

# Selecting the right IBM server connectivity options for your IBM @server xSeries servers



## Completing your server solution with KVM (keyboard, video, mouse) solutions

No solution built with IBM @server xSeries™ servers is complete until the products are brought together using the right KVM switching options. KVM switching systems provide access and control of multiple servers from a central console. These switches eliminate extra keyboards, monitors and mice, allowing businesses to save critical space in their data centers. IBM console switch solutions are designed to accommodate the full line of xSeries server products, providing centralized control and management of rack-optimized servers.



IBM offers two unique families of KVM products. Each provides specific benefits to the customer, and choosing the right one is an easy task. Customers have come to depend on the reliable NetBAY™ Console Switch family. An exciting addition to the family is the **new IBM Advanced Connectivity Technology (ACT)** suite of products. These new entries offer an amazing array of IBM-unique features, simplified installation and scalability—all in an economical package not available before.

Both product families offer compelling reasons to buy a KVM solution from IBM:

- NetBAY KVM products have an intuitive graphical user interface (GUI) that makes switching between connected systems simple and easy.
- NetBAY KVM products have been tested by IBM under the IBM ServerProven® program and approved for operation with xSeries servers, helping speed deployment while maximizing manageability and control.
- As with all NetBAY products, these KVM options are backed by acclaimed IBM service and support and include a three-year limited warranty\*\* when installed in an IBM NetBAY rack or used with IBM servers.
- All NetBAY KVM solutions offer the security needed to help keep your critical data safe from unwanted intrusion.

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\*\*See page 15 for additional information on limited warranty.<sup>1</sup>

## Products and solutions

### NetBAY Console Switch family

The IBM NetBAY Console Switch family consists of the four-port single-user model and the eight-port switch, which can support up to two simultaneous users. These time-tested switching products are manufactured for IBM by Avocent Corporation—an innovation leader in the KVM industry. They feature:

- OSCAR® (On Screen Configuration And Reporting), a user-friendly interface that makes management a breeze
- Scalability from only a few servers to as many as 64 using multiple tiered switches
- Choice of multiple cable lengths to support most installations.

For a comparison of the NetBAY Console Switch products and the new IBM ACT products, see page 12 of this document. For more detailed information on these application-proven NetBAY Console Switch products, visit the xSeries rack and rack solutions Web page at [www.pc.ibm.com/www/eserver/xseries/rack.html](http://www.pc.ibm.com/www/eserver/xseries/rack.html) and download the IBM NetBAY Rack Console Switch Options spec sheet.

### NEW! IBM ACT products

The IBM ACT solution is a brand new approach to server connectivity, based on the revolutionary IBM C2T Interconnect™ cable chaining technology. C2T Interconnect enables you to manage a "daisy chain" of multiple servers through a single connection to a console or KVM switch, replacing many long cables with just a few short ones, simplifying rack management, lowering cabling cost and reducing setup, diagnostic and maintenance time. C2T Interconnect is available on selected xSeries server models, including the x330.

ACT brings this "daisy chain" connectivity capability to the full line of xSeries servers—with the added advantage of thin, flexible industry-standard CAT5 cabling and standard RJ-45 connectors. These new products remove the need for one-to-one, dedicated cable connections between KVM switch ports and managed devices—which has limited scalability and created burdensome cable bulk and cable management. ACT can eliminate the typical distance limitation of 500ft or less allowed between users and managed devices.

IBM ACT solutions incorporate both analog and digital technology to provide flexible server management—both local management or combined local and remote console control. ACT solutions also can enable a significant reduction in cable bulk. This new IBM-only family of KVM management solutions includes:

#### Two new switches:

NetBAY Local Console Manager (LCM)	MTMN: 1735L04 (32P1635)
NetBAY Remote Console Manager (RCM)	MTMN: 1735R16 (32P1651)

#### Three new "smart" cable options:

NetBAY 250mm KVM Conversion Option (Short KCO)	p/n: 32P1636
NetBAY 1.5m KVM Conversion Option (Long KCO)	p/n: 32P1652
NetBAY C2T Conversion Option (CCO)	p/n: 32P1637
<b>NetBAY 1.5m USB Conversion Option (Long UCO)</b>	<b>p/n: 73P5832 (NEW)</b>

#### New firmware and software:

- OSCAR for IBM firmware/software (for local management)
- NetBAY Virtual Console software (for remote management)



NetBAY Local Console Manager (LCM)



NetBAY Remote Console Manager (RCM)



NetBAY KVM Conversion Option (detail of CAT5 input/output end of cable unit)

### Key features and benefits

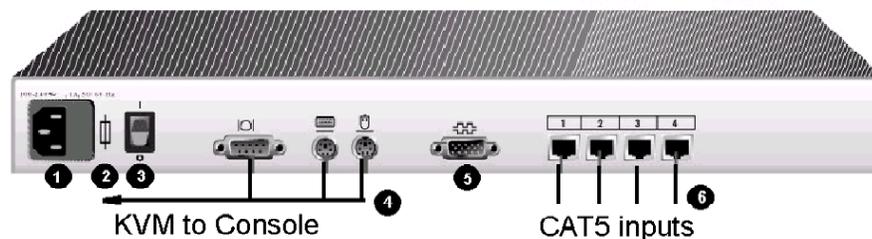
These IBM ACT products go far beyond merely offering the strength of the IBM name and renowned IBM service and support. Much of this solution is exclusive to IBM and will bring more power and control to customers that choose IBM as their IT partner. Here's why:

