

THE BASICS OF REMOTE VIDEO ACCESS

Consumer Guide

English Version1.0



www.lorexcctv.com

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Introduction

There are many video surveillance products available today that allow the video signals to be accessed via digital, network connections. These products are suitable for use over Internet connections, allowing access from anywhere in the world. However, many users are not familiar with the technologies needed to get this to work reliably.

This document provides a background to networking and remote network access concepts pertaining to video surveillance and is intended to give the Do-It-Yourself user a fundamental understanding of key concepts for all network video products.

Background to the Technology

Types of Surveillance Systems

In discussing video surveillance systems there are three types to consider;

- Direct Surveillance
- Local Network Surveillance
- Remote Network Surveillance

Direct Surveillance Systems display the video images on a monitor or PC-system screen without using a data network, as shown in the following figure. Only the cameras connected to the monitor or the PC-system can be viewed on their respective systems;



Figure 1: Direct Surveillance Systems

Network Surveillance systems use a data network to connect to the video devices, so that the video signals can be accessed using a digital data protocol across the network. To do this the devices need to be designed for Internet Protocol (IP) networking.

What is the difference between Local and Remote Network Surveillance?

If you wish to view the video images from any of the network-enabled video devices using a viewer application or web browser that is connected to the Local Area Network(LAN), such as the PC(a) in the figure below, then this is considered local network surveillance. In this case the video signals never reach the Internet and there is no special setup required. If you wish to view the video from a network location not directly connected to the LAN you must go through the Internet. This is considered remote network surveillance and remote access configuration is required. The two figures below illustrate the differences between these.

