

DS NVR Prospective Network Configurations

1. Introduction

1.1 Purpose

This document discusses options for using dual network cards in a DS NVR system.

1.2 Definitions, acronyms, and abbreviations

1.2.1 Acronyms

DS NVR – DigitalSENTRY Network Video Recorder

NIC – Network Interface Card

1.2.2 Definitions

Router—a communications device that determines the best path between networks for optimal performance. Routers are used in complex networks of networks, such as enterprise-wide networks and the Internet.

Network switch—a computer networking device that connects network segments. It is often used to replace network hubs. A switch is also often referred to as an intelligent hub.

2. Summary

IP cameras by nature can generate significant amounts of network traffic, resulting in a detrimental effect on a company's corporate network. Some IP camera installations can benefit by separating the network traffic generated by the IP cameras from the company network. There are several ways to accomplish this task.

3. IP Camera Network vs. Corporate Network

In each of these examples, all IP cameras and IP video servers are physically connected to their own network backbone. Large numbers of IP cameras can benefit from a gigabit network switch. The TCP/IP address scheme for the IP camera network must be different than the corporate network.

For example, the IP camera network can use the private address scheme 192.168.7.1 through 192.168.7.254, and the company network can use 10.159.16.*. The following examples discuss several configuration options, including their advantages and disadvantages.

The corporate network in this document is typically used for printing, file sharing, email, and Internet access. Some environments require the security (IP network) to be physically separated from the corporate network, whereas other environments need to share resources across the networks.

4. Separate Physical Network

This method is the simplest to implement and support. All the IP cameras and IP video devices share the same network backbone as the DS NVR system and all DigitalSENTRY client computers.

Each IP camera, IP video server, and DS NVR system has a static TCP/IP address. Any client

computers can have either a static or dynamic TCP/IP address if there a DHCP server exists on this network. If necessary, this design is easily upgraded to a dual NIC configuration. See Figure 1.

