IBM ®

IBM 1754 LCM8 and LCM16 Local Console Managers
IBM Redbooks Product Guide

The IBM® 1754 1x8 and 2x16 Local Console Managers (LCM8 and LCM16) are the next generation analog keyboard-video-mouse (KVM) console managers that provide enhanced local access, management, and security capabilities to IBM System x® and IBM BladeCenter® environments.

The LCM8 has eight target ports and supports one local user, and the LCM16 has 16 target ports and supports up to two local users. Local video resolution can be up to 1600x1200 or 1680x1050 (widescreen). Two level tiering allows you to manage up to 256 servers connected to multiple switches from one local console. Figure 1 shows the LCM8 and LCM16.

Figure 1. The IBM 1754 Local Console Managers: LCM8 (top) and LCM16 (bottom)

Did You Know?

The LCM8 and LCM16 support Two Factor Authentication (TFA), a system where two different security elements are used in conjunction to authenticate to a server or desktop. TFA is an authentication process where a person proves their identity with two methods: *something you know* (for example, a password or PIN) and *something you have* (such as a smart card). Use of TFA is growing due to requirements by governments and other institutions with a high need for security. An example of a TFA device that the Local Console Managers support is the CCID-compliant Common Access Card (CAC) reader.

You can use the LCM8 and LCM16 with a Global Console Manager to provide network-wide remote access with out-of-band access to servers, network equipment, and other devices with serial configuration or console ports all from a single appliance. This unified approach improves staff efficiency by reducing the time required to remotely diagnose, reconfigure, repair, or restore servers and network devices and other hardware with serial configuration, management consoles, or both.

Part number information

Ordering information is shown in Table 1. Note that when ordering with feature codes, use machine type-model 1754HC3 for the LCM8 and 1754HC4 for the LCM16.

Table 1. Ordering part numbers and feature codes

Description	Part number	LCM8 feature code	LCM16 feature code
IBM Local 1x8 Console Manager (LCM8)	1754A1X	1754HC3 fc 0725	Not applicable
IBM Local 2x16 Console Manager (LCM16)	1754A2X	Not applicable	1754HC4 fc 0726
IBM USB Conversion Option (UCO)	43V6147	1754HC3 fc 3757	1754HC4 fc 3757
IBM USB Conversion Option (UCO) 4-pack	39M2895	1754HC3 fc 3756	1754HC4 fc 3756
IBM Long KVM Conversion Option (KCO) 4-pack	39M2897	1754HC3 fc 3754	1754HC4 fc 3754
IBM Virtual Media Conversion Option Gen2 (VCO2)	46M5383	1754HC3 fc 5341	1754HC4 fc 5341
IBM 1754 LCM Digital Activation Key	81Y2393	1754HC3 fc A17X	1754HC4 fc A17X

The IBM LCM8 Local Console Manager includes the following items:

● An 8-port console switch
● Mounting hardware for an EIA space for rack sidewall compartment
● One 1U filler panel
● One 1.5 m C13/C14 rack power cable
● One RJ45-DB9F DCE adapter for use with the Setup port
● One RJ45-DB9M DTE adapter for use with the Modem port
● Eight terminators for daisy-chaining configurations
● Installation publications and warranty

The IBM LCM16 Local Console Manager includes the following items:

● A 16-port console switch
● Mounting hardware for an EIA space for rack sidewall compartment
● One 1U filler panel
● One 1.5 m C13/C14 rack power cable
● One RJ45-DB9F DCE adapter for use with the Setup port
● One RJ45-DB9M DTE adapter for use with the Modem port
● 16 terminators for daisy-chaining configurations
● Installation publications and warranty

Each of the Conversion Option parts listed in Table 1 ships with:

● One Conversion Option (4-packs have four)
● One CAT-5 cable (4-packs have four)
● Installation publications and warranty

The Local Console Managers enable you to share one workspace (keyboard, mouse, and display) across many target systems. The target systems are connected to the console switch via CAT-5 cables and the appropriate conversion option at the target end. Conversion options are available with either USB or PS/2 connectors.

