Deployment Guide

# AX Series with Microsoft Exchange Server 2010

v.1.2

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# DEPLOYMENT GUIDE

## AX Series with Microsoft Exchange Server 2010

# 1. Introduction

**Microsoft Exchange Server** is the cornerstone of Microsoft's Unified Communications solution, offering a flexible and reliable messaging platform. Exchange's major features consist of electronic mail, calendaring, contacts and tasks; support for mobile and web-based access to information; and support for data storage.

To reply to the different enterprise needs, Exchange Server has different roles:

- Client Access Server – a front-end server that receives end-user requests (Outlook, webmail clients, mobile devices, etc.)
- Edge Transport server role – handles all Internet-facing mail flow to minimize the attack surface
- Hub Transport roles – responsible for all internal mail flows
- Mailbox role – Exchange databases within which the user mailboxes are contained
- Unified Messaging role – merge VoIP infrastructure with your Exchange organization

For more information on Microsoft Exchange Server, visit:
http://www.microsoft.com/exchange/2010/en/us/default.aspx

Adding the **AX Series** to all your Microsoft Exchange Server deployments provides the following benefits:

- Higher Scalability – enterprises can provide Exchange services to a very high number of employees, load balancing them among multiple Exchange servers in parallel
- High Availability – Exchange services are guaranteed even if an Exchange Server goes offline
- Higher Performance – end users access their Exchange services faster thanks to multiple Exchange server optimizations such as, but not limited to, compression and SSL offload
- Higher Security – protects services from DDoS attacks
- Higher flexibility – different Exchange services can be accessible via the same public VIP

This deployment guide contains configuration procedures for AX Series application delivery controllers and server load balancers, to support a Microsoft Exchange Server 2010 solution.

## 1.1 Prerequisites and Assumptions

- The A10 Networks AX Series device should be running software version 2.4.3 or later.
- It is assumed that readers have some basic configuration familiarity with both the AX Series and Microsoft Exchange Server.
- All AX integration modes are supported (routed mode, one-arm mode and transparent modes). The examples in this deployment guide use routed mode.
- Both IPv4 and IPv6 are supported. The examples in this deployment guide use IPv4.
  Note: There are some limitations on IPv6 support for Microsoft Exchange 2010: http://technet.microsoft.com/en-us/library/gg144561.aspx

# 2. AX Deployment for Exchange Server 2010 Roles

Exchange has two roles when front ending end users, the Client Access Server role and the Edge Transport server role.

The Client Access Server role accepts connections to your Exchange 2010 server from different clients such as, but not limited to, Microsoft Outlook.

The five Client Access modes are:

- Outlook Web App (OWA) – access your email from any Web browser
- Outlook Anywhere – access your email from the Internet using Microsoft Outlook Messaging API (MAPI) over HTTP
- ActiveSync – synchronize email between your mobile phone and Exchange 2010
- Remote Procedure Call (RPC) Client Access – access your email via Microsoft Outlook MAPI
- POP3/IMAP4 – access your email from standard email clients

And the Client Access mode also offers different services:

- Exchange Web Services (EWS) – offers web services API
- Autodiscover – simplify user's profile configuration
- Offline Address Book (OAB) distribution – OAB access via web-based distribution for Outlook clients

The Edge Transport server role performs anti-spam and antivirus filtering, and applies messaging and security policies to messages in transport.

This chapter gives you step-by-step procedures for each mode.

## 2.1 Lab diagram

The following diagram shows the network used for the configuration procedures.

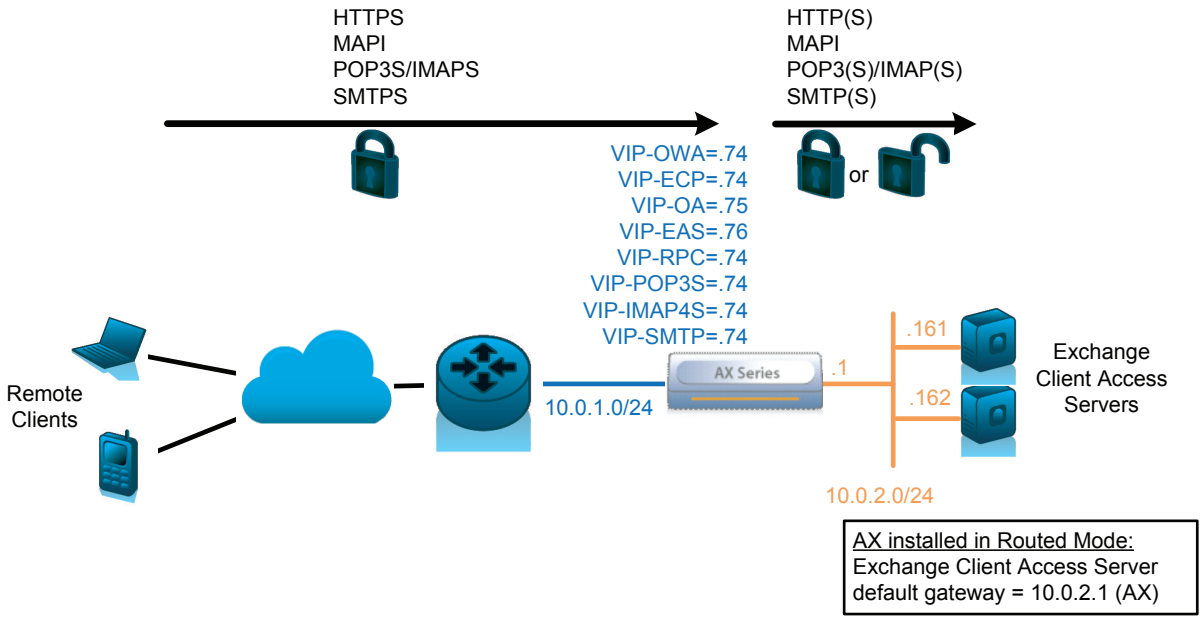



**Figure 1: AX – Exchange Server 2010 lab diagram**

# 2.2 AX Configuration Summary

## 2.2.1 AX Configuration Summary - Exchange Client Access Roles

The following table summarizes the AX configuration for each Exchange Client Access role. For more information on step-by-step configuration, see the configuration sections later in this document.

| Client Access Role | Real Servers | Health Monitor | VIP | Other |
|---|---|---|---|---|
| **Outlook Web App** | **IP**: Exchange Server<br>**Port**: 443 (no SSL offload)<br>80 (with SSL offload) | **HTTPS** (no SSL offload)<br>**HTTP** (with SSL offload) | **IP**: IP accessed by clients<br>**Type**: HTTPS<br>**Port**: 443<br>**Persistence**: Cookie | Optional:<br>• Enable HTTP compression<br>• Exchange OWA SSL offload<br>• HTTP VIP listen to port 80 and transparently redirect HTTP clients to HTTPS<br>• Transparently add the "/owa" to requests without it |
| **Exchange Control Panel** | **IP**: Exchange Server<br>**Port**: 443 (no SSL offload)<br>80 (with SSL offload) | **HTTPS** (no SSL offload)<br>**HTTP** (with SSL offload) | **IP**: IP accessed by clients<br>**Type**: HTTPS<br>**Port**: 443<br>**Persistence**: Cookie | Optional:<br>• Enable HTTP compression<br>• Exchange ECP SSL offload<br>• HTTP VIP listen to port 80 and transparently redirect HTTP clients to HTTPS |
| **Outlook Anywhere** | **IP**: Exchange Server<br>**Port**: 443 (no SSL offload)<br>80 (with SSL offload) | **HTTPS** (no SSL offload)<br>**HTTP** (with SSL offload) | **IP**: IP accessed by clients<br>**Type**: HTTPS<br>**Port**: 443<br>**Persistence**: either aFleX script with persist uie, or Source-IP | Optional:<br>• Exchange OA SSL offload |
| **Exchange ActiveSync** | **IP**: Exchange Server<br>**Port**: 443 (no SSL offload)<br>80 (with SSL offload) | **HTTPS** (no SSL offload)<br>**HTTP** (with SSL offload) | **IP**: IP accessed by clients<br>**Type**: HTTPS<br>**Port**: 443<br>**Persistence**: either aFleX script with persist uie, or Source-IP | **Optional**:<br>• Exchange EAS SSL offload |

| | | | | |
|---|---|---|---|---|
| **RPC** | **IP**: Exchange Server<br>**Port**: 0 (all TCP) | **TCP** (port 135) | **IP**: IP accessed by clients<br>**Type**: TCP<br>**Port**: 0 (wildcard)<br>**Persistence**: Source-IP | • Increase TCP aging to a minimum of 3600 seconds (1 hour), or a maximum of 28,800 seconds (8 hours). Enable Reset Forward and Reset Receive<br>**Optional**:<br>• Limit the ports numbers on AX (via ACL) and Exchange servers |
| **POP3** | **IP**: Exchange Server<br>**Port**: 995 (no SSL offload)<br>110 (with SSL offload) | **TCP** | **IP**: IP accessed by clients<br>**Type**: TCP (no SSL offload)<br>SSL-Proxy (with SSL offload)<br>**Port**: 995<br>**Persistence**: No need | **Optional**:<br>• Exchange POP3 SSL offload |
| **IMAP4** | **IP**: Exchange Server<br>**Port**: 993 (no SSL offload)<br>143 (with SSL offload) | **TCP** | **IP**: IP accessed by clients<br>**Type**: TCP (no SSL offload)<br>SSL-Proxy (with SSL offload)<br>**Port**: 993<br>**Persistence**: No need | **Optional**:<br>• Exchange IMAP4 SSL offload |
| **Exchange Web Services (EWS)** | **IP**: Exchange Server<br>**Port**: 443 (no SSL offload)<br>80 (with SSL offload) | **HTTP** | **IP**: IP accessed by clients<br>**Type**: HTTP<br>**Port**: 80<br>**Persist**: Cookie | **Optional**:<br>• Enable HTTP compression<br>• Exchange EWS SSL offload |
| **Autodiscover** | **IP**: Exchange Server<br>**Port**: 443 (no SSL offload)<br>80 (with SSL offload) | **HTTP** | **IP**: IP accessed by clients<br>**Type**: HTTP<br>**Port**: 80<br>**Persist**: No need | **Optional**:<br>• Enable HTTP compression<br>• Exchange SSL offload |
| **Offline Address Book (OAB) distribution** | See Client Access RPC | See Client Access RPC | See Client Access RPC | See Client Access RPC |

| | | | | |
|---|---|---|---|---|
| **Same VIP for multiple services using same servers** | **IP**: Exchange Server<br>**Port**: 443 (no SSL offload)<br>80 (with SSL offload) | **HTTPS** (no SSL offload)<br>**HTTP** (with SSL offload) | **IP**: IP accessed by clients<br>**Type**: HTTPS<br>**Port**: 443<br>**Persistence**: Source IP | **Optional**:<br>• Exchange SSL offload |
| **Same VIP for multiple services using different servers** | **IP:** Exchange Server<br>**Port:** 443 (no SSL offload)<br>80 (with SSL offload) | **HTTPS** (no SSL offload)<br>**HTTP** (with SSL offload) | **IP:** IP accessed by clients<br>**Type:** HTTPS<br>**Port:** 443<br>**Persistence:** Source-IP<br>**aFleX:** Select specific service group per client access | **Optional:**<br>• Exchange SSL offload |

### 2.2.2 AX Configuration Summary - Exchange Edge Transport Server Role

The following table summarizes the AX configuration for the Exchange Edge Transport Server role. For more information on step-by-step configuration, see the Edge section later in this document.

| Client Access Role | Real Servers | Health Monitor | VIP | Other |
|---|---|---|---|---|
| **Edge Transport Server** | **IP**: Exchange Server<br>**Port**: 25 | **SMTP** | **IP**: IP accessed by clients<br>**Type**: TCP<br>**Port**: 25<br>**Persist**: No need | **Optional**:<br>Exchange SMTP TLS (STARTTLS) offload |

## 2.3 Exchange Client Access Role - Outlook Web App

Outlook Web App (OWA) offers Exchange mailboxes access through a web browser via HTTPS.

AX provides the following benefits:

- Load Balancing and High Availability of Exchange OWA servers

And can also provide the following optional benefits:

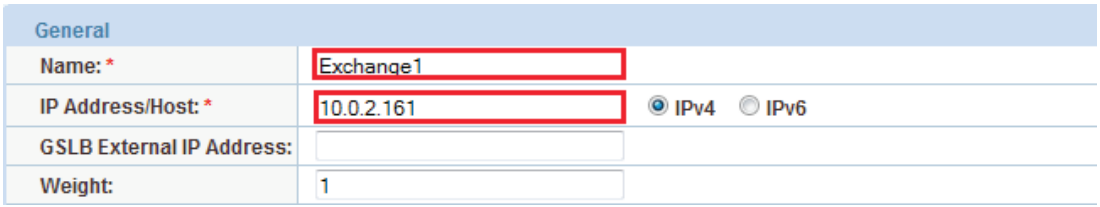
- HTTP Compression to reduce remote end user response time and data center bandwidth usage
- SSL offload to reduce CPU and memory usage on Exchange OWA servers
- Transparently redirect HTTP clients to HTTPS
- Transparently add the "/owa" to requests that do not have it

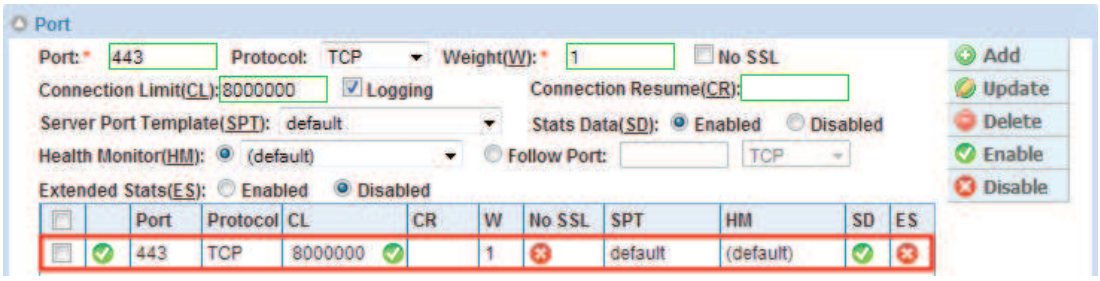
### 2.3.1 AX Configuration

*Note: If the same virtual IP address (VIP) will to be used for Outlook Anywhere or Exchange ActiveSync services, see "2.14 Multiple Exchange Services with a Single VIP".*

### a. Create Exchange OWA Real Servers

- Create a real server for each Exchange OWA real server. Enter the OWA **Name, IP address,** and add the **Protocol** TCP **Port 443**
  - Via Web GUI: Config Mode > Service > SLB > Server



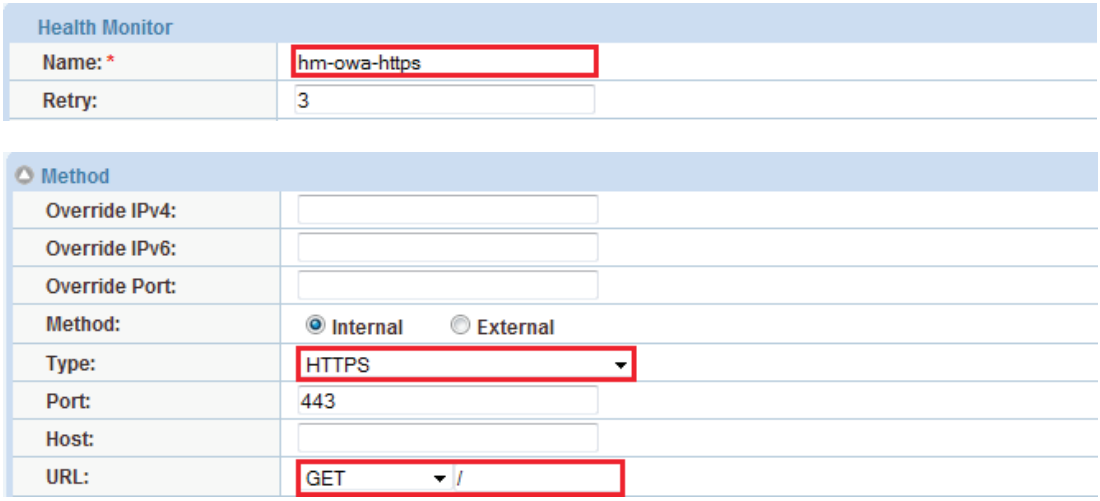




  - Via CLI:

```
AX(config)#slb server Exchange1 10.0.2.161
AX(config-real server)#port 443 tcp
```

## b. Create Exchange OWA Health Check

- Create a health monitor template to test the availability of the Exchange OWA servers. Enter the health monitor template **Name** and select **Type** HTTPS with **URL** “GET /”
  - Via Web GUI: Config Mode > Service > Health Monitor

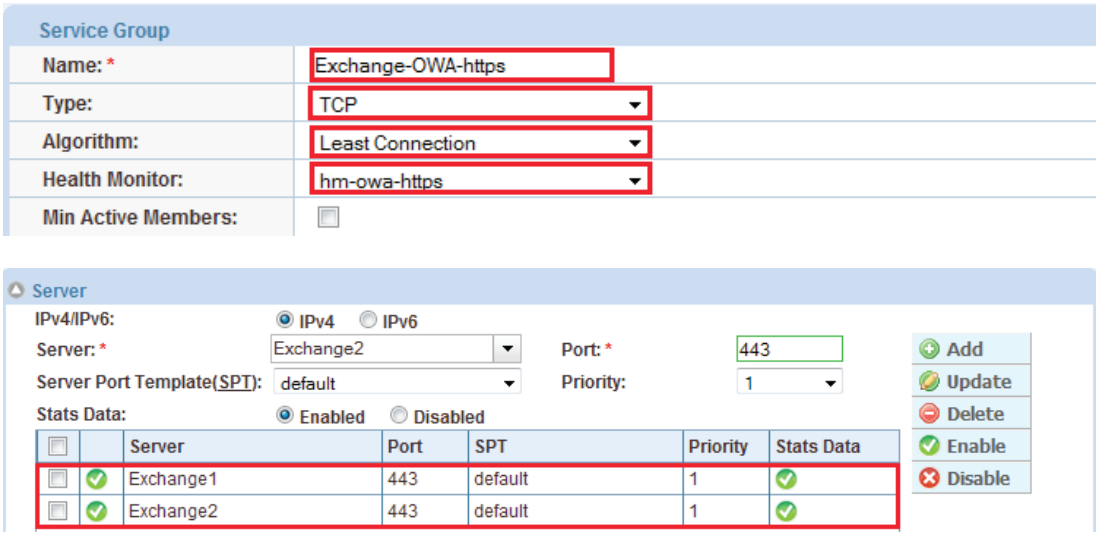



  - Via CLI:

```
AX(config)#health monitor hm-owa-https
AX(config-health:monitor)#method https
```

## c. Create Exchange OWA Service Group

- Create a TCP service group for the Exchange OWA servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, select the Least Connection load balancing **Algorithm,** and select the OWA **Health Monitor.** Assign each Exchange OWA **Server** to the service group with **Port** 443
  - Via Web GUI: Config Mode > Service > SLB > Service Group

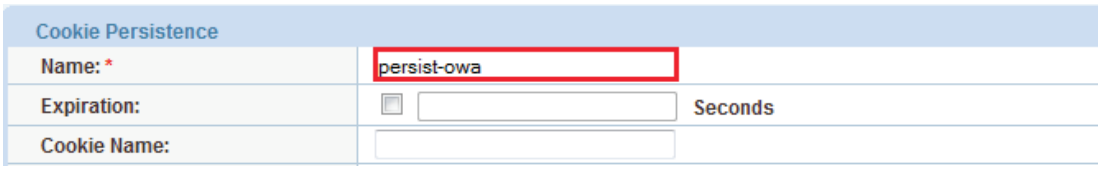



  - Via CLI:

```
AX(config)#slb service-group Exchange-OWA-https tcp
AX(config-slb svc group)#method least-connection
AX(config-slb svc group)#health-check hm-owa-https
AX(config-slb svc group)#member Exchange1:443
AX(config-slb svc group)#member Exchange2:443
```

## d. Create Exchange OWA Persistence

- Create a cookie persistence template to guarantee each end user will always go to the same Exchange OWA. Enter the persistence template **Name** and select match type server
  - Via Web GUI: Config Mode > Service > Template > Persistent > Cookie Persistence