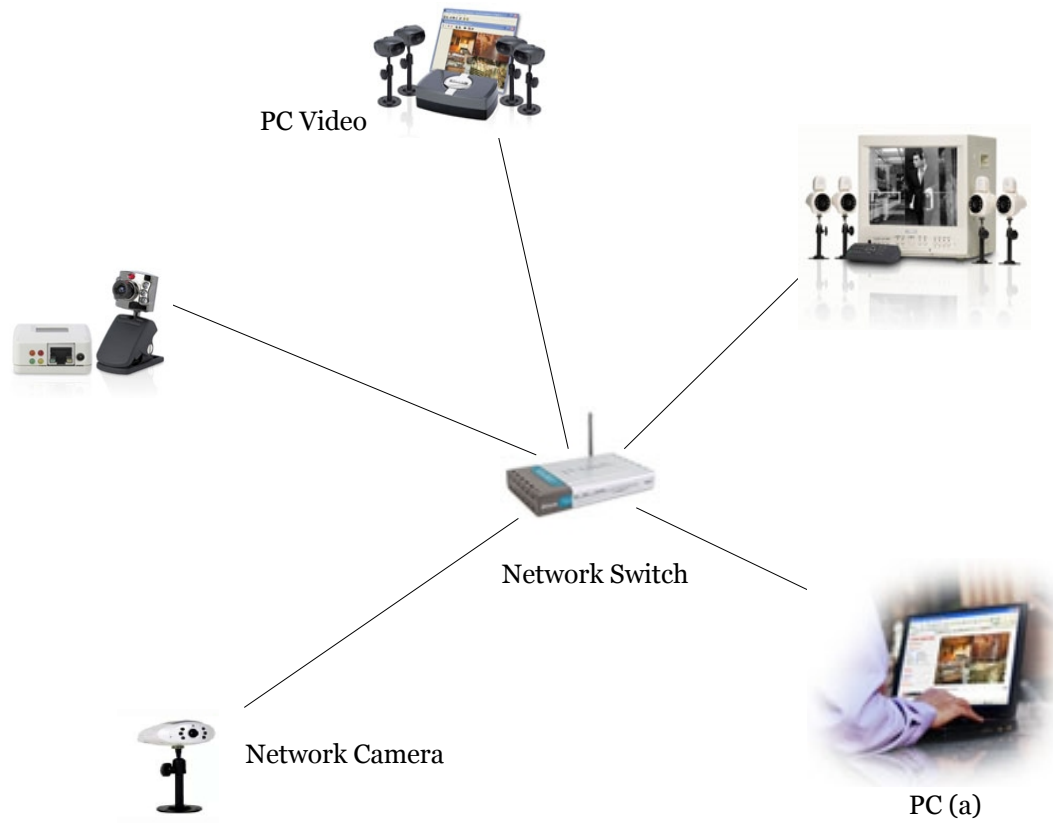


Figure 2: Local Network Surveillance

In the figure 2 above, the video is displayed on a computer, PC(a), that is connected to the Local Area Network.

In the following figure 3, the video is being monitored by a computer PC(b) that is attached to the Internet at some remote location. Hence all connections from the remote computer needs to traverse the Internet Gateway between the Internet, or Wide Area Network (WAN) and the Local Area Network (LAN) to reach the Video device. The video signal need to traverse the gateway in the reverse direction.

