Avocent

KVM Tech Guide

Five Guidelines for Choosing the Best KVM Switching System

What is Keyboard, Video, and Mouse (KVM) Switching?

KVM switches eliminate extra keyboards, monitors and mice and allow you to save critical space in your data center. They give you powerful BIOS-level access and control of multiple racks of servers from a single console, as well as control from remote locations.

Traditionally, KVM switches have provided many advantages for consolidating control of servers. By connecting directly to the keyboard, video and mouse (KVM) ports of a target device, they provide direct analog control, down to the BIOS level. While analog matrix switching systems provide powerful control for multiple servers, some enterprise customers may require greater scalability. With today's advanced KVM OVER IP™ switches, the concept of flexibility and scalability has been reinvented in the data center. Distance limitations are eliminated. Now you can use the power of IP connections to control almost any number of data center devices, regardless of where they are located. Data center control has never been more flexible.

Whether you need analog access at the rack, in the Network Operating Center (NOC) or any location in the world, we'll explain what to look for in today's KVM switching systems.

at the rack...

in the NOC...

from any location!

The most powerful systems feature KVM OVER IP connectivity. These systems give you the most flexibility and scalability for your data center since they leverage your existing network infrastructure. Today's most advanced systems provide much more than just point and click control for connected servers; they also provide IP-based control of serial devices too.

Leveraging the IP connections you already have, these systems can be expanded to support virtually any number of users and scaled to control an unlimited number of data center devices.

We'll tell you more about how these rapid advancements in KVM switching can result in huge cost savings and deliver a quick return on investment for any business.

"Global access to multiple servers is proving to be a key success factor for many companies," said Lloyd Cohen, Director of Worldwide Market Analysis for IDC. *"The benefits in terms of decreased server downtime and distributed IT control are clear."*
– IDC

What to look for in a KVM switching system

As the number of servers and network devices in your data center continue to grow, you need to know the facts when evaluating a KVM switching system.

This guide will provide you with an overview of KVM switching and the five guidelines to consider when evaluating a switching system for your data center.

Five guidelines for evaluating KVM switching:

- **Scalability** - It's a given your network will expand; choose a switch designed for growth.

- **Flexibility** - Prepare for reconfigurations with TCP/IP infrastructure.

- **Security** - Maintain multi-level security for individual users or use KVM for locked, "lights-out" data centers.

- **Serial Devices** - Don't overlook the opportunity to consolidate control.

- **KVM OVER IP** - Experience the advantage of TCP/IP connectivity.

Five Guidelines for Evaluating KVM Switching

1. Scalability

It's a given your network will expand; choose a switch designed for growth.
As the number of users, servers and network devices grow in your data center, you will need a KVM switching system that can easily expand with your business.

Consider how often you will need to add servers or users. Would you prefer to access your data center devices using TCP/IP connections or do you prefer direct analog connections? Is access at the rack adequate, or do you also need to control servers from 1,000 feet away, or hundreds of miles from your data center?

Ask for TCP/IP connectivity so that adding users and servers is as simple as adding a device on your network. As the data center grows, you can be confident your network is benefitting from the latest advancements since it is based on your existing network infrastructure. IP connectivity lets you avoid rebuilding complex matrix systems as you continually modify your network.

How easy is it to add additional users? Is it necessary for you to pre-define the number of users who will access the system? An IP-based system leverages your network infrastructure; therefore, adding groups of servers is as simple as adding an IP address. An industry standard system that scales with your existing network infrastructure requires that your software interface do the same. Determine if flash upgrades are provided with the system.

It is only logical that you would require a Graphical User Interface (GUI) that would not require re-training your staff. A standard Windows application provides a familiar interface for busy IT staff who need to quickly access and control any network device from just one screen. Avoid proprietary software systems that require re-training.

2. Flexibility
Prepare for reconfigurations with TCP/IP infrastructure.

The need to reconfigure equipment will continue, so today's data center must be designed to protect your investment from the very beginning. Reconfiguration is a fact of life. Prepare for this by choosing a system that is designed for flexibility. Look for standard CAT 5 cabling options.