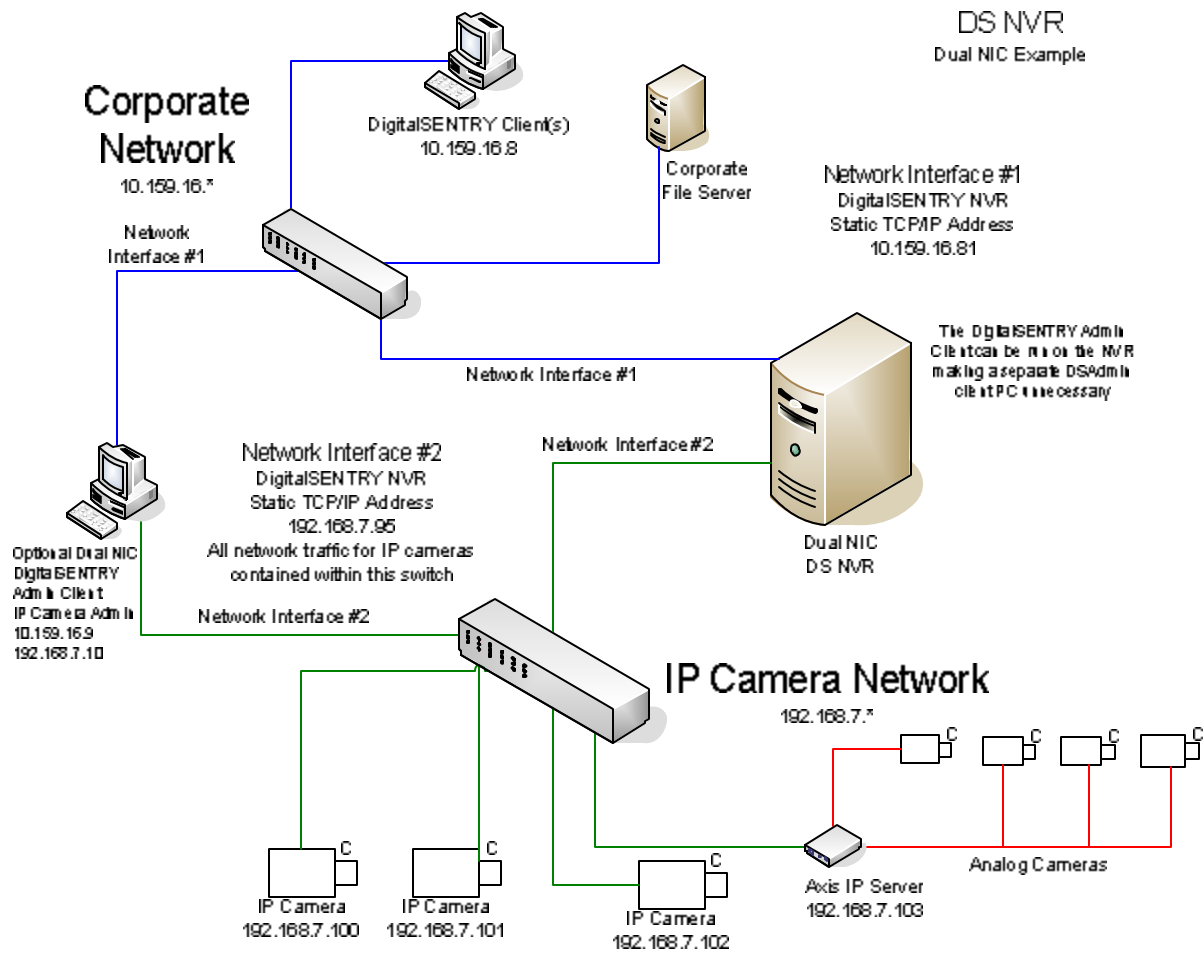


Figure 1

4.1 Advantages

4.1.1 Easy Installation and Management

Installing and managing a separate network is the simplest method for separating the IP network from a corporate network. Adding a new client involves adding a new computer onto the network. This design can be implemented by anyone with basic networking skills.

4.1.2 Simple Security

Security is physically controlled by access to this network. Nobody on the corporate network has access to the NVR or any IP camera. It is not necessary to set up any security at the network level.

4.1.3 Network Performance

Network performance is governed by the backbone network hardware used in the IP camera network. Live and recorded video delivered from the DS NVR system to the DigitalSENTRY clients share the same network hardware as the IP cameras. The optimal configuration would include a high-quality gigabit switch and a gigabit network adapter in the server running the DS NVR software.

4.2 Disadvantages

4.2.1 Limited Flexibility

Every user requires a dedicated computer connected to the IP camera network. Computers on the IP camera network do not have access to the corporate network; another computer would be necessary to access the corporate network.

4.2.2 Limited Access

The physically separate network limits the IP camera network's access to any video data. There is no way for a computer that is connected to the corporate network to access any data from the NVR.

5. Separate Physical Network Using Dual NICs in the NVR

This design is similar to setting up two separate networks; however, it has the advantage of accessing data from the DS NVR system from a computer connected to the corporate network. The DS NVR system with two network cards (dual NICs) is able to communicate on the corporate network as well as the IP camera network. It is important to note there is no direct network connection between these two networks. See Figure 2.