- **Extreme scalability** is both painless and seamless with these building-block products that allow customers to "pay as they grow." Start as small as five servers, and grow to as many as 256 servers—all supported on a single switch!
- **Faster deployment** is possible with ACT products. The built-in memory of the cables simplifies configuration by assigning and retaining unique server identification codes for each attached server. They take only minutes per server to install because of the short cable lengths needed and use of standard plug-and-lock RJ-45 connectors.
- **Complete legacy compatibility** with all existing xSeries servers, whether those servers are KVM based or C2T based, provides investment protection and flexibility. Plus, ACT products are even easily integrated into existing deployments of traditional KVM-based NetBAY Console Switch products.

- **Space-saving 1U design** cuts down on the amount of rack real estate it takes to build out the solution. ACT needs less cable and fewer switches than traditional KVM products for comparably sized systems. Plus, the KCO and CCO intelligent cables with CAT5 design dramatically reduce cable clutter while providing optimal display resolution and video settings.
- **High levels of system availability** can be achieved thanks to ACT's multiport switch design and "smart" cables. When servers are powered off or removed from the rack, no recabling is required to maintain connectivity within the chain. Plus, the cables are powered directly from the server, providing "keep alive" functionality even if the console manager is not powered.

### **IBM NetBAY Local Console Manager**

The **IBM NetBAY Local Console Manager (LCM)** is a rack-mountable switch that provides flexible, centralized control of up to 64 servers. Each of the switch's four CAT5 Analog Rack Interface (ARI) input ports can support a chain of up to 16 servers. Additionally, servers can be supported by attaching a legacy KVM switch to one of the ports using a KVM conversion cable. The LCM provides local, single-user management with enhanced video quality of up to 1600 x 1280 with an end-to-end total CAT5 cable length of up to 15m (50ft) between the LCM and the farthest server. The 1U form factor and compact size allow the LCM to fit behind a 1U NetBAY Flat Panel Monitor Console Kit. It can also be mounted in a side pocket of the rack or placed in the EIA space.



#### Components:

- 1) Power supply
- 2) Power on/off LED indicator
- 3) Power switch
- 4) Local analog ports (PS/2 keyboard, video, PS/2 mouse)
- 5) Serial connection for flash update of firmware
- 6) Four CAT5 inputs

#### What is shipped with each option part number:

- Mounting hardware to mount in side pocket or EIA space
- 1U filler panel for EIA mounting
- Four-pack of terminators
- One 6ft length of CAT5 cable
- C13/C14 line cord
- Quick install guide
- User guide
- OSCAR for IBM firmware/software

## IBM NetBAY Remote Console Manager

The **IBM NetBAY Remote Console Manager (RCM)** combines both analog and digital technology to provide flexible, centralized control of up to 256 data center servers. This premier switch product delivers both local access and secure remote digital access from virtually anywhere, at any time. The RCM does this by digitizing the analog signals that support the operation of directly attached keyboards, monitors and mice and sending those digital signals as packets over an IP network connection.

### KVM Over IP

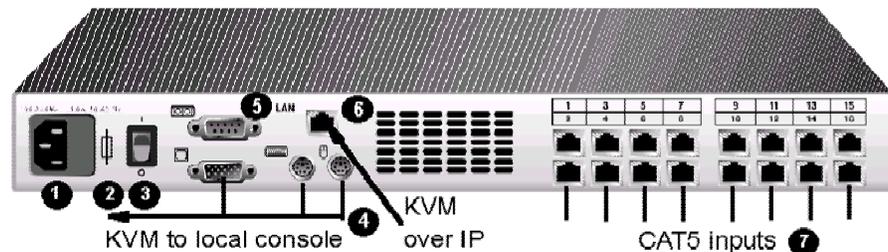
Because IP is the universal networking standard for enterprise networks, private carrier WANs and the Internet itself, KVM Over IP™ signals can be sent from virtually anywhere to anywhere. Highly intelligent compression technology enables customers to utilize LAN resources for in-band server management without significantly affecting network performance. Compression of traffic between clients, switches and managed devices is important for two reasons. First, it conserves bandwidth. This is an especially important consideration for sites that use their existing production network to support KVM Over IP. Without adequate compression, KVM Over IP traffic may adversely impact the performance of other enterprise applications. Second, compression improves performance of the KVM system itself. The fewer packets that have to traverse KVM network connections, the less likely it is that any latency will be introduced into keyboard and mouse operations.

So, whether a network administrator is down the hall or across the globe, a KVM Over IP solution provides quick, hands-on access to any server or network device. The NetBAY Remote Console Manager is a powerful tool for enabling finite technical teams to manage very large numbers of devices that are spread over a large geographic area.

### RCM features

The RCM is a rack-mountable KVM switch configurable for analog or digital connectivity. It allows users to implement both true KVM Over IP (for remote management) as well as convenient analog KVM (for local management) in a single solution. Each RCM has 16 CAT5 Analog Rack Interface (ARI) ports and operates using industry-standard RJ-45 connectors. Each input port can support a chain of up to 16 servers, for a total capacity of 256 servers supported on a single RCM.

