



KVM over IP Comparison

What other KVM companies aren't telling you.

Avocent pioneered KVM over IP technology several years ago while other KVM companies focused their efforts on older analog technology. Some of these same KVM manufacturers are now starting to experiment with KVM over IP technology. This document highlights the key areas that customers should understand about this technology and looks at how these new KVM over IP solutions stack up.

SECURITY

Many of the companies that promote KVM over IP products do not incorporate the security features that you expect to find in equipment used to manage critical servers. Here are just a few examples. Companies that *appear* to offer similar solutions...

- **Fail to provide a centralized authentication** and force users to log into each separate appliance every time a connection is made. This requires many repetitive tasks to maintain user permissions across multiple appliances. If user permissions change or need to be removed, each KVM box will need to have that user name and password added or deleted.
- **Fail to support different authentication** models or do not operate with any existing authentication models such as LDAP, NT Domains, Active Directory, and Radius. This limits the flexibility of the solution by not allowing customers to use security or access and control lists that exist.
- **Fail to offer a moderated security model to audit and manage connections.** Many of these new products rely on browser connections made directly to each box. Allowing direct connections to the appliances means that anyone with a browser and the IP address of the appliance can interrogate the appliance directly to gain access.
- **Fail to provide centralized management** or require the use of expensive additional hardware to ease the management of their digital KVM switches. The absence of centralized management requires each piece to be managed separately. Management appliances do provide centralized management, however they create a single point of failure and require multiple pieces of expensive hardware to add redundancy.
- **Fail to provide authentication fail over capabilities.** This means that if the users can't authenticate to the primary authentication they cannot access any of the attached servers. Others fail over to a direct connection model if the central authentication is unavailable; this means that users trying to connect are forced back to connecting and authenticating to each individual digital KVM product.

The Avocent DS Series has the important security features you expect to find in an enterprise solution. It includes centralized authentication with support for LDAP, NT Domains, Radius, and Active Directory; a moderated security model that eliminates direct communication with the appliance before credentials are cleared; no hidden hardware cost for centralized management; and fail over authentication to a backup if the primary is unavailable.

COMPRESSION ALGORITHM

The method used to compress and digitize analog KVM signals is made up of three closely-related parts. Most companies do not effectively balance this relationship, which dramatically affects the remote user experience and performance. Avocent is the only company with a patented compression algorithm. Mouse latency, video quality/speed, and bandwidth consumption are all related to producing a quality customer experience when using a digital KVM switch. Other company's digital compression methods do not address all three parts equally. This results in a KVM over IP product that suffers from poor video and mouse tracking problems. Here are a few examples of tradeoffs that are made to improve performance and reduce bandwidth consumption...

- Network traffic can be greatly reduced by **limiting the number of colors that are transmitted**, so color depth and video quality are often neglected. While this conserves the packets that are sent, the result is inaccurate video with low color depth and the omission of various shades or variants of colors.
- Several compression algorithms simply **ignore small changes in the video output** in order to speed up performance and save bandwidth. This usually results in artifacts, or large pieces of data, left on the screen because the video change was not large enough to be detected. By not recognizing or acknowledging certain small changes in video, companies are able to speed up their performance without using more bandwidth.
- **Mouse latency**, which is the delay between the local and remote mouse pointers, is a common problem with digital KVM. Alignment issues and slow mouse performance are present if the local and remote mice signals are not communicating at fast enough rates. Because there is ongoing communication across the remote user, the KVM appliance, and the target device, shortcuts in this area result in constant alignment issues or the inability to sync the local and remote mouse pointers for extended periods of time.

Many of the companies with new KVM over IP products have made various tradeoffs in order speed up development and release products. The Dambrackas Video Compression (DVC) algorithm from Avocent maximizes all three key components to provide premium video quality with fast and accurate screen updates, excellent color fidelity, extremely fast mouse response, and minimal bandwidth consumption. Avocent invented digital KVM compression and has continually researched and improved the performance and the relationships between all of these critical pieces.

