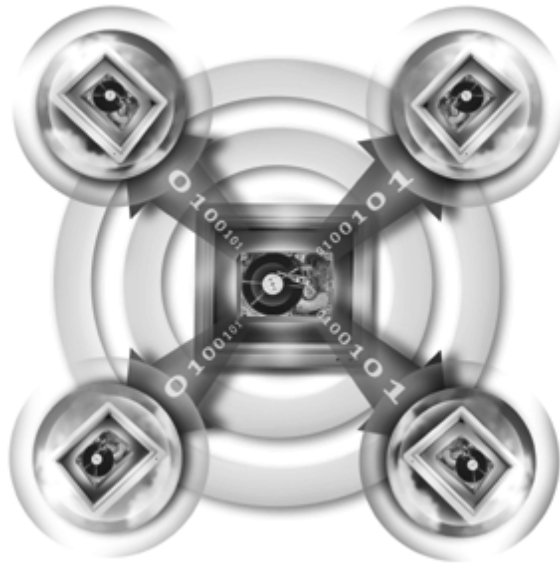


ImageCast™



**Network Image Duplication
and Multicasting Utility**




Network Image Duplication

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Introduction

About ImageCast

ImageCast is a complete hard disk image duplication system. It allows you to produce exact copies of a system hard disk – including partitions, system files, operating systems and applications. The key feature of ImageCast is the ability to *multicast* a single image to many Client workstations simultaneously, greatly reducing the time it takes to set up new workstations or perform software upgrades. It also can be used as a standalone application, with or without network connectivity, to produce copies individually.

With ImageCast, you no longer need to spend tedious hours setting up multiple workstations with the same operating systems, applications, and driver updates. Reconfiguring multiple PCs is now a one-step operation. ImageCast can even be set to perform its chores unattended during non-working hours.

What Does It Do?

ImageCast dramatically reduces the time required to set up or reconfigure PCs on your network. With ImageCast, you can:

- Set up or reconfigure systems in minutes.
- Pre-load partitions, operating systems, and suites of applications for downloading to Clients.
- Clone hard drives within or across PCs.

ImageCast duplicates a hard drive image from any PC on your network and distributes it simultaneously to multiple target PCs or servers with the press of a button. After the image is transferred, the target systems contain a perfect clone of the original image. This means you can set up multiple new PCs, complete with the same operating system, applications, and data as the original image.

ImageCast is the *only* drive imaging product that lets you multicast images from a master location to multiple target PCs. Multicast means one signal is broadcast over the network and read by all target computers. In contrast, similar applications that do not use multicasting have to have a separate communications session for each intended target. Multicasting saves time and avoids overloading network bandwidth. You can also control the process from each individual PC, and “pull” an image from the server.

ImageCast’s efficiency doesn’t end when it’s done cloning systems. ImageCast dynamically adjusts restored images so any excess capacity is available for use. With some similar products, restoring an image to a larger drive can result in excess space being left unpartitioned.

ImageCast's graphical user interface makes it the easiest and fastest way to duplicate and distribute images ever. You can even automate image distribution to predefined groups of PCs at scheduled times.

How Does ImageCast Work?

ImageCast consists of a pair of complementary utilities, the Client and Controller. The Client is a DOS application that runs on an individual workstation and is used to create and restore image files. The Controller is a 32-bit application that runs on either Windows 95 or Windows NT. The Controller is used to remotely manage the functions of one or more Clients across a network. From the Controller, you may create and restore images of any connected Client's hard drive. The Controller offers a wide range of flexibility such as the ability to select Clients individually or as named groups.

ImageCast can restore an image in one of two modes: 1) Multicast mode and 2) Standalone Client mode. In Multicast mode, the Controller broadcasts an image to one or more Clients across a network simultaneously via TCP/IP multicast. TCP/IP multicast means that only one image travels over the network and is used by all Clients. In Standalone Client mode, the Controller is not used at all—the Client does all the work. The Client can individually create an image or restore one from a local or network-mapped drive.

Key Features

ImageCast includes a Client application that runs on each target PC, and a Controller application that offers additional image management features.

Controller Application

- 32-bit Windows Controller application lets you create and push images to multiple PCs (multicast) at once.
- True multicasting reduces network traffic. Transmissions are only read by selected Clients.
- Image management functions let you schedule image downloads, and define groups of Clients.

Client Application

- Create and copy images to a network, or pull an existing image file from a network file server.
- Image file compression with configurable compression ratios.
- In-process image duplication statistics, including image name and size, actual transfer rate, and estimated transfer completion time.
- Supports FAT16, FAT32, Win 95, NTFS, NetWare, and UNIX partitions.
- Create complete backups of disks.
- Support for removable media.

System Requirements

ImageCast must be run on systems that conform to the following minimum requirements:

LAN

- File Server** Requires adequate storage capacity for at least one image file. No network file server is required if the Controller or Client saves image files locally.
- Communications**. Controller and Client require a TCP/IP stack for the multicasting feature. Standalone Client mode requires the Client to have a DOS-bootable protocol matching the file server's protocol.

See **page 6** for information on operating modes.

Controller Application

- CPU** Intel 80X86/PC-ISA compatible, 486/66 or higher.
- RAM** 8 MB minimum. 16 MB recommended. 16 MB minimum for Windows NT.
- OS** MS Windows 95/NT

Client Application

- CPU** Intel 80X86/PC-ISA compatible, 386SX/16 or higher.
- RAM** 4 MB minimum. 8 MB recommended.
- OS** MS/PC DOS 5.0 and above.
- Restrictions** Any disk-caching hardware or software must be disabled, including SMARTDRV.SYS and caching controllers. Disk caching interferes with drive setup by intercepting data that should be directly coming from or going to the drive.
- The amount of data from the model system cannot exceed the total hard disk capacity of the target system receiving the image.

Additionally, the target system should meet the minimum requirements for the operating system and applications that will be installed.

Maintain License Agreements

Please note that you are responsible for maintaining the terms of the license agreements of any software you make images of. It is strongly recommended that you review the agreements for all software installed on the original system prior to making an image.