Users can access servers across a 100BaseT Ethernet connection or directly through an analog port on the RCM for local KVM connectivity and administration. Locally, the RCM can achieve enhanced video quality of up to 1600x1280 with a total end-to-end CAT5 cable length of up to 15m (50ft). Digital (remote) users can achieve video resolution of up to 1280x1024 with a cable length of up to 10m (32ft) between the RCM and the farthest server. The 1U form factor of the RCM allows users to choose whether the unit is mounted in the side pocket of the rack or in the EIA space. Mounting hardware for both is included with the switch.



RCM components:

- 1) Power supply
- 2) Power on/off LED indicator
- 3) Power switch
- 4) Local analog ports (PS/2 keyboard, video, PS/2 mouse)
- 5) LAN connection for remote management
- 6) Serial connection for flash update of firmware
- 7) 16 CAT5 inputs

What is shipped with each option part number:

- Mounting hardware to mount in side pocket or EIA space
- 1U filler panel for EIA mounting
- 16-pack of CAT5 terminators
- One 6ft length of CAT5 cable
- C13/C14 line cord
- Quick install guide

- User guide
- OSCAR for IBM firmware/software (for local management)
- NetBAY Virtual Console software (for remote management)

**The RCM and LCM  
at a glance**

	LCM	RCM
<b>Machine number</b>	1735L04	1735R16
<b>Part number</b>	32P1635	32P1651
<b>Form factor</b>	1U	1U
<b>Server ports</b>		
Number	4	16
Types	KCO, CCO, UCO	KCO, CCO, UCO
Connectors	RJ-45	RJ-45
Sync types	Separate horizontal and vertical	
Plug and play	DDC2B	DDC2B
Video resolution @ 75Hz (maximum)	Analog port 1600x1280	Analog port 1600x1280 Digital port 1280x1024
<b>Configuration port</b>		
Number	1	1
Type	Serial RS232	Serial RS232
Connector	DB9 Female	DB9 Female
<b>Analog port</b>		
Number	1	1
Type	PS/2 and VGA	PS/2 and VGA
Connectors	PS/2 MiniDIN and 15-pin D	PS/2 MiniDIN and 15-pin D
<b>Dimensions</b>		
HxWxD	4.38x43.18x13.97cm (1.72x17.00x5.75")	4.45x43.18x27.94cm (1.72x17.00x11.00")
Weight (without cables)	1.6kg (3.6 lb)	3.6kg (8 lb)
Heat dissipation	17 BTU/Hr	92 BTU/Hr
Power consumption	5W	25W
AC-input power	10W maximum	40W
AC-input voltage rating	100-240 VAC autosensing	100-240 VAC autosensing
AC-input current rating	.1A	1A
AC-input cable	18 AWG three-wire cable, with a three-lead IEC-320-C13 receptacle on the power supply end and an IEC-320-C14 plug on the power source end	
AC-frequency	50/60Hz	50/60Hz
Temperature	10° to 50° Celcius (50° to 122° Fahrenheit) operating -20° to 60° Celcius (-4° to 140° Fahrenheit) nonoperating	
Humidity	20 to 80% noncondensing operating 5 to 95% noncondensing nonoperating	
<b>Agency approvals</b>	EN55022 Class A, EN55024, EN61000-3-3, FCC15 Class A, IEC950, ENS0950, UL60950 third edition, CSA C22.2 No. 60950	

## KVM and USB Conversion Option cables

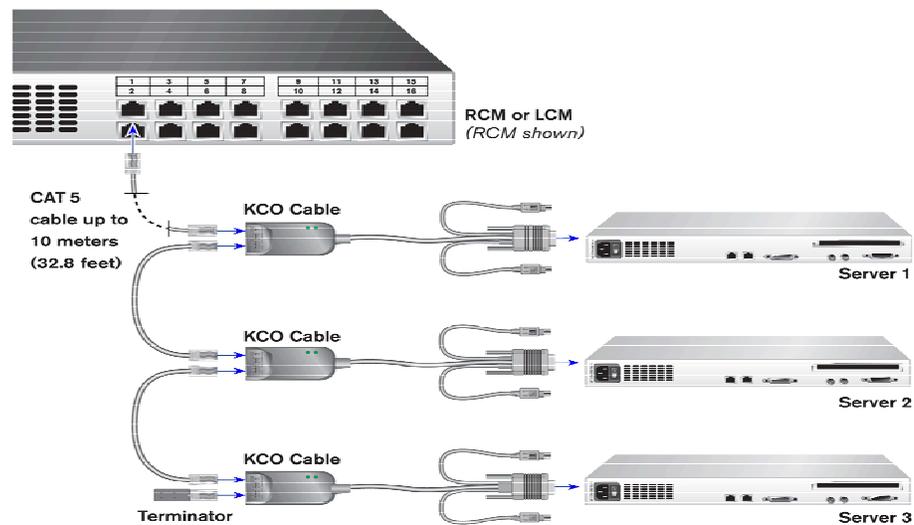
NetBAY KVM Conversion Option (KCO) and USB Conversion Option (UCO) cables are used to convert keyboard, monitor and mouse signals from a server into a combined signal that can travel along a single CAT5 cable. Generically called Conversion Options (CO) these cables are designed to link up to 16 servers into a single chain, feeding the signals of each server into the NetBAY Local or Remote Console Manager. Each CO cable in the chain draws its power from the server or legacy switch it is attached to. This “local power” design provides “keep alive” functionality, enabling attached devices to work properly whether or not they are connected to a powered-on console manager.