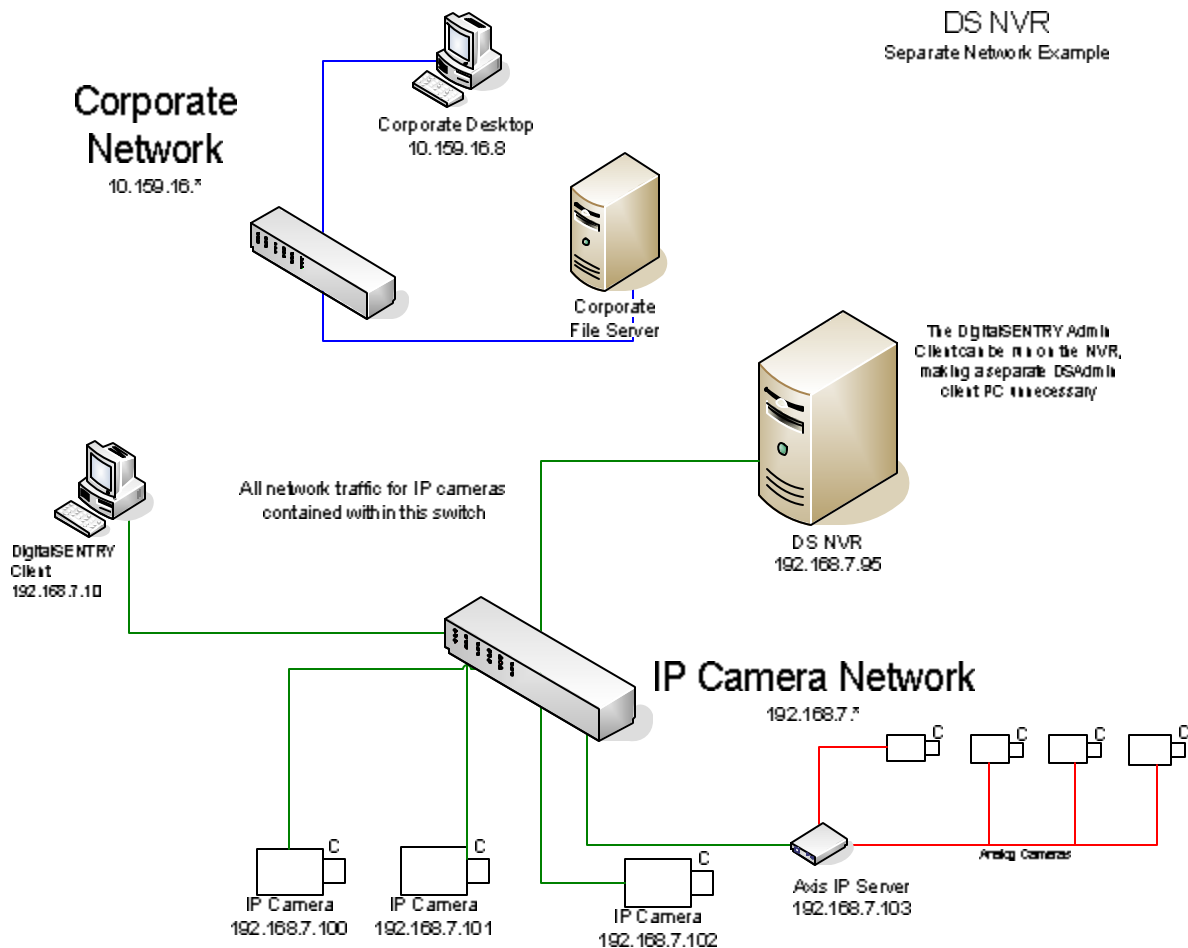


Figure 2

5.1 Configure TCP/IP Address in DSAdmin

The TCP/IP address that is stored in the database is used by the DigitalSENTRY client software to connect to the VideoServer to gain access to live and recorded video. To make the video data available to users on the corporate network, the stored TCP/IP address is compatible with the corporate network. When the VideoServer service starts, it updates the DigitalSENTRY database with the TCP/IP address of the computer.

Configure the TCP/IP address in Windows for each network adapter. Start the VideoServer and DSAdmin on the NVR, and then look at the TCP/IP address assigned to the VAU. If the TCP/IP address is compatible with the corporate network (10.159.16.81 in the previous example), then you are finished.

If the TCP/IP address is compatible with the IP camera network (192.168.7.95 in the previous example), swap the network cables between the two network adapters in the NVR. When the VideoServer restarts, the TCP/IP address is updated to an address compatible with the corporate network. Make sure you restart DSAdmin after restarting the VideoServer service.

