Technical Support
See the Support Web site for documentation, technical updates, drivers and downloads, warranty information, and software revisions.

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Inquiries regarding patented technology should be directed to ClearCube Corporate Headquarters.
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How to Use This Guide

This guide explains how to install and set up ClearCube Technology, Inc. A–Series chassis, blades and components necessary for managed desktop environments. We recommend that you familiarize yourself with the ClearCube architecture and product descriptions and read through all installation and setup procedures before beginning installation.

If you encounter any issues, contact ClearCube Support using the contact information provided on the inside front cover of this manual and in Appendix D. “Support” on page 77.

FCC Warning

This equipment generates and uses radio frequency energy and, if not installed and used in strict accordance with the instructions in this manual, may cause interference to radio and television reception. Changes or modifications not expressly approved by ClearCube Technology, Inc. could void the user's authority to operate the equipment under FCC rules.

California Proposition 65 Statement

WARNING: ClearCube products contain chemicals, including lead, known to the State of California to cause cancer, birth defects, or other reproductive harm. Wash hands after handling.

ClearCube products should be disposed of in accordance with local laws governing computer equipment disposal.

WEEE Information

The products described in this document are subject to regulation under the European Union Directive 2002/96/EC, that mandates separate waste collection, treatment, and recycling of electronic products. This directive is commonly known as WEEE, for Waste from Electrical and Electronic Equipment, and its intent is to promote the safe and sensible disposal of products that have outlived their usefulness.
The “crossed-out” trash bin symbol, shown above, identifies products that should be recycled, and not simply discarded. ClearCube Technology, Inc. supports the reuse, recycling, recovery, and responsible disposal of all products.

ClearCube Technology, Inc. is committed to meeting the requirements of the European Union WEEE Directive. The goal of the directive is to reduce the environmental impact due to the disposal of electrical and electronic equipment that has reached the end of its useful service life.

ClearCube products are sold exclusively to commercial and industrial customers and not to private households. Under the WEEE legislation terms, commercial and industrial customers have the responsibility to ensure that all electrical and electronic equipment is disposed of properly and in accordance with all applicable laws and local regulations. For more information, email recycle@clearcube.com, or call (866) 652-3400 or +1 (512) 652-3400.

Materials used in this product, if not disposed of properly, could have adverse effects on the environment and on human health. Do not dispose of these products in unsorted municipal waste containers. Deliver electronic waste only to an approved recycling facility, a treatment facility, or both. If one is not available, contact ClearCube for assistance.

Medical and Clinical Use of ClearCube Products

ClearCube products are not designed with components and testing for a level of reliability suitable for use in or in connection with surgical implants or as critical components in any life support systems whose failure to perform can reasonably be expected to cause significant injury to a human. Applications of ClearCube products involving medical or clinical treatment can create a potential for death or bodily injury caused by product failure, or by errors on the part of the user. Because each end-user system environment is customized and differs from ClearCube testing platforms and because a user may use ClearCube products in combination with other products in a manner not evaluated or contemplated by ClearCube, the user is ultimately responsible for verifying and validating the suitability of ClearCube products whenever ClearCube products are incorporated in a system, including, without limitation, the appropriate design, process and safety level of such system or application.
Symbols

Symbols are displayed on the hardware described in this document to convey specific information to the operator and service person. It is important to understand the intended meaning of these symbols. The following list shows each symbol displayed on ClearCube Technology, Inc. products and explains the meaning of each symbol.

Refer to Manual
Used on the equipment’s rating label to direct the operator or service person to this manual for additional information.

Shock Hazard
This symbol indicates the presence of electric shock hazards. Enclosures marked with these symbols should only be opened by qualified service personnel. Refer to the manual for additional information.

Power
Identifies the soft-start switch located on a blade used to power a blade on and off.

Fuse
Located on equipment rating label. Symbol is accompanied with the specifications needed for replacement. Only qualified technicians should perform this operation.

Protective Earth Terminal
This symbol identifies the terminal that is used to connect all metal parts of an enclosure through an external conductor to ground for protection against electrical shock in a fault condition.

Ground Bond Terminal
This symbol identifies the ground bond terminal. This terminal is used to connect the ground bonding conductor, or the combination of conductive parts, to earth ground for safety purposes.

Equipment Protection Class II
May be located on the power adapter’s rating label. Indicates that equipment is double-insulated from hazardous voltages. Not to be confused with Class 2, a US National Electrical Code (NEC) circuit classification.
The following caution and warning symbols are used in this document to indicate situations that merit checking this or another manual, or situations that could result in damage to equipment or physical injury.

CAUTION: A Caution notice in this manual indicates that equipment damage or minor injury may result if proper procedures are not followed.

WARNING: A Warning notice in this manual indicates that catastrophic equipment damage or serious injury, including death, may result if proper procedures are not followed.

Safety Guidelines

Before undertaking any troubleshooting or maintenance procedure, carefully read all WARNING and CAUTION notices. Equipment displaying warning or caution notices contains voltage hazardous to human life and is capable of inflicting personal injury.

- **Installations**—You must install ClearCube equipment in accordance with local electrical codes. Equipment might be subject to inspection.

- **Chassis grounding**—ClearCube’s chassis is designed with a three-conductor IEC 60320 appliance inlet that—with the proper power cord—connects the building’s external protective earthing conductor to all accessible metal parts of the enclosure. To minimize shock hazard, make sure your electrical power outlet has an appropriate earth safety ground that is connected each time you power on the equipment.

  Swedish safety regulations require the following statement:

  —Apparaten skall anslutas till jordat uttag när den anslutas till ett nätuerk.—

  Finnish safety regulations require the following statement:

  — Laite on liitettävä suojsamaadoituskoskettimilla varustettuun pistorasiaan.—

- **Power cord selection**—ClearCube or ClearCube distributors provide power cords that are specifically designed for use with particular pieces of equipment and are approved for use by the local authority having jurisdiction in the country where the equipment is put into service. Refer to the installation sections of this manual for specific power cord requirements. For information about obtaining replacement power cords, see Appendix D. “Support” on page 77.

- **Power adapters**—ClearCube or ClearCube distributors provide power adapters that are specifically designed for use with particular pieces of equipment and are approved for use
by the local authority having jurisdiction in the country where the equipment is put into service. Refer to the installation sections of this guide for specific power cord requirements. For information about obtaining replacement power adapters, see Appendix D, “Support” on page 77.

- **IT power systems**—ClearCube equipment has been evaluated and found to be compatible with IT power distribution systems with a phase-to-phase voltage not to exceed 240 V.

- **Live circuits**—Operating personnel and service personnel must not remove protective covers when operating the ClearCube chassis. Adjustments and service to internal components must be undertaken by qualified service technicians. During any service of this product, other than replacing a Blade PC or externally accessible modules on the expansion backplane, the main connector to the premise wiring must be disconnected. Dangerous voltages may be present under certain conditions. Use extreme caution.

- **Explosive atmosphere**—Do not operate the chassis in conditions where flammable gases are present. Under such conditions this equipment is unsafe and may ignite the gases or gas fumes.

- **Part replacement**—Only service equipment with parts that are exact electrical and mechanical replacements. Contact your authorized ClearCube Technology, Inc. reseller for information about replacement parts. Installation of parts that are not direct replacements will void the warranty and may cause harm to personnel operating the chassis. Furthermore, damage or fire may occur if replacement parts are unsuitable.

- **Modification**—Do not modify any part of the chassis or Blade PC from its original condition. Modifications may result in hazards.
Chapter 1. A–Series Architecture and Product Overview

ClearCube A–Series architecture delivers PC functionality to users from a secure, centralized location. This architecture increases IT manageability and security, and provides mission-critical reliability, performance, and uptime improvements with lowered costs. Replacing a traditional PC with a ClearCube Cloud Desktop (zero client or thin client) saves space, eliminates or reduces fan noise, and simplifies cabling. The key components of the ClearCube architecture include (devices not shown to scale):

**Blade PC**
A computer in a dense form factor that uses Intel® CPU(s). Blades are typically remotely located. See “A–Series Blade PCs” on page 2 for more information about blades.

**Chassis**
Holds up to 10 A–Series Blade PCs and enables you to manage all external cables connected to blades from a single location. See “A–Series Chassis and Expansion Backplane” on page 7 for more information about chassis.

**Cloud Desktop (zero client or thin client)**
Physical devices, typically placed on a desk, to which you can connect peripherals such as a monitor, keyboard, and pointing device. See “Cloud Desktops: Zero Clients and Thin Clients” on page 9 for more information about zero clients and thin clients.

**System Management Software Suite**
ClearCube Sentral™ is a management suite that provides system management capabilities (including connection brokering, mass storage lockout, alerting, and much more) for your ClearCube environment. Sentral takes advantage of monitoring hardware that is built into blades, chassis, and Cloud Desktops. For more information about Sentral, see ClearCube Sentral Administrator’s Guide.
The picture below shows the A–Series architecture components.

![A-Series Architecture Diagram](image)

**Figure 1. A–Series architecture**

1.1 A–Series Blade PCs

ClearCube A–Series Blade PCs are computers with Intel processors that deliver full PC functionality to users, including USB functionality, from a centralized location. Each A–Series Blade PC contains all the industry-standard components of a desktop PC:

- Processor
- Memory
• Hard disk
• Video support (PCoIP® host card, GPU or graphics card, or integrated graphics)
• PCoIP host card (depending on configuration)
• Ethernet® network interface card (NIC)

You can connect USB peripherals to a Blade PC through USB ports on a Cloud Desktop (zero client or thin client). You can install software on your Blade PC through a cloud desktop network connection or by using peripherals connected to the blade’s USB ports.

1.1.1 Blade PC Overview, Identification Labels, and Serial Number

This figures in this section show

• an overview of an A–Series blade detailing the front panel, buttons, and indicators, and

• all identification labels on a blade.
1.1.1.1 Blade PC Components
The picture and table below show each A–Series blade component.

Figure 2. A–Series blade components and features

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>Part</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front panel</td>
<td>Provides indicators and power-related buttons. See &quot;Blade PC Front Panel&quot; below for more information.</td>
</tr>
<tr>
<td>2</td>
<td>Handle</td>
<td>Use to aid insertion and removal from chassis.</td>
</tr>
<tr>
<td>3</td>
<td>I/O access slot</td>
<td>Provides access to select motherboard I/O ports for configuration outside of a chassis.</td>
</tr>
<tr>
<td>4</td>
<td>Power connector</td>
<td>Connects to the AC power backplane on the A3100 chassis.</td>
</tr>
<tr>
<td>5</td>
<td>Ethernet ports</td>
<td>Connect to Ethernet ports on the A–Series chassis backplane.</td>
</tr>
<tr>
<td>6</td>
<td>Storage drive carrier</td>
<td>Holds up to two storage drives (hard drives), connecting directly to SATA connectors inside the blade. Does not support hot-swap operation.</td>
</tr>
<tr>
<td>7</td>
<td>Video configuration label</td>
<td>Provides important blade configuration information, including video host card MAC address, serial number, and more. See &quot;Blade PC Identification Labels&quot; on page 6 for more information.</td>
</tr>
</tbody>
</table>
1.1.1.2 Blade PC Front Panel
Blade PC front panels provide power-related buttons, power-related indicators, and drive activity indicators. The pictures and table below show the front panel for the A6106HL, A6106H, and A6106D Blade PCs.

![Figure 3. Front Panel features](image)

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>Part</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A6106HL Front Panel</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| A1            | Power button and indicator  | **Button:** Press to power on and power off blade. Press and hold for three seconds to force power off. Button is illuminated (solid) when power is on.  
**Indicator:** Power button flashes slowly when blade is in standby (Windows Sleep power state). |
| A2            | Reset button and Drive indicator | **Button:** Press to reset blade power.  
**Indicator:** Flashes to indicate storage drive activity. |
| **A6106H and A6106D Front Panel** |                             |                                                                          |
| B1            | Power indicator             | Illuminated when blade is powered on.                                    |
| B2            | Drive activity indicator    | flashes to indicate storage drive activity.                              |
| B3            | Reset button                | Press to reset blade power.                                              |
| B4            | Power button                | Press to power on or power off blade. Press and hold for three seconds to force power off. |
| B5            | Display                     | Displays boot codes and blade serial number. ClearCube Sentral management suite enables the LCD to display user-defined strings and to blink for identification purposes. |
1.1.1.3 Blade PC Identification Labels
Labels on A–Series blades provide a variety of important information about the blade. Each A–Series blade has a serial number. By default, the last three digits of the serial number are displayed on the blade LCD. The serial number is also printed on a label adjacent to the fans on the front of the blade, as shown in the following figure.

![Figure 4. A–Series serial number and configuration labels](image)

1.1.1.4 Blade PC Serial Number
The blade serial number (located on a label shown in the section above) is useful if you need to identify a blade or a blade model. A–Series blade serial numbers use the following syntax:

- **A6106H/HL**
  AVHnnnnn (where AVH is the serial number prefix, and nnnnn is a five-digit number.)

- **A6106D**
  AVCnnnnn (where AVC is the serial number prefix, and nnnnn is a five-digit number.)

The following sections detail the features of each A–Series blade.

1.1.2 A6106H and A6106HL Blade PC
A6106H/HL Blade PCs provide the robust features of 4th generation Intel® Core™ i7 and i5 series processors, the Intel® Q87 PCH chipset, DDR3-1600 memory, PCI Express® graphics, a variety of disk drives (SSD/SED/SSHD/SATA), and on-board dual LAN (Ethernet) connections.