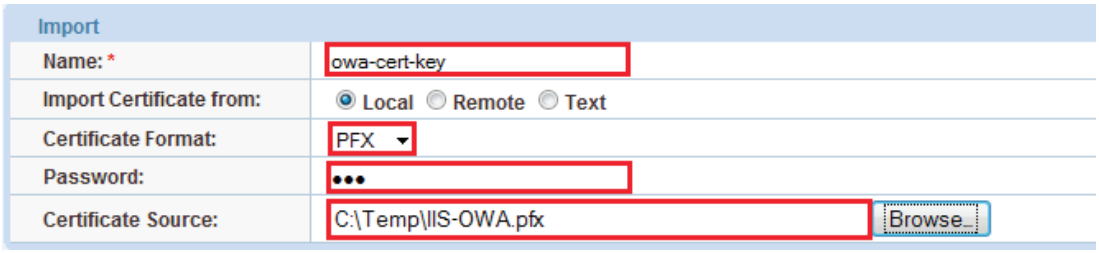

  - Via CLI:

```
AX(config)# slb template persist cookie persist-owa
```

## e. Import the IIS Server Public Certificate/Private Key onto the AX

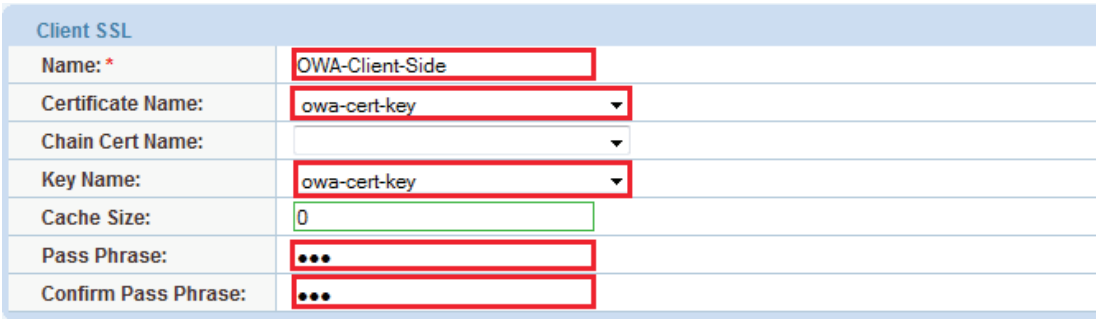
*Note: To export a certificate/key from Microsoft IIS, see* http://technet.microsoft.com/en-us/library/cc731386%28WS.10%29.aspx

- Import the IIS public certificate / private key onto the AX device. Enter a **Name** for the certificate, select the import method (**Local** or **Remote**), and select the **Format.** Enter or select download settings. (These depend on whether you select **Local** or **Remote)**
  - Via Web GUI: Config > Service > SSL Management > Certificate



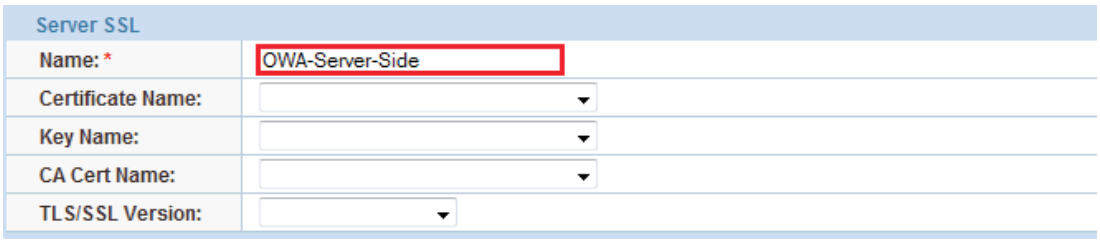

  - Via CLI: `AX(config)#slb ssl-load certificate OWA-cert-key type pfx password a10 tftp://10.0.1.10/IIS-OWA.pfx`

- Create a client-SSL template. Enter a **Name** for the template, select the **Certificate** and **Key** files, and enter the **Pass Phrase**
  - Via Web GUI: Config > Service > Template > SSL > Client SSL




  - Via CLI:
```
AX(config)#slb template client-ssl OWA-Client-Side
AX(config-client ssl)#cert OWA-cert-key
AX(config-client ssl)#key OWA-cert-key passphrase a10
```

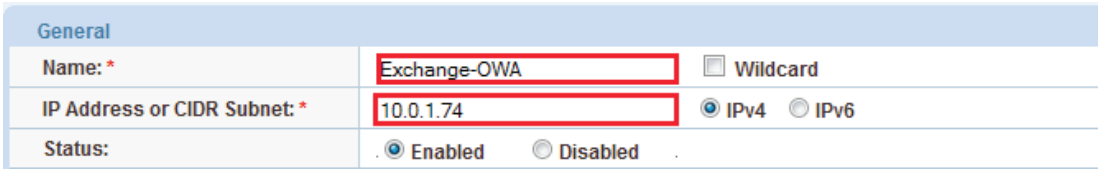
- Create a server-SSL template. Enter a **Name** for the template
  - Via Web GUI: Config > Service > Template > SSL > Server SSL




- Via CLI: `AX(config)# slb template server-ssl OWA-Server-Side`

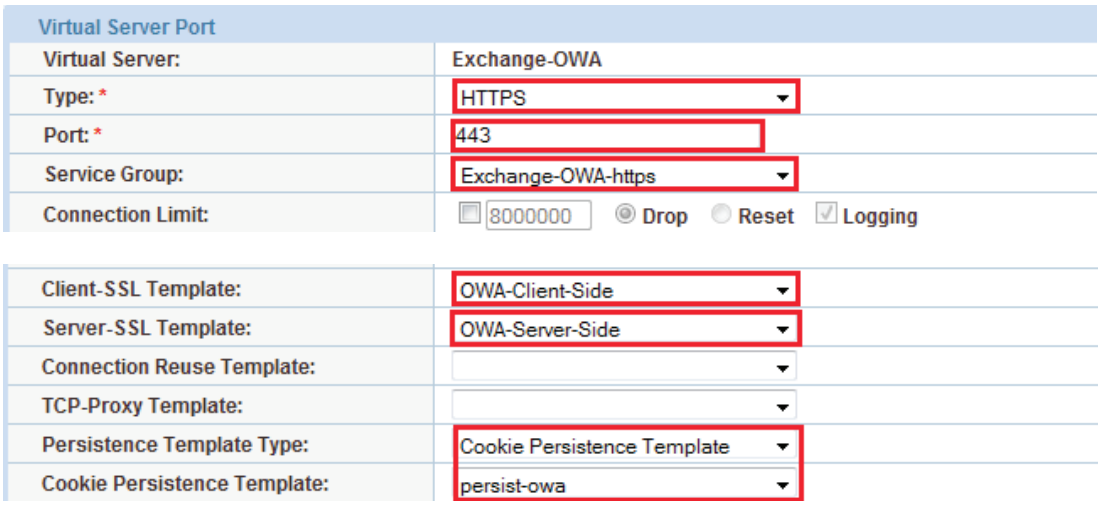
## f. Create Exchange OWA VIP

- Create the virtual IP address (VIP), which is the IP address that end users will access
  - Enter a **Name** for the VIP, and enter the **IP address**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server




- Via CLI: `AX(config)#slb virtual-server Exchange-OWA 10.0.1.74`

- Add port **Type** HTTPS **Port** 443 and select the **Service Group, Client-SSL Template, Server-SSL template** and **Persistence Template**
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port

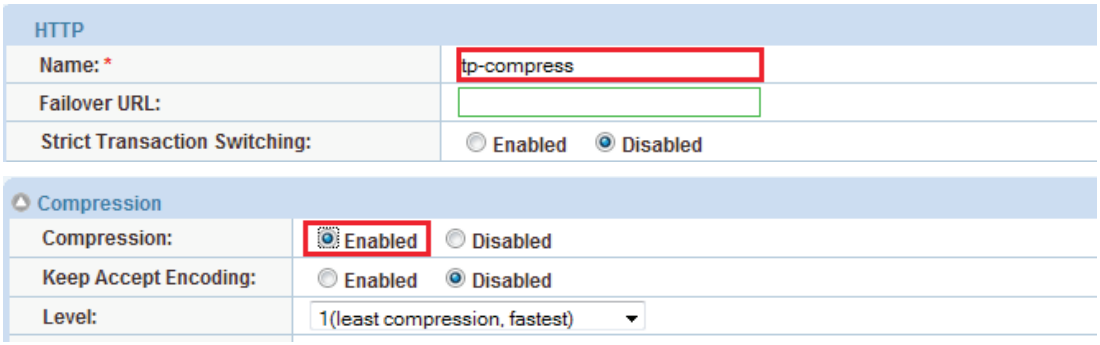



- Via CLI:
```
AX(config-slb vserver)#port 443 https
AX(config-slb vserver-vport)#service-group Exchange-OWA-https
AX(config-slb vserver-vport)#template client-ssl OWA-Client-Side
AX(config-slb vserver-vport)#template server-ssl OWA-Server-Side
AX(config-slb vserver-vport)#template persist cookie persist-owa
```

## g. (Optional) Enable HTTP Compression

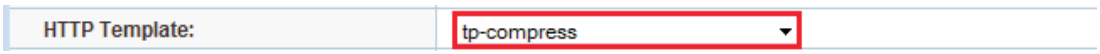
- Create a HTTP template to compress HTTP content. Enter the HTTP template **Name** and enable **Compression**

  *Note: Keep the **Level** at 1. Increasing the level increases AX CPU usage without much compression benefit.*
  - Via Web GUI: Config Mode > Service > Template > Application > HTTP




  - Via CLI:
```
AX(config)# slb template http tp-compress
AX(config-http)#compression enable
```

- Assign the HTTP compression template to the virtual server
  - Via Web GUI: Config > Service > SLB > Virtual Server > Port



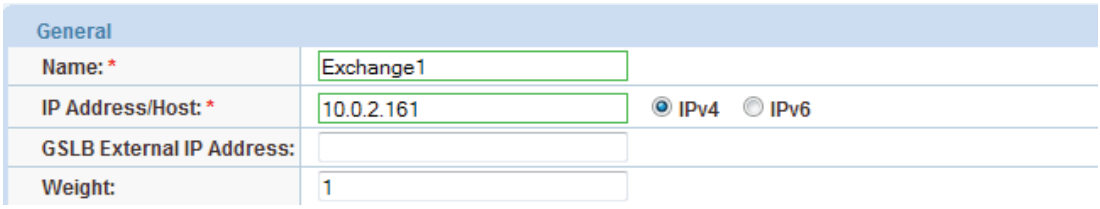

- Via CLI:

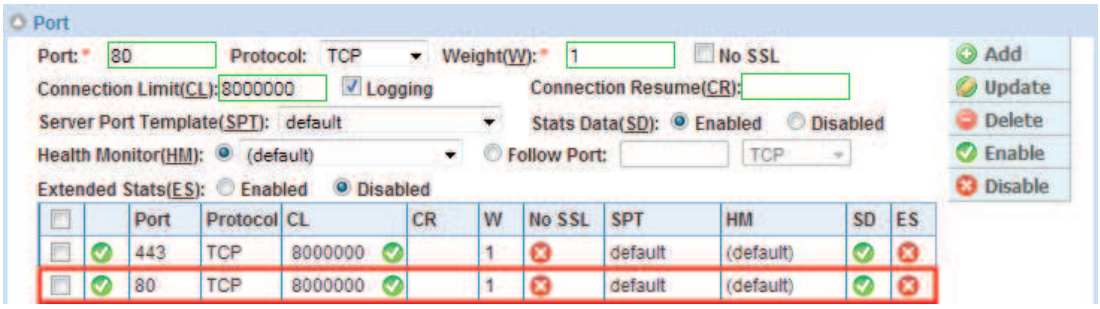
```
AX(config)#slb virtual-server Exchange-OWA
AX(config-slb vserver)#port 443 https
AX(config-slb vserver-vport)#template http tp-compress
```

## h. (Optional) Offload SSL on Exchange OWA Servers

With this option end users still use HTTPS to connect to their OWA service, but the AX connects to the OWA servers via HTTP, thus offloading SSL from the servers.

- Create the **Port** 80 for each Exchange OWA real server
  - Via Web GUI: Config Mode > Service > SLB > Server

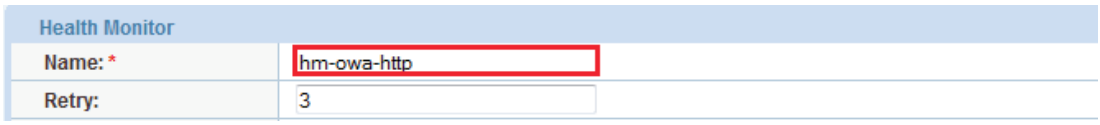


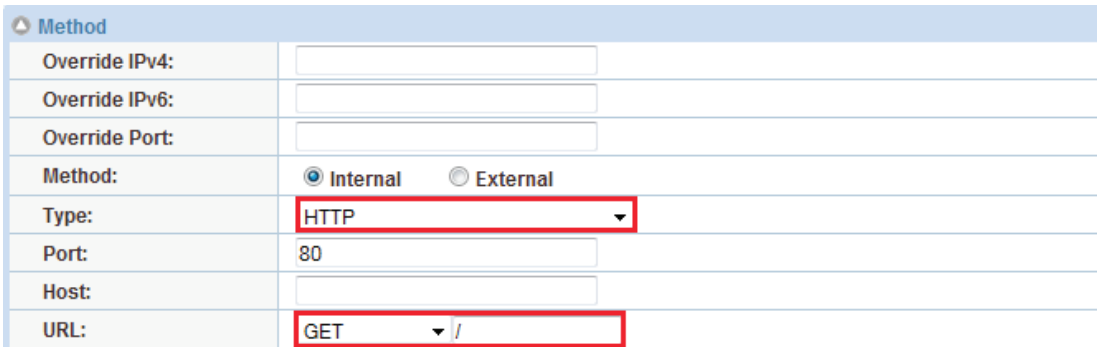




- Via CLI:

```
AX(config)#slb server Exchange1
AX(config-real server)#port 80 tcp
```

- Create a health monitor template to test the availability of the Exchange OWA servers. Enter the health monitor template **Name** and select **Type** HTTP with **URL** "GET /"
  - Via Web GUI: Config Mode > Service > Health Monitor

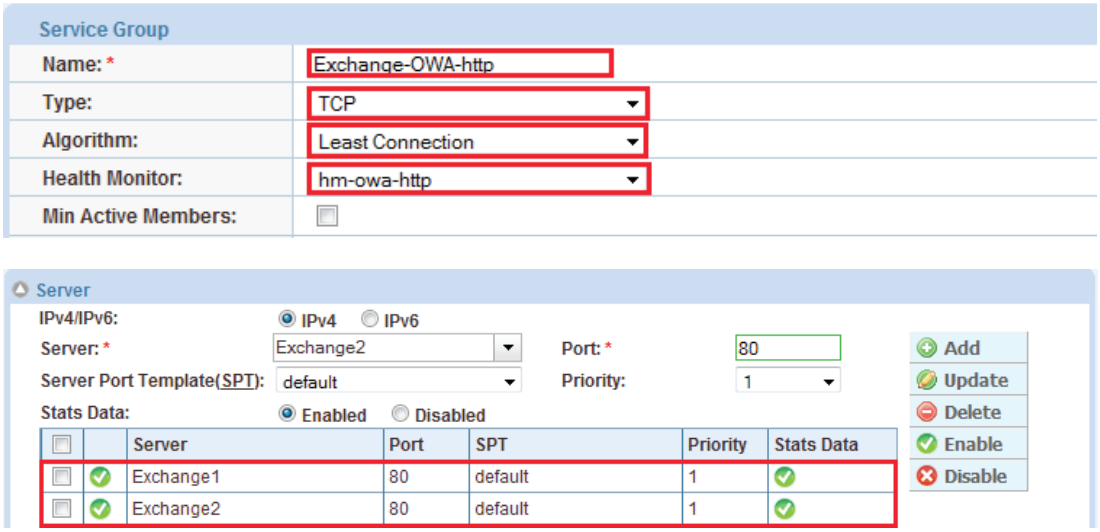





- Via CLI:

```
AX(config)#health monitor hm-owa-http
AX(config-health:monitor)#method http
```

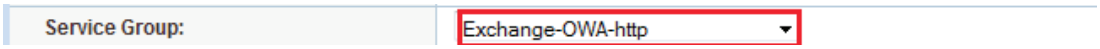
- Create a TCP service group with Exchange OWA servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, select the load balancing **Algorithm** Least Connection, and select the OWA **Health Monitor.** Assign each Exchange OWA **Server** to the service group with **Port** 80
  - Via Web GUI: Config Mode > Service > SLB > Service Group




- Via CLI:

```
AX(config)#slb service-group Exchange-OWA-http tcp
AX(config-slb svc group)#method least-connection
AX(config-slb svc group)#health-check hm-owa-http
AX(config-slb svc group)#member Exchange1:80
AX(config-slb svc group)#member Exchange2:80
```

- In the OWA VIP, select the **Service Group** with HTTP servers
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port




  - Via CLI:

```
AX(config)#slb virtual-server Exchange-OWA
AX(config-slb vserver)#port 443 https
AX(config-slb vserver-vport)#service-group Exchange-OWA-http
```

- In the OWA VIP, remove the **Server-SSL Template** since the AX device will communicate with the OWA servers via HTTP instead of HTTPS
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port


  - Via CLI:

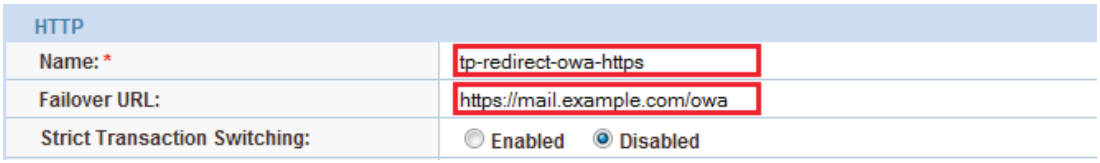
```
AX(config)#slb virtual-server Exchange-OWA
AX(config-slb vserver)#port 443 https
AX(config-slb vserver-vport)#no template server-ssl OWA-Server-Side
```

- Enable SSL offload on the Exchange OWA servers; see http://social.technet.microsoft.com/wiki/contents/articles/how-to-configure-ssl-offloading-in-exchange-2010.aspx

## i. (Optional) Transparently Redirect HTTP Clients to HTTPS

By default, end users accessing the Exchange OWA service via HTTP cannot connect since that service must be accessed via HTTPS. With this option, end users accessing the Exchange OWA service via HTTP are transparently redirected to HTTPS.

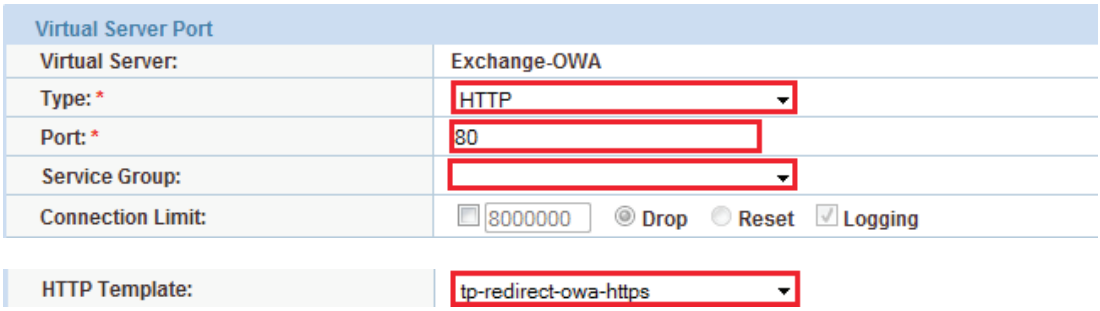
- Create an HTTP template to redirect all end users to the HTTPS Exchange OWA service. Enter the HTTP template **Name** and the **Failover URL** with your Exchange OWA HTTPS access
  - Via Web GUI: Config Mode > Service > Template > Application > HTTP




  - Via CLI:

```
AX(config)# slb template http tp-redirect-owa-https
AX(config-http)# failover-url https://mail.example.com/owa
```

- In the existing Exchange OWA Virtual Server, add port **Type** HTTP **Port** 80 with no **Service Group** and select the failover **HTTP template**
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server




  - Via CLI: `AX(config-slb vserver)#port 80 http`
    `AX(config-slb vserver-vport)#template http tp-redirect-owa-https`

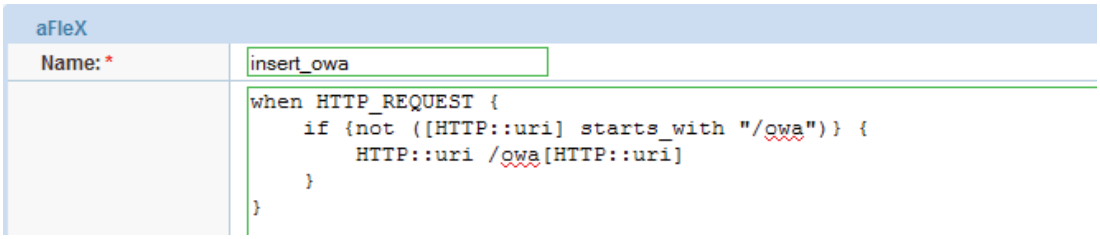
## j. (Optional) Transparently Add "/owa" to the Requests That Are Without It

By default, end users accessing the Exchange OWA service without specifying "/owa" in the request (i.e.,"https://mail.example.com") will access the default IIS page instead of the Exchange OWA service. The AX can transparently add the "/owa" to the requests so they always access the Exchange OWA service.

- Create an aFleX policy to insert the "/owa" in the request if not present.
  The aFleX policy is:

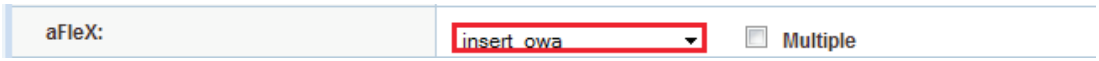
```
when HTTP_REQUEST {
    # transparently insert "/owa" if not already present
    if {not ([HTTP::uri] starts_with "/owa")} {
        HTTP::uri /owa[HTTP::uri]
    }
}
```

  - Via Web GUI: Config > Service > aFleX




  - Via CLI: `AX(config)#import aflex insert _ owa tftp://10.0.1.10/insert _ owa. txt`

- Assign the aFleX policy to the virtual server
  - Via Web GUI: Config > Service > SLB > Virtual Server > Port




  - Via CLI:

```
AX(config)#slb virtual-server Exchange-OWA
AX(config-slb vserver)#port 443  https
AX(config-slb vserver-vport)#aflex insert _ owa
```

### 2.3.2 Configuration Validation

## a. Validate AX Deployment for Exchange OWA Without SSL Offload

Validate the status of the VIP and that its members are UP.

