

Deploying Array Networks APV Series Application Delivery Controllers for Microsoft Lync Server 2013

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1 Introduction

This guide provides information and instructions about configuring Array Networks APV Series application delivery controllers with Microsoft Lync server 2013.

Microsoft has been focused on a vision of providing an integrated software suite that allows users to communicate and collaborate in new and innovative ways. Lync Server 2013 represents the latest iteration in the product line that has been designed to fulfill that vision. As an alternative to traditional voice-only systems such as Private Branch Exchanges (PBX), Lync Server instead offers a software-based infrastructure that combines voice, video, instant messaging, conferencing, and collaboration managed from a single interface. The end result is a unified communications system that can easily adapt to the changing needs of an organization and can be extended to provide new functionality as it becomes available.

Compared to Lync 2010, there are no significant changes within the network topology.

1.1 Lync Server Roles

Standard Edition Server

- The Standard Edition of Lync Server provides a relatively simple way for small to medium sized organizations to introduce unified communications into a network. It enables many of the features of Lync Server but does not provide a true high-availability solution.

Enterprise Edition Server

- The Enterprise Edition of Lync Server provides a scalability jump compared to the Standard Edition, and provides additional high-availability options. The increase in scalability results from the separating of roles onto separate systems for better performance. A typical Enterprise Edition deployment at a given site consists of at least two Front End servers, with hardware load balancers used to distribute the load between the systems.

Front-End Server and Back-End Server

- In Lync Server Enterprise Edition, the Front End Server is the core server role, and runs many basic Lync Server functions. The Front End Server, along with the Back End Servers, are the only server roles required to be in any Lync Server Enterprise Edition deployment.
- A Front End pool is a set of Front End Servers, configured identically, that work together to provide services for a common group of users. A pool of multiple servers running the same role provides scalability and failover capability.
- The Front End Server includes the following:
 - User authentication and registration
 - Presence information and contact card exchange

- Address book services and distribution list expansion
- Instant Messaging (IM) functionality, including multiparty IM conferences
- Web conferencing, Public Switched Telephone Network (PSTN) dial-in conferencing and audio/video (A/V) conferencing (if deployed)
- Application hosting, for both applications included with Lync Server (for example, Conferencing Attendant and Response Group application), and third-party applications
- Optionally, monitoring, to collect usage information in the form of call detail records (CDRs) and call error records (CERs). This information provides metrics about the quality of the media (audio and video) traversing your network for both enterprise voice calls and A/V conferences.
- Web components to supported Web-based tasks such as Web scheduler and join launcher.
- Optionally, archiving, to archive IM communications and meeting content for compliance reasons. For details, see Planning for Archiving in the Microsoft Planning documentation.

Additionally, one Front End pool in the deployment also runs the Central Management Server, which manages and deploys basic configuration data to all servers running Lync Server. The Central Management Server also provides Lync Server Management Shell and file transfer capabilities.

The Back End Servers are database servers running Microsoft SQL Server that provide the database services for the Front End pool. The Back End Servers serve as backup stores for the pool's user and conference data, and are the primary stores for other databases such as the Response Group database. You can have a single Back End Server, but a solution that uses SQL Server mirroring is recommended for failover. Back End Servers do not run any Lync Server software.

Edge Server

Edge Server enables your users to communicate and collaborate with users outside the organization's firewalls. These external users can include the organization's own users who are currently working offsite, users from federated partner organizations, and outside users who have been invited to join conferences hosted on your Lync Server deployment. Edge Server also enables connectivity to public IM connectivity services, including Windows Live, AOL, Yahoo!, and Google Talk.

Deploying Edge Server also enables mobility services, which supports Lync functionality on mobile devices. Users can use supported Apple iOS, Android, Windows Phone, or Nokia mobile devices to perform activities such as sending and receiving instant messages, viewing contacts, and viewing presence. In addition, mobile devices support some Enterprise Voice features, such as click to join a conference, Call via Work, single number reach, voice mail, and missed calls. The mobility feature also supports push notifications for mobile devices that do not support

applications running in the background. A push notification is a notification that is sent to a mobile device about an event that occurs while a mobile application is inactive.

Edge Servers also include a fully-integrated Extensible Messaging and Presence Protocol (XMPP) proxy, with an XMPP gateway included on Front End Servers. You can configure these XMPP components to enable your Lync Server 2013 users to add contacts from XMPP-based partners (such as Google Talk) for instant messaging and presence.

1.3 Array Networks APV/vAPV Series

The real-time nature of services provided by Microsoft Lync Server 2013, combined with the business-critical status of the underlying software applications, requires high reliability for IT Department implementing Microsoft Lync Server 2013. Array Networks APV Series Application Delivery Controllers provide a strategic point of control for optimizing the availability, security and performance of enterprise applications, IP data services and data center equipment. Leveraging robust and powerful distribution algorithms, health check mechanisms and failover capabilities, Array Networks APV Series maintains connections, ensures persistence, directs traffic away from failed data centers, and intelligently distributes application services between multiple nodes and locations for optimized performance and availability.