About This Manual

Chapter One contains information on installation and setup of ImageCast components. Chapter Two covers basic information on usage of the Controller and Client. Chapter Three contains some typical uses for ImageCast that may help you in your own applications. Chapter Four covers troubleshooting and frequently asked questions concerning ImageCast.

See the Help file in the ImageCast Program Group for the latest update information which may not be contained in this manual.

Disclaimer

ImageCast is designed primarily for information systems professionals who have at least a working familiarity with computers, networks, and operating systems. This manual accordingly covers only topics specifically related to the operation of ImageCast. For information concerning local and network operating systems, please consult the documentation for the product you are working with or obtain assistance from your network administrator.

Terminology

The following terms are defined as they relate to ImageCast.

Model System. The computer with the hard disk that an image file will be derived from. The model system is set up as a template from which multiple clones will be made via an image file.

Multicast..... A process of sending a single image file to one or more selected Clients in one transmission.

Image File..... A file that contains the contents of a model system's hard drive, including partitions, system files, directories, and user files.

Server A network file server.

Controller..... The network computer running the ImageCast Controller utility.

Client Title case (Client) refers to a workstation running the ImageCast Client utility. Lower case (client) refers to a general relationship to a network server.

Target A drive that will be written to with the contents of an image file.

Getting Started

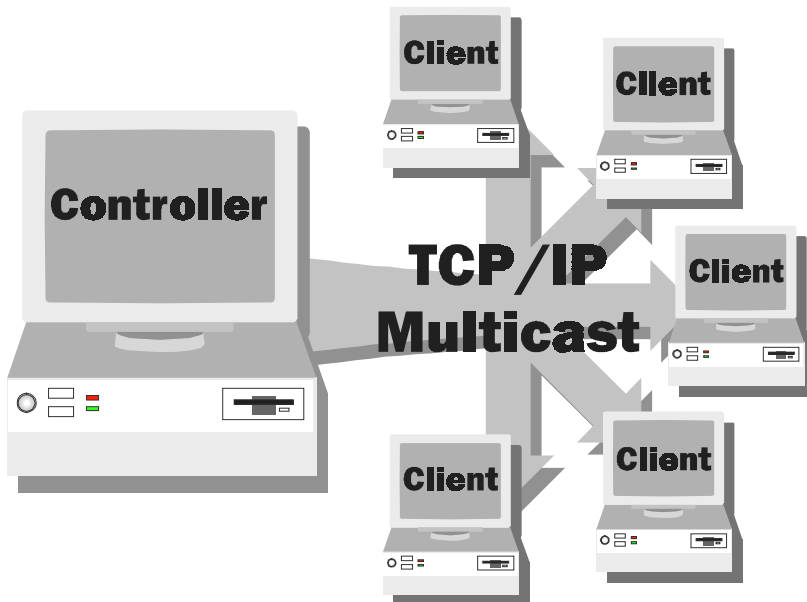
This section contains information on the procedures for setting up the Controller and Client applications. More information on this topic is contained in the ImageCast help file, which can be accessed from the Controller utility (F1) or the ImageCast program group.

ImageCast Operating Modes

ImageCast can be operated in two general modes: Multicast mode and Standalone Client mode. You need to know about modes now because the Client needs to run from a special boot floppy diskette. How you build a Client boot diskette will depend on the mode that you will be using ImageCast in. The contents of a Multicast Client boot diskette will be very different from a Standalone Client boot diskette.

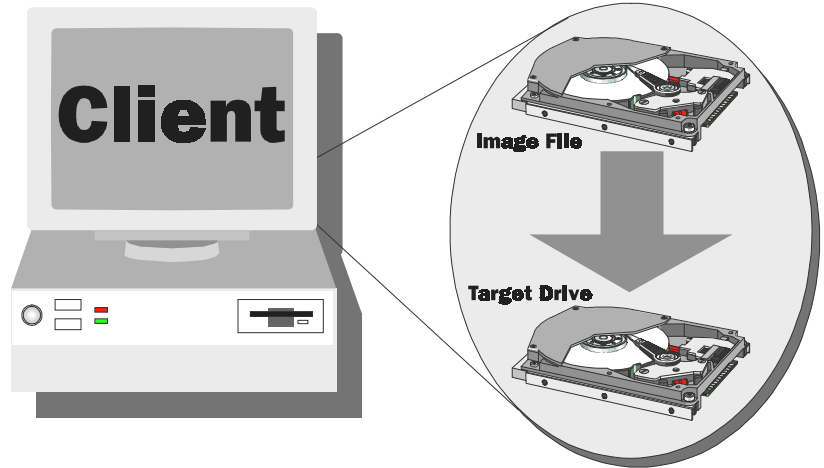
Multicast Mode

Multicast mode allows the Controller to direct the functions of one or more Clients remotely. From the Controller, you may select any Client to create an image file from and send that image to any combination of Clients for restoration. In most cases, this is the most efficient and preferred mode of operation. Only one image travels over the network—adding more Clients does not mean additional network traffic. This mode is sometimes referred to as Controller “Push” mode.



Standalone Client Mode

Standalone Client mode does not require the use of the Controller utility. Operations in this mode are conducted strictly from a Client workstation. Image creation and restoration can be performed on any internal or network-mapped drives.



Installation and Setup

Installation consists of running SETUP.EXE from the floppy disk labeled "Disk 1 of 3," then preparing a boot diskette for the Client(s) (DOS application). If you obtained ImageCast from our website, first copy the file you downloaded to a temporary directory and run it to extract the setup files. The files for the Client will be placed under \IMAGECAST\CLIENT.

Controller Installation

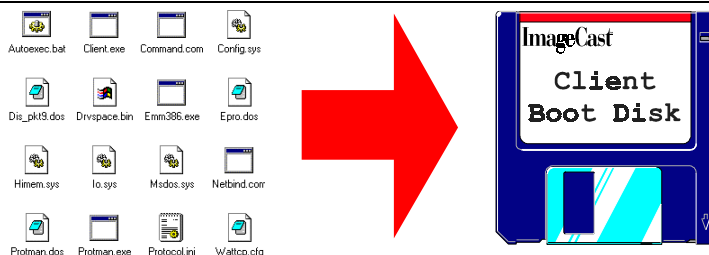
- 1) Start Windows.
- 2) Close all applications.
- 3) Bring up the Run Dialog from the Start menu.
- 4) Enter "A:\SETUP."
- 5) Click on the **OK** button.