With server densities continually increasing, cable bulk remains a major concern for network administrators. The LCM8 and LCM16 switches significantly reduce KVM cable volume in the rack by utilizing the innovative conversion option cables and single, industry-standard CAT-5 UTP cabling. This allows a higher server density while providing greater airflow and cooling capacity. In addition, multiple target systems can be daisy-chained together using CAT-5 cables, and then all connected to the console switch using one cable, thereby eliminating a lot of cable clutter.

The IBM 1754 LCM Digital Activation Key, part number 81Y2393, is a software upgrade that turns your IBM 1754 Local Console Manager KVM analog switch into a digital device enabling remote access to servers it is connected to. No hardware changes are needed.

Feature comparison

Table 2 compares the console switches.

Table 2. Comparison of features (Part 1)

Feature	LCM8	LCM16
Part number	1754A1X	1754A2X
Number of local concurrent users	1	2
Local user connections: KVM	VGA + PS/2 or USB	VGA + PS/2 or USB
Local user connections: Extra USB	Yes (2)	Yes (2)
Remote user connections	Not available	Not available
Maximum number of target systems: Direct (analog rack interface (ARI) ports)	8	16
Maximum number of target systems: Daisy-chained	128	256
Maximum number of target systems: Tiered configuration	128	256
Maximum video resolution	1600x1200 (4:3) 1680x1050 (wide)	1600x1200 (4:3) 1680x1050 (wide)
Support for USB Conversion Option, UCO (43V6147 and 39M2895)	Yes	Yes
Support for KVM (PS/2) Conversion Option, KCO (39M2897)	Yes	Yes
Support for Virtual Media Conversion Option Gen2, VCO2 (46M5383)	Yes	Yes
Support for Serial Conversion Option, (SCO) 46M5382	No	No
Virtual Media	Yes	Yes
Two Factor Authentication (TFA) device support	Yes	Yes
Password protection	Yes	Yes
Serial port	Yes	Yes
True serial capabilities	No	No
Ethernet port (10/100)	Yes	Yes

* The 1x8 and 2x16 console switches support the use of the Virtual Media Conversion Option (VCO) for connectivity, but they do not support the use of remote virtual media. The use of the VCO with these console switches represents a lower-cost alternative to the UCO if chaining is not required.

Table 2. Comparison of features (Part 2)

Feature	LCM8	LCM16
Local user interface	OSCAR Web GUI†	OSCAR Web GUI†
Supports remote access with IBM 1754 LCM Digital Activation Key	Yes	Yes
IPv6 support	Yes	Yes
Keep Alive feature in Conversion Options	Yes	Yes
Firmware upgrades to the console switch	Via Ethernet or serial	Via Ethernet or serial
Firmware upgrades to the COs	Via Web GUI or serial	Via Web GUI or serial
Input power	100-240V, 50/60 Hz 8.5W power, 15W max	100-240V, 50/60 Hz 8.5W power, 15W max

† The Web GUI is only for appliance management and not for connection to target devices when operating as an analog switch.