NetBAY KCO cables come in two varieties: The **NetBAY 250mm KVM Conversion Option (Short KCO)**—used to connect 1U xSeries servers with no cable management arm, such as the x300—and the **NetBAY 1.5m KVM Conversion Option (Long KCO)** for connecting xSeries servers with a cable management arm, such as the x345, x360 and x440. The **NetBAY 1.5m USB Conversion Option (Long UCO)** is used in the same manner as the Long KCO.

The Short CO is intended to be placed in the side wall of the rack. Hook-and-loop patches are supplied to allow for neat placement. The Long CO is long enough to allow the cable end to be placed at the end of a cable management arm so that the LEDs can be easily seen; hook-and-loop strips are supplied to keep the unit snugly attached to the cable management arm.

The typical ACT solution is large scale, involving multiple servers. For that reason, CO cables are sold in packages of four.

The diagram below shows how the CO cables are used to chain multiple servers, terminating in a single CAT5 connection to the NetBAY Local or Remote Console Manager. Although the Remote Console Manager is shown, the Local Console Manager supports the same chaining function of the KCO cables.



KCO/UCO components:

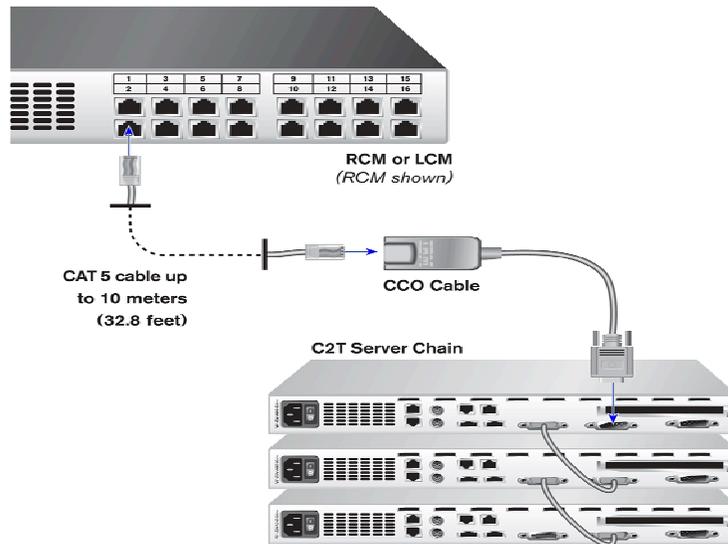
- Two CAT5 ports
- KVM inputs (PS/2 keyboard, monitor, PS/2 mouse) or single USB input with color coding
- LED indicating that the chain is "up and active"
- LED indicating when a user is video-connected to the CO and attached server

What is shipped with each option part number:

- Four KCO or UCO cables per package
- Four Kurly Lock cable connectors
- Four hook-and-loop strips or patches (unit dependent)
- Four CAT5 cables (6" on Short KCO, 14" on Long KCO and UCO options)
- Quick install guide

## C2T Conversion Option cable

The **NetBAY C2T Conversion Option (CCO) cable** is designed to allow chains of IBM C2T Interconnect-based servers to be connected to a NetBAY local or remote console manager. High-quality video resolution is possible with up to 42 C2T servers in a single chain. The CCO takes the information from IBM's proprietary C2T connector and converts it to a CAT5 signal. A single CCO CAT5 cable allows local and remote console users access to and control of any server in the chain by simply navigating to that server using standard C2T methods. The CCO takes its power from the C2T connector, not the switch. Only one CCO is required per chain of C2T servers.



Components:

- One C2T Interconnect input port
- One CAT5 output port

What is shipped with each option part number:

