Appendix A. Firewall and Network Address Translations (NAT) Deployments

NAT INTRODUCTION

The VidyoConferencing platform utilizes reflexive addressing to assist in the setup of Vidyo calls. Reflexive addressing is used when the end user is using VidyoDesktop to make a call from behind a NAT. This happens automatically and is transparent to the user.

Reflexive addressing requires the VidyoRouter to have a public IP address in order to provide NAT traversal of the Vidyo endpoints. So if the VidyoRouter itself is placed behind a NAT, reflexive addressing won't work.

When the VidyoRouter is behind a NAT, the preferred configuration uses DNS to resolve properly to the server IP addresses. In some cases, a combination of the ICE and STUN protocols are used to determine the Public IP translated to the VidyoRouter. This appendix outlines how to configure the VidyoConferencing system to work when placed behind a NAT and still allow users to connect from the public Internet.

There are three basic areas that need to be addressed in order to configure the VidyoConferencing system to operate from behind a NAT. Each is explained in detail in the following sections.

- Firewall and NAT Configuration
- DNS configuration
- Vidyo Server configurations

There are several options to deploy the VidyoConferencing system in order to provide service for your entire organization:

1. Place the VidyoPortal and VidyoRouter on a public Static IP address.
2. Place the VidyoPortal and VidyoRouter in a private network having a private Static IP address within the organization.
3. Place the VidyoPortal and VidyoRouter within the DMZ with a private Static IP address.

When deployed with a public IP address and no server side firewall or NAT, the VidyoPortal and VidyoRouter are reachable by either IP address or DNS name. This is the simplest scenario, since we're only concerned with the NAT and firewall at the far-end (client side).

Generally speaking, the client-side firewall most often permits any connection initiated on the Private LAN to any outside network destination. In some cases, the local firewalls must be configured to allow each application from the inside to the Public Network.

VIDYOCONFERENCING FIREWALL PORTS

VidyoDesktop and VidyoRoom Requirements

To register to the VidyoPortal and place calls, the client side connection must be open to the VidyoPortal on these TCP and UDP ports:

VidyoDesktop and VidyoRoom Connectivity to VidyoPortal and VidyoRouter		
TCP Port 80	HTTP – Outbound to VidyoPortal	Client to VidyoPortal authentication and GUI
TCP Port 443	HTTPS – Outbound to VidyoPortal (optional)	Optional for SSL connection to VidyoPortal
TCP Port 17992	EMCP – Outbound to VidyoPortal	Client connection to VidyoManager
TCP Port 17990	SCIP – Outbound to VidyoPortal/ VidyoRouter **Note**: If you are using a standalone VidyoRouter, the VidyoPortal does not apply.	Client connection to VidyoRouter
UDP Ports 50,000 – 65,535	RTP, sRTP, RTCP – Bi-Directional to and from the VidyoRouter	Audio and Video Media from participants (6 ports per participant). RTP and RTCP pair for each audio, video, and data collaboration stream.
UDP Timeout	General Comment	Change from Default (0:02:00 – 2 minutes) to something larger (e.g., 3:00:00 – 3 hours) to avoid call timeouts

Note:

- Some Firewalls have a UDP default timeout. On the Cisco PIX Firewall, for example, if the UDP timeout is not changed, then the call drops in exactly two minutes and the Vidyo client or clients must reconnect.
- The VidyoPortal also has an embedded VidyoRouter running on the same appliance. It’s possible for them to share the same IP address.
- Many newer consumer home firewalls have SPI (Stateful Packet Inspection) active by default. This may need to be disabled for better performance.
- For VidyoConferencing clients, who are behind restricted firewalls where the ports above cannot be opened, Vidyo provides the VidyoProxy to address these users. For more information, see “VidyoProxy” on page 273.

Vidyo Server Requirements

To enable remote management access to the Vidyo servers, the following TCP and UDP ports need to be opened through any server-side firewall or NAT:

Management Access to VidyoPortal, VidyoRouter, VidyoManager and VidyoGateway		
TCP Port 80	HTTP – Inbound to Server	Web Access to VidyoPortal and VidyoRouter
TCP Port 443	HTTPS – Inbound to Server (optional)	Secure Web Access to VidyoPortal and VidyoRouter
TCP Port 2222	SSH – Inbound to Server	SSH access to the VidyoPortal and VidyoRouter

The following services outline the ports required for Vidyo Cloud cascading.

