

APC Console Port Servers and Out-of-Band Management for Microsoft Windows® Server 2003

Abstract

This note provides an overview of out-of-band management, explains Emergency Management Service (EMS), and describes how APC Console Port Servers provide native support for the EMS and the management of Windows Server 2003 server farms, helping to further automate data center management.

Introduction

Many networked devices such as UNIX servers, routers and switches are accessible through local serial console ports for initial configuration and emergency management. Today, “console management” is an integral part of the data center, allowing secure access to systems—even when the network is unavailable. Until now, this functionality has not been available on Microsoft Windows servers, which are traditionally managed through KVM (keyboard, video, and mouse) switches.

In Windows Server 2003, Microsoft introduced Emergency Management Services (EMS), a powerful suite of applications for out-of-band management. EMS enables true “headless” server operation, which significantly reduces hardware costs by eliminating the need for video cards, monitors, keyboards, and mice during Operating System (OS) installation, operation, and recovery.

This note provides an overview of out-of-band management, explains EMS, and describes how APC Console Port Servers provide native support for the EMS and the management of Windows Server 2003 server farms, helping to further automate data center management.

In-Band vs. Out-of-Band Management

System administrators typically use tools such as Remote Desktop Connection (RDC) or VNC to manage Windows servers through the network. In-band management tools assume the availability of basic networking and system services; therefore, they are only effective for system monitoring and remedying application-related failures.

Out-of-band management provides an alternative route that is independent of the data network (WAN and/or LAN), using direct physical access provided by management ports (serial console ports) of network and infrastructure equipment. In essence, it provides an alternative controlled access point to the network components (including servers, switches and

routers). An out-of-band connection through a serial console port relies on only the most primitive of system services. As long as the kernel is functioning, access to the system is possible—even if the network or graphical user interface is down. And, since data through the console port is text based, management is possible over low-bandwidth connections such as dial-up lines. Out of Band Management can provide an alternative management option in the event of a failure of a critical network component like a gateway router or network switch.

Out-of-band management doesn't replace in-band management—it improves a system administrator's ability to quickly respond to situations when standard tools aren't available. Out-of-band management directly addresses infrastructure, not application, failures. It also contributes to decreased human and operational/environment errors by simplifying failure detection and recovery procedures. , According to Gartner, these factors account for 60% of unplanned data center downtime.

About Emergency Management Services

Emergency Management Services (EMS) is a suite of features spread over multiple elements of Windows Server 2003. Together, these applications enable remote management and system recovery through the server's serial console port, even when the server is unavailable through the network. EMS consists of Console Redirection and the Special Administration Console.

Console Redirection

Console Redirection allows administrators to monitor and control the boot process by sending all system output to both the video adapter (if present) and the serial console port. Likewise, it accepts inputs from the console port, as well as the keyboard (if present).

During a server's Power on Self-Test (POST), before Windows begins to load, Console Redirection is typically a function of the server's BIOS. EMS Console Redirection starts as soon as Windows begins to load, and is available until the Windows graphical interface becomes active. Once the Windows graphical interface is active, Console Redirection is no longer available, and EMS focuses on the Special Administration Console.

Special Administration Console

The Special Administration Console (SAC) allows administrators to access and control the OS when standard remote management tools such as Remote Desktop Connection are unavailable. Since SAC is a kernel-level function, it remains accessible even after higher-level applications have ceased to respond. For example, a misbehaving program has used all available memory.

SAC allows you to perform low-level emergency tasks, such as:

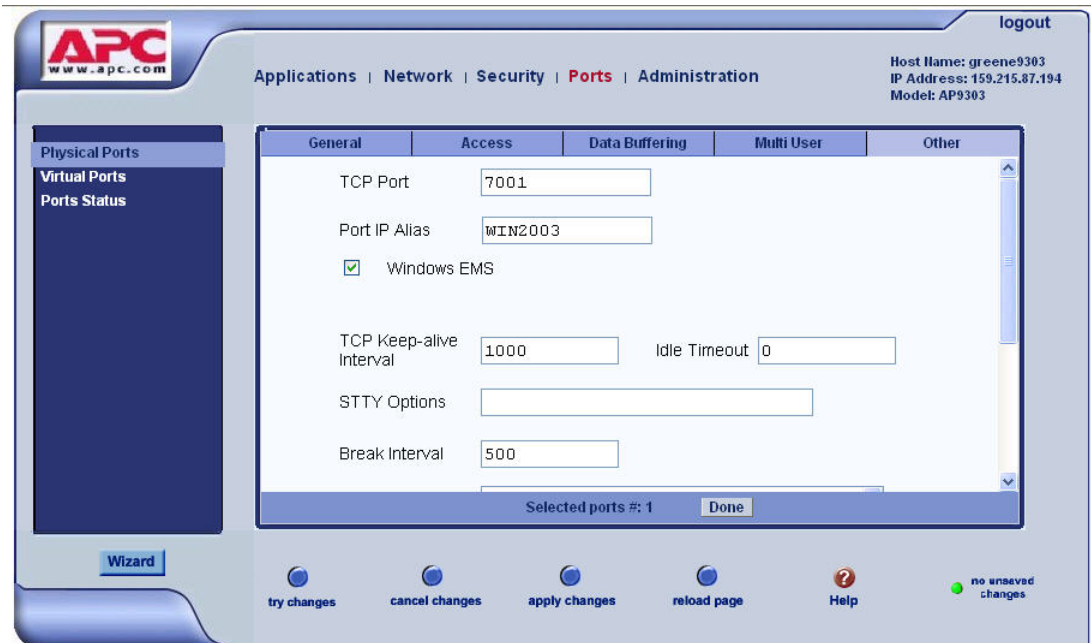
- Set the server's IP address during the initial install