See Table 5 on page 69 for a detailed specification of A6106H/HL features and components.
### 1.1.3 A6106D Blade PC

A6106D Blade PCs provide the robust features of 3rd generation Intel® Core™ i7 and i5 series processors, the Intel® Q77 Express chipset, DDR3-1600 memory, PCI Express® graphics, a variety of disk drives (SSD/SED/SATA), and on-board dual Ethernet connections.

See [Table 6](#) on page 70 for a detailed specification of A6106D features and components.

### 1.2 A–Series Chassis and Expansion Backplane

The following sections describe the A3100 chassis and the expansion backplane.

The list below shows dimensions and features of the A3100 chassis.

- 6U high
- Compatible with industry-standard, 19-inch racks and cabinets (see [Figure 7](#) on page 15 for examples)
- Holds up to 10 A–Series blades (70-blade maximum density in a 42U rack)
- Chassis mounts to rack or cabinet with:
  - Rack ears (included), or
  - Optional chassis rapid–mount kit (see “Using a Chassis Rapid–Mount Kit” on page 27 for more information)
- Removable front bezel.
- Expansion backplane—A modular component that provides signal connectors and a chassis ID, or an electronic asset tag, for blades.
Chapter 1. A–Series Architecture and Product Overview

The picture below shows an A3100 chassis with front bezel, rack ears, and expansion backplane.

![Chassis with Front Bezel and Rack Ears](image1)

![Front Bezel Removed](image2)

![Rear of Chassis with Expansion Backplane](image3)

Figure 5. The A3100 chassis with front bezel, rack ears, and expansion backplane

The A3100 chassis contains an expansion backplane, a modular component that contains all signal connectors and a chassis ID for A–Series blades. Figure 6 on page 9 shows detail of an A3100 chassis and with an expansion backplane.

An A–Series blade connects to the expansion backplane when you insert and seat the blade in an A3100 chassis. To connect power and Ethernet to a blade in an A3100 chassis, plug power and Ethernet cables into the expansion backplane. The expansion backplane enables you to remove the blade from the chassis without disconnecting any cables.
The picture below shows the rear of an A3100 chassis with an expansion backplane attached.

![Figure 6. Rear view of A3100 chassis with expansion backplane and AC tray](image)

For more information, see

- “Chassis and Blade Power Requirements” on page 17
- “Chassis Expansion Backplane and Cabling” on page 18, and
- “Example Deployment Diagrams” on page 20.

## 1.3 Cloud Desktops: Zero Clients and Thin Clients

ClearCube Cloud Desktops include zero clients using PCoIP technology and thin clients (typically with embedded operating systems). Cloud Desktops connect to Blade PCs over a standard Ethernet network. Zero clients and thin clients deliver video and peripheral signals to a user from a Blade PC, allowing users to work over standard switched networks.

Cloud Desktops extend the ClearCube product line to let IT managers use their existing IP network and cabling infrastructure, regardless of the distance between users' physical locations and their centralized Blade PCs or other remote computing devices. ClearCube management software—Sentral—enables IT administrators to manage assets and users, perform connection brokering, and more.

For detailed instructions about setting up, using, and managing Cloud Desktops, see the Quick Start Guide for your client on the ClearCube Support site. For information about PCoIP technology, see PC-over-IP™ System User’s Guide on the Support site at [www.clearcube.com/support/](http://www.clearcube.com/support/).
1.4 Monitor Support and Requirements

A–Series Blade PCs support up to four monitors. The tables below show GPU, host card, and zero client combinations that provide the specified number of monitors and resolutions for each A–Series blade. Various GPU and zero client options are available.

1.4.1 A6106H and A6106HL Blade PCs

The table below shows GPU, host card, and zero client combinations that provide the specified number of monitors and resolutions for A6106H/HL blades.

<table>
<thead>
<tr>
<th>Monitors</th>
<th>Resolution</th>
<th>GPU</th>
<th>Host Card</th>
<th>Zero Client</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1920 x 1200</td>
<td>Quadro K420</td>
<td>V5422</td>
<td>CD9522</td>
<td>Fiber CD7522</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9526</td>
<td>Fiber CD7526</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9722</td>
<td>Fiber CD7722</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9724</td>
<td>Fiber CD7724</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9822</td>
<td>Fiber CD7822</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9924</td>
<td>Fiber CD7924</td>
</tr>
</tbody>
</table>

For high-resolution video, connect zero client to monitor using single-link-to-dual-link DVI cable (Y-cable) included with zero client.

1.4.1 A6106H and A6106HL Blade PCs

The table below shows GPU, host card, and zero client combinations that provide the specified number of monitors and resolutions for A6106H/HL blades.

<table>
<thead>
<tr>
<th>Monitors</th>
<th>Resolution</th>
<th>GPU</th>
<th>Host Card</th>
<th>Zero Client</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2560 x 1600</td>
<td>Quadro K420</td>
<td>V5422</td>
<td>CD9522</td>
<td>Fiber CD7522</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9526</td>
<td>Fiber CD7526</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9722</td>
<td>Fiber CD7722</td>
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<td>CD9724</td>
<td>Fiber CD7724</td>
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<td>CD9822</td>
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<td></td>
<td></td>
<td>CD9924</td>
<td>Fiber CD7924</td>
</tr>
</tbody>
</table>

For high-resolution video, connect zero client to monitor using single-link-to-dual-link DVI cable (Y-cable) included with zero client.

1.4.1 A6106H and A6106HL Blade PCs

The table below shows GPU, host card, and zero client combinations that provide the specified number of monitors and resolutions for A6106H/HL blades.

<table>
<thead>
<tr>
<th>Monitors</th>
<th>Resolution</th>
<th>GPU</th>
<th>Host Card</th>
<th>Zero Client</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2560 x 1600</td>
<td>Quadro K420</td>
<td>V5422</td>
<td>CD2022</td>
<td>Fiber CD1022</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD2024</td>
<td>Fiber CD1024</td>
</tr>
</tbody>
</table>

† This model connects to displays using DisplayPort® cables.
## Monitor Support and Requirements

<table>
<thead>
<tr>
<th>Monitors</th>
<th>Resolution</th>
<th>GPU</th>
<th>Host Card</th>
<th>Zero Client</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1920 x 1200</td>
<td>Quadro K420</td>
<td>V5422</td>
<td>CD9522</td>
<td>CD7522</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K2200</td>
<td></td>
<td>CD9526</td>
<td>CD7526</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K420</td>
<td></td>
<td>CD9722</td>
<td>CD7722</td>
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<td></td>
<td></td>
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<td>CD9724</td>
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<td>CD9924</td>
<td>CD7924</td>
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<tr>
<td>2</td>
<td>1920 x 1200</td>
<td>Quadro K420</td>
<td>V5422</td>
<td>CD2022</td>
<td>CD1022</td>
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<tr>
<td></td>
<td></td>
<td>Quadro K2200</td>
<td></td>
<td>CD2024</td>
<td>CD1024</td>
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<tr>
<td></td>
<td></td>
<td>Quadro K420</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2560 x 1600</td>
<td>Quadro K2200</td>
<td>V5422</td>
<td>CD9552†</td>
<td>CD7552†</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K420</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1920 x 1200</td>
<td>Quadro K420</td>
<td>V5422</td>
<td>CD9542</td>
<td>CD7542</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K2200</td>
<td></td>
<td>CD9742</td>
<td>CD7742</td>
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<tr>
<td></td>
<td></td>
<td>Quadro K420</td>
<td></td>
<td>CD9744</td>
<td>CD7744</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1920 x 1200</td>
<td>Quadro K1200</td>
<td>V5442</td>
<td>CD9542</td>
<td>CD7542</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9742</td>
<td>CD7742</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9744</td>
<td>CD7744</td>
</tr>
</tbody>
</table>

†: This model connects to displays using DisplayPort cables.

For high-resolution video, connect zero client to monitor using single-link-to-dual-link DVI cable (Y-cable) included with zero client.
### 1.4.2 A6106D Blade PC

The table below shows GPU, host card, and zero client combinations that provide the specified number of monitors and resolutions for A6106D blades.

**Table 2. A6106D monitors, resolution, and device requirements**

<table>
<thead>
<tr>
<th>Monitors</th>
<th>Resolution</th>
<th>GPU</th>
<th>Host Card</th>
<th>Zero Client</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1920 x 1200</td>
<td>NVS 310</td>
<td>V5422</td>
<td>CD9522 CD7522</td>
<td>For high-resolution video, connect zero client to monitor using single-link-to-dual-link DVI cable (Y-cable) included with zero client.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K2000</td>
<td></td>
<td>CD9526 CD7526</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K4000</td>
<td></td>
<td>CD9722 CD7722</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9724 CD7724</td>
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<td>CD9822 CD7822</td>
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<td></td>
<td></td>
<td></td>
<td>CD9924 CD7924</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2560 x 1600</td>
<td>NVS 310</td>
<td>V5422</td>
<td>CD9522 CD7522</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K2000</td>
<td></td>
<td>CD9526 CD7526</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K4000</td>
<td></td>
<td>CD9722 CD7722</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9724 CD7724</td>
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<td></td>
<td></td>
<td>CD9924 CD7924</td>
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</tr>
<tr>
<td>2</td>
<td>1920 x 1200</td>
<td>NVS 310</td>
<td>V5422</td>
<td>CD9522 CD7522</td>
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<tr>
<td></td>
<td></td>
<td>Quadro K2000</td>
<td></td>
<td>CD9526 CD7526</td>
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<tr>
<td></td>
<td></td>
<td>Quadro K4000</td>
<td></td>
<td>CD9722 CD7722</td>
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<td></td>
<td>CD9724 CD7724</td>
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<td>CD9822 CD7822</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>CD9924 CD7924</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2560 x 1600</td>
<td>Quadro K2000</td>
<td></td>
<td>CD9552 † CD7552 †</td>
<td>This model connects to displays using DisplayPort cables. These zero clients include four DisplayPort connectors. Connect ports 1 and 2 only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quadro K4000</td>
<td></td>
<td>CD9542 CD7542</td>
<td>For high-resolution video, connect zero client to monitor using single-link-to-dual-link DVI cable (Y-cable) included with zero client.</td>
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<td>CD9742 CD7742</td>
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<td>CD9744 CD7744</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1920 x 1200</td>
<td>NVS 510</td>
<td>V5442</td>
<td>CD9542 CD7542</td>
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<td>CD9742 CD7742</td>
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<td>CD9744 CD7744</td>
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</tr>
</tbody>
</table>

† This model features DisplayPort video jacks.
Chapter 2. Site Preparation and Network Planning

This chapter describes preliminary steps to take after receiving your A–Series shipment, and describes the hardware and environmental requirements for your A–Series products. The following list identifies each of the topics discussed in this chapter.

- “About Your Shipment” on this page
- “Rack and Cabinet Requirements” on page 15
- “Space and Floor Support” on page 16
- “Cooling and Airflow” on page 16
- “Chassis and Blade Power Requirements” on page 17
- “Chassis Expansion Backplane and Cabling” on page 18

2.1 About Your Shipment

This section details precautions to follow before unpacking your shipment and the order in which to unpack each device in your shipment.

2.1.1 Inspecting Your Shipment and Devices

Examine the outside of all containers in your shipment before opening them.

NOTE If you find any external damage to the containers that you receive, do not open them. Notify the shipper that damage has occurred and request that they inspect the containers before you unpack them.
If you discover damaged devices after unpacking your shipment:

- Contact the shipper to notify them of the damage.
- Contact ClearCube Support for a replacement. For information about contacting Support, see Appendix D, “Support” on page 77.

2.1.2 Unpacking Your Shipment

ClearCube components are typically shipped in separate containers. The following list describes the components shipped for typical installations and specifies the order in which you should unpack your shipment.

NOTE To protect ClearCube devices, keep them in their shipping containers until you install, insert, or connect the devices.

1. **Chassis**—Unpack immediately before attaching to a previously-installed rack or cabinet. Do not unpack and leave unprotected for any period of time.

2. **Blade PCs**—Unpack immediately before inserting in an A–Series chassis. Do not unpack and leave unprotected for any period of time.

3. **Zero client and thin client**—Only unpack before connecting to a Blade PC. Cloud Desktops (zero clients and thin clients) are shipped with or without power supplies and keyboards, depending on the devices that you use in your environment. See the documentation included with your zero clients or thin clients for instructions about setting up, configuring, and using them.

NOTE Save shipping containers and packing materials at least until your ClearCube installation is complete and tested. Use the original shipping containers for RMAs (see Appendix D, “Support” on page 77 for more information).

See “Installing an A–Series Chassis” on page 23 for instructions about unpacking and installing chassis. See “Installing Blade PC in a Chassis” on page 50 for instructions about installing blades.
2.2 Rack and Cabinet Requirements

Before installing ClearCube components, it is important to properly prepare the site where you will install the chassis and Blade PCs. This section explains how to plan for cabinet, rack and chassis installation. The pictures below show two options for holding ClearCube chassis. A standard 42U rack or cabinet can hold as many as seven A3100 chassis.

Figure 7. A fully-loaded rack with A3100 chassis and a standard 19-inch cabinet

CAUTION: Equipment racks and cabinets can become highly unstable if not adequately secured. Read and follow the manufacturer’s specifications and recommendations for mounting. Additional ClearCube guidelines are provided throughout this section that—with the manufacturer’s requirements—will ensure a safe installation.
Fully-enclosed electrical cabinets are the preferred option for mounting your ClearCube chassis. When using cabinets, make sure that:

- Front and rear panels and doors are vented to provide sufficient airflow for intake and exhaust.
- Ensure that you have at least 34 inches (86 cm) of interior depth measured from the front of the unit to accommodate the cabling that exits from the rear of the chassis.
- Provide adequate space at the back of the rack or cabinet to allow servicing the cables and equipment.

