OnSSI

White paper

Using NAT with Ocularis 5

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Date: June 10, 2016

General Information

The purpose of this document is to identify recommended configurations for using NAT with Ocularis 5. NAT is supported with all OnSSI recorders. This document makes references to both the Ocularis CS version 4 recorder, RC-C and Ocularis 5 recorder, Core + DM.

What is NAT?

NAT, or Network Address Translation, is a process that allows resources outside of an organization's network to gain access to resources inside the network (and vice-versa). For instance, you may have an Ocularis Base server, Ocularis Client and one or more Ocularis recorders installed in your office network. You may have a branch location that contains one or more recorders and Ocularis Clients. In order for operators in your office to view video from the cameras in the branch location, NAT can be used. Similarly, external operators who need access to video in the office may also take advantage of NAT.

Sample Installation

The following diagram shows an example of how NAT can be used in a Mix and Match environment with an Ocularis 5 Base. It shows a mix and match environment with RC-C recorders and Ocularis 5 recorders (Core + DM).The subsequent screens and examples refer back to this graphic.
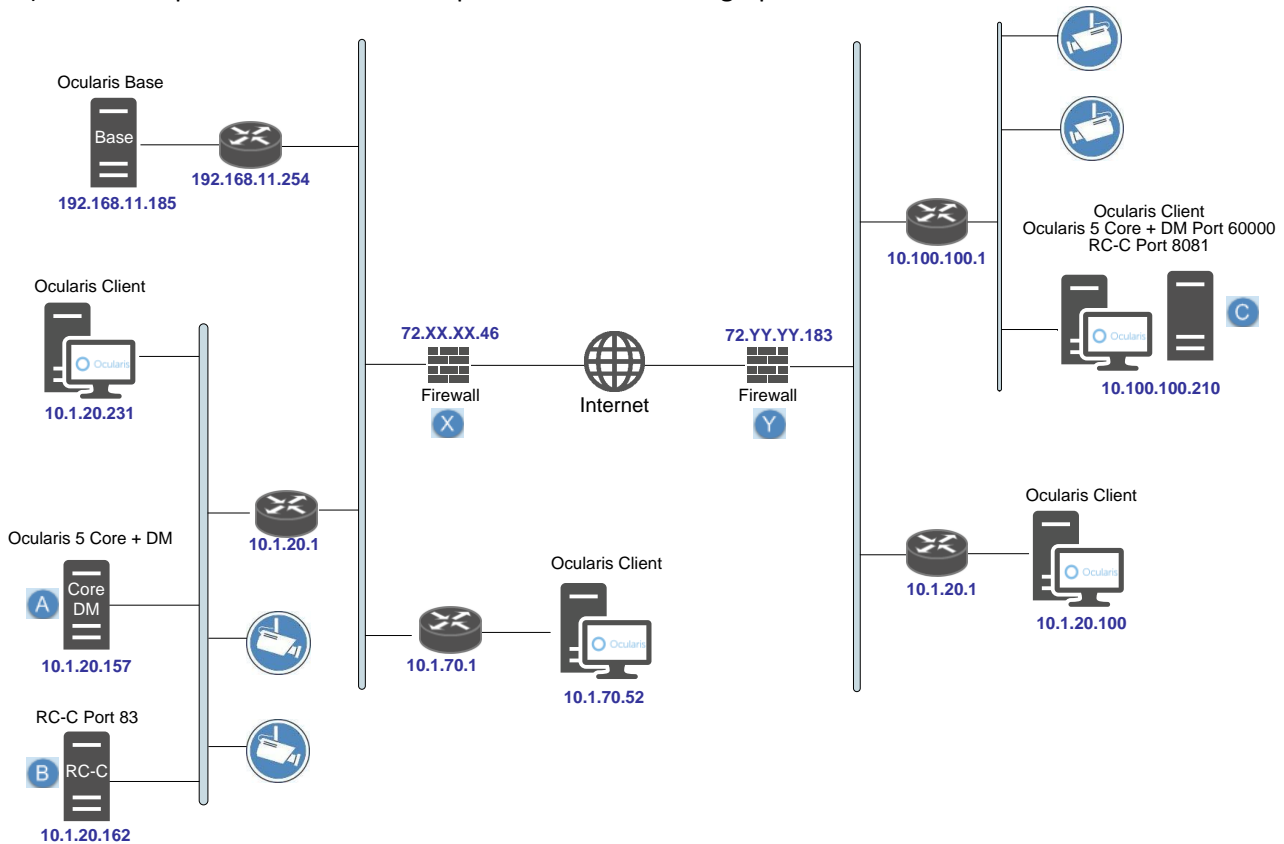