Keep the serial
number handy
in case you
need to call
Micro House
Tech Support.

Follow the prompts and choose from the desired installation options. When prompted, enter the serial number for your copy of ImageCast. This number is located on the license certificate. If you have purchased ImageCast via the web, the serial number was E-mailed to the address that you specified.

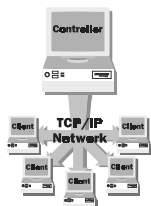
If not already installed, add the TCP/IP communications protocol to the Windows Network settings within Control Panel. Record the IP Address and Subnet Mask. Power down and restart the Controller machine if you have made any changes.

Client Setup



Client Builder

We recommended that you use the Client Builder application for making Client boot diskettes. To run the Client Builder, select it from the ImageCast Program Group or from the **File** menu on the Controller. The Client Builder will walk you through all the necessary steps—simply follow the prompts to completion. Remember to select the appropriate mode (Multicast or Standalone Client) when you are prompted.



Manually Building a Boot Floppy for a Multicast Client:

Although the Client is a DOS application, you may find it easier to set up Client floppy diskettes from within Windows. The instructions in this section are for building a boot floppy diskette for a Client that will be used in Multicast mode. Instructions for building a boot floppy diskette for a Client that will be used in Standalone Client mode begin on **page 10**.

Note: Be sure to run SETUP.EXE first to obtain some of the files referenced below.

- 1) Prepare a clean, DOS bootable floppy diskette. Make sure that you copy the system files. Use FORMAT A: /S from the DOS prompt. In Windows 95, open My Computer, click on the A: drive, pull down the File menu and select **Format**. Be sure to check in **Copy System Files**.

Copy EMM386.EXE and HIMEM.SYS from the \Windows directory.

- 2) Insert the drivers diskette that came with the network card into your floppy drive.
- 3) Look for a \NDIS, \NDIS2, \MSLANMAN, or similarly named directory. If one of these exists, look for a \DOS sub-directory within. Look for a file with a .DOS extension. Ignore the file named DRIVERS.DOS if it appears. If you are not sure about the identity of the file, look in a README file on the drivers disk and see if it lists the name of the NDIS or NDIS2 driver. Copy that file to the Client diskette you just created. Write down the full name of this file for future reference.

- 4) Set the jumpers on the network card (if necessary) and install it in the computer. Record the base address and IRQ number you set the card to.

If you are using a jumperless NIC that needs to be software-configured, follow the steps below. Note: these steps are not necessary if you are using *both* a NIC and mainboard/BIOS that are Plug and Play capable.

- a) Boot up the Client computer with your bootable diskette in the A: drive.
 - b) Remove the boot floppy and insert the configuration diskette that came with the network card. Run the setup program for the card. See the documentation that came with the card for specifics.
 - c) Use the setup program to select jumperless mode. Be sure to set the base I/O address and IRQ so that they will not conflict with any other devices installed in the system.
- 5) If necessary, put the Client floppy back into the floppy drive on the computer where you installed the ImageCast software.
 - 6) *For jumperless cards*, copy all the files from the \IMAGECAST\CLIENT, \IMAGECAST\CLIENT\MCLIENT, and \IMAGECAST\CLIENT\MCLIENT\JUMPLESS subdirectories to the floppy you created above.

For jumpered cards, copy all the files from the \IMAGECAST\CLIENT, \IMAGECAST\CLIENT\MCLIENT, and \IMAGECAST\CLIENT\MCLIENT\NE2000 subdirectories to the floppy you created above.

If you specified the default directories during installation, the subdirectories listed above will reside under C:\Program Files.

- 7) *For jumperless cards*, edit the last line of the PROTOCOL.INI file on the Client floppy to reflect the .DOS file name you wrote down in **step 4**, above. If the system is not Plug and Play capable, you will have to add the lines:

```
INTERRUPT = 5
IOBASE = 0x300
```

Substitute the correct IRQ and Base I/O Address for your Client.

For jumpered cards, edit the last few lines of the PROTOCOL.INI file on the Client floppy to reflect the interrupt and base address you wrote down in **step 5**, above.

The last line of PROTOCOL.INI should now read:

```
drivename = your$
```

where "your" is the file name written down in **step 4**, minus the .DOS extension.

- 8) *For jumpered cards*, edit CONFIG.SYS on the floppy to change NE2000.DOS to the filename recorded in **step 4**.

For jumperless cards, edit CONFIG.SYS on the floppy to change PNPND.DOS to the filename recorded in **step 4**.

- 9) Edit the file WATTCP.CFG on the floppy and assign a unique IP address (MY_IP =) and Station name (HOSTNAME =) to this system. Assuming the NETMASK value is 255.0.0.0, the first number in MY_IP must match that assigned in the Controller system's IP address. For example, if the Controller's IP address is 100.200.200.200 each Client it has to see must be 100.xxx.xxx.xxx.

Note: if the Controller will be running on a DHCP server (Windows NT), you may specify MY_IP = BOOTP. The IP Address will then be automatically assigned by the server.

Make sure that the Client diskette contains the following files:

- AUTOEXEC.BAT
- CLIENT.EXE
- COMMAND.COM
- CONFIG.SYS
- DIS_PKT9.DOS
- NDIS packet driver for the network interface card
- EMM386.EXE
- HIMEM.SYS
- NETBIND.COM
- PROTMAN.DOS
- PROTMAN.EXE
- PROTOCOL.INI
- WATTCP.CFG

Prepare as many Client floppy diskettes as you have purchased ImageCast licenses for.

To start the Client program, insert the bootable floppy, with the above steps completed on it, into the boot drive of the Client system and re-boot the system. Remove the floppy once the Client software is running and the IP address is displayed near the top of the screen.