Array Networks APV Series ensures that both end users and administrators obtain the optimal user experience by creating a highly available and scalable platform that achieves the highest levels of reliability through network optimization. Unified client applications are more responsive when supported by Array Networks APV Series because application health monitoring, intelligent load balancing, and refined network optimization ensure the most reliable delivery of Microsoft Lync services. Advantages to enterprises supported by Array Networks APV Series include:

Scalability

Enterprises can provide Lync services to a large number of employees, load balancing each client to the most optimal Lync server at any given point of time.

High Availability

Lync services provide guaranteed uptime even if a Lync Server goes offline or into maintenance mode.

High Performance

End users are able to access their Lync applications faster due to multiple Lync server optimizations such as HTTP compression.

Security

Services are protected from malicious traffic such as DDoS attacks.

Flexibility

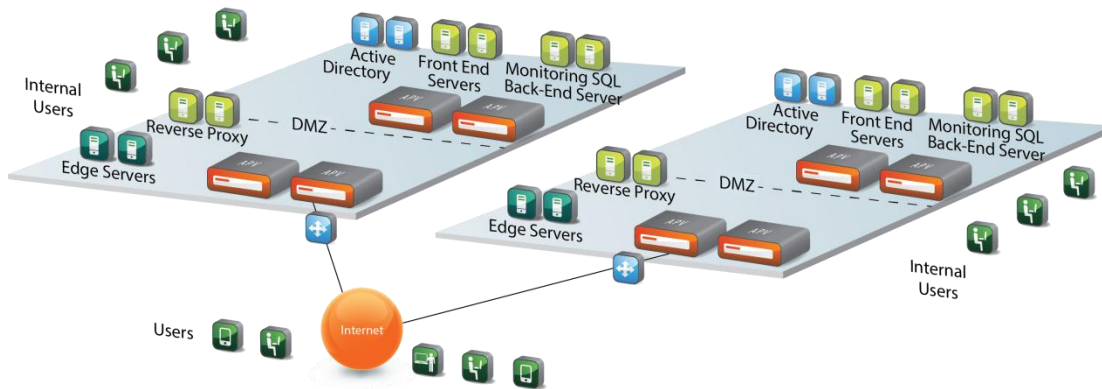
All Lync server accessibility to IM, conferencing, desktop sharing, presence, and voice is optimized with APV Series load balancing, completely transparently to the user.

2 Deployment Overview

2.1 Topology

The Array Networks APV/vAPV Series can be used to add high availability and traffic direction to the Microsoft Lync Server Enterprise Pool.

The following example shows a typical configuration with APV/vAPV Series and Lync Server 2013 deployment.



2.2 Configuration Requirement Tables

Table 1: Internal Front-End Services

| Description | Port | Protocol | Feature Templates |
|--|------|----------|---|
| Used for DCOM-based operations such as moving end-users, end-user replicator synchronization, and address book synchronization | 135 | TCP | SLB algorithm: pi and lc TCP idle timeout:1200 Health check: TCP |
| For communication from front end servers to the Web farm FQDNs, which are the URLs used by IIS web components | 443 | TCP | SLB algorithm: pi and lc Health check: TCP |
| For communication between Lync Server components, which manage the conference status and individual servers | 444 | TCP | SLB algorithm: pi and lc Health check: TCP |
| Front end pools for all internal SIP communications between servers (by MTLs), for SIP communication between server and client (by TLS). | 5061 | TCP | SLB algorithm: pi and lc TCP idle timeout: 1200 Health check: TCP |

Table 2: Optional Internal Front End Services

| Description | Port | Protocol | Feature Templates |
|---|------|----------|---|
| For front end servers for static routes to trusted services | 5060 | TCP | SLB algorithm: pi and lc TCP idle timeout: 1200 Health check: TCP |
| For incoming SIP requests for application sharing | 5065 | TCP | SLB algorithm: pi and lc TCP idle timeout: 1200 Health check: TCP |
| For incoming SIP requests for the response group application. | 5071 | TCP | SLB algorithm: pi and lc TCP idle timeout: 1200 Health check: TCP |
| For incoming SIP requests for Microsoft Lync 2013 attendant (dial-in conferencing). | 5072 | TCP | SLB algorithm: pi and lc TCP idle timeout: 1200 Health check: TCP |
| For incoming SIP requests for Lync Server conferencing announcement service. | 5073 | TCP | SLB algorithm: pi and lc TCP idle timeout: 1200 Health check: TCP |
| For incoming SIP requests for the call park application | 5075 | TCP | SLB algorithm: pi and lc TCP idle timeout: 1200 Health check: TCP |

Table 3: Services for the Internal Edge

| Description | Port | Protocol | Feature Templates |
|--|------|----------|--|
| For communications between the internal edge server farm FQDN that is used by Web components | 443 | TCP | SLB algorithm: pi and lc TCP idle timeout:1200 Health check: TCP |
| Preferred path for media transferring between internal and external users (by UDP). | 3478 | UDP | SLB algorithm: pi and lc Health check: ICMP |

| | | | |
|---|------|-----|--|
| For external ports for SIP/MTLS communications for federation or remote user access | 5061 | TCP | SLB algorithm: pi and lc TCP idle timeout:1200 Health check: TCP |
| For authentication of AV users | 5062 | TCP | SLB algorithm: pi and lc TCP idle timeout:1200 Health check: TCP |
| For outgoing PSOM traffic to the web conferencing server | 8057 | TCP | SLB algorithm: pi and lc TCP idle timeout:1200 Health check: TCP |