Figure 1 Sample NAT (Mix & Match environment)

NAT Configuration

NAT Configuration is done in 4 easy steps:

1. Create a NAT list on the recording component Master Core (for a version 5 recorder)

2. Configure NAT settings for the Master Core (or version 4 recorder) when you add it to Ocularis Base

3. Forward ports on the router on the Base Network

4. Forward ports on the router on the remote network(s)

Create a NAT List on the Master Core

In the Ocularis Recorder Manager, a NAT list must be created. This is done on each Master Core.

1. From the Ocularis Recorder Manager, select 'System' (1) (See Figure 2)

2. Select 'NAT List' (2).

3. Click 'Add' (3) to start the first row.

4. Enter the IP address of the Master Core Server (4). (Your system's IP address will be different from what is shown in Figure 2.)

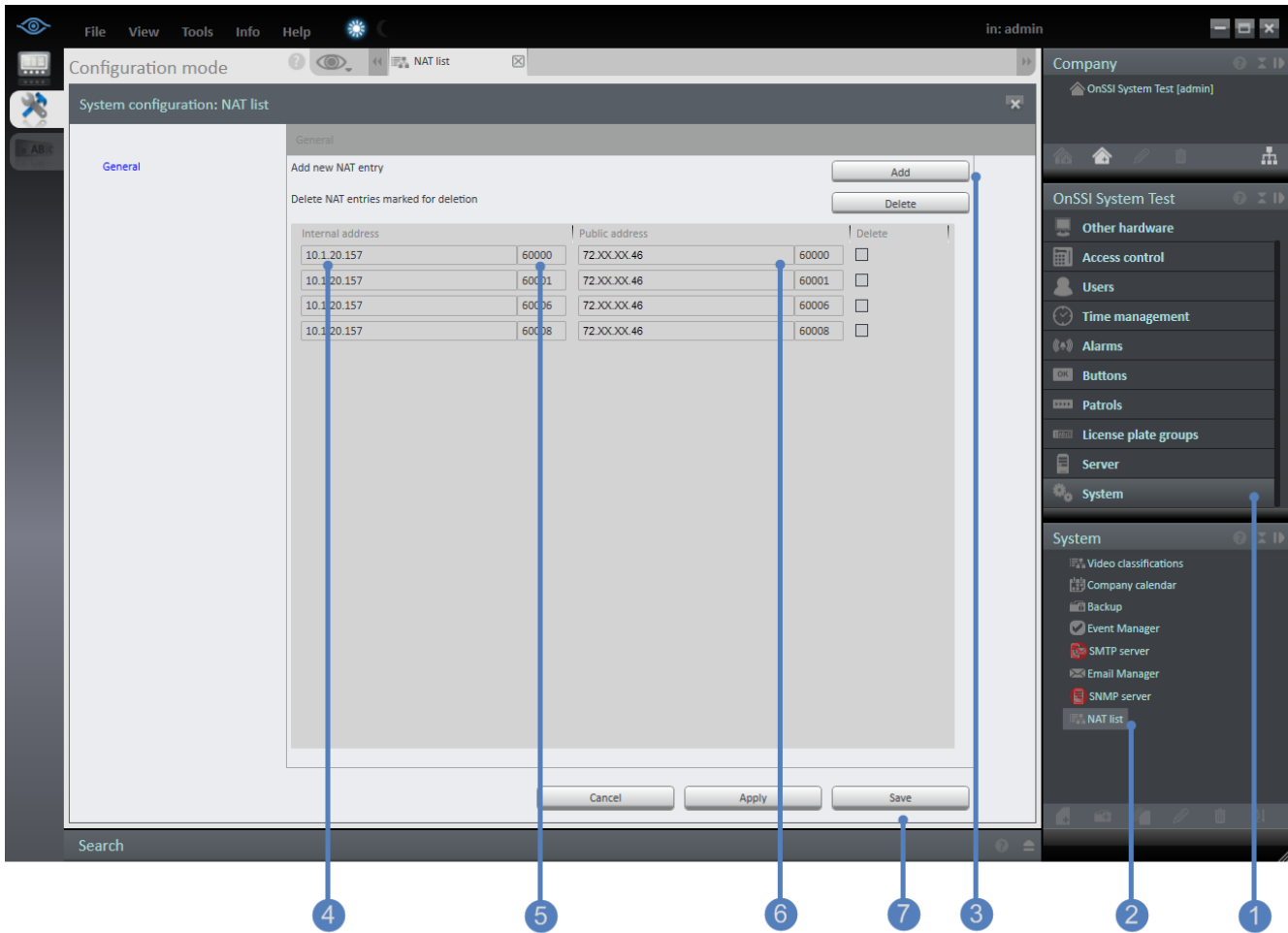5. Enter port 60000 for the Master Core port (5).

