



Got Blades?

A Raritan Blade Server Solution Technical Brief

Market Overview

Data centers are running out of critical resources — space, power, and cooling — even while the need for computing power continues to grow. To help address this dilemma, businesses are increasingly deploying blade servers. Besides providing space savings, blade servers drastically reduce the number of physical network, power, and storage interconnects, and potentially simplifies server deployment, troubleshooting and repair.

According to Gartner, blade servers represent the fastest-growing server segment, lead by IBM, HP and Dell; and will rise to 20% of all server shipments in 2012.

However, data center infrastructure managers continue to discover that blade servers also create complexities of their own:

- ▶ **Remote server administration becomes more difficult**, because blade systems add yet another vendor proprietary technology and management system to the already complex server mix. Today's data center comprises a jumble of heterogeneous server platforms: multiple generations of rack-mounted servers and blade servers coexist, each from different vendors whose proprietary architecture dictates different ways to access and manage them. Further, virtualization from VMware, Xen, Microsoft, etc. decouples logical servers from their underlying physical units. As a result, a proliferation of remote access methods used by different groups of users must be managed: in-band tools such as RDP, VNC, and SSH; embedded service processors such as HP iLO, IBM RSA, Dell DRAC and IPMI; VMware client and web access; out-of-band KVM and serial access; and blade management systems.
- ▶ **Local blade access is cumbersome and insecure**. Direct access to servers inside a data center is a necessity for day-to-day maintenance or emergency access in the event of local area network interruption. When a user interacts with a blade chassis using a keyboard, mouse and monitor, only a blank screen welcomes him; users must navigate to the intended blade with a cryptic set of hotkeys which vary between manufacturers. Worse, from this local interface, users cannot determine how many blades are healthy, nor which exact blade he is currently controlling.
- ▶ **Security is compromised** due to lack of centralized user authentication, authorization and audit logs when using multiple access methods. Because so many different methods can be used, there exists no central access control or auditing of server access activities performed on blades.

Raritan Blade Server Solution

Raritan's Blade Server Solution provides customers with at-the-rack, IP and in-band access to the leading blade servers from IBM, HP and Dell. By consolidating physical and LAN connections, Raritan Blade Server Solution provides a single, reliable, secure method for accessing data center elements — whether physically at the rack; or via TCP/IP from the office, at home, or the road.

A turnkey digital KVM appliance, Dominion KX II alone can provide at-the-rack access to blade servers in the data center, as well as remote TCP/IP or dial-up modem access. This configuration is ideal for a small data center or computer room.

For larger environments, Dominion KX II integrates with Raritan's centralized management appliance, CommandCenter Secure Gateway, to provide the most powerful enterprise data center management solution. Ideal for enterprise data centers, or multiple data centers in geographical dispersed locations, CommandCenter Secure Gateway consolidates all server management tools (including 3rd-party solutions) into a single, convenient, secure portal.

Local (at-the-rack) Blade Server Access

Although proprietary in nature, blade servers from leading manufacturers such as IBM, HP and Dell, share similar management features. A complete blade unit consists of the blade chassis, individual server blades, a management module, and possibly a KVM module. The blade unit will generally provide physical KVM ports, but these critical ports may be provided on the chassis, management module, KVM module, or even on the server blade itself — sometimes requiring an additional adapter from the manufacturer.

Raritan's Blade Server Solution interfaces with blade servers through both a physical KVM connection and a LAN connection. The Dominion KX II KVM-over-IP switch physically connects to the KVM ports on the blade unit through a Raritan Computer Interface Module (CIM) to enable BIOS-level access to the individual blade servers.



Figure 1. Dominion KX II provides out-of-band access to blade servers by physically connecting a Computer Interface Module to the blade chassis.

Dominion KX II presents a graphical user interface (Figure 2) displaying the hierarchical view of the blade chassis and the individual blades. Users can access the individual blade servers simply by selecting from the interface. The blade status is updated dynamically when configured for auto-discovery, and all requisite switching commands / hotkeys are automatically handled.

