

## Leash Network with Zero Clients

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**Abstract-** The purpose of this paper is to introduce zero-client architecture. Zero client technology is the latest trend in reduced footprint computing. Much like a thin client, a zero client moves the computing power back to the data center, leaving little more than a keyboard and monitor at a users' desk. While thin clients require some local processing power and locally installed software, zero clients eliminate the need for locally installed software and connect directly to virtual PCs back in the data center, usually over an Ethernet connection. Zero clients are connected over the network to applications running on a PC or server located elsewhere on the IP network. The zero client contains network protocols, allowing each of these interface types to be supported over a wired or wireless IP network.

**Keywords-** Zero-Client, Thin Client, Architecture, Flexible, PCoIP, VDI (virtual desktop infrastructure).

### 1. Introduction

A zero-client is an I/O redirector device that allows a full cluster of peripheral devices to be deployed at the desired point of service without a dedicated PC or thin client at that same location and without requiring any modifications to existing software applications. Zero-clients are network-based and contain interfaces for a variety of peripheral device types including VGA and other video monitor interfaces, serial, USB and optionally others such as audio or PS/2. The zero-client contains network protocols, allowing each of these interface types to be supported over a wired or wireless IP network without a local PC or thin client. They are connected over the network to applications running on a PC or server elsewhere on the IP network. Zero-clients may run in two modes: standard remote device mode or terminal emulation mode. Remote device mode allows remote peripherals to connect to applications running on PCs elsewhere on the network. Terminal emulation mode allows the zero-client and standard devices such as printers and keyboards to replace legacy terminals.

### 2. Web Based Software “Zero Clients”

A variety of software companies have coined the term “zero-client” to refer to a software solution that runs on desktop PCs and eliminates the need for application software to run on those desktop PCs. Most of these solutions employ a network connection from the desktop PC to a special program on a network server that translates application programs' inputs and outputs into network based communications. This can reduce the IT management on the desktop PC by making all users access the same version of the application on the server and the same client code (often a browser interface) to interface to that application. PCs are still unreliable, with hard drives and fans that go bad. The Microsoft Windows operating systems that run on them still have the same high maintenance costs. This approach also makes it difficult for applications to access peripheral devices deployed at the desktop PC location, an absolute requirement for retail and other commercial applications.

### 3. Zero-Clients Architecture

A zero-client is designed to facilitate moving or eliminating dedicated PCs. Deployments may be done in a variety of different scenarios

#### 3.1 Point-to-Point

The simplest scenario is to move the formerly dedicated PC to a different location, often in a back room or data center location, while leaving the cluster of peripheral devices at their desired location. The PC accesses the peripheral devices over a standard TCP/IP network connection.

#### 3.2 Benefits Point-to-Point

1. The user still interacts with the desired peripheral devices at the desired location.
2. The PC can now be placed in a completely secure physical location that is accessible only by security-cleared employees.
3. The PC may be removed from a hostile environment where temperatures, dust or electromagnetic interference can reduce its effectiveness or lifetime.
4. The PC is now in an environment where maintenance, upgrades or replacements can be done easily.
5. The space formerly occupied by the PC may now be used for other functions such as merchandising or manufacturing.

### 3.3 Multiple Point-to-points

The point-to-point scenario described above may be extended to multiple point-to-point connections within the same facility.

The network topology is the same as for single point-to-point connections, only with more connections.

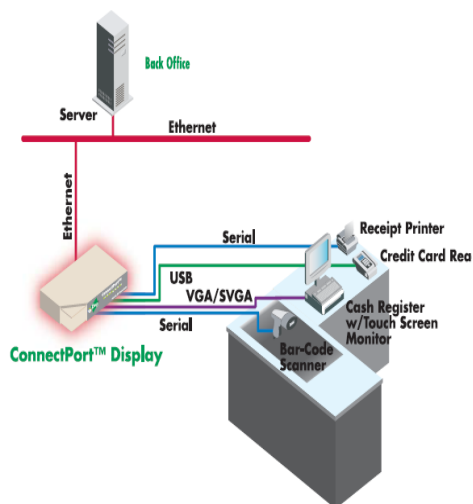


Fig. No. 1

### 3.4 Following features of Multiple Point-to-point

- ✓ It allows a single TCP/IP network to be leveraged across multiple connections between PCs and their peripherals.
- ✓ It offers the flexibility of rack mounting individual PCs or replacing them with a blade server. Each option (rack or blade) has its advantages. Regardless of the choice, each connection between PC and peripheral device is still point-to-point.
- ✓ It makes it much easier to swap out a failed PC (or blade) and substitute a backup unit.

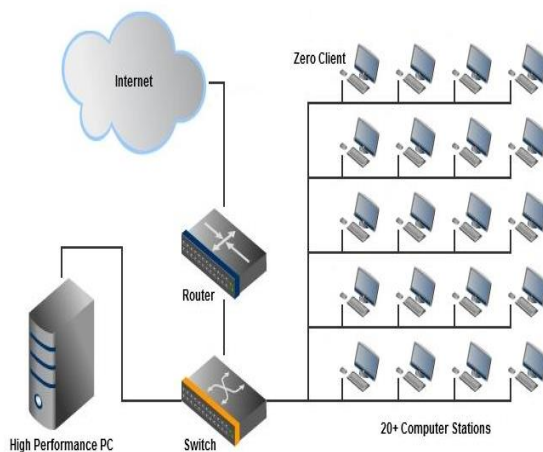


Fig. No 2

## 4. Zero clients versus thin clients

A zero client is essentially a thinned down version of a thin client. A thin client works in conjunction with a backend server to offload much of the work that would typically be done locally on a desktop system. Thin clients often run a pared-down version of a Windows® or Linux operating system that resides on the client device. In contrast, zero clients have no operating system, which makes them even easier to manage. They require no software drivers, no antivirus software, and no OS patches or other application software updates. The most that zero clients might need in terms of management is centralized. Everything else is handled on the backend server.

### **Protocol used for zero-clients**

PCoIP is a high performance display protocol purpose-built to deliver virtual desktops and to provide end users with the best, total rich desktop experience regardless of task or location. With PCoIP, the entire computing experience is compressed, encrypted and encoded in the datacenter before being transmitted across a standard IP network to PCoIP-enabled endpoint devices.

The PCoIP on the central source, compresses, encrypts and rapidly transports image pixels to PCoIP end-user devices. They in turn decompress, decrypt and display the image on a screen. From a user's perspective, there is no difference between working with a local computer loaded with software and a zero client receiving the image of the software running via PcoIP.

### **CONCLUSION**

In this paper we have presented the zero-clients work with lease network or server software and applications. Zero-clients offer a bold new solution for improving the cost, flexibility, reliability and security of client server applications. They provide these benefits in a wide variety of vertical market applications, without requiring changes to application software. Upgrade to zero-client based solutions is easy and inexpensive and, in the case of terminal based applications, enables future migration to more feature rich applications without hardware upgrades.

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