Figure 2 Configure a NAT List on Master Core: Example for Computer A

6. Enter the external IP address as configured in the network router for the Base network (6). In our sample diagram this would be the address at Firewall X.

7. Enter the same port number adjacent to this as in (5).

8. Click 'Add' (3) again to create a new blank row.

9. You need three more entries to accommodate other recorder services such as device managers, media database server and core. Follow the example shown in Figure 2 with your own IP address of the Master Core using ports: 60001, 60006 and 60008.

10. Repeat with the public address and corresponding port numbers as shown in Figure 2.

11. When done, click 'Save' (7).

Referring back to Figure 1, a NAT list must be created on each Master Core. Here is a sample of the NAT list for the Core located outside the firewall on computer C:
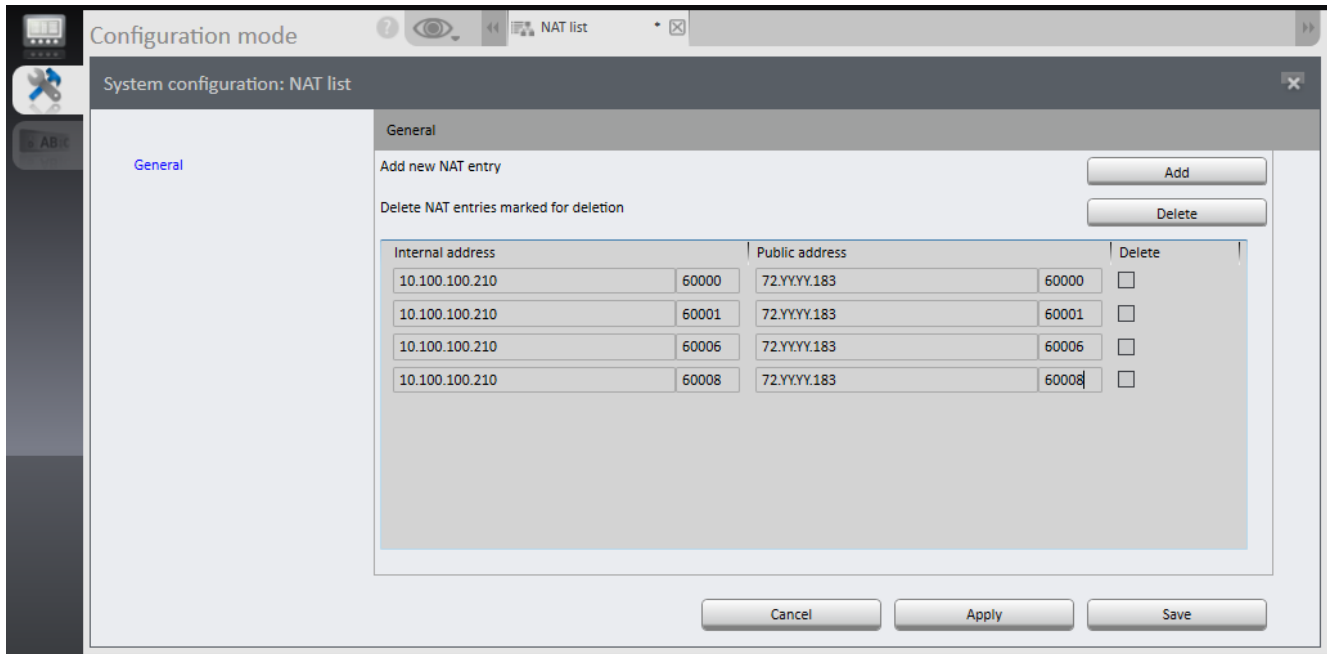