Manually Building a Boot Floppy for a Standalone Client

The following instructions are for setting up a Client that will be operating in Standalone Client mode. You can ignore this section if you will only be using ImageCast in Multicast mode. See **page 8** for Multicast Client setup instructions.

Note: You will first need to run SETUP.EXE as instructed on **page 6** to create the install directories mentioned in the instructions below.

1) Prepare a clean, DOS bootable floppy diskette. Make sure that you copy the system files. Use `FORMAT A: /S` from the DOS prompt. In Windows 95, open My Computer, click on the A: drive, pull down the File menu and select **Format**. Be sure to check in **Copy System Files**.

Copy `EMM386.EXE` and `HIMEM.SYS` from the `\Windows` directory.

2) Add `AUTOEXEC.BAT`, `CONFIG.SYS`, and the files required to make the workstation a DOS client to the network operating system used on the file server, then modify `AUTOEXEC.BAT` to map to a drive on the file server. Consult the documentation for the network operating system (such as NetWare or NT) for information on how to do this.

3) Copy all the files from the `\IMAGECAST\CLIENT` sub-directory to the floppy you created above. If you specified the default directories during installation, the `\IMAGECAST` directory will reside under `C:\PROGRAM FILES`. Copy `EMM386.EXE` and `HIMEM.SYS` from the `\Windows` directory.

4) Copy the file `WATTCP.CFG` from the `\IMAGECAST\CLIENT\SCIENT` directory.

5) Add the following lines to the end of `AUTOEXEC.BAT`:

```
prompt $p$g
lh CLIENT
```

Note: Be sure to load all files high where possible.

The Client diskette will now contain the following files:

- `AUTOEXEC.BAT`
- `CLIENT.EXE`
- `COMMAND.COM`
- `CONFIG.SYS`
- `EMM386.EXE`
- `HIMEM.SYS`
- `WATTCP.CFG`
- Any files necessary to connect the Client to your network.

Prepare as many Client floppy diskettes as you have purchased ImageCast licenses for. To start the Client program, insert the bootable floppy into the boot drive of the Client system and re-boot the system. Remove the floppy once the Client software is running

Using ImageCast

The Controller

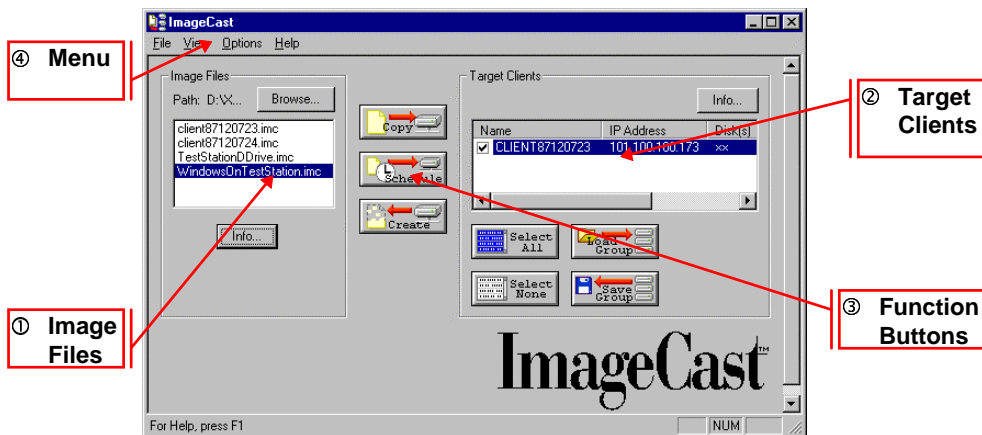
The function of the Controller utility is to manage network-enabled ImageCast features. When initialized, the Controller searches for any Multicast Clients (see **page 8** for Multicast Client setup information) that exist on the network. Any Clients it finds are logged in and listed by their IP address. Clients may be named to more easily identify them. Additionally, Clients may be grouped and the grouping information stored for later use.

The Controller can pull and store an image of any logged Client hard drive on an available local or network directory. After selecting an image file from a storage directory, you may select from a list of Client systems to copy that image onto. That image is then sent out to the Clients via TCP/IP multicast protocol and all selected systems are set up concurrently. No interaction is required at individual Client workstations.

Running the Controller Program

- 1) Start Windows (95/NT).
- 2) From the Start menu, bring up the ImageCast program group and select **CONTROL.EXE**.



Controller Interface



The Controller interface is easy to understand and use. It consists of four sections: **Image Files**, **Target Clients**, **Function Buttons**, and the **Menu**.


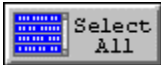



① Image Files Section

The section on the left of the interface is used to select the path to write or read an image file. There are two buttons in this section:

	Changes the path.
	Displays details on a highlighted image file.

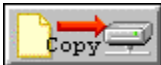

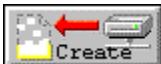
② The Target Clients Section

The section on the right is used to manage any logged Clients. The field lists information on available Clients, including IP Address, number of hard drives, selected target drive, and system name. There are five buttons around the Client list:

	Brings up the Client Drive dialog that details information about drives installed in the Client. Use this dialog to change the drive that you wish to create an image from or restore an image to.
	Checks all available Clients in the list. An action initiated by another button can then be performed on selected Clients. Clients can be individually de-selected by clicking on them.
	De-selects all Clients in the list (see above).
	Brings up the Save Group dialog. This dialog allows selected Clients to be saved as a group. This allows you to manage future multicasts to groups more easily.
	Brings up the Load Group dialog. This dialog allows you to load a previously saved Client group.

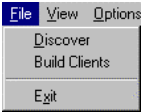
③ Function Buttons

There are three buttons in the center that are used to control functions on selected Clients:

	Initiates multicast of an image file to selected Clients.
	Same as Copy, but requires that you specify a time for the multicast to occur.
	Creates an image file from the selected Client. Only one Client can be selected at a time for this.

④ Menu

There are additional functions that can be accessed from the **Menu** at the top of the interface.

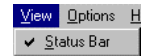


From the File Menu, you can access three functions.

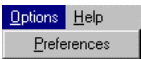
Discover: Used to poll the network and log in additional Clients that may not have been present during Controller initialization.