You can fit cabinets with casters to improve mobility and to ease access when servicing.

**2.2.1 Space and Floor Support**

Before installing racks, chassis, and blades, verify that your rack and floor can support the weight of a fully-loaded rack. If your initial installation contains fewer than seven chassis, ensure that your rack and floor can support the weight of a fully-loaded rack so you can add additional blades and chassis in the future. If you are installing other equipment in the rack or cabinet, take this additional weight into consideration.

Seven fully-loaded chassis (including expansion backplanes) weigh approximately 1347.5 pounds (612 kilograms), not including any cabling. One 42U rack can hold up to seven chassis, creating a load of greater than 225 pounds per square foot (1099 kilograms per square meter) for each of the roughly 6 square feet (0.56 square meters) of floor space required for each rack.

**NOTE** When planning for the space required in your data center, include 36 inches in front of each cabinet to provide adequate room when you remove blades from chassis.

**WARNING:** Improper structural support could cause the rack or cabinet to lean and cause the floor to buckle and potentially cause structural damage.

**2.2.2 Cooling and Airflow**

The following sections detail items to consider when addressing cooling and airflow for A3100 chassis.
A–Series chassis draw cool air (25 degrees Celsius) in through the front of the chassis, and exhausts it out the back.

- Ensure that the air conditioning and ventilation system for the installation area can accommodate your installation’s thermal load. Contact ClearCube Support for detailed power and cooling requirements tables.

- The rear of the chassis has air vents for Blade PC fans. The fan openings must be at least five inches from any airflow-impeding barriers such as walls, the rear of the rack door or panel, large bundles of cables, and so on. The availability of an air exit path from these fans is imperative for the efficient operation of units. Failure to provide sufficient air venting will result in a thermal overload of Blade PCs. If the chassis is installed in a cabinet, use a fully vented rear door or panel.

| CAUTION: Failure to provide sufficient space and room ventilation will result in overheating that can cause eventual unit failure not covered as part of unit warranty. |

- Each chassis produces varying amounts of heat, depending on processor activity. Contact ClearCube Support for detailed power and cooling requirements tables. See Appendix D. “Support” on page 77 for information about contacting ClearCube Support.

### 2.3 Chassis and Blade Power Requirements

Your ClearCube system centralizes computing components in a single location, which centralizes power requirements in one area. Although the ClearCube solution reduces the overall power required when compared to traditional PCs, the power demands in the IT center are increased. Use the power and current specifications in this section and in the power and cooling requirements documentation available on the ClearCube Support site to ensure that your facilities can provide the required power safely without tripping circuit breakers.

#### 2.3.1 Power Input Considerations

A3100 chassis hold up to 10 blades and have four A/C power inputs (two inputs for each half of the chassis). For each half of the chassis, one input powers the blades in that half (blades 1 to 5 or blades 6 to 10) and the other input is a redundant backup.

- You must connect both power cords to the chassis for failover power.

- The maximum steady-state current draw of a single fully loaded chassis ranges between 7 and 12 amps at 120 VAC per input, based on the level of user activity.

- Peak initial current draw of a fully-populated chassis is 16.3 amps at 120 VAC per input.

See ClearCube Support for detailed power and cooling requirements tables. See Appendix D. “Support” on page 77 for information about contacting ClearCube Support.
2.3.2 Power Circuit Considerations

If you are putting multiple chassis on a single power circuit, ensure that the circuit can safely handle the combined peak currents of the chassis. If your existing power circuit cannot handle the peak current, you must have additional power system capacity installed by a qualified electrician.

CAUTION: Make sure your power strips, power grid, and circuit breakers can safely provide the required current. Ensure that any extension cords used meet local safety regulations and local fire codes.

Contact ClearCube for detailed power and cooling requirements tables. See Appendix D, “Support” on page 77 for information about contacting ClearCube Support.

2.4 Chassis Expansion Backplane and Cabling

This section shows

• expansion backplane network ports and features
• maximum number of Ethernet cables the expansion backplane supports
• supported cable types for A-Series blades and chassis.

2.4.1 Chassis Ports and Supported Protocols

Network ports on the A3100 expansion backplane (on the rear of the chassis, shown in the pictures below) support various network functions and protocols. All ports are standard RJ45 Ethernet ports. The list below shows each network port on the expansion backplane, shows the protocols each supports, and notes any blade model differences.

- **PCoIP Port** — This port is dedicated to all PCoIP traffic from the PCoIP host card in an A-Series blade.
- **Pri (Primary Port)** — This port is for standard network traffic, with support for Intel AMT.
- **Sec (Secondary Port)** — This port is for standard network traffic.
The picture below shows the rear of the A3100 chassis and expansion backplane port assignments for A–Series blades.

Figure 8. A3100 chassis expansion backplane with A6106H/HL and A6106D blades

2.4.2 Ethernet Cable Requirements

The table below shows, for each blade model, the

- purpose and number of Ethernet cables, and
- the total number of Ethernet cables for each blade model and for a fully-populated chassis.

Table 3. The number of Ethernet cables by Blade PC model and for fully-loaded chassis

<table>
<thead>
<tr>
<th>Purpose of Cable</th>
<th>A6106H/HL Blade PC</th>
<th>A6106D Blade PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCoIP cable</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Primary Network Adapter cable (LAN) (Also supports Intel AMT)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Secondary Network Adapter cable (LAN)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total cables for each Blade PC</strong></td>
<td><strong>3</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td><strong>Maximum cables for each chassis</strong></td>
<td><strong>30</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>
2.4.3 Supported Cables

The A3100 chassis uses standard network cables with RJ-45 connectors to connect to Ethernet networks. The list below shows supported network cable types:

- CAT5
- CAT5e
- CAT6

Network connections follow standard Ethernet guidelines.

2.5 Example Deployment Diagrams

Each fully-loaded chassis requires up to 30 network cables (depending on blade model and deployment type) for connections to network hubs or switches (see “Chassis Ports and Supported Protocols” on page 18 for more information).
2.5.1 Dedicated PCoIP Network

The picture below is a high-level diagram of a deployment where PCoIP host cards and zero clients are optimized by isolating PCoIP traffic on a dedicated PCoIP network (using physical or virtual LANs).

Figure 9. A-Series deployment optimized by isolating PCoIP traffic
2.5.2 **Shared Network**

The picture below is a high-level diagram of a deployment where PCoIP traffic (from host cards and zero clients) and regular network traffic is on the same network.

| NOTE | To optimize PCoIP traffic, ClearCube recommends using dedicated networks (physical or virtual LANs) as shown above. |

---

Figure 10. A–Series deployment with shared PCoIP and regular network traffic
Chapter 3. Chassis and Blade PC Installation

Installing ClearCube products is a series of simple tasks that you can perform in a short amount of time. The following instructions are intended for IT technicians who are familiar with computer systems and familiar with configuring hardware. This chapter discusses the following topics:

• “Tools for Installation” on this page
• “Installing an A–Series Chassis” on this page
• “Installing Blade PC in a Chassis” on page 50

3.1 Tools for Installation

You can perform all installation tasks with the following tools:

• #2 Phillips screwdriver—Required.
• 1/4–inch nut driver with magnetic tip—Optional. Suggested for removing and replacing the self-tapping sheet metal screws located on the A3100 chassis.

3.2 Installing an A–Series Chassis

Mount your A–Series chassis on a standard, 19-inch rack or cabinet to hold your A–Series blades. The following list describes the chassis components.

• Front Bezel—A removable bezel at the front of the chassis that protects blades and provides labels for buttons and indicators.
Chapter 3. Chassis and Blade PC Installation

- **Expansion backplane**—Provides signal connectors for Blade PCs.

| NOTE | This modular component might be shipped separately from your chassis. If the expansion backplane is not included in your A3100 chassis, see "Attaching and Removing the Expansion Backplane" on page 30 for instructions about how to insert the expansion backplane. |

The following sections describe:

- The contents of your chassis shipment container. See “Chassis Container Contents” on this page for more information.

- How to mount a chassis. See “Mounting A–Series Chassis” on page 25 for more information.

The following sections assume that you already have appropriate blade racks, cabinets, or both correctly installed with adequate space for the chassis you are mounting.

### 3.2.1 Chassis Container Contents

The list below shows how to unpack your A–Series chassis container.

1. Open the chassis box.

2. Remove the packing material

3. Remove the chassis and set it on a flat working surface.

4. Check the chassis for any visible damage. If you find any product damage, immediately contact the shipper for an on-site inspection.

A–Series chassis are shipped with the following items:

- **Chassis**—AC power cords are shipped in a separate container, as described in “Chassis AC Power Cords” on page 25.

- **Quick Start Guide**—Briefly describes how to install the chassis and how to install blades in the chassis.

- **Chassis accessory kit**—Allows universal mounting in standard, 19-inch racks or cabinets. The chassis accessory kit includes the following:
  - Four rack-mount brackets
  - Chassis ground strap and mounting hardware
  - Mounting hardware

See "Using a Chassis Rapid–Mount Kit" on page 27 for information about mounting a kit.
3.2.2 **Chassis AC Power Cords**

Chassis AC power cords are shipped in different containers than A–Series chassis. Only use power cords included with your shipment. Chassis shipped to countries with a:

- 100–130-volt power system use power cords rated at 15 amps
- 250-volt power system use power cords rated at 10 amps
- 250-volt power system use power cords rated at 13 amps

3.2.3 **Mounting A–Series Chassis**

Mount your A–Series chassis to a four-post rack or cabinet using the kit you purchased. The list below shows each kit.

- **Chassis accessory kit**— Included with each A–Series chassis. The kit fits all standard, four-post, 19-inch racks and includes front and back mounting brackets and all necessary hardware. See “Using a Chassis Accessory Kit” on page 26 for instructions about using the kit.

—OR—

- **Chassis rapid-mount kit**—Compatible with racks and cabinets with four posts and square mounting holes for snap-in rack nuts. Not all third-party racks are compatible with the chassis rapid–mount kit. See “Using a Chassis Rapid–Mount Kit” on page 27 for instructions about using the kit.

| NOTE | A–Series chassis do not support two-post enclosures. |

Before mounting your chassis, ensure that you have the tools listed in “Tools for Installation” on page 23.

---

**CAUTION:** To avoid equipment damage and potential personal injury, install the chassis without blades installed.

3.2.3.1 **Cabinet Mounting Considerations**

A–Series chassis draw cool air in through the front of the chassis and exhausts it out the back. If you mount your A–Series chassis in a cabinet-style enclosure, ensure that:

- There is at least 34 inches (86 cm) of interior depth measured from the front of the enclosure to accommodate the cabling and air flow that exits from the rear of each chassis.
- If the cabinet enclosure front doors are not vented, add an additional 4 inches (11 cm) in front of the chassis for proper airflow.
- The spacing between the front and back rails is no more than 30 inches (76 cm).
3.2.3.2 Using a Chassis Accessory Kit

Using the brackets and hardware included in your kit, you can install an A–Series chassis from the front or from the rear of the rack.

To install a chassis using the chassis accessory kit, perform the following steps.

1. When installing in a cabinet enclosure, loosely attach the adjustable rear mounting brackets to the chassis with three screws on each side.

2. Position the chassis in the cabinet so that the front of the chassis lines up with the front rail and then slide the adjustable rear brackets into place. Tighten the screws that hold the rear brackets in place.

3. With the rear brackets firmly attached to the chassis, slide the chassis into the cabinet from the rear. Open the front bezel of the chassis (latch is shown in Figure 23 on page 50) and then attach the front brackets with three screws on each side.

   NOTE   You can attach front brackets from the inside or from the outside of the chassis.

4. Using the hardware provided with your cabinet, attach the chassis mounting brackets to the cabinet rails.

5. As shown in Figure 12 below, attach one end of the ground strap (included with the chassis) to the chassis and attach the other end to the rack frame with the two 10-32 screws.
supplied in your shipment. Obtain a cage nut to attach the strap to your cage. Ensure that the rack is properly grounded.

![Chassis ground strap attached to the Dual Input Module (located above the expansion backplane)](image)

**Figure 12.** Chassis ground strap attached to the Dual Input Module (located above the expansion backplane)

6. Supply power to the chassis.

   a. Attach the AC power cords included with the chassis to the rear panel power connectors on the chassis.

   b. Connect the AC power cords to a surge-protected power source such as an uninterruptible power supply (UPS) or power strip. Use the cable retention clamps (included with your chassis) to secure the power cables.

**NOTE** ClearCube products shipped to countries using 100-130-volt power systems include power cords rated at 15 amps. ClearCube products shipped to countries using 208-240-volt power systems include power cords rated at 10 amps. See “Safety Guidelines” on page x for more information.

Ensure that all rooms or data centers in which you install Blade PCs are clean before you begin installing blades. ClearCube recommends completing all additional chassis hardware installation and preliminary network cabling for zero clients and thin clients (if applicable) before you begin installing any Blade PCs.

### 3.2.3.3 Using a Chassis Rapid-Mount Kit

The chassis rapid-mount kit is compatible with most four-post racks and cabinets. To install a chassis with the chassis rapid-mount kit, perform the following steps.

1. Ensure that you:
   
   - Install your chassis from the front of the rack or cabinet.
   
   - Begin installing chassis at the bottom of the rack or cabinet to provide support for each chassis before it is securely mounted. This simplifies getting the chassis square and level in the rack.