- Via Web GUI: Monitor > Service > SLB > Virtual Server

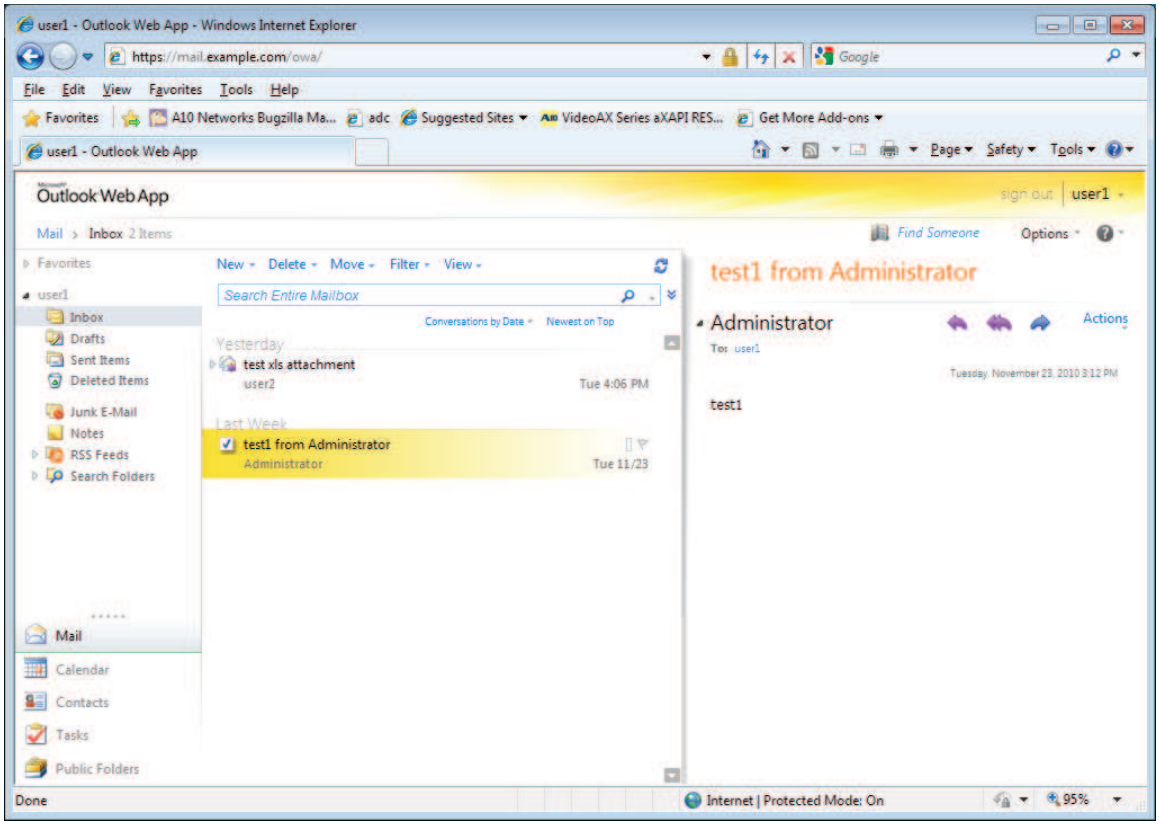
| | | Name | Connections | | Packets | | Bytes | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Current | Total | Forward | Reverse | Forward | Reverse | |
| | | Exchange-OWA/10.0.1.74 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | HTTPS/443 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 443 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 443 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 | |

- Via CLI:

```
AX#show slb virtual-server Exchange-OWA
AX#show slb service-group Exchange-OWA-https
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange OWA via https://mail.example.com/owa




## b. Validate AX Deployment for Exchange OWA with HTTP Compression

Validate there is HTTP compression. Check that the **Total Data After Compression** is lower than the **Data Before Compression**

- Via Web GUI: Monitor > Service > Application > Proxy > HTTP

**Statistics for HTTP** Disabled Refresh Clear

| | Control CPU | Data CPU1 | Data CPU2 | Total |
|---|---|---|---|---|
| Curr Proxy Conns | 0 | 1 | 1 | 2 |
| Total Proxy Conns | 0 | 103 | 100 | 203 |
| HTTP Requests | 0 | 138 | 145 | 283 |
| HTTP Requests(succ) | 0 | 136 | 143 | 279 |
| Data Before Compression | 0 | 6.2K | 107.5K | 113.7K |
| Data After Compression | 0 | 2.5K | 41.8K | 44.3K |

- Via CLI: `AX#show slb http-prox`

## c. Validate AX deployment for Exchange OWA with SSL Offload

Validate the status of the VIP and that its members are UP.

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| Name | Connections | | Packets | | Bytes | |
|---|---|---|---|---|---|---|
| | Current | Total | Forward | Reverse | Forward | Reverse |
| Exchange-OWA/10.0.1.74 | 0 | 0 | 0 | 0 | 0 | 0 |
| HTTPS/443 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 |

- Via CLI:
```
AX#show slb virtual-server Exchange-OWA
AX#show slb service-group Exchange-OWA-https
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange OWA via https://mail.example.com/owa
  *Same as "Validate AX deployment for Exchange OWA without SSL offload"*

## d. Validate AX Deployment with Transparent Redirect HTTP Clients to HTTPS

Validate the AX deployment:

- Access the Exchange OWA via http://mail.example.com/owa
  The end user will be transparently redirected to https://mail.example.com/owa

Technical Note:
The VIP port 80 is associated to no Service Group. So it is expected to have its status under monitor.
*Note: The screenshot is from an AX deployment with SSL offload (VIP port 443 is using Exchange OWA servers on port 80).*

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| Name | Connections | | Packets | | Bytes | |
|---|---|---|---|---|---|---|
| | Current | Total | Forward | Reverse | Forward | Reverse |
| Exchange-OWA/10.0.1.74 | 0 | 0 | 0 | 0 | 0 | 0 |
| HTTPS/443 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 |
| HTTP/80 | 0 | 0 | 0 | 0 | 0 | 0 |

- Via CLI: `AX#show slb virtual-server Exchange-OWA`

### e. Validate Exchange OWA access with requests without "/owa"

Validate the AX deployment:

- Access the Exchange OWA via https://mail.example.com and validate you still have access to the Exchange OWA service

## 2.4 Exchange Client Access Role – Exchange Control Panel

Exchange Control Panel (ECP) is a component of OWA that offers the ability to do Exchange administrative tasks via HTTPS.

AX provides ECP with the same benefits as OWA; in this case:

- Load Balancing and High Availability of Exchange ECP servers

AX can also provide these optional benefits:

- HTTP Compression to reduce remote end user response time and data center bandwidth usage
- SSL offload to reduce CPU and memory usage on Exchange ECP servers
- Transparently redirect HTTP clients to HTTPS

### 2.4.1 AX Configuration

*Note: If the same VIP will be used for the Outlook Anywhere or Exchange ActiveSync services, see "2.14 Multiple Exchange Services with a Single VIP".*

- Same as "Exchange Client Access roles - Outlook Web App"

### 2.4.2 Configuration Validation

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Access "https://mail.example.com/ecp:.*

## 2.5 Exchange Client Access Role - Outlook Anywhere

Outlook Anywhere offers Microsoft Outlook end users with access to their mailboxes via HTTPS when MAPI access is blocked.

AX provides the following benefits:

- Load Balancing and High Availability of Exchange Anywhere servers

And can also provide the optional benefits:

- SSL offload to reduce CPU and memory usage on Exchange Anywhere servers

### 2.5.1 AX Configuration

*Note: If the same VIP will be used for the Client Access Role Outlook Web App or Exchange ActiveSync services, see "2.14 Multiple Exchange Services with a Single VIP".*

#### a. Create Exchange OA real servers

- Same as "Exchange Client Access roles - Outlook Web App"

#### b. Create Exchange OA health check

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the **Name** "hm-oa-https".*

#### c. Create Exchange OA service group

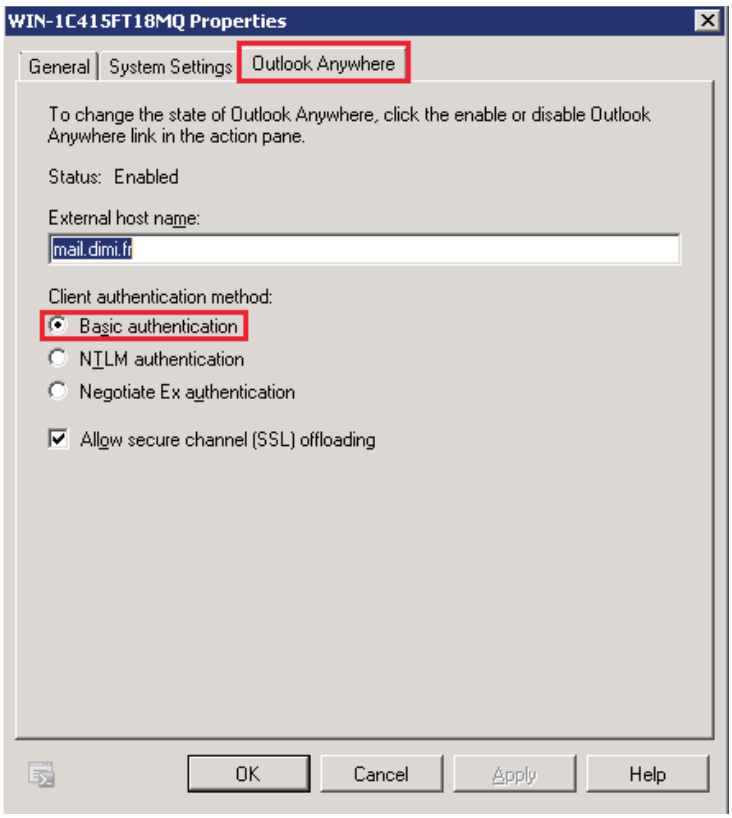
- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the **Name** "Exchange-OA-https", **Algorithm** Round-Robin and **Health Monitor** "hm-oa-https".*

## d. Create Exchange OA persistence

*Note: Outlook is not a standard web browser and does not support cookies. So we cannot use cookie stickiness. The three possible persistency options for Exchange OA are no persistence, Source-IP persistence and aFleX UIE persistence.*

*No persistence can be selected, but at the cost of performance on the Client Access Servers (*http://technet.microsoft.com/en-us/library/ff625248.aspx).

*aFleX UIE persistence offers better granularity (multiple clients coming through the same proxy with the same IP address will use different servers), but requires Basic Authentication (under Exchange Management Console > Server Configuration > Client Access > Properties):*



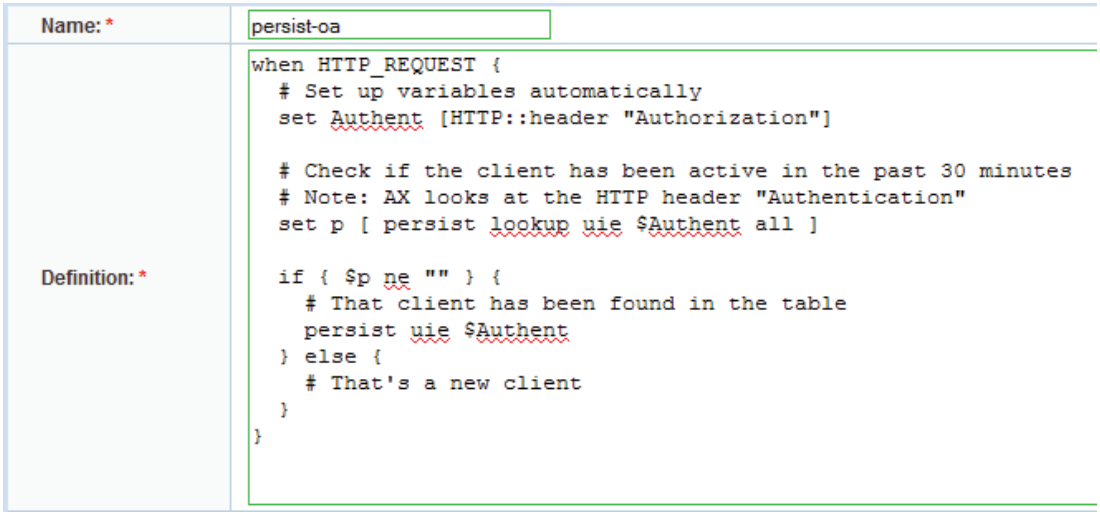

*If you can accept Basic authentication for OA, use aFleX UIE persistence, otherwise use source IP persistence.*

**aFleX UIE persistence configuration:**

- Create an aFleX policy to define the Exchange OA persistence rule.
  The aFleX policy is:

```
when HTTP_REQUEST {
  # Set up variables automatically
  set Authent [HTTP::header "Authorization"]

  # Check if the client has been active in the past 30 minutes
  # Note: AX looks at the HTTP header "Authentication"
  set p [ persist lookup uie $Authent all ]

  if { $p ne "" } {
    # That client has been found in the table
    persist uie $Authent
  } else {
    # That's a new client
  }
}

when HTTP_RESPONSE {
  # Update persist uie table with Client Authent information
  persist add uie $Authent 1800
  log "Add persist entry for client $Authent"
}
```

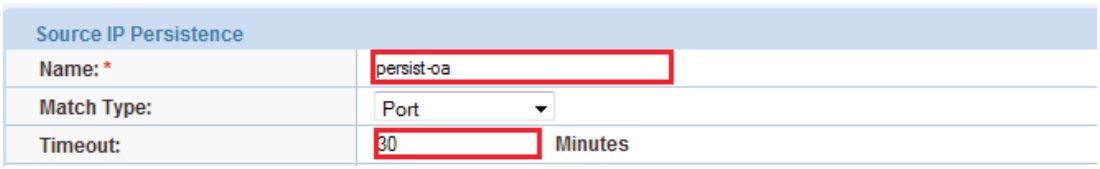
  - Via Web GUI: Config > Service > aFleX




  - Via CLI: `AX(config)#import aflex persist-oa tftp://10.0.1.10/persist-oa.txt`

**Source IP persistence configuration:**

- Create a Source-IP persistence template to guarantee each end user will always go to the same Exchange OA. Enter the persistence template **Name** and increase the **Timeout**
  - Via Web GUI: Config Mode > Service > Template > Persistent > Source IP Persistence




  - Via CLI:
```
AX(config)#slb template persist source-ip persist-oa
AX(config-source ip persist)#timeout 30
```

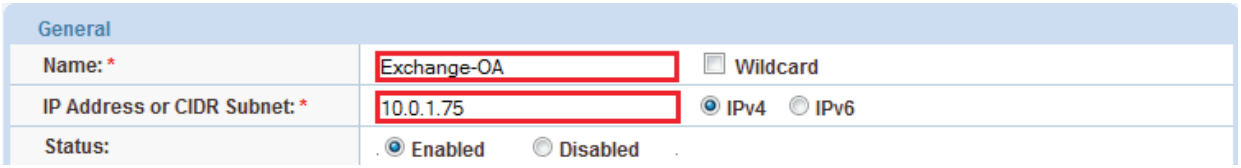
## e. Import the IIS server public certificate / private key onto the AX

*Note: You can access your mailboxes even if you do not have a trusted signed certificate with Outlook Web App. (You simply accept the presented untrusted certificate in your browser.) But Outlook will not accept the connection to mail boxes via Outlook Anywhere if the presented certificate is not trusted. So you must have a trusted certificate with Outlook Anywhere.*

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the **Certificate Name** "oa-cert-key", **Client-SSL Template Name** "OA-Client-Side" and **Server-SSL Template Name** "OA-Server-Side".*

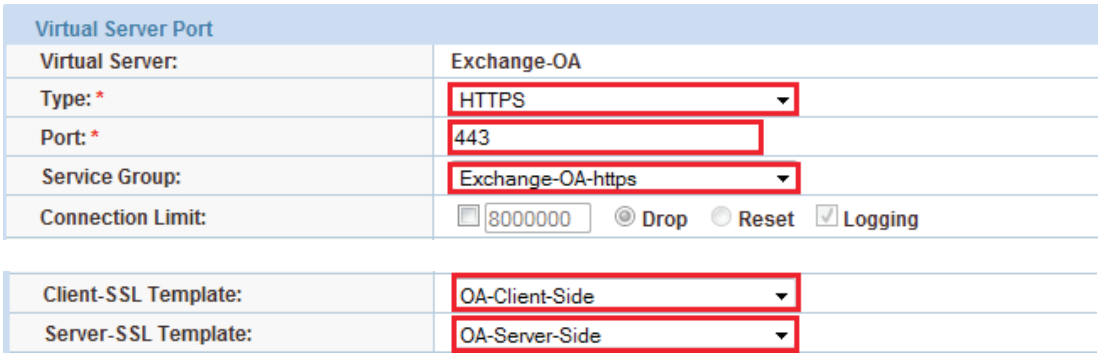
## f. Create Exchange OA VIP

- Create the virtual IP address (VIP), which is the IP address that end users will access
  - Enter a **Name for the VIP, and enter the IP address**
- Via Web GUI: Config Mode > Service > SLB > Virtual Server



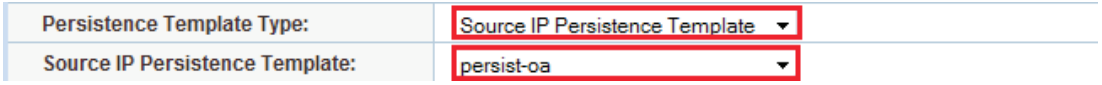

- Via CLI: `AX(config)#slb virtual-server Exchange-OA 10.0.1.75`

- Add port **Type** HTTPS **Port** 443 and select the **Service Group, aFleX** or **Source IP Persistence Template, Client-SSL Template,** and **Server-SSL template**
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port




**If aFleX iue persistency is selected**


**If Source IP persistency is selected**




- Via CLI:

```
AX(config-slb vserver)#port 443 https
AX(config-slb vserver-vport)#service-group Exchange-OA-https
AX(config-slb vserver-vport)#template client-ssl OA-Client-Side
AX(config-slb vserver-vport)#template server-ssl OA-Server-Side
```

**If aFleX UIE persistence is selected**

```
AX(config-slb vserver-vport)#aflex persist-oa
```

**If Source-IP persistence is selected**

```
AX(config-slb vserver-vport)#template persist source-ip persist-oa
```

## g. (Optional) Offload SSL on Exchange OA servers

With this option, end users still use HTTPS to connect to their Exchange OA service, but the AX connects to the OA servers via HTTP, offloading SSL from the servers.

- Create the port 80 for each Exchange OA real server
  - Same as “Exchange Client Access roles - Outlook Web App”

- Create a health monitor template to test the availability of the Exchange OA servers. Enter the health monitor template **Name** and select **Type** HTTP with **URL** “GET /”
  - Same as “Exchange Client Access roles - Outlook Web App”
    *Note: Use the **Name** “hm-oa-http”.*

- Create a TCP service group with Exchange OA servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, select the load balancing Least Connection **Algorithm,** and select the OA **Health Monitor.** Assign each Exchange OA **Server** to the service group **with Port** 80
  - Same as “Exchange Client Access roles - Outlook Web App”
    *Note: Use the **Name** “Exchange-OA-http” and **Health Monitor** “hm-oa-http”.*

- *In the OA VIP, select the* **Service Group** with HTTP servers
  - Same as “Exchange Client Access roles - Outlook Web App”
    *Note: Use the **Service Group** “hm-oa-http”.*

- *In the OA VIP, remove the* **Server-SSL Template** since the AX will communicate with the OA servers via HTTP instead of HTTPS.
  - Same as “Exchange Client Access roles - Outlook Web App”

- Enable SSL offload on Exchange OA servers; see http://social.technet.microsoft.com/wiki/contents/articles/how-to-configure-ssl-offloading-in-exchange-2010.aspx

### 2.5.2 Configuration Validation

## a. Validate AX deployment for Exchange OA without SSL offload

Validate the status of the VIP and the its members are UP.

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| Name | Connections | | Packets | | Bytes | |
|---|---|---|---|---|---|---|
| | Current | Total | Forward | Reverse | Forward | Reverse |
| Exchange-OA/10.0.1.75 | 0 | 0 | 0 | 0 | 0 | 0 |
| HTTPS/443 | 0 | 0 | 0 | 0 | 0 | 0 |
| 443 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 |
| 443 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 |

- Via CLI:
```
AX#show slb virtual-server Exchange-OA
AX#show slb service-group Exchange-OA-https
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange OA via Outlook Anywhere mode.
  For more information on how to configure Microsoft Outlook, *see* [http://technet.microsoft.com/en-us/library/cc179036.aspx](http://technet.microsoft.com/en-us/library/cc179036.aspx)

## b. Validate AX deployment for Exchange OA with SSL offload

Validate the status of the VIP and that its members are UP.

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| Name | Connections | | Packets | | Bytes | |
|---|---|---|---|---|---|---|
| | Current | Total | Forward | Reverse | Forward | Reverse |
| Exchange-OA/10.0.1.75 | 0 | 0 | 0 | 0 | 0 | 0 |
| HTTPS/443 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 |

- Via CLI:
```
AX#show slb virtual-server Exchange-OA
AX#show slb service-group Exchange-OA-http
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange OA via Outlook Anywhere mode

## 2.6 Exchange Client Access role – Exchange ActiveSync

Exchange ActiveSync offers end users with low bandwidth and high-latency devices such as cell phones a way to access their mailboxes via HTTPS.