Connections

Figure 2 shows the connections on the LCM16 Local Console Manager. The LCM8 Local Console Manager has identical connections except it only has one local user port and eight analog rack interface (ARI) ports, whereas the LCM16 has two local user ports and 16 ARI ports.
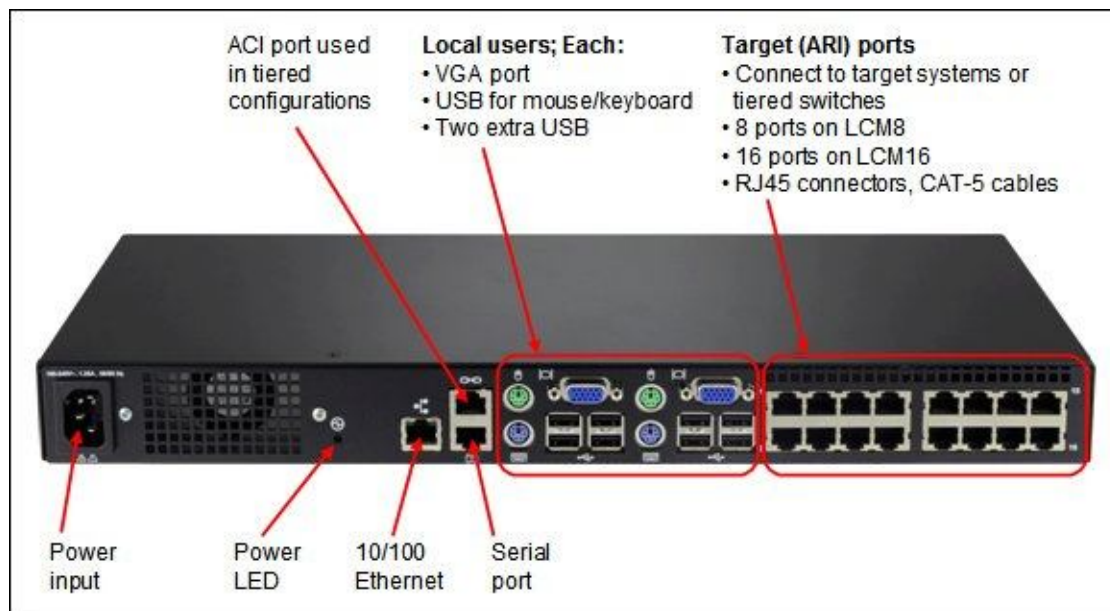

Figure 2. Connections on the LCM16 Local Console Manager

Note: Figure 2 shows the rear of the unit. There are no connectors on the front of the unit.

Features

Details about the features of the LCM8 and LCM16 are discussed in this section.

Local users

The LCM8 and LCM16 console switches enable one or two local users to access any attached servers. Local displays are connected to the console switch using VGA analog connections. The local users can use either USB or PS/2 mice and keyboards.

Two additional USB ports (for a total of four USB ports) are available for each local user, and devices plugged into these ports (for example, memory key, optical drive, and CAC reader) are visible to the target servers if a Virtual Media Conversion Option Gen2 (VCO2), part number 46M5383 is used. Note, however, that the VCO2 does not support chaining of target systems. (There is more information about virtual media in the "Virtual media" section below.)

For the LCM16, if the target server is currently in use, a second user attempting to gain access will be given an opportunity to force a connection to the device if their preemption level is equal to or higher than the current user's level. If the user attempting to gain access has a lower preemption level, the active user will be asked if they wish to give up control to the new user (a timeout is also configurable).

Target systems

The LCM16 has 16 target system ports (known as analog rack interface (ARI) ports) and the LCM8 has eight target system ports. These can be directly attached to systems with the appropriate USB or PS/2 conversion option connector on the end. These connections use standard CAT-5 cables. You can increase the number of connected target systems by two methods: chaining or a tiered arrangement of switches. (There is more information about these options in the "Chaining" and "Tiered consoles" sections below). Both methods mean that each of the eight or 16 ports will have multiple systems connected to it. You can mix connection methods.

Conversion options

These options are cable-connector combinations that are connected between the CAT-5 cables from the console switches to the target systems. Figure 3 shows the conversion option cables available for use with the console switches. The part numbers are listed in Table 1.

