admin

Service Status: Running

Start Type: Automatic

Product Activation Status

Product	Latest Version	Expiration	Valid
M-Vault	19.0	31-Dec-2026	● YES

DSA Database: C:\Isode\d3-db

Select “Isode M-Vault DSA Creation Service”

Change “Start Type” to “Disabled”

In “DSA Database” type “x”

Press “Apply”

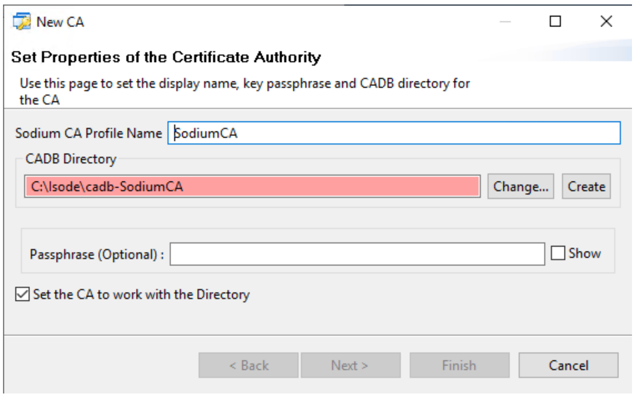
Configure CA

Create the directory “c:\IsodeCerts” (Linux : “/var/isode/certs”)

Open “Sodium CA” from the Windows start menu (Linux: “/opt/isode/sbin/sodiumca”)

Click “New”

create ca



New CA

Set Properties of the Certificate Authority

Use this page to set the display name, key passphrase and CADB directory for the CA

Sodium CA Profile Name: SodiumCA

CADB Directory: C:\Isode\cadb-SodiumCA

Passphrase (Optional) :

☑ Set the CA to work with the Directory

On “Set Properties of the Certificate Authority” leave Defaults

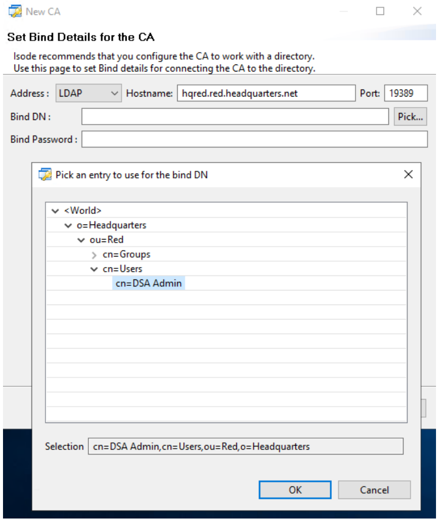
Click “Create”

Click “Next >”

In “Hostname” type “hqred.red.headquarters.net” [5]

Click “Pick”

set bind details for the CA



New CA

Set Bind Details for the CA

Isode recommends that you configure the CA to work with a directory.
Use this page to set Bind details for connecting the CA to the directory.

Address : LDAP Hostname: hqred.red.headquarters.net Port: 19389

Bind DN :

Bind Password :

Pick an entry to use for the bind DN

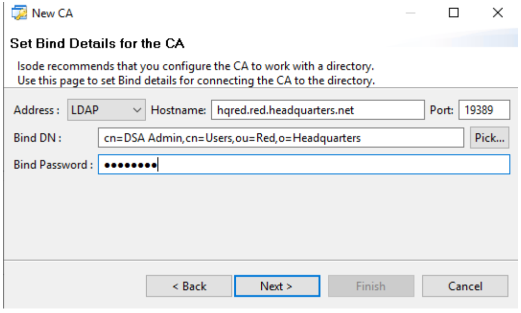
```
<World>
  o=Headquarters
    ou=Red
      cn=Groups
      cn=Users
        cn=DSA Admin
```

Selection: cn=DSA Admin,cn=Users,ou=Red,o=Headquarters

Browse to “cn=DSA Admin, CN=Users, ou=Red,o=Headquarters” [6]

Click “OK”

set bind password for ca



New CA

Set Bind Details for the CA

Isode recommends that you configure the CA to work with a directory.
Use this page to set Bind details for connecting the CA to the directory.

Address : LDAP Hostname: hqred.red.headquarters.net Port: 19389

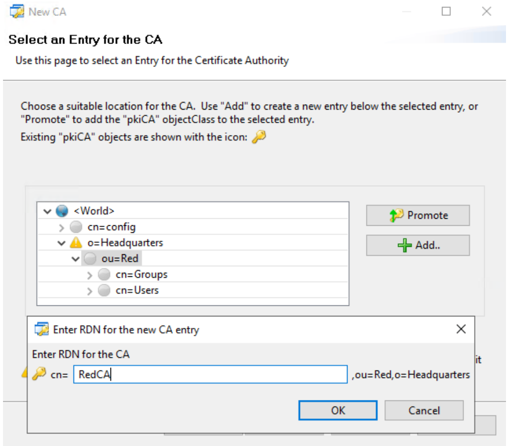
Bind DN : cn=DSA Admin,cn=Users,ou=Red,o=Headquarters

Bind Password : ••••••••

In “Bind Password” type “Secret1+”

Click “Next >”

create ca directory entry



New CA

Select an Entry for the CA

Use this page to select an Entry for the Certificate Authority

Choose a suitable location for the CA. Use "Add" to create a new entry below the selected entry, or "Promote" to add the "pkiCA" objectClass to the selected entry.
Existing "pkiCA" objects are shown with the icon:

Enter RDN for the new CA entry

Enter RDN for the CA

cn= RedCA ,ou=Red,o=Headquarters

On “Select an Entry for the CA” browse to and select “ou=Red,o=Headquarters” [7]

Click “Add”

On “Enter RDN for the new CA” type “RedCA” [8]

Click “OK”

Click “Next >”

On “Set Key Type, Subject and Subject Alternative Names” leave default options.

Click “Next >”

On “Certificate Status Sharing” leave Defaults

Click “Next >”

On “Set the CRL Distribution Point for the CA” leave defaults

Click “Next >”

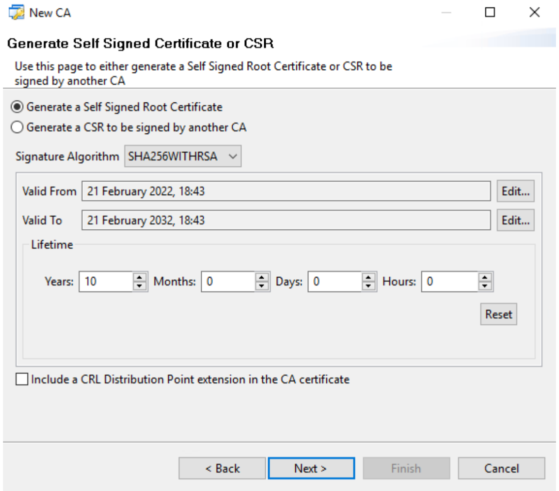
On “Set the Access Description List for the CA” leave defaults

Click “Next >”

On “Set Basic Constraints and KeyUsage Extension” leave defaults

Click “Next >”

generate self signed ca certificate



New CA

Generate Self Signed Certificate or CSR

Use this page to either generate a Self Signed Root Certificate or CSR to be signed by another CA

● Generate a Self Signed Root Certificate
○ Generate a CSR to be signed by another CA

Signature Algorithm: SHA256WITHRSA

Valid From: 21 February 2022, 18:43
Valid To: 21 February 2032, 18:43

Lifetime

Years: 10 Months: 0 Days: 0 Hours: 0

□ Include a CRL Distribution Point extension in the CA certificate

On “Generate Self Signed Certificate or CSR” select “Generate a Self Signed Root Certificate”

Leave the defaults

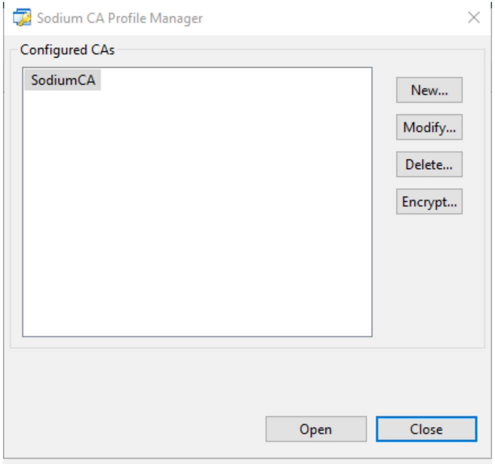
Click “Next >”

On “Root CA Certificate” leave Defaults

Click “Next >”

On “Finish CA Configuration” press “Finish”

open configured ca



Sodium CA Profile Manager

Configured CAs

SodiumCA

On “Sodium CA Profile Manager” select “SodiumCA”

Click “Open”

In “Password” type “Secret1+”

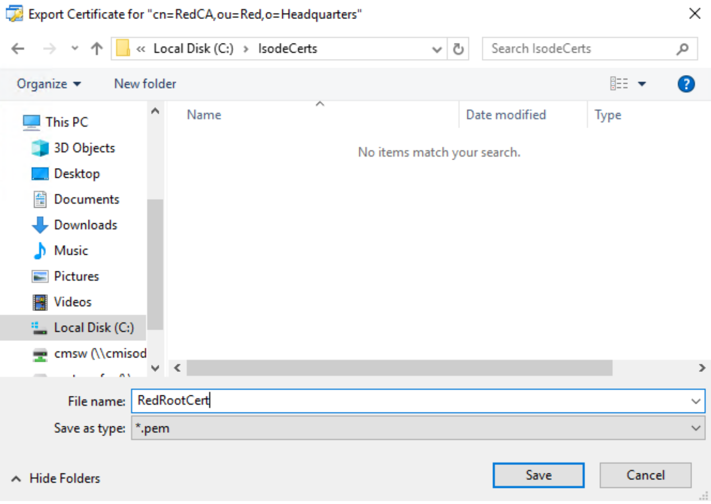
Click “OK”

Select “Certificate for cn=RedCA, ou=Red,o=Headquarters” [9]

Select “Export PEM ..”

On “Export Certificate for “cn=RedCA, ou=Red,o=Headquarters” [9], browse to “c:\IsodeCerts” (Linux : “/var/isode/certs”)

Change Filename to “RedRootCert.pem” [10] *export root certificate*



Export Certificate for "cn=RedCA,ou=Red,o=Headquarters"

No items match your search.

File name: RedRootCert

Save as type: *.pem

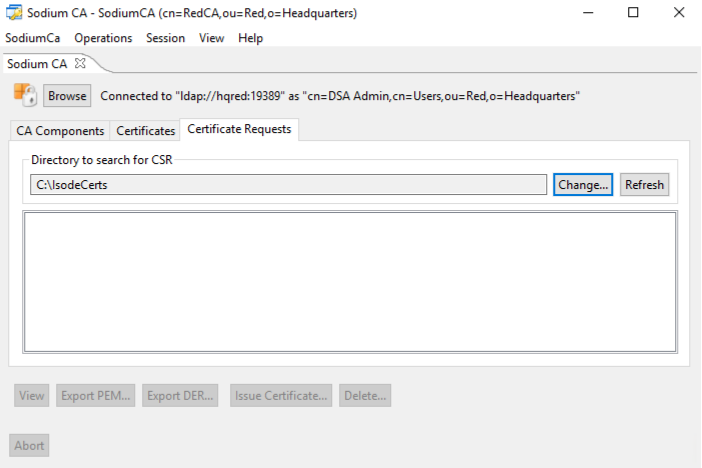
Press “Save”

On “Certificate for … exported” Click “OK”

Change to “Certificate Requests” tab

Change “Directory to Search for CSR” to “C:\IsodeCerts” (Linux: “/var/isode/certs”)

CSR directory changed



Sodium CA - SodiumCA (cn=RedCA,ou=Red,o=Headquarters)

Connected to "ldap://hqred:19389" as "cn=DSA Admin,cn=Users,ou=Red,o=Headquarters"

Directory to search for CSR: C:\IsodeCerts

Create a Certificate for M-Vault and Red/Black

Open a command prompt (Linux: a Terminal Session)

Change directory to “c:\IsodeCerts” (Linux: “/var/isode/certs”)

Create a certificate request by executing the following:

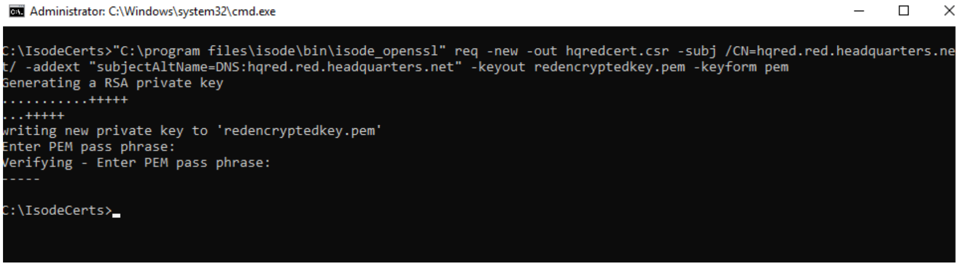
Windows:

```
“”C:\program files\isode\bin\isode_openssl" req -new -out
hqredcert.csr -subj /CN=hqred.red.headquarters.net/ -addext
"subjectAltName=DNS:hqred.red.headquarters.net" -keyout
redencryptedkey.pem -keyform pem” [11]
```

Linux:

```
“"/opt/isode/bin/isode_openssl" req -new -out hqredcert.csr -subj
/CN=hqred.red.headquarters.net/ -addext
"subjectAltName=DNS:hqred.red.headquarters.net" -keyout
redencryptedkey.pem -keyform pem” [12]
```

create certificate request



Administrator: C:\Windows\system32\cmd.exe

```
C:\IsodeCerts>"C:\program files\isode\bin\isode_openssl" req -new -out hqredcert.csr -subj /CN=hqred.red.headquarters.ne
t/ -addext "subjectAltName=DNS:hqred.red.headquarters.net" -keyout redencryptedkey.pem -keyform pem
Generating a RSA private key
...........+++++
...+++++
writing new private key to 'redencryptedkey.pem'
Enter PEM pass phrase:
Verifying - Enter PEM pass phrase:
-----

C:\IsodeCerts>_
```

When asked “Enter PEM pass phrase” type “Secret1+” and press “Return”

When asked “Verifying – Enter PEM pass phrase:” type “Secret1+” and press “Return”

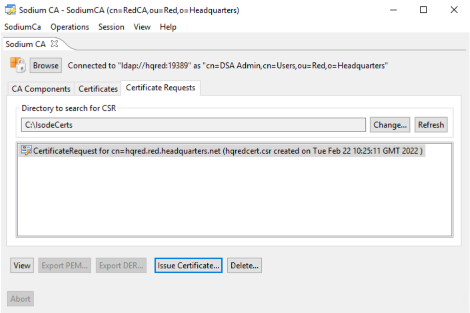
In Sodium CA, change to “Certificate Requests” tab.