Ask your vendor how your IT staff will be able to control the connected data center devices. You should be able to easily 'click and connect' to any server or network device from any location. Do you have a choice of IP connectivity or direct KVM access at the rack? Confirm if the system combines this connectivity in one chassis. You can gain flexible control and benefit from a switch that requires minimal space in your rack.

If you choose a KVM OVER IP switch system, determine if it uses a Windows application that provides flexible control for user administration. Does it leverage the security features of your Windows operating system? Can you specify permissions for individual users? And finally, is the firmware and software flash upgradeable?

By giving your IT staff a choice of how they can access and control data center devices, you can improve productivity. By using a standard Windows GUI, your IT staff will be able to quickly begin working with a server management system that does not require re-training. They should be able to work with an interface they already know.

You can leverage your IT resources by avoiding systems that require proprietary cabling systems and on-screen menus, device converters and special DIP switch settings or plug-in cards. These items take up valuable rack space and add hidden deployment and maintenance costs in your data center.

3. Security
Maintain "lights-out" data centers and control access for multiple users.

One of the advantages of a KVM system is the ability to maintain a "lights-out" server room. Because you can extend access to your servers, you can keep your data center under lock and key. If this is your goal, it is important that your KVM system provides advanced security features for individual users. In order to run a "lights-out" facility, your KVM system must perform with absolute reliability and deliver a proven security model.

Ask if your system includes multi-level security. Does it leverage NT security in addition to providing multi-level authentication and encryption? Does the KVM system provide the flexibility to assign individual user rights, or does it only assign permission by group settings?

Regardless of whether or not you choose to maintain a "lights-out" data center, your KVM switching system must provide secure access and control. When evaluating systems, be aware that not all systems are created equally. In addition to features such as privacy and stealth mode, determine if the system provides detailed reporting and event logs. For example, does the KVM system provide you with the activity log from any hour of the day so that you can track users and events in the system?

If your KVM switch is integrated into your network, it inherits many of the aspects of the security model you already have in place. With IP-based systems, users access a switch that is not connected to an Ethernet port on the target computer, only the KVM port. Any system that provides this type of powerful KVM access must also feature multi-level passwords, authentication and the strictest security model.

Finally, ask if the KVM system leverages the industry standard features of Windows already being used in your network with the multi-level security in the vendor's switch.

Providing users with the freedom to access and control any server or network device requires that your KVM system deliver on its promise to enhance, not compromise, your network security.

4. Serial and Multi-Platform Devices
Don't overlook the opportunity to consolidate control.

Today, serial devices and systems that are not PC-based are usually accessed from a separate console or over Telnet sessions. If you are considering a KVM switching system, specify a solution that will integrate with a serial switch for access and control of not only your PC servers, but also your UNIX, Sun and power devices as well.

Also look for a system that provides consolidated control of your serial devices from one central Windows application over IP connections. Ask if the system provides a consolidated GUI to servers with SSL encryption on direct Telnet sessions.

Multi-platform control is important.

Because the world is not only comprised of PCs, you need a system that is designed for multi-platform control. The majority of your data center may be PC-based, but you can easily predict that your network will involve multiple platforms and operating systems.

Look for a KVM switching system that is designed to provide a centralized view of all of these devices. You should ask your vendor if you can easily use one console to gain BOOT level control of any device, including PS/2, USB or Sun computers.