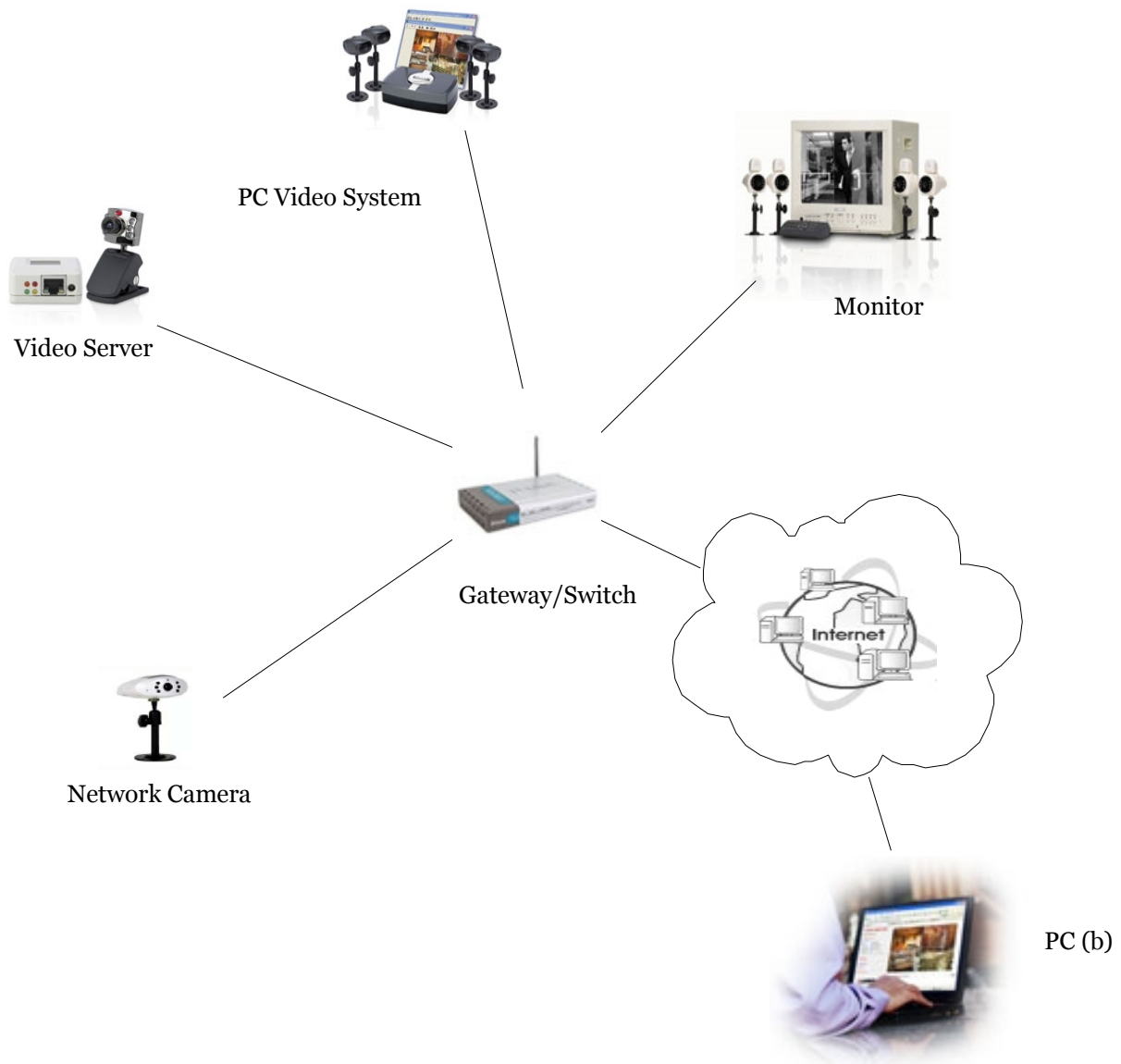


Figure 3: Remote Network Surveillance

When you are viewing the video signals across the Internet, you need to consider;

How do I configure my gateway/router?

This question depends on the particular model of router you have. Nearly all models support some form of inbound TCP/IP routing, or port forwarding, and there are many resources to help you to forward an incoming connection to your video device, including online guides and technical support from Lorex Technology Inc. (<http://lorexstore.strategcvista.com/article.aspx?aid=3>). You can also refer to www.portforward.com for details on a large variety of routers.

How to I locate the video devices?

The second question depends on the nature of your Internet connection. If you are fortunate to have a static IP Address, then this is all you will need. Static IP Addresses are typically available to corporations and organizations that run servers. Service providers charge substantially more for static IP addresses and will often

rent them in blocks. If, like most broadband Internet users, you have a service provider who assigns you a temporary IP Address and changes it from time to time, then you will need to sign up for a Dynamic DNS service.

What is the difference between a Static and Dynamic IP Addresses?

IP Addresses are the numbers used by the Internet Protocol(IP) to identify your computer or device. Every computer or device that wants to communicate over the Internet must have an address, unique to that computer or device. Internet Service Providers can issue IP Addresses in two ways;

Static assignment: This is simply determining the address to be used and (usually manually) entering it into the computer or device. The number will not change, and may not be used by any other device.

Dynamic assignment: This utilizes a protocol calls Dynamic Host Configuration Protocol (DHCP) that generates an IP Address and leases(i.e. provides) it to your computer or device for a predetermined length of time. After that time expires, your computer or device must request a new IP Address. There is usually no guarantee that the new IP Address will be the same as the old one, and in many practical instances it isn't.

What is the difference between an internal and an external IP Addresses?

Every device that communicates over the Internet must have a unique IP Address. These are all external, or public, IP Addresses. However, there are ranges of IP Addresses that are excluded from this address space, so that they can be used internally by devices connected via Local Area Networks. These are internal, or private, IP Addresses. If devices that are using internal addresses wish to communicate with devices on the Internet, they must pass their messages through a network gateway, which will map the internal IP Addresses into a valid external IP Address. This is called Network Address Translation (NAT), as shown in the following figure.

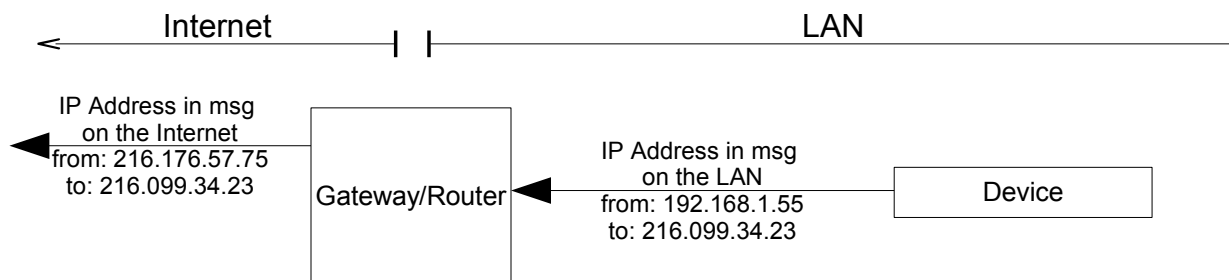


Figure 4: Example of Network Address Translation

What is port forwarding?