- Reconfigure IP settings to regain in-band connectivity
- Reboot or shutdown the server
- List all used and available resources (physical memory, kernel memory, etc.)
- List all processes, kill them, limit memory usage or change their priority
- Create Command Prompt Channels, for access to the file system.
- Run text-based applications (e.g., trace route, telnet, etc.)

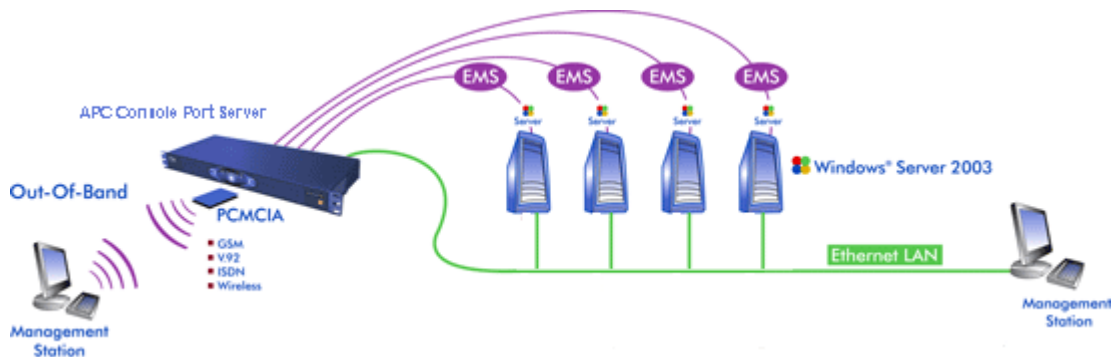
SAC provides the ability to analyze the logs and restart the server even after a Stop Error (i.e., “Blue screen”), though most other features will be disabled. SAC is text-based and command-line driven, very much like DOS.

APC Console Port Servers—Making EMS Easy

Windows administrators are accustomed to graphical user interfaces, rather than command lines. With that in mind, APC Console Port Servers have a browser-based point-and-click interface to SAC, which simplifies server management. APC Console Port Servers include robust security features, such as SSH v2, RADIUS, and LDAP authentication and user access lists per port, allowing data center managers and system administrators to remotely manage Windows 2003 servers with greater control. Management capabilities such as off-line data buffering with time stamps help ensure the data center environment is in compliance with Sarbanes-Oxley (SOX) while automatic scripting of corrective actions, proactive monitoring and support for event notification improves failure response time and decreases server downtime. These features are not available when using Keyboard-Video-Mouse (KVM) switches and remote control software—the management tools commonly used with previous versions of Windows servers.



APC Console Port Servers have native support for EMS protocols and high performance models support PCMCIA slots with support for many interface cards, such as Ethernet, modem (V.90, CDMA, GPRS, GSM and ISDN) and wireless LAN. APC Console Port Servers dual entry redundant power supply (AC/DC) provides increased reliability to the console server, improving availability during critical network infrastructure failures and helping to further automate data center management.



Conclusion

Out-of-band management is an alternative method of managing network components in the event of a network infrastructure failure. Emergency Management Services brings the benefits of out-of-band management to Windows Server 2003 systems, providing access to vital server functions over a low-bandwidth connection, even when the server's network stack and user

interface are down. By adding new Windows systems to APC Console Port Servers, one common technology can be used to reach any server, router or network device within a company, independent of its location or OS through a Web browser or SSH v2 connection. This approach consolidates and simplifies out-of-band data center management and helps contribute to increased uptime and greater IT efficiency.