2. Unscrew the thumbscrew holding each pair of chassis and rack brackets together, and then slide the brackets apart.

   - The bracket containing springs is the rack bracket and is installed on the rack.
   
   - The solid bracket is the chassis bracket, and it is screwed to the chassis.

3. Remove the front rack ears that are currently on the A3100 chassis.
4. Mount the chassis bracket to the chassis with four flathead screws included in your kit. Repeat on the other side of the chassis.

**NOTE** You can use the chassis and rack brackets on either side of your rack or cabinet; that is, the brackets are not specific to either side of your enclosure.

5. Determine the location and holes to use to mount the rack ears on the rack bracket. A guide is provided with the chassis rapid-mount kit.

6. Insert the slider rack ears, as shown in the left portion of Figure 14 on this page, in the back side of the rear rack post.

7. Pull the rack bracket forward and insert the front rack ears into holes on the front side of the front post, as shown in the right-hand portion of Figure 14 on this page.

8. Push forward on the ears until the locking latch, shown in Figure 13 on page 28, snaps and locks into place. To ensure that the bracket is level, check that you placed the front and rear ends of the bracket in corresponding holes on the front and rear post. If you need to
reposition the brackets, remove them as described in “Removing a Rapid–Mount Kit Bracket” on this page.

9. With the other rapid–mount kit bracket, repeat steps 4 through 6 on the opposite side of the rack, ensuring that the bracket is in the appropriate, mirrored orientation. Ensure that the brackets are level with each other.

10. Slide the chassis and brackets onto the rack brackets from the front. Ensure the U channels on the chassis bracket engage the flanges on the rack bracket.

11. Slide the chassis all the way onto the rack brackets until flush with the front of the rack and tighten the thumb screws.

12. Attach the ground strap provided with each chassis to the chassis and to the rack, and ensure that the rack is properly grounded. Use a 10-32 screw and cage nut (not included) to attach the strap to your cage.

CAUTION: High Leakage Current. Connect chassis earth ground before supplying AC power to the chassis.

13. Supply power to the chassis (see “Chassis Power and Failover Power Feature” on page 32 for information about the chassis failover power feature).

   a. Attach the AC power cords included with the chassis to the power connectors on the chassis AC tray (see Figure 15 on page 30).

   b. Connect the AC power cords to a surge-protected power source such as an uninterruptible power supply (UPS) or power strip, and use the cable retention clamps to secure the power cables.

NOTE ClearCube products shipped to countries using 100–130-volt power systems include power cords rated at 15 amps. ClearCube products shipped to countries using 208–240-volt power systems include power cords rated at 10 amps. See “Safety Guidelines” on page x for more information.

Ensure that all rooms or data centers in which you install Blade PCs are clean before you begin installing blades. ClearCube recommends completing all additional chassis hardware installation and preliminary network cabling for Cloud Desktops before you begin installing any Blade PCs.

3.2.3.4 Removing a Rapid–Mount Kit Bracket
To remove a rapid–mount kit bracket (shown in Figure 14 on page 28), perform the steps below.

1. Use your finger to pull the finger tab on the front of the bracket toward the rear of the bracket.

2. Slide the ears forward and remove the bracket. Repeat on the other side.
3.2.4 Attaching and Removing the Expansion Backplane

This section describes how to attach and remove the expansion backplane from the A3100 chassis. The following figure shows the rear of an A3100 chassis with an expansion backplane attached.

![Figure 15. Rear view of A3100 chassis with expansion backplane](image)

The expansion backplane contains all signal connectors and an electronic asset tag for the A3100 chassis.

3.2.4.1 Attaching the Expansion Backplane

Perform the following steps to attach the expansion backplane to an A3100 chassis.

1. Ensure that no AC power cords are connected to the chassis. If any AC power cords are connected, remove them.

2. From the rear of the chassis, insert the hooks on each side of the expansion backplane into the slots on each side of the chassis, then gently lower the backplane until it rests on the
chassis. The following figure shows the backplane hooks and the corresponding slots on the chassis.

![Figure 16. Attaching the expansion backplane to a chassis](image)

3. Insert the screws included in your kit into the flanges on the bottom edge of the backplane. Use a #2 Phillips screwdriver to screw both screws into the chassis, as shown below.

![Figure 17. Location of screws on the bottom edge of the expansion backplane](image)

Connect power to the chassis, as described in “Chassis Power and Failover Power Feature” below, to complete your chassis installation.

### 3.2.4.2 Removing the Expansion Backplane

Perform the following steps to remove the expansion backplane from an A3100 chassis.

1. Ensure that you disconnect all AC power cords from the chassis.

2. Use a #2 Phillips screwdriver to remove both screws from the flanges on the bottom edge of the expansion backplane. Figure 17 above shows the location of the screws.

3. Gently lift the expansion backplane straight up to remove the hooks on each side of the backplane from the slots on the chassis.
3.2.5 **Chassis Power and Failover Power Feature**

As shown in the following figure, the A3100 chassis has four power receptacles: two for each half of the chassis providing power and redundant power.

![Power Receptacles](https://via.placeholder.com/150)

### Figure 18. The A3100 chassis power receptacles

To ensure the most reliable operation of the A3100 chassis, ClearCube recommends that all chassis power sources are connected to an uninterruptible power supply (UPS).

<table>
<thead>
<tr>
<th>NOTE</th>
<th>If excessive power surges or voltage spikes damage the failover power feature, the damage might not be externally evident. Regulating, uninterruptible power supplies can protect the A3100 from surges and spikes.</th>
</tr>
</thead>
</table>

The A3100 chassis has four power receptacles:

- Receptacles A and B power blades in slots one through five (one receptacle provides redundant power when both receptacles are populated—see sections below).

- Receptacles C and D power blades in slots six through ten (one receptacle provides redundant power when both receptacles are populated—see sections below).

Dual receptacles for each half of the chassis provide failover power for each set of blades. Power indicator LEDs are below each power receptacle. LEDs are illuminated when receptacles receive power.

ClearCube recommends the following power configurations.

### 3.2.5.1 To Enable Chassis Failover Power Feature

Connect power to all power inputs.

- Receptacles A and C provide primary power.

- Receptacles B and D provide failover power. ClearCube recommends connecting the cords in receptacles B and D to a backup power supply, such as a different power circuit or to a UPS.
3.2.5.2 To Power Chassis without Failover Power Feature

To power a chassis using primary power only (without the failover power feature), connect power cords to receptacles B and D.

**NOTE**
For the most reliable power configuration use the failover power feature, where power receptacles A and C are powered by a different power source than receptacles B and D.

If only one power cord is connected to an A–Series chassis, only the side of the chassis that is connected to power will supply power to blades. Only use AC power cords supplied with the chassis. See Appendix D. “Support” on page 77 for information about contacting ClearCube Support to obtain replacement power cords.

**NOTE**
Based on the level of user activity, the maximum steady-state current draw of a single, fully-loaded chassis ranges between 7 and 12 amps at 120 VAC on each side of the chassis (that is, on each power supply). The peak initial current draw is 16 amps on each input. If you place multiple chassis on a single power circuit, ensure that the circuit can safely handle the combined currents of all the equipment on the circuit. Contact ClearCube Support for detailed power and cooling requirements tables.

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**CAUTION:** Ensure that your power strips, power grid, and circuit breakers can safely provide the required current. Ensure that any extension cords used meet local safety regulations and fire codes. Use peak current draws when specifying uninterruptible power supply (UPS) capacity.

Contact ClearCube Support for detailed power and cooling requirements tables. See Appendix D. “Support” on page 77 for contact information.

3.3 Configuring A–Series Blade PCs before Installation

The sections below show how to configure A–Series Blade PCs.

3.3.1 Viewing Pre-OS Video (BIOS and Network Boot, PXE Boot)

This section describes how to view video output (such as power-on self test [POST] codes and BIOS configuration utility screens) generated before a blade or VM operating system starts.
3.3.1.1 Before You Begin
Be sure to have the following:

- a switch connected to a DHCP network
- a Blade PC and a standard computer power cable appropriate for your region (such as a 120 V, IEC 60320 C13 connector with NEMA 5-15 inlet)
- a ClearCube zero client compatible with the blade’s video configuration (a dual zero client for a dual host card or a quad zero client for a quad host card). The blade’s video configuration is specified on a label on the side of the blade (shown in Figure 4 on page 6).
- a zero client power supply
- a monitor, appropriate video cable, and power cable
- a USB keyboard and a mouse, and
- two Ethernet cables.

These instructions assume that devices set to their default settings and are connected to an imaging network or other network with a DHCP server to provide IP addresses for the blade’s PCoIP host card and for the zero client. MAC addresses are specified on labels on the side of the blade and on the zero client. To identify the blade host card to connect to from the zero client, you might need to consult DHCP tables. DHCP tables should show each device’s MAC address and the corresponding IP address assigned to the host card and to the zero client.

3.3.1.2 Connecting Devices
The list below shows how to connect devices to view pre-OS video.

1. Remove the **Blade PC** from the chassis as described in “Removing Blade PC from a Chassis” on page 51. Place the blade on a stable surface, such as a bench or on the top of a desk.

2. Connect a **USB keyboard** to a port on the top of the blade. (Ensure that you do not disconnect the Ethernet cable that might be visible from this opening.)

3. Connect **monitors** to the zero client as described below.

   **NOTE** Connect a monitor to a zero client as described below. **Do not** connect a monitor to a video port on the top of the blade.

4. Connect the blade and the zero client to your network:
a. Connect an Ethernet cable to the blade’s dedicated PCoIP port on the rear of the blade (the top-most port shown in the picture below). Connect the other end of the cable to a switch connected to your network.

![Dedicated PCoIP](image1)

**Figure 19. The dedicated PCoIP port on the rear of the blade**

b. Connect the zero client to the same switch.

c. Optionally, if you are imaging the blade, connect an Ethernet cable to the LAN port on the rear of the blade (the bottom-most port shown in the picture below) and connect the other end of the cable to the switch (see “Custom Operating System Requirements” on page 37 for information about system image requirements).

![Standard LAN](image2)

**Figure 20. The LAN port on the rear of the blade**

5. Connect the monitor and a mouse to the zero client.

6. Connect the power adapter to the zero client and then plug the cord into a power outlet.

**Next steps:** power on blade, create a PCoIP session, and view pre-OS video.

**3.3.1.3 Create Session and View Video**

The steps below show how to create a PCoIP session to view pre-OS video.

1. Connect a power cable to the external power connector at the rear of the blade and then plug the cable into a power outlet.
2. Press the **power button** on the front of the blade to power it on, and then press the **power button** on the front of the zero client to power it on.

3. From the monitors connected to the zero client, click the **Connect** button. After several moments, the zero client will identify host cards to which it can connect. The zero client *on-screen display (OSD)* displays one or more host card IP addresses and their corresponding MAC addresses.

4. Select the blade's **host card** from the list and click **OK**.

    **Result**: The zero client connects to the Blade PC’s host card and displays the desktop.

5. From the operating system, restart the Blade PC.

    **Result**: The operating system displays shutdown messages and the screen goes blank.

6. Watch the keyboard lights. As soon as they blink or illuminate, press the **F2** key repeatedly for about 10 seconds. If you are performing a different pre-OS task, press the appropriate key at this time (for example, press F10 for a list of boot devices or CTRL+P for the Intel ME BIOS extension).

    **Result**: Pre-OS video is displayed.

7. After performing configuration steps, power off both devices. Remove the Blade PC and zero client **power cables** from the power outlets and then remove the cables from each device.

8. Remove peripherals from both devices.

9. Replace the blade in the chassis as shown in “Removing Blade PC from a Chassis” on page 51.

**Next steps**: You can now deploy your A–Series blade.

### 3.3.2 Operating System Images

The following sections describe how to:

- Install a customized operating system image on an A–Series Blade PC
- Prepare the default operating system image before deploying an A–Series blade

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**NOTE** The video host card MAC address is shown on a label on the side of the Blade PC. The zero client MAC address is on a label on the rear or bottom of the zero client.
3.3.2.1 Using the Default Operating System Image
If your blades were purchased with a Windows operating system, you must complete the Windows Out of Box Experience (OOBE) on each blade. The steps below show how to connect to a blade and complete OOBE.

NOTE With one exception, the steps shown below are shown in previous sections. Be sure to note the exception in the steps below.

1. Complete the steps shown in sections “Before You Begin” on page 34 and in “Connecting Devices” on page 34.

2. Begin the procedure shown in “Create Session and View Video” on page 35. When you reach step 4, select the blade’s host card and click OK. After a moment you are connected to the blade, where you can view and complete OOBE.

3. Accept the operating system license and specify a name for the blade.

After the operating system initial configuration is complete, the blade boots to the operating system. You can now deploy the blade.

3.3.2.2 Custom Operating System Requirements
If you are re-imaging a ClearCube blade or are installing a custom image on a blade, note that your blades require specific firmware, motherboard chipset drivers, device drivers, and more.

NOTE ClearCube devices do not necessarily support every driver or firmware that vendors provide. To ensure that your devices support drivers and firmware, only use drivers and firmware obtained from ClearCube.

The following procedure details steps and items required when creating and configuring operating systems for ClearCube blades, and it assumes you are using Windows® 7 operating system. The menu options specified here might be different in other Windows operating systems.