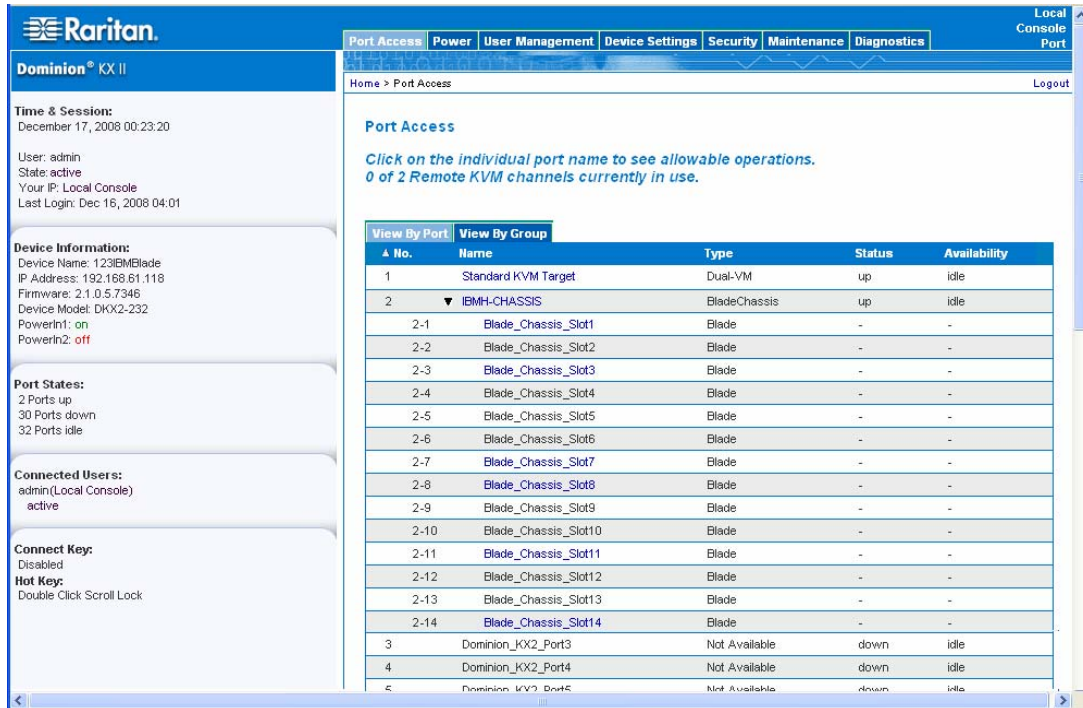


Figure 2. Dominion KX II features the industry’s first and only browser-based local access interface. Intuitive and common to the remote access interface, it provides full administrative functionality. IT administrators can access blade servers without needing to memorize cryptic hotkeys.

Dominion KX II enforces stringent access security far beyond that provided by the blade manufacturers themselves, even when users are physically located at the rack. Users must sign on to Dominion KX II and are authenticated against either Dominion KX II’s own local database, or against centralized AAA servers such as LDAP or AD. User permissions can be precisely configured on a per blade basis. Administrators have the option to block hotkey execution to prevent unauthorized switching. And audit logs insure accountability by capturing all blade switching activities of every user.

Remote Blade Server Access via Dominion KX II (Standalone Mode)

Besides consolidating and securing access to the individual blade servers at the rack, Dominion KX II also remote users with a simplified yet secure access methodology to blade servers – down to the BIOS level – via TCP/IP or modem.

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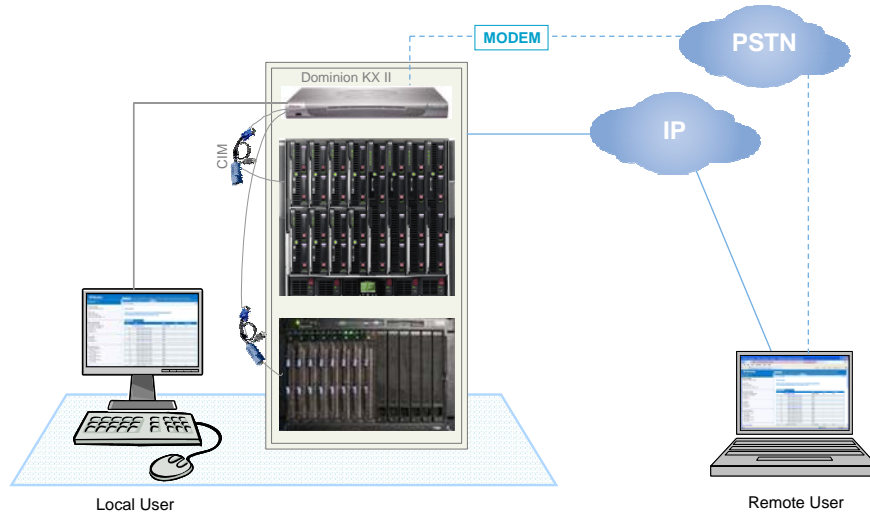