AX provides the following benefit:

- Load Balancing and High Availability of Exchange ActiveSync servers

And can also provide the optional benefit:

- SSL offload to reduce CPU and memory usage on Exchange ActiveSync servers

### 2.6.1 AX Configuration

*Note: If the same VIP will be used for Outlook Web App or Outlook Anywhere services, see "2.14 Multiple Exchange Services with a Single VIP".*

#### a. Create Exchange EAS Real Servers

- Same as "Exchange Client Access roles - Outlook Web App"

#### b. Create Exchange EAS Health Check

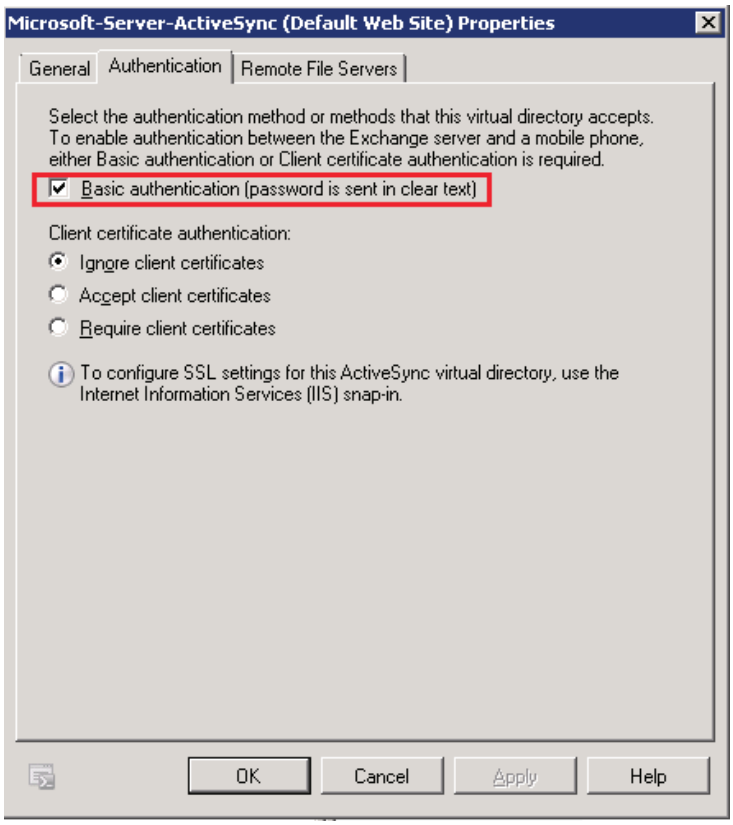
- Same as "Exchange Client Access Roles - Outlook Web App"
  *Note: Use the **Name** "hm-eas-https".*

#### c. Create Exchange EAS Service Group

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the **Name** "Exchange-EAS-https" and **Health Monitor** "hm-eas-https".*

## d. Create Exchange EAS Persistence

*Note: Most cell phones support cookies with ActiveSync, but some may not. We could use Source-IP persistence instead; however, in the case where multiple clients come through the same Service Provider, the load balancing would not be fair. This is why we recommend aFleX UIE persistence.*
*But aFleX UIE persistence requires Basic Authentication (under Exchange Management Console > Server Configuration > Client Access > Properties):*




If you can accept Basic authentication for AS, use aFleX UIE persistence, otherwise use source-IP persistence.

**aFleX UIE persistence configuration:**

- Same as "Exchange Client Access roles - Outlook Anywhere"
  *Note: Use the aFleX **Name** "persist-eas".*

**Source IP persistence configuration:**

- Same as "Exchange Client Access roles - Outlook Anywhere"
  *Note: Use the aFleX **Name** or Source-IP persistence **Name** "persist-eas".*

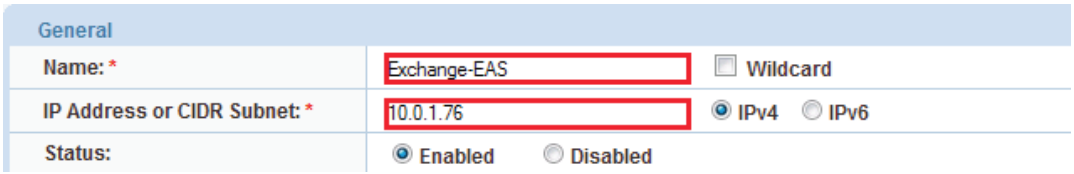
## e. Import the IIS server Public Certificate/Private Key onto the AX

*Note: You can access your mailboxes even if you do not have a trusted signed certificate with Outlook Web App. (You simply accept the untrusted certificate presented in your browser.) However, some cell phones and carriers do not let you accept the untrusted certificate. So you must have a trusted certificate with Outlook Anywhere.*

- Same as "Exchange Client Access Roles - Outlook Web App"
  *Note: Use the **Certificate Name** "eas-cert-key", **Client-SSL Template Name** "EAS-Client-Side" and **Server-SSL Template Name** "EAS-Server-Side".*

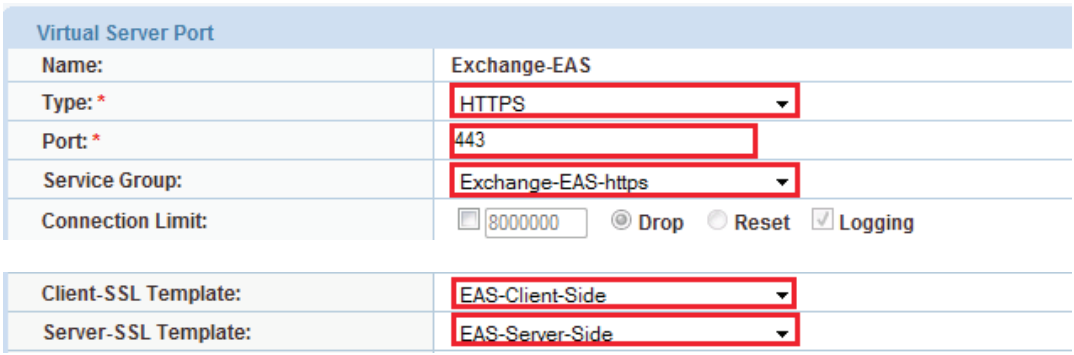
## f. Create Exchange EAS VIP

- Create the virtual IP address (VIP), which is the IP address that end users will access
  - Enter a **Name** for the VIP, and enter the **IP address**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server

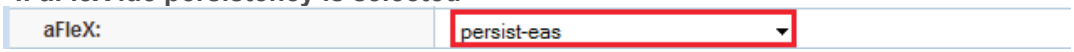



    - Via CLI: `AX(config)#slb virtual-server Exchange-EAS 10.0.1.76`

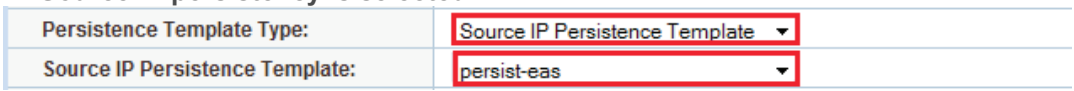
  - Add port **Type** HTTPS **Port** 443 and select the **Service Group, aFleX, Client-SSL Template,** and **Server-SSL template**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port




**If aFleX iue persistency is selected**




**If Source IP persistency is selected**



- Via CLI:
```
AX(config-slb vserver)#port 443 https
AX(config-slb vserver-vport)#service-group Exchange-EAS-https
AX(config-slb vserver-vport)#template client-ssl EAS-Client-Side
AX(config-slb vserver-vport)#template server-ssl EAS-Server-Side
```

**If aFleX UIE persistence is selected**

```
AX(config-slb vserver-vport)#aflex persist-eas
```

**If Source-IP persistence is selected**

```
AX(config-slb vserver-vport)#template persist source-ip
persist-eas
```

## g. (Optional) Offload SSL on Exchange EAS Servers

With this option, end users still use HTTPS to connect to their Exchange EAS service, but the AX connects to the EAS servers via HTTP, offloading SSL from the servers.

- Create the port 80 for each Exchange EAS real server
  - Same as “Exchange Client Access Roles - Outlook Web App”

- Create a health monitor template to test the availability of the Exchange EAS servers. Enter the health monitor template **Name** and select **Type** HTTP with **URL** “GET /”
  - Same as “Exchange Client Access roles - Outlook Web App”
    *Note: Use the **Name** “hm-eas-http”.*

- Create a TCP service group with Exchange EAS servers. Enter a Name for the service group, select TCP from the **Type** drop-down list, select the Least Connection load balancing **Algorithm,** and select the EAS **Health Monitor.** Assign each Exchange EAS server to the **Service** group and **Port** 80
  - Same as “Exchange Client Access roles - Outlook Web App”
    *Note: Use the **Name** “Exchange-EAS-http” and **Health Monitor** “hm-eas-http”.*

- In the EAS VIP, select the **Service Group** with HTTP servers
  - Same as “Exchange Client Access Roles - Outlook Web App”
    *Note: Use the **Service Group** “hm-eas-http”.*

- In the EAS VIP, remove the **Server-SSL Template,** since the AX will communicate with the EAS servers via HTTP
  - Same as “Exchange Client Access Roles - Outlook Web App”

- Enable SSL offload on Exchange EAS servers; see http://social.technet.microsoft.com/wiki/contents/articles/how-to-configure-ssl-offloading-in-exchange-2010.aspx

### 2.6.2 Configuration Validation

## a. Validate AX Deployment for Exchange EAS Without SSL Offload

Validate the status of the VIP and that its members are up.

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| | Name | Connections | | Packets | | Bytes | |
|---|---|---|---|---|---|---|---|
| | | Current | Total | Forward | Reverse | Forward | Reverse |
| | Exchange-EAS/10.0.1.76 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HTTPS/443 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 443 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 |
| | 443 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 |

- Via CLI:
```
AX#show slb virtual-server Exchange-EAS
AX#show slb service-group Exchange-EAS-https
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange EAS via ActiveSync
  - For more information on how to configure ActiveSync, *see your device user guide.*

## b. Validate AX Deployment for Exchange EAS with SSL Offload

Validate the status of the VIP and that its members are up.

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| | Name | Connections | | Packets | | Bytes | |
|---|---|---|---|---|---|---|---|
| | | Current | Total | Forward | Reverse | Forward | Reverse |
| | Exchange-EAS/10.0.1.76 | 0 | 0 | 0 | 0 | 0 | 0 |
| | HTTPS/443 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 |
| | 80 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 |

- Via CLI:
```
AX#show slb virtual-server Exchange-EAS
AX#show slb service-group Exchange-EAS-http
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange EAS via ActiveSync

## 2.7 Exchange Client Access Roles – RPC

Exchange RPC access offers end users with Microsoft Outlook access to their mailboxes via the native Microsoft Outlook Messaging API (MAPI) protocol.

AX provides the following benefits:

- Load Balancing and High Availability of Exchange RPC servers

**Technical Note:**

Outlook using the MAPI protocol contacts the Exchange server via TCP port 135 first and then opens a dynamic port between 1024 and 65535. Since by default any dynamic port number can be used, this requires a wildcard VIP on the AX that listens on all TCP ports. This is the configuration shown below.

For security reasons, it is possible and recommended by Microsoft to specify the dynamic port Outlook will open; see the following:

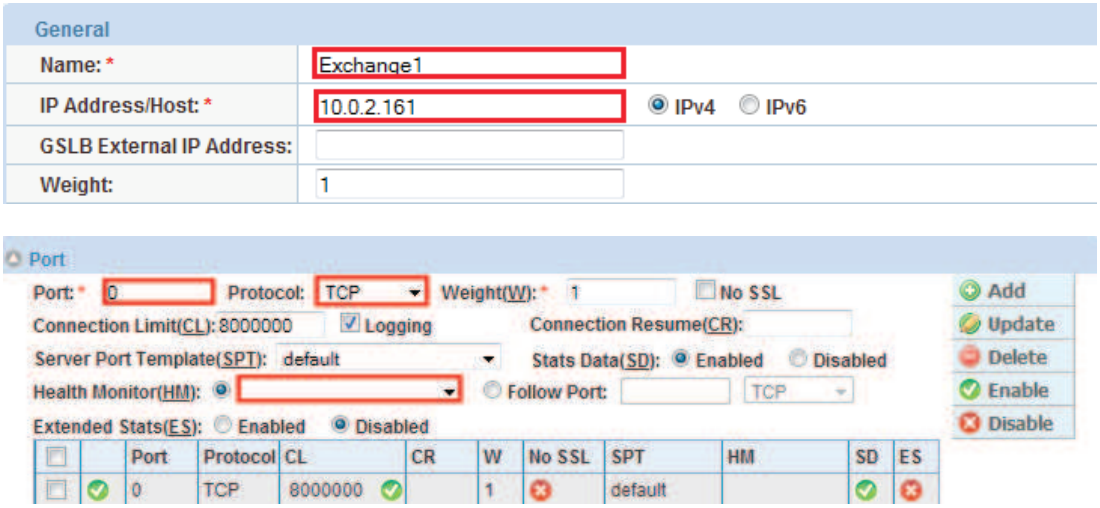
- http://technet.microsoft.com/en-us/library/ff625248.aspx#ipports
- http://www.msexchange.org/articles_tutorials/exchange-server-2007/planning-architecture/uncovering-new-rpc-client-access-service-exchange-2010-part2.html

If you limit the dynamic ports for MAPI, you can limit the ports open on AX via an ACL.

### 2.7.1 AX Configuration

### a. Create Exchange RPC Real Servers

- Create a real server for each Exchange RPC real server. Enter the RPC **Name** and **IP address,** and add **Protocol** TCP **port** 0 with no **Health Monitor**
  - Via Web GUI: Config Mode > Service > SLB > Server

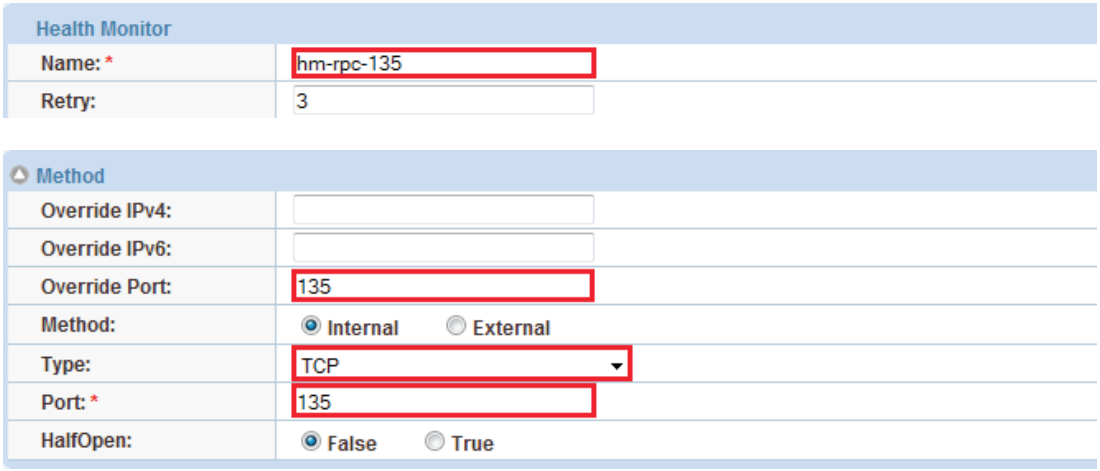



  - Via CLI:

```
AX(config)#slb server Exchange1 10.0.2.161
AX(config-real server)#port 0 tcp
AX(config-real server-node port)#no health-check
```

## b. Create Exchange RPC Health Check

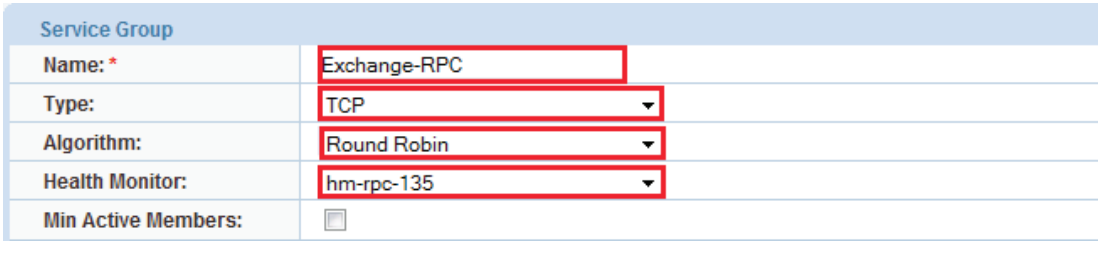
- Create a health monitor template to test the availability of the Exchange RPC servers. Enter the health monitor template **Name,** select **Type** TCP with **Port** 135 and **Override Port** 135
  - Via Web GUI: Config Mode > Service > Health Monitor

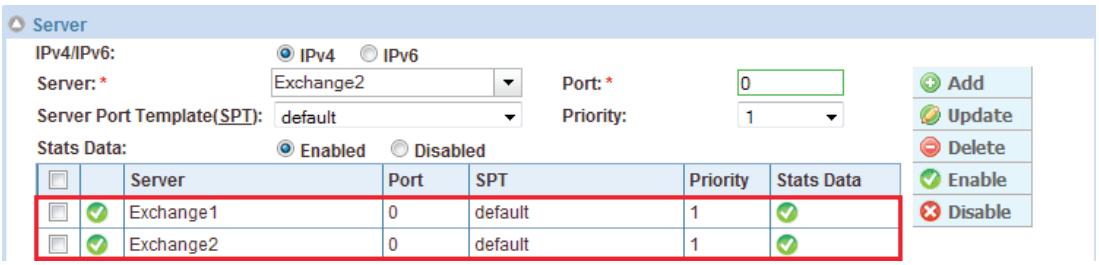



- Via CLI:
```
AX(config)#health monitor hm-rpc-135
AX(config-health:monitor)#method tcp port 135
AX(config-health:monitor)#override-port 135
```

## c. Create Exchange RPC Service Group

- Create a TCP service group with Exchange RPC servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, select the Round Robin load balancing **Algorithm,** and select the RPC **Health Monitor.** Assign each Exchange RPC **Server** to the service group with **Port** 0
  - Via Web GUI: Config Mode > Service > SLB > Service Group






- Via CLI:

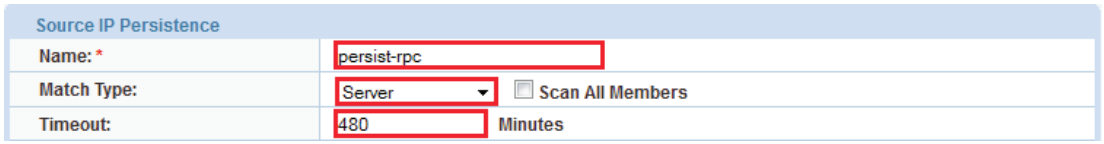
```
AX(config)#slb service-group Exchange-RPC tcp
AX(config-slb svc group)#method least-connection
AX(config-slb svc group)#health-check hm-rpc-135
AX(config-slb svc group)#member Exchange1:0
AX(config-slb svc group)#member Exchange2:0
```

## d. Create Exchange RPC Persistency

- Create a Source-IP persistence template to guarantee each end user will always go to the same Exchange RPC. Enter the persistence template **Name,** select **Match Type** server, and increase the **Timeout**
  - Via Web GUI: Config Mode > Service > Template > Persistent > Source IP Persistance

Via CLI:

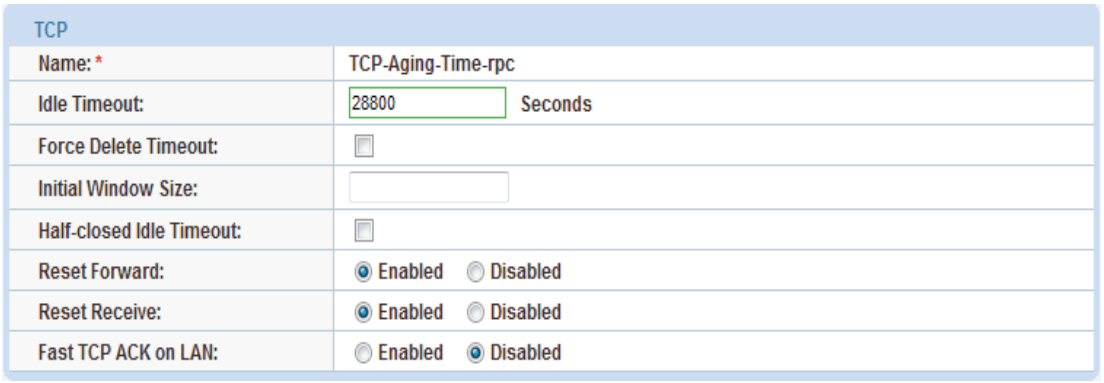
```
AX(config)#slb template persist source-ip persist-rpc
AX(config-source ip persist)#match-type server
AX(config-source ip persist)#timeout 480
```




## e. Create TCP Aging Time Template

- Create a TCP template to guarantee each RPC end connection will not be discarded even with end-user inactivity. Enter the TCP template **Name**, and increase the **Idle Timeout** to a minimum of 3600 seconds (1 hour) to a maximum of 28,800 seconds (8 hours).
  *Note: Having an Idle timeout that is to short can cause a user to re-authenticate.*