The KVM Conversion Option (KCO) is suitable for target servers with VGA and PS/2-style mouse and keyboard connections. The USB Conversion Option (UCO) is for systems with VGA and USB connections. The Virtual Media Conversion Option Gen 2 (VCO2) supports the virtual media capability of the console switches; however, it does not support chaining. We describe both virtual media and chaining in the "Virtual media" and "Chaining" sections below.
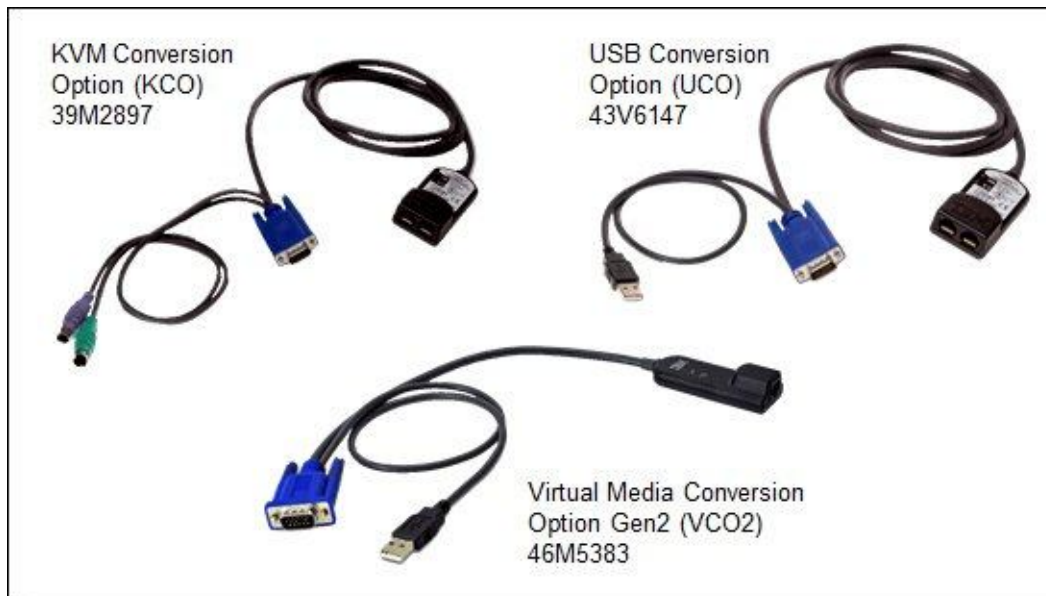
Figure 3. Supported conversion options

The built-in memory of each connection option helps simplify the configuration by assigning and retaining unique server identification codes for each attached server. This integrated intelligence enhances security and helps prevent unauthorized access to a server through cable manipulation. The connection option is powered directly from the server, providing Keep Alive functionality even if the server is not powered on.

Local and remote user interfaces

The LCM8 and LCM16 offer two user interfaces to manage connections:

- An on-screen display (OSCAR) accessible via the Print Screen button on either local user keyboard. This interface is used to control connectivity to the target servers.

- A Web browser interface accessible from any computer on the same Ethernet network as the console switch (provided the Ethernet port of the console switch is connected and properly configured). This interface is used to configure and manage the appliance.

Virtual media

The LCM8 and LCM16 support virtual media when the target systems are connected using the Virtual Media Conversion Option Gen2 (VCO2), part number 46M5383. You can use virtual media support to connect USB 2.0 media devices to the console switch using one of the four USB ports and make those devices available to any connected system. With this feature, you can install software, install, upgrade, or recover the operating system, update the BIOS code, or boot the target system from a USB drive.

Control of how the USB device is connected to the target system is managed through the user interface. The user interface presents the following configuration options:

- Virtual Media Locked: The locking option specifies whether a virtual media session is locked to the KVM session on the target device. When locking is enabled (default) and the KVM session is closed, the virtual media session will also be closed. When locking is disabled and the KVM session is closed, the virtual media session will remain active.

- Allow Reserved Sessions: Ensures that a virtual media connection can only be accessed with your user name and that no other user can create a KVM connection to that target device. When the associated KVM session is disconnected, the virtual media session may be disconnected according to the Locked setting.

- Write Access: With this option, you can specify whether the target system can write to the USB device (assuming it is writable).

- Encryption: You can configure encryption levels for virtual media sessions. The choices are None (default), 128-bit SSL (ARCFOUR), DES, 3DES, and AES.

Note that USB ports are assigned to a single virtual media session and cannot be independently mapped. This means you cannot map one USB device to one target system and another USB device to another target system.

Use of smart cards to authenticate access

The LCM8 and LCM16 switches allow you to use CCID-compliant smart cards to ensure access is authorized. Smart cards are pocket-sized cards that store and process information and enable Two Factor Authentication (TFA). Smart cards such as the Common Access Card (CAC) can be used to store identification and authentication to enable access to computers, networks, and secure rooms or buildings. Smart card readers are connected directly to the switch via one of the USB ports.

