BLACK BOX WHITEPAPER:
BRIDGING THE GAP BETWEEN PHYSICAL AND VIRTUAL SERVERS

LEAVE THE TECH TO US
BLACK BOX’S EMERALD™ KVM FAMILY SUPPORTS TRANSITION FROM PHYSICAL DEVICES TO THE HYBRID WORLD OF PHYSICAL AND VIRTUAL NODES

KVM has become an integral part of many facilities, allowing operators to locate computers away from work environments. On top of that, KVM technology has enabled many users to access multiple computers when they need them — sharing resources in a "virtual" manner. These improvements in operational workflow save hours every day and increase hardware resilience. KVM technology allows users to switch between, and share, expensive machines and resources. As the industry continues to embrace virtualization, KVM technology needs to become a future-proof solution that provides "virtual access" to both physical and virtualized servers and machines.

PHYSICAL VS. VIRTUAL SERVERS: THE PROS AND CONS

While virtualization is steadily making its way into most businesses, a strong case can still be made for using physical machines to store and analyze data. Here’s a breakdown of the pros and cons for both types of servers.

A CASE FOR (AND AGAINST) VIRTUALIZATION

Many companies are being driven to virtualization to lower overhead and hardware costs. Since virtual machines are more economical than traditional servers, this technology has captured the attention of businesses looking to reduce IT expenses. Virtualization is the future — replacing physical servers with a centralized system management platform that improves performance, availability and scalability. Without the need to install and manage multiple servers, businesses can reduce time-consuming processes and total operation costs.

Virtualization also consolidates data by housing workloads from multiple servers in one location. That brings us to a leading benefit of virtualization: easier management.

Businesses searching for ways to improve workflow and decrease downtime will find them through a virtualized system. For example, they can upgrade this type of system with more application resources without having to stop operations. Whereas physical servers are nearly impossible to upgrade without downtime, virtual machines give businesses the flexibility to scale up and down based on demand.

Virtual servers are also:
• Ready to work immediately
• Able to be used without prior inspection
• Easier to back up and restore
Even with these benefits, virtualization isn’t without challenges. The upfront cost to implement this type of system can be steep, often more than what it costs to upgrade to new servers and desktop applications. It’s important to think of virtual servers as a long-term investment that will pay for itself over time.

Control is another potential drawback. Virtual servers are easy and affordable to create, causing many businesses to take measures against “virtualization sprawl” — the development of rogue machines without proper procedures or control. When unplanned servers start dominating the data center, companies are apt to waste money, productivity and valuable resources.

Virtualization can also cause resource contention. When workloads increase from one virtual machine to another, competition grows for shared resources, such as CPUs and memory. The problem is that there aren’t enough resources to meet demand, leading to performance degradation. Performance issues, such as latency and bottlenecks, can also occur when servers compete for input/output on the same physical disk.

A CASE FOR (AND AGAINST) PHYSICAL

There are still solid reasons for using a dedicated server. Virtual machines rescind control from operators, but physical servers give IT teams full access to system resources at all times — a critical advantage for different business operations. A physical server can also be fully customized and configured to a company’s exact needs and specifications.

Physical machines also boast a great deal of power. Without the same performance shortcomings as virtualization, dedicated servers often provide better and faster processing. Businesses that prefer raw power over flexibility and scalability will benefit more from a physical system.

Physical servers have numerous disadvantages, most of which have been resolved through virtualization. For one, physical machines don’t share the same economic qualities as their virtual counterparts. While virtual servers are a long-term cost-saving investment, physical machines need frequent maintenance and upkeep. There’s also the possibility of hardware failure and subsequent costs for repairs and potential server replacement.

Physical servers also aren’t as flexible. Unlike with virtual machines, you cannot scale storage in small increments once your workload reaches its max. You’ll also need to plan for extra downtime if you make upgrades. Physical servers must be shut down prior to any hardware enhancements, which will halt production and likely cause financial losses.
THE VERDICT
Choosing the right type of server depends on several requirements, including cost, resources and performance. Many companies are using a hybrid approach to get the best of both options, but virtualization is quickly taking over. In fact, the fifth annual Cisco Global Cloud Index projected that cloud workloads would more than triple between 2014 and 2019. With a growing demand to do more with fewer resources, many businesses are searching for solutions that will streamline and future-proof their operations.

The Black Box Emerald™ KVM Platform — a flexible and future-proof system that enables users to access physical or virtualized systems over an IP infrastructure, or a proprietary network — is an effective tool to help businesses go virtual.