Table 4: Services for the External Edge

| Description | Port | Protocol | Feature Templates |
|---|------|----------|---|
| For external ports for SIP/TLS communications for remote user access, accessing all internal media communications | 443 | TCP | SLB algorithm: pi and lc TCP idle timeout:1200 Health check: TCP |
| For external ports for STUN/UDP inbound and outbound media resources | 3478 | UDP | SLB algorithm: pi and lc Health check: ICMP |
| Port for external SIP/MTLS communication for remote user access and federation. | 5061 | TCP | SLB algorithm: pi and lc TCP idle timeout: 1200 Health check: TCP |

Note: Not all list ports are used in common deployments. The ports listed above are based on Microsoft's document "[Ports and protocols for internal servers in Lync Server 2013](#)"

2.3 CLI Config Level of Array Networks APV Series

Two methods are available to configure an APV Series appliance:

- Command Line Interface (CLI) — Text-based interface in which users type commands.

Web User Interface (WebUI) — Web-based interface in which users configure or manage the APV by typing or selecting values on configuration or management pages.

In this guide, the CLI is adopted to describe APV configurations.

The APV provides three levels for global configuration and access to the ArrayOS™ — User, Enable, and Config. Each level is designated by a unique cursor prompt, which consists of the host name of the APV followed by “>”, “#”, or “(config)#”.

To configure the APV or change configurations, you must obtain the Config level.

To obtain the Config level, do as follows:

1. On a PC connected to a network that can access the APV configuration interface, open an SSH connection to the IP address of the management interface.
2. If the user name and password are valid, the command prompt for the User level of the CLI appears:

```
AN>
```

3. Run the `enable` command to obtain the Enable level. At the `enable password:` prompt, simply press "Enter". If the `AN#` prompt appears, the Enable level has been obtained.

```
AN>enable
```

```
Enable password:
```

```
AN#
```

4. Type the `config terminal` command to obtain the Config level. If the `AN(config)#` prompt appears, the Config level has been obtained.

```
AN#config terminal
```

```
AN(config)#
```

3. Configuring APV for Internal Lync Front End Servers

In the following example, we set up two Lync 2013 front end servers. You can add more Lync front-end servers based on your specific situation.

- Lync front end server 1: 10.3.0.42
- Lync front end server 2: 10.3.0.43

3.1 Define Real Services

Table 5: Front End Server 1 Settings

| Real Service | IP Address | Port | Protocol |
|--------------|------------|------|----------|
| FE135_1 | 10.3.0.42 | 135 | TCP |
| FE443_1 | 10.3.0.42 | 443 | TCP |
| FE444_1 | 10.3.0.42 | 444 | TCP |
| FE5060_1 | 10.3.0.42 | 5060 | TCP |
| FE5061_1 | 10.3.0.42 | 5061 | TCP |
| FE5065_1 | 10.3.0.42 | 5065 | TCP |
| FE5071_1 | 10.3.0.42 | 5071 | TCP |
| FE5072_1 | 10.3.0.42 | 5072 | TCP |
| FE5073_1 | 10.3.0.42 | 5073 | TCP |
| FE5075_1 | 10.3.0.42 | 5075 | TCP |

Table 6: Front End Server 2 Settings

| Real Service | IP Address | Port | Protocol |
|--------------|------------|------|----------|
| FE135_2 | 10.3.0.43 | 135 | TCP |
| FE443_2 | 10.3.0.43 | 443 | TCP |
| FE444_2 | 10.3.0.43 | 444 | TCP |

| | | | |
|----------|-----------|------|-----|
| FE5060_2 | 10.3.0.43 | 5060 | TCP |
| FE5061_2 | 10.3.0.43 | 5061 | TCP |
| FE5065_2 | 10.3.0.43 | 5065 | TCP |
| FE5071_2 | 10.3.0.43 | 5071 | TCP |
| FE5072_2 | 10.3.0.43 | 5072 | TCP |
| FE5073_2 | 10.3.0.43 | 5073 | TCP |
| FE5075_2 | 10.3.0.43 | 5075 | TCP |

At the AN(config)# prompt, type:

```

slb real tcp FE135_1 10.3.0.42 135 1000 tcp 3 3
slb real tcp FE443_1 10.3.0.42 443 1000 tcp 3 3
slb real tcp FE444_1 10.3.0.42 444 1000 tcp 3 3
slb real tcp FE5060_1 10.3.0.42 5060 1000 tcp 3 3
slb real tcp FE5061_1 10.3.0.42 5061 1000 tcp 3 3
slb real tcp FE5065_1 10.3.0.42 5065 1000 tcp 3 3
slb real tcp FE5071_1 10.3.0.42 5071 1000 tcp 3 3
slb real tcp FE5072_1 10.3.0.42 5072 1000 tcp 3 3
slb real tcp FE5073_1 10.3.0.42 5073 1000 tcp 3 3
slb real tcp FE5075_1 10.3.0.42 5075 1000 tcp 3 3
slb real tcp FE135_2 10.3.0.43 135 1000 tcp 3 3
slb real tcp FE443_2 10.3.0.43 443 1000 tcp 3 3
slb real tcp FE444_2 10.3.0.43 444 1000 tcp 3 3
slb real tcp FE5060_2 10.3.0.43 5060 1000 tcp 3 3
slb real tcp FE5061_2 10.3.0.43 5061 1000 tcp 3 3
slb real tcp FE5065_2 10.3.0.43 5065 1000 tcp 3 3
slb real tcp FE5071_2 10.3.0.43 5071 1000 tcp 3 3
slb real tcp FE5072_2 10.3.0.43 5072 1000 tcp 3 3
slb real tcp FE5073_2 10.3.0.43 5073 1000 tcp 3 3
slb real tcp FE5075_2 10.3.0.43 5075 1000 tcp 3 3