Note: For smart card use, the target device must be connected to the console switch using the Virtual Media Conversion Option Gen2 (VCO2), part number 46M5383. Other conversion options such as the VCO are not supported with smart cards.

The following figure shows how a smart card solution can be implemented. Here our Common Access Card (CAC) reader is connected to the USB Passthru Port of the 19-inch Flat Panel Console Kit. The CAC reader is effectively connected to the remote server by way of the LCM16 and the VCO2 conversion option.
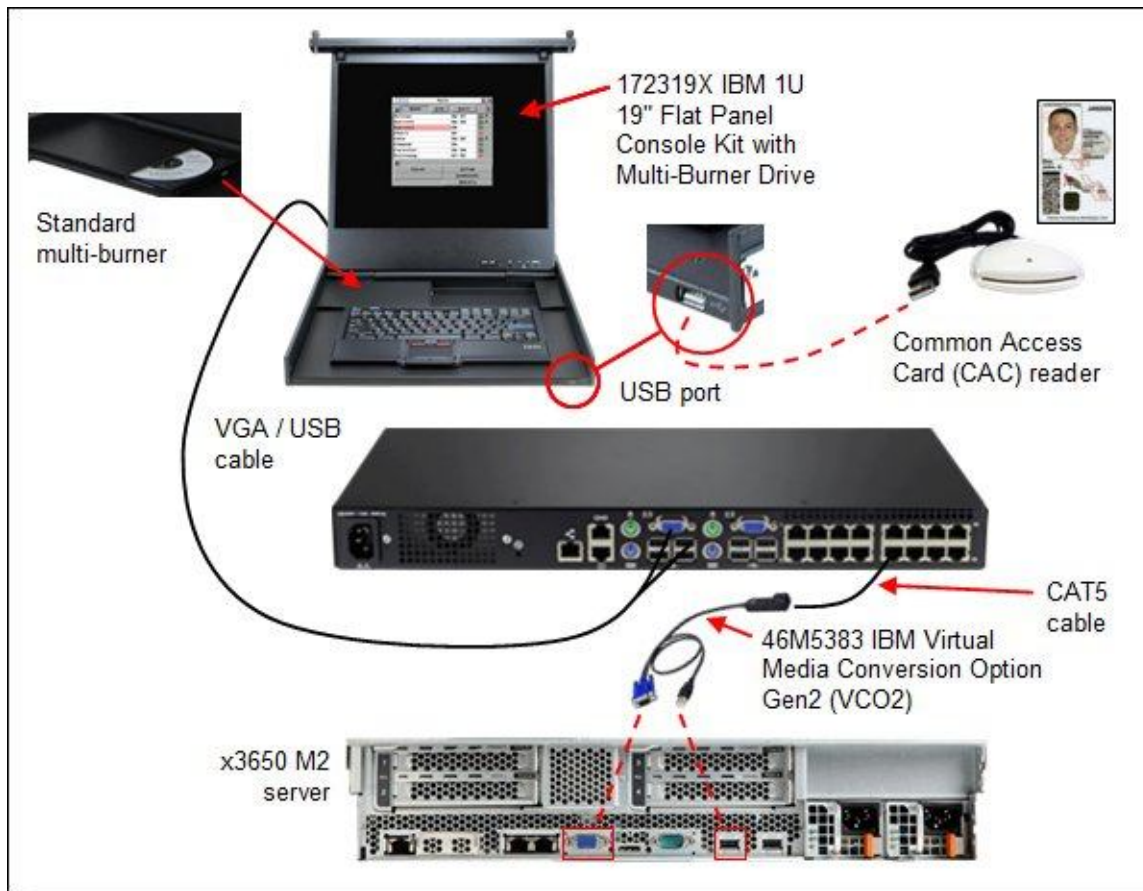
Figure 4. Using the Local Console Manager with a Common Access Card (CAC) reader

Chaining

The IBM cable chaining solution enables users to manage a "daisy chain" of multiple servers through a single connection to the console switch, replacing many long cables with just a few short ones, simplifying rack management, helping lower cabling cost, and reducing setup, diagnostic, and maintenance times. The daisy-chain connectivity has the added advantage of thin, flexible, and industry-standard CAT5 cabling and standard RJ-45 connectors, eliminating the need for one-to-one, dedicated cable connections between KVM switch ports and managed devices. This cable chaining solution allows up to 16 target systems to be chained together and connected to one port on the switch.