5.2 Advantages

5.2.1 Accessibility

Anyone on the corporate network can install the DigitalSENTRY client software and review live and recorded video from the NVR.

5.2.2 Security Controlled within the DigitalSENTRY Software

User accounts are managed within the DigitalSENTRY software. Network administration is not required.

5.2.3 Network Performance

The heavy network traffic between the IP cameras and the NVR is contained within the IP camera network, with little impact on the corporate network. For optimal performance, the server running the DS NVR software should have dual gigabit network adapters. The network adapter connected to the corporate network should be connected to a gigabit port. The computers connected to the corporate network can be connected to 100 MB connections.

5.2.4 Simple Network Administration

After the dual network adapters have been properly configured on the DS NVR system, no additional network configuring is necessary. This design can be easily implemented with little interaction with any corporate IT personnel.

5.3 Disadvantages

5.3.1 Network Performance

The corporate network backbone network hardware governs the network performance between all DigitalSENTRY clients and the DS NVR system. To optimize network performance, someone with a good understanding of switched networks should review the design. The IT person responsible for supporting the corporate network should have the necessary background.

5.3.2 IP Camera Administration

Most DigitalSENTRY administrative functions are available by running DSAdmin on a computer

connected to the corporate network. The computer running DSAdmin needs to be on the same network as the IP camera to connect directly to the IP camera using a browser (such as clicking on a button in DSAdmin to bring up a cameras web page).

IP cameras can be administered by running DSAdmin on the NVR. The example here shows a optional dual NIC DigitalSENTRY Admin Client computer. This computer is the same as one connected to a corporate network with the addition of a second network card that is connected to the IP camera network.

6. Using a Router

Using a router require a deeper network skill set than the methods previously discussed, but it also provides the most flexibility. The router acts as a traffic cop between networks, allowing and restricting the type and amount of data that can pass between networks. See Figure 3.