- One CCO per unit
- Quick install guide

## Short KCO, Long UCO, Long KCO, and CCO cables at a glance

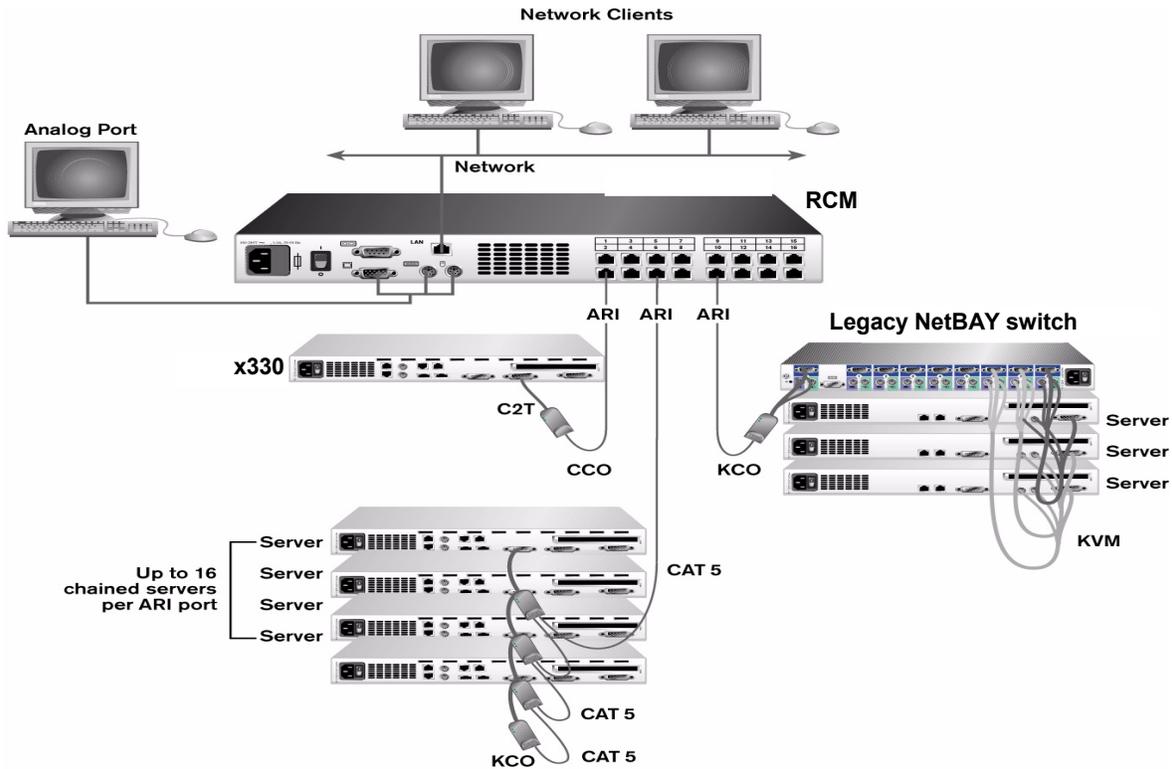
	Long UCO	Short KCO	Long KCO	CCO
<b>Option part number</b>	73P5832	32P1636	32P1652	32P1637
<b>Cable length</b>	1.5m	250mm	1.5m	100mm
<b>Design</b>	Chaining	Chaining	Chaining	Direct to switch
<b>Where used</b>	USB based servers with cable management arms	KVM based servers without cable management arms	KVM based servers with cable management arms	Chains of C2T based servers
<b>Installation method</b>	Hook and loop patch attaches to rack side walls	Hook and loop patch attaches to rack side walls	Hook and loop strip straps it onto end of cable arm	Free hanging from back of server
<b>Quantity per option part number</b>	4	4	4	1
<b>Power</b>	Taken from keyboard/mouse	Taken from keyboard/mouse	Taken from keyboard/mouse	Taken from C2T connector
<b>Warranty**</b>	Three-year limited warranty when installed in a NetBAY rack or used with IBM servers; includes onsite labor when cable option is purchased with a NetBAY LCM or NetBAY RCM			

\*\*See page 16 for additional information on limited warranty.<sup>1</sup>

## IBM ACT solution architecture

Below is a typical architecture using IBM ACT. Notice the legacy compatibility with NetBAY Console Switch products as well as the complete and seamless interoperability with C2T-based servers.

- The example below shows the NetBAY RCM, but could have easily depicted the LCM as the center of this solution.
- All three user consoles — the two network clients and the local, KVM-attached console — can access different ports on the RCM concurrently.
- The diagram shows only one x330 connected to the RCM via a CCO cable. Instead of just one server, this could easily be a chain of up to 42 C2T-based servers supported by that same single CAT5 port on the RCM.



## NetBAY ACT security features

NetBAY ACT and the RCM in particular establish a new entry point into the rack environment that offers an expanded range of management opportunities. The flip side of this new “doorway” is that it could also be a point of entry for unauthorized access to the system. IBM has made the protection of servers and data a key design point in the development of these products.

With other remote access solutions, providing encryption and security features means running a separate, specialized authentication server. With NetBAY ACT products, the security functions that are crucial when you are providing administrator-level access to critical resources over a shared IP network are built in, including:

- **Permissioning.** Not all users need or should be given the same access rights. Some only need to view certain resources. Others need to be able to control certain devices. Other higher-level users may need access to all devices. Both the RCM and the LCM offer three levels of access control that enable granular permissioning.
- **Encryption.** During remote access, communications between KVM clients and the KVM switch are encrypted using 128-bit SSL technology to help enhance protection for data traveling across the network.
- **Client authentication.** The KVM is authenticated prior to the establishment of a KVM session. This is done using technologies such as Remote Access Dial-In User Service (RADIUS) and/or Challenge Authentication Protocol (CHAP), in addition to user-specific passwords.
- **Preventing unwanted access via hardware or cable tampering.** The cables for NetBAY ACT solutions have built-in memory that can help prevent someone from gaining access by unplugging and replugging a device in the chain.

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## Software components

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Both IBM ACT switches include powerful software and/or firmware. All the necessary software is included with both switches. Both of these software products offer password protection and comprehensive access control and security features.

These features are available with multiple language support. For worldwide users, IBM has translated documentation into the following languages:

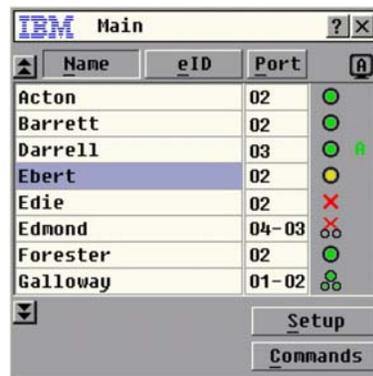
- English
- Spanish
- Japanese
- French
- Dutch
- Korean
- Italian
- Danish
- Simplified Chinese
- German
- Portuguese
- Traditional Chinese

The user interface for the LCM and RCM firmware, the RCM client software and online help have been translated into the following languages:

- English
- German
- Danish
- French
- Spanish
- Portuguese
- Italian
- Dutch
- Japanese

### OSCAR for IBM

**OSCAR for IBM**, included with both the RCM and the LCM, is a version of Avocent's popular, intuitive OSCAR package that has been tailored for IBM. OSCAR enables local switch management via KVM. It is also the preferred method for setting up the system even if remote management is available. If one is familiar with the management software that is included with the NetBAY 2x8 Console Switch, then using the LCM or the RCM with OSCAR for IBM will be an easy transition.