Press “Refresh”

Ensure the recent request is highlighted.

Click “Issue Certificate”

issue certificate



Sodium CA - SodiumCA (cn=RedCA,ou=Red,o=Headquarters)

Connected to "ldap://hqred:19389" as "cn=DSA Admin,cn=Users,ou=Red,o=Headquarters"

Directory to search for CSR: C:\IsodeCerts

CertificateRequest for cn=hqred.red.headquarters.net (hqredcert.csr created on Tue Feb 22 10:25:11 GMT 2022)

On “Certificate Signing Request” leave defaults

Click “Next >”

On “Select and Add Subject Alternative names” leave defaults

Click “Next >”

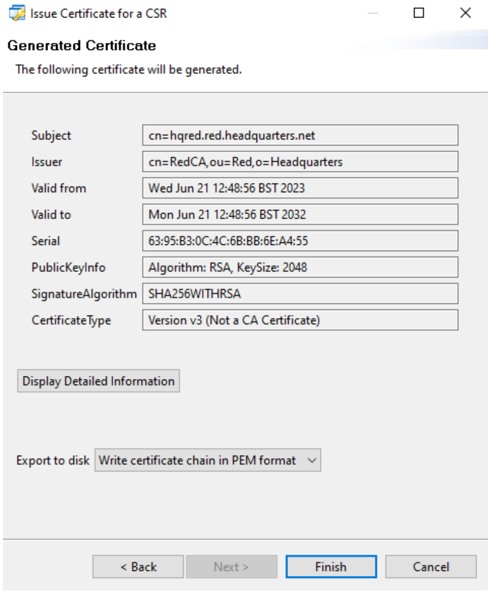
On “Select and Create X.509 Extensions” leave defaults

Click “Next >”

On “Set Validity and Signature Algorithm for the Certificate” leave defaults

Click “Next >”

Generated Certificate



Generated Certificate

The following certificate will be generated.

Subject	cn=hqred.red.headquarters.net
Issuer	cn=RedCA,ou=Red,o=Headquarters
Valid from	Wed Jun 21 12:48:56 BST 2023
Valid to	Mon Jun 21 12:48:56 BST 2032
Serial	63:95:B3:0C:4C:6B:BB:6E:A4:55
PublicKeyInfo	Algorithm: RSA, KeySize: 2048
SignatureAlgorithm	SHA256WITHRSA
CertificateType	Version v3 (Not a CA Certificate)

Export to disk: Write certificate chain in PEM format

On “Generated Certificate”, “Export to disk”, choose “Write certificate chain in PEM format”

Click “Finish”

On “CSR Signed” Click “OK”

Copy the file “c:\IsodeCerts\hqredcert_cert_Chain.pem” [13] to the file “c:\IsodeCerts\hqredcert_cert.pem” [14]. The path will differ on Linux.

Edit the file: “c:\IsodeCerts\hqredcert_cert.pem” [14] using a text editor.

Delete the second certificate from the file (the CA Cert)

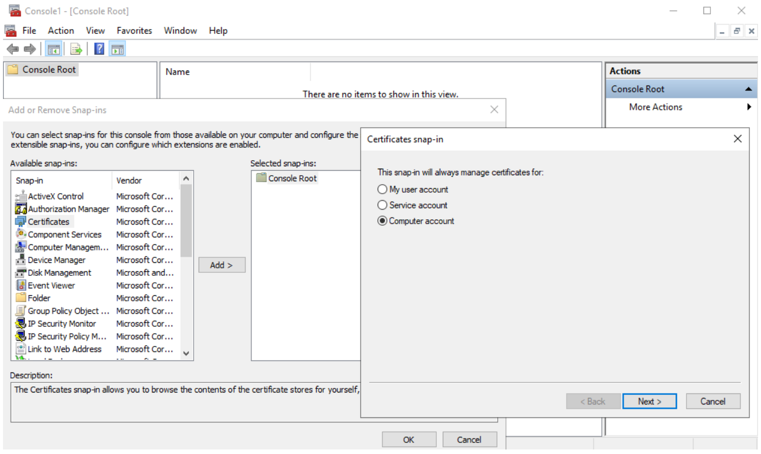
Save the file.

Import Root Certificate to Windows Certificate Store (Windows)

From the start menu Run “MMC”

Browse “File/Add or Remove Snap-in ..”

add certificate snap-in



There are no items to show in this view.

Add or Remove Snap-ins

You can select snap-ins for this console from those available on your computer and configure the extensible snap-ins, you can configure which extensions are enabled.

Available snap-ins:

Snap-in	Vendor
ActiveX Control	Microsoft Cor...
Authorization Manager	Microsoft Cor...
Certificates	Microsoft Cor...
Component Services	Microsoft Cor...
Computer Managem...	Microsoft Cor...
Device Manager	Microsoft Cor...
Disk Management	Microsoft and...
Event Viewer	Microsoft Cor...
Folder	Microsoft Cor...
Group Policy Object ...	Microsoft Cor...
IP Security Monitor	Microsoft Cor...
IP Security Policy M...	Microsoft Cor...
Link to Web Address	Microsoft Cor...

Selected snap-ins:

Console Root

Description:

The Certificates snap-in allows you to browse the contents of the certificate stores for yourself,

Certificates snap-in

This snap-in will always manage certificates for:

○ My user account

○ Service account

● Computer account

Select “Certificates”

Press “Add”

Select “Computer Account”

Press “Next >”

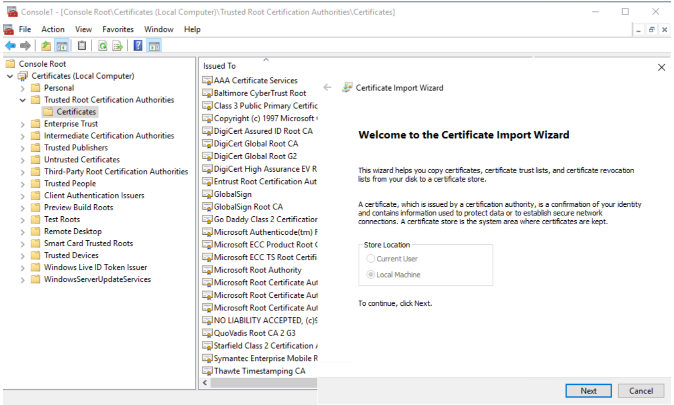
On “Select Computer” leave defaults

Press “Finish”

On “Add or Remove Snap-ins Press “OK”

In the left-hand pane browse to and Select “Trusted Root Certification Authorities\Certificates”

import certificate


Console1 - [Console Root\Certificates (Local Computer)\Trusted Root Certification Authorities\Certificates]
File Action View Favorites Window Help
Next
Cancel

Console Root
- Certificates (Local Computer)
  - Personal
  - Trusted Root Certification Authorities
    - Certificates
  - Enterprise Trust
  - Intermediate Certification Authorities
  - Trusted Publishers
  - Untrusted Certificates
  - Third-Party Root Certification Authorities
  - Trusted People
  - Client Authentication Issuers
  - Preview Build Roots
  - Test Roots
  - Remote Desktop
  - Smart Card Trusted Roots
  - Trusted Devices
  - Windows Live ID Token Issuer
  - WindowsServerUpdateServices

Issued To
AAA Certificate Services
Baltimore CyberTrust Root
Class 3 Public Primary Certific
Copyright (c) 1997 Microsoft
DigiCert Assured ID Root CA
DigiCert Global Root CA
DigiCert Global Root G2
DigiCert High Assurance EV R
Entrust Root Certification Aut
GlobalSign
GlobalSign Root CA
Go Daddy Class 2 Certificatior
Microsoft Authenticode(tm) F
Microsoft ECC Product Root (
Microsoft ECC TS Root Certifi
Microsoft Root Authority
Microsoft Root Certificate Aut
Microsoft Root Certificate Aut
Microsoft Root Certificate Aut
NO LIABILITY ACCEPTED, (c)9
QuoVadis Root CA 2 G3
Starfield Class 2 Certification /
Symantec Enterprise Mobile R
Thawte Timestamping CA

Certificate Import Wizard

Welcome to the Certificate Import Wizard

This wizard helps you copy certificates, certificate trust lists, and certificate revocation lists from your disk to a certificate store.

A certificate, which is issued by a certification authority, is a confirmation of your identity and contains information used to protect data or to establish secure network connections. A certificate store is the system area where certificates are kept.

Store Location

○ Current User

● Local Machine

To continue, click Next.

Right Click/All tasks/Import ..

On “Welcome to Certificate Import Wizard”, press “Next”

On “File to import” Browse to “C:\IsodeCerts”

In the “file types” dropdown select “All Files”

Select “RedRootCert.pem” [10] and “Open”

Press “Next >”

On “Certificate Store” leave defaults

Press “Next >”

On “Completing the Certificate Import Wizard” Press “Finish”

On “The import was successful”, press “OK”

Close the MMC.

On “Save console settings to Console1” Press “Yes”

On “Save As” in “File name:” field type “Certificates”

Saving the console as “Certificates”

Click “Save”

Import Root Certificate to Linux Certificate Store (Linux)

Open Firefox Browser

Select “Settings/Privacy and Security/View Certificates…”

Select “Authorities” tab.

Click “Import..”

Select “/var/isode/certs/RedRootCert.pem” [10]

Click “Open”

Check “Trust This CA to identify web sites”

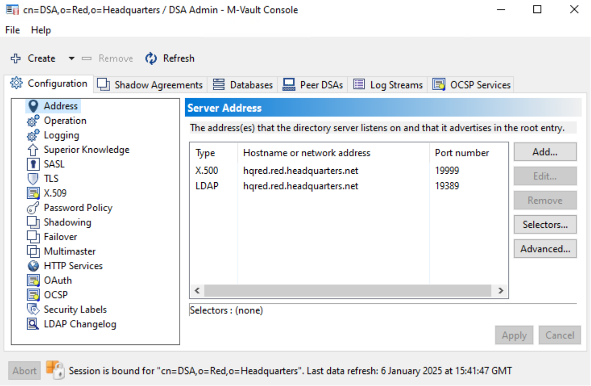
Click “OK”

On “Certificate Manager” click “OK”

Configure M-Vault to Support TLS

Return to the open “M-Vault Console”

import certificate



cn=DSA,o=Red,o=Headquarters / DSA Admin - M-Vault Console

Server Address

The address(es) that the directory server listens on and that it advertises in the root entry.

Type	Hostname or network address	Port number
X.500	hqred.red.headquarters.net	19999
LDAP	hqred.red.headquarters.net	19389

Selectors : (none)

Session is bound for "cn=DSA,o=Red,o=Headquarters". Last data refresh: 6 January 2025 at 15:41:47 GMT

Select “TLS” on the left-hand side of the “Configuration” tab

On the “Identities” tab Press “Create ..”

On “Set the Key parameters and edit Subject DN” leave defaults

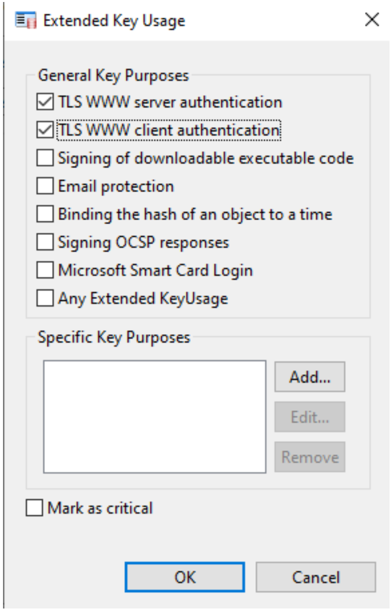
Click “Next >”

On “Select and add Subject Alternative names and Clearance” leave defaults

Click “Next >”

On “Select X.509 Extensions”, press “Edit..”

Extended Key Usage



Extended Key Usage

General Key Purposes

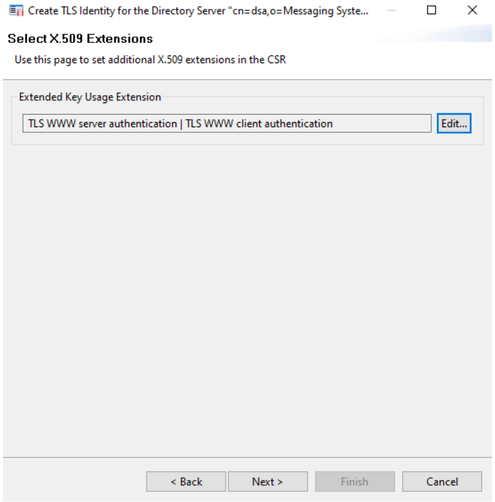
☑ TLS WWW server authentication
☑ TLS WWW client authentication
☐ Signing of downloadable executable code
☐ Email protection
☐ Binding the hash of an object to a time
☐ Signing OCSP responses
☐ Microsoft Smart Card Login
☐ Any Extended KeyUsage

☐ Mark as critical

Check “TLS WWW client authentication”

Press “OK”

X.509 Extensions Selected



Create TLS Identity for the Directory Server "cn=dsa,o=Messaging Syste...