Another important consideration is choosing a system that is *certified* to support Windows, Windows NT, Windows 2000, Novell, UNIX and Solaris.
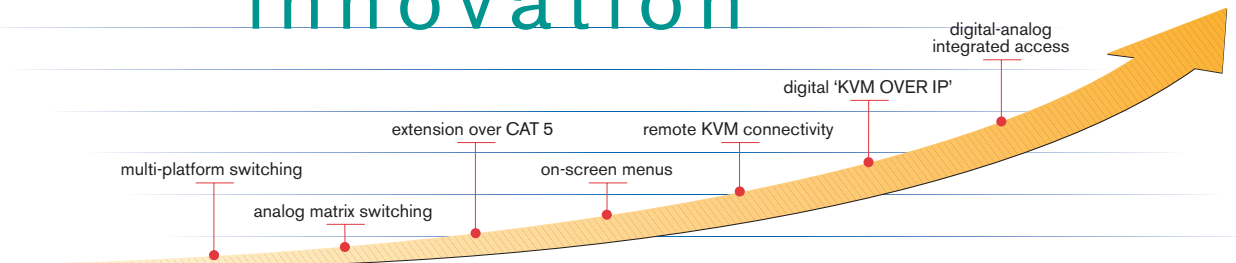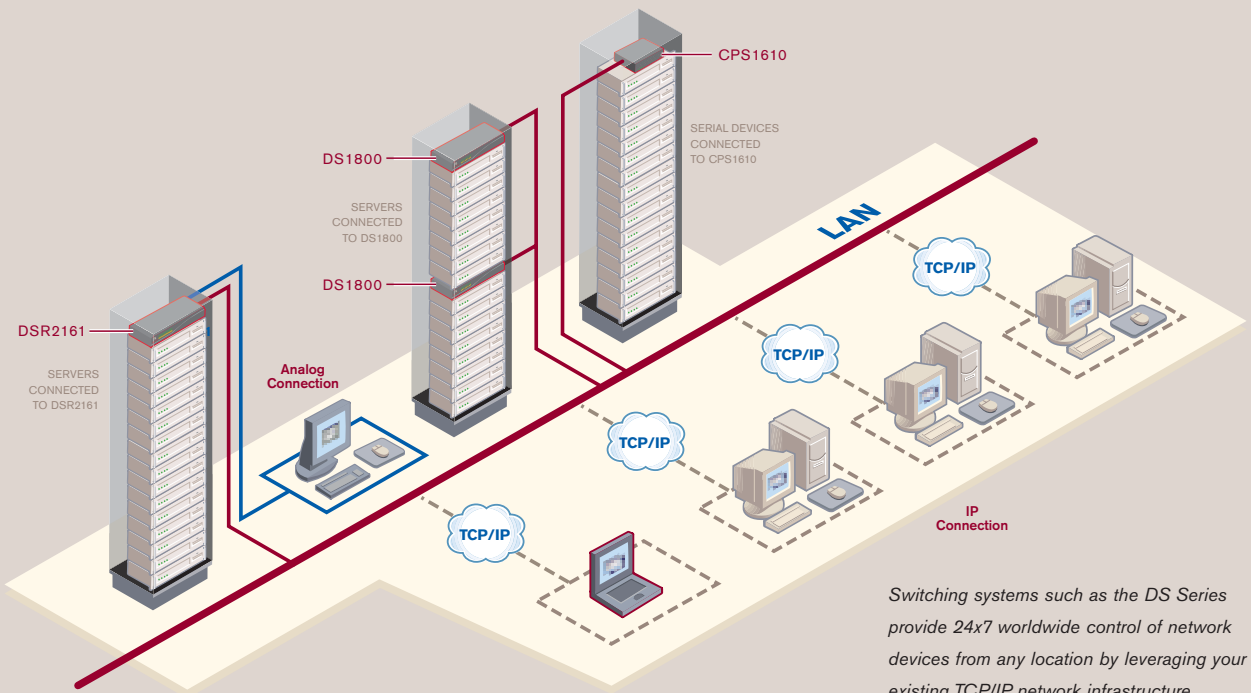
"The Avocent DSR Series is a logical follow-on from the digital KVM leaders, making global server access and control accessible and practical for a broader range of data center environments."

– IDC

A HISTORY OF
innovation

digital-analog integrated access

digital 'KVM OVER IP'

extension over CAT 5   remote KVM connectivity

multi-platform switching   on-screen menus

analog matrix switching

CPS1610

DS1800

DS1800

DSR2161

SERVERS
CONNECTED
TO DSR2161

SERVERS
CONNECTED
TO DS1800

SERIAL DEVICES
CONNECTED
TO CPS1610

LAN

Analog
Connection

TCP/IP

TCP/IP

TCP/IP

TCP/IP

TCP/IP

IP
Connection

Switching systems such as the DS Series
provide 24x7 worldwide control of network
devices from any location by leveraging your
existing TCP/IP network infrastructure.