### NetBAY Virtual Console Software

The **NetBAY Virtual Console Software (NetBAY VC)** is a cross-platform management application that allows you to view and control the RCM and all attached servers. NetBAY VC software provides secure authentication, data transfers and username/password storage. By utilizing an intuitive split-screen interface, this software provides a single point of access for your entire system. From here, you can manage the RCM, install a new RCM or launch a video session to a system server. Multiple servers can be accessed by one user; each additional computer's video will appear in a separate program window. Several NetBAY RCMs could be managed while using the VC software. This key feature enables global management of widely dispersed RCM solutions. This is truly point-and-click control.

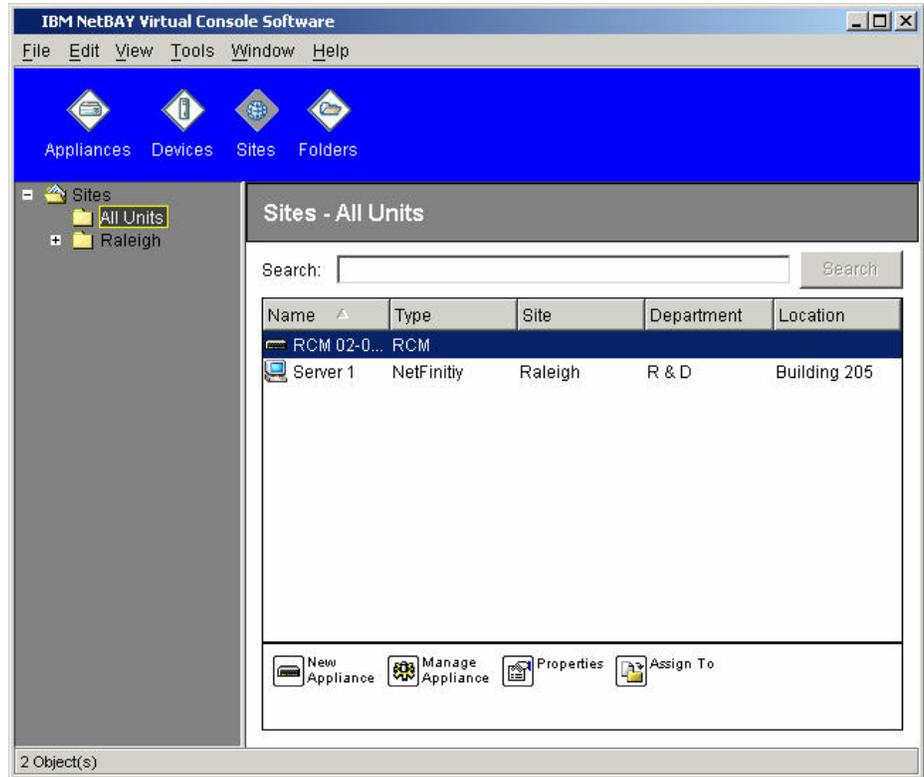
Remote management users access the RCM and all attached systems via Ethernet from a PC running NetBAY VC. This software resides on the user's PC only. No cards, drivers or additional software are required on either the user's PC or the attached target servers. User PCs can be located anywhere a valid network connection exists. NetBAY VC is supported on the following operating systems:

- Microsoft Windows NT 4.0 (service pack 6A)
- Microsoft Windows® 2000 (service pack 2)
- Microsoft Windows 2000 XP
- Red Hat Linux 7.1 and 7.2

Although the NetBAY VC client is supported only on these operating systems, the server management it provides is OS independent, allowing management of multivendor environments from a single NetBAY VC client.

Key features of NetBAY VC that make management quick and productive:

- Easy access to and control of multiple systems simultaneously, with one-click “toggling” between each one
- The ability to create keyboard “macros” as ready substitutes for the type of keyboard combinations (such as Ctl+Alt+Del) that can’t be used from a KVM client—because the user’s PC would interpret them as being applied to the client device, rather than the managed target device
- Quick and easy alignment of the mouse or other selection device on the KVM client with the screen of the managed target
- Automatic video quality adjustment button that samples variables from the server’s video output to quickly maximize video performance.
- A full screen button that allows full screen monitoring of the target server



# Buying NetBAY ACT solutions

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## Customer challenges

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### Who will benefit from deploying ACT and why?