Before You Begin

Be sure to have the following:

- a switch connected to a DHCP network
- a Blade PC and standard computer power cable appropriate for your region (such as a 120 V, IEC 60320 C13 connector with NEMA 5-15 inlet)
- a ClearCube zero client compatible with the blade’s video configuration (a dual zero client for a dual host card or a quad zero client for a quad host card). The blade’s video configuration is specified on a label on the side of the blade (shown in Figure 4 on page 6).
- a zero client power supply
- a monitor, appropriate video cable, and power cable
Chapter 3. Chassis and Blade PC Installation

- a USB keyboard and a mouse, and
- two Ethernet cables.

| NOTE | These instructions assume that devices are connected to an imaging network or other network with a DHCP server to provide IP addresses for the blade's PCoIP host card and for the zero client. MAC addresses are specified on labels on the side of the blade and on the zero client. To identify the blade host card to connect to from the zero client, you might need to consult DHCP tables. DHCP tables should show each device's MAC address and the corresponding IP address assigned to the host card and to the zero client. |

General Guidelines

The guidelines below apply to A–Series blades.

| NOTE | Be sure to see "A6106H/HL Blades and PCoIP Host Software" on page 40 for important information about including PCoIP Host Software in operating system images for A6106H/HL blades. |

1. Ensure that you obtain drivers for your blade or VM from the ClearCube Support site at http://www.clearcube.com/support/. All drivers and downloads cited in this procedure are available on the Support site.

2. Connect to the blade you are imaging as described in “Viewing Pre-OS Video (BIOS and Network Boot, PXE Boot)” on page 33. When you reach step 4 in “Create Session and View Video” on page 35:
   - follow the step as shown to view pre-boot options
   — OR —
   - if an operating system is already installed, select the blade’s host card and click OK.

3. Install a supported operating system. See Appendix A. “Specifications” on page 69 for supported operating systems.

4. Install the Intel chipset driver appropriate for your blade.

5. Install the Intel network adapter driver appropriate for your blade.

6. Optionally, install an appropriate RAID driver.

| NOTE | Ensure that RAID is enabled in the BIOS and the RAID volume is configured using the RAID configuration BIOS extension. |

7. Install the BMC driver.

8. Install the video driver in your blade’s driver download. Note that driver downloads are categorized according to blade, video, and operating system configurations.
9. Optionally, install PCoIP Host Software on the blade or VM containing a host card. The version of the PCoIP Host Software must be compatible with the host card and the zero client firmware versions.

**NOTE**

Install PCoIP Host Software on A6106H/HL blades only after imaging the blade. Installing an operating system image that includes PCoIP Host Software on an A6106H/HL blade can cause unsupported behavior. See "A6106H/HL Blades and PCoIP Host Software" on page 40 below for more information.

**NOTE**

PCoIP Host Software is required when using dual-link, HD displays (2560 x 1600) and for zero clients connecting only one monitor. See your zero client *Quick Start Guide* for more information.

**NOTE**

Quad host cards with Tera 1 processors (models V5140, V5240, and V534x) do not support PCoIP Host Software.

10. Install drivers for any additional peripherals or hardware.

11. From a compatible zero client, connect to the blade you are imaging to install zero-client-specific drivers.

   a. Install the Realtek HD Audio driver.

   b. Install the DB9 driver if your zero client has a DB9 port.

   c. Install the Common Access Card (CAC) driver if the zero client contains an internal CAC reader.

12. Configure PCI Express® power management:

   a. Click **Start > Control Panel > Power Options**. (If the Control Panel **View by** option is set to **Category**, click **Start > Control Panel > Hardware and Sound > Power Options**).

   b. Select any power plan (you must perform this procedure on all power plans) and click **Change plan settings > Change advanced power settings** to display the Power Options dialog box.

   c. Expand the **PCI Express** item. From the **Link State Power Management** drop-down menu, select **Off**. Click **OK** to save your changes, close the window, and return to the Edit Plan Settings window. (Note that you have saved your PCI Express settings even though **Cancel** is the only option available in the Edit Plan Settings window. This is normal behavior.)

      Ensure that you specify this setting for all power plans.

13. From the Edit Plan Settings window, select **Never** in the **Put the computer to sleep** drop-down box. Click **Save changes**. Repeat this step for all power plans.
A6106H/HL Blades and PCoIP Host Software

If you create an operating system image for A6106H/HL blades and the Sysprep process captures PCoIP Host Software drivers, issues can occur during the Windows out-of-box experience (OOBE). In some instances, PCoIP-related drivers are not installed, the OOBE can hang, or a fatal error (blue screen) can occur.

When creating a custom image, make sure that the PCoIP Host Software is not installed when the image is sealed (the software installer package can be in the image as long as it is not installed). If you are using the default ClearCube image, uninstall the PCoIP Host Software through Add/Remove programs. The PCoIP Host Software drivers must be installed after the Windows Setup process.

Use either of the methods below to include PCoIP Host Software drivers as part of your custom imaging process.

- **Custom scripting**: Create an image that includes a script that performs a passive installation of PCoIP Host Software after Windows Setup is complete.

  —OR—

- **Manual installation**: Exclude PCoIP Host Software from the operating system image, and manually install it after imaging a blade.

Note that the default A6106H/HL operating system image includes PCoIP Host Software and an installation script. The PCoIP Host Software is in the location shown below:

```
C:\Drivers\PCoIP_Host_Software_for_Windows_xxbit_n-n
```

Where `xx` is 32- or 64-bit and `n-n` is the PCoIP Host Software version number.

**Custom Scripting**

Use a SetupComplete.cmd script to install PCoIP Host Software after Windows Setup is complete. These steps assume you are preparing a Windows 7 image and that the PCoIP Host Software installer is located on the computer in the directory specified below (change the script as appropriate if the PCoIP Host Software is in a different location). See “For More Information” below for information about obtaining PCoIP Host Software.

1. Log on to the A6106H/HL blade as a user with Administrator privileges.
2. Navigate to `C:\\Windows\\Setup\\Scripts` (create the Scripts directory if it does not exist).
3. Create a text file and name it `SetupComplete.cmd`.
4. Right-click the file and select **Edit**. Specify the location of the PCoIP Host Software installer and include the `/passive` option as shown below. Change the values of the operating system version and software version, shown in italics below, as appropriate for your installation.

```
C:\Drivers\PCoIP_Host_Software_for_Windows_64bit_4.2\PcoipHostSoftware_x64-v4.2.2.msi /passive
```
5. Save the file. This command is run after Windows Setup completes.
You can now use the Sysprep tool to prepare the image for duplication and installation on A6106H/HL blades.

**Manual Installation**

Install an operating system image that *does not include the PCoIP Host Software*. After image installation is complete, manually install the PCoIP Host Software.

**For More Information**

See the links below for more information.

- **PCoIP Host Software**

- **SetupComplete.cmd file**

- **Windows installer options (/passive option)**

### 3.3.2.3 Installing a Custom Image from an Image File Server

A–Series blades are set to boot from a network first, enabling administrators to easily configure A–Series blades using an image server before deployment.

As configured when shipped, the boot device priority (set in A–Series blade BIOS) is:

1. Network
2. Optical drives
3. Removable drives
4. Hard disk drive

where item 1 above is the highest boot priority, and item 4 above is the lowest boot priority.

| **NOTE** | This boot device priority can change if a user loads BIOS defaults from the BIOS setup menu. |

To boot (or download a custom operating system image) from a network:

1. Ensure that blades can access the same network that the image file server uses.
2. Perform the steps in “**Viewing Pre-OS Video (BIOS and Network Boot, PXE Boot)**” on page 33 to connect to a blade and boot from a network.
3.4 Creating RAID Volumes

A6106H/HL and A6106D A–Series blades have up to two hard drives, supporting RAID 0 (striping) and RAID 1 (mirroring).

3.4.1 A6106H/HL

To access RAID-related settings from the BIOS RAID Option-ROM, you must change several default BIOS settings.

3.4.1.1 Viewing the A6106H/HL BIOS Menu Expert Mode

To enable RAID for the A6106H/HL, you must change several settings using the BIOS Menu Expert Mode. The sections below show how to perform these steps.

This section assumes that the zero client and PCoIP host card use default settings (DHCP enabled, SLP discovery enabled).

The steps below show how to view the BIOS Menu Expert Mode screens.

1. Connect one or more monitors, a keyboard, and mouse to a zero client. Connect the zero client to a network switch (with a DHCP server on the network) and power on the zero client.

2. Remove the blade from a chassis, and place the blade on a stable surface such as a bench. Be sure to record the host card’s MAC address so you can select the correct blade when connecting from a zero client. The MAC address of the V5nnn-series host card is shown on a video configuration label on the side of the blade (see Figure 4 on page 6).

3. Connect a keyboard to a USB port on the top edge of the blade.

4. Remove the storage drive carrier from the blade. See “Hard Drives” on page 57 for instructions about how to remove a storage drive carrier.

5. Connect the blade to the same network switch that the zero client is connected to. Be sure to connect one end of the Ethernet cable to the blade’s dedicated PCoIP port (the top-most...
port shown in the picture below), and connect the other end of the Ethernet cable to the switch.

![Dedicated PCoIP and Standard LAN](image)

**Figure 21. Ports on the rear of the A-Series blade: dedicated PCoIP (top) and LAN (bottom)**

6. Connect a power cable to the rear of the blade.

7. Power on the blade.

8. Press the ALT+F3 keys repeatedly for about 15 seconds.

9. From the zero client, click the on-screen display (OSD) Connect button.

   **Result:** The OSD displays a Discovering Hosts message. The OSD then displays the Discovered Hosts menu, listing all discovered hosts.

10. Select the blade’s host card (identify the host card using the MAC address you recorded at the beginning of this section). Click OK.

    **Result:** A Connecting message is displayed, then the display is blank for a moment. The BIOS screen is then displayed.

Continue by changing BIOS settings to enable RAID configuration as shown below.

### 3.4.1.2 Enabling RAID

This section assumes you have performed the steps in the previous section to connect to a blade and view the BIOS screens. The steps below show how to enable RAID from the BIOS.

1. From the BIOS Main Menu, use the arrow keys to select the **BIOS Menu Expert Mode** item and press ENTER.

2. Select **Enabled** and press ENTER.

3. Use the arrow keys to move to the **Advanced** menu. Select **SATA Configuration** and then press ENTER.

4. Select the **SATA Mode Selection** item and press ENTER.

   **Result:** The SATA Mode Selection menu is displayed.
5. Select **RAID** and press **ENTER**.

6. Press **ESC** to return to the Main menu, then use the arrow keys to select the **Boot** menu.

7. Use the arrow keys to select the **CMS16 Parameters** menu. Press **ENTER**.

8. Select the **Option ROM Messages** item and press **ENTER**.

9. Select **Force BIOS** and press **ENTER**.

10. Press **F4** to save the changes and exit. Select **Yes** and press **ENTER**.

11. Power off the blade and remove the power cable.

Continue by configuring the RAID volume as described in the section below.

### 3.4.1.3 Create a RAID Volume

The steps below show how to create a RAID volume using the Intel(R) Rapid Storage Technology - Option ROM utility.

| CAUTION | Creating a RAID volume will erase all data on the drives. |

To access this utility, you must change a SATA setting in the BIOS as described in the previous section. Making this change provides a RAID prompt that is displayed immediately after powering on a blade. You can enter a keystroke when the RAID prompt is displayed to enter the Intel(R) Rapid Storage Technology - Option ROM utility.

1. Ensure that

   - The blade and a zero client are connect to the same network switch, and there is a DHCP server on the network.
   - A local USB keyboard (and mouse for an A6106D only) are inserted in USB ports located on the top edge of the blade, and
   - While power is removed from the blade, the storage driver carrier contains two drives and the carrier is fully seated in the blade.

| NOTE | Do not insert or remove hard drives while a blade is powered on. A–Series blades do not support hot-swapping hard drives. |

2. Insert the power cable in the rear of the blade.

3. Be prepared to press **CTRL+I** on the local keyboard (connected to the USB ports on the top of the blade) immediately after powering on the blade. Press the power button on the front of the blade—immediately press the **CTRL+I** keys repeatedly for about 15 seconds.

4. Connect to the blade from a zero client (see step 9 on page 43 and step 10 on page 43 for instructions about connecting to a blade from a zero client).

5. From the Intel(R) Rapid Storage Technology - Option ROM utility, select **Create RAID Volume** and press **ENTER**.
6. From the **CREATE VOLUME MENU**, enter values for your RAID volume. (See the on-screen help text for information about navigating fields and changing values.)

7. After entering RAID volume values, ensure **Create Volume** is selected. Press **ENTER** to create the volume, and then press **Y**. You are returned to the main menu.

8. **Optional:** You can prepare the blade for imaging by connecting it to an imaging network or other imaging device.
   - **PXE server:** If you are imaging the blade using a PXE server, ensure an Ethernet cable is connected to a PXE network and the other end of the cable is connect to the blade’s standard LAN (Ethernet) port (see the bottom-most port in **Figure 22** on page 46).

   —OR—

   - **External imaging device:** If you are imaging the blade from an external drive, connect the external drive to a USB port on the top edge of the blade.

9. Press **ESC** to exit the utility, and then press **Y** to confirm.

The RAID volume is now configured. Continue by installing an operating system or an OS image.

### 3.4.1.4 Installing an Operating System

After creating the RAID volume as shown in the previous section, you can install an operating system or image the volume. You can:

- **Boot to a PXE server.** A network interface is the first boot device in the default BIOS configuration. You can connect the blade’s standard LAN connector (see **Figure 22**) to an imaging network or PXE server and power on the blade. By default, the blade boots to a network interface and should connect to a PXE server. If you have changed the default boot order, you can press **F10** during boot and select a network interface.