The following figure shows an example of chaining three target systems from one port on the console switch. Each conversion option part number includes a CAT-5 cable to connect it to either the console switch or its neighboring conversion option. The console switch includes the terminator needed at the end of the daisy chain.
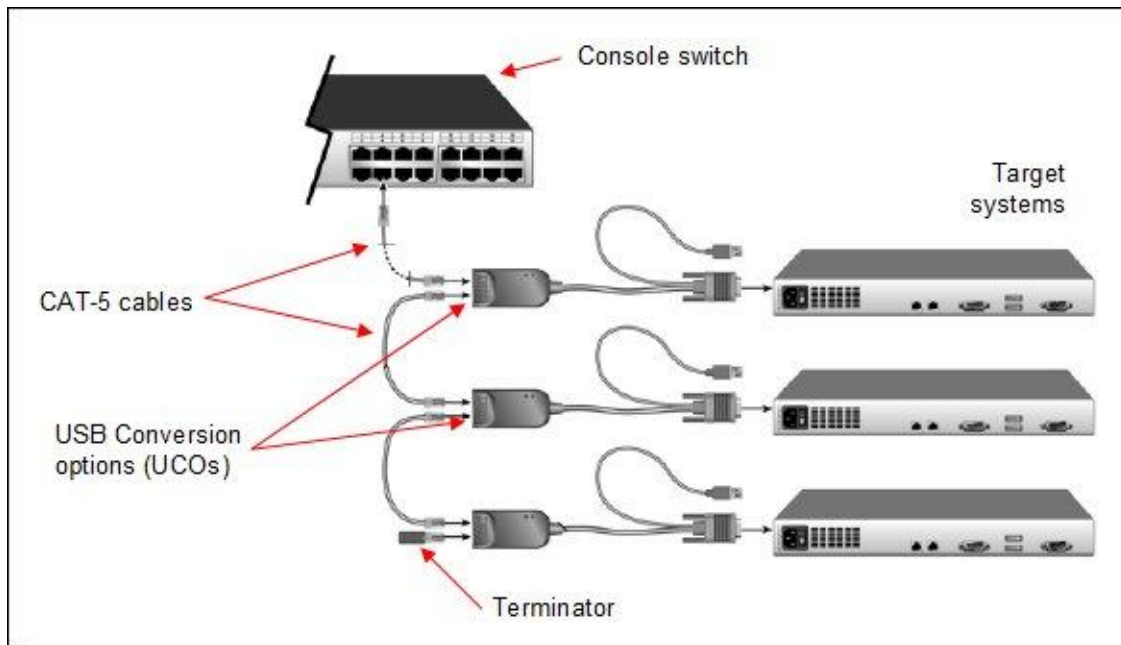

Figure 5. Chaining using USB Conversion Options

Note: Neither the Virtual Media Conversion Option (VCO) or the Virtual Media Conversion Option 2 (VCO2) support chaining.

Tiered consoles

You can tier multiple rack console switches to enable access to additional servers. In a tiered system, an ARI port on the main rack console switch connects to the Analog Console Interface (ACI) port of a tiered rack console switch (see Figure 3 for the locations of these ports). Consider a tiered configuration if you want to manage servers connected to multiple switches from one central location. For example, you could have a primary LCM16 console switch with 16 switches tiered underneath it that all have servers chained to their ports.

The LCM8 and LCM16 support two levels of tiering. The use of virtual media and smart card authentication are both supported only when primary and secondary switches are LCM8 or LCM16 console switches.