```

3.2 Define Groups

Table 7: Group Definition

| Group | SLB Algorithm |
|----------|---------------|
| g_FE135 | pi and lc |
| g_FE443 | pi and lc |
| g_FE444 | pi and lc |
| g_FE5060 | pi and lc |
| g_FE5061 | pi and lc |
| g_FE5065 | pi and lc |
| g_FE5071 | pi and lc |
| g_FE5072 | pi and lc |
| g_FE5073 | pi and lc |
| g_FE5075 | pi and lc |

At the AN(config) # prompt, type:

```
slb group method g_FE135 pi 32 lc 10
slb group method g_FE443 pi 32 lc 10
slb group method g_FE444 pi 32 lc 10
slb group method g_FE5060 pi 32 lc 10
slb group method g_FE5061 pi 32 lc 10
slb group method g_FE5065 pi 32 lc 10
slb group method g_FE5071 pi 32 lc 10
slb group method g_FE5072 pi 32 lc 10
slb group method g_FE5073 pi 32 lc 10
slb group method g_FE5075 pi 32 lc 10
```

3.3 Adding Real Services to Defined Groups

Table 8: Group Setting

| Group | Member | |
|----------|-----------|-----------|
| g_FE135 | FE135_1 | FE135_2 |
| g_FE443 | FE443_1 | FE443_2 |
| g_FE444 | FE444_1 | FE444_2 |
| g_FE5060 | FE_5060_1 | FE_5060_2 |
| g_FE5061 | FE_5061_1 | FE_5061_2 |
| g_FE5065 | FE_5065_1 | FE_5065_2 |
| g_FE5071 | FE5071_1 | FE5071_2 |
| g_FE5072 | FE5072_1 | FE5072_2 |
| g_FE5073 | FE5073_1 | FE5073_2 |
| g_FE5075 | FE5075_1 | FE5075_2 |

At the AN(config) # prompt, type:

```
slb group member g_FE135 FE135_1 1 0
slb group member g_FE443 FE443_1 1 0
slb group member g_FE444 FE444_1 1 0
slb group member g_FE5060 FE5060_1 1 0
slb group member g_FE5061 FE5061_1 1 0
slb group member g_FE5065 FE5065_1 1 0
slb group member g_FE5071 FE5071_1 1 0
slb group member g_FE5072 FE5072_1 1 0
slb group member g_FE5073 FE5073_1 1 0
slb group member g_FE5075 FE5075_1 1 0
slb group member g_FE135 FE135_2 1 0
```

```

slb group member g_FE443 FE443_2 1 0
slb group member g_FE444 FE444_2 1 0
slb group member g_FE5060 FE5060_2 1 0
slb group member g_FE5061 FE5061_2 1 0
slb group member g_FE5065 FE5065_2 1 0
slb group member g_FE5071 FE5071_2 1 0
slb group member g_FE5072 FE5072_2 1 0
slb group member g_FE5073 FE5073_2 1 0
slb group member g_FE5075 FE5075_2 1 0

```

3.4 Define Virtual Services

Table 9: Virtual Service Definition

| Virtual Service | Virtual IP Address | Port | Protocol |
|-----------------|--------------------|------|----------|
| v_FE135 | 10.8.6.32 | 135 | TCP |
| v_443 | 10.8.6.32 | 443 | TCP |
| v_444 | 10.8.6.32 | 444 | TCP |
| v_5060 | 10.8.6.32 | 5060 | TCP |
| v_5061 | 10.8.6.32 | 5061 | TCP |
| v_5065 | 10.8.6.32 | 5065 | TCP |
| v_5071_1 | 10.8.6.32 | 5071 | TCP |
| v_5072 | 10.8.6.32 | 5072 | TCP |
| v_5073 | 10.8.6.32 | 5073 | TCP |
| v_5075 | 10.8.6.32 | 5075 | TCP |

At the AN(config)# prompt, type:

```

slb virtual tcp v_FE135 10.8.6.32 135 arp 0
slb virtual tcp v_FE443 10.8.6.32 443 arp 0