Vidyo Cloud Connectivity to VidyoPortal and VidyoRouter to VidyoRouter		
TCP Port 80	HTTP – Router to VidyoPortal	Client to VidyoPortal authentication and GUI
TCP Port 443	HTTPS – Router to VidyoPortal (optional)	Optional for SSL connection to VidyoPortal
TCP Port 17991	RMCP – Router to VidyoPortal	Router connection to VidyoManager
TCP Port 17990	SCIP – Bi-Directional to and from VidyoRouters	Signaling connections between VidyoRouters
UDP Ports 50,000 – 65,535	RTP, sRTP, RTCP – Bi-Directional to and from VidyoRouters	▪ Audio and Video Media from participants (6 ports per participant) ▪ RTP and RTCP pair for each audio, video, and data collaboration stream

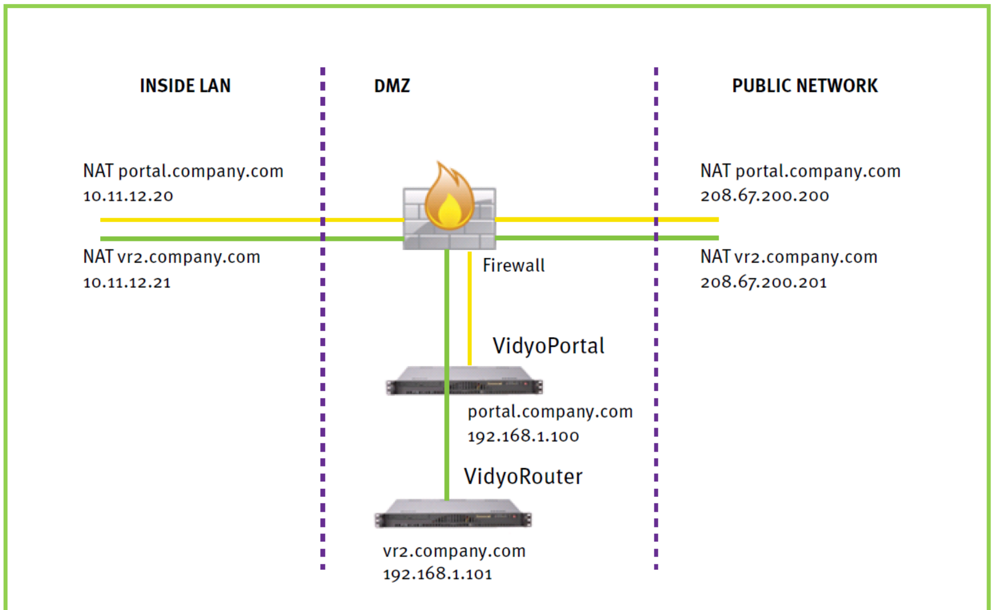
The following services are optional on the VidyoPortal, VidyoRouter and VidyoGateway, and require the following TCP and UDP ports if they are used:

Other Services on VidyoPortal, VidyoRouter and VidyoGateway		
UDP Port 123	NTP – Outbound from Server	Network Time Protocol

Other Services on VidyoPortal, VidyoRouter and VidyoGateway		
TCP Port 25	SMTP – Outbound from Server	Email notifications for new user accounts, lost passwords, and licensing notifications. VidyoPortal only
TCP Port 3306	MySQL – Inbound to Server	Call Detail Record (CDR) access for billing systems. VidyoPortal only
TCP Port 389	LDAP – Outbound from Server	Optional authentication to LDAP and Active Directory.
TCP Port 636	LDAPS – Outbound from Server	Secure LDAP. Optional authentication to LDAP and Active Directory
UDP Port 161 – 162	SNMP – Inbound to Server	Basic SNMP functions
TCP and UDP 3478	STUN – Bi-directional to and from Server	Optional, only if using STUN for NAT traversal

CONFIGURING VIDYOCONFERENCING WITH A FIREWALL NAT

In this section, we’ll discuss the steps to configure the VidyoPortal and VidyoRouter in a NATed firewall or DMZ environment. For this, the Vidyo servers are installed either fully behind a firewall on the corporate LAN, or installed in the firewall DMZ with one or more NATed addresses and Static IP address. The figure below illustrates an example of firewall NAT topologies.



Example Dual Firewall/NAT Deployment

Note: This appendix doesn't apply to deployments using a VidyoProxy. Separate instructions are available for use with a VidyoProxy. The two deployment scenarios can coexist.

For this configuration, there are three tasks to accomplish:

1. Firewall NAT Configuration
2. DNS configuration
3. Vidyo Server configurations

Note: Actual steps to configure the Firewall NAT and DNS environments are outside the scope of this appendix, and vary based on the Firewall NAT and DNS servers used. This appendix focuses on conceptual information.