Figure 3. Standalone Mode – the Dominion KX II KVM-over-IP switch provides full blade support without requiring the use of a separate management system. Dominion KX II provides BIOS-level access and control of the blade servers at the rack, over TCP/IP, and via modem.

With an intuitive graphical interface that is almost identical to the local interface, the Dominion KX II switch masks the complexities of the various hot-key switching mechanisms from different blade manufacturers. Users can easily switch to a blade using its name or the slot number – while retaining an extremely high level of security.

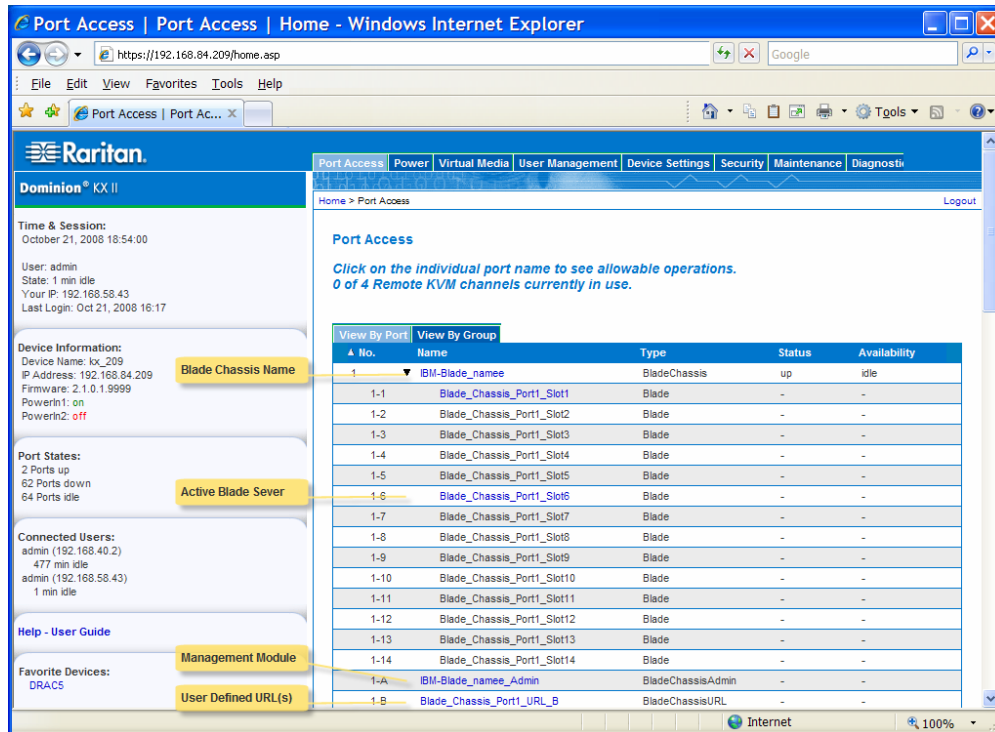


Figure 4. Dominion KX II's remote access interface provides a hierarchical display of the blade chassis and servers, as well as convenient links to Blade Management Modules and up to three user-defined URLs.

The Raritan Blade Server Solution can provide multiple advanced services when the customer configures secure access to his blade server's management module. So long as the blade server provides these capabilities over the network, Dominion KX II can consolidate remote access to the management module, automated blade discovery, dynamic blade server status, secure blade switching, and even virtual media.

Unlike competing offerings, the Raritan Blade Server Solution provides these powerful blade capabilities without requiring the use of a separate management system: all these capabilities are enabled on every Dominion KX II unit out-of-the-box. Small and medium business (SMB) customers can leverage the power of blades with a simple and low-cost configuration using Dominion KX II alone. Later, as they grow and scale their business, they can evolve to a centralized management system over time. Enterprise customers can also leverage this "standalone mode" if the network infrastructure ever becomes compromised.