5. KVM OVER IP
Experience the advantage of
TCP/IP connectivity.

If you prefer absolutely no distance limitations, consider a
'KVM OVER IP' switching system that provides secure and
centralized control of servers from any location on your network.

Leverage your existing infrastructure. With KVM OVER IP
switching, adding users or servers is as simple as adding an
IP address. KVM OVER IP switching systems have redefined
the concept of flexibility and scalability in the data center.
Now, your IT staff can access and control almost any server or
network device from any location!

If you prefer IP connectivity, ask if the system is centralized with
a Windows application and not proprietary software. A standard
Windows application that simplifies access and control of any
network appliance is critical for point and click administration.
Adding serial devices such as power devices, firewalls and
routers should only require a few clicks of the mouse within
one centralized Windows application.

Avoid systems that require you to specify the number of servers
and users you have today. It is difficult to predict how many
servers you will install in your network, but vendors who provide a
wide range of solutions can help you plan for future growth.

A system that leverages your TCP/IP connections also
enables you to maintain interoperability with today's industry
standards. As the data center grows, you can be confident
that your network is benefitting from the latest advancements.

Customers Worldwide Achieve Cost Savings with KVM

Warranty Corporation of America realizes ROI in 4 months

Data center growth in excess of 480 percent would stress any IT department. Some might panic, some might start on a hiring binge – some take the opportunity to look at overall efficiency and seek out better, more efficient ways to make it all work. When Warranty Corporation of America's (WaCA) success had it growing at a rate of nearly 200 percent, their offices were squeezed out of the building that housed the data center and their IT department was being stretched thin. They were faced with cross-campus, 'sneaker-net' commutes to the 2000 square-foot data center that houses 62 hard-working mission-critical, 24/7 servers. WaCA knew there was a better way; they just needed to find it.

They started researching remote access solutions and quickly realized that the security and reliability of a hard-ware-based solution was a must. When WaCA made the choice to go with a digital KVM solution built on Avocent's DS1800 digital KVM switches, they estimated their initial investment of $70,000 to set the system up would be recouped in six months. After further analysis and realization of the potential cost savings for a high profile and time sensitive internal project, WaCA revised that ROI down to 4 months. New numbers project that the DS1800 will save WaCA more than $25,000 each month during the project timeline!

"We decided that the best response to increased demands on the systems and staff in the IT department would be to add a combination of technology and people. The efficiencies that this system bring are just amazing."

- Al Edwards, Warranty Corporation

Microsoft

"*Avocent has showcased its KVM switching solutions in the Microsoft Partner Solution Center in Redmond for the past two years, which has given developers a unique opportunity to configure real-world applications using Avocent's data center solutions,*" said Steve Bauman, General Manager of E-commerce Solutions at Microsoft Corp. "*We are pleased to see Avocent participate in this center, which will provide similar opportunities for e-commerce clients in the Mountain View area to see firsthand Avocent's innovative remote access solutions.*"

– MICROSOFT

"*We like the ease of management and consolidated control that the DSView application provides with DS1800. We like the way Avocent has integrated CAT 5 cabling into their DS Series and continued to centralize control with one application.*"

INTERNET SECURITY SYSTEMS™

"*With Avocent's DS1800, our administrators can use IP connections to gain complete control of the Microsoft® NT or Sun® servers from just one console,*" said Patrick Tierney, system administrator at Internet Security Systems, Inc.