Build Clients: Launches the Client Builder (**see page 8**).

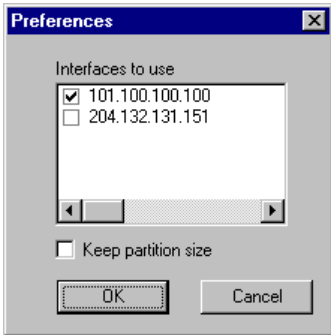
Exit: Closes the Controller.



Use this menu to toggle the status bar at the bottom of the interface.



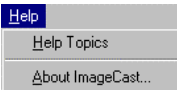
Select **Preferences** from this menu to bring up the Preferences dialog.



If you have access to different IP sub-networks, you can choose the addresses that the Controller will respond to from here.

By default, ImageCast will scale the size of partitions it creates to maximize available disk volume. If you wish to keep the cloned partition size the same as the original model system, then check in the box next to **Keep Partition Size**.

Note: this option should never be selected if the target drive is smaller than the drive the image file was created from.



Pull down the **Help** menu to access the help file. To find out version, licensing, and contact information, select **About ImageCast**.

NOTE: Make sure the target drive is equal to or larger than the drive the image file was created from if you enable Keep Partition Size.

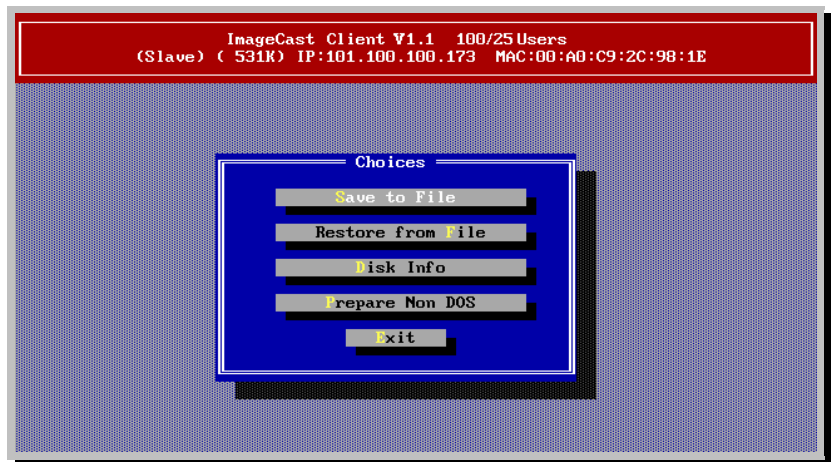
The Client

The Client is the workhorse of the paired utilities. Its basic functions are to create image files from model systems and to write the contents of image files to target drives.

Running the Client Program

To run the Client program, simply boot from the ImageCast floppy diskette you previously prepared. Remove the boot floppy from the drive after the Client program appears. Do not manually run CLIENT.EXE; the program needs to be loaded into high memory in order to maximize space for operations.

Client Interface



The Client program main menu gives the following choices for use in Standalone Client mode:

- Save to File**Initiates the process for creating an image file.
- Restore from File**...Initiates the process for reproducing a system setup from an image file.
- Disk Info**Leads to a display of the BIOS setup parameters and Partition Table for the drive selected.
- Prepare Non-DOS**..Used to prepare a model system that an image file will be made from if that system will use a non-DOS-compatible (non-FAT) operating system. This process wipes out the entire hard disk, therefore should be done before installing operating systems and applications on the model system. Choose the appropriate operating system from the options presented.
- Exit**.....Exit from the Client application and return to the DOS prompt.

Additional Notes About the Client

To enable the ImageCast Client utility in Standalone mode to access a network file server, you will need to install a DOS client for the specific network operating system the server is running, then map the location of file server. The instructions previously outlined were based on one possible example. Refer to the documentation for your specific network operating system for instructions.

To enable the multicast feature from the Client side, you will need to first install the DOS driver for your specific network card. Use a text editor to open up the file named WATTCP.CFG. Look for the lines that start with HOSTNAME and MY_IP and ensure that the values to the right of these items are not being used by any other Clients. When you are done, remember to save any changes to WATTCP.CFG.



Multicast Mode Operation

Multicast mode requires the Controller utility. Before starting a multicast session, boot all Clients that will be involved and **remove the diskettes from the floppy drives**. No further action is required at the local workstations.

Creating an Image File

If the image will contain a non-DOS (non-FAT) operating system, use the **Prepare Non-DOS** function to prepare the drive *prior* to setting it up with the operating system and applications.

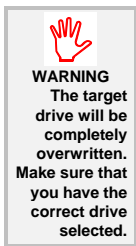
- 1) Boot up the Client(s) you will be making image files from. Run the Controller utility (CONTROLE.EXE) and maximize the main window.
- 2) Check to see that all Clients appear in the Target Clients pane within the Controller. If any are missing, check for two Clients with the same IP addresses and make them unique. See the troubleshooting section starting on **page 23**, as well as the Controller help file for additional suggestions.
- 3) Select the Client from the Target Clients pane that you desire to create an image from by checking in the box next to it.
- 4) By default, ImageCast will select the boot drive in the system for imaging and restoring operations. To change to another drive, click on the **Info** button. Check in the box next to the desired drive. Click on **OK** when finished.
- 5) Click on the **Create** button.
- 6) Enter a path and filename for the image file and click **Save**.

- 7) Select compression level and click on **Receive Image**. Using no compression is fastest, but takes the most amount of space. Using high compression saves space, but takes longest to create an image.

When ImageCast is finished creating the image file, you have a valid image file to send out to as many Clients as you like.

Multicasting an Image File to Target Clients

- 1) Boot up the Client(s) you will be multicasting the image file to. Run the Controller utility (CONTROL.EXE) and maximize the main window.
- 2) Select the Clients you wish to multicast the image to by checking in the box next to them in the Target Clients pane. If you are going to multicast to all detected Clients, click on the **Select All** button.
- 3) The image will go to the boot hard disk in the Client system by default. If you wish to send the image to a different drive in the system, highlight a Client and click on the **Info** button. Check in the box next to the desired target drive and click **OK**. The contents of the target hard drive *will* be overwritten, so make sure that you have the correct drive selected. Also make sure that all target drives have adequate capacity to receive the image.
- 4) Select the image file you wish to multicast. Change the path by clicking on the **Browse** button and clicking **OK** when finished.
- 5) Click on the Copy button to begin multicasting.