Internet Protocols use IP Addresses to identify devices on the Internet, and ports to identify specific services within the devices. When a network gateway maps the messages coming from the Internet to individual internal IP Addresses(i.e. devices) on the LAN it does so on a per port basis. This is known as port forwarding.

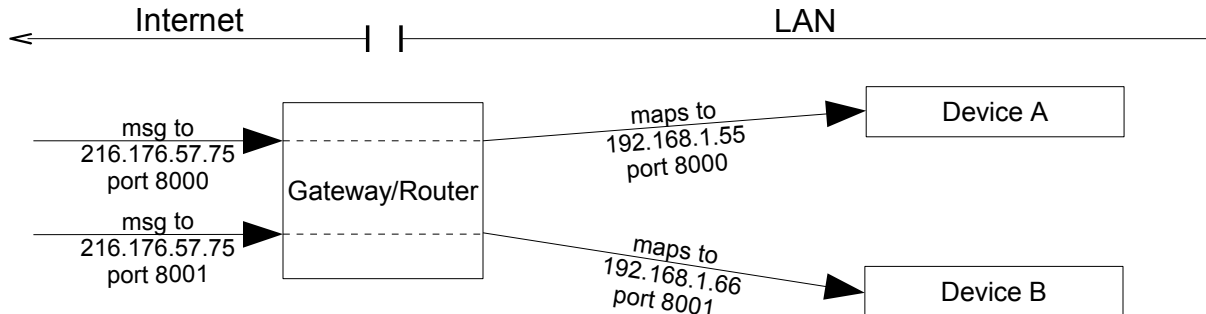


Figure 4: Example of Port Forwarding

What is Domain Name Service (DNS)?

As most Internet users are aware, servers on the Internet are usually identified by their Universal Resource Locators, or URLs. These are protocol identifiers and domains and subdomains arranged in a hierarchy separated by periods ('.'), for example; <http://www.strategcvista.com>. However, the real network addresses that are commonly used to communicate over the Internet are called IP Addresses. The device that converts a URL into the associated IP Address is called a name server. When your computer wants to access an Internet site, it first makes a call to the name server to resolve the URL into an IP Address. Then it will access the named site. Name servers do more than just translate URLs. They also share their information with other name servers to form an hierarchical, distributed database, collectively called a Domain Name System (DNS).

What does a Dynamic DNS service do?

The DDNS service has 2 components to it. When you register your device, you are assigned a unique identifier that you program into your video device. You are also assigned a fixed URL that corresponds to your video device. Then from time to time or when the IP Address of your device changes, this device sends a message to the DDNS server on the Internet which instructs the server to capture and record your real network IP address and propagate it into the DNS.

When you want to locate your video device, you will enter the fixed URL into the web browser or video application address field. No matter what your real IP Address is at the time, the DNS system will be able to translate the URL into the current IP Address and enable the browser or application to communicate with the video server, via the network router. There are free and commercial DDNS services available. Both of these work the same way, but the commercial (paid) services guarantee a higher level of service. lorescctv.net is a DDNS service that is bundled with Lorex Technology Inc. Remote Access products and provides a reliable and easy way to connect to these devices. There are no recurring payments for this service.

Implementing Remote Access

Where is the best place to start?

The first step in implementing remote access is to get Local network access working properly, using the same client computer application or browser as you intend to use for remote access later on. Use the instructions provided with the product, as setup methods will vary from product to product. There may well be a utility PC-application to help you do this.

Once this is up and working you should then configure the gateway/router for remote network access and finally sign up for DDNS service and then set up the video device to work with the service.

What does setting up a gateway/router involve?