Figure 3 Sample NAT List for Core located on computer C

Configure NAT Settings on Ocularis Base

Next, when you add a Master Core to Ocularis Base check the 'Enable NAT' checkbox and configure additional settings. Instructions differ slightly depending on whether the recorder is on the same internal network as the Base or is outside of the Base network.

To Add a Recorder or Core That Resides Inside the Firewall

You add the server using the usual method in the Servers / Events tab. However, some additional information is required.

For the example shown in Figure 1, this would refer to the Master Core (computer A) and RC-C recorder (computer B).

1. In the *Ocularis Administrator* **Servers / Events** Tab, click the **Add** button.

2. In the *Add Server* pop-up (see Figure 4), check the **Enable NAT** checkbox (1).
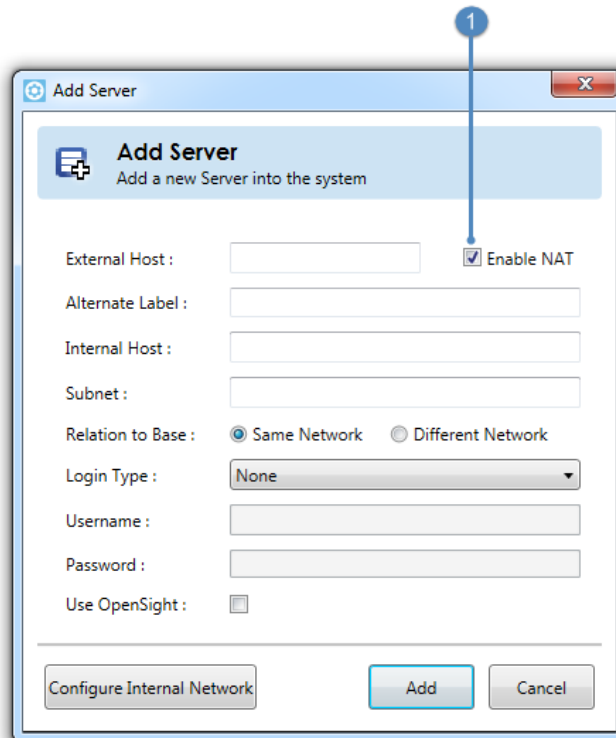