Select X.509 Extensions

Use this page to set additional X.509 extensions in the CSR

Extended Key Usage Extension

TLS WWW server authentication | TLS WWW client authentication

Press “Next >”

On “Certificate Request Contents” leave defaults

Press “Next >”

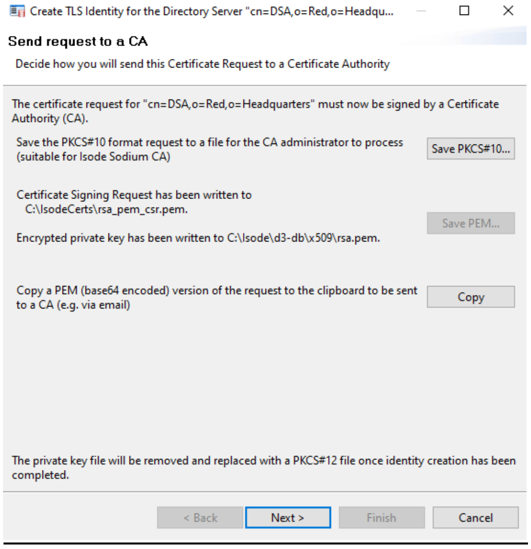
On “Send Request to a CA” press “Save PEM …”

On “Choose a Directory” browse to “C:\IsodeCerts” (Linux: “/var/isode/certs”)

Click “Select Folder” (Linux: “Open”).

Back on “Send Request to CA” leave defaults

populated send request to CA



Create TLS Identity for the Directory Server "cn=DSA,o=Red,o=Headqu...

Send request to a CA

Decide how you will send this Certificate Request to a Certificate Authority

The certificate request for "cn=DSA,o=Red,o=Headquarters" must now be signed by a Certificate Authority (CA).

Save the PKCS#10 format request to a file for the CA administrator to process (suitable for Isode Sodium CA)

Certificate Signing Request has been written to
C:\IsodeCerts\rsa_pem_csr.pem.

Encrypted private key has been written to C:\Isode\d3-db\x509\rsa.pem.

Copy a PEM (base64 encoded) version of the request to the clipboard to be sent to a CA (e.g. via email)

The private key file will be removed and replaced with a PKCS#12 file once identity creation has been completed.

Click “Next >”

In Sodium CA:

Change to “Certificate Requests” Tab

Press “Refresh”

Ensure Certificate request is selected

Click “Issue Certificate ..”

On “Certificate Signing Request” leave defaults

Click “Next >”

On “Select and add Subject Alternative Names” leave defaults

Press “Next >”

On “Select and Create X.509 Extensions” leave defaults

Press “Next”

On “Set Validity and Signature Algorithm for the Certificate” leave defaults

Click “Next >”

On “Generated Certificate” press “Finish”

On “CSR Signed” Click “OK”.

Back in M-Vault Console:

Select “The CA has provided a certificate” and press “Next >”

On “User Certificate” leave defaults

Click “Next >”

On “Other Certificates” leave defaults

Click “Next >”

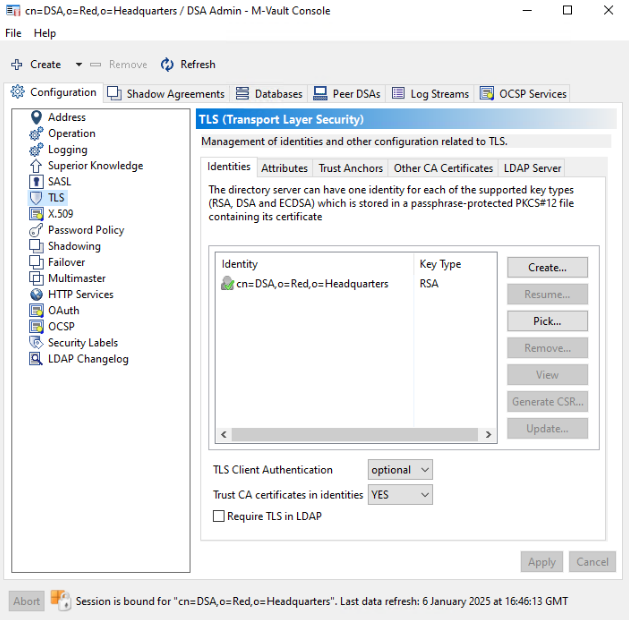
On “Finish directory servers Identity creation” leave defaults

Click “Finish”

On “Trust Root CA Certificate” dialogue click “Yes”

On “Configuration” tab press “Apply”

apply TLS identity



cn=DSA,o=Red,o=Headquarters / DSA Admin - M-Vault Console

TLS (Transport Layer Security)

Management of identities and other configuration related to TLS.

The directory server can have one identity for each of the supported key types (RSA, DSA and ECDSA) which is stored in a passphrase-protected PKCS#12 file containing its certificate

Identity	Key Type
cn=DSA,o=Red,o=Headquarters	RSA

TLS Client Authentication: optional

Trust CA certificates in identities: YES

□ Require TLS in LDAP

Session is bound for "cn=DSA,o=Red,o=Headquarters". Last data refresh: 6 January 2025 at 16:46:13 GMT

Close M-Vault Console configuration dialogue

On “M-Vault Console” click “Stop”

Wait for the directory service to stop.

Select the “Managed Directory Server”

Click “Start”

On “Directory Server Started” click “Yes”

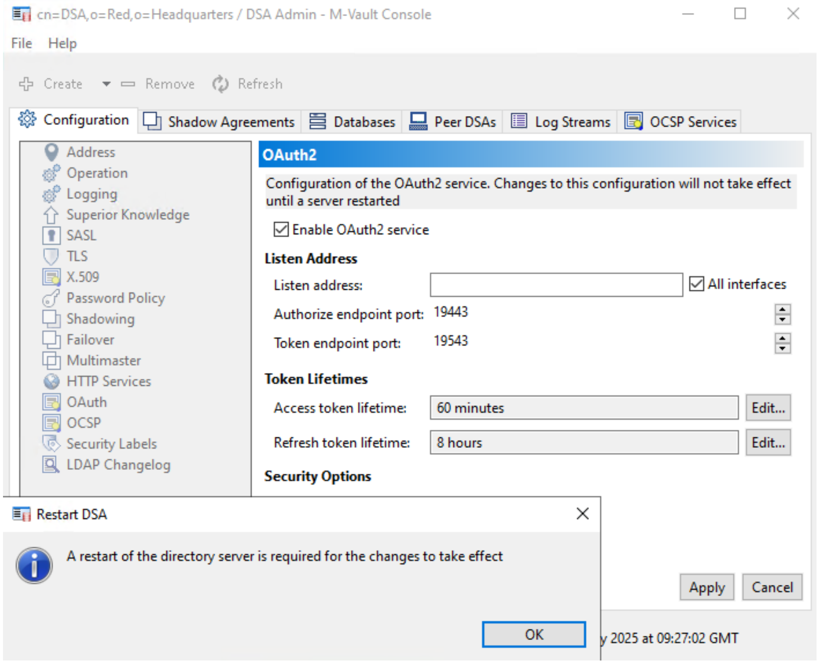
Configure M-Vault to Support OAuth

Select “OAuth”

Check “Enable OAuth2 service”

Press “Apply”

enable OAuth2



Configuration of the OAuth2 service. Changes to this configuration will not take effect until a server restarted

☑ Enable OAuth2 service

Listen Address

Listen address: ☑ All interfaces

Authorize endpoint port: 19443

Token endpoint port: 19543

Token Lifetimes

Access token lifetime: 60 minutes Edit...

Refresh token lifetime: 8 hours Edit...

Security Options

Restart DSA

A restart of the directory server is required for the changes to take effect

OK

On “Restart DSA” press “OK”

Close M-Vault Console configuration dialogue

On “M-Vault Console” click “Stop”

Wait for the directory service to stop.

Select the “Managed Directory Server”

Click “Start”

On “Directory Server Started” click “Yes”

Configure Red/Black Server

On Windows, ensure the “Isode RedBlack server” service has started using the “Isode Service Configuration” tool

On Linux, after installing the package, enable and start the service by:

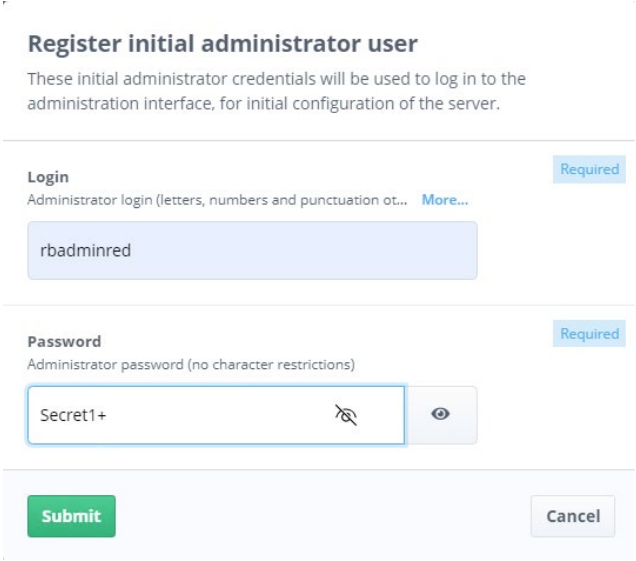
```
    “systemctl enable redblack”

    “systemctl start redblack”
```

If not already launched, browse to https://localhost:8080

The browser will warn of a security risk. Choose an option to override the warning.

Register initial administrator user



Register initial administrator user

These initial administrator credentials will be used to log in to the administration interface, for initial configuration of the server.

Login — Required

Administrator login (letters, numbers and punctuation ot... More...

rbadminred

Password — Required

Administrator password (no character restrictions)

Secret1+

In “Login” field type “rbadminred” [15]

In “Password” type “Secret1+”

Press “Submit”

Configuration will occur and the application will log itself out.

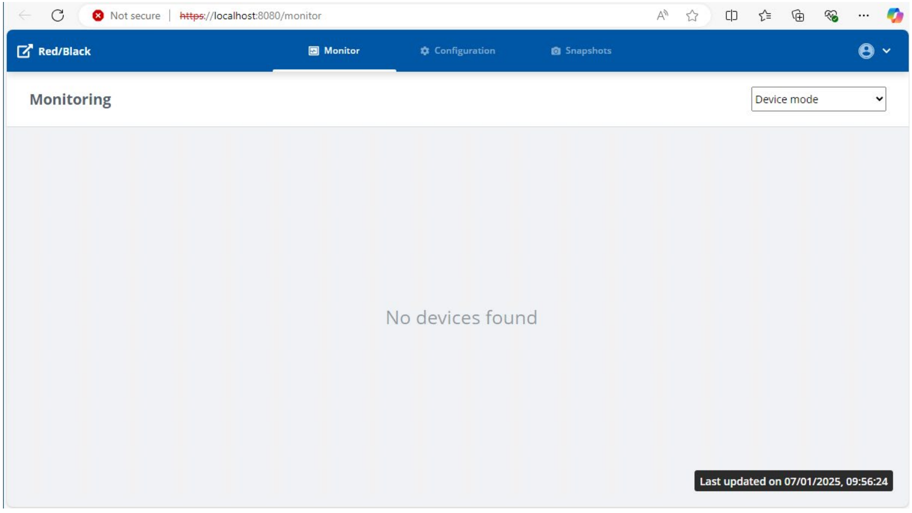
Use the Isode Service Configuration tool to stop and start the “Isode RedBlack server” service. This will ensure that the product is correctly activated.

On the Red/Black login screen in “Username” type “rbadminred” [15]

In “Password” type “Secret1+”

Click “Login”

First login



Monitoring

Device mode

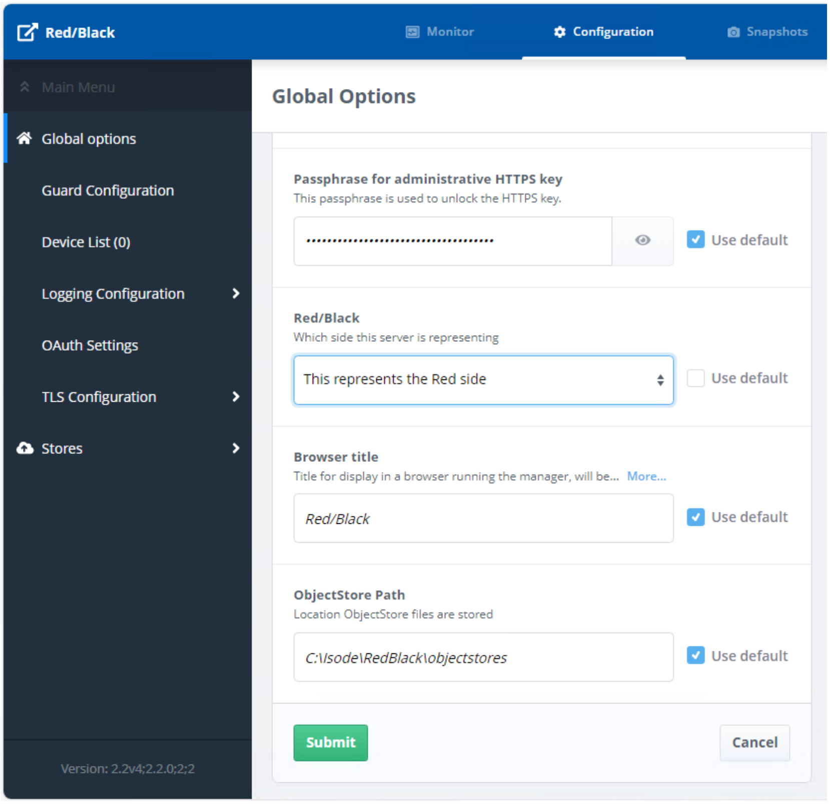
No devices found

Last updated on 07/01/2025, 09:56:24

Select the “Configuration” tab

Scroll down the “Global options”

configure side



Global Options

Passphrase for administrative HTTPS key
This passphrase is used to unlock the HTTPS key.
••••••••••••••••••••••••••••••••••••• ☑ Use default