Remote Blade Server Access via Dominion KX II & CommandCenter Secure Gateway

Raritan's CommandCenter Secure Gateway (CC-SG) management system incorporates and expands the power of Raritan Blade Server Solution even further. From a single interface, users can access blade servers, rack servers as well as virtual servers in the same data center, or from multiple data centers in geographically dispersed locations.

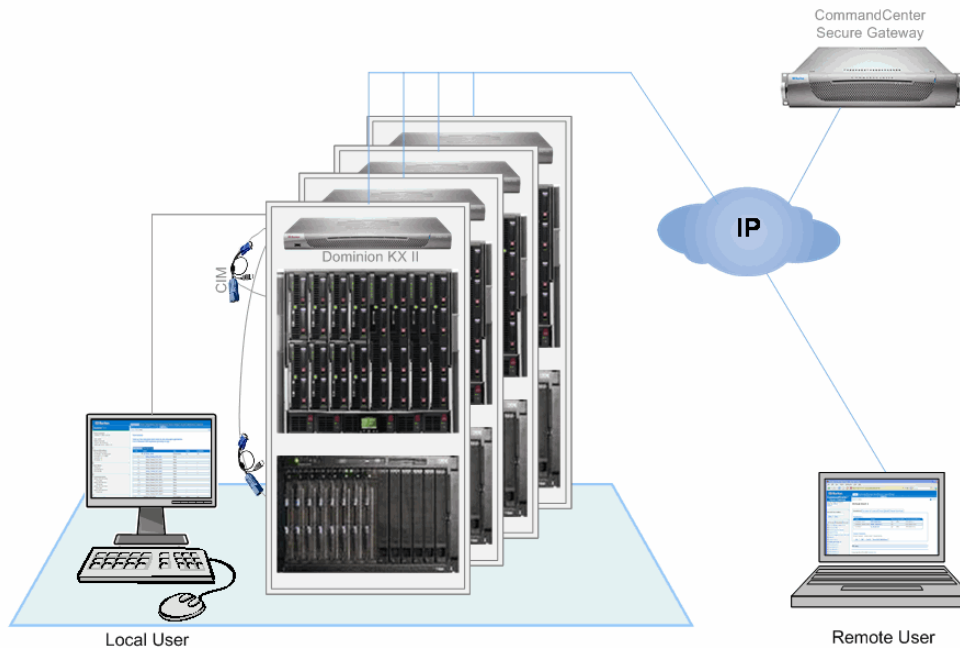


Figure 5. The CommandCenter Secure Gateway management system, when deployed together with Dominion KX II KVM-over-IP switches, provides enterprise customers with powerful access to blade servers and virtual environments from a single interface.

Dominion KX II seamlessly integrates with CC-SG to provide KVM-over-IP as well as access to management modules across many cabinets, across many locations. In addition, customers can leverage CC-SG's integrated in-band access tools (such as RDP, VNC, or SSH) to individual blade servers; as well place 3rd-party remote access clients (iLO, DRAC or RSA) all in the same, secured, audited interface. As a result, users can choose the appropriate method of access most useful to them for the task at hand — from a single login on a single web page.