- **Boot to an external drive or imaging device.** Connect an external imaging drive or other device to a USB port of the top edge of the blade, and press **F10** during boot and select a the USB device.

### 3.4.2 A6106D

The sections below show how to create a RAID volume.

### 3.4.2.1 Viewing the BIOS

This section assumes that the zero client and PCoIP host card use default settings (DHCP enabled, SLP discovery enabled).

The steps below show how to view BIOS screens.

1. Connect one or more monitors, a keyboard, and mouse to a zero client. Connect the zero client to a network switch (with a DHCP server on the network) and power on the zero client.
2. Remove the blade from a chassis, and place the blade on a stable surface such as a bench. Be sure to record the host card’s MAC address so you can select the correct blade when connecting from a zero client. The MAC address of the V5nnn-series host card is shown on a video configuration label on the side of the blade (see Figure 4 on page 6).

3. Connect a keyboard and mouse to the USB ports on the top edge of the blade.

4. Remove the storage drive carrier from the blade. See “Hard Drives” on page 57 for instructions about how to remove a storage drive carrier.

5. Connect the blade to the same network switch that the zero client is connected to. Be sure to connect one end of the Ethernet cable to the blade’s dedicated PCoIP port (the top-most port shown in the picture below), and connect the other end of the Ethernet cable to the switch.

![Figure 22. Ports on the rear of the A–Series blade: dedicated PCoIP (top) and LAN (bottom)](image)

6. Connect a power cable to the rear of the blade.

7. Power on the blade.

8. Press the F2 key repeatedly for about 15 seconds.

9. From the zero client, click the on-screen display (OSD) Connect button.

   **Result:** The OSD displays a Discovering Hosts message. The OSD then displays the Discovered Hosts menu, listing all discovered hosts.

10. Select the blade’s host card (identify the host card using the MAC address you recorded at the beginning of this section). Click OK.

   **Result:** A Connecting message is displayed, then the display is blank for a moment. The BIOS screen is then displayed.

   Continue by enabling RAID as shown in the section below.

### 3.4.2.2 Enabling RAID

This section assumes you have performed the steps in the previous section to connect to a blade and view the BIOS screens. The steps below show how to enable RAID from the BIOS.
1. From the BIOS Main Menu, click the large **SATA** button located in the lower portion of the screen.

2. Change the **Chipset SATA Mode** field to **RAID**.

3. Press the **F10** key. Click **Yes** to save your changes and exit.

4. Power off the blade and remove the power cable.

Continue by configuring the RAID volume as described in the section below.

### 3.4.2.3 Create a RAID Volume

Use the same steps to create a RAID volume for an A6106D blade or an A6106H/HL blade. See “Create a RAID Volume” on page 44 for instructions about how to create a RAID volume.

### 3.4.2.4 Installing an Operating System

Use the same steps to install an operating system on an A6106D or an A6106H/HL RAID volume. See “Installing an Operating System” on page 45 for instructions about how to install an operating system on a RAID volume.

---

## 3.5 Enabling Intel® AMT

Intel® Active Management Technology (Intel AMT) enables administrators to manage supported blades remotely (including when blades are powered off) using an AMT management console.

A6106D blades support Intel AMT Release 8.0. A6106H/HL blades support Release 9.0 and above.

**NOTE** A6106D and A6106H blades support all Intel AMT features except for KVM over IP.

### 3.5.1 Requirements

The table below details Intel AMT requirements.

<table>
<thead>
<tr>
<th>BIOS settings</th>
<th>Blades that are managed remotely using Intel AMT must have settings enabled in the Intel AMT BIOS extension (see the sections below for information).</th>
</tr>
</thead>
</table>
3.5.2 Default Login Credentials

The list below shows default Intel AMT credentials.

- Default Intel AMT password is admin.

  **NOTE** Change this password immediately after first login.

- Default Intel AMT user is admin.

3.5.3 Accessing Intel ME BIOS extension

Intel AMT settings are located in the Intel Management Engine BIOS extension. Intel AMT is enabled by default in A-series blades.

**NOTE** Though AMT is enabled, you must activate network access to enable management console connections (see "Activate Network Access" below).

The steps below show how to access the BIOS extension.

1. Remove the blade from the chassis and configure as shown in “Before You Begin” on page 34 and “Connecting Devices” on page 34.

2. Power on the blade.

3. Press CTRL+P during startup (this is the same time you would press, for example, F2 to display the BIOS setup utility).

4. Use the keyboard to select MEBx Login and press ENTER. If this is your first time logging in, use the credentials listed in "Default Login Credentials" above (otherwise, enter your AMT password). Make any changes appropriate for your environment. If your management console requires a user name to perform Intel AMT commands, use the user name listed above.

**Next steps:** Activate network access as shown below to enable management console connections.
3.5.4 Activate Network Access

This assumes that devices in your environment use dynamic IP addresses. If devices in your environment use static IP addresses, specify an address in the Network Setup menu in the Intel(R) AMT Configuration menu noted below.

The steps below enable an AMT management console to connect to a blade. Perform these steps on each blade you will manage from an AMT management console.

1. Log in to the AMT BIOS extension as shown in the section above.
2. Select **Intel(R) AMT Configuration** and press **ENTER**.
3. Select **Activate Network Access** and press **ENTER**.
   
   **Result:** A message is displayed. Enter **Y** and then press **ENTER**.

4. Press **ESC** to return to the main menu.
5. Select **MEBx Exit** and press **ENTER**.
   
   **Result:** The blade boots to the operating system.

6. Power off the blade and return it to an A3100 chassis.

You can now use an AMT management console to perform AMT operations on the blade during any power state.

To access the Intel® Active Management Technology Web interface from a supported browser, enter the IP address of the blade's primary network interface and specify port 16992 (for example: http://192.168.1.2:16992). If you have not changed the default user, use the name shown in “Default Login Credentials” above.

3.5.5 For More Information

See **Intel® Active Management Technology (Intel® AMT) Start Here Guide**, available at [www.intel.com](http://www.intel.com). To find the document, search for the title shown above.
3.6 Installing Blade PC in a Chassis

To install an A–Series Blade PC, perform the following steps.

1. Remove the front bezel on the chassis by pressing in on the latch located on the upper-right side of the chassis.

2. Tilt the bezel toward yourself and lift it free from the chassis.

3. Orient each blade right-side up with the D-shaped cutout in the front panel facing up, and then slowly insert blades into the chassis by lining up the blade edges with the top and the bottom guides in the chassis.

4. Blade slots are numbered from 1 to 10, starting with the left-most slot. There will be a slight resistance to insertion when the rear connector goes into the backplane power and signal connector. When properly seated, the Blade PC is flush with the front edge of the bottom guide bracket.

5. After inserting all blades, replace the bezel.

6. Attach one or more Ethernet cables. The picture below shows details of the network connections for one slot (or blade) on the rear of the expansion backplane.

   - **PCoIP Port** — This port is dedicated to all PCoIP traffic from the PCoIP host card in an A–Series blade.
   - **Pri (Primary Port)** — This port is for standard network traffic, with support for Intel AMT.
   - **Sec (Secondary Port)** — This port is for standard network traffic.

See “Chassis Expansion Backplane and Cabling” on page 18 for details about network connections on the rear of an A3100 chassis.
7. Power on the blade. On the front of the blade, press the right-most button above the power symbol (\(\mathbin{\text{\Large \wedge}}\)).

**NOTE**

By default, Blade PCs are configured to power on automatically when inserted in a chassis. If the default configuration of a Blade PC BIOS is changed, you must press the power button to power it on.

8. After you have finished inserting blades, replace the front bezel.

### 3.7 Removing Blade PC from a Chassis

To remove a blade, perform the following steps.

**CAUTION:** Some surfaces on the blade may be hot, especially when the blade has been powered on. Remove and handle the blade with care.

1. Remove the chassis front bezel by pressing the latch on the right side toward the center of the chassis (shown in Figure 23 above).

2. If the blade is powered on, power down the blade by pressing the power button (the right-most button) on the front of the blade (Figure 2 on page 4 for location)

3. Using the D-shaped handle on the front panel, pull gently on the blade until it slides out of the chassis. Be sure to support both ends of the blade when you remove it completely from the chassis.

Never leave a Blade PC unprotected when not in use. A blade should always be in a chassis or in a storage box. Dust, dirt, and other debris can damage blades.
Chapter 4. Upgrading and Maintaining Blade PCs

ClearCube’s A–Series architecture simplifies computer and component upgrades. You can easily upgrade or replace Blade PC components.

**CAUTION:** Some surfaces on blades can be hot, especially when the blade has been powered on. Remove and handle Blade PCs with care.

The following figures show A–Series blades and their major components (depending on configuration, components in blades can vary).

Figure 24. Layout of A6106H/HL and A6106D
4.1 Use Authorized Components

Customers and qualified technicians can upgrade and replace blade components such as memory and hard drives. To ensure proper operation and to maintain your ClearCube warranty when performing upgrades, only use commodities that you obtain from ClearCube or from your Authorized ClearCube Reseller.

CAUTION: All maintenance and upgrades should be performed by a qualified computer technician. Take proper precautions to avoid electrostatic discharges by working at a grounded computer equipment repair bench. Damage caused by improper upgrade procedures will void your warranty.

4.2 Replacing Components: Permitted and Prohibited Units

ClearCube products consist of components, or units, that customers and qualified technicians can replace. The following list identifies these units.

• **Customer–Replaceable Units (CRUs)**—Items that customers can replace. CRUs include the following:
  - Memory
  - Hard drives (solid-state, hybrid, self-encrypting, and hard disk drives)
  - Chassis power cords
  - Chassis front bezels
  - Host cards using PCoIP technology

Components not intended for customer replacement are listed below.

• **Field–Replaceable Units (FRUs)**—Items that trained service providers and ClearCube Systems Engineers (SEs) must replace on–site. FRUs include all CRUs and the following:
  - Chassis power input units
  - Blade power supplies
  - Blade fans
  - Blade motherboards
Removing any of these FRUs voids your warranty. Contact ClearCube Support Engineers for information about replacing CRUs or FRUs. See Appendix E, “Warranty” on page 79 for information about your warranty.

## 4.3 Memory

The following sections show features of A–Series blade memory, provide guidelines about memory configuration, and explain how to install memory.

### 4.3.1 A6106H/HL Memory Features

A6106H/HL blades use the Intel Q87 (Intel DH82Q87 PCH) chipset. The motherboard has four DIMM sockets and supports the following memory features.

- Two independent memory channels
- 240-pin, unbuffered, non-ECC, single-sided or double-sided DIMMs.

**NOTE** Only DIMMs with x8 organization are supported.

- Up to 32 GB maximum total system memory

**NOTE** Minimum recommended total system memory: 1 GB

- DDR3 1600, 1333 and 1066 MHz

### 4.3.2 A6106D Memory Features

A6106D blades use the Intel DQ77MK chipset. The motherboard has four DIMM sockets and supports the following memory features.

- Two independent memory channels with interleaved mode support
- Unbuffered, single-sided or double-sided DIMMs.

**NOTE** DIMMs with x16 organization are not supported.

- 32 GB maximum total system memory (with 4 Gb memory technology).

**NOTE** Minimum recommended total system memory: 1 GB

- Non-ECC DIMMs
- Serial Presence Detect
• DDR3 1600 MHz, DDR3 1333 MHz, and DDR3 1066 MHz SDRAM DIMMs

| NOTE | DDR3 1600 MHz DIMMs are only supported by 3rd generation Intel Core processor family processors. |

• XMP version 1.3 performance profile support for memory speeds of 1600 MHz or lower

4.3.3 General Guidelines

• For optimum memory compatibility, use only ClearCube-supplied memory.

• Install only identical (same speed, size, and vendor) DIMM pairs for each memory channel.

4.3.4 Population Guidelines

A–Series blade motherboards have four memory sockets arranged in two channels with color-coded memory sockets, as shown in Figure 25 below.

![Figure 25. A–Series blade memory sockets and channels](image)

For best performance when populating DIMM sockets

• always start with the blue sockets when installing two DIMMs in your blade, and

• populate memory sockets in the order shown in the figure above (starting with DIMM 1).

4.3.5 Installing DIMMs

Observe anti-static procedures when you work on blades. To install DIMMs in an A–Series blade, use a #2 Phillips screwdriver to remove the blade cover’s screws.

To replace or upgrade the memory on an A–Series Blade PC, perform the following steps.
1. Remove the blade from the chassis as described in “Removing Blade PC from a Chassis” on page 51.

```
CAUTION: Some surfaces on the blade may be hot, especially when the blade has been powered on. Remove and handle the blade with care.
```

2. Place the blade on a flat surface and remove the four 6-32 screws on the top cover.

3. Slide the top cover back and remove it from the blade.

4. Pull the tabs on the sides of the memory socket away from the DIMM socket and remove the DIMM.

5. Insert the new DIMM. Gently press down on the top edge of the DIMM to seat it completely. If the memory socket latches are not fully closed automatically, press the memory socket latches onto the sides of the DIMM.

6. Replace the top cover panel, ensuring that the side walls of the cover are on the outside of the flanges on the base frame.

7. Replace the four 6-32 screws that retain the top cover.

8. Replace the blade in the chassis, as described in “Installing Blade PC in a Chassis” on page 50.

9. Replace the chassis front bezel.

10. Power on the blade. Press the right-most button above the power symbol (\(\bigcirc\)) on the front of the blade.

```
NOTE
By default, Blade PCs are configured to power on automatically when inserted in a chassis. If the default configuration of a Blade PC BIOS is changed, you must press the power button to power it on.
```

### 4.4 Hard Drives

When working with hard drives consider the following:

- Hard drives are sensitive to mechanical shock and are most vulnerable when handled as an unmounted unit. Handle them gently, especially when setting them down on a surface to work.