EMERALD IN THE CONTROL ROOM
Fast-paced, ever-changing control room environments can be challenging for planners, operators and IT administrators. With Emerald, you can easily meet the future requirements of modern AV technology and user friendly interfaces. Providing access to multiple physical and virtual machines from a single monitor allows operators to move smoothly and quickly from one computer to the next. Emerald enables users to route and re-route AV and content, as well as add and remove screens and interfaces at their convenience.

CAP AND GROW
Many businesses are turning to digital KVM to grow their current systems. It’s easy and affordable to expand a small platform, but larger systems with hundreds of servers and many user stations, are not as simple to upgrade. In that case, you can “cap” your existing system and “grow” it with a new IP-based platform, such as Emerald. That way, you can avoid investing in old technology while using new solutions to keep your system in play.

EMERALD FOR OLD HARDWARE CONSOLIDATION
Emerald allows operators to add apps to virtual servers from machines or computers they no longer need. In turn, they’ll have one less piece of equipment to maintain.

EMERALD FOR DISASTER RECOVERY
In response to a catastrophic event, Emerald facilitates a fast transition from the primary site to the disaster recovery location. Once there, typical master control systems operate on virtual machines running on common COTS server hardware.

Emerald provides access to disaster recovery systems through virtual machines either directly via the DR facility network or remotely across the company WAN. The ability to interface with the DR systems remotely can prove invaluable, particularly during the transition of services to the DR facility, and restoration at the end of the event.

EMERALD APPLICATIONS
Emerald can be used across multiple industries and professions. By serving as a direct portal to virtual machines, this technology enables users to increase efficiency, improve performance and lower costs.

MOBILE BROADCASTING
Emerald can help outside broadcast vehicles and satellite news-gathering vehicles replace heavy computers with a single server that manages multiple machines.

GRAPHIC DESIGN
Graphic designers in different offices or locations can share expensive software on one or more computers, with no adverse effect on display or usability.

EDUCATION
From K–12 to higher education, Emerald reduces equipment costs by giving students and educators simultaneous access to remote computers.

MANUFACTURING
With an Emerald transmitter, manufacturers can move vulnerable equipment to a secure, climate-controlled room free of noise, vibration and dust.

ENGINEERING
Engineers can use Emerald to access simulation servers from a remote location, helping them save time and boost productivity.
WHAT MAKES EMERALD UNIQUE?

With multiple managed transmitter and receiver units, Emerald™ integrates KVM switching and virtual desktop technology. The receiver connects to the “remote” physical PC over a TCP/IP network or a virtual desktop using standard RDP or PCoIP protocols. The transmitter converts the video, audio and USB connection of a PC or workstation to a format that can be connected and controlled over a TCP/IP network.

Emerald provides the user the same experience as if sitting directly at a PC. Black Box’s advanced compression technology delivers low latency and low bandwidth to allow flawless operation, even over standard corporate networks. Multiple keyboards, mice and headsets can be connected to the receiver with other USB devices, such as scanners, printers and smartphones.

Emerald provides the ability to future-proof a deployment even if virtualization is not needed immediately. Whether a new virtualized master control room is on the agenda or not, customers often desire to move legacy applications or services to virtual machines. This move is an effort to protect existing investments and minimize any porting costs that can occur as old hardware becomes obsolete. Emerald provides the unique ability to repurpose KVM to support these new virtualized workloads as well as physical resources.

Add the award-winning Boxilla™ KVM manager to your Emerald matrix to manage and monitor up to hundreds of endpoints. Boxilla facilitates maintenance and deployment of new user stations and servers, allows you to monitor and control network load, and enables intrusion detection via automated alerts.

BRIDGING THE GAP BETWEEN PHYSICAL & VIRTUAL SERVERS

Many businesses are attracted to virtualization because it saves time, money and space. The downside is that most KVM solutions don’t support virtualized interfaces or targets. To help our clients virtualize their assets, we’ve paired the technologies of our DKM, Emerald, and Boxilla systems. With Emerald, you can smoothly move your applications and systems to the cloud for more efficiency and flexibility. Once everything is virtualized, you can use Boxilla, an enterprise KVM and AV/IT system manager, to access and manage up to thousands of devices at once. When your DKM works with these platforms, you can expand it beyond private networks and connect it to other DKM systems — virtually and across the internet. With virtual access to servers, companies can improve operational workflow and increase resilience, saving hours of work every day. It’s also possible to share expensive machines and applications when you move to virtualization, which leads to even greater cost savings.