```

```

slb virtual tcp v_FE444 10.8.6.32 444 arp 0
slb virtual tcp v_FE5060 10.8.6.32 5060 arp 0
slb virtual tcp v_FE5061 10.8.6.32 5061 arp 0
slb virtual tcp v_FE5065 10.8.6.32 5065 arp 0
slb virtual tcp v_FE5071 10.8.6.32 5071 arp 0
slb virtual tcp v_FE5072 10.8.6.32 5072 arp 0
slb virtual tcp v_FE5073 10.8.6.32 5073 arp 0
slb virtual tcp v_FE5075 10.8.6.32 5075 arp 0

```

3.5 Setting the TCP Idle Timeout of the Virtual Services

Table 10: Virtual Service Setting

| Virtual Service | TCP Idle Timeout |
|-----------------|------------------|
| v_FE135 | 1200 |
| v_443 | 1200 |
| v_444 | 1200 |
| v_5060 | 1200 |
| v_5061 | 1200 |
| v_5065 | 1200 |
| v_5071_1 | 1200 |
| v_5072 | 1200 |
| v_5073 | 1200 |
| v_5075 | 1200 |

At the AN(config)# prompt, type:

```

slb timeout v_FE135 1200
slb timeout v_FE443 1200
slb timeout v_FE444 1200

```

```

slb timeout v_FE5060 1200
slb timeout v_FE5061 1200
slb timeout v_FE5065 1200
slb timeout v_FE5071 1200
slb timeout v_FE5072 1200
slb timeout v_FE5073 1200
slb timeout v_FE5075 1200

```

3.6 Binding Virtual Services to Defined Groups

Table 11: Binding Relationship

| Virtual Service | Group |
|-----------------|----------|
| v_FE135 | g_FE135 |
| v_443 | g_FE443 |
| v_444 | g_FE444 |
| v_5060 | g_FE5060 |
| v_5061 | g_FE5061 |
| v_5065 | g_FE5065 |
| v_5071_1 | g_FE5071 |
| v_5072 | g_FE5072 |
| v_5073 | g_FE5073 |
| v_5075 | g_FE5075 |

At the AN(config)# prompt, type:

```

slb policy default v_FE135 g_FE135
slb policy default v_FE443 g_FE443
slb policy default v_FE444 g_FE444
slb policy default v_FE5060 g_FE5060

```



```
slb policy default v_FE5061 g_FE5061
slb policy default v_FE5065 g_FE5065
slb policy default v_FE5071 g_FE5071
slb policy default v_FE5072 g_FE5072
slb policy default v_FE5073 g_FE5073
slb policy default v_FE5075 g_FE5075
```

4. Configuring APV for Lync Internal Edge Servers

The following sections describe how to configure the APV for Lync internal edge server. For the purposes of this deployment guide, we set up two Lync internal edge servers. You can add more Lync internal edge servers based on your specific situation.

- Lync internal edge server 1 : 10.3.0.39
- Lync internal edge server 2 : 10.3.0.44

4.1 Defining Real Services

Table 12: Internal Edge Server 1 Settings

| Real Service | IP Address | Port | Protocol |
|---------------|------------|------|----------|
| In_edge443_1 | 10.3.0.39 | 443 | TCP |
| In_edge3478_1 | 10.3.0.39 | 3478 | UDP |
| In_edge5061_1 | 10.3.0.39 | 5061 | TCP |
| In_edge5062_1 | 10.3.0.39 | 5062 | TCP |
| In_edge8057_1 | 10.3.0.39 | 8057 | TCP |

Table 13: Internal Edge Server 2 Settings

| Real Service | IP Address | Port | Protocol |
|---------------|------------|------|----------|
| In_edge443_2 | 10.3.0.44 | 443 | TCP |
| In_edge3478_2 | 10.3.0.44 | 3478 | UDP |
| In_edge5061_2 | 10.3.0.44 | 5061 | TCP |
| In_edge5062_2 | 10.3.0.44 | 5062 | TCP |
| In_edge8057_2 | 10.3.0.44 | 8057 | TCP |

At the AN(config)# prompt, type:

```
slb real tcp in_Edge443_1 10.3.0.39 443 1000 tcp 3 3
slb real tcp in_Edge5061_1 10.3.0.39 5061 1000 tcp 3 3
slb real tcp in_Edge5062_1 10.3.0.39 5062 1000 tcp 3 3
```

```

slb real tcp in_Edge8057_1 10.3.0.39 8057 1000 tcp 3 3
slb real tcp in_Edge443_2 10.3.0.44 443 1000 tcp 3 3
slb real tcp in_Edge5061_2 10.3.0.44 5061 1000 tcp 3 3
slb real tcp in_Edge5062_2 10.3.0.44 5062 1000 tcp 3 3
slb real tcp in_Edge8057_2 10.3.0.44 8057 1000 tcp 3 3
slb real udp in_Edge3478_1 10.3.0.39 3478 1000 3 3 60 icmp
slb real udp in_Edge3478_2 10.3.0.44 3478 1000 3 3 60 icmp

```

4.2 Defining Groups

Table 14: Group Definition

| Group | SLB Algorithm |
|----------|---------------|
| g_IN443 | pi and lc |
| g_IN3478 | pi and lc |
| g_IN5061 | pi and lc |
| g_IN5062 | pi and lc |
| g_IN8057 | pi and lc |