Red/Black
Which side this server is representing
This represents the Red side □ Use default

Browser title
Title for display in a browser running the manager, will be... More...
Red/Black ☑ Use default

ObjectStore Path
Location ObjectStore files are stored
C:\Isode\RedBlack\objectstores ☑ Use default

Submit Cancel

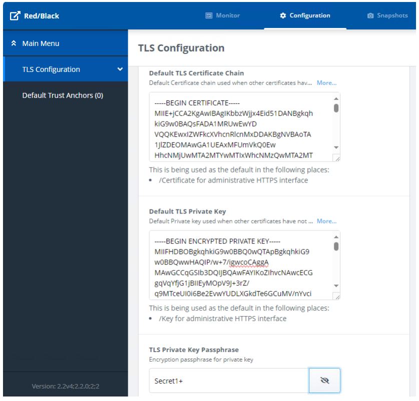
In “Red/Black” Select “This represents the Red Side” [16]

Press “Submit”

Configure Red/Black for TLS

Select “TLS Configuration”

Red/Black TLS configuration



TLS Configuration

Default TLS Certificate Chain
Default Certificate chain used when other certificates hav...

```
-----BEGIN CERTIFICATE-----
MIIE+jCCA2KgAwIBAgIKbbzWjjx4Eid51DANBgkqh
kiG9w0BAQsFADA1MRUwEwYD
VQQKEwxIZWFkcXVhcnRlcnMxDDAKBgNVBAoTA
1JlZDEOMAwGA1UEAxMFUmVkQ0Ew
HhcNMjUwMTA2MTYwMTIxWhcNMzQwMTA2MT
```

This is being used as the default in the following places:

- /Certificate for administrative HTTPS interface

Default TLS Private Key
Default Private key used when other certificates have not ...

```
-----BEGIN ENCRYPTED PRIVATE KEY-----
MIIFHDBOBgkqhkiG9w0BBQ0wQTApBgkqhkiG9
w0BBQwwHAQIP/w+7/igwcoCAggA
MAwGCCqGSIb3DQIJBQAwFAYIKoZIhvcNAwcECG
gqVqYfjG1jBIIEyMOpV9J+3rZ/
q9MTceUI0i6Be2EvwYUDLXGkdTe6GCuMV/nYvci
```

This is being used as the default in the following places:

- /Key for administrative HTTPS interface

TLS Private Key Passphrase
Encryption passphrase for private key

Secret1+

Delete the contents of the field “Default TLS Certificate Chain”

Paste the contents of the file “C\IsodeCerts\hqredcert_cert_Chain.pem” [13] into the field “Default TLS Certificate Chain” (Linux: “/var/isode/certs/hqredcert_cert_Chain.pem” [13])

Delete the contents of the field “Default TLS Private Key”

Paste the contents of the file “C:\IsodeCerts\redencryptedkey.pem” [19] into the field “Default TLS Private Key” (Linux : “/var/isode/certs/redencryptedkey.pem”)

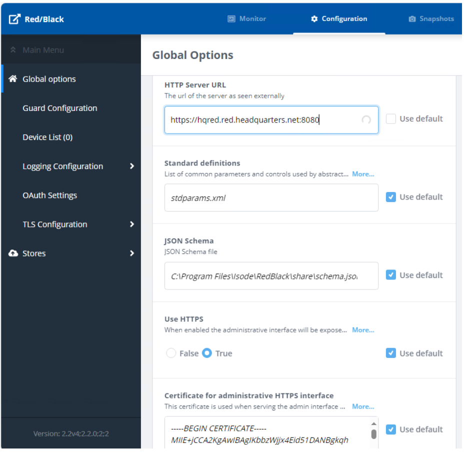
In the field “TLS Private Key Password” type “Secret1+”

Press “Submit”

Press the browser “Refresh” button

Select “Main Menu” in the left-hand pane.

configure Red/Black url



Global Options

HTTP Server URL
The url of the server as seen externally
https://hqred.red.headquarters.net:8080 □ Use default

Standard definitions
List of common parameters and controls used by abstract...
stdparams.xml ☑ Use default

JSON Schema
JSON Schema file
C:\Program Files\Isode\RedBlack\share\schema.jso ☑ Use default

Use HTTPS
When enabled the administrative interface will be expose...
○ False ● True ☑ Use default

Certificate for administrative HTTPS interface
This certificate is used when serving the admin interface ...
-----BEGIN CERTIFICATE-----
MIIE+jCCA2KgAwIBAgIKbbzWjjx4Eid51DANBgkqh ☑ Use default

In “HTTP Server URL” enter https://hqred.red.headquarters.net:8080 [21]

For “Use HTTPS” select “True”

Press “Submit”

Stop and Start the “Isode RedBlack server” using the “Isode Service Configuration” tool

```
(Linux: “systemctl restart redblack”)
```

It should now be possible to manage the product by browsing to the url “https://hqred.red.headquarters.net:8080” [21]

Install and configure Cobalt

On Windows, ensure the "Isode Cobalt server" service has started using the "Isode Service Configuration" tool.

On Linux, after installing the package, enable and start the service by:

```
"systemctl enable cobalt"

"systemctl start cobalt"
```

Browse to "https://localhost:8001".

The browser will warn of a security risk. Choose an option to override the warning.

The "Initial Cobalt Configuration" page will be launched.

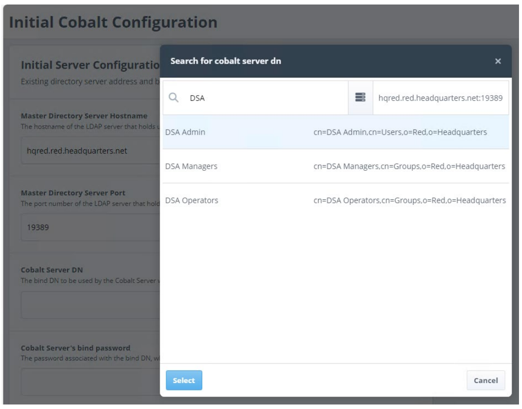
Ensure "Use an existing directory server" is checked and press "Next".

The "Initial Cobalt Configuration 2/3" page will be launched.

In the "Master Directory Server Hostname" type "hqred.red.headquarters.net" [22]

Press "Choose" to the right of "Cobalt Server DN"

select Cobalt admin



Initial Cobalt Configuration

Initial Server Configuratio

Existing directory server address and b

Master Directory Server Hostname

The hostname of the LDAP server that holds

hqred.red.headquarters.net

Master Directory Server Port

The port number of the LDAP server that hold

19389

Cobalt Server DN

The bind DN to be used by the Cobalt Server

Cobalt Server's bind password

The password associated with the bind DN, w

Search for cobalt server dn

DSA

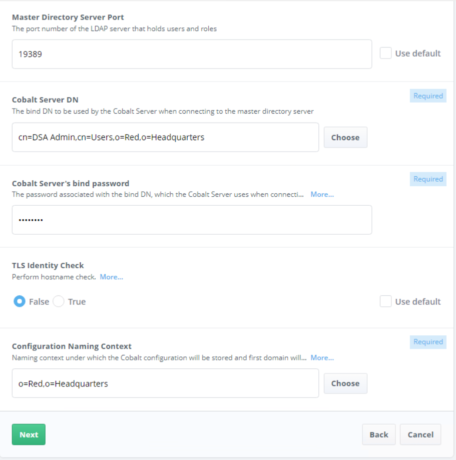
hqred.red.headquarters.net:19389

DSA Admin	cn=DSA Admin,cn=Users,o=Red,o=Headquarters
DSA Managers	cn=DSA Managers,cn=Groups,o=Red,o=Headquarters
DSA Operators	cn=DSA Operators,cn=Groups,o=Red,o=Headquarters

In the "Search" field, type "DSA" and Select "DSA Admin"

Press "Select"

initial Cobalt server configuration



Master Directory Server Port
The port number of the LDAP server that holds users and roles
19389 □ Use default

Cobalt Server DN Required
The bind DN to be used by the Cobalt Server when connecting to the master directory server
cn=DSA Admin,cn=Users,o=Red,o=Headquarters

Cobalt Server's bind password Required
The password associated with the bind DN, which the Cobalt Server uses when connecti... More...
••••••••

TLS Identity Check
Perform hostname check. More...
● False ○ True □ Use default

Configuration Naming Context Required
Naming context under which the Cobalt configuration will be stored and first domain will... More...
o=Red,o=Headquarters

In the “Cobalt Server’s bind password” field type “Secret1+”

Under “TLS Identity Check”, select “False”.

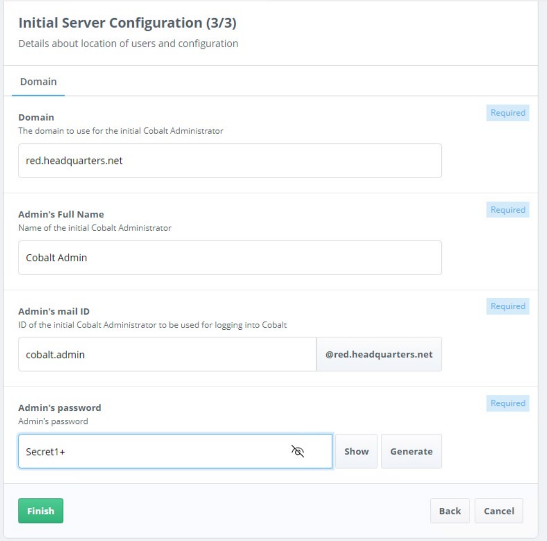
Press “Choose” to select the “Configuration Naming Context”

Select “o=Red,o=Headquarters” [4]

Press “Select”

Press “Next”

Initial Server Configuration (3/3)



Initial Server Configuration (3/3)
Details about location of users and configuration

Domain

Domain Required
The domain to use for the initial Cobalt Administrator
red.headquarters.net

Admin's Full Name Required
Name of the initial Cobalt Administrator
Cobalt Admin

Admin's mail ID Required
ID of the initial Cobalt Administrator to be used for logging into Cobalt
cobalt.admin @red.headquarters.net

Admin's password Required
Admin's password
Secret1+

In “Domain” type “red.headquarters.net” [23]

In “Admin’s Full Name” Type “Cobalt Admin”

In “Admin’s password” type “Secret1+”

Press “Finish”

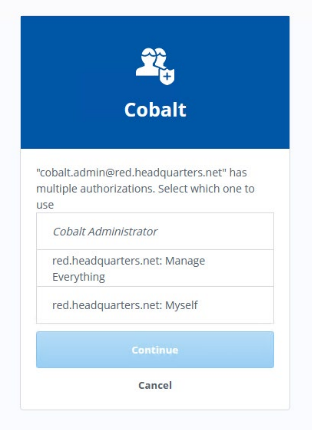
You will be redirected back to the Cobalt Login Screen.

In “Username” type cobalt.admin@red.headquarters.net [24]

In “Password” type “Secret1+”

Press “Login”

select Cobalt admin view



"cobalt.admin@red.headquarters.net" has multiple authorizations. Select which one to use

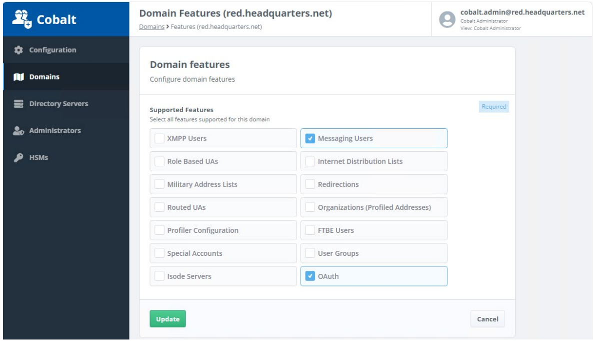
- *Cobalt Administrator*
- red.headquarters.net: Manage Everything
- red.headquarters.net: Myself

Select "Cobalt Administrator"

Press "Continue"

Press "Features"

select Cobalt features



Domain Features (red.headquarters.net)

Domains > Features (red.headquarters.net)

cobalt.admin@red.headquarters.net
Cobalt Administrator
View: Cobalt Administrator

Domain features

Configure domain features

Supported Features

Select all features supported for this domain

Required

□ XMPP Users	☑ Messaging Users
□ Role Based UAs	□ Internet Distribution Lists
□ Military Address Lists	□ Redirections
□ Routed UAs	□ Organizations (Profiled Addresses)
□ Profiler Configuration	□ FTBE Users
□ Special Accounts	□ User Groups
□ Isode Servers	☑ OAuth

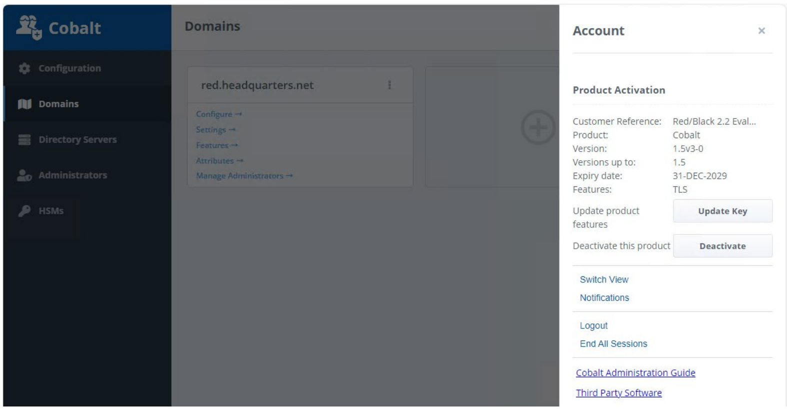
Uncheck "XMPP Users"

Check "OAuth"

Press "Update"

In the top right hand corner press "cobalt.admin@red.headquarters.net" [24]

switch Cobalt view

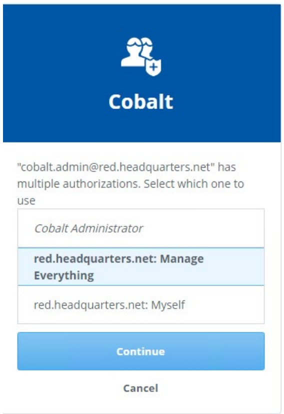


Product Activation

Customer Reference:	Red/Black 2.2 Eval...
Product:	Cobalt
Version:	1.5v3-0
Versions up to:	1.5
Expiry date:	31-DEC-2029
Features:	TLS
Update product features	Update Key
Deactivate this product	Deactivate