Figure 4 Add Server with NAT

3. Fill in the NAT fields as follows:

External host	Enter the public (outside) IP address as defined on the Base's network firewall. For Ocularis v4 and prior recorders, append the IP address with **":port #"**. It is not necessary to add the port number for v5 recorders/Master Core in this field.
Alternate Label	Optional: add a label to your server name to change how is it listed in the Servers / Events tab.
Internal Host	Enter the internal IP address of the Master Core. For v4 and prior recorders include "**:port #**" after the address. It is not necessary to add the port number for v5 recorders/Master Core in this field.
Subnet	Enter the local subnet(s).
Relation to Base	Check the radio button for 'Same Network'. This option is used when the Master Core or v4 recorder computer is on the same network as Ocularis Base.
Login type	Choose 'Basic' or 'Windows' based on the user account set up on the recorder that you will be using to add the Base. For v5 recorders, only 'Basic' users are supported at this time.
User name	Enter the user name for a user account on the Master Core or recorder. In most cases, add an account with full administrative privileges.
Password	Enter the password for the corresponding user account.
Use OpenSight	To apply OpenSight licenses to the cameras on this recorder, this box should be checked. Refer to the *Ocularis Administrator User Manual* for more information about OpenSight.
Configure Internal Network	Use this button to define internal VLANS. Enter the Network Address and Subnet Mask for each VLAN. Use the [TAB] key to add a new row as needed.

4. When the *Add Server* pop-up is completed, click **Add**.

5. Repeat this for any additional v5 Master Cores inside the firewall. If you also have any v4 recorders, repeat these steps for all internal recorders.

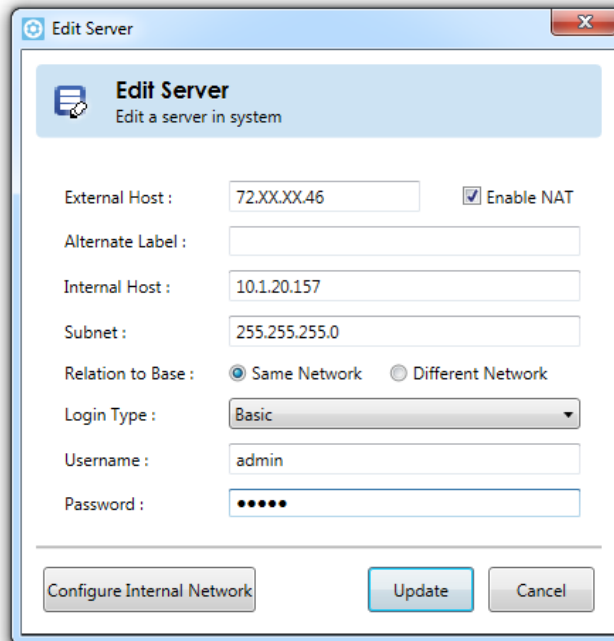The examples below display the configuration for computer A and B from Figure 1.