DIGITAL CAPABILITIES

Companies that claim to offer a KVM over IP switch often have appliances with limited digital connections. Most of the products are limited to one or two digital connections at a time. This restricts how many users can connect and manage the attached servers at a given time. For example a 32-port product that has 2 digital channels can only provide access to 2 servers at a time. This means that 30 servers will be unavailable or “blocked” from other remote users until one of the digital connections is not in use. In the area of digital capabilities other companies...

- **Fail to offer independent local and remote access.** The local user and remote user on some products share a single “path” to the connected servers. This means that the local and remote users are unable to have connections to different servers at the same time- if either is in use all of the other attached servers cannot be connected to by any other users.
- **Fail to offer cost-effective solutions for both small and large applications.** Many companies in the KVM market offer a handful of solutions. Therefore, products designed for main data center applications do not have the features or price point to address smaller remote locations with only a few devices. At the same time, products designed for small installations lack the management, security, and authentication features required for larger customers with multiple sites and hundreds of servers.
- **Fail to offer direct connection and support for USB or Sun computers.** PS2 and VGA are the default connections that all KVM companies can connect to and manage. The use of adapters is a common approach to expand the range of connection types. But, simply converting all types of connections using external adapters will limit or compromise the necessary native support and add additional expense to the solution.
- **Fail to provide more than one or two remote connections per appliance.** Decisions about the required digital capabilities should not be made without carefully considering the number of servers attached to each appliance and the number of general and administrative users that will need access. Companies with limited product offerings force decisions to be made on what is available rather than what is required.

Avocent has an expansive KVM product range that includes 1, 2, 4, or 8 digital path appliances, providing more digital capabilities than anyone else in the industry. Avocent solutions are designed to fit customer requirements from small branch offices to medium-sized regional offices and large primary data centers. Product users benefit from CAT-5 based adapters that support PS2, USB, Sun, and even VT100 serial devices. No other company comes close to the digital capabilities, the range of solutions, or variety of connections that Avocent has to allow multiple users to support a variety of platforms and devices regardless of their location.

FIELD-PROVEN TECHNOLOGIES

Other companies have developed and marketed KVM products, however all of them have one thing in common – analog solutions. Analog and digital KVM technology are vastly different and experience in one does not equal experience in the other. Traditional KVM companies that are unfamiliar with networks and digital KVM technology face a steep learning curve before they can properly support their customers buying their new KVM over IP products. Many companies that are just starting to experiment with digital KVM technology...

- **Do not have the software and management features** to meet the requirements of global installations or even large single site installations. Companies that lack the necessary management features in their products will often force the customer to perform many manual and repetitive steps during installation.
- **Fail to have real world experience supporting digital KVM installations.** New customers may have a difficult time getting questions answered because the KVM manufacturer is often in uncharted waters. New customers with critical installations can't afford to hear "I am not sure... let me check into that and get back with you....."
- **Fail to have a proven track record** and are likely to have initial bugs or reliability issues. Mission-critical servers and data centers cannot be the testing ground for new unproven products and technology.
- **Fail to have an install base** to help guide the direction of the product features and user interface. Most technology products are refined and enhanced after their initial release based on real customers using the products in a variety of applications for long periods of time.

Avocent is the only KVM over IP innovator with years of experience developing and supporting digital KVM switch technology. Avocent DS Series KVM appliances are installed in thousands of data centers throughout the world and manage hundreds of thousands of mission-critical servers and other data center devices. Our Field Engineers, Customer Service, and Tech Support are all very familiar with the technology and have years of experience assisting customers with basic installation questions or even global deployments.

Avocent invented and patented KVM over IP and is the most experienced KVM vendor today with the largest install base in the world. Clients include a growing number of Fortune 100 and Fortune 500 businesses. The DS Series appliances from Avocent offer superior performance and functionality stemming from thousands of installations and years of development. The DS Series includes enterprise class security, the highest digital capabilities available, an advanced compression algorithm, and a wide variety of field proven solutions. For more information about the KVM over IP solution that best meets your needs, contact Avocent today for a consultation.

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