The amount of time it takes to multicast an image depends on a variety of factors. After the Client is finished receiving the image, it will automatically re-boot. All of the machines you sent the image to will exactly match the content of the model system you created the image from.

Scheduling Multicasts

This operation is basically the same as above, but you will click on the **Schedule** button instead of **Copy**. You can schedule by entering a date and time or specify a delay. Click on **Start** to begin.



Standalone Client Mode Operation

The Controller is not required for Standalone Client mode. All actions are controlled locally by the Client. One Client at a time can be restored in this mode.

To make
copies of
internal
drives, use
EZ-Copy.

The Client can perform its functions on network-mapped as well as internal hard drives. If more than one drive is installed in the Client workstation, the second drive can be used as the target for an image file that resides on the first. Although ImageCast can be used for copying an internal drive, the Micro House utility EZ-Copy is better suited for this purpose. EZ-Copy supports IDE drives only. This program is located under the \IMAGECAST\EZCOPY directory.

If a Client workstation is mapped to a network file server, it can store an image it creates on the server or pull an image from it for restoration to a target drive. Note that the appropriate software must be installed to enable the Client workstation to act as a DOS client to the network operating system that controls the file server. Please refer to your network administrator or the documentation for the specific network operating system for further instructions on making a DOS client to your network operating system.

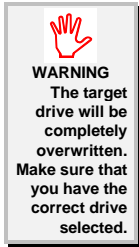
Creating an Image File in Standalone Client Mode

- 1) Insert the Client boot diskette into a computer that you wish to make an image of and re-boot the system.
- 2) If the model system will contain a non-DOS (non-FAT) system, then use the **Prepare Non-DOS** feature on the drive the image will be made from prior to installing the operating system and applications. Otherwise, go to the next step.
- 3) Select **Save To File** from the main menu.
- 4) Type in the file name path to the drive letter you wish to save the image file to. It should have the .IMC extension. Tab over to **OK** and hit **<Enter>**.
- 5) Select the level of compression you want, tab over to **OK** and hit **<Enter>**. Using no compression is fastest, but takes the most amount of space. Using high compression saves space, but takes longest to create an image.

When ImageCast is finished creating the image file, you have a valid image file to restore to as many Clients as you like. This image file can be copied over to a network location that the Controller has access to for use in Multicast mode.

Restoring an Image File in Standalone Client Mode

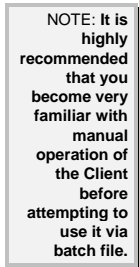
- 1) Insert the Client boot diskette into a computer that you wish to restore an image to and re-boot the system.
- 2) Remove the diskette from that Client.
- 3) Select **Restore From File** from the main menu.



- 4) Select the target drive that the image will be copied to. Keep in mind that the contents of this drive *will* be overwritten. Make sure that this drive has adequate capacity to receive the image.
- 5) Enter the file name and path to the image file that you wish to restore. Tab over to **OK** and hit **<Enter>**.

When the copy is completed the system will automatically re-boot. The Client machine's hard disk contents will exactly match the Client you created the image from.

Operating the Client from a Batch File



You can run the Client manually as outlined above, or further automate operation through a batch file.

After you've built the Client diskette (see **page 10**) you can edit your AUTOEXEC.BAT file and add the `/?` switch to the LH CLIENT line of the file. This will give you a complete list of the batch mode operations. Once you figure out what you wish to do, simply add those command line parameters to the LH CLIENT line in your AUTOEXEC.BAT and re-boot the system.

NOTE: Do not execute the CLIENT.EXE file outside of the AUTOEXEC.BAT file as it will not load high. This will drastically limit the amount of memory available for operation.

Partition Sizes and File Restoration

By default, ImageCast will dynamically re-size restored partitions to maximize the capacity of the target drive. This means that if the target drive is larger than the drive the image file was created from, any leftover space will be available.

This also has benefits if you are attempting to restore an image file created from a larger drive onto a smaller target drive. This will work as long as the total amount of bytes contained in the image file does not exceed the capacity of the target drive.

Restored Partitions will occupy the same ratio of space as the model system. Let's say that the model system was a 1GB drive occupied by two partitions of equal size—500MB each. If the target drive has a 2GB capacity, then it will be occupied by two 1GB partitions when imaging is complete.

You can disable automatic scaling of partition sizes and keep the model system's original partition sizes if you so desire by selecting the **Keep Partition Size** option from the **Preferences** dialog (**Options** menu). If this option is enabled, then ImageCast will not attempt to resize restored partitions according to the target drive's capacity. If the target drive is larger than the drive the image file was created from, any leftover space will not be partitioned and therefore unavailable. If the target drive is smaller than the drive the image file was created from, then restoration will fail.

Examples

These examples may help you further clarify the information covered in previous sections.

Multicast Session

This is an example of ImageCast being used to multicast to a Client using an NE2000-compatible network card on an Ethernet network.

1) Set Up the Controller

Run the setup program if you have not already done so.

If not already installed, add the TCP/IP communications protocol to the Controller's Network settings within Control Panel. Record the IP Address and Netmask of the Controller. Power down the Controller machine and restart it (IP Addresses may be saved in the NIC, so a simple operating system restart may not suffice).

2) Build the Client Diskettes

The ImageCast Client is a very memory intensive application; therefore, everything that can be loaded high should be. The following three sample files are real-world examples using the ImageCast Controller communicating with TCP/IP. TCP/IP is the only supported protocol for this mode of operation. The \IMAGECAST directory contains these and other files in the \CLIENT sub-directory. It is easiest to put all files in the root of a new, bootable floppy so that paths are not necessary in the files. If you use directories WATTCP.CFG must be in the root directory with CLIENT.EXE.