Customers addressing one or more of the following challenges can potentially benefit from NetBAY ACT solutions:

- **Large data centers and rack-dense server installations.** High server numbers, with minimal technical people to manage, require more efficient management solutions.
- **Branch office rollouts.** Widely dispersed systems mean that IT professionals may or may not be close by.
- **Small business.** Fast growing small businesses need an easy, economical way to scale up on demand.
- **Space constrained customers.** With servers getting denser the rack “framework” needed to support these is becoming stressed. Every customer buying a rack-optimized server (x300, x345, x360 or an x440) should be looking at this solution.
- **Security concerns.** The security features built into ACT products can benefit customers that want remote access and management but are concerned about system and data security.
- **Duplicate IT systems.** Recent events have shown how important it is to have alternate IT capabilities in a distant, safe, and reliable location. The NetBAY RCM can be the answer to managing these remote systems from the primary IT center.

These challenges pose similar problems for many customers. Here is an overview of the benefits that ACT can bring to your organization.

### Manage more IT resources and manage more efficiently

The RCM can be especially interesting as the limited IT resources needed to run and manage your large scale installations is stretched further than ever. The RCM could expand the reach of your highly skilled staff beyond that of simply being at the front of the rack.

### Take up less space in the rack

The reduced number of switches required to manage and control large numbers of servers is a compelling reason for looking at NetBAY ACT rather than choosing a traditional KVM solution. Whether you are concerned with maximizing the available space in the rack, lowering the number of outlets needed to power all the tiered switches or reducing the vast amount of cable bulk in the rack with old KVM, ACT offers real value. The density of today's servers also means that customers are running out of available non-EIA space in the rack. Side pockets are completely filled with PDUs and KVM switches in some environments. ACT can free up some of this extremely valuable space.

### Reduce costs

When compared to traditional KVM, ACT can cut the cost of implementation. Unlike many KVM solutions where economies of scale are not realized, NetBAY ACT continues to get more economical on a per-server basis the higher the server count grows. This is due to the fact that ACT only requires a single switch; this cost can be spread over the entire installation base of attached servers.

### Manage duplicate IT systems or widely dispersed solutions

The RCM has particular benefits here. Imagine having a single IT group controlling and managing solutions at branches all over the world. The branch benefits by having expertise available virtually anytime, and the company as a whole benefits because the highest skilled people can be “virtually there” from almost anywhere worldwide. Many customers are currently building secondary IT infrastructure away from their primary installation in case of catastrophe, yet cannot afford to have duplicate IT staff as well. An RCM would add the power to control the secondary system for those back at the main site.

### Pay as you grow

The scalability aspects of ACT are also a benefit for companies doing branch rollouts. If your solution needs to start off small, with expected future growth, there is no easier way to scale up than by adding a few KCOs to an already operating system. The RCM and LCM are designed to automatically recognize new servers when they are added to the chain.

## Selecting the right IBM KVM solution

When shopping for KVM switches, it is important to get the right solution for your needs. These questions and answers, plus the table below, should help simplify this decision-making process.

### How many servers do I want to manage?

Less than five servers in the solution: NetBAY Console Switches are the answer with our 1X4 or 2X8 KVM offering. More than five in the solution or plans to have more than five in the near future: choose IBM ACT.

### Do I want C2T-based servers or an ACT solution?

C2T is still the very best way to cable and set up a management solution. Since it is a switchless technology it is inexpensive and easy to set up. When C2T is available on the planar of the server that is your best bet. When C2T is not available, ACT provides many of the same benefits.

### What if I want to provide local access only, but for two users?

The NetBAY 2X8 Console Switch is probably the best choice unless the solution is very sizable and the RCM makes financial sense. The LCM offers only single-user support. The RCM supports one local and two network-based remote connections simultaneously.

### Which switch is the best for a mixed environment of C2T servers and traditional KVM product?

Either solution can be used. The overall size of the solution and the growth needs of the customer have to be determined to make the best decision. If NetBAY Console Switch products are chosen, a C2T break-out cable can provide connectivity to the switch. If ACT is the chosen method, then a CCO should be used. ACT also stands out in it's ability to manage both USB and PS2 based servers on the same switch.

### Which switch will provide remote access and remote console control?

NetBAY RCM only

### How can I start small today, scale up as I need and pay as I grow?

Choose the IBM ACT product family. With only the addition of extra cables and servers, ACT solutions scale quicker, easier and cheaper than traditional products.

### Which product family is best suited for high-density environments?

IBM ACT. First, chaining and CAT5 make cable management much easier than with the older KVM products. Second, the reduced number of switches with ACT makes finding room in a tight rack environment less of a problem.

IBM KVM product	NetBAY 1x4 Console Switch	NetBAY 2x8 Console Switch	NetBAY Local Console Manager	NetBAY Remote Console Manager
<b>Description</b>	<ul style="list-style-type: none"> <li>•Nonintrusive, out-of-band operation that never interferes with server operations or network resources</li> <li>•Interlocking cable connectors eliminate potential point of failure at device connection</li> <li>•Password-protected access helps ensure a protected environment</li> <li>•Flash software allows for Web-based delivery of updates</li> </ul>		<ul style="list-style-type: none"> <li>•Provides flexible centralized control of data center servers</li> <li>•Operates over a standard CAT5 connection</li> <li>•Built-in memory simplifies configuration</li> <li>•Delivers a significant reduction in cable volume</li> <li>•Enhanced video quality</li> </ul>	<ul style="list-style-type: none"> <li>•Combines local and remote technology to provide flexible, centralized control of servers</li> <li>•Reduction in cable volume</li> <li>•Secure remote access from virtually anywhere, at any time</li> <li>•Accessible over both 10/100 BaseT Ethernet connection and traditional KVM local port for access and control</li> </ul>
<b>User console</b>	1	2	1	2 remote, 1 local
<b>System ports</b>	4	8	4	16
<b>Max. systems</b>	16	64	64	Virtually unlimited
<b>Max. video resolution</b>	1600x1280	1600x1280	1600x1280	Local: 1600x1280 Remote: 1280x1024
<b>Multiplatform support</b>	Yes	Yes	Yes	Yes
<b>Auto-system restart</b>	Yes	Yes	Yes	Yes
<b>Locking cables</b>	Yes	Yes	Yes	Yes
<b>Intuitive GUI</b>	OSCAR	OSCAR	OSCAR for IBM	OSCAR for IBM NetBAY Virtual Console
<b>Height/width</b>	1.7"x17 "	1.7"x17 "	1.72"x17 "	1.72"x17 "