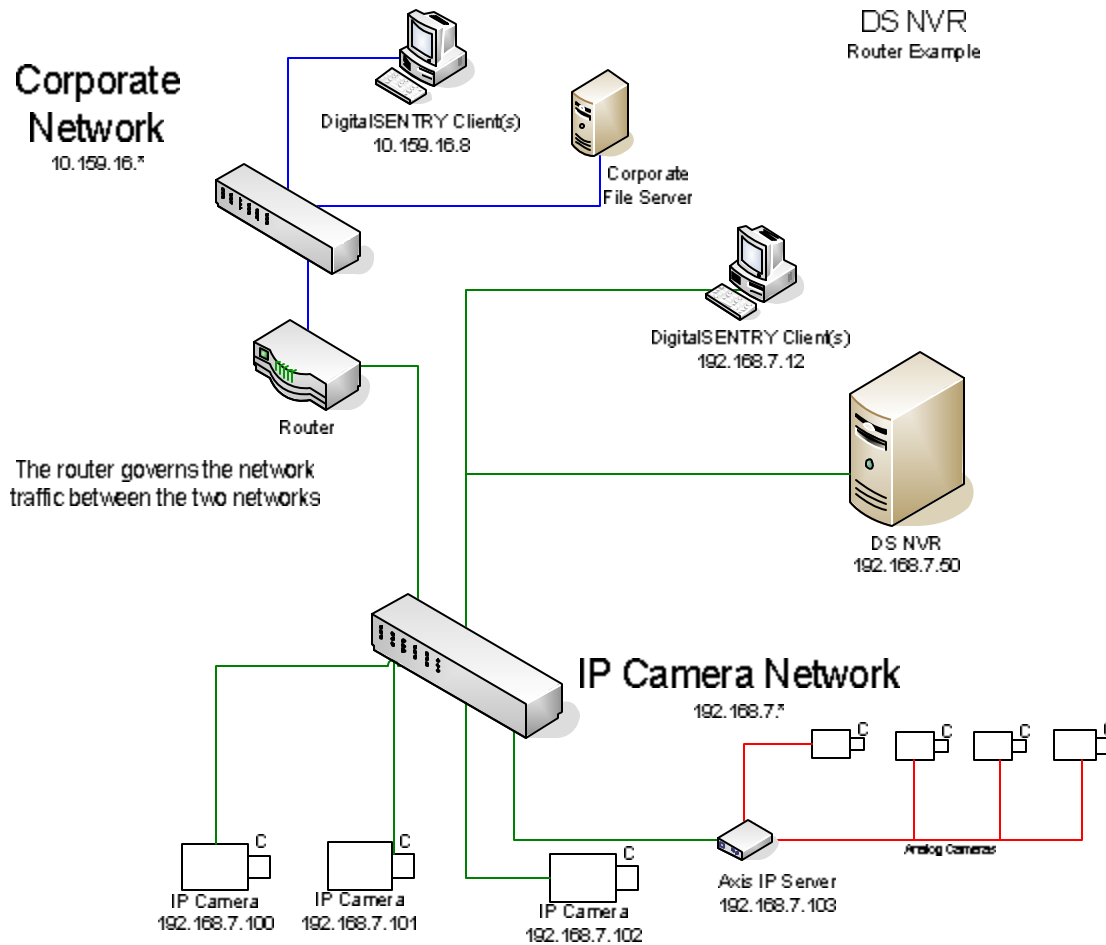


Figure 3

Figure 3 shows two DigitalSENTRY client computers: one DigitalSENTRY client is connected to the corporate network while the other is connected to the IP camera network. The router is the device between the two networks. One possible configuration allows the DigitalSENTRY client computer connected to the IP camera network access to the corporate network, but restricts access into the IP camera network from the corporate network. This configuration has the advantage of achieving maximum throughput between DS NVR and the DigitalSENTRY client while allowing the DigitalSENTRY client computer to safely access the IP camera network.

The DigitalSENTRY client computer connected to the corporate network can access the DS NVR system and IP cameras when the router is configured to allow the data to pass to the DigitalSENTRY client. This configuration has the advantage of allowing anyone on the corporate network to look at live and recorded video while protecting the corporate network from the heavy traffic generated by the IP cameras and IP servers. The router would also protect the corporate network by restricting the amount and type of data that would be passed into the corporate network. In both cases, the DSAdmin software can run on either computer.

6.1 Advantages

6.1.1 Flexibility

While the system is up and running, it is possible to run the DigitalSENTRY client software from just about anywhere. The router configuration can be modified as requirements change and evolve. The router can be a single point of upgrade to provide even more flexibility and increase bandwidth.

6.1.2 Security

The router can be used to enhance the overall security. Network access can be managed at the router, restricting access to the IP camera network. For example, someone with a laptop and DigitalSENTRY client software can be restricted from connecting and accessing the DS NVR system through the router itself.

6.2 Disadvantages

6.2.1 Network Administration

Unlike the separate physical network configuration, a router requires the support of a IT group. Using a router requires a strong networking skill set. The network administrator responsible for maintaining the corporate network must be involved in installation and configuration, and it will require a large amount of time to determine the optimal router configuration.

7. DigitalSENTRY 4.0.1

The behavior of the DS Videoerver Service has been change in DigitalSENTRY 4.0.1 to better handle multiple network ports on a VAU or DS XPress system.

When the service starts, it queries the DigitalSENTRY database for its assigned TCP/IP address. If the returned TCP/IP address is assigned to one of the network cards, it continues starting up normally. If the returned TCP/IP address is not assigned to either NIC, the service updates the database with the TCP/IP address from the first NIC port.

If the TCP/IP address chosen by the service is not the desired address—perhaps it's a TCP/IP address valid in the IP camera network but not the corporate network—DSAdmin must be used to update the TCP/IP address for the VAU.