Figure 5 Add an Ocularis v5 Master Inside the Firewall (computer A)
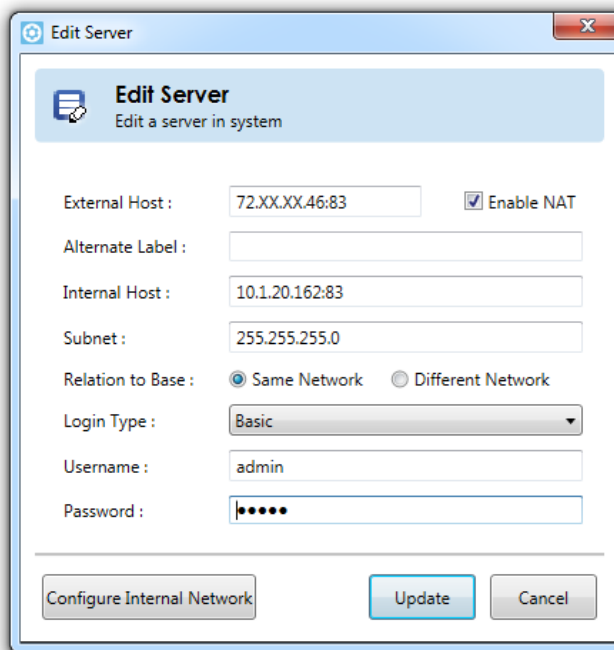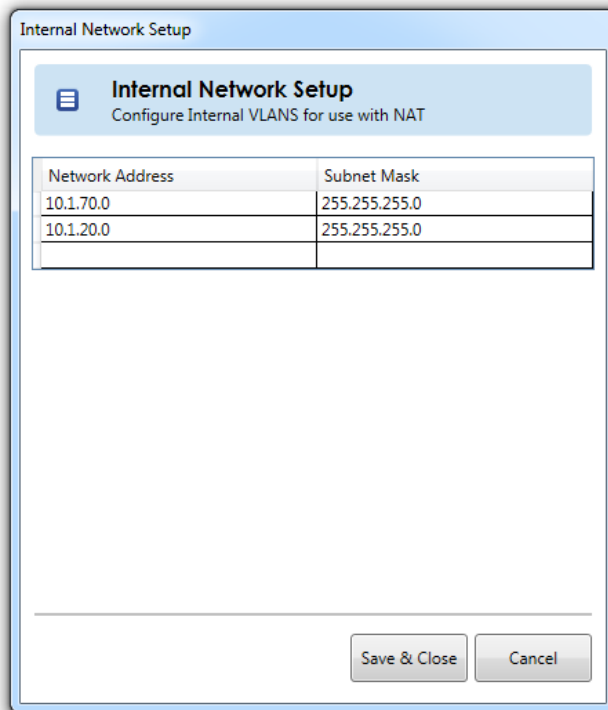

Figure 6 Add an Ocularis v4 RC-C Recorder Inside the Firewall (computer B)

The Internal Network Setup would be the same for both recorders since it is identified at the Base level.

Figure 7 Internal Network Setup for VLANs

To Add a Recorder or Core That Resides Outside the Firewall

In the example shown in Figure 1, this would refer to the Ocularis 5 Core + DM and the RC-C on computer C.

1. In the *Ocularis Administrator* **Servers / Events** Tab, click the **Add** button.

2. In the *Add Server* pop-up (see Figure 4), check the **Enable NAT** checkbox (1).

3. Fill in the NAT fields as follows:

External host	Enter the public (external) IP address as defined on the network firewall of the network where the recorder/device manager resides. For Ocularis v4 and prior recorders, append the IP address with **":port #"** as defined on the recorder.
Alternate Label	Optional: add a label to your server name to change how is it listed in the Servers / Events tab.
Internal Host	Enter the internal IP address of the Master Core/v4.x recorder. For v4 and prior, append the IP address with ":**port #**" as defined on the recorder. It is not necessary to add the port number for v5 recorders/Master Core in this field.
Subnet	Enter the local subnet(s).
Relation to Base	Check the radio button for 'Different Network'. This option is used when the recorder/Master Core computer is on a different network as Ocularis Base or resides outside the firewall.
Login type	Choose 'Basic' or 'Windows' based on the user account set up on the recorder that you will be using to add the Base. For v5 DMs/recorders, only 'Basic' users are supported at this time.
User name	Enter the user name for a user account on the Master Core or recorder. In most cases, add an account with full administrative privileges.
Password	Enter the password for the corresponding user account.
Use OpenSight	To apply OpenSight licenses to the cameras on this recorder, this box should be checked. Refer to the *Ocularis Administrator User Manual* for more information about OpenSight.
Configure Internal Network	Use this button to define internal VLANS. Enter the Network Address and Subnet Mask for each VLAN. Use the [TAB] key to add a new row as needed.