Press "Switch View"

select red.headquarters.net [23] view



Cobalt

"cobalt.admin@red.headquarters.net" has multiple authorizations. Select which one to use

- Cobalt Administrator
- **red.headquarters.net: Manage Everything**
- red.headquarters.net: Myself

Select "red.headquarters.net[23]:Manage Everything"

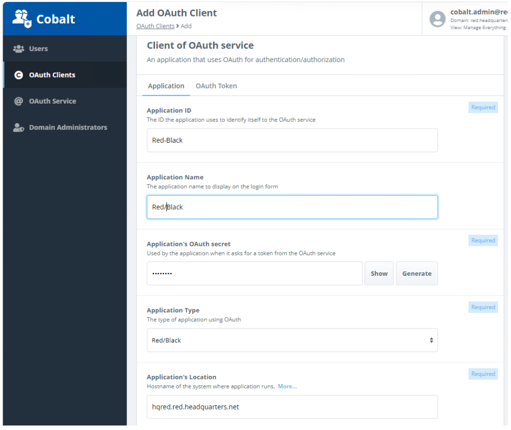
Press "Continue"

Configure OAuth in Cobalt

Select "OAuth Clients"

Press "Add"

configure OAuth client



Add OAuth Client

OAuth Clients > Add

cobalt.admin@re
Domain: red.headquarters
View: Manage Everything

Client of OAuth service

An application that uses OAuth for authentication/authorization

Application ID (Required)
The ID the application uses to identify itself to the OAuth service
Red-Black

Application Name
The application name to display on the login form
Red/Black

Application's OAuth secret (Required)
Used by the application when it asks for a token from the OAuth service
••••••••

Application Type (Required)
The type of application using OAuth
Red/Black

Application's Location (Required)
Hostname of the system where application runs. More...
hqred.red.headquarters.net

In "Application ID" type "Red-Black"

In "Application Name" type "Red/Black"

In "Application's OAuth secret" type "Secret1+"

In "Application Type" Select "Red/Black"

In "Application's Location" ensure "hqred.red.headquarters.net" [26]

Copy the "Redirect URI" to a text file for later use

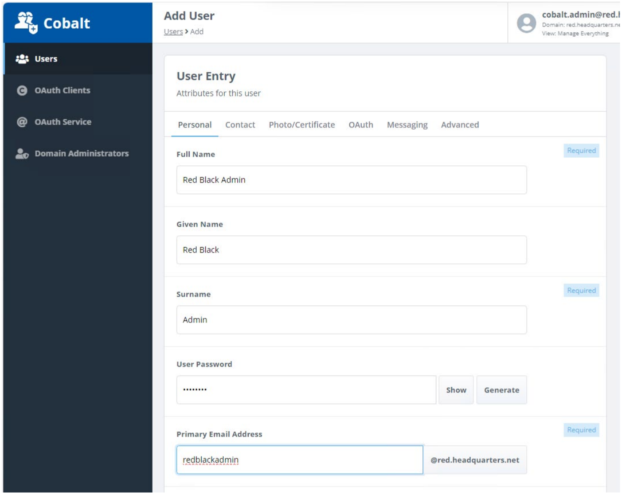
Press "Add"

Create the Red/Black Admin User in Cobalt

Select “Users”

Press “Add”

Configure Red/ Black Admin User



Full Name: Red Black Admin

Given Name: Red Black

Surname: Admin

User Password: ••••••••

Primary Email Address: redblackadmin @red.headquarters.net

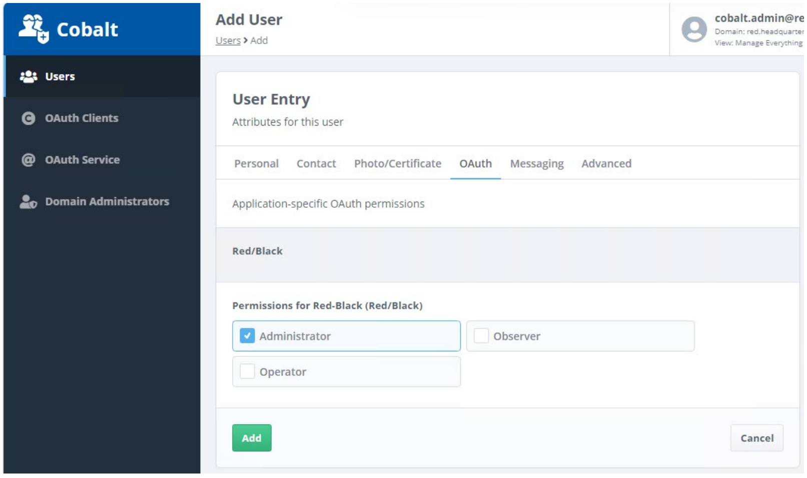
In “Full Name” type “Red Black Admin”

In “User Password” type “Secret1+”

Change “Primary Email Address” to “redblackadmin”

Change to “OAuth” tab

Add Red/Black Admin user



Application-specific OAuth permissions

Red/Black

Permissions for Red-Black (Red/Black)

☑ Administrator ☐ Observer

☐ Operator

Check “Administrator”

Press “Add”

Configure Red/Black to Use OAuth

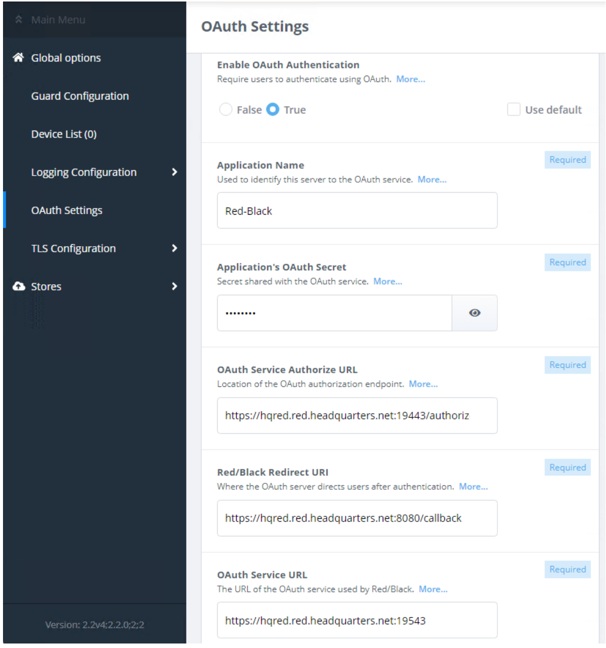
Return to the Red/Black Configuration tab in the browser

You may need to log back in.

Select “OAuth Settings”

Set “Enable OAuth Authentication” to “True”

configure Red/Black OAuth



OAuth Settings

Enable OAuth Authentication
Require users to authenticate using OAuth. More...
○ False ● True □ Use default

Application Name
Used to identify this server to the OAuth service. More...
Red-Black

Application's OAuth Secret
Secret shared with the OAuth service. More...
••••••••

OAuth Service Authorize URL
Location of the OAuth authorization endpoint. More...
https://hqred.red.headquarters.net:19443/authoriz

Red/Black Redirect URI
Where the OAuth server directs users after authentication. More...
https://hqred.red.headquarters.net:8080/callback

OAuth Service URL
The URL of the OAuth service used by Red/Black. More...
https://hqred.red.headquarters.net:19543

In “Application Name” type “Red-Black”

In “Application’s OAuth Secret” type “Secret1+”

In the “OAuth Service Authorize URL” enter “https://hqred.red.headquarters.net:19443/authorize”[27]

In “Red/Black Redirect URI” paste the value previously saved from Cobalt

In the “OAuth Service URL” enter “https://hqred.red.headquarters.net:19543 [28]

Press “Submit”

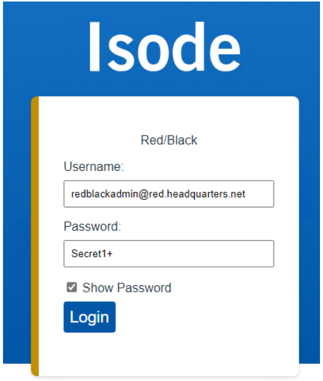
In the top right-hand corner of the page, press “Profile”

Press “Sign Out”

Continue Configuring Red/Black Authenticating Using OAuth

Browse to https://hqred.red.headquarters.net:8080/ [21]

login to Red/Black using OAuth



Red/Black

Username: redblackadmin@red.headquarters.net

Password: Secret1+

☑ Show Password

In "User" type "redblackadmin@red.headquarters.net" [29]

In "Password" type "Secret1+"

Press "Login"

Select "Configuration" tab

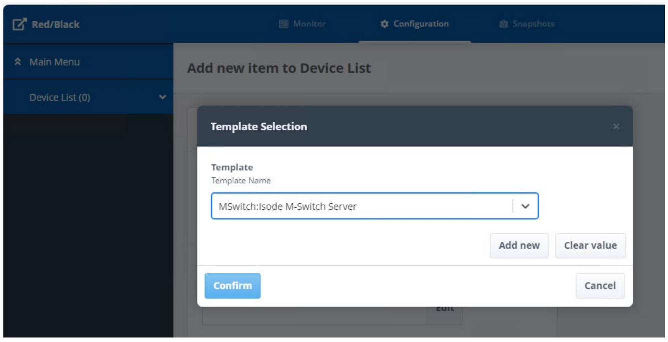
Select "Device List" [30]

Press "Add"

In "Device Name" type "M-Switch in Red"

Press "Edit"

add device



Template
Template Name: MSwitch:Isode M-Switch Server

In "Template Selection" Select "MSwitch:Isode M-Switch Server"

Press "Confirm"

In "Driver Options" select "Null Driver"

Press "Add"

Press "Add Another"

Repeat for the following name/template pairs:

Name : Harrier in Red

Template : Harrier:Isode Harrier Server

Name : Icon-5066 in Red

Template : Icon5066 : Isode Icon-5066 Server

Name : M-Box in Red

Template : MBox:Isode M-Box Server

Name : Icon-PEP in Red

Template: IconPEP:Isode Icon-PEP Server

Name : M-Guard

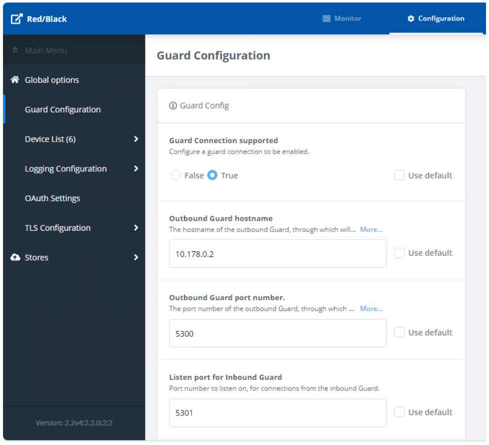
Template: MGuard:Represents a single M-Guard Guard

Configure Red/Black for Guard

Select "Main Menu"

Select "Guard Configuration"

Red/Black guard connection



Guard Configuration

Guard Config

Guard Connection supported
Configure a guard connection to be enabled.
○ False ● True □ Use default

Outbound Guard hostname
The hostname of the outbound Guard, through which will... More...
10.178.0.2 □ Use default

Outbound Guard port number.
The port number of the outbound Guard, through which ... More...
5300 □ Use default

Listen port for Inbound Guard
Port number to listen on, for connections from the inbound Guard.
5301 □ Use default

Set "Guard Connection Supported" to "True"

In "Outbound Guard Hostname" type "10.178.0.2" [31]

In "Outbound Guard port Number" type "5300" [32]

In "Listen Port for Inbound Guard" type "5301" [33]

Press "Submit"

Setting Up the Black Side

Follow the above steps for the red side changing the data marked like $^{\text{this}}$ with that referenced in Appendix A.

Set up the M Guard Appliance on Hyper-V

Follow the “M-Guard Evaluation guide” section “Initial Installation on Hyper-V” .

On the new M-Guard virtual machine, change the Virtual switch mapped to your first Network adaptor from “M-Guard Management” to the Virtual Switch currently mapped to your Red/Black machines. This is probably your local network.

Copy the M-Guard console software (folder mgc-x.y.z) to c:\on the machine “hqred” (Linux : “/opt/isode”)

Rename the folder “M-GuardConsole”

Create the Folder “C:\M-GuardConsole\M-GuardEval” (Linux: “/opt/isode/M-GuardConsole/M-GuardEval”)

Follow the “M-Guard Evaluation guide” section “Configuring the M-Guard Appliance with M-Guard Console” using the software in “c:\M-GuardConsole (Linux:” /opt/isode/M-GuardConsole”) while making the following modifications at the appropriate points :

Place the project in C:\M-Guard Console\M-Guard Eval. (Linux: “/opt/isode/M-GuardConsole/M-GuardEval”)

Name the project “Red Black Guard”

Place the ssh keys in C:\M-Guard Console\M-Guard Eval (Linux: “/opt/isode/M-GuardConsole/M-GuardEval”)

In the comment field use rbadminred@red.headquarters.net

For the password use “Secret1+”

When Adding Appliance use the Name: “Red Black Guard”

After logging in, change password to “Secret1+”

For the hno use address : “192.168.56.3”

Use the suggested host name for the guard: guard.headquarters.net

Configure Guard Networks

Associate the Second NIC on the Guard Virtual Machine with the Red Network

Associate the third NIC on the Guard Virtual Machine with the Black Network

Associate the second NIC on “hqred.red.headquarters.net” with the Red Network and configure the suggested IP address (see table).