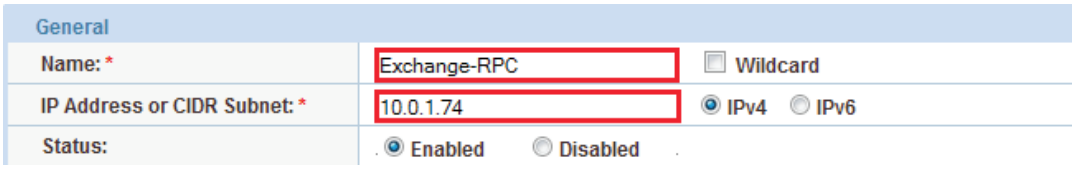
  - Via Web GUI: Config Mode > Service > Template > L4 > TCP



- Via CLI:
```
AX(config)# slb template tcp TCP-Aging-Time-rpc
AX(config-l4 tcp)# idle-timeout 28800
AX(config-l4 tcp)# reset-fwd
AX(config-l4 tcp)# reset-rev
```

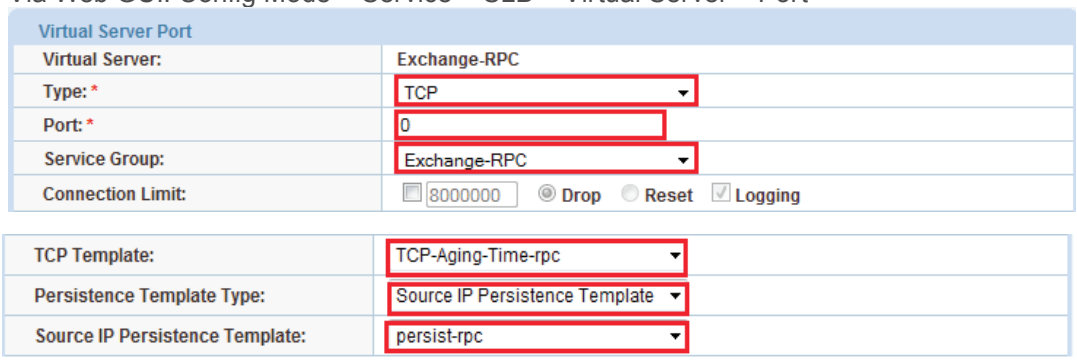
## f. Create Exchange RPC VIP

- Create the virtual IP address (VIP), which is the IP address that end users will access
  - Enter a **Name** for the VIP, and enter the **IP address**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server




    - Via CLI:
```
AX(config)#slb virtual-server Exchange-RPC 10.0.1.74
```

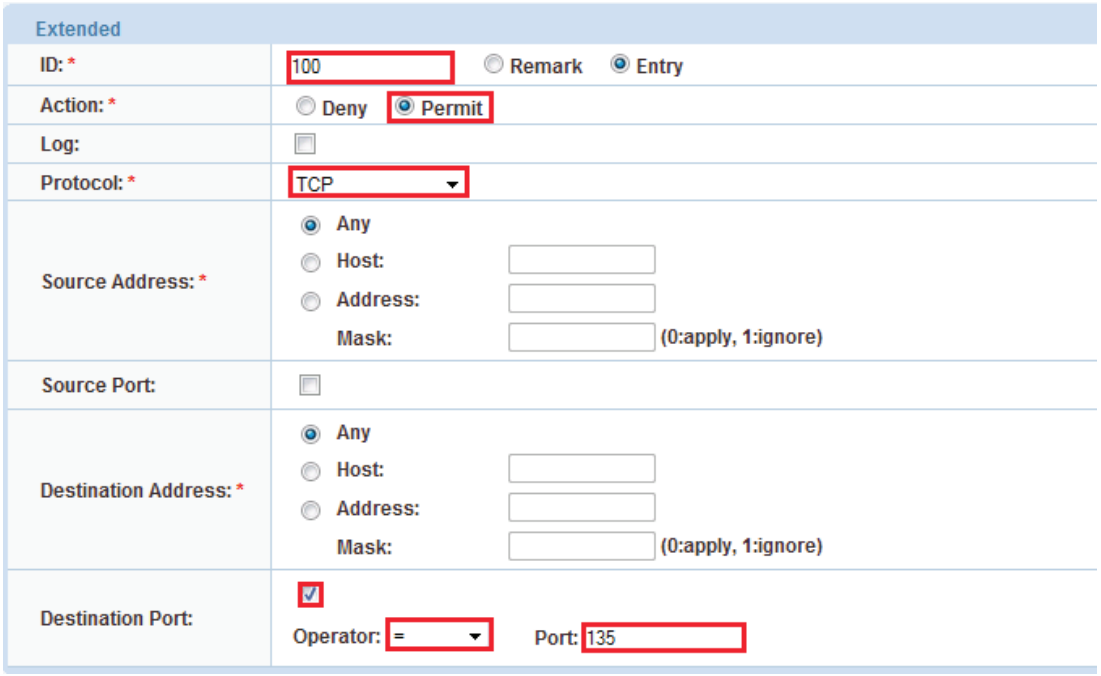
  - Add port **Type** TCP **Port** 0 and select the **Service Group,** and **Persistence Template**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port



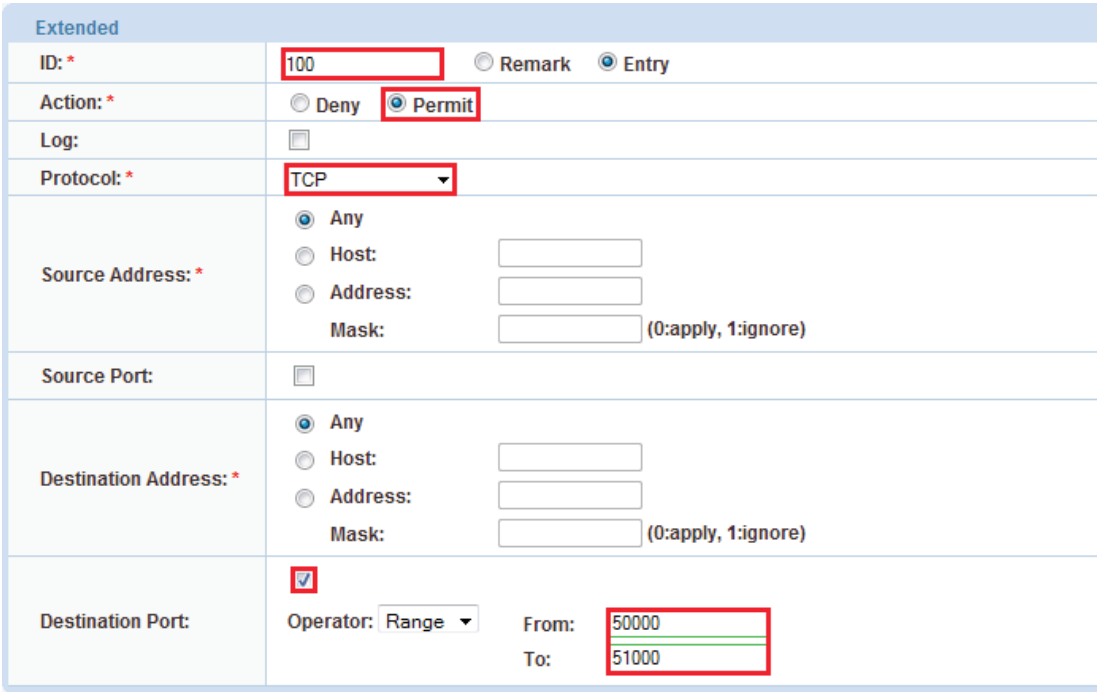

  - Via CLI:
```
AX(config-slb vserver)#port 0 tcp
AX(config-slb vserver-vport)#service-group Exchange-RPC

AX(config-slb vserver-vport)#template persist source-ip per-
sist-rpc

AX(config-slb vserver-vport)#template tcp TCP-Aging-Time-rpc
```

## g. (optional) Create an ACL to limit the number of ports open on AX

- Create an ACL that authorizes only the Exchange TCP ports configured
  *Note: The example below refers to an Exchange configuration with the ports are 135 +50000-51000.*
  *Enter an* **ID** for the ACL, **Action** Permit, **Protocol** TCP, and enter the **Destination Port**
  - Via Web GUI: Config Mode > Network > ACL > Extended




And




- Via CLI:

```
AX(config)#access-list 100 permit tcp any any eq 135
AX(config)#access-list 100 permit tcp any any range 50000 51000
```

- Associate the ACL to the RPC VIP port
  Enter an **ID** for the ACL, **Action** Permit, **Protocol** TCP, and enter the **Destination Port**
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port


  - Via CLI:

```
AX(config)#slb virtual-server Exchange-RPC
AX(config-slb vserver)#port 0 tcp
AX(config-slb vserver-vport)#access-list 100
```

### 2.7.2 Configuration Validation

## a. Validate AX deployment for Exchange without SSL offload

Validate the status of the VIP and that its members are up

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| | | Name | Connections | | Packets | | Bytes | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Current | Total | Forward | Reverse | Forward | Reverse | |
| ☐ | ↑ | Exchange-RPC/10.0.1.74 ⊟ | 0 | 0 | 0 | 0 | 0 | 0 | |
| | ↑ | TCP/0 ⊟ | 0 | 0 | 0 | 0 | 0 | 0 | |
| | ↑ | 0 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 | |
| | ↑ | 0 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 | |

- Via CLI:

```
AX#show slb virtual-server Exchange-RPC
AX#show slb service-group Exchange-RPC
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange RPC via Microsoft Outlook

## 2.8 Exchange Client Access Roles – POP3

Exchange POP3 offers end users a way to access their mailboxes via many different email clients, for example Mozilla Thunderbird.

AX provides the following benefits:

- Load Balancing and High Availability of Exchange POP3 servers

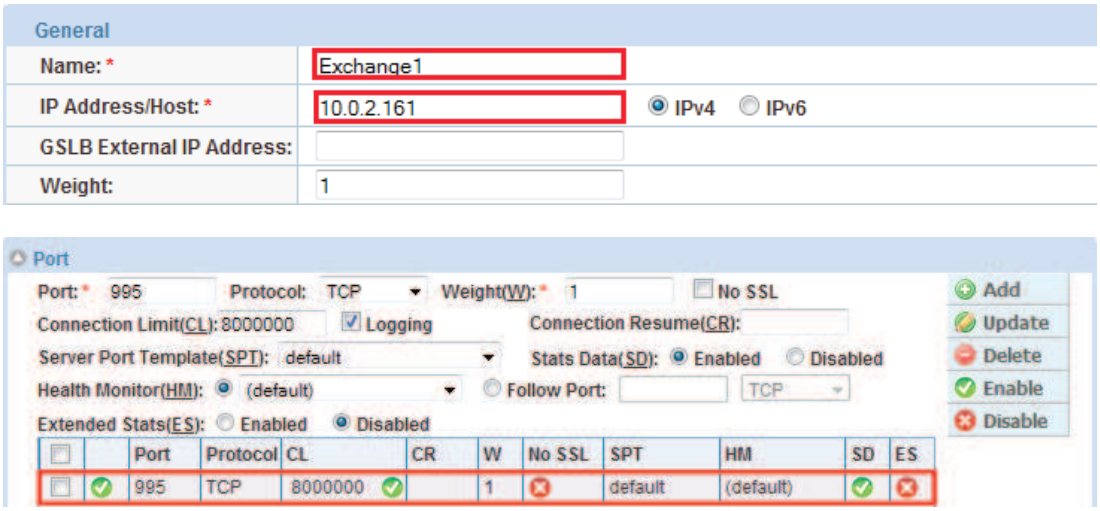
And can also provide the optional benefit:

- SSL offload to reduce CPU and memory usage on Exchange POP3 servers

### 2.8.1 AX Configuration

### a. Create Exchange POP3 Real Servers

- Create a real server for each Exchange POP3 real server. Enter the POP3 **Name** and **IP address,** and add the **Protocol** TCP **port** 995 (SSL over POP3)
  - Via Web GUI: Config Mode > Service > SLB > Server



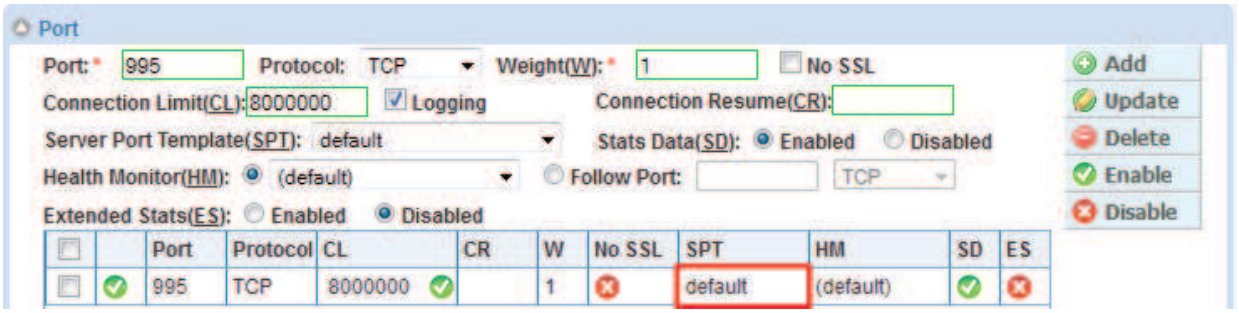

  - Via CLI:

```
AX(config)#slb server Exchange1 10.0.2.161
AX(config-real server)#port 995 tcp
```

## b. Create Exchange POP3 Health Check

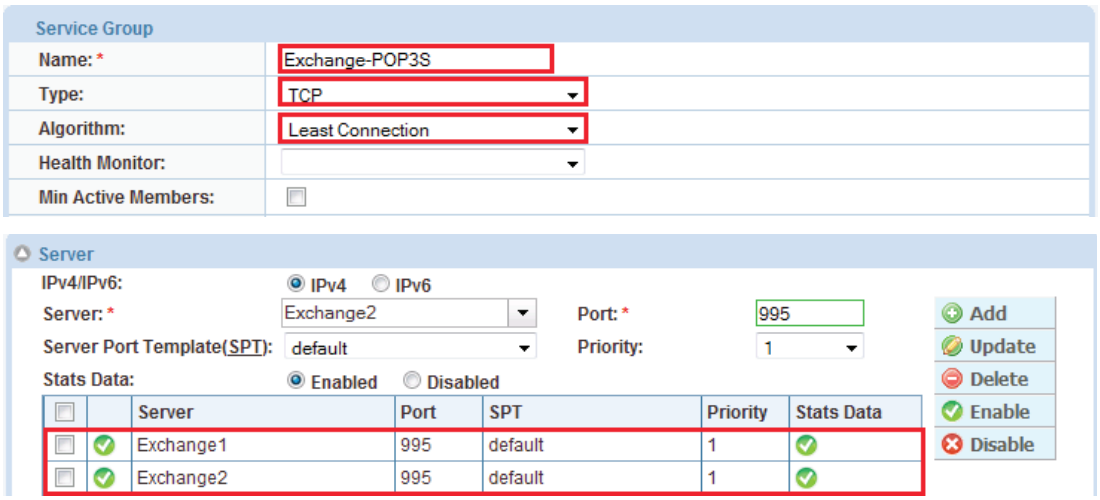
AX supports the  POP3 health checks. However, we will not use a POP3 health check here because we assume the Exchange servers are configured to support only POP3S (SSL over POP3).

The Exchange POP3 servers will be tested via TCP health checks on port 995. There is no need to create a specific health monitor to test the server TCP stack. This is done within the Real Server with the default health monitor:




## c. Create Exchange POP3 Service Group

- Create a TCP service group with Exchange POP3 servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, and select the Least Connection load balancing **Algorithm.** Assign each Exchange POP3 **Server** to the service group with **Port** 995
  - Via Web GUI: Config Mode > Service > SLB > Service Group




  - Via CLI:

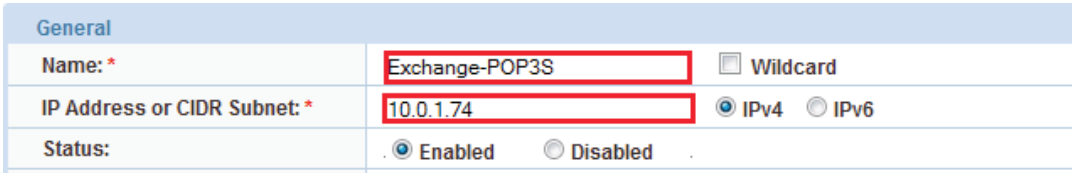
```
AX(config)#slb service-group Exchange-POP3S tcp
AX(config-slb svc group)#method least-connection
AX(config-slb svc group)#member Exchange1:995
AX(config-slb svc group)#member Exchange2:995
```

### d. Create Exchange POP3 Persistence

Exchange POP3 service does not require any persistence.

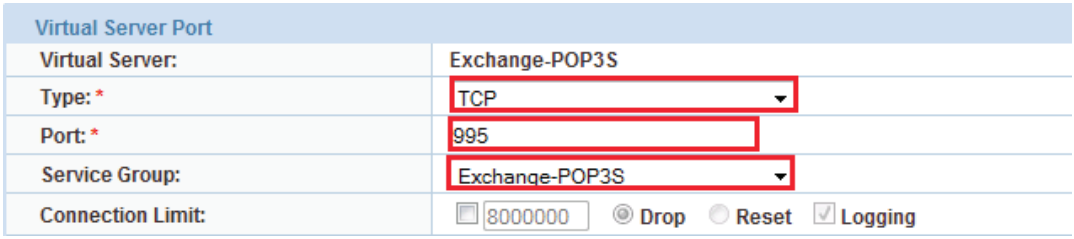
### e. Create Exchange POP3 VIP

- Create the virtual IP address (VIP), which is the IP address that end users will access
  - Enter a **Name for the VIP, and enter the IP address**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server




    - Via CLI: `AX(config)#slb virtual-server Exchange-POP3S 10.0.1.74`

  - Add port **Type** TCP **Port** 995 and select the **Service Group**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port



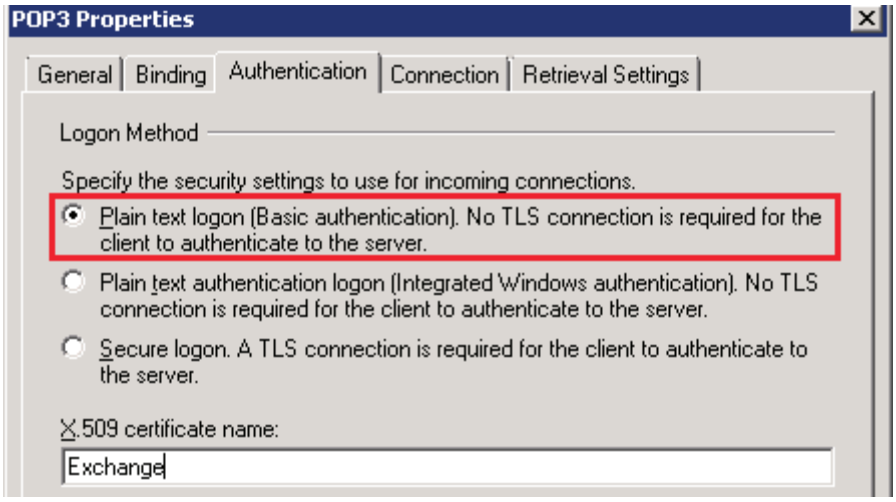

    - Via CLI:
```
AX(config-slb vserver)#port 995 tcp
AX(config-slb vserver-vport)#service-group Exchange-POP3S
```

### f. (Optional) Offload SSL on Exchange POP3 Servers

With this option, end users still use POP3S to connect to their Exchange POP3 service, but the AX connects to the POP3 servers via POP3, offloading SSL from the servers.

- Create the port 110 for each Exchange POP3 real server
  - Replace server port 995 with 110 in “step a”

- Create a health monitor template to test the availability of the Exchange POP3 servers.
  AX supports the POP3 health checks
  *Important Note: The POP3 health check can be used only if the Exchange POP3 servers are configured with Authentication “Plain text login (Basic Authentication)” (under Exchange Management Console > Server Configuration > Client Access > POP3 > Properties):*



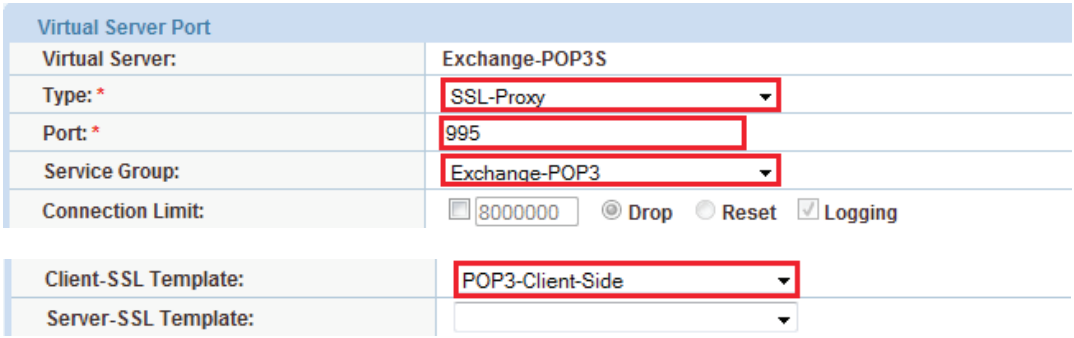

This is not the default Exchange configuration and we will not use the POP3 health check in this example. Instead, the Exchange POP3 servers will be tested via TCP health checks on port 110. There is no need to create a specific health monitor to test the server TCP stack. This is done within the Real Server with the default health monitor.

- Create a TCP service group with Exchange POP3 servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, and select the Least Connection load balancing **Algorithm.** Assign each Exchange POP3 **Server** to the service group with **Port** 110
  - Replace the **Name** "Exchange-POP3S" with "Exchange-POP3" and **Port** "995" with "110" in "step c"

- Import the POP3S server public certificate/private key onto the AX
  *Note: Since this VIP will be accessed by applications that may accept only trusted certificates, you must have a trusted certificate.*
  *Note: To export a certificate/key from Exchange POP3, see* http://technet.microsoft.com/en-us/library/bb676455.aspx

  - Same as "Exchange Client Access roles - Outlook Web App"
    *Note: Use the **Certificate Name** "pop3-cert-key", **Client-SSL Template Name** "POP3-Client-Side" and no **Server-SSL Template Name***

- Create Exchange POP3 VIP
  - Replace the VIP Port created in “step e” with port **Type** SSL-Proxy, **Port** 995; select the **Service Group** and **Client-SSL Template**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port




- Via CLI:
```
AX(config-slb vserver)#port 995 ssl-proxy
AX(config-slb vserver-vport)#service-group Exchange-POP3
AX(config-slb vserver-vport)#template client-ssl POP3-Client-Side
```

### 2.8.2 Configuration Validation

## a. Validate AX deployment for Exchange without SSL Offload

Validate the status of the VIP and that its members are up

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| Name | Connections | | Packets | | Bytes | |
|---|---|---|---|---|---|---|
| | Current | Total | Forward | Reverse | Forward | Reverse |
| Exchange-POP3S/10.0.1.74 | 0 | 0 | 0 | 0 | 0 | 0 |
| TCP/995 | 0 | 0 | 0 | 0 | 0 | 0 |
| 995 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 |
| 995 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 |

- Via CLI:
```
AX#show slb virtual-server Exchange-POP3S
AX#show slb service-group Exchange-POP3S
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange POP3 with your email POP3 client