- Imaged drives swapped between different blade models will not function correctly.

- Store unused drives in an anti-static bag in a climate-controlled area.
A–Series blades do not support hot-swap replacement of drives. When configuring a blade outside of a chassis, be sure to power down the blade and remove the power cable before removing drives or servicing any components.

Storage drives do not require power cables or data cables when mounted in the storage drive carrier. Power and data connectors are housed inside the blade—insert and fully seat the carrier and fasten with screws.

The picture below shows the storage drive carrier.

![Figure 26. Removing and attaching the storage drive carrier](image)

The picture below shows how drive carrier slots correspond to motherboard drive order.

![Figure 27. Hard drive order in the A–Series blade storage drive carrier](image)
If necessary, reinstall operating system, drivers, and application software. See “Custom Operating System Requirements” on page 37 for information about creating custom operating system images.

See “Creating RAID Volumes” on page 42 for information about creating RAID volumes on A–Series blades.

## 4.5 BIOS

The sections below show how to perform BIOS-related tasks for A–Series blades.

### 4.5.1 Before You Begin

- These instructions assume that SLP discovery is enabled on the zero client and the blade’s host card is enabled to accept any peer. See PC-over-IP System User’s Guide for more information.

- Ensure that you can connect a zero client and the A–Series blade to a network switch with a DHCP server, and that the devices are on the same subnet.

- Find the MAC address of the blade's PCoIP host card listed on a Video Configuration label on the side of the blade. You will use this MAC address to connect to the blade from a zero client.

### 4.5.2 Required Items

- A–Series blade and blade power cable
- Monitor and monitor power cable
- USB keyboard
- PCoIP zero client compatible with the host card in the A–Series blade (use a dual zero client with a dual host card and a quad zero client with a quad host card). Additionally, both devices must use compatible firmware. (See PC-over-IP System User’s Guide and PC-over-IP Device Firmware Support and Compatibility Guide for information about firmware and upgrading firmware.)
- USB mouse
- Network switch connected to a network with a DHCP server
- Two Ethernet cables
- #2 screwdriver
- Optional: needle-nose pliers
4.5.3 A6106H/HL

The sections below show how to perform the following tasks for an A6106H/HL blade PC:

- “Clearing BIOS Passwords” on this page
- “Updating (Flashing) the BIOS” on page 61, and
- “Resetting the CMOS” on page 63

4.5.3.1 Clearing BIOS Passwords

You can use the A–Series BIOS setup menu to create supervisor and user passwords that must be entered to access various options, including accessing the BIOS setup menu. You can change A6106H/HL BIOS passwords from the BIOS.

NOTES The following sections assume that the BIOS password(s) are set.

Setting up Zero Client and Blade PC

1. Connect a monitor, a mouse, and a power cable to the zero client.

2. Remove the blade from a chassis and place it on a stable surface, such as a desk or workbench. Do not connect power to the blade.

3. Connect a USB keyboard to a USB connector located on the top edge of the blade (you might need to move a safety cover that covers the ports). (This is referred to as a local keyboard in these instructions, as distinguished from a keyboard connected to a zero client.)

4. Use Ethernet cables to connect the zero client and the blade to a network switch. Use the blade’s dedicated PCoIP port - the top-most port shown in the picture below.

![Dedicated PCoIP](image)

Figure 28. The dedicated PCoIP port on an A–Series blade

5. Power on the zero client (do not power on the blade).

Result: After several moments the zero client's On-Screen Display (OSD) is displayed.
**Connecting Zero Client and Blade PC**

1. Ensure that a local keyboard is connected to a USB port on the top edge of the blade.

2. Connect power to the rear of the A–Series blade and press the **power button** on the front of the blade (the right-most button) to power on the blade.

3. Press the **F2** key on the keyboard repeatedly for about 15 seconds.

4. From the zero client’s OSD (the monitor connected to the zero client), click **Connect**.
   
   **Result:** a progress message is displayed. After several moments the OSD displays a list of available host cards.

5. Use the host card's **MAC address** to identify it in the list (you might need to scroll down to find the host card). If you do not see the host card, power off the zero client and power it on again, then click **Connect**. Select the **host card** and click **OK**.
   
   **Result:** the BIOS main menu is displayed.

**Clearing Passwords**

1. From the BIOS main menu, use the arrow keys to select the **Security** menu.

2. Use the arrow keys to select the **Administrator Password** item or the **User Password** item, depending on which password you want to clear.

3. Press the **ENTER** key.
   
   **Result:** The Enter Current Password dialog box is displayed.

4. Enter the current password and press **ENTER**.
   
   **Result:** The Create New Password dialog box is displayed.

5. Do not enter any characters (leave the field blank), and press **ENTER**.
   
   **Result:** A warning message is displayed.

6. Select **Yes** and press **ENTER**.

7. Press **F4** to save your changes and exit the BIOS utility. Select **Yes** and press **ENTER**.

The selected password is cleared. The blade boots to the operating system, if it is installed. If you need to clear another password, repeat this process.

### 4.5.3.2 Updating (Flashing) the BIOS

A–Series blades use a customized BIOS. Use only ClearCube BIOS updates on A–Series blades.

**Downloading a BIOS**

The steps below show how to download BIOS updates from the ClearCube Support site.

2. Select the appropriate A–Series blade in the **Blade PCs** drop-down list box.

3. Click the **BIOS** link to display a list of BIOS downloads.

4. To download a BIOS, click the appropriate link and save the file to your computer. The .ZIP file contains a readme file with instructions about how to update the BIOS.

Continue by updating the BIOS as shown in the following section.

**Updating a BIOS**

The steps below show how to update an A–Series BIOS.

1. Place the BIOS you previously downloaded on a bootable medium, such as a flash drive. Ensure all files in the download (.EXE file, .BAT file, and .ROM file) are located in the same directory on the device.

   | **NOTE** The device containing the BIOS files must be bootable.

2. Connect the boot device to the blade.

3. Power on or restart the blade and repeatedly press the **F10** key for about 15 seconds to display the Boot Menu.

4. Connect to the blade from a zero client.

   **Result:** The Boot Menu is displayed. Depending on how quickly the connection is made, the splash screen might be displayed before the Boot Menu.

5. From the Boot Menu, use the arrow keys on the local keyboard to select your boot device, and press **ENTER**.

   **Result:** The boot device starts.

6. Change directory to the location of the BIOS-related files (.EXE file, .BAT file, and ROM file).

7. Enter the name of the .BAT file (for example, A03) and press **ENTER**.

   **Result:** The .BAT file automatically starts the AMI Firmware Utility and installs the BIOS ROM file with all of the required command options.

   The update utility displays multiple status messages. When the utility displays the final status message, **Verify RomHole Block....done**, the blade restarts. The BIOS update is complete.

   The zero client then displays a **Network connection lost** message and then displays the zero client’s on-screen display (OSD).

   You can click **Connect** to reconnect to the blade. If an operating system is installed, the blade will boot to the operating system.
4.5.3.3 Resetting the CMOS
Use a motherboard jumper to reset the CMOS settings, for example, if the BIOS becomes inaccessible.

**NOTE**  Resetting the CMOS returns all BIOS settings to their default settings.

The sections below show how to move the Reset CMOS jumper, and how to connect to a blade after resetting the CMOS to set the CMOS clock.

**Move the CMOS Reset Jumper**
1. Remove the blade from the chassis as described in “Removing Blade PC from a Chassis” on page 51.

2. **CAUTION: Some surfaces on the blade may be hot, especially when the blade has been powered on. Remove and handle the blade with care.**

3. Place the blade on a flat surface and remove the four 6-32 screws on the top cover.

4. Slide the top cover back and remove it from the blade.

5. Before continuing to the next step, be sure that power is not connected to the rear of the blade. If power is connected, remove it from the rear of the blade.

6. Find the two-pin jumper, J2P2, on the motherboard. The jumper is located to the left of the DIMM sockets and below the chipset heatsink, as shown below.

![Figure 29. The location of the J2 CMOS reset jumper](image-url)
6. Use needle-nose pliers to move the jumper to pins 2 and 3. Leave the jumper on the pins for five seconds, then return the jumper to pins 1 and 2.

7. Replace the top cover and fasten it using the 6-32 screws.

The next section shows how to reset the CMOS, and then connect to the blade to set the system time and date.

**Connect and Set the System Time and Date**

1. Set up a zero client to connect to the blade as shown in “Setting up Zero Client and Blade PC” on page 60.

2. Connect to the blade from a zero client. Note that after resetting the CMOS, the splash screen displays the message WARNING: CMOS Time Not Set. Continue after 10 seconds. Use a local keyboard (connected to the blade) and press F2 to enter the BIOS setup utility (see “Connecting Zero Client and Blade PC” on page 61 for complete instructions).

3. From the BIOS main menu, use the arrow keys to select System Date. Press the TAB key to select each field. To increase the value, press SHIFT+PLUS SIGN. To decrease the value, press MINUS SIGN.

4. Press the down arrow key to select System Time. Press the TAB key to move to each time element, and the PLUS SIGN and MINUS SIGN to change the values. Note that time is specified using 24-hour time notation (for example, 3 am is 03:00 and 3 pm is 15:00).

5. Press F4 to save your changes and exit the BIOS utility.

**Result:** The Save & Exit Setup dialog box is displayed.

6. Ensure Yes is selected and press ENTER to save your changes.

The blade continues to boot. If an operating system is installed, the operating system starts. You can continue working or shut down the blade.

### 4.5.4 A6106D

The sections below show how to perform the following tasks for an A6106D blade PC:

- clear BIOS passwords
- update blade BIOS, and
- recover a corrupted BIOS

#### 4.5.4.1 Clearing BIOS Passwords

You can use the A–Series BIOS setup menu to create supervisor and user passwords that must be entered to access various options, including accessing the BIOS setup menu. If you need to
reset BIOS passwords on an A6106D blade, you must move a jumper on the motherboard’s three-pin BIOS configuration jumper block to configure mode.

<table>
<thead>
<tr>
<th>NOTES</th>
<th>The following sections assume that</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• BIOS password(s) are set</td>
</tr>
<tr>
<td></td>
<td>• the motherboard is installed in the A–Series blade, and</td>
</tr>
<tr>
<td></td>
<td>• the configuration jumper block is set to normal mode.</td>
</tr>
</tbody>
</table>

**Setting up Zero Client and Blade PC**

**CAUTION:** Do not move jumpers when the blade is powered on. Always power off the blade and unplug the power cord from the blade before moving a jumper. Doing otherwise can damage the motherboard and cause irreparable damage.

1. Connect a monitor, a mouse, and a power cable to the zero client.
2. Remove the blade from a chassis and place it on a stable surface, such as a desk or workbench. Do not connect power to the blade.
3. Use a #2 screwdriver to remove the blade’s cover.
4. Move the jumper to pins 2 and 3 on the BIOS configuration jumper block.

Pictures below show the jumper (Figure 30) and the location of the jumper block on each A–Series blade (Figure 31). In the pictures below, host card brackets are omitted for clarity.

![Figure 30. The jumper on the BIOS configuration block](image)
Chapter 4. Upgrading and Maintaining Blade PCs

Figure 31. BIOS jumper block location and jumper pin numbers on A6106D motherboards

The jumper block is located beneath the PCoIP host card bracket. For blades with:

- **Dual-monitor host cards**: access the jumper through the opening in the PCoIP host card bracket. Use needle-nose pliers to move the jumper to pins 2 and 3 (see the figure above). Continue to step 5.

- **Quad-monitor host cards**: remove the host card and bracket to access the jumper.
  
  a. Press the release lever on the PCIe ×16 slot to release the silver PCIe ×16 flex cable (only release the end nearest the DIMM slots). Gently lift up the cable, being sure not to crease or bend it.

  b. If the host card is a Tera 1 card (roughly 11.75 inches long with a silver heat sink and fan), continue to step c below. If it is a Tera 2 card (roughly 6.5 inches long with a black heat sink), remove the end of the silver PCIe ×1 flex cable that is connected to the host card. Remove both screws and gently remove the cable, being sure not to crease or bend it.

  c. Remove Ethernet cable(s), being sure to note their arrangement for correct reassembly. If present, remove video cables (for example, Mini DisplayPort) from the host card.

  d. Remove screws from the host card and carefully remove the card from the bracket (you can safely leave the power cable connected).

  e. Move the jumper to configuration mode (pins 2 and 3). Use needle-nose pliers to ease access. See the figure above for jumper placement.

  f. Replace the host card bracket and host card, including all cables, by reversing these steps.

5. Replace the blade cover and fasten with screws.

6. Connect a **USB keyboard** to a USB connector located on the top edge of the blade (you might need to move a safety cover that covers the ports). (This is referred to as a *local keyboard* in these instructions, as distinguished from a keyboard connected to a zero client.)
7. Use Ethernet cables to connect the zero client and the blade to a network switch. Use the blade’s dedicated PCoIP port - the top-most port shown in the picture below.

![Figure 32. A–Series blade dedicated PCoIP port](image)

8. Power on the zero client (do not power on the blade).
   
   **Result:** After several moments the zero client's On-Screen Display (OSD) is displayed.

### Connecting Zero Client and Blade PC

1. Ensure that a local keyboard is connected to a USB port on the top edge of the blade.

2. Connect power to the rear of the A–Series blade and press the power button on the front of the blade (the right-most button) to power on the blade.