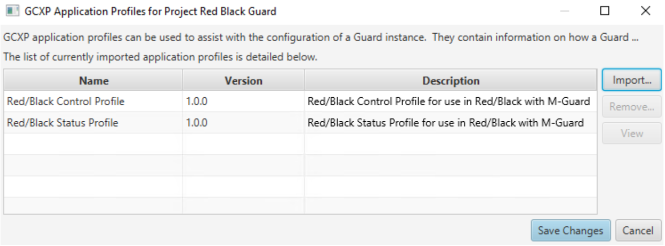
Associate the second NIC on “hqblack.black.headquarters.net” with the Black Network and configure the suggested IP address (see table).

Follow the “M-Guard Evaluation guide” section “Prepare to Add an M-Guard Instance” to:

Import the “red-black-control-profile.xml”

Import the “red-black-status-profile.xml”

Red/Black application profiles



GCXP application profiles can be used to assist with the configuration of a Guard instance. They contain information on how a Guard ...
The list of currently imported application profiles is detailed below.

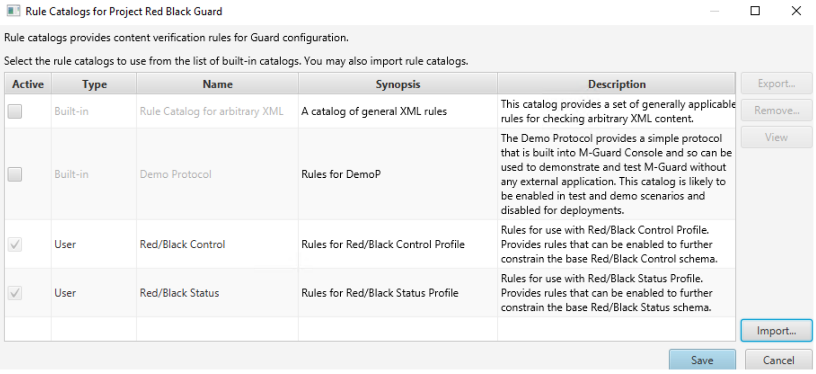
Name	Version	Description
Red/Black Control Profile	1.0.0	Red/Black Control Profile for use in Red/Black with M-Guard
Red/Black Status Profile	1.0.0	Red/Black Status Profile for use in Red/Black with M-Guard

Press “Save Changes”

Import the “red-black-2.2v3-control-rule-catalog.xml”which is in the file “red-black-2.2v3-control-rule-catalog.zip”

Import the “rule-catalog.xml” from the file “red-black-status-profile-1.0.0”.zip

Red/Black rule catalog



Rule catalogs provides content verification rules for Guard configuration.

Select the rule catalogs to use from the list of built-in catalogs. You may also import rule catalogs.

Active	Type	Name	Synopsis	Description
□	Built-in	Rule Catalog for arbitrary XML	A catalog of general XML rules	This catalog provides a set of generally applicable rules for checking arbitrary XML content.
□	Built-in	Demo Protocol	Rules for DemoP	The Demo Protocol provides a simple protocol that is built into M-Guard Console and so can be used to demonstrate and test M-Guard without any external application. This catalog is likely to be enabled in test and demo scenarios and disabled for deployments.
☑	User	Red/Black Control	Rules for Red/Black Control Profile	Rules for use with Red/Black Control Profile. Provides rules that can be enabled to further constrain the base Red/Black Control schema.
☑	User	Red/Black Status	Rules for Red/Black Status Profile	Rules for use with Red/Black Status Profile. Provides rules that can be enabled to further constrain the base Red/Black Status schema.

Press “Save”

Follow the “M-Guard Evaluation guide” section “Configuring a new M-Guard Instance” to add the two guard instances as described substituting the following information:

Data for Red to Black Guard:

Jail Name : redblackrtb

GXCP Application Profile: Red/Black Control Profile

Allow GXCP responses in response flow

Tag: redblackrtb

Inbound peer address: 10.178.0.1

Inbound peer name: hqred.red.headquarters.net

Inbound Listen-on interface : hn1

Inbound “Listen-on address”: 10.178.0.2/24

Inbound “Listen Port”: 5300

Outbound Peer IP address: 192.168.106.1

Outbound Peer Port: 5300

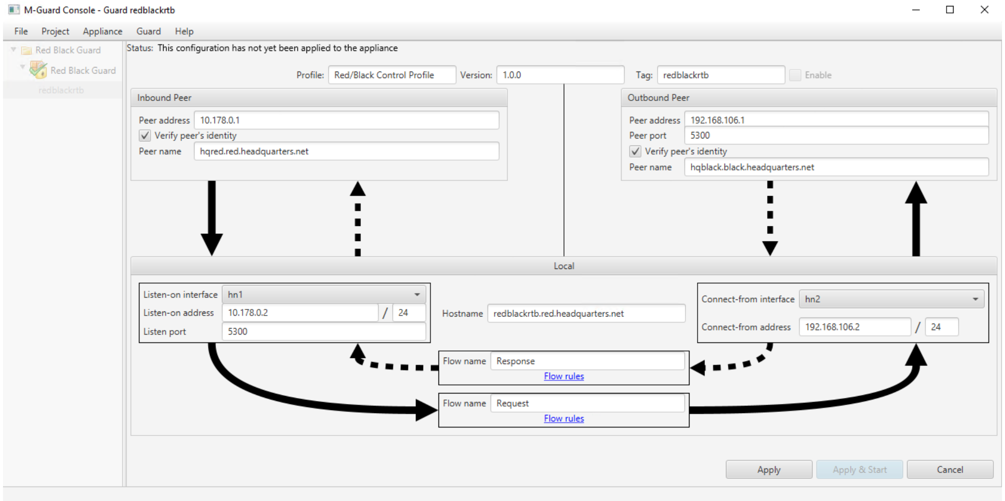
Outbound Peer name: “hqblack.black.headquarters.net”

Outbound Peer Connect-from interface : hn2

Outbound Peer “Connect-from Address”: 192.168.106.2/24

Hostname : redblackrtb.red.headquarters.net

Red to Black guard configuration



Status: This configuration has not yet been applied to the appliance

Profile: Red/Black Control Profile Version: 1.0.0 Tag: redblackrtb □ Enable

Inbound Peer

Peer address 10.178.0.1
☑ Verify peer's identity
Peer name hqred.red.headquarters.net

Outbound Peer

Peer address 192.168.106.1
Peer port 5300
☑ Verify peer's identity
Peer name hqblack.black.headquarters.net

Listen-on interface hn1
Listen-on address 10.178.0.2 / 24
Listen port 5300

Hostname redblackrtb.red.headquarters.net

Connect-from interface hn2
Connect-from address 192.168.106.2 / 24

Flow name Response
Flow rules

Flow name Request
Flow rules

Data for Black to Red Guard :

Name: redblackbtr

GXCP Application Profile: Red/Black Status Profile

Allow GXCP responses in response flow

Tag: redblackbtr

Inbound peer address: 192.168.106.1

Inbound peer name: hqblack.black.headquarters.net

Inbound Listen-on interface : hn2

Inbound “Listen-on address”: 192.168.106.3/24

Inbound “Listen Port”: 5301

Outbound Peer IP address: 10.178.0.1

Outbound Peer Port: 5301

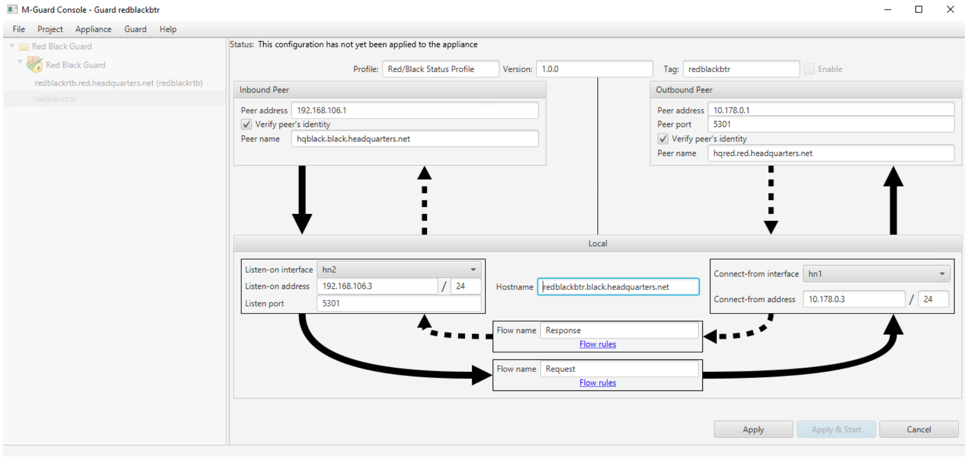
Peer name: “hqred.red.headquarters.net”

Outbound Peer Connect-from interface : hn1

Outbound Peer “Connect From Address”: 10.178.0.3/24

Hostname : redblackbtr.black.headquarters.net

Black to Red guard configuration



Status: This configuration has not yet been applied to the appliance

Profile: Red/Black Status Profile

Version: 1.0.0

Tag: redblackbtr

□ Enable

Inbound Peer

Peer address: 192.168.106.1

☑ Verify peer's identity

Peer name: hqblack.black.headquarters.net

Outbound Peer

Peer address: 10.178.0.1

Peer port: 5301

☑ Verify peer's identity

Peer name: hqred.red.headquarters.net

Local

Listen-on interface: hn2

Listen-on address: 192.168.106.3 / 24

Listen port: 5301

Hostname: redblackbtr.black.headquarters.net

Connect-from interface: hn1

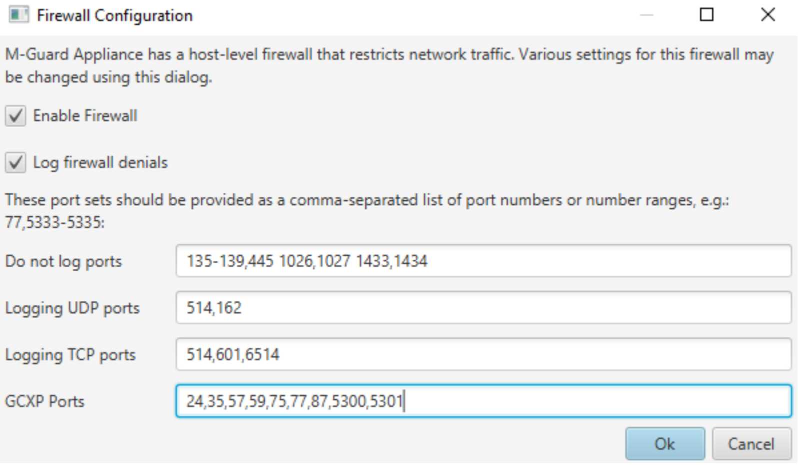
Connect-from address: 10.178.0.3 / 24

Flow name: Response — Flow rules

Flow name: Request — Flow rules

Ensure ports 5300 and 5301 are configured in the firewall GXCP ports as described in the M-Guard Evaluation guide.

Configure GXCP firewall ports



M-Guard Appliance has a host-level firewall that restricts network traffic. Various settings for this firewall may be changed using this dialog.

☑ Enable Firewall

☑ Log firewall denials

These port sets should be provided as a comma-separated list of port numbers or number ranges, e.g.: 77,5333-5335:

Do not log ports: 135-139,445 1026,1027 1433,1434

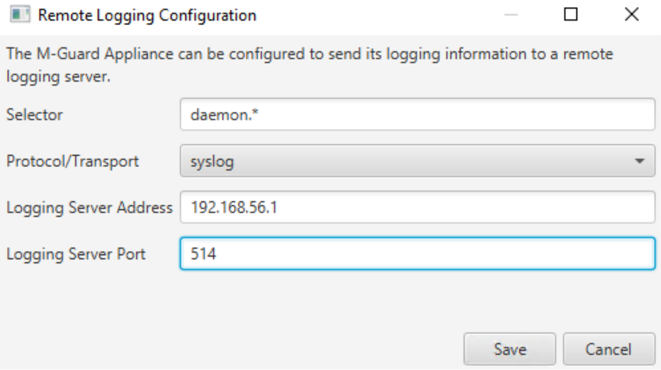
Logging UDP ports: 514,162

Logging TCP ports: 514,601,6514

GCXP Ports: 24,35,57,59,75,77,87,5300,5301

The Remote Logging Configuration server address is 192.168.56.1

Remote Logging Configuration



The M-Guard Appliance can be configured to send its logging information to a remote logging server.

Selector: daemon.*

Protocol/Transport: syslog

Logging Server Address: 192.168.56.1

Logging Server Port: 514

Select "Appliance/Save Configuration .."

On "Confirmation" press "OK"

On "The appliance returned the following:" press "Close"

Configure the Guard Connection Security

This section should be completed on both the Red and Black servers.

Create a Certificate to Connect to M-Guard

Open a command prompt (Linux: a Terminal Session)

Change directory to “c:\IsodeCerts” (Linux: “/var/isode/certs”)

Create a certificate request by executing the following:

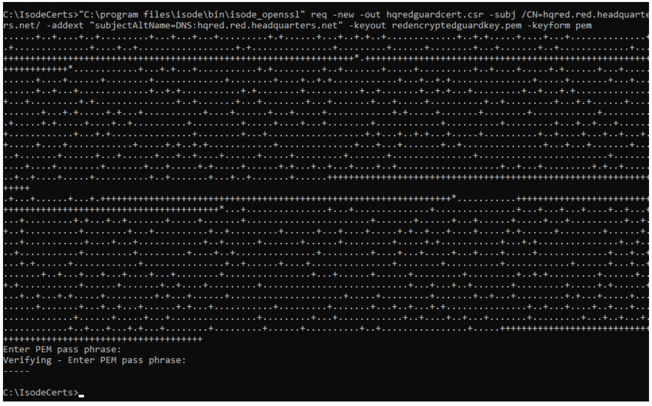
Windows:

```
“”C:\program files\isode\bin\isode_openssl" req -new -out
hqredguardcert.csr -subj /CN=hqred.red.headquarters.net/ -addext
"subjectAltName=DNS:hqred.red.headquarters.net" -keyout
redencryptedguardkey.pem -keyform pem” [34]
```

Linux:

```
“"/opt/isode/bin/isode_openssl" req -new -out hqredguardcert.csr -
subj /CN=hqred.red.headquarters.net/ -addext
"subjectAltName=DNS:hqred.red.headquarters.net" -keyout
redencryptedguardkey.pem -keyform pem” [35]
```

create certificate request



```
C:\IsodeCerts>"C:\program files\isode\bin\isode_openssl" req -new -out hqredguardcert.csr -subj /CN=hqred.red.headquarte
rs.net/ -addext "subjectAltName=DNS:hqred.red.headquarters.net" -keyout redencryptedguardkey.pem -keyform pem
Enter PEM pass phrase:
Verifying - Enter PEM pass phrase:
-----

C:\IsodeCerts>
```

When asked “Enter PEM pass phrase” type “Secret1+” and press “Return”

When asked “Verifying – Enter PEM pass phrase:” type “Secret1+” and press “Return”

If configuring the Black server, copy the file “C:\IsodeCerts\hqblackguardcert.csr” to the “C:\IsodeCerts\” directory on the Red server.