At the AN(config)# prompt, type:

```

slb group method g_IN443 pi 32 lc 10
slb group method g_IN3478 pi 32 lc 10
slb group method g_IN5061 pi 32 lc 10
slb group method g_IN5062 pi 32 lc 10
slb group method g_IN8057 pi 32 lc 10

```

4.3 Adding Real Services to Defined Groups

Table 15: Group Settings

| Group | Member | |
|---------|--------------|--------------|
| g_IN443 | in_Edge443_1 | in_Edge443_2 |

| | | |
|----------|---------------|---------------|
| g_IN3478 | in_Edge3478_1 | in_Edge3478_2 |
| g_IN5061 | in_Edge5061_1 | in_Edge5061_2 |
| g_FE5062 | in_Edge5062_1 | in_Edge5062_2 |
| g_IN8057 | in_Edge8057_1 | in_Edge8057_2 |

At the AN(config)# prompt, type:

```
slb group member g_IN443 in_Edge443_1
slb group member g_IN3478 in_Edge3478_1
slb group member g_IN5061 in_Edge5061_1
slb group member g_IN5062 in_Edge5062_1
slb group member g_IN8057 in_Edge8057_1
slb group member g_IN443 in_Edge443_2
slb group member g_IN3478 in_Edge3478_2
slb group member g_IN5061 in_Edge5061_2
slb group member g_IN5062 in_Edge5062_2
slb group member g_IN8057 in_Edge8057_2
```

4.4 Defining Virtual Services

Table 16: Virtual Service Definition

| Virtual Service | Virtual IP Address | Port | Protocol |
|-----------------|--------------------|------|----------|
| v_IN443 | 10.8.6.33 | 443 | TCP |
| v_IN3478 | 10.8.6.33 | 3478 | UDP |
| v_IN5061 | 10.8.6.33 | 5061 | TCP |
| v_IN5062 | 10.8.6.33 | 5062 | TCP |
| V_IN8057 | 10.8.6.33 | 8057 | TCP |

At the AN(config)# prompt, type:

```
slb virtual tcp v_IN443 10.8.6.33 443 arp 0
```

```

slb virtual tcp v_IN5061 10.8.6.33 5061 arp 0
slb virtual tcp v_IN5062 10.8.6.33 5062 arp 0
slb virtual tcp v_IN8057 10.8.6.33 8057 arp 0
slb virtual udp v_IN3478 10.8.6.33 3478 arp 0

```

4.5 Setting the TCP Idle Timeout of the Virtual Services

Table 17: Virtual Service Settings

| Virtual Service | TCP Idle Timeout |
|-----------------|------------------|
| v_IN443 | 1200 |
| v_IN5061 | 1200 |
| v_5062 | 1200 |
| V_IN8057 | 1200 |

At the AN(config)# prompt, type:

```

slb timeout v_IN443 1200
slb timeout v_IN5061 1200
slb timeout v_IN5062 1200
slb timeout v_IN8057 1200

```

4.6 Binding Virtual Services to Defined Groups

Table 18: Binding Relationships

| Virtual Service | Group |
|-----------------|----------|
| v_IN443 | g_IN443 |
| v_IN3478 | g_IN3478 |
| v_IN5061 | g_IN5061 |
| v_IN5062 | g_IN5062 |
| v_IN8057 | g_IN8057 |

At the AN(config)# prompt, type:

```
slb policy default v_IN443 g_IN443
slb policy default v_IN3478 g_IN3478
slb policy default v_IN5061 g_IN5061
slb policy default v_IN5062 g_IN5062
slb policy default v_IN8057 g_IN8057
```

5. Configuring APV for Lync External Edge Server

The following sections describe how to configure the APV for Lync external edge server. For this example, we set up 2 Lync external edge servers. You can add more Lync external edge servers based on your specific situation.

- Lync external edge server 1 : 10.8.0.241
- Lync external edge server2 : 10.8.0.242

5.1 Define Real Services

Table 19: External Edge Server 1 Settings

| Real Service | IP Address | Port | Protocol |
|---------------|------------|------|----------|
| ex_edge443_1 | 10.8.0.241 | 443 | TCP |
| ex_edge3478_1 | 10.8.0.241 | 3478 | UDP |
| ex_edge5061_1 | 10.8.0.241 | 5061 | TCP |

Table 20: External Edge Server 2 Settings

| Real Service | IP Address | Port | Protocol |
|---------------|------------|------|----------|
| ex_edge443_2 | 10.8.0.242 | 443 | TCP |
| ex_edge3478_2 | 10.8.0.242 | 3478 | UDP |
| ex_edge5061_2 | 10.8.0.242 | 5061 | TCP |

At the AN(config)# prompt, type:

```
slb real tcp ex_Edge443_1 10.8.0.241 443 1000 tcp 3 3
slb real tcp ex_Edge5061_1 10.8.0.241 5061 1000 tcp 3 3
slb real tcp ex_Edge443_2 10.8.0.242 443 1000 tcp 3 3
slb real tcp ex_Edge5061_2 10.8.0.242 5061 1000 tcp 3 3
slb real udp ex_Edge3478_1 10.8.0.241 3478 1000 3 3 60 icmp
slb real udp ex_Edge3478_2 10.8.0.242 3478 1000 3 3 60 icmp
```