CONFIG.SYS

```
REM *** SETUP FOR A NE2000-COMPATIBLE CARD AND TCP/IP ***
REM *** NOTE: LOAD EVERYTHING HIGH YOU CAN ***
DOS=HIGH,UMB
DEVICE=HIMEM.SYS /NUMHandles=128 /TESTMEM:OFF
DEVICE=EMM386.EXE /RAM
FILES=30
BUFFERS=20
STACKS=0,0
DEVICEHIGH=PROTMAN.DOS /i:\ // Provided with ImageCast
DEVICEHIGH=NE2000.DOS // Provided with net card
DEVICEHIGH=DIS_PKT9.DOS // Provided with ImageCast
```

AUTOEXEC.BAT

```

REM *** SETUP FOR A NE2000-COMPATIBLE CARD AND TCP/IP ***
REM *** NOTE: LOAD EVERYTHING HIGH YOU CAN ***
@ECHO OFF
PROMPT $P$G
NETBIND                // Provided with ImageCast
LH CLIENT              // Run Client in High Memory

```

WATTCP.CFG

```

MY_IP = 209.132.131.101 // Each Client must be unique
HOSTNAME = Station01    // Each Client must be unique
NETMASK = 255.0.0.0     // Must match your server

```

3) Initialize All Clients

Use the Client diskettes to reboot all systems that will be involved in the multicast. The Client program will automatically be initialized. Once booted, remove the diskettes from all of the Client systems.

4) Initialize the Controller

- A) Run the Controller software (CONTROL.EXE) and maximize the main window.
- B) Check to see that all Clients appear in the Target Clients window within the Controller. If any are missing, check for two Clients with the same IP addresses and make them unique. Troubleshooting information is located in the Help file (F1).

5) Create an Image File

- A) Select a single Client from within the Controller software to create the image from. Click on the **Info** button to change the drive. This is the model system.
- B) Click on the **Create** button.
- C) Enter a path and filename for the image file. The file must have the .IMC extension.
- D) Select compression level and click on **OK**. Once imaging is complete, the file is ready to multicast.

6) Multicast the Image File

- A) Select the desired Clients to multicast the image file to from within the Controller software. To change the target drive within selected Clients, highlight the Client and click on the **Info** button.
- B) Highlight the image file you wish to multicast.
- C) Click on the **Copy** button.

All of the machines you sent the image file to will exactly match the contents of the model system you created the image from.

Sample Files from a Standalone Client Connected to a Network

The following three sample files are real-world examples using a Novell 3.12 server running IPX/ODI protocol. If you are using a different server or protocol, the files will need to be modified accordingly. The \IMAGECAST directory contains these and other files in the \CLIENT sub-directory. It is easiest to put all files in the root of a new, bootable floppy so that paths are not necessary in the files.

The process of building a Client disk, in a nutshell: 1) create a DOS bootable floppy disk, 2) add your particular network's files to that diskette such that it will boot up and be able to see a network drive, 3) add the ImageCast Client files to the CONFIG.SYS (DEVICEHIGH=DIS_PKT9.DOS) and AUTOEXEC.BAT (LH CLIENT).

CONFIG.SYS

```
REM *** SETUP FOR A NE2000-COMPATIBLE CARD AND NOVELL 3.12***
REM *** FILE SERVER, NOTE: LOAD EVERYTHING HIGH YOU CAN ***
DOS=HIGH,UMB
DEVICE=HIMEM.SYS /NUMHandles=128
DEVICE=EMM386.EXE /RAM
FILES=30
BUFFERS=20
STACKS=0,0
LASTDRIVE=Z
```

AUTOEXEC.BAT

```
REM *** SETUP FOR A NE2000-COMPATIBLE CARD AND NOVELL 3.12***
REM *** FILE SERVER, NOTE: LOAD EVERYTHING HIGH YOU CAN ***
@ECHO OFF
PROMPT $P$G
CD\NW_NET                // NetWare client files location
LH LSL
LH LCS8634                // Your network card's driver
LH IPXODI                 // Your network protocol
LH VLM
MAP F:\NOVELL_SRV        // Use your server name here
F:\LOGIN SUPERVISOR      // Use your path here
A:
CD \
LH CLIENT                // Run Client in High Memory
```

Troubleshooting/FAQs

Creating and transferring image files involves many variables in both hardware and software elements. If you are experiencing problems using ImageCast, take a moment to try to narrow down the cause.

You should try to first determine if the problem is on the Controller or Client side. All hardware should be properly installed and set up.

Troubleshooting the Client

Problem: Unable to open file for compression - out of memory.

Solution: Load all network drivers and the Client in high memory. The Client must be loaded from AUTOEXEC.BAT in order to be loaded high.

If you are still unsuccessful, then try creating the image on the network drive without using compression.

Problem: Out of disk space even though the Model System image is smaller than the target system hard drive.

Solution: Sometimes a larger hard drive will have larger clusters than the hard drive in the System Model that the image was created from. This results in less usable space, and, under certain conditions may result in an image not fitting on the larger drive. Try maintaining the original partition size when restoring an image file (Options menu: Preferences, then check in Keep Partition Size). Another alternative is to try restoring the image onto a slightly smaller or larger drive.

Problem: It takes a long time to create an image file from a Model System that is Windows NT using NTFS, even though the size is small.

Solution: Before installing the OS and other files on a non-FAT (non-DOS) system, use the **Prepare Non-DOS** feature in the Client software. Additionally, use data compression when creating the image file.

Problem: My image file transfer aborts for no apparent reason.

Solution: Verify that the power saving options in your system BIOS are disabled. If they are not, disable them and re-send the image. This can also be the cause of the image to seem to send OK, but cause problems after a reboot.

Problem Image restoration stops and I get a dialog that says: "Disk write failure - check CMOS settings."

Solution The CMOS is not set up with the correct parameters for the drive or there is a hardware problem. Check to make sure that the CMOS settings are correct. Also check the jumper settings. If you still cannot write an image to the drive, try running a diagnostic routine on it—there may be a hardware failure.

Problem Restoration of image file hangs during Multicast or Standalone Client operation.