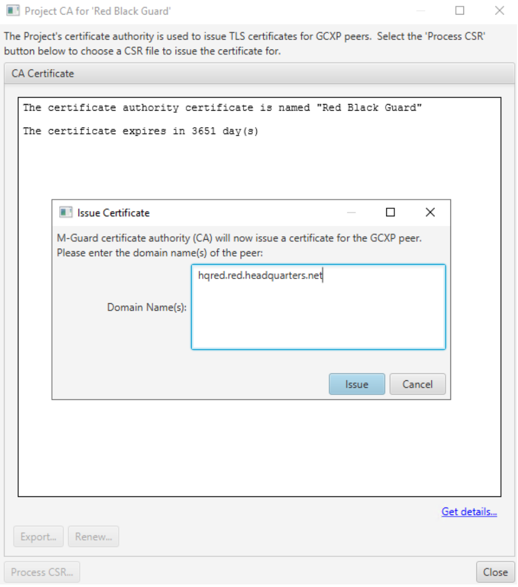
Open the Guard CA (“Project/Certificate Authority”)

Press “Process CSR”

Select the file “C:\IsodeCerts\hqredguardcert.csr[36]”

Press “Open”

Issue Cert



The Project's certificate authority is used to issue TLS certificates for GCXP peers. Select the 'Process CSR' button below to choose a CSR file to issue the certificate for.

CA Certificate

```
The certificate authority certificate is named "Red Black Guard"

The certificate expires in 3651 day(s)
```

M-Guard certificate authority (CA) will now issue a certificate for the GCXP peer. Please enter the domain name(s) of the peer:

Domain Name(s): hqred.red.headquarters.net

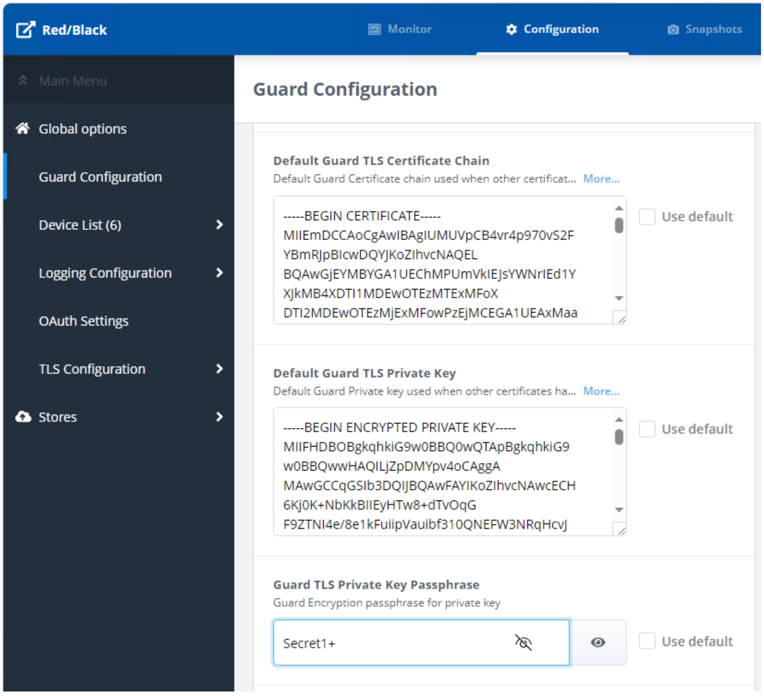
Press “Issue”

On “Certificate Issued” press “OK”

If configuring the Black server, copy the file “C:\IsodeCerts\hqblack_black_headquarters_net_chain.pem” to the “C:\IsodeCerts\” directory on the Black server.

In the Red/Black configuration, Select “Guard Configuration”

Guard configuration



Guard Configuration

Default Guard TLS Certificate Chain

Default Guard Certificate chain used when other certificat... More...

```
-----BEGIN CERTIFICATE-----
MIIEmDCCAoCgAwIBAgIUMUVpCB4vr4p970vS2F
YBmRJpBIcwDQYJKoZIhvcNAQEL
BQAwGjEYMBYGA1UEChMPUmVkIEJsYWNrIEd1Y
XJkMB4XDTI1MDEwOTEzMTExMFoX
DTI2MDEwOTEzMjExMFowPzEjMCEGA1UEAxMaa
```

□ Use default

Default Guard TLS Private Key

Default Guard Private key used when other certificates ha... More...

```
-----BEGIN ENCRYPTED PRIVATE KEY-----
MIIFHDBOBgkqhkiG9w0BBQ0wQTApBgkqhkiG9
w0BBQwwHAQILjZpDMYpv4oCAggA
MAwGCCqGSIb3DQIJBQAwFAYIKoZIhvcNAwcECH
6Kj0K+NbKkBIlEyHTw8+dTvOqG
F9ZTNI4e/8e1kFuiipVauibf310QNEFW3NRqHcvJ
```

□ Use default

Guard TLS Private Key Passphrase

Guard Encryption passphrase for private key

Secret1+

□ Use default

Delete the contents of the field “Default Guard TLS Certificate Chain”

Paste the contents of the file “C:\IsodeCerts\hqred_red_headquarters_net_chain.pem” [37] into the field “Default Guard TLS Certificate Chain” (Linux: “/var/isode/certs/hqredcert_cert_Chain.pem” [37])

Delete the contents of the field “Default Guard TLS Private Key”

Paste the contents of the file “C:\IsodeCerts\redencryptedguardkey.pem” [38] into the field “Default Guard TLS Private Key” (Linux : “/var/isode/certs/redencryptedguardkey.pem” [38])

In the field “Guard TLS Private Key Password” type “Secret1+”

Press “Submit”

Restart the Red/Black services on both servers.

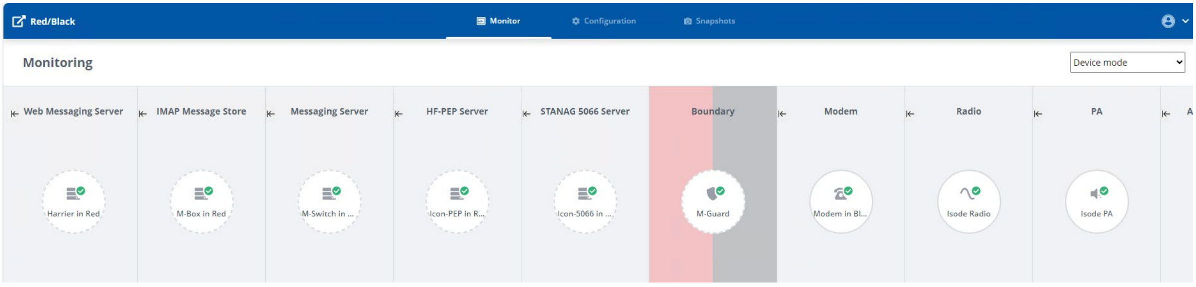
Explore Services With Red/Black

You have now completed the configuration of the simple Red/Black environment.

On the Red server, log into Red/Black

Change to the “Monitor” tab

monitor Red/Black



Note that devices can be seen that are located both in Red and Black.

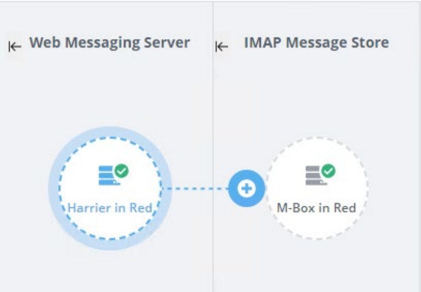
Connecting services

It is possible to connect Red/Black monitored devices.

Ensure “Connection mode” selected in top right hand corner.

Select “Harrier in Red”

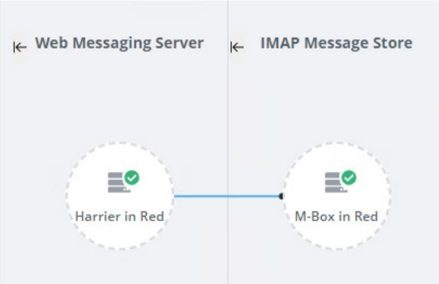
Connection available



Press “+”

Note that a connection has been made.

Connection made



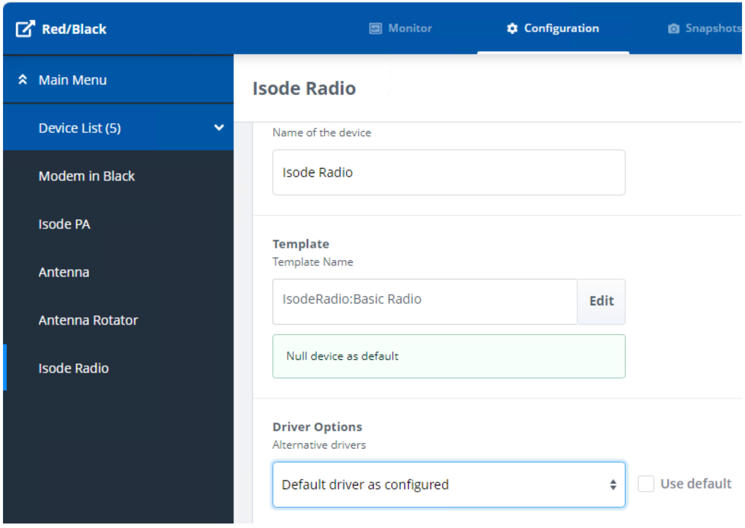
Connections between certain other devices can be defined within the device itself (For example within M-Switch).

Setting Guard Rules

It is possible to use Guard Rules to limit cross-guard communication.

On the black server, modify the configuration of the “Isode Radio” device so that the “Driver Options” are “Default Driver as configured”

Modify driver options



Isode Radio

Name of the device: Isode Radio

Template

Template Name: IsodeRadio:Basic Radio

Null device as default

Driver Options

Alternative drivers: Default driver as configured

□ Use default

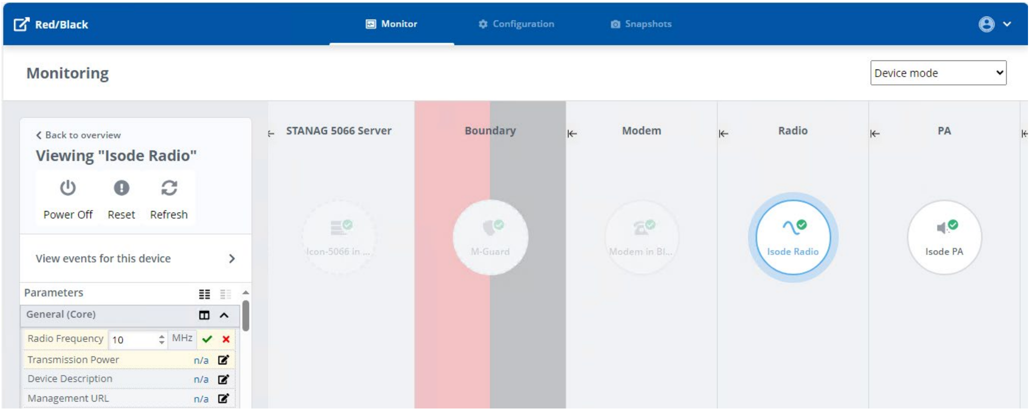
Press “Submit”

On the red server, change to “Device mode”

Select “Isode Radio”

Press the edit button next to “Radio Frequency”

Modify radio frequency



Monitoring

Device mode

Viewing "Isode Radio"

Parameters

General (Core)

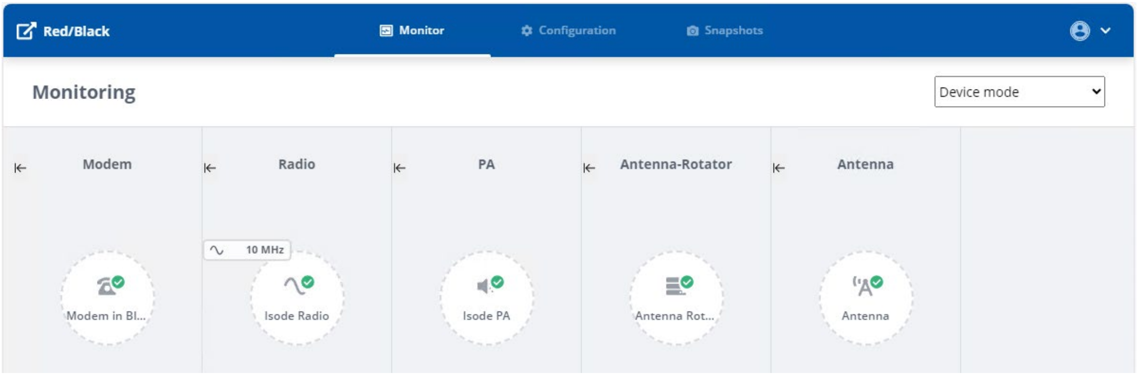
Radio Frequency	10 MHz	✓ ✗
Transmission Power	n/a	
Device Description	n/a	
Management URL	n/a	

Type “10” in the edit box

Press the green tick (Apply Change)

View the monitor on the black server

Radio frequency at black



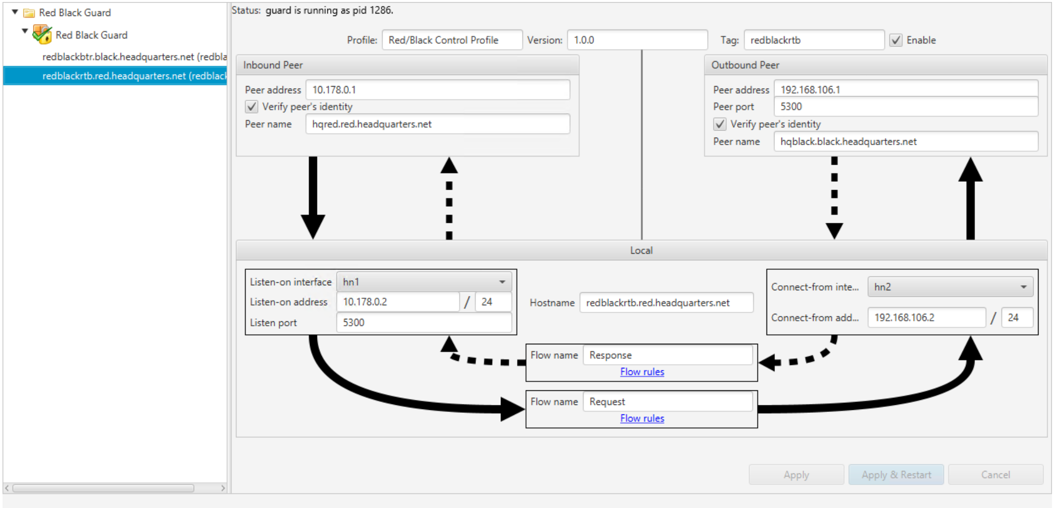
Note that the radio frequency has been changed to “10”

Back on the red server, press “Refresh” and the frequency will also be shown in Red.