Configuring the Firewall NAT

Allocate an external, public static IP address to use for the VidyoPortal and VidyoRouters and configure a one-to-one NAT statement to the desired private or DMZ static IP address. In cases where the internal network is NATed to the DMZ, a similar static NAT must be configured from the static private LAN to the Static DMZ server addresses.

With the NAT configured, you'll need to permit access to the TCP and UDP ports needed by the Vidyo solution. In the firewall access-control list, be sure to open these ports as a minimum:

- Inbound TCP Port 80 – web access to the VidyoPortal and administrative interfaces
- Inbound TCP Port 443 – optional for SSL secured web access and calls
- Inbound TCP Port 17992 – EMCP protocol client connection to VidyoManager and VidyoPortal (configurable)
- Inbound TCP Port 17990 – SCIP protocol client connection to VidyoRouter (configurable)
- Bi-Directional UDP Port 50000 – 65535 – RTP and SRTP media, one RTP and RTCP port pair for each audio, video, data sharing stream in the conference

Lastly, it's beneficial to check the UDP timeout for the firewall. Some firewalls limit the duration of UDP port openings, and this may cause the calls to terminate prematurely.

Configuring DNS and FQDN

For the firewall NAT traversal to properly communicate between servers and clients through the IP address translations, DNS must be configured properly for hosting the Vidyo servers in the DMZ or behind the NAT. In firewall deployments, Vidyo communicates based on DNS information rather than exposing IP addresses.

The DNS servers for both inside and outside networks (if different) must be configured for the Vidyo server's Fully Qualified Domain Name – FQDN. In our example, we are assuming the server is using the FQDN of yourportal.yourcompany.com.

Configure both public and private DNS records for the server FQDN. Regardless where the client resides, it needs to match the same hostname to the proper IP address, public Internet clients resolve to the outside NAT address, and internal WAN clients resolve to the inside IP address (either real IP or NAT inside address if double NAT is used) when they access the server URL. To test, from both the inside and outside subnets, ping to the server URL.

Configuring the VidyoServer

With the firewall configured for the proper NAT statements, the required TCP and UDP ports opened, and the DNS entries configured, you can move on to the configuration in the Vidyo servers to enable using DNS and to route calls properly between the LAN and Public Network.

This is done by selecting System Console menu option `2. Configure DNS Nameserver`. For more information, see "Configuring the Network Settings at the System Console" on page 24.

Note:

- When configuring your DNS Nameserver, set the server local hostname and domain name as well as the working DNS server address.
- It's very important to note that the IP address shown in the System Console (127.0.1.1) must remain intact for proper communications.
- In a firewalled installation, the VidyoManager and VidyoRouters need to be configured to use the server FQDN instead of the IP addresses.

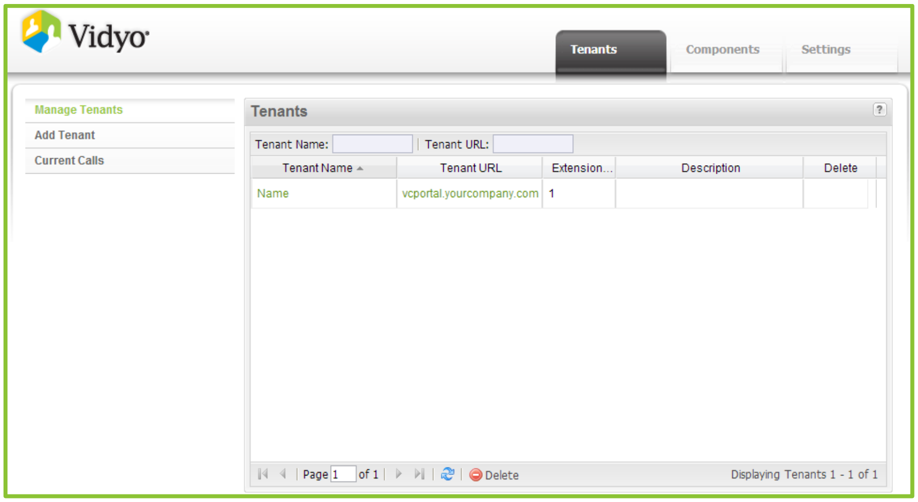
Configuring Tenant URLs

1. Log in to the Super Admin portal using your Super Admin account.

   For more information, see "Logging in to the Super Admin Portal" on page 33.

2. Click the **Tenants** tab.

3. Select **Manage Tenants**.



Tenant Name: Tenant URL:

Tenant Name	Tenant URL	Extension...	Description	Delete
Name	vcportal.yourcompany.com	1		

Displaying Tenants 1 - 1 of 1

4. Ensure that each Tenant (including the Default Tenant) is using a FQDN for Tenant URL.