5.2 Define Groups

Table 21: Group Definition

| Group | SLB Algorithm |
|----------|---------------|
| g_EX443 | pi and lc |
| g_EX3478 | pi and lc |
| g_EX5061 | pi and lc |

At the AN(config) # prompt, type:

```
slb group method g_EX443 pi 32 lc 10
slb group method g_EX3478 pi 32 lc 10
slb group method g_EX5061 pi 32 lc 10
```

5.3 Adding Real Services to Defined Groups

Table 22: Group Settings

| Group | Member | |
|----------|---------------|---------------|
| g_EX443 | ex_Edge443_1 | ex_Edge443_2 |
| g_EX3478 | ex_Edge3478_1 | ex_Edge3478_2 |
| G_EX5061 | ex_Edge5061_1 | ex_Edge5061_2 |

At the AN(config) # prompt, type:

```
slb group member g_EX443 ex_Edge443_1
slb group member g_EX3478 ex_Edge3478_1
slb group member g_EX5061 ex_Edge5061_1
slb group member g_EX443 ex_Edge443_2
slb group member g_EX3478 ex_Edge3478_2
slb group member g_EX5061 ex_Edge5061_2
```


5.4 Defining Virtual Services

Table 23: Virtual Service Definition

| Virtual Service | Virtual IP Address | Port | Protocol |
|-----------------|--------------------|------|----------|
| v_EX443 | 10.8.6.34 | 443 | TCP |
| v_EX3478 | 10.8.6.34 | 3478 | UDP |
| v_EX5061 | 10.8.6.34 | 5061 | TCP |

At the AN(config)# prompt, type:

```
slb virtual tcp v_EX443 10.8.6.34 443 arp 0
slb virtual tcp v_EX5061 10.8.6.34 5061 arp 0
slb virtual udp v_EX3478 10.8.6.34 3478 arp 0
```

5.5 Setting the TCP Idle Timeout of the Virtual Services

Table 24: Virtual Service Setting

| Virtual Service | TCP Idle Timeout |
|-----------------|------------------|
| v_EX443 | 1200 |
| v_IN5061 | 1200 |

At the AN(config)# prompt, type:

```
slb timeout v_EX443 1200
slb timeout v_EX5061 1200
```

5.6 Binding Virtual Services to Defined Groups

Table 25: Binding Relationship

| Virtual Service | Group |
|-----------------|----------|
| v_EX443 | g_EX443 |
| v_EX3478 | g_EX3478 |
| v_EX5061 | g_EX5061 |

At the AN(config)# prompt, type:

```
slb policy default v_EX443 g_EX443
```

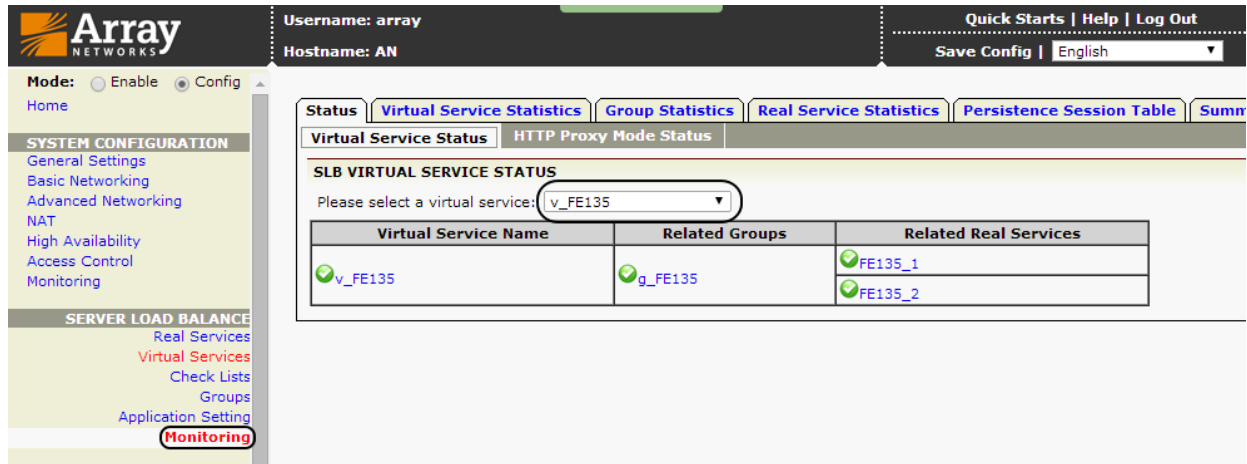
```
slb policy default v_EX3478 g_EX3478
```

```
slb policy default v_EX5061 g_EX5061
```

6. Deployment Validation and monitoring

To validate that the configuration is functioning correctly, do the following.