3. Watch the lights on the keyboard - when the lights blink or illuminate, wait for about 10 seconds. From the OSD (the monitor connected to the zero client), click Connect.
   
   **Result:** a progress message is displayed. After several moments the OSD displays a list of available host cards.

4. Use the host card’s MAC address to identify it in the list (you might need to scroll down to find the host card). If you do not see the host card, power off the zero client and power it on again, then click Connect. Select the host card and click OK.
   
   **Result:** the BIOS Maintenance menu is displayed.

### Clearing Passwords

1. From the BIOS Maintenance menu, select Clear BIOS Passwords and press ENTER on the local keyboard.
   
   **Result:** A dialog box is displayed asking you to confirm clearing the password(s). Press Y to clear the password(s).

2. Verify that passwords are cleared. Press arrow keys on the local keyboard to scroll to the Security menu. From the top portion of the screen, ensure that all passwords display Not Installed.
Chapter 4. Upgrading and Maintaining Blade PCs

3. From the local keyboard, press **F10** to save the BIOS changes. Select **Yes** (depending on the BIOS, you might need to press **ENTER** to continue).

   **Result:** A message is displayed about powering off the blade and moving the jumper.

4. Power off the blade by pressing the **power button** on the front of the blade.

5. Remove the **power cable** from the rear of the blade.

6. Use a screwdriver to remove the blade cover.

7. Return the BIOS configuration **jumper** to pins 1 and 2 (see **Figure 31** on page 66 for the jumper location).

8. Replace the blade cover and fasten with screws.

BIOS passwords are now cleared. You can now deploy the blade or create new passwords by viewing the BIOS Security menu.

### 4.5.4.2 Updating (Flashing) BIOS

A6106D blades use a customized BIOS. Use only ClearCube BIOS updates on A–Series blades. To download BIOS updates from the ClearCube Support site, perform the following steps.


2. Select the appropriate A–Series blade in the **Blade PCs** drop-down list box.

3. Click the **BIOS** link to display a list of BIOS downloads.

4. To download a BIOS, click the appropriate link and save the file to your computer. The .ZIP file contains a readme file with instructions about how to update the BIOS.

### 4.5.4.3 Recovering BIOS

If the BIOS on your A6106D blade becomes corrupted or you need to recover your BIOS for any other reason, follow the instructions in the documentation (**Desktop Boards Instructions for Recovery BIOS update**) on the Intel support site ([www.intel.com/support/motherboards/desktop/sb/CS-023360.htm](http://www.intel.com/support/motherboards/desktop/sb/CS-023360.htm)).

Motherboard model numbers are shown in **Appendix A. “Specifications”** on page 69, and are also shown on the motherboard. From the Intel Support site, search for the BIOS for your blade’s motherboard.
# Appendix A. Specifications

## Table 5. A6106H/HL Blade PC Specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processor</strong></td>
<td>Depending on configuration:</td>
</tr>
<tr>
<td></td>
<td>• Intel® Core™ i7-4790S</td>
</tr>
<tr>
<td></td>
<td>• Intel Core i5-4590S</td>
</tr>
<tr>
<td><strong>Chipset</strong></td>
<td>Intel Q87 Platform Controller Hub (PCH)</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>• Dual-Channel</td>
</tr>
<tr>
<td></td>
<td>• Four 240-pin DDR3 U-DIMM sockets supporting:</td>
</tr>
<tr>
<td></td>
<td>• Up to 32 GB maximum total system memory.</td>
</tr>
<tr>
<td></td>
<td>• DDR3 1600 MHz, 1333 MHz and 1066 MHz DIMMs.</td>
</tr>
<tr>
<td></td>
<td>• Non-ECC DIMMs.</td>
</tr>
<tr>
<td><strong>Video</strong></td>
<td>• Intel Graphics Media Accelerator 4600 (Intel GMA 4600)</td>
</tr>
<tr>
<td></td>
<td>• External graphics support through PCIe 3.0 ×16 and ×1 (for GPU and PCoIP host card)</td>
</tr>
<tr>
<td></td>
<td>• Supports dual- and quad-monitor host cards with PCoIP technology</td>
</tr>
<tr>
<td></td>
<td>• One DVI-I port (for bench top configuration and setup only).</td>
</tr>
<tr>
<td><strong>LAN Support</strong></td>
<td>• On bench top: Two Gigabit Ethernet controllers (Intel I217-LM and Intel I210-AT)</td>
</tr>
<tr>
<td></td>
<td>• In A3100 Chassis: Three Gigabit Ethernet controllers (both controllers noted above plus one controller dedicated to PCoIP traffic).</td>
</tr>
<tr>
<td><strong>Intel® vPro™ Technology</strong></td>
<td>Provides remote management support</td>
</tr>
</tbody>
</table>
### Table 5. A6106H/HL Blade PC Specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Intel Advanced Technologies and Data Protection Technology** | • Intel IPT  
• Intel AMT  
• Intel TXT  
• Intel TPM  
• Intel Virtualization Technology  
• Intel AES-NI |
| **Operating System Support**             | • Windows 7                                                                                          |
| **BIOS**                                 | AMI UEFI BIOS, support for ACPI                                                                     |
| **Dimensions**                          | • Size: 10.03 inch (H) × 29.22 inches (L) × 1.63 inches (W)  
• Weight: 14.5 pounds                                                                             |
| **Environment**                         | Stationary office, 0–35° C  
Relative humidity (non-condensing):  
• Operating: 15% - 80%  
• Non-operating: 5% - 95%                                                                     |

### Table 6. A6106D Blade PC Specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Processor** | Depending on configuration:  
• Intel Xeon Processor E3-1275 v2  
• Intel Core™ i7  
• Intel Core i5  
• Intel Pentium® Processor G2120 |
| **Chipset** | Intel Q77 Express Chipset |
| **Memory** | • Dual-Channel  
• DDR3 1600 and 1333 MHz  
• Four DIMM sockets, unbuffered, non-ECC  
• Supports up to 32 GB |
| **Video**  | Supports dual- and quad-head digital host cards with PCoIP technology |
Table 6. (Continued) A6106D Blade PC Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN Support</td>
<td>Two Gigabit (10/100/1000 Mb/s) LAN subsystems using Intel 82579LM and Intel 82574L Gigabit Ethernet Controllers</td>
</tr>
<tr>
<td>Intel® vPro™ Technology support</td>
<td>Provides remote management support</td>
</tr>
<tr>
<td>Operating System Support</td>
<td>• Windows 7</td>
</tr>
<tr>
<td>BIOS</td>
<td>Intel BIOS (resident in SPI flash device)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>• Size: 10.03 inch (H) × 29.22 inches (L) × 1.63 inches (W)</td>
</tr>
<tr>
<td></td>
<td>• Weight: 14.5 pounds</td>
</tr>
<tr>
<td>Environment</td>
<td>Stationary office, 0–35° C</td>
</tr>
<tr>
<td></td>
<td>Relative humidity (non-condensing):</td>
</tr>
<tr>
<td></td>
<td>• Operating: 15% - 80%</td>
</tr>
<tr>
<td></td>
<td>• Non-operating: 5% - 95%</td>
</tr>
</tbody>
</table>

Table 7. A3100 Chassis Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections</td>
<td>• 6U form factor, 10-slot chassis</td>
</tr>
<tr>
<td></td>
<td>• Fit 7 chassis (70 Blade PCs) in a single 42U rack or cabinet</td>
</tr>
<tr>
<td></td>
<td>• Four AC power connectors: one main and one redundant A/C line connections for every 5 slots</td>
</tr>
<tr>
<td>Dimensions</td>
<td>• 6U (10.5 inches high, standard 19-inch rack width)</td>
</tr>
<tr>
<td></td>
<td>• x 10.5 inches (H) x 29.75 inches (L) x 17.0 inches (W)</td>
</tr>
<tr>
<td>Power Input</td>
<td>• 100–240 VAC, 50/60 Hz</td>
</tr>
<tr>
<td></td>
<td>• Power supplied to each individual blade slot</td>
</tr>
<tr>
<td></td>
<td>• 12 Amps current required per power input (at 100 VAC) (maximum)</td>
</tr>
<tr>
<td>AC Input Fuse</td>
<td>![Fuse icon] T15A, 250V (5x20 mm slow-acting 15 amp fuse)</td>
</tr>
<tr>
<td>Weight</td>
<td>40 pounds empty, 192.5 pounds with 10 blades and expansion backplane</td>
</tr>
<tr>
<td>Environmental</td>
<td>Rack mounted, 0–35° Celsius (C)</td>
</tr>
</tbody>
</table>
Appendix B. Beep Codes

The A–Series BIOS provides beep codes to indicate recoverable errors that occur during power-on self test (POST). The sections below show these beep codes.

B.1 A6106H/HL

The table below shows the A6106H/HL beep code.

<table>
<thead>
<tr>
<th>Beep Code</th>
<th>Sequence/Pattern</th>
<th>Meaning</th>
<th>Troubleshooting Steps</th>
</tr>
</thead>
</table>
| 3 Beeps   | On-off (1.0 second each) three times, then 2.5-second pause (off). Pattern repeats until blade is powered off. | Memory initialization error. No usable memory detected | • Reseat the memory.  
• Make sure that the socket and the memory contacts are clean.  
• Try removing one bank of memory modules at a time.  
• Check for a faulty memory module by trying the memory in a known, good blade. |
B.2 A6106D

The table below shows the A6106D beep codes.

<table>
<thead>
<tr>
<th>Beep Code</th>
<th>Sequence/Pattern</th>
<th>Meaning</th>
<th>Troubleshooting Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 beeps</td>
<td>On-off (1.0 second each) two times, then 2.5-second pause (off). The pattern repeats once, then the computer continues to boot.</td>
<td>Video error (no add-in graphics card installed)</td>
<td>Reseat the add-in graphics card.</td>
</tr>
</tbody>
</table>
| 3 beeps   | On-off (1.0 second each) three times, then 2.5-second pause (off). The pattern repeats until blade is powered off. | Memory initialization error. No usable memory detected | • Reseat the memory.  
• Make sure that the socket and the memory contacts are clean.  
• Try removing one bank of memory modules at a time.  
• Check for a faulty memory module by trying the memory in a known, good blade. |
| High/low beeps | Alternate high and low beeps (1.0 second each) for 8 beeps, then the computer shuts down. | CPU thermal trip warning | • Contact ClearCube Support.  
• Ensure the processor heatsink/fan is properly installed. |
Appendix C. Regulatory Compliance

The products described in this document meet the following:

- Electromagnetic Compatibility (EMC)
- Various safety compliance standards
- CE compliance
- Various environmental standards, including RoHS and REACH

Appendix D. Support

D.1 Contact Information

If any problems arise with your ClearCube hardware or software, check the support Web site for any relevant technical bulletins and updates for your product(s) before calling your authorized reseller or ClearCube Support. If your system is serviced by a local ClearCube service partner (such as an authorized reseller), see the contact information provided by the service partner or see the ClearCube Web site for partner contact information. Use any of the methods shown below to contact ClearCube Support.

- support@clearcube.com  ClearCube Support email address
- www.clearcube.com/support/  ClearCube Support Web site
- www.clearcube.com/support/  Service request and RMA form
- +1-866-652-3400  ClearCube Support from outside US
- +1-512-652-3400  ClearCube Support in the US

D.2 Return Merchandise Authorization (RMA)

ClearCube’s policy for products under warranty is to ship replacement parts to the customer within 24-48 hours after the replacement has been approved by the ClearCube Support.

If you are instructed to return any hardware, you must obtain a Return Merchandise Authorization (RMA) number from ClearCube and clearly mark the RMA number on the outside of all shipments to ensure proper and prompt handling. Do not return any equipment without the appropriate ClearCube packaging materials. If you no longer have ClearCube shipping containers, contact Support for replacements.
If an issue arises that requires a warranty replacement part:

- Call Support (+1-512-652-3400 or +1-866-652-3400)
- e-mail support@clearcube.com, or
- use the RMA form on the Support Web site (www.clearcube.com/support/) to report the product issue.

Provide the following information for all product RMAs:

- Name and address
- Product serial number(s)
- Product configuration information
- A brief description of the issue.

Once submitted, Support opens a ticket and provides a case number to the customer. Support then gathers information about the issue and performs troubleshooting processes to determine if a replacement part is required.

If the product is covered under warranty, Support ships a replacement to the customer.

If the product is not under warranty, Support advises the customer about replacement options, or provides information about the manufacturer’s warranty for non-ClearCube-branded products.

Customers who choose to purchase replacement products should contact their Account Executive to confirm and coordinate the replacement purchase.

D.3 Power Cord Replacement

ClearCube A–Series equipment is designed with a three-conductor IEC 60320 appliance inlet that—with the proper power cord—connects a building’s external protective earthing conductor to all accessible metal parts of the enclosure. To minimize shock hazard, make sure your electrical power outlet has an appropriate earth safety ground that is connected each time you power on equipment.

Only use the AC power cords packaged and supplied with your product or power cords and adapters obtained from ClearCube. See “Contact Information” on page 77 for information about contacting ClearCube Support for replacement power cords and adapters.
Appendix E. Warranty

The ClearCube warranty is available on the Support site:

http://www.clearcube.com/support/

From the Support site, click the ClearCube Warranty Overview link to view the ClearCube warranty.

See “Contact Information” on page 77 for information about how to contact ClearCube Support.
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