Remote Network Hardware Management

Tips for managing remote equipment from your desk.

Managing the software on your network servers, changing configuration, and installing patches and updates can be done remotely instead of requiring IT to be next to the hardware. Hardware management, including inspecting and changing the BIOS (Basic Input/Output System), rebooting and power-cycling, and managing serial devices such as routers, requires direct keyboard, video and mouse (KVM) access to the back of the hardware.

Like software-level administration, managing network hardware remotely is no longer a luxury for medium- and large-sized companies. Remote locations often have network hardware that needs management — a router, a switch and servers, possibly point-of-sale devices or ATM machines — but no onsite IT staff. In lights-out (unattended) locations, there may not be anyone that an IT person can talk to regarding operations such as power-cycling. "IT people aren't always where they might be needed," says Steve Burman, regional account manager at ATEN Technology.

Remote Management Within a Facility

Remote management is also increasingly useful to manage hardware in computer rooms and data center systems when IT staff are away from the premises.

"Remote management software is needed to save time and improve productivity," says C.C. Fridlin, director of product management, data centers, at Avocent. "Your desk may be only eight feet from the computer room, but it's still easier to use the remote management tool. People like staying at their desks. And server rooms are often hot and noisy. Working from your desk is more comfortable."

In bigger facilities and campuses, distance becomes a meaningful factor. "If it takes you 15 minutes to walk to the server, versus 15 seconds to open a session, that saves a lot of time," says Fridlin. "We have one customer, a major enterprise, that was able to increase their administrator-to-equipment-managed ratio from 1-to-30 to 1-to-100."

Security is another reason that organizations may prefer IT administration to use remote management solutions, even within a facility, to minimize access to the machines.

Another reason to use remote management rather than direct management is to minimize opportunity for error. "Most errors are human errors," says Fridlin. "Doing things remotely eliminates a lot of errors, since you're doing things by computer name, not looking at physical boxes and trying to correlate them to the one you know has a problem."

KVM Switches and Console Servers

Remote-access programs such as Microsoft Remote Desktop, Citrix GoToMyPC and Symantec pcAnywhere let IT access, control and administer some systems — those that are up, support the necessary software and work well enough to be accessed over the network.

However, many servers and most network devices can't run the necessary piece of a remote access program. And even on computers that can, many IT management tasks, such as changing BIOS settings, installing BIOS or other firmware updates, can't be done from an application or operating-system-level connection.

Managing hardware on this equipment requires hardware-level access. That means a keyboard and video display — and for devices with a GUI (graphical user interface), a mouse or other pointing device. If software installation is needed, USB or FTP access may also be called for.

KVM switches and serial console servers let IT connect multiple devices — typically 8, 16, 32 or 64 — to a master keyboard, video display and mouse, and even more if switches or console servers are daisy chained.

KVM switches, says Avocent's Fridlin, are used to connect to and control devices such as servers, "most often for Windows boxes and some databases, since they're not easily managed via command line." Serial consoles, Fridlin adds, connect to devices through their serial ports. "Serial consoles let you control headless servers with no video like routers, network switches, firewalls and some phone systems."

IT administrators access the KVM switch or console server and control the remote hardware through management software from the switch/console vendor, such as Avocent's DSView 3 software. "DSView provides hardware-level management and access," says Fridlin.

Remotely Managing Via the Network

Historically, the keyboard, display and mouse would connect directly to the switch/console and be used at that site, for example, right at the rack in the computer room or data center.

Increasingly, however, that's not preferable or even an option. This makes remote network management — controlling devices without being at the KVM switch or server console — a necessity.

The simplest, albeit least flexible, degree of emoting can be done by using long cables to the peripherals and possibly a cable extender. This allows the peripherals to be dozens, or perhaps hundreds of feet away, at a desk just outside the data center's locked door or in an administrator's office. **»**

KVM and Serial over IP (IP/KVM and IP/serial), in turn, have loosened the tether much more significantly. IP-based KVM switches and serial consoles let IT administrators connect via the company network, even over the Internet, from a desktop, notebook or tablet computer using the machine's keyboard, display and pointing device.

"IP over KVM and IP over Serial let IT be virtually in the data center, in front of servers, from anywhere outside that they have network or Internet access," says ATEN's Burman. "This makes IT more efficient and reduces downtime."

IP-based KVM and serial switches also allow more than one IT administrator on the network at the same time managing different machines.

Product Offerings

There is a wide range of KVM switches and serial console servers for remote management.