Since there is a wide variety of gateway/routers available, you may have one that is not explicitly described in the video device setup documentation. In this case use the video device setup information and the gateway/router manual information to translate the port forwarding instructions to match the gateway/router being used. If this is not successful, use the Internet to find the setup information, for example by visiting <http://lorexstore.statagicvista.com/article.aspx?aid=3>.

If this is still not sufficient, make use of the available e-mail or phone dial-in technical support.

You can test that the external Internet data path is correct by entering the external IP Address into the client video application or browser. If the port forwarding has been done correctly, this should result in the same video picture as the local network access. There are a number of ways to find the external IP Address, including entering the following address in a browser;

<http://dns1.srategicvista.net:8245/nic/ipreferrer.php>

Is Dynamic DNS really necessary?

DDNS is necessary if you have an external IP Address that is subject to change from time to time. This will generally apply to all broadband residential Internet services, including DSL, Cable TV and Wireless Internet. In addition, the ability to use a familiar URL to access the video, rather than a numeric IP Address, is a good reason to sign up for the DDNS service.

Note that whenever the IP Address is changed it takes a short while, typically a few minutes, for the DDNS service to be notified and propagate the change through the network.

What do I need on the client side to display video?

There are a few choices you will have;

1. PC-based client application.

Lorex Technology Inc. provides a Windows-PC software application for each Lorex Technology Inc. video product that supports remote access. The applications must be installed on the remote PC and configured with the address of each video device to be accessed.

2. Web-browser access.

Standalone remote access video servers can be viewed using a web browser. All the servers will work with Microsoft Internet Explorer. Other browsers may also be used if they support Java applets.

Glossary

DDNS

Dynamic Domain Name Service(DDNS) is the service used by a host system (device on a LAN) to register its current external IP address (as provided by the ISP) with the external DDNS system. This is associated with a Universal Resource Locator (URL) to make looking up the IP Address possible.

Since many ISP providers change the IP address of the connected computer every several minutes, to connect a remote system to a host system for remote video surveillance requires that

DHCP

Dynamic Host Configuration Protocol (DHCP), is a protocol used for automating the assignment of Dynamic IP addresses for computers.

Dynamic IP Address

A Dynamic IP address is an IP address that is leased (i.e. provided) to you automatically by your ISP while you are on the Internet. Once the lease expires it needs to be renewed and the new IP Address may be different

from the previous one.

Gateway

A gateway is a device that connects 2 different networks together. The gateway will perform any address and protocol translations required so that messages can flow between the networks.

IP Address

Computing devices connected to the Internet, are identified by a unique network number. This number is called an IP Address (IP = Internet Protocol). Each IP Address consists of 4 numbers in the range 0-255, and is written as; aaa.bbb.ccc.ddd, e.g. 216.176.57.75

MAC Address

The Media Access Control(MAC) Address is your device's 12-digit network hardware address that identifies the device on a LAN. The MAC hardware address is unique to each network product.

MAC Addresses follow a specific format mm-mm-mm-ss-ss-ss. The mm's are the manufacturer's ID number and the ss's identify the product's ID number.

Network Address Translation (NAT)

NAT is the process by which a device on a LAN, using a private/internal IP Address can communicate with a device on the Internet via a network gateway. The internal IP Address is translated to the public/external of the network gateway.

Static (Fixed) IP Address

A Static IP address is an IP address, which never changes, that is provided to you by your Internet Service Provider (ISP).

URL

The Universal Resource Locator (URL) is a user-friendly name, comprising a protocol, an hierarchy of domain names and port number(optional), that is entered into an application or web browser address field to access resources over the Internet. e.g. <http://www.stratgicvista.com:80>.

Conclusion

The information provided here will enable the reader to have a basic understanding of the Remote Network Access technology and to relate this to the specific remote access setup procedures of the various video device products.

To find out more about our available products and detail setup instructions, please visit our website at: <http://lorexstore.strateglcvista.com>.

It's all on the web



Product Information



Specification Sheets



User Manuals



Software Upgrades



Quick Start Guides



Firmware Upgrades



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www.lorexcctv.com

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