"*We chose DS1800 because of its scalable TCP/IP design and ability to provide BIOS level control of any server, from any location as well as the ability to easily add administrators - with unique security privileges - to the system in the future.*

– ISS

VeriCenter

"*DS1800 gives us the ability to access and administer our servers regardless of where they are located,*" said Ron Pollvogt, Vice President of Product Management for VeriCenter. "*We can securely manage our customer environments from our network operations centers without the distance and space limitations associated with legacy KVM technology. The installation of the DS1800 was easily accomplished and I have been very impressed with the quality of support VeriCenter has received.*

– VERICENTER

MetroRED®

"*The DS1800 system allows our administrators to easily control servers in our Internet Data Centers and Network Operation Centers (NOCs) throughout Latin America, where 24/7 access and control is critical,*" said Enrique Fornonzini, Vice President of Sales and Marketing at MetroRED. "*DS1800's scalable design gives us the flexibility we need to accommodate future growth in each region. MetroRED will now be able to easily manage and control thousands of servers and devices located in these three countries.*

– METRORED

Two and four-port switches reduce desktop clutter

Avocent's SwitchView product line offers On-Screen Display with the OSD model, desktop and monitor stand flexibility with the DT model, enhanced security switching with the SC model and true multi-platform support with the innovative desktop MP model.

Proven analog switching systems for multi-platform data centers

Avocent's AutoView, OutLook, ViewPoint and XP4000 switches provide unparalleled access to racked or grouped servers. These product lines support multiple users, multi-platform integration and offer the benefit of CAT 5 extension. Designed for dense rack environments, these switches are available in a variety of models to consolidate control of hundreds of servers.

KVM OVER IP switching systems

Avocent's DS Series provides secure control over TCP/IP connections, for maximum scalability and flexible control with a single Windows interface. The DSR switches combine powerful digital and analog technology for access and control of servers at the rack, in the NOC or from any location in the world. Avocent's DS Series includes: DS1800, DSR1161, DSR2161, DSR4160, CPS810 and CPS1610 network appliances.

Distance limitations eliminated with proven capabilities of KVM OVER IP

The most advanced KVM OVER IP switching systems combine powerful digital and analog technology in one switch. These systems eliminate distance limitations for IT staff - access and control are possible from the desk, the NOC or any location in the world. Systems that are integrated with a Windows application provide more secure and powerful control. How does a true KVM OVER IP switch system work?

- The analog signals are captured from a keyboard, monitor and mouse.

- The signals are converted into digital packets.

- Once the signals are digitized, the signals are compressed and securely transmitted across TCP/IP connections.

With the combination of a KVM OVER IP switch and a Windows application, it is possible to access and control servers from any location. You can even control multiple computers on one screen.

IT staff can access and control almost any server or network device, from any location, using a Windows interface they already understand.

Systems that include a standard Windows application can provide access and control of not only servers, but also serial devices and power distribution units.

True KVM OVER IP switch systems provide a compelling solution for controlling the costs of managing critical network devices, regardless of the location of the server or the IT staff. These systems make it possible to consolidate control when resources may be limited.

The Many Advantages of KVM

- Allows multiple sets of keyboards, monitors and mice to be replaced with a single set of peripherals

- Provides easy access and control to any connected CPU

- Requires no special software or hardware modifications to the target computer

- Saves space and money by eliminating redundant peripherals and wasted space

- Provides access to multiple platforms within one switching system

Choose wisely, choose a proven partner in the industry

Avocent is the largest and most experienced KVM vendor today. For more than 20 years, we have been providing IT managers in any industry with access and control of multiple servers and network devices. With thousands of installations worldwide, Avocent has the experience to help you custom design a KVM switching system for your data center.

Avocent continues to introduce new technology that advances the KVM industry. Now more than ever, IT managers have a choice for how to manage growing data centers.

Avocent's proven solutions for managing servers and network devices include: DS Series - DS1800, DSR1161, DSR2161, DSR4160, CPS810/1610; SwitchView; AutoView; LongView; OutLook; ViewPoint and XP4000.

Avocent was formed in the year 2000 by the merger of leading industry innovators Apex Inc. and Cybex Computer Products Corporation. Headquartered in Huntsville, Alabama, Avocent has locations in Redmond, Washington; Austin, Texas; Chelmsford, Massachusetts; Sunrise, Florida; London, England; Shannon, Ireland; Steinhagen and Munich, Germany; China; Singapore and Tokyo, Japan.

For more information about the

KVM switch or network appliance that

best meets your needs, contact

Avocent for a consultation today:

1-866-286-2368

Visit us online at

www.avocent.com