"For GUI-oriented access, you would use our DSR Series KVM over IP appliances," says Avocent's Fridlin. "For serial-console access, you would use our Cyclades ACS Serial over IP appliances. It looks like a terminal session — you run it with an SSH telnet client, and we remote it. We also have complementary products, like our MergePoint 5200 management gateway appliance, for accessing embedded products like HP's iLO (Integrated Lights-Out) management features, which provides secure Serial over LAN (SoL) console access, power control and server hardware monitoring."

Avocent's DSView 3 management software for its KVM switches and serial consoles is intended to be used with a browser from a desktop or notebook, says Fridlin. "We run Java and ActiveX, so the client machine can be Windows or Linux running Internet Explorer or Firefox."

In addition to its enterprise-oriented KVMs and console servers, "We have products for companies with fewer devices to manage, like less than 100 servers: the AutoView 3100 and AutoView 3200," says Fridlin. "These are lower-end KVM over IP switches with all the authentication built into the appliance. It doesn't require our DSView software."

Remote office products from Raritan include the Dominion SX serial console server and the Dominion KSX and XRO, which, according to Al Young, remote office sales manager, "combine serial and KVM so you can have a limited number of serial and KVM boxes at the remote location."

Mobile Devices and Out-of-Band Management

Network problems don't always occur when an IT administrator has access to a desktop or notebook computer or is in the office. Increasingly, IT administrators not only want to be able to administer devices remotely, but also when they're away from their desk, using notebook or tablet computers or even handheld devices.

Some remote-network-management solutions, such as Avocent's DSView 3 management software, are Web-based. Others require specific software such as a Java client. Many remote management software clients require a Windows computer and possibly also Microsoft Internet Explorer. Fortunately, there are several options.

All current handheld computers and smartphones include Web browsers supporting secure SHTTP (Secure HyperText Transfer Protocol) or HTTP-S connections. Phones and wireless-enabled devices can connect to the switch/console using 802.11 Wi-Fi or broadband cellular service, or if need be, out-of-band connections.

Avocent's SonicAdmin software "allows administrators to perform a lot of management tasks on Windows servers using Windows mobile devices.," says Fridlin. "For example, you can reboot or reset passwords, although you can't use it to access the BIOS or watch a boot." SonicAdmin includes the SonicAdmin Server and SonicAdmin Clients, which get installed on IT administrator's Windows Mobile 5 or BlackBerry mobile devices.

For tools that can't run or be directly accessed from mobile devices, remote users equipped only with a handheld device or smartphone should be able to do remote management tasks. This assumes they have the management program on their office computer and are using a remote-access program such as Citrix' GoToMyPC. A remote-management solution also needs to be able to work when the network isn't available. "You need out-of-band tools as well so you can respond," Fridlin points out.

Adding Remote Access to Existing KVMs

"For companies that already have KVM switches, add-on products such as ATEN's KVM on the Net let you add IP access to a KVM switch," says Burman. KVM on the Net is intended to work with most third-party KVMs, not just ATEN KVMs, he notes.

ATEN also offers a CAT5 KVM with a serial dongle. And for use with devices that don't have IP networking, "We have a Power over IP that connects to a serial port, so you can turn their power on and off," notes Joseph Zhang, KVM product manager, at ATEN.

Bandwidth Considerations

Bandwidth is another challenge for remote access, especially when IT administrators have to resort to out-of-band dial. A lot of devices require high-bandwidth connections to support the video portion of IP over KVM. "We're working to improve video compression, so you feel more like you're in the computer room, even over low bandwidth," says Zhang. "And we're working to let our products sense the amount of bandwidth you have."

"KVM is the big bandwidth hog; serial doesn't use anything," notes Raritan's Young. "We can operate well in low bit-rate environments. We do good video compressions so we can even operate into a dial environment. This is important in a remote environment where dial backup matters. When you lose the VPN (virtual private network) or carrier network or leased line, you have to come in via the dial network. We include an integral modem for the connecting device and operate well over that low bandwidth."

So whether your IT administrators are at their desks, or elsewhere, as long as

they've got at least a handheld device and cellular, Wi-Fi or dial-up connectivity, they should be able to manage servers and network gear without having to first get back to the computer room or data center.

"We are experiencing a transition in the way we manage things," says Jeffrey Nudler, senior analyst at Enterprise Management Associates (EMA), based in Boulder, Colo. "We are beginning to see a shortage of skilled personnel for managing networks. You have an expanding need to take care of things that are geographically separated with a shortage of people and the growing cost for travel. So you have to reduce the number of truck rolls going to sites by your people." ◊

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