## b. Validate AX deployment for Exchange with SSL offload

Validate the status of the VIP and that its members are up

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| | | Name | Connections | | Packets | | Bytes | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Current | Total | Forward | Reverse | Forward | Reverse | |
| | | Exchange-POP3S/10.0.1.74 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | SSL-Proxy/995 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 110 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 110 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 | |

- Via CLI:
```
AX#show slb virtual-server Exchange-POP3S
AX#show slb service-group Exchange-POP3
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange POP3 with your email POP3 client

## 2.9 Exchange Client Access Roles – IMAP4

Exchange IMAP4 offers end users a way to access their mailboxes via many different email clients, for example Mozilla Thunderbird.

AX provides the following benefits:

- Load Balancing and High Availability of Exchange IMAP4 servers

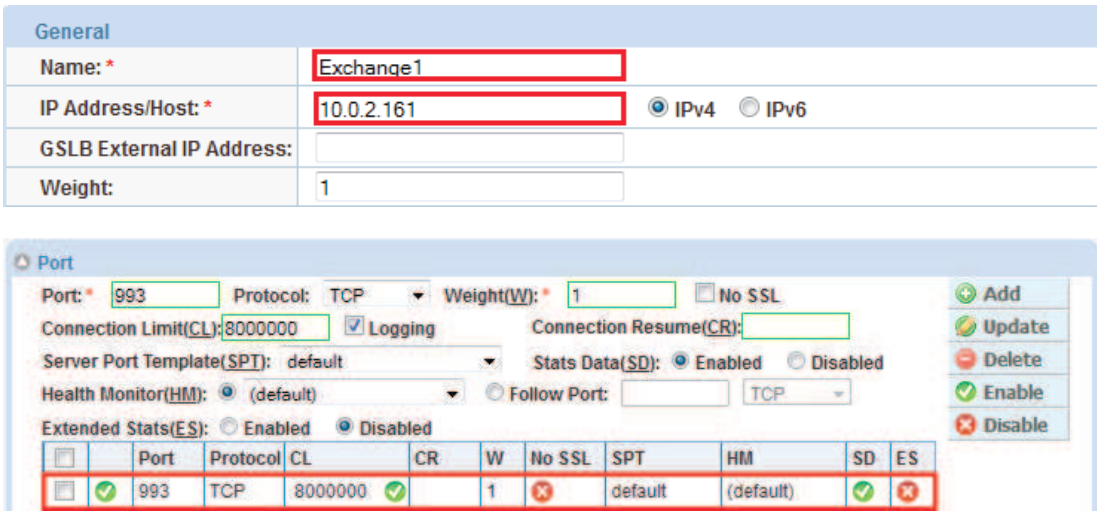
And can also provide the optional benefit:

- SSL offload to reduce CPU and memory usage on Exchange IMAP4 servers

### 2.9.1 AX Configuration

### a. Create Exchange IMAP4 Real Servers

- Create a real server for each Exchange IMAP4 real server. Enter the IMAP4 N**ame** and **IP address,** and add **Protocol** TCP **port** 993 (SSL over IMAP4)
  - Via Web GUI: Config Mode > Service > SLB > Server

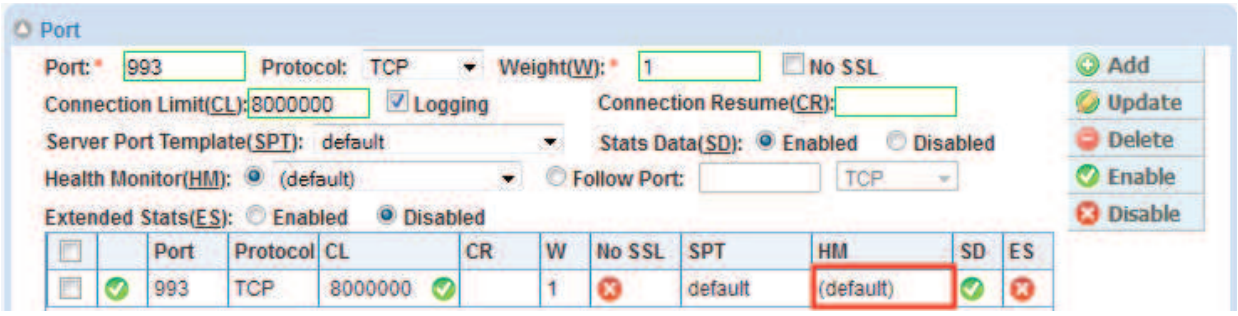



  - Via CLI:

```
AX(config)#slb server Exchange1 10.0.2.161
AX(config-real server)#port 993 tcp
```

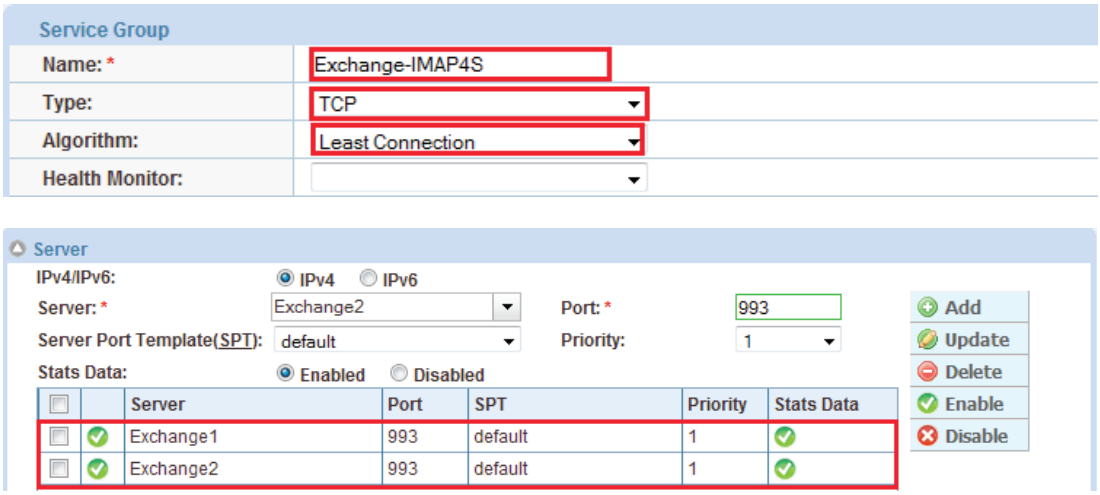
## b. Create Exchange IMAP4 Health Check

AX supports IMAP4 health checks. But we will not use that type of health check in this example because we assume the Exchange servers are configured to support only IMAP4S (SSL over IMAP4).
The Exchange IMAP4 servers will be tested via TCP health checks on port 993. There is no need to create a specific health monitor to test the server TCP stack. This is done within the Real Server with the default health monitor:




## c. Create Exchange IMAP4 Service Group

- Create a TCP service group with Exchange IMAP4 servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, and select the Least Connection load balancing **Algorithm.** Assign each Exchange IMAP4 Server to the service group with **Port** 993
  - Via Web GUI: Config Mode > Service > SLB > Service Group




  - Via CLI:

```
AX(config)#slb service-group Exchange-IMAP4S tcp
AX(config-slb svc group)#method least-connection
AX(config-slb svc group)#member Exchange1:993
AX(config-slb svc group)#member Exchange2:993
```

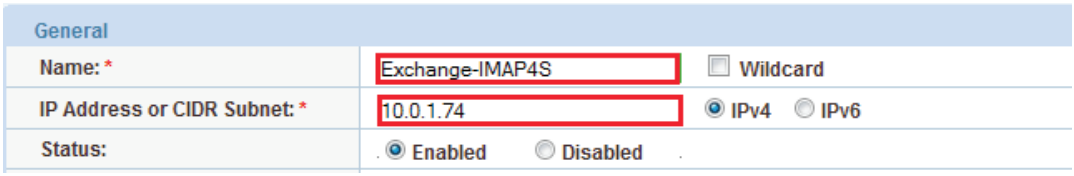
### d. Create Exchange IMAP4 Persistence

Exchange IMAP4 service does not require any persistence.

### e. Create Exchange IMAP4 VIP

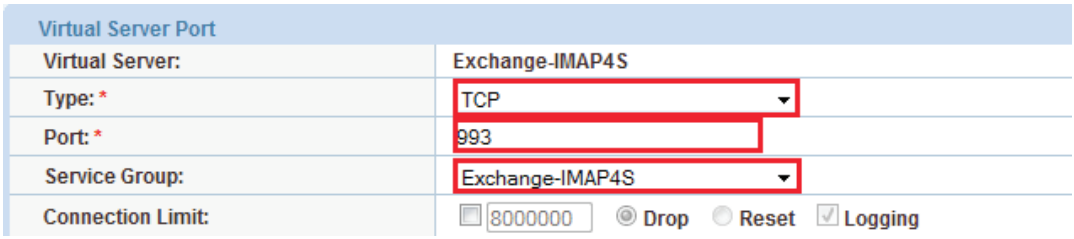
Create the virtual IP address (VIP), which is the IP address that end users will access

- Enter a **Name** for the VIP, and enter the **IP address**
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server




  - Via CLI: `AX(config)#slb virtual-server Exchange-IMAP4S 10.0.1.74`

- Add port **Type** TCP **Port** 995 and select the **Service Group**
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port




  - Via CLI:
```
AX(config-slb vserver)#port 993 tcp
AX(config-slb vserver-vport)#service-group Exchange-IMAP4S
```

### f. (Optional) Offload SSL on Exchange IMAP4 servers

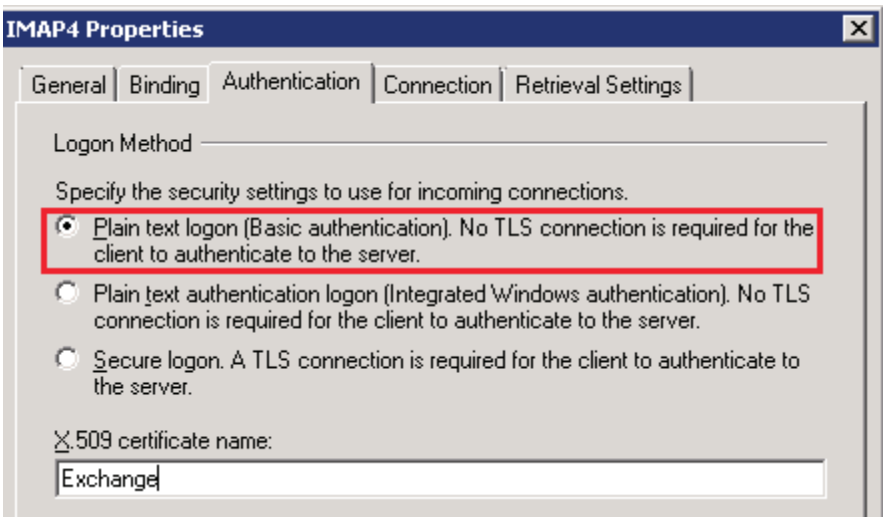
With this option, end users still use IMAP4S to connect to their Exchange IMAP4 service, but the AX connects to the IMAP4 servers via IMAP4, offloading SSL from the servers.

- Create the port 143 for each Exchange IMAP4 real server
  - Replace the server port 993 with 143 in “step a”

Create a health monitor template to test the availability of the Exchange IMAP4 servers.

AX supports IMAP4 health checks.

*Important Note: The IMAP4 health check can be used only if the Exchange IMAP4 servers are configured with Authentication “Plain text login (*Basic Authentication*)” (under Exchange Management Console > Server Configuration > Client Access > IMAP4 > Properties):*

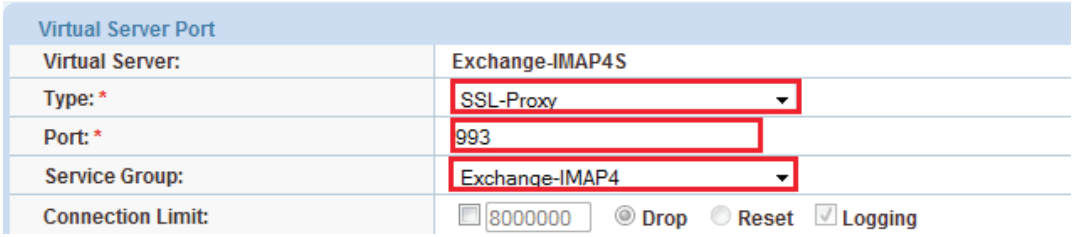


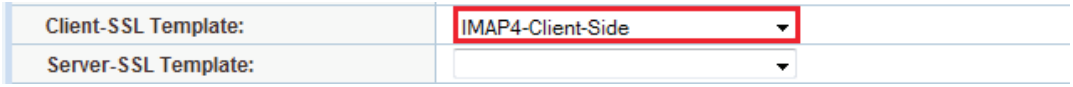

This is not the default Exchange configuration and we will not use IMAP health checking in this step. Instead, the Exchange IMAP4 servers will be tested via TCP health checks on port 143. There is no need to create a specific health monitor to test the server TCP stack. This is done within the Real Server with the default health monitor.

- Create a TCP service group with Exchange IMAP4 servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, and select the Least Connection load balancing **Algorithm.** Assign each Exchange IMAP4 Server to the service group with **Port** 143
  - Replace the **Name** "Exchange-IMAP4S" with "Exchange-IMAP4" and **Port** "993" with "143" in "step c"

- Import the IMAP4S server public certificate/private key onto the AX
  *Note: Since this VIP will be accessed by applications that may accept only trusted certificates, you must have a trusted certificate.*
  *Note: To export certificate/key from Exchange IMAP4, see* http://technet.microsoft.com/en-us/library/bb676455.aspx
  - Same as "Exchange Client Access roles - Outlook Web App"
    *Note: Use* ***Certificate Name*** *"imap4-cert-key",* ***Client-SSL Template Name*** *"IMAP4-Client-***Side" and no Server-SSL Template Name**

- Create Exchange IMAP4 VIP
  - Replace the VIP Port created in "step e" with port **Type** SSL-Proxy, **Port** 993; select the **Service Group,** and **Client-SSL Template**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port






- Via CLI:
```
AX(config-slb vserver)#port 993 ssl-proxy
AX(config-slb vserver-vport)#service-group Exchange-IMAP4
AX(config-slb vserver-vport)#template client-ssl IMAP4-Client-Side
```

### 2.9.2 Configuration Validation

## a. Validate AX Deployment for Exchange Without SSL offload

Validate the status of the VIP and that its members are up

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| | | Name | Connections | | Packets | | Bytes | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Current | Total | Forward | Reverse | Forward | Reverse | |
| | | Exchange-IMAP4S/10.0.1.74 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | TCP/993 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 993 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 993 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 | |

- Via CLI:
```
AX#show slb virtual-server Exchange-IMAP4S
AX#show slb service-group Exchange-IMAP4S
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange POP3 with your email IMAP4 client

## b. Validate AX deployment for Exchange AS with SSL offload

Validate the status of the VIP and that its members are up

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| | | Name | Connections | | Packets | | Bytes | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Current | Total | Forward | Reverse | Forward | Reverse | |
| | | Exchange-IMAP4S/10.0.1.74 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | SSL-Proxy/993 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 143 (Exchange2) | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 143 (Exchange1) | 0 | 0 | 0 | 0 | 0 | 0 | |

- Via CLI:
```
AX#show slb virtual-server Exchange-IMAP4S
AX#show slb service-group Exchange-IMAP4
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Access the Exchange POP3 with your email IMAP4 client

## 2.10 Exchange Client Access role – Exchange Web Services

Exchange Web Services (EWS) is a component that offers web services API for Exchange.

AX provides EWS with the same benefits as OWA; in this case:

- Load Balancing and High Availability of Exchange EWS servers

AX can also provide these optional benefits:

- HTTP Compression to reduce remote end user response time and data center bandwidth usage
- SSL offload to reduce CPU and memory usage on Exchange EWS servers

### 2.10.1 AX Configuration

*Note: If the same VIP will be used for the Outlook Anywhere or Exchange ActiveSync services, see "2.14 Multiple Exchange Services with a Single VIP".*

- Same as "Exchange Client Access roles - Outlook Web App"

### 2.10.2 Configuration Validation

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Access your web services via the VIP "https://mail.example.com".*

## 2.11 Exchange Client Access role – Autodiscover

Autodiscover allows you to automatically configure Outlook 2007/2010 clients.

AX provides Autodiscover with the same benefits as OWA; in this case:

- Load Balancing and High Availability of Exchange Autodiscover servers

AX can also provide these optional benefits:

- HTTP Compression to reduce remote end user response time and data center bandwidth usage
- SSL offload to reduce CPU and memory usage on Exchange EWS servers

### 2.11.1 AX Configuration

*Note: If the same VIP will be used for the Outlook Anywhere or Exchange ActiveSync services, see "2.14 Multiple Exchange Services with a Single VIP".*

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: There is no persistence need (skip step d.)*

### 2.11.2 Configuration Validation

See http://technet.microsoft.com/en-us/library/bb123573.aspx

## 2.12 Exchange Client Access role – Offline Address Book distribution

An offline address book (OAB) is a copy of a collection of address lists that has been downloaded so that a Microsoft Outlook user can access the information it contains while disconnected from the server.

There are two methods by which the OAB is distributed to client computers:

- Web-based distribution
- Public folder distribution

AX provides Autodiscover with the same benefits as OWA; in this case:

- Load Balancing and High Availability of Exchange Autodiscover servers

*Note: Appendix A15 is an aFleX script that blocks all Exchange services except OWA and OAB distributions. The script is very useful for Exchange administrators that control Exchange services originating from external access.*

### 2.12.1 AX Configuration

- For web-based distribution: Same as “Exchange Client Access roles - Outlook Web App”
- For public folder distribution: Same as “Exchange Client Access roles -RPC”

### 2.12.2 Configuration Validation

See http://technet.microsoft.com/en-us/library/bb124351.aspx

## 2.13 Exchange Edge Transport Server Role - SMTP

Exchange Edge Transport Server role performs anti-spam and antivirus filtering, and applies messaging and security policies to messages in transport.

AX provides the following benefits:

- Load Balancing and High Availability of Exchange Anywhere servers

And can also provide the optional benefit:

- TLS (STARTTLS) offload to reduce CPU and memory usage on Exchange SMTP servers

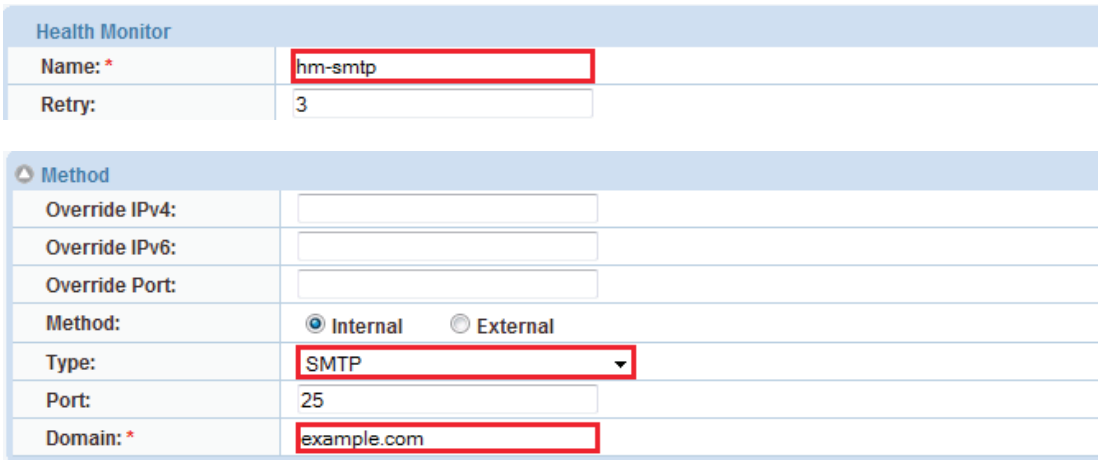
### 2.13.1 AX Configuration

#### a. Create Exchange SMTP real servers

- Same as “Exchange Client Access roles - Outlook Web App”

#### b. Create Exchange SMTP Health Check

- Create a health monitor template to test the availability of the Exchange SMTP servers. Enter the health monitor template **Name** and select **Type** SMTP with its **Domain**
  - Via Web GUI: Config Mode > Service > Health Monitor




  - Via CLI:

```
AX(config)#health monitor hm-smtp
AX(config-health:monitor)#method smtp domain example.com
```

### c. Create Exchange SMTP Service Group

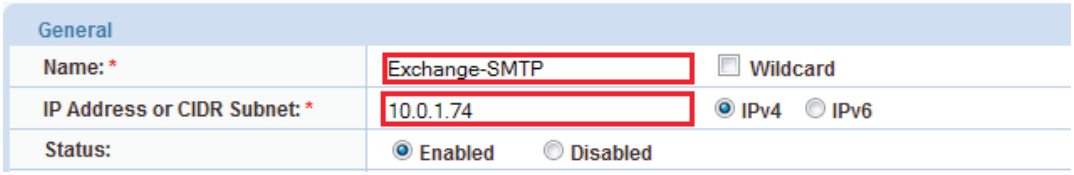
- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the* ***Name*** *"Exchange-SMTP" and* ***Health Monitor*** *"hm-smtp".*

### d. Create Exchange SMTP persistence

Exchange SMTP service does not require any persistence.

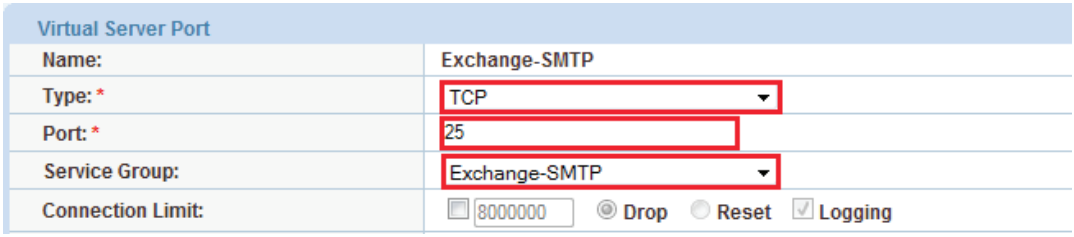
### e. Create Exchange SMTP VIP

- Create the virtual IP address (VIP), which is the IP address that end users will access
  - Enter a **Name** for the VIP, and enter the **IP address**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server




    - Via CLI: `AX(config)#slb virtual-server Exchange-SMTP 10.0.1.74`

  - Add port **Type** TCP **Port** 25 and select the **Service Group**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port

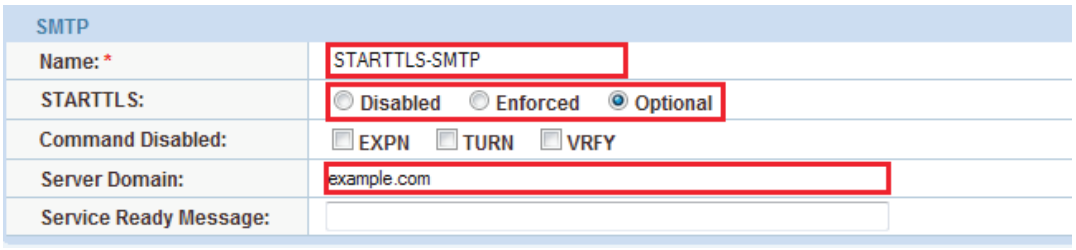



    - Via CLI: `AX(config-slb vserver)#port 25 tcp`
      `AX(config-slb vserver-vport)#service-group Exchange-SMTP`

### f. (Optional) Offload TLS on Exchange SMTP servers

With this option, AX can offer or enforce TLS access for end users connecting to the Exchange SMTP service. However Exchange servers are still configured with no TLS for SMTP.

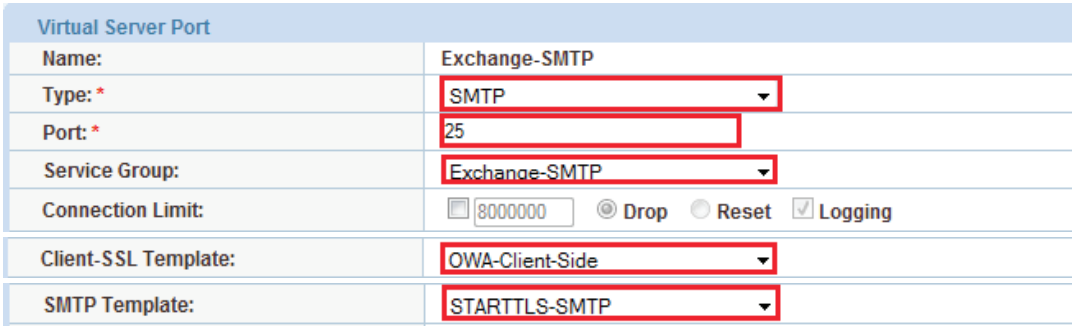
- Create the SMTP template to define the TLS (STARTTLS) SMTP access
  - Enter a **Name** for the template, specify whether STARTTLS is optional or enforced, and enter the **Server Domain**
    - Via Web GUI: Config Mode > Service > Template > Application > SMTP




- Via CLI:
```
AX(config)#slb template smtp STARTTLS-SMTP
AX(config-smtp)#server-domain example.com
AX(config-smtp)#starttls optional
```

- Import the certificate/private key onto the AX to use for SMTP
  *Note: You can access your mailboxes even if you do not have a trusted signed certificate with Outlook. (You simply accept the untrusted certificate presented in Outlook.) However, clients may use other software than Outlook and will not give you the option to accept the untrusted certificate. Therefore, we recommend that you use a trusted certificate with TLS on SMTP.*
  - Same as "Exchange Client Access roles - Outlook Web App"
    *Note: Use the **Certificate Name** "smtp-cert-key" and **Client-SSL Template Name** "SMTP-Client-Side"*

- In the SMTP VIP, replace the TCP port 25 with:
  - Add port **Type** SMTP **Port** 25, select the **Service Group,** the **Client-SSL template** and **SMTP Template**
    - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port




- Via CLI:
```
AX(config-slb vserver)#port 25 smtp
AX(config-slb vserver-vport)#service-group Exchange-SMTP
AX(config-slb vserver-vport)#template client-ssl OWA-Client-Side
AX(config-slb vserver-vport)#template smtp STARTTLS-SMTP
```

### 2.13.2 Configuration Validation

## a. Validate AX Deployment for Exchange SMTP without TLS offload

Validate the status of the VIP and that its members are up

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| | | Name | Connections | | Packets | | Bytes | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Current | Total | Forward | Reverse | Forward | Reverse | |
| | | Exchange-SMTP/10.0.1.74 | 0 | 1 | 18 | 18 | 2.3K | 3.1K | |
| | | TCP/25 | 0 | 1 | 18 | 18 | 2.3K | 3.1K | |
| | | 25 (Exchange1) | 0 | 8 | 100 | 90 | 8.5K | 10.3K | |
| | | 25 (Exchange2) | 0 | 7 | 115 | 107 | 11.2K | 12.8K | |

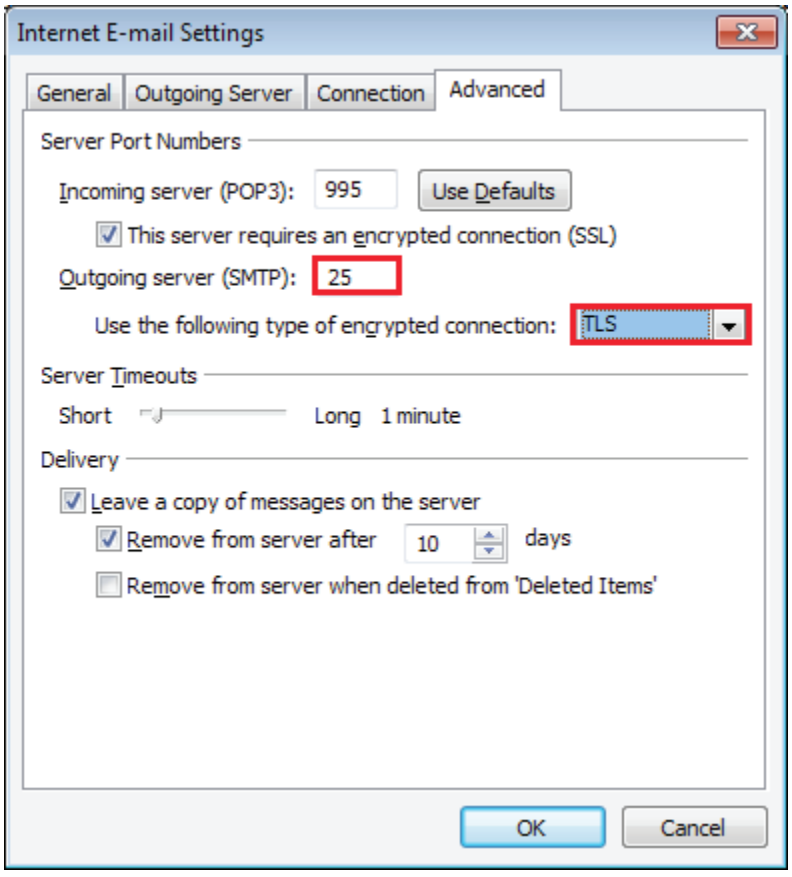
- Via CLI:

```
AX#show slb virtual-server Exchange-SMTP
AX#show slb service-group Exchange-SMTP
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Send email via SMTP via Outlook or any mail client

  *Note: If Exchange accepts only TLS connections for the SMTP service, enable TLS on the Client. For instance, on Outlook 2007, this is under "Tools > Account Settings > Edit email > More Settings > Advanced":*



## b. Validate AX deployment for Exchange SMTP With SSL Offload

Validate the status of the VIP and that its members are up

- Via Web GUI: Monitor > Service > SLB > Virtual Server

| | Name | Connections | | Packets | | Bytes | |
|---|---|---|---|---|---|---|---|
| | | Current | Total | Forward | Reverse | Forward | Reverse |
| | Exchange-SMTP/10.0.1.74 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SMTP/25 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 25 (Exchange1) | 0 | 8 | 100 | 90 | 8.5K | 10.3K |
| | 25 (Exchange2) | 0 | 7 | 115 | 107 | 11.2K | 12.8K |

- Via CLI:
```
AX#show slb virtual-server Exchange-SMTP
AX#show slb service-group Exchange-SMTP
AX#show slb server [Exchange1 | Exchange2]
```

Validate the AX deployment:

- Send email via SMTP via Outlook or any mail client
  *Note: If Exchange accepts only TLS connections for the SMTP service, enable TLS on the Client.*

## 2.14 Multiple Exchange Services with a Single VIP

Microsoft Exchange uses different TCP ports for their different services (RPC, POP3, and so on). However for five services, the same TCP port 443 access is used:

- Outlook Web App (and its optional service Exchange Control Panel)
- Outlook Anywhere
- Exchange ActiveSync
- Exchange Web Services
- Autodiscover

By using different VIP access methods for these client access roles, enterprises can manage each service independently and use specific security, monitoring and load balancing settings. However, some organizations may need to use the same VIP for these Exchange services.

AX supports such deployment and provides the following benefits:

- Load Balancing and High Availability of Exchange servers

And can also provide the optional benefit:

- SSL offload to reduce CPU and memory usage on Exchange servers

*Note: With this deployment, AX will not provide the following benefits:*

- HTTP Compression
- Transparent redirection of HTTP clients to HTTPS for OWA + ECP
- Transparent addition of "/owa" to OWA requests that do not have it

### 2.14.1 AX Configuration with 1 VIP for OWA + OA + EAS Services Hosted on the Same Exchange Servers

#### a. Create Exchange Real Servers

- Same as "Exchange Client Access roles - Outlook Web App"

#### b. Create Exchange Health Check

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the **Name** "hm-exchange-https".*

#### c. Create Exchange Service Group

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the **Name** "Exchange-https" and **Health Monitor** "hm-exchange-https".*

## d. Create Exchange Persistence

*Note: Since this VIP will be accessed by some devices that support cookies and others that do not, we recommend using Source-IP persistence.*

- *Same as "Exchange Client Access roles - Outlook Anywhere"*
  *Note: Use the Source-IP Persistence* ***Name*** *"persist-exchange-https".*

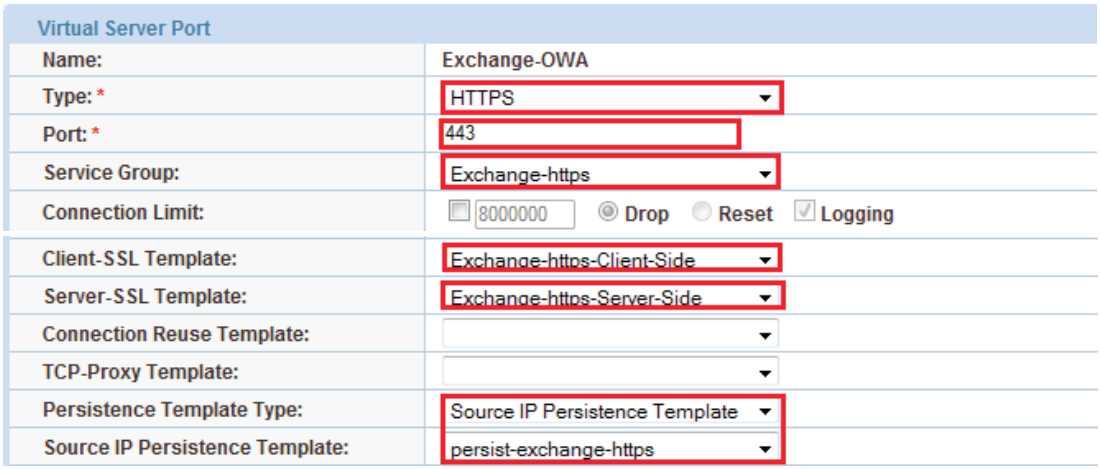
## e. Import the IIS server public certificate / private key onto the AX

*Note: Since this VIP will be accessed by devices supporting only trusted certificates, you must have a trusted certificate.*

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the* ***Certificate Name*** *"exchange-https-cert-key",* ***Client-SSL Template Name*** *"exchange-https-Client-Side", and* ***Server-SSL Template Name*** *"exchange-https-Server-Side"*

## f. Create Exchange VIP

- Same as "Exchange Client Access roles - Outlook Anywhere"
  *Note: Use the* ***Name*** *"Exchange" and add the port* ***Type*** *HTTPS* ***Port*** *443 and select the* ***Service Group*** ***"****Exchange-https",* ***Source IP Persistence Template*** *"persist-exchange-https",* ***Client-SSL Template*** *"exchange-https-Client-Side", and* ***Server-SSL template*** *"exchange-https-Server-Side"*
  - Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port




  - Via CLI:

```
AX(config-slb vserver)#port 443 https
AX(config-slb vserver-vport)#service-group Exchange-https
AX(config-slb vserver-vport)#template client-ssl Exchange-
https-Client-Side
AX(config-slb vserver-vport)#template server-ssl Exchange-
https-Server-Side
AX(config-slb vserver-vport)#template persist source-ip per
sist-exchange-https
```

### g. (Optional) Offload SSL on Exchange Servers

With this option, end users still use HTTPS to connect to their Exchange service, but the AX connects to the Exchange servers via HTTP, offloading SSL from the servers.

- Create the port 80 for each Exchange OWA/OA/EAS real server
  - Same as "Exchange Client Access roles - Outlook Web App"

Create a health monitor template to test the availability of the Exchange OWA/OA/EAS servers. Enter the health monitor template **Name** and select **Type** HTTP with **URL** "GET /"

  - Same as "Exchange Client Access roles - Outlook Web App"
    *Note: Use the **Name** "hm-exchange-http".*

- Create a TCP service group with Exchange OWA/OA/EAS servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, select the Least Connection load balancing **Algorithm,** and select the **Health Monitor.** Assign each Exchange OWA/OA/EAS **Server** to the service group and **Port** 80
  - Same as "Exchange Client Access roles - Outlook Web App"
    *Note: Use the **Name** "Exchange-http" and **Health Monitor** "hm-exchange-http".*

- In the OWA/OA/EAS VIP, select the **Service Group** with HTTP servers and remove the **Server-SSL Template, since the AX will** communicate withthe OWA/OA/EAS servers via HTTP
  - Same as "Exchange Client Access roles - Outlook Web App"
    *Note: Use the **Service Group** "Exchange-http".*

- *Enable SSL offload on Exchange OWA/OA/EAS servers; see* http://social.technet.microsoft.com/wiki/contents/articles/how-to-configure-ssl-offloading-in-exchange-2010.aspx

## 2.14.2 AX Configuration with 1 VIP for OWA + OA + EAS Services Hosted on Different Exchange Servers

### a. Create Exchange Real Servers for Each Service

- Outlook Web app
  - Same as "Exchange Client Access Roles - Outlook Web App"
- Outlook Anywhere
  - Same as "Exchange Client Access Roles - Outlook Anywhere"
- Exchange ActiveSync
  - Same as "Exchange Client Access Roles – Exchange ActiveSync"

### b. Create Exchange Health Check for Each Service

- Outlook Web app
  - Same as “Exchange Client Access Roles - Outlook Web App”
- Outlook Anywhere
  - Same as “Exchange Client Access Roles - Outlook Anywhere”
- Exchange ActiveSync
  - Same as “Exchange Client Access Roles – Exchange ActiveSync”

### c. Create Exchange Service Group

- Outlook Web app
  - Same as “Exchange Client Access Roles - Outlook Web App”
- Outlook Anywhere
  - Same as “Exchange Client Access Roles - Outlook Anywhere”
- Exchange ActiveSync
  - Same as “Exchange Client Access Roles – Exchange ActiveSync”

### d. Create Exchange Persistence

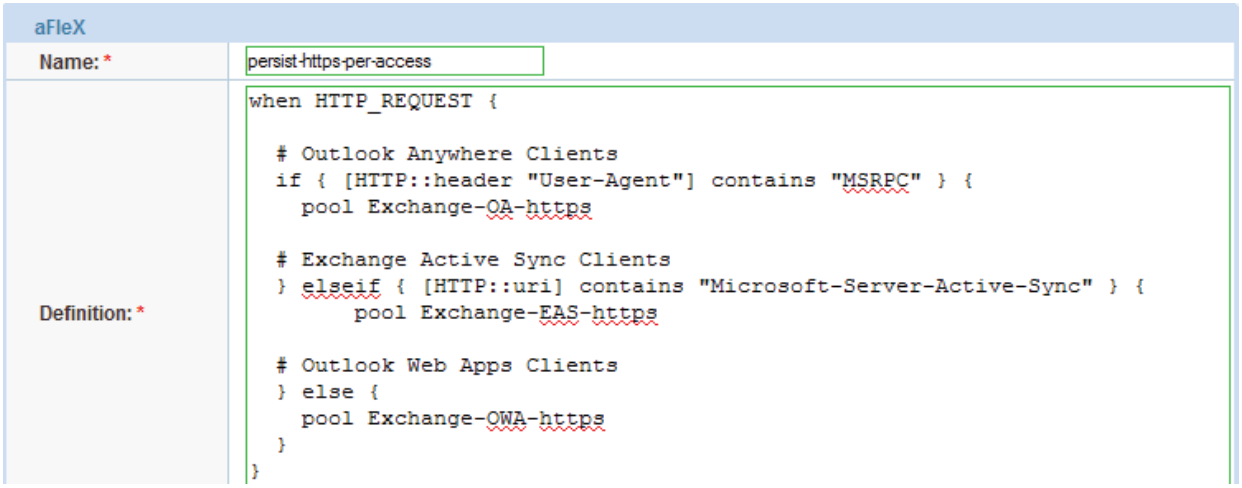
**Each client access (OWA, OA, EAS) must use specific servers:**

aFleX will be used to redirect specific client accesses to their specific Exchange servers.