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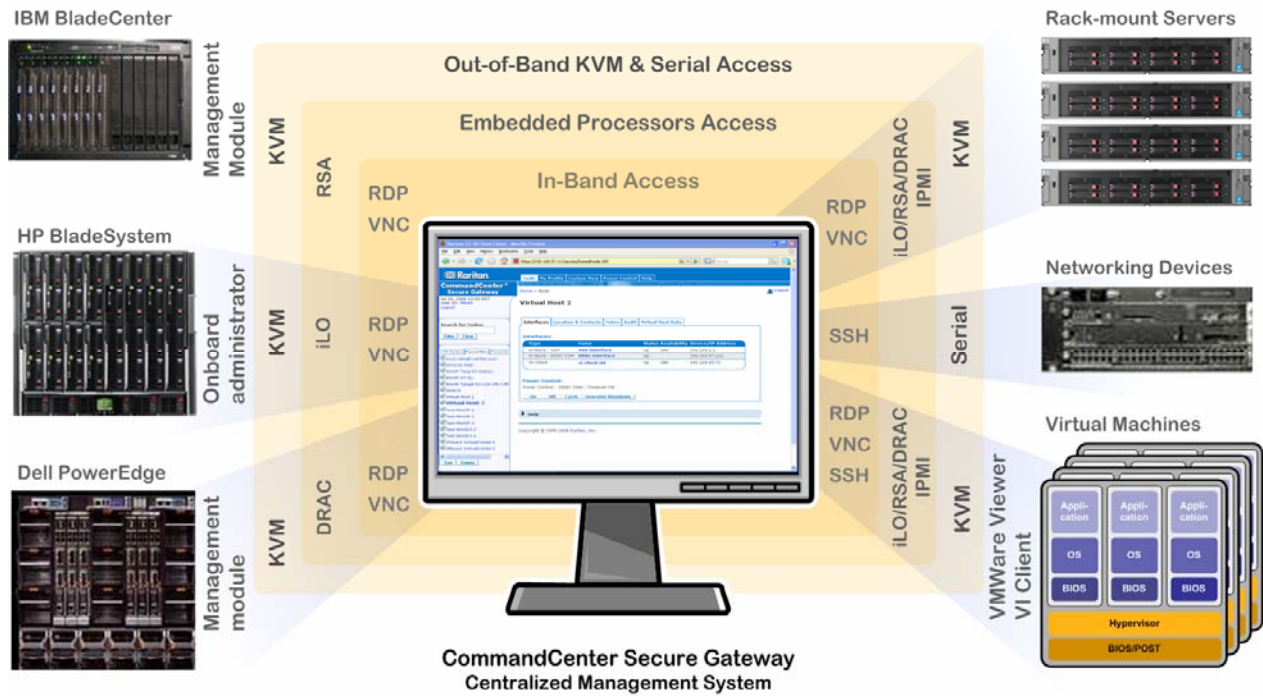


Figure 6. CommandCenter Secure Gateway provides a single point of access to blade servers, rack servers and virtual environments through a variety of access methods — both in-band and out-of-band.

CC-SG provides multiple views for blade servers including a device view that shows the blade servers organized by chassis. Powerful custom views allow the customer to organize blade servers by a variety of parameters.

And because virtualization is also a mega-trend revolutionizing the computing and IT industries (alongside the migration to blade servers), CC-SG supports VMware based virtual machines running on blade servers as well.

Supported Blade Servers

Raritan’s Blade Server Solution supports leading blade products from the three main server manufacturers:

IBM:

- IBM BladeCenter H
- IBM BladeCenter E
- IBM BladeCenter S

Dell:

- Dell PowerEdge 1855
- Dell PowerEdge 1955
- Dell PowerEdge M1000e

HP:

- HP BladeSystem c3000
- HP BladeSystem c7000

In addition, Raritan’s “generic blade server” features enable basic compatibility with all blade servers that are not on the above list.

Top 5 Benefits of Using Raritan's Blade Server Solution

#1. Accessing blade servers, rack-mounted servers and virtual machines from a unified interface

Raritan's solution provides unified access to the heterogeneous IT infrastructure inside a data center.

- ▶ Sign on to a single IP address using a standard Web browser and attain multiple, secure management interfaces to the entire IT infrastructure. A single login at a single web address opens the door to physical servers, blade servers, virtual machines, ESX servers, and networking devices.
- ▶ Multiple access and power control mechanisms from a single interface. IT administrators can access servers and networking devices using a variety of toolkits:
 - In-band software tools such as RDP, VNC, SSH, or Telnet, or
 - Service Processors such as HP iLO, Dell DRAC, IBM RSA and IPMI, or
 - Out-of-band tools such as KVM switches and serial console servers, or
 - Power control and metering using Raritan's intelligent power strips or service processors.

#2. Local at-the-rack access to blade servers is easier and more secure

Dominion KX II provides a ubiquitous graphical user interface to access blade servers from various vendors, and dramatically improves the security for physical (at-the-rack) blade access.