Open M-Guard console and connect to the guard

Select the Red to Black Guard

Select flow rules



Status: guard is running as pid 1286.

Profile: Red/Black Control Profile Version: 1.0.0 Tag: redblackrtb ☑ Enable

Peer address 10.178.0.1
☑ Verify peer's identity
Peer name hqred.red.headquarters.net

Peer address 192.168.106.1
Peer port 5300
☑ Verify peer's identity
Peer name hqblack.black.headquarters.net

Listen-on interface hn1
Listen-on address 10.178.0.2 / 24
Listen port 5300

Hostname redblackrtb.red.headquarters.net

Connect-from inte... hn2
Connect-from add... 192.168.106.2 / 24

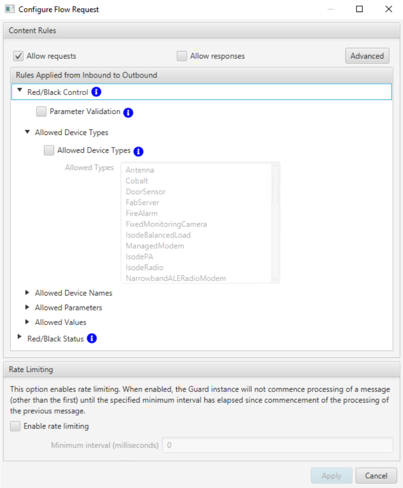
Flow name Response
Flow rules

Flow name Request
Flow rules

Select “Flow Rules” under “Request”

Expand to “Allowed Device Types” under “Red/Black Control”

Configure flow request



Configure Flow Request

Content Rules

☑ Allow requests □ Allow responses Advanced

Rules Applied from Inbound to Outbound

- Red/Black Control
  - □ Parameter Validation
  - Allowed Device Types
    - □ Allowed Device Types
    - Allowed Types: Antenna, Cobalt, DoorSensor, FabServer, FireAlarm, FixedMonitoringCamera, IsodeBalancedLoad, ManagedModem, IsodePA, IsodeRadio, NarrowbandALERadioModem
  - Allowed Device Names
  - Allowed Parameters
  - Allowed Values
- Red/Black Status

Rate Limiting

This option enables rate limiting. When enabled, the Guard instance will not commence processing of a message (other than the first) until the specified minimum interval has elapsed since commencement of the processing of the previous message.

□ Enable rate limiting

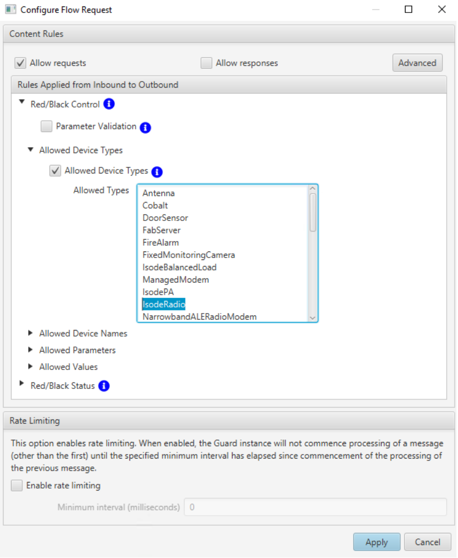
Minimum interval (milliseconds) 0

Apply Cancel

Check “Allowed Device Types”

Select and delete “IsodeRadio”

Delete Isode Radio



Configure Flow Request

Content Rules

☑ Allow requests □ Allow responses Advanced

Rules Applied from Inbound to Outbound

- Red/Black Control
  - □ Parameter Validation
  - Allowed Device Types
    - ☑ Allowed Device Types
    - Allowed Types: Antenna, Cobalt, DoorSensor, FabServer, FireAlarm, FixedMonitoringCamera, IsodeBalancedLoad, ManagedModem, IsodePA, IsodeRadio, NarrowbandALERadioModem
  - Allowed Device Names
  - Allowed Parameters
  - Allowed Values
- Red/Black Status

Rate Limiting

This option enables rate limiting. When enabled, the Guard instance will not commence processing of a message (other than the first) until the specified minimum interval has elapsed since commencement of the processing of the previous message.

□ Enable rate limiting

Minimum interval (milliseconds) 0

Apply Cancel

Press “Apply”

On the guard, press “Apply and Restart”

Return to the “Monitor” tab on the red server

Select “Isode Radio”

Press the edit button next to “Radio Frequency”

Type “20” in the edit box

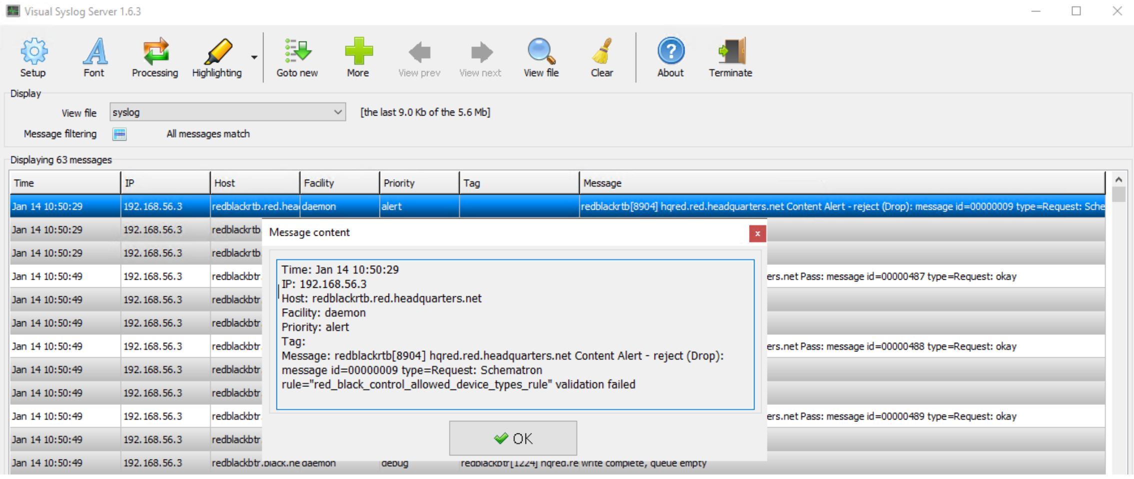
Press the green tick (Apply Change)

Look at the monitor on the black server

Note that the change to the radio frequency has not been propagated as a consequence of the configured guard rule.

A content alert event should be viewable in the Visual syslog server that confirms the guard action :

Content alert event



Display

View file: syslog [the last 9.0 Kb of the 5.6 Mb]

Message filtering: All messages match

Displaying 63 messages

Time	IP	Host	Facility	Priority	Tag	Message
Jan 14 10:50:29	192.168.56.3	redblackrtb.red.hea	daemon	alert		redblackrtb[8904] hqred.red.headquarters.net Content Alert - reject (Drop): message id=00000009 type=Request: Sche
Jan 14 10:50:29	192.168.56.3	redblackrtb				
Jan 14 10:50:29	192.168.56.3	redblackrtb				
Jan 14 10:50:49	192.168.56.3	redblackbtr				ers.net Pass: message id=00000487 type=Request: okay
Jan 14 10:50:49	192.168.56.3	redblackbtr				
Jan 14 10:50:49	192.168.56.3	redblackbtr				
Jan 14 10:50:49	192.168.56.3	redblackbtr				ers.net Pass: message id=00000488 type=Request: okay
Jan 14 10:50:49	192.168.56.3	redblackbtr				
Jan 14 10:50:49	192.168.56.3	redblackbtr				
Jan 14 10:50:49	192.168.56.3	redblackbtr				ers.net Pass: message id=00000489 type=Request: okay
Jan 14 10:50:49	192.168.56.3	redblackbtr				
Jan 14 10:50:49	192.168.56.3	redblackbtr.black.ne	daemon	debug	redblackbtr[1224] hqred.re	write complete, queue empty

Message content

```
Time: Jan 14 10:50:29
IP: 192.168.56.3
Host: redblackrtb.red.headquarters.net
Facility: daemon
Priority: alert
Tag:
Message: redblackrtb[8904] hqred.red.headquarters.net Content Alert - reject (Drop):
message id=00000009 type=Request: Schematron
rule="red_black_control_allowed_device_types_rule" validation failed
```

Appendix A - A list of substitutions for Black

1. Machine Name: hqblack

2. Primary DNS suffix: black.headquarters.net

3. Product activation reference: “Red/Black Evaluation – Black Server”

4. Base DN: ou=Black,o=Headquarters

5. Hostname: hqblack.black.headquarters.net

6. Bind DN: “cn=DSA Admin,CN=Users,ou=Black,o=Headquarters”

7. CA Location: ou=Black,o=Headquarters

8. CA RDN: BlackCA

9. Root CA DN: cn=BlackCA,ou=Black,o=Headquarters

10. Root Cert Name: BlackRootCert.pem

11. To Create a Certificate on Windows: “ "C:\program files\isode\bin\isode_openssl" req -new -out hqblackcert.csr -subj /CN=hqblack.black.headquarters.net/ -addext "subjectAltName=DNS:hqblack.black.headquarters.net" -keyout blackencryptedkey.pem -keyform pem “

12. To Create a Certificate on Linux: "/opt/isode/bin/isode_openssl" req -new -out hqblackcert.csr -subj /CN=hqblack.black.headquarters.net/ -addext "subjectAltName=DNS:hqblack.black.headquarters.net" -keyout blackencryptedkey.pem -keyform pem

13. Certificate Chain Filename: “c:\IsodeCerts\hqblackcert_cert_Chain.pem”

14. Certificate File name: “c:\IsodeCerts\hqblackcert_cert.pem”

15. Red Black admin: rbadminblack

16. Red Black side: “This represents the Black side”

17. Name of the windows certificate file: “C:\IsodeCerts\hqblackcert.pem”

18. Name of the linux certificate file: “/var/isode/certs/ hqblackcert.pem.pem”

19. Name of encrypted key name: file “C:\IsodeCerts\blackencryptedkey.pem”

20. Trust anchor identifier: Black Root CA

21. HTTP Server URL: “https://hqblack.black.headquarters.net:8080”

22. Cobalt Master directory server hostname: hqblack.black.headquarters.net

23. Initial cobalt operator domain: black.headquarters.net

24. Cobalt login id: cobalt.admin@black.headquarters.net

25. Oauth Server Name: Black HQ

26. Red Black Application Location: hqblack.black.headquarters.net

27. OAuth Authorize URL: https://hqblack.black.headquarters.net:19443/authorize

28. OAuth Service URL: enter https://hqblack.black.headquarters.net:19543

29. Red Black admin user: redblackadmin@black.headquarters.net

30. 5 Device Name pairs to add:

Name: Modem in Black

Device: NarrowbandALEModem:Narrowband ALE Modem

Name: Isode PA

Device: IsodePA:Power Amplifier

Name: Antenna

Device: Antenna:An antenna placeholder

Name: Antenna Rotator

Device: IESAROTORPST71D:iessrl

Name: Isode Radio

Device: IsodeRadio:Basic Radio

31. Outbound guard hostname: 192.168.106.3

32. Outbound Guard Port Number: 5301

33. Listen port for Inbound Guard: 5300

34. To Create a Certificate on Windows: “ "C:\program files\isode\bin\isode_openssl" req -new -out hqblackguardcert.csr -subj /CN=hqblack.black.headquarters.net/ -addext "subjectAltName=DNS:hqblack.black.headquarters.net" -keyout blackencryptedguardkey.pem -keyform pem “

35. To Create a Certificate on Linux: "/opt/isode/bin/isode_openssl" req -new -out hqblackguardcert.csr -subj /CN=hqblack.black.headquarters.net/ -addext "subjectAltName=DNS:hqblack.black.headquarters.net" -keyout blackencryptedguardkey.pem -keyform pem

36. Guard connection certificate request: “hqblackguardcert.csr”

37. Guard certificate chain : “C:\IsodeCerts\hqblack_black_headquarters_net_chain.pem”

38. Guard private key : “C:\IsodeCerts\blackencryptedguardkey.pem”