- Create an aFleX policy to redirect specific clients to their specific service group. The aFleX policy is:

```
when HTTP_REQUEST {
  # Outlook Anywhere Clients
  if { [HTTP::header "User-Agent"] contains "MSRPC" } {
    pool Exchange-OA-https
  # Exchange ActiveSyncActiveSync Clients
  } elseif { [HTTP::uri] contains "Microsoft-Server-Active-Sync" } {
   pool Exchange-EAS-https
  # Outlook Web Apps Clients
  } else {
    pool Exchange-OWA-https
  }
}
```

- Via Web GUI: Config > Service > aFleX




- Via CLI: `AX(config)#import aflex persist-https-per-access tftp://10.0.1.10/persist-https-per-access.txt`

**Server persistence for each client**

*Note: Since this VIP will be accessed by some devices that support cookies and others that do not, we recommend using Source-IP persistence.*

- *Same as "Exchange Client Access roles - Outlook Anywhere"*
  *Note: Use the Source-IP Persistence* ***Name*** *"persist-exchange-https".*
- *To achieve better load distribution across Exchange server using persistence, refer to Appendix A16.*

## e. Import the IIS Server Public Certificate/Private Key onto the AX

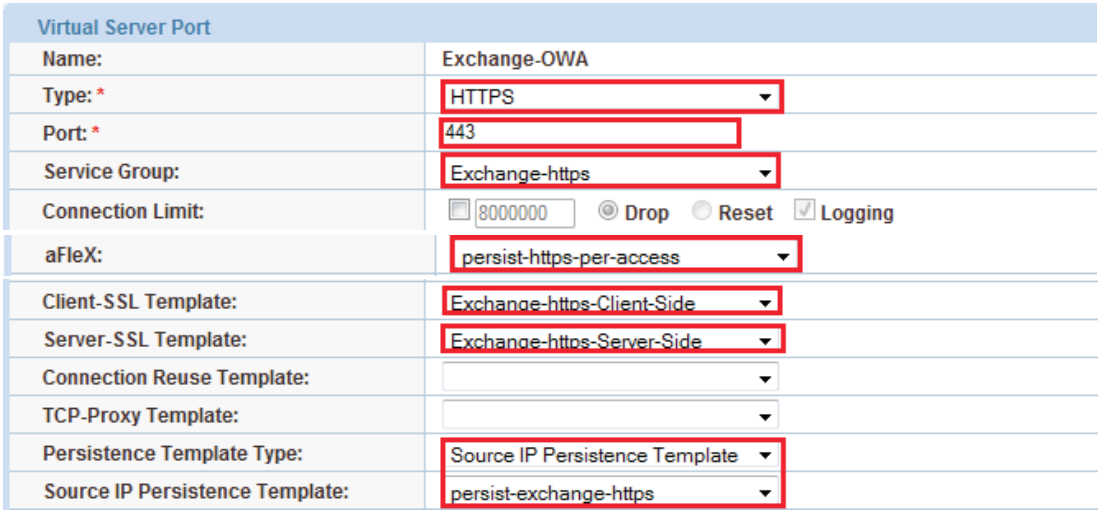
*Note: Since this VIP will be accessed by devices supporting only trusted certificates, you must have a trusted certificate.*

- Same as "Exchange Client Access roles - Outlook Web App"
  *Note: Use the* ***Certificate Name*** *"exchange-https-cert-key",* ***Client-SSL Template Name*** *"exchange-https-Client-Side" and* ***Server-SSL Template Name*** *"exchange-https-Server-Side".*

## f. Create Exchange VIP

- Same as "Exchange Client Access roles - Outlook Anywhere"
  *Note: Use the* ***Name*** *"Exchange", add port* ***Type*** *HTTPS* ***Port*** *443 and select the* ***Service Group*** ***"****Exchange-https",* ***aFleX*** *"persist-https-per-access",* ***Source IP Persistence Template*** *"persist-exchange-https",* ***Client-SSL Template*** *"exchange-https-Client-Side", and* ***Server-SSL template*** *"exchange-https-Server-Side"*

- Via Web GUI: Config Mode > Service > SLB > Virtual Server > Port




- Via CLI:

```
AX(config-slb vserver)#port 443 https
AX(config-slb vserver-vport)#service-group Exchange-https
AX(config-slb vserver-vport)#aflex persist-https-per-access
AX(config-slb vserver-vport)#template client-ssl Exchange-
https-Client-Side
AX(config-slb vserver-vport)#template server-ssl Exchange-
https-Server-Side
AX(config-slb vserver-vport)#template persist source-ip per
sist-exchange-https
```

## g. (Optional) Offload SSL on Exchange Servers

With this option, end users still use HTTPS to connect to their Exchange service, but the AX connects to the Exchange servers via HTTP, offloading SSL from the servers.

- Create the port 80 for each Exchange OWA/OA/EAS real server
  - Outlook Web app
    - Same as “Exchange Client Access Roles - Outlook Web App”
  - Outlook Anywhere
    - Same as “Exchange Client Access Roles - Outlook Anywhere”
  - Exchange ActiveSync
    - Same as “Exchange Client Access Roles – Exchange ActiveSync”

- Create a health monitor template to test the availability of the Exchange OWA/OA/EAS servers. Enter the health monitor template **Name** and select **Type** HTTP with **URL** "GET /"
  - Outlook Web app
    - Same as "Exchange Client Access Roles - Outlook Web App"
  - Outlook Anywhere
    - Same as "Exchange Client Access Roles - Outlook Anywhere"
  - Exchange ActiveSync
    - Same as "Exchange Client Access Roles – Exchange ActiveSync"

- Create a TCP service group with Exchange OWA/OA/EAS servers. Enter a **Name** for the service group, select TCP from the **Type** drop-down list, select the Least Connection load balancing **Algorithm**, and select the **Health Monitor**. Assign each Exchange OWA/OA/EAS **Server** to the service group and **Port** 80
  - Outlook Web app
    - Same as "Exchange Client Access roles - Outlook Web App"
  - Outlook Anywhere
    - Same as "Exchange Client Access roles - Outlook Anywhere"
  - Exchange ActiveSync
    - Same as "Exchange Client Access roles – Exchange ActiveSync"

- Update the aFleX "persist-https-per-access" with the new pools of servers "Exchange-OWA-http", "Exchange-OA-http", and "Exchange-EAS-http"

- In the OWA/OA/EAS VIP, select the **Service Group** with HTTP servers, and remove the **Server-SSL Template** to communicate to the OWA/OA/EAS servers via HTTP
  - Same as "Exchange Client Access roles - Outlook Web App"
    *Note: Use the **Service Group** "Exchange-http".*

- Enable SSL offload on Exchange OWA/OA/EAS servers; see http://social.technet.microsoft.com/wiki/contents/articles/how-to-configure-ssl-offloading-in-exchange-2010.aspx

### 2.14.3 Configuration Validation

## a. Validate AX deployment for Exchange without SSL offload

- Validate Exchange Outlook Web App
  - Same as “Exchange Client Access roles - Outlook Web App”
- Validate Exchange Control Panel
  - Same as “Exchange Client Access roles - Exchange Control Panel”
- Validate Exchange Outlook Anywhere
  - Same as “Exchange Client Access roles - Outlook Anywhere”
- Validate Exchange ActiveSync
  - Same as “Exchange Client Access roles - ActiveSync”

## b. Validate AX deployment for Exchange with SSL offload

- Validate Exchange Outlook Web App
  - Same as “Exchange Client Access roles - Outlook Web App”
- Validate Exchange Control Panel
  - Same as “Exchange Client Access roles - Exchange Control Panel”
- Validate Exchange Outlook Anywhere
  - Same as “Exchange Client Access roles - Outlook Anywhere”
- Validate Exchange ActiveSync
  - Same as “Exchange Client Access roles - ActiveSync”

# 3. Summary and Conclusion

The AX Series Advanced Traffic Manager enhances Microsoft Exchange service by providing:

- Higher Scalability – enterprises can provide Exchange services to a very high number of employees, load balancing them among multiple Exchange servers in parallel
- High Availability – Exchange services are guaranteed even if an Exchange Server goes offline
- Higher Performance – end users access their Exchange services faster thanks to multiple Exchange server optimizations; for example, compression and SSL offload
- Higher Security – protects services from DDoS attacks
- More Deployment flexibility – different Exchange services can be accessible via the same public VIP

For more information about AX Series products, please refer to:
http://a10networks.com/products/axseries.php
http://a10networks.com/resources/solutionsheets.php
http://a10networks.com/resources/casestudies.php

# A. Appendix - AX configuration

## A.1. Exchange Client Access Role – Outlook Web App

Note: The configuration below is with the following options:

- HTTP Compression
- SSL offload
- Transparent Redirect HTTP Clients to HTTPS
- Transparently add "/owa" to the requests that are without it

```
slb server Exchange1 10.0.2.161
   port 80  tcp
!
slb server Exchange2 10.0.2.162
   port 80  tcp
!
health monitor hm-owa-http
 method http
!
slb service-group Exchange-OWA-http tcp
    method least-connection
    health-check hm-owa-http
    member Exchange1:80
    member Exchange2:80
!
slb template client-ssl OWA-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb template persist cookie persist-owa
!
slb template http tp-compress
   compression enable
!
slb template http tp-redirect-owa-https
   failover-url https://OWA-cert-key/owa
!
slb virtual-server Exchange-OWA 10.0.1.74
   port 443  https
      service-group Exchange-OWA-http
      template http tp-compress
```

```
      template client-ssl OWA-Client-Side
      template persist cookie persist-owa
      aflex insert_owa
   port 80  http
      template http tp-redirect-owa-https
!
```

## A.2. Exchange Client Access Role – Exchange Control Panel

Note: The configuration below is with the following options:

- HTTP Compression
- SSL offload
- Transparent Redirect HTTP Clients to HTTPS

```
slb server Exchange1 10.0.2.161
   port 80  tcp
!
slb server Exchange2 10.0.2.162
   port 80  tcp
!
health monitor hm-owa-http
 method http
!
slb service-group Exchange-OWA-http tcp
    method least-connection
    health-check hm-owa-http
    member Exchange1:80
    member Exchange2:80
!
slb template client-ssl OWA-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb template persist cookie persist-owa
!
slb template http tp-compress
   compression enable
!
slb template http tp-redirect-owa-https
   failover-url https://OWA-cert-key/owa
```

```
!
slb virtual-server Exchange-OWA 10.0.1.74
   port 443  https
      service-group Exchange-OWA-http
      template http tp-compress
      template client-ssl OWA-Client-Side
      template persist cookie persist-owa
   port 80  http
      template http tp-redirect-owa-https
!
```

## A.3. Exchange Client Access Role – Outlook Anywhere

Note: The configuration below is with the following options:

- SSL offload
- aFleX uie persistence

```
slb server Exchange1 10.0.2.161
   port 80  tcp
!
slb server Exchange2 10.0.2.162
   port 80  tcp
!
health monitor hm-oa-http
 method http
!
slb service-group Exchange-OA-http tcp
    health-check hm-oa-http
    member Exchange1:80
    member Exchange2:80
!
slb template client-ssl OA-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb virtual-server Exchange-OA 10.0.1.75
   port 443  https
      service-group Exchange-OA-http
      template client-ssl OA-Client-Side
      afleX persist-oa
!
```

## A.4. Exchange Client Access Role – Exchange ActiveSync

Note: The configuration below is with the following options:

- SSL offload
- aFleX uie persistence

```
slb server Exchange1 10.0.2.161
   port 80  tcp
!
slb server Exchange2 10.0.2.162
   port 80  tcp
!
health monitor hm-eas-http
 method http
!
slb service-group Exchange-EAS-http tcp
    method least-connection
    health-check hm-oa-http
    member Exchange1:80
    member Exchange2:80
!
slb template client-ssl EAS-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb virtual-server Exchange-EAS 10.0.1.76
   port 443  https
      service-group Exchange-EAS-http
      template client-ssl EAS-Client-Side
      aFleX persist-eas
!
```

## A.5. Exchange Client Access Role – RPC

```
slb server Exchange1 10.0.2.161
   port 0  tcp
       no health-check
!
slb server Exchange2 10.0.2.162
   port 0  tcp
       no health-check
!
health monitor hm-rpc-135
 override-port 135
 method tcp port 135
!
slb service-group Exchange-RPC tcp
    health-check hm-rpc-135
    member Exchange1:0
    member Exchange2:0
!
slb template persist source-ip persist-rpc
   match-type server
   timeout 480
!
slb template tcp TCP-Aging-Time-rpc
   idle-timeout 28800
   reset-fwd
   reset-rev

slb virtual-server Exchange-RPC 10.0.1.74
   port 0  tcp
      service-group Exchange-RPC
      template persist source-ip persist-rpc
      template tcp TCP-Aging-Time-rpc
!
```

## A.6. Exchange Client Access Role – POP3

Note: The configuration below is with the following options:

- SSL offload
- POP3 healthcheck

```
slb server Exchange1 10.0.2.161
   port 110  tcp
!
slb server Exchange2 10.0.2.162
   port 110  tcp
!
health monitor hm-pop3
 method pop3 username user1 password a10
!
slb service-group Exchange-POP3 tcp
    method least-connection
    health-check hm-pop3
    member Exchange1:110
    member Exchange2:110
!
slb template client-ssl POP3-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb virtual-server Exchange-POP3S 10.0.1.74
   port 995  ssl-proxy
      service-group Exchange-POP3
      template client-ssl POP3-Client-Side
!
```

## A.7. Exchange Client Access Role – IMAP4

Note: The configuration below is with the following options:

- SSL offload
- IMAP4 healthcheck

```
slb server Exchange1 10.0.2.161
   port 143  tcp
!
slb server Exchange2 10.0.2.162
   port 143  tcp
!
health monitor hm-imap4
 method imap username user1 password a10
!
slb service-group Exchange-IMAP4 tcp
    method least-connection
    health-check hm-imap4
    member Exchange1:143
    member Exchange2:143
!
slb template client-ssl IMAP4-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb virtual-server Exchange-IMAP4S 10.0.1.74
   port 993  ssl-proxy
      service-group Exchange-IMAP4
      template client-ssl IMAP4-Client-Side
!
```

## A.8. Exchange Client Access Role – Exchange Web Services

Note: The configuration below is with the following options:

- HTTP Compression
- SSL offload

```
slb server Exchange1 10.0.2.161
   port 80  tcp
!
slb server Exchange2 10.0.2.162
   port 80  tcp
!
health monitor hm-owa-http
 method http
!
slb service-group Exchange-OWA-http tcp
    method least-connection
    health-check hm-owa-http
    member Exchange1:80
    member Exchange2:80
!
slb template client-ssl OWA-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb template persist cookie persist-owa
!
slb template http tp-compress
   compression enable
!
slb virtual-server Exchange-OWA 10.0.1.74
   port 443  https
      service-group Exchange-OWA-http
      template http tp-compress
      template client-ssl OWA-Client-Side
      template persist cookie persist-owa
!
```

## A.9. Exchange Client Access Role – Autodiscover

Note: The configuration below is with the following options:

- HTTP Compression
- SSL offload

```
slb server Exchange1 10.0.2.161
   port 80  tcp
!
slb server Exchange2 10.0.2.162
   port 80  tcp
!
health monitor hm-owa-http
 method http
!
slb service-group Exchange-OWA-http tcp
    method least-connection
    health-check hm-owa-http
    member Exchange1:80
    member Exchange2:80
!
slb template client-ssl OWA-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb template persist cookie persist-owa
!
slb template http tp-compress
   compression enable
!
slb virtual-server Exchange-OWA 10.0.1.74
   port 443  https
      service-group Exchange-OWA-http
      template http tp-compress
      template client-ssl OWA-Client-Side
      template persist cookie persist-owa
!
```

## A.10. Exchange Client Access Role – Offline Address Book distribution

Note:

- For Web Based distribution: Same as OWA
- For public folder distribution: Same as RPC

## A.11. Exchange Client Access Role – SMTP

Note: The configuration below is with the following options:

- TLS (STARTTLS) offload

```
slb server Exchange1 10.0.2.161
   port 25  tcp
!
slb server Exchange2 10.0.2.162
   port 25  tcp
!
health monitor hm-smtp
 method smtp domain example.com
!
slb service-group Exchange-SMTP tcp
    method least-connection
    health-check hm-smtp
    member Exchange1:25
    member Exchange2:25
!
slb template client-ssl SMTP-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb template smtp STARTTLS-SMTP
   server-domain example.com
   starttls optional
!
slb virtual-server Exchange-SMTP 10.0.1.74
   port 25  smtp
      service-group Exchange-SMTP
      template smtp STARTTLS-SMTP
      template client-ssl SMTP-Client-Side
!
```

## A.12. Exchange Client Access Role – Multiple Exchange Services with a Single VIP (OWA + OA + EAS on same servers)

Note: The configuration below is with the following options:

- SSL offload

```
slb server Exchange1 10.0.2.161
   port 80  tcp
!
slb server Exchange2 10.0.2.162
   port 80  tcp
!
health monitor hm-exchange-http
 method http
!
slb service-group Exchange-http tcp
    health-check hm-exchange-http
    member Exchange1:80
    member Exchange2:80
!
slb template persist source-ip persist-exchange-https
   timeout 30
!
slb template client-ssl exchange-https-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb virtual-server Exchange-HTTPS 10.0.1.74
   port 443  https
      service-group Exchange-http
      template client-ssl exchange-https-Client-Side
      template persist source-ip persist-exchange-https
!
```

## A.13. Exchange Client Access Role – Multiple Exchange Services with a Single VIP (OWA + OA + EAS on different servers)

Note: The configuration below is with the following options:

- SSL offload

```
slb server Exchange1-OWA 10.0.2.161
   port 80  tcp
!
slb server Exchange2-OWA 10.0.2.162
   port 80  tcp
!
slb server Exchange1-OA 10.0.2.163
   port 80  tcp
!
slb server Exchange2-OA 10.0.2.164
   port 80  tcp
!
slb server Exchange1-AS 10.0.2.165
   port 80  tcp
!
slb server Exchange2-AS 10.0.2.166
   port 80  tcp
!
health monitor hm-owa-http
 method http
!
health monitor hm-oa-http
 method http
!
health monitor hm-as-http
 method http
!
slb service-group Exchange-OWA-http tcp
    method least-connection
    health-check hm-owa-http
    member Exchange1-OWA:80
    member Exchange2-OWA:80
!
slb service-group Exchange-OA-http tcp
    method least-connection
```

```
    health-check hm-oa-http
    member Exchange1-OA:80
    member Exchange2-OA:80
!
slb service-group Exchange-AS-http tcp
    method least-connection
    health-check hm-as-http
    member Exchange1-AS:80
    member Exchange2-AS:80
!
slb template client-ssl exchange-https-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb template persist source-ip persist-exchange-https
   timeout 30

!slb virtual-server Exchange-HTTPS 10.0.1.74
   port 443  https
      service-group Exchange-OWA-http
      template client-ssl exchange-https-Client-Side
      aflex persist-https-per-access
      template persist source-ip persist-exchange-https
!
```

## A.14. Exchange Client Access Role – Multiple Exchange Services with a Single VIP (OWA + OA + EAS + RPC + SMTP on on same servers)

Note: The configuration below is with the following options:

- • SSL offload
- • TLS (STARTTLS) offload

```
slb server Exchange1 10.0.2.161
   port 80  tcp
   port 25  tcp
   port 0  tcp
       no health-check
!
slb server Exchange2 10.0.2.162
   port 80  tcp
```

```
   port 25  tcp
   port 0  tcp
       no health-check
!
health monitor hm-exchange-http
 method http
!
health monitor hm-smtp
 method smtp domain example.com
!
health monitor hm-rpc-135
 override-port 135
 method tcp port 135
!
slb service-group Exchange-http tcp
    health-check hm-exchange-http
    member Exchange1:80
    member Exchange2:80
!
slb service-group Exchange-SMTP tcp
    method least-connection
    health-check hm-smtp
    member Exchange1:25
    member Exchange2:25
!
slb service-group Exchange-RPC tcp
    health-check hm-rpc-135
    member Exchange1:0
    member Exchange2:0
!
slb template smtp STARTTLS-SMTP
   server-domain example.com
   starttls optional
!
slb template persist source-ip persist-exchange-https
   timeout 30
!
slb template client-ssl exchange-https-Client-Side
   cert OWA-cert-key
```

```
   key OWA-cert-key
!
slb template client-ssl SMTP-Client-Side
   cert OWA-cert-key
   key OWA-cert-key
!
slb template persist source-ip persist-rpc
   match-type server
   timeout 480
!
slb template tcp TCP-Aging-Time-rpc
   idle-timeout 28800
   reset-fwd
   reset-rev

slb virtual-server Exchange-HTTPS 10.0.1.74
   port 0  tcp
      service-group Exchange-RPC
      template persist source-ip persist-rpc
      template tcp TCP-Aging-Time-rpc
   port 25  smtp
      service-group Exchange-SMTP
      template smtp STARTTLS-SMTP
      template client-ssl SMTP-Client-Side
!
   port 443  https
      service-group Exchange-http
      template client-ssl exchange-https-Client-Side
      template persist source-ip persist-exchange-https
```

## A15. aFleX script to block specific services(Optional):

The aFleX script below is an example showing how to block all Exchange services except OWA and OAB distributions.

```
when HTTP_REQUEST {
switch -glob [string tolower [HTTP::uri]] {
  "/owa*" { return }
  "/oab*" { return }
  "/ews*" { drop ; return }
  "/rpc*" { drop ; return }
  "/microsoft-server-activesync*" { drop ; return }
  "/public*" { drop ; return }
  "/rpcwithcert*" { drop ; return }
  "/autodiscover*" { drop ; return }
  "/powershell*" { drop ; return }
}
if { [HTTP::uri] equals "/"} {
HTTP::uri /owa
}

}
```

## A16. aFleX persistence script(Optional):

Some Exchange services can only support cookie persistence. The aFleX script shown below is an example of how to use persistence to achieve better load distribution across Exchange services.

```
when HTTP_REQUEST {
switch -glob [string tolower [HTTP::uri]] {
  "/ews*" { set cookie 1 ; pool CAS-80 ; return }
  "/rpc*" { persist uie [IP::client_addr] ; pool CAS-80 ; return }
  "/microsoft-server-activesync*" { persist uie [IP::client_addr] ;
pool CAS-80 ; return }
  "/owa*" { set cookie 1 ; pool CAS-80 ; return }
  "/oab*" { persist uie [IP::client_addr] ; pool CAS-80 ; return }
  "/public*" { persist uie [IP::client_addr] ; pool CAS-80 ; return }
  "/rpcwithcert*" { persist uie [IP::client_addr] ; pool CAS-80 ; re-
turn }
  "/autodiscover*" { persist uie [IP::client_addr] ; pool CAS-80 ; re-
turn }
  "/powershell*" { persist uie [IP::client_addr] ; pool CAS-80; return
}
}
if { not([HTTP::uri] starts_with "/owa")} {
HTTP::uri /owa[HTTP::uri]
set cookie 1
pool CAS-80
}
}

when HTTP_RESPONSE {
if { not($cookie == 1) } {
persist add uie [IP::client_addr] 1800
}
}
```