## Frequently asked questions

### **Are the RCM and LCM compatible with all xSeries servers?**

Yes and then some. The implementation of ACT using the traditional KVM output allows these products to work over a broad range of products. The solution even has the CCO cable which allows C2T-based products to benefit from ACT. One big reason that the RCM is so popular is its complete backward compatibility with legacy NetBAY Console Switch products. Simply add a KCO cable to one of the analog ports on your current switch, connect it to an RCM and you have added complete remote management to your entire data center.

### **Since this is a chaining solution, what happens if I lose power to one of the cables? Do I lose the servers beyond that one in the chain?**

No. While the CO cables take power for the KVM-to-CAT5 conversion from the server they are attached to, they do not need power to act as a pass-through for signals already formed in the chain. If one needs to power off or take down a server, then no action is needed, other than possibly disconnecting the KVM portion of the CO if the server needs to be removed from the rack. The only time we lose the chain is if you disconnect a CAT5 cable in the chain.

### **Why are there two KCOs?**

Because there are two basic kinds of server—those with cable management arms and those without. Since the KCOs have LEDs to help in setup and for improving everyday onsite usability, we wanted customers to have a way to see them. If we only provide a short KCO cable, then the LED would not be visible in the cable arm. Also, to maximize video quality we try to minimize the total length of CAT5 cable. Having longer runs of KVM cable when needed helps increase the number of servers in a chain while still achieving the highest quality video.

### **If I have a C2T chain and I want to take advantage of ACT, what do I need?**

Simply a single CCO cable per chain of C2T servers (currently the limit in a single chain of C2T servers is 42). The CCO is then fed directly into either the LCM or the RCM. It is important to mention that only one user can access a server within any C2T chain when using an RCM. RCMs allow three simultaneous users. We suggest breaking the C2T chains up into smaller chains to minimize the amount of system blocking.

### **Can CCOs be chained together or to KCOs?**

No. CCOs are designed for direct attachment of a C2T chain to the switch.

### **If I use a KCO to connect an existing NetBAY Console Switch to the LCM or RCM, can I add the console switch to a chain rather than doing a straight connection?**

No. Since the management software of the existing KVM switch will be used to manage the devices connected to it even when it is tied to an RCM or LCM, we must do a one-to-one connection for KVM switches to the ACT switch.

### **What do I do if I need other (longer, shorter, more, etc.) CAT5 cables than what came with my option?**

The type of cables used in ACT are readily available worldwide. This cabling can easily be terminated by the customer at any length needed. The actual spec for the needed CAT5 cables is: CAT5e meeting 100MHz, 24AWG, UTP, 4T/P, stranded round cable.

### **Is there anything special I need to order if I plan to install the LCM or RCM into a Nema-style wall outlet or PDU?**

Yes. ACT switches are intended for the rack environment, so we only include a C13/C14 rack jumper cord. If installing into a Nema outlet, order option part number 94G6667 (14ft C13 to Nema 5-15 line cord) along with your switch.

### **Why is there distance limitations on how far servers can be from the switch?**

There are distance limitation of about 10m or 15m (32/50ft) that should be maintained to maximize video quality. It is important to note that the 10m and 15m limitation is placed on the solution because of video quality/resolution. IBM guarantees users exceptional video resolution with IBM ACT products, going beyond these limits may lead to video quality below what is promised. IBM did test ACT topologies far beyond these 10 and 15m limits and saw adequate video resolution.

### **What are the terminators for?**

The terminators are included with the LCM and the RCM in the needed amounts to configure an entire switch. The terminator is plugged into the one open RJ-45 connector at the end of the chain. These connectors help improve video quality and aid in lengthening the total CAT5 cable one can use and still achieve the highest video quality.

## Additional resources

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***For more  
information***

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**IBM @server xSeries Racks and rack options**

You can find extensive information about IBM NetBAY ACT products, including interactive 3D product tours, at:

[ibm.com/pc/ww/eserver/xseries/rack](http://ibm.com/pc/ww/eserver/xseries/rack)

**IBM @server xSeries Options**

[ibm.com/pc/us/eserver/xseries/storage](http://ibm.com/pc/us/eserver/xseries/storage)

**IBM @server xSeries Rack Configurator**

[ibm.com/pc/us/eserver/xseries/library/configtools](http://ibm.com/pc/us/eserver/xseries/library/configtools)

**IBM @server xSeries Configuration and Options Guide**

[ibm.com/pc/us/eserver/xseries/library](http://ibm.com/pc/us/eserver/xseries/library)

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