- ▶ An intuitive graphical interface, which is similar to the remote access interface, provides IT administrators critical information and easy navigation to access blade servers when standing at the cabinet:
 - A hierarchical view of the blade chassis and blade servers;
 - Dynamic status of the individual blades;
 - Switching between the blade servers without the hassle of using the hotkeys.
- ▶ User are centrally authenticated and authorized. Unlike the native mechanisms for physical access to blades provided by HP, IBM, and Dell, a Dominion KX II solution requires all access attempts (whether local or remote) to authenticate against a central LDAP or Active Directory server, or against Dominion KX II's local database. Authorization to view and control blade servers can be set on a per-blade, per-user basis.
- ▶ Option of centralized out-of-band BIOS access to the entire data center from the NOC. By placing a consolidating tier of analog KVM switches as a front-end to Dominion KX II units located throughout the data center racks, IT administrators provide network-independent BIOS-level access to all the servers from a single workstation in the NOC.

#3. Combine blade servers and virtualization with ease

Deploying virtualization on blade servers is a solution gaining momentum, and Raritan's solution simplifies the management of these two vendor-propriety technologies.

- ▶ Auto-discovery of blade servers and virtual environments. Providing native integration with IBM, HP and Dell's blade server and VMware's virtualization technologies, Raritan's enterprise solution allows IT

administrators to painlessly import blade server and virtual server topologies into CommandCenter Secure Gateway for a turnkey deployment.

- ▶ A single interface to manage blade servers as virtual hosts, as well as the virtual machines they support. From a single CommandCenter Secure Gateway web interface, IT administrators can access virtual hosts running on a blade server using SSH, KVM, or iLO / DRAC / RSA tools; as well as the virtual machines themselves using either RDP/VNC or VMware's proprietary Viewer.
- ▶ Integrated access to Blade Management Modules and VMWare VI Client. Also from the CommandCenter Secure Gateway interface, IT administrators can access vendor-proprietary blade or virtualization management tools with a single click.

#4. Complete security

Raritan's Blade Server Solution provides complete security for at-the-rack or over-IP server access, by enforcing the highest level of AAA for every access method.

- ▶ Centralized Authentication. Users are authenticated against LDAP, Active Directory or RADIUS servers before accessing any tool or device through Dominion KX II or CommandCenter Secure Gateway.
- ▶ Centralized Authorization. Raritan enables per-blade access permissions to be parceled among individual users, and hot-key blocking to avoid unauthorized back-door access. CommandCenter Secure Gateway also allows users to define even more sophisticated authorization policies based on roles and rules.
- ▶ Encryption of video, mouse and keyboard data over-IP. Raritan's solution supports 256-bit AES encryption for all communication between users and remote servers.
- ▶ Consolidated audit logs. By consolidating access data across all server and networking devices and methods, Raritan's solution is able to centralize logging to meet compliance requirements and ensure 100% accountability.

#5. Scalable, flexible solution for data centers of all sizes

Raritan's Blade Server Solution is flexible and scalable for data centers of all sizes.

- ▶ Standalone deployment of Dominion KX II. Small data centers or server rooms can employ Dominion KX II as a standalone network appliance without additional management system. With simple plug-and-play installation, Dominion KX II allows IT administrators from even the smallest organizations to securely manage their blade servers at-the-rack, over-IP, or via modem.
- ▶ Managing the entire IT infrastructure with CommandCenter Secure Gateway. By integrating Dominion KX II and CommandCenter Secure Gateway together, IT administrators can enjoy the additional convenience and security of combining all management of all virtual environments, physical servers, and blade servers throughout the enterprise. The entire infrastructure — every relevant tool, from every relevant vendor, for every relevant device, across every location — can all be secured and consolidated in one managed interface.

About Raritan

Raritan is a leading provider of secure IT infrastructure management solutions that provide IT directors, managers and administrators the control they need to improve data center productivity, enhance branch office operations and increase overall power management efficiency. In over 50,000 locations around the world, our integrated secure in-band and out-of-band server access, control and power management products help companies better monitor and manage server access, utilization and energy consumption. Our intelligent PDUs offer remote power control and monitoring at the rack and device level, empowering data center owners with information to improve uptime and capacity planning, and efficiently utilize energy to save power and money. Raritan's OEM division provides embedded hardware and firmware for server and client management, including KVM over IP, IPMI, intelligent power management and other industry standards-based management applications.

Based in Somerset, N.J., Raritan has 38 offices worldwide, serving 76 countries. For more information, please visit Raritan.com.