The following figure shows an example of tiered consoles. The red connections are simply CAT-5 cables between an ARI port on the master and the ACI port of each secondary switch.
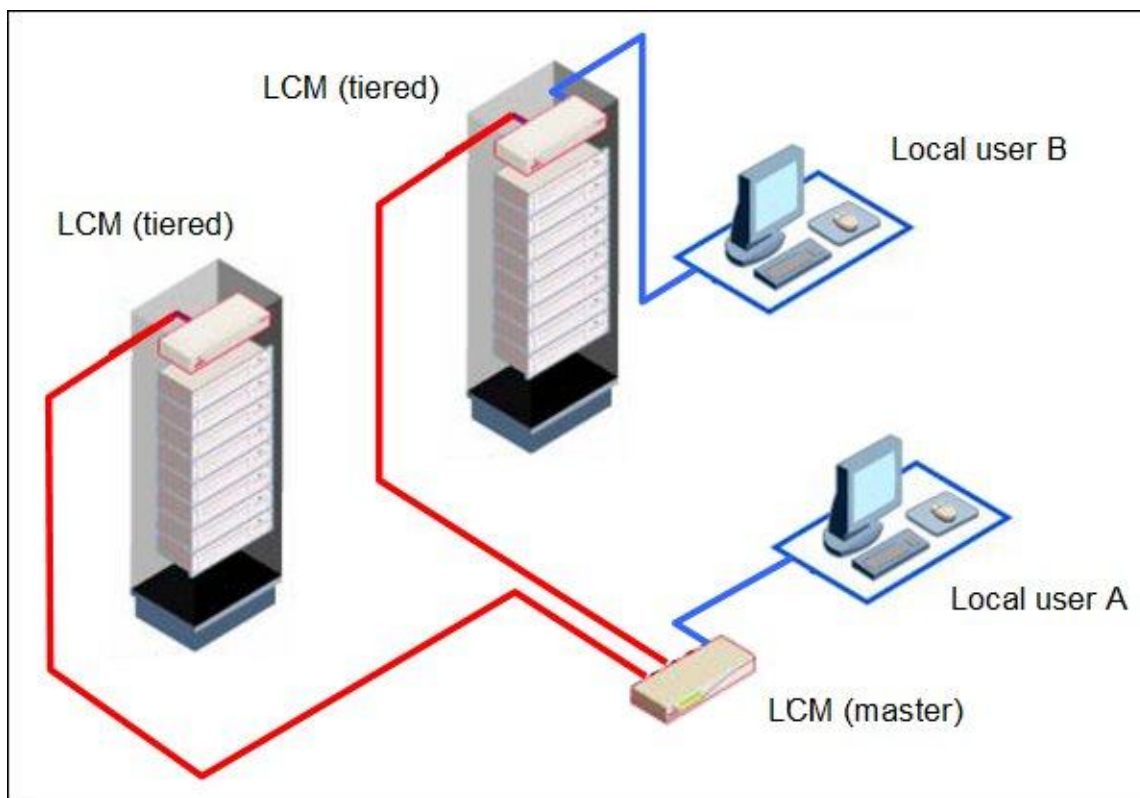

Figure 6. Tiered consoles

If there are local users attached to other tiered consoles, each can control target systems connected to that specific console. The local user at the primary console (Local user A in Figure 6) can preempt other local users if necessary.

The LCM8 supports up to 128 target systems and the LCM16 supports up to 256 target systems in a tiered configuration.

If the master switch is a Global Console Manager, GCM16 (1754D1X), or GCM32 (1754D2X), then tiering can also be used with the additional benefit of supporting remote network-attached users.

Physical specifications

The LCM8 and LCM16 have the following specifications:

Height: 4.37 cm (1.72 inches): 1 rack unit (1R)
Width: 43.2 cm (17 inches)
Depth: 16.5 cm (6.5 inches)
Weight: 1.9 kg (4.2 lb)

Operating environment

The adapter is supported in this environment:

- Temperature:
    - Operating: 0° to 50°C (32° to 132°F)
    - Non-operating: -20° to 70°C (-4° to 158°F)
- Relative humidity:
    - 10% to 95%

Warranty

The LCM8 and LCM16 have a three-year limited warranty.