4. When the *Add Server* pop-up is completed, click **Add**.

5. Repeat these steps for all external recorders or each external Master Core(s).

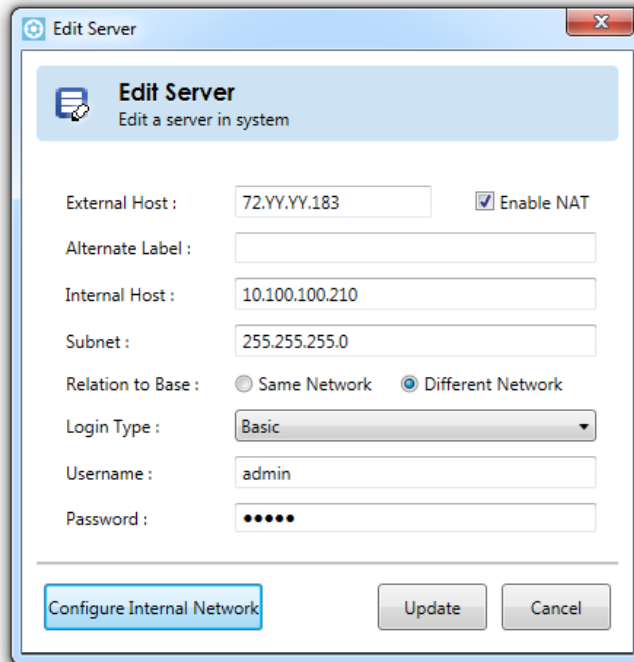The following example is for the Ocularis 5 Core + DM on computer C from Figure 1.

Figure 8 Add an Ocularis v5 recorder/core that resides outside the Firewall

The following example is for the RC-C recorder on computer C in Figure 1. The recorder port number is required on the External Host and Internal Host here.
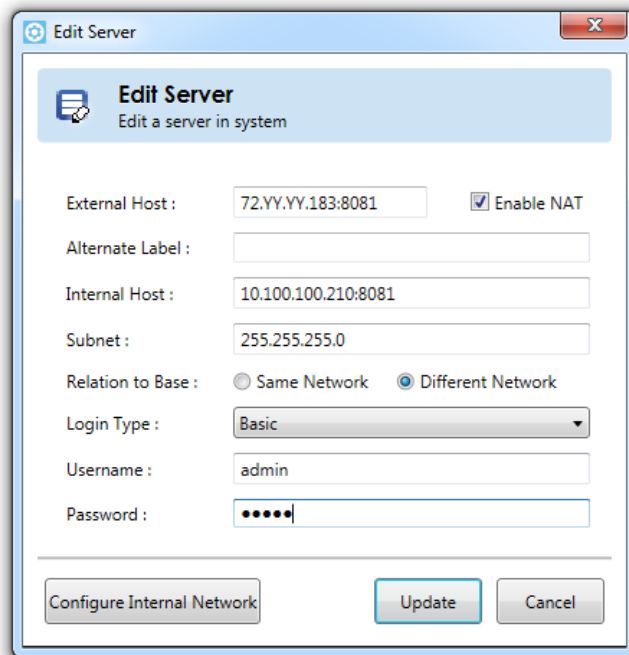

Figure 9 Add an Ocularis v4 RC-C recorder that resides outside the Firewall

Forward Ports on Routers

Lastly, you need to have the IT department configure the network routers to forward certain ports.

> **Note**: Your router must support hairpin NAT.

On the Ocularis Base Network Router

1. Forward the following ports to the Master Core IP Address:

   - 60000
   - 60001
   - 60006
   - 60008

   In the example shown in Figure 1, these ports would be forwarded to 10.1.20.157

2. Forward the ports of any v4 recorders to their corresponding recorder IP addresses.

   In the example shown in Figure 1, port 83 would be forwarded to 10.1.20.162

3. Forward the following video ports to Ocularis Base: 80, 1801, 7008

   In the example shown in Figure 1, forward these ports to 192.168.11.185

On the Remote Network Router

1. Forward the following ports to each recorder:

   - 1801
   - 7008
   - if using a v4 or prior recorder, include its corresponding port number

   In the example shown in Figure 1, forward ports 1801, 7008 and 8081 to 192.168.10.103

NAT Settings on the Recorder / Device Manager

For Ocularis v5 Device Managers

Ocularis 5 Device Managers must communicate with a Core on its own side of the firewall.