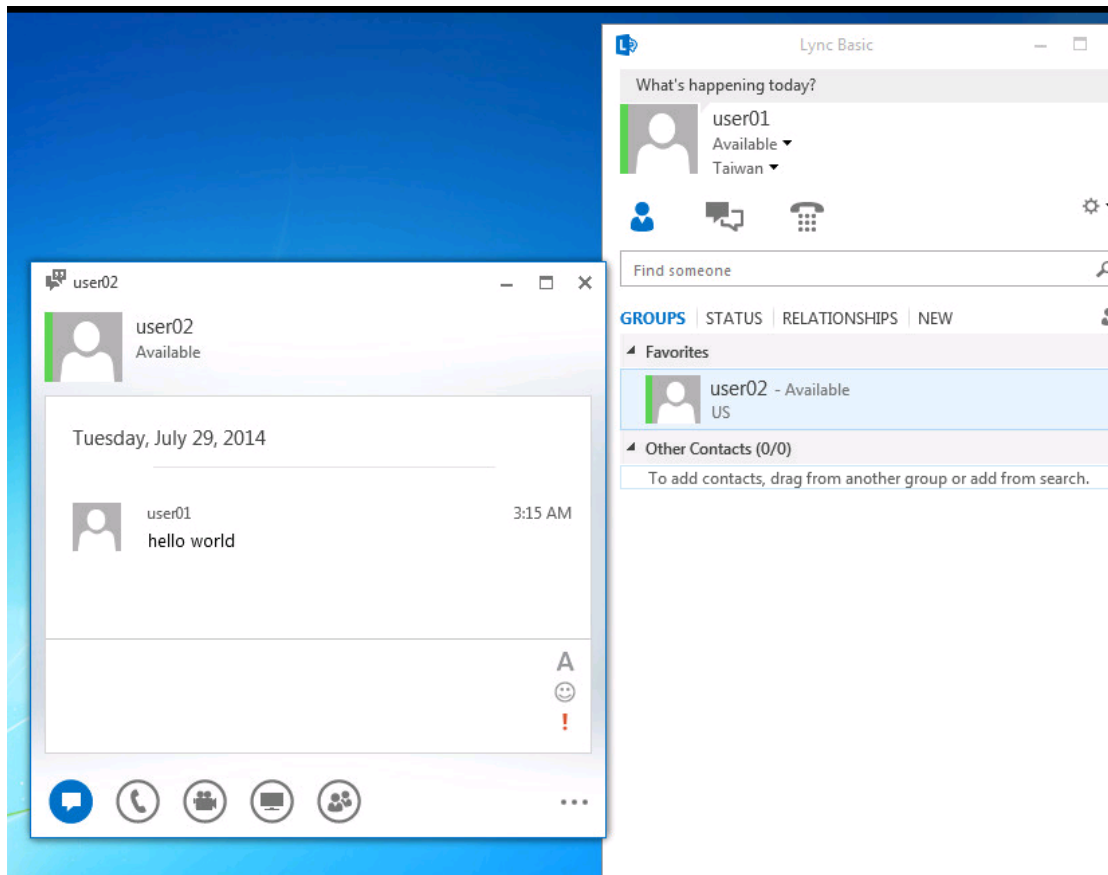
1. Open a Web browser and navigate to the APV. For example : https://my_apv_IP:8888
2. You can monitor your virtual and real services by selecting virtual service.



The screenshot shows the Array Networks management interface. The top navigation bar includes the Array Networks logo, a username field (array), a hostname field (AN), and links for Quick Starts, Help, and Log Out. Below the navigation bar, there are tabs for Status, Virtual Service Statistics, Group Statistics, Real Service Statistics, Persistence Session Table, and Summary. The Virtual Service Statistics tab is active, displaying the SLB Virtual Service Status page. A dropdown menu is set to v_FE135. Below the dropdown is a table with three columns: Virtual Service Name, Related Groups, and Related Real Services. The table contains one row with a green checkmark in the first column, v_FE135 in the second, and FE135_1 and FE135_2 in the third.

| Virtual Service Name | Related Groups | Related Real Services |
|----------------------|----------------|------------------------|
| ✓ v_FE135 | ✓ g_FE135 | ✓ FE135_1 ✓ FE135_2 |

3. Check your Lync client access status and make sure you can successfully communicate.



The screenshot shows the Lync Basic client interface. The main window displays a chat conversation with user02. The chat history shows a message from user01: "hello world" at 3:15 AM on Tuesday, July 29, 2014. The contact list on the right shows user01 as Available in Taiwan and user02 as Available in US. The interface includes a search bar, a "Find someone" button, and a "To add contacts, drag from another group or add from search." message.

7. Summary

The preceding sections describe how to configure APV Series appliances for Microsoft Lync Server 2013. APV Application Delivery Controllers deliver all required application delivery functions for optimizing Microsoft Lync Server 2013 environments in a single and easy-to-manage appliance.

For more information about Array Networks APV Series, please visit:
<http://www.arraynetworks.com>

About Array Networks

Array Networks is a global leader in application delivery networking with over 5000 worldwide customer deployments. Powered by award-winning SpeedCore software, Array application delivery, WAN optimization and secure access solutions are recognized by leading enterprise, service provider and public sector organizations for unmatched performance and total value of ownership. Array is headquartered in Silicon Valley, is backed by over 300 employees worldwide and is a profitable company with strong investors, management and revenue growth. Poised to capitalize on explosive growth in the areas of mobile and cloud computing, analysts and thought leaders including Deloitte, IDC and Frost & Sullivan have recognized Array Networks for its technical innovation, operational excellence and market opportunity.



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