Supported systems

The console switches are supported connected to the IBM BladeCenter chassis listed in the following table.

Table 4. Supported IBM BladeCenter chassis

	Part number	BladeCenter S	BladeCenter E	BladeCenter H	BladeCenter T	BladeCenter HT
IBM Local 1x8 Console Manager (LCM8)	1754A1X	Y	Y	Y	Y	Y
IBM Local 2x16 Console Manager (LCM16)	1754A2X	Y	Y	Y	Y	Y

The console switches are supported connected to the IBM System x servers listed in the following table.

Table 5. Supported System x servers (Part 1)

Product description	Part number	x3100 M4 (2582)	x3250 M4 (2583)	x3300 M4 (7382)	x3500 M4 (7383)	x3530 M4 (7160)	x3550 M4 (7914)	x3630 M4 (7158)	x3650 M4 (7915)	x3690 X5 (7147)	x3750 M4 (8722)	x3850 X5 (7143)	dx360 M4 (7912)
IBM Local 1x8 Console Manager (LCM8)	1754A1X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
IBM Local 2x16 Console Manager (LCM16)	1754A2X	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N

Table 5. Supported System x servers (Part 2)

Product description	Part number	x3200 M3 (7327, 7328)	x3250 M3 (4251, 4252)	x3400 M3 (7378, 7379)	x3500 M3 (7380)	x3550 M3 (7944)	x3620 M3 (7376)	x3630 M3 (7377)	x3650 M3 (7945)	x3755 M3 (7164)	dx360 M3 (6391)
IBM Local 1x8 Console Manager (LCM8)	1754A1X	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
IBM Local 2x16 Console Manager (LCM16)	1754A2X	Y	Y	Y	Y	Y	Y	Y	Y	Y	N

See the IBM ServerProven Web site for the latest compatibility information:
http://ibm.com/servers/eserver/serverproven/compat/us/.

Supported racks

The LCM8 and LCM16 Console Managers can be mounted in one of the following rack cabinets:

- IBM IBM 42U S2 Rack
- IBM 42U Enterprise Rack
- IBM 25U S2 Rack
- IBM 11U Office Enablement kit
- IBM S2 42U Dynamic Standard Rack
- IBM S2 25U Standard Rack
- IBM 1200 mm Deep Static Rack
- IBM 1200 mm Dynamic Rack
- IBM 42U Enterprise V2 Rack

Related publications and links

For more information, refer to these documents and websites:

- IBM Console Switches product page
  http://ibm.com/systems/x/options/rackandpower/kvm.html

- Local Console Manager LCM8 and LCM16 Installation and User's Guide
  http://ibm.com/support/entry/portal/docdisplay?Indocid=psg1MIGR-5085151

- IBM Redbooks® at-a-glance guide for the IBM 1U 17-inch and 19-inch Flat Panel Console Kits
  http://www.redbooks.ibm.com/abstracts/tips0731.html?Open

- IBM Redbooks at-a-glance guide for the IBM GCM16 and GCM32 Global Console Managers
  http://www.redbooks.ibm.com/abstracts/tips0772.html?Open

- IBM Redbooks at-a-glance guide for the IBM 1x8 and 2x16 Local Console Managers
  http://www.redbooks.ibm.com/abstracts/tips0730.html?Open

- IBM US Announcement Letter
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS110-171

Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service. IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing, IBM Corporation, North Castle Drive, Armonk, NY 10504-1785 U.S.A.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you. This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

This document was created or updated on March 28, 2013.

Send us your comments in one of the following ways:
- Use the online **Contact us** review form found at:
  ibm.com/redbooks
- Send your comments in an e-mail to:
  redbook@us.ibm.com
- Mail your comments to:
  IBM Corporation, International Technical Support Organization
  Dept. HYTD Mail Station P099
  2455 South Road
  Poughkeepsie, NY 12601-5400 U.S.A.

This document is available online at http://www.ibm.com/redbooks/abstracts/tips0788.html .

Trademarks