For Ocularis PS/IS/CS Recorders

1. In the *Management Application* for each recorder, right-click 'Server Access' to open the 'Server Access Properties' dialog.

2. Check the 'Enable internet access' checkbox.

3. In the Internet address, enter the public (external) IP address of the recorder network.

4. For Internet port, use the port on the firewall configured to forward to the recorder's port 8081. This is often the same port number.
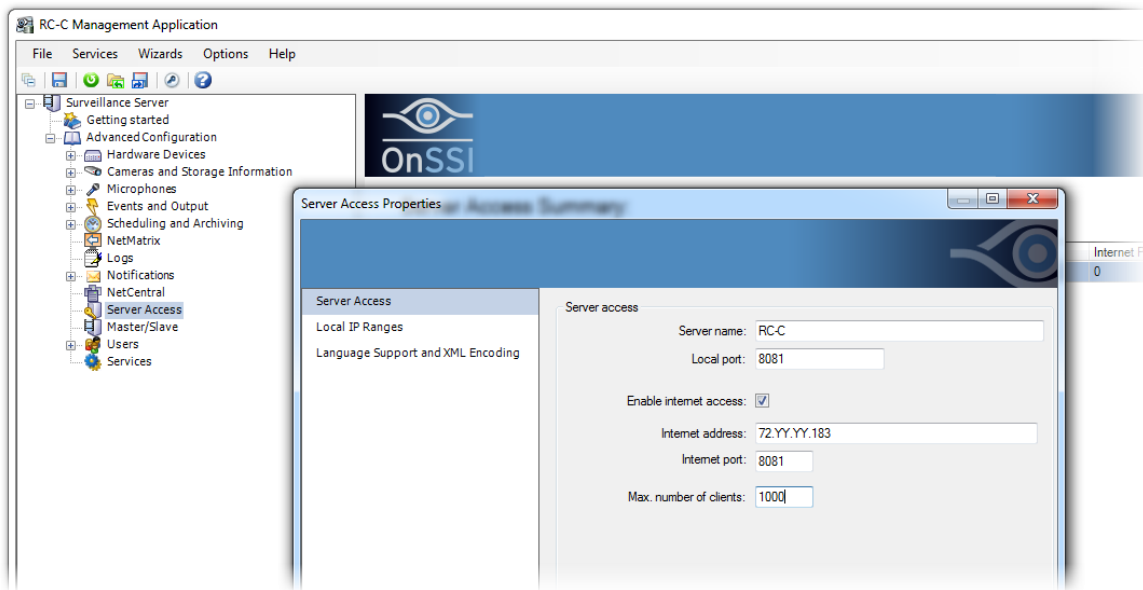
Figure 10 Sample Configuration for the RC-C Recorder in Figure 1 on Computer C

5. In the same pop-up, select 'Local IP Ranges'. Enter the subnets for the internal network VLANs.
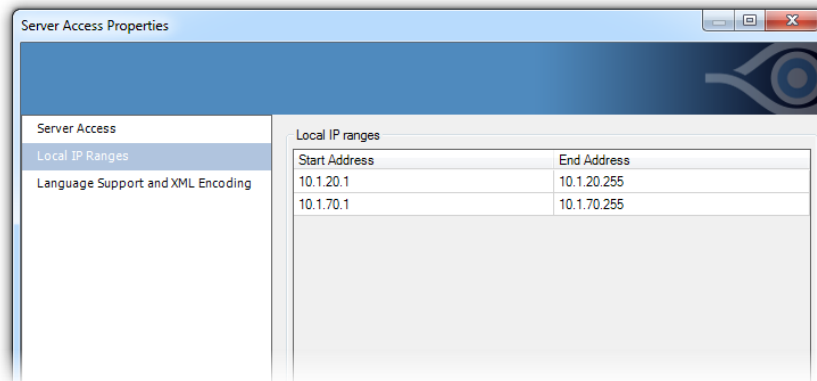
Figure 11 Identify local VLANs

6. When done, click **OK**.