Solution It is possible that there is problem reading the image file. Check the integrity of the image file by running a diagnostic utility, such as ScanDisk, on the drive it resides on. The restoration will fail if the image file is corrupt.

Troubleshooting the Controller

Problem Controller cannot see Client(s).

Solution 1 Open up the TCP/IP configuration file (WATTCP.CFG) for the Client(s) that won't appear in the list. Make sure that it's using a unique IP address (MY_IP) and station name (HOSTNAME). De-conflict as necessary.

Solution 2 Be sure the Netmask (Subnet Mask) on the Controller allows for the complete IP address range of all Clients. The widest Netmask allowed is 255.0.0.0. This allows Client IP addresses to be MC.xxx.xxx.xxx where MC=same # as the Controller and xxx=any legal range of IP numbers (0-255). Ask your network administrator for assistance on setting IP addresses and Netmasks.

Problem When running the Controller on Windows 95, I can see the Station Name, but not the IP address. Also, when I try to send an image to any of the Clients I get strange error messages. What's wrong?

Solution Early versions of Windows 95 require a patch from Microsoft: COM32UPD.EXE. You can get this patch at <http://www.microsoft.com>. Additionally, be sure that OLEPRO32.DLL is in your WINDOWS\SYSTEM directory. If not, you may also obtain that from Microsoft.

Problem The multicast stops and I get a dialog that says: "List of failed Clients."

Solution 1 There is a setup or hardware problem on the Client(s) listed in the dialog box. Check to make sure that the CMOS and jumper settings are correct on the target drive. Also try running a diagnostic program on the drive—it may be experiencing a hardware failure.

Also, check to see if the target drive is too small to restore the image file onto. Keep in mind that if the Keep Partition Size option is enabled when restoring the image file, the target drive must be equal to or larger than the drive the image file was created from.

Problem I have a Token Ring network and am trying to use Multicast mode. The Controller cannot see any Clients—what is wrong?

Solution ImageCast does not currently support Token Ring in Multicast mode. This will be amended shortly. In the meantime, use Standalone Client mode.

Other Frequently Asked Questions

Q I downloaded the Trial version and I can't get it to work because...

A E-mail your question or problem report to imagecast@microhouse.com. Please be as detailed as possible and include your return E-mail address. You can also fill out a Problem Report Form and fax it back to us.

Q How does ImageCast handle Windows NT SID files?

A ImageCast does not have an automated method for dealing with NT's SID files at present. Here's a suggested workaround:

1) If using NTFS, use the Prepare Non-DOS function in the Client software before putting anything on the hard disk—if using FAT disregard this step.

2) Install NT and all other programs you wish to put on other systems—be sure you enter a bogus workgroup name when setting up NT and ensure the model system CANNOT see the primary domain system when setting it up

3) Create the image

4) Multicast it to the Clients

5) Set up the Clients individually so they can see the primary domain server

6) The unique SIDs will be created at that point for each workstation.

Q My systems have different network cards. I am multicasting an image of Windows 95 or NT to all of them. How will each system get set up properly?

A After the image is on each Client system you must go around to each of them that has a different network card than the original and set them up accordingly.

You may also want to create an image file from a model system before installing a network card to it. You can then do a “clean” network card setup on individual workstations after the multicast.

Q Do I need to have TCP/IP enabled over the entire network to multicast?

A No. You simply add the TCP/IP network stack to the Windows 95 or Windows NT system that has been designated as the controller, map to the server (if any) you’d like to store the images, build the multicast Client diskettes similar to the image that exists in the \CLIENT\MCLIENT directory, and you are set. When you create an image of one of the Client systems you simply use the Browse button in the Controller to select where you wish to save the image (local drive/directory or network drive/directory), hit the Create button in the Controller and enter a filename. ImageCast will take over from there.

Q My systems have different video cards. How does ImageCast handle this?

A ImageCast puts an identical image of the model system on each Client system. If you have different video boards it is best to set up the model system to use a default video driver such as 640x480 or 800x600. After the image file is transferred, you can change the video mode/drivers on individual workstations as needed.

Q In general, how are all of the customized settings for Client workstations handled by ImageCast?

A ImageCast puts an identical image of the model system on each Client system. Therefore, you must go around to each workstation and put in any customization necessary, such as: 1) station name, 2) primary domain, 3) IP address if not auto assigned on your network, 4) video drivers, if different from model, 5) configure network card, if different from model, 6) etc... Future versions of ImageCast will integrate custom settings more gracefully.

Q With regards to licensing: If I buy the 25/5 license pack, this will allow me to multicast to any 5 machines at one time. Correct? We wanted to get this clarified—a competitor of yours licenses completely differently and we wanted to be sure we we're comparing apples to apples.

A If you buy a 25/5 license pack you are allowed to set up a TOTAL of twenty five machines with the software with five at any one time, NOT 5 at a time, with an unlimited number of PC's. Although with another utility in the package called EZ Copy, you may do disk to disk cloning for as many PCs as you like (as long as the cloning is done within a PC and NOT across the network). If you are a configuration house (configure and ship out 100 or more PCs a week) the licensing is based around that. Please contact our sales department for information on that type of licensing at (800) 926-8299.

Q Does ImageCast run under Windows NT?

A Yes it does. It is designed for Windows 95 and NT 4.0 or higher.

Q I downloaded the trial version of ImageCast and cannot unzip it. I get a message that it won't run under DOS. I'm running DOS ver 6.22\Novell 3.12. My company uses DOS to move system images back and forth to the server. How can we run this program using DOS?

A The file is meant to be installed on either Windows 95 or NT. Once installed, you can grab the Client-appropriate files (the help walks you through building a Client disk) and build your DOS-bootable Clients. The main feature of ImageCast is the ability to multicast. This mode of operation requires the Controller, which runs on Windows95/NT and is installed using the file you mentioned. However, if you are used to the pull (Standalone Client) mode used by some competing products you can also build DOS-bootable disks for that mode which do not require the Controller or any other Windows system to be on the network. You still have to have a Windows-based machine to get the files out of the installation program.

Q If you have a 4 gig drive and a 1gig image to be copied to it, does the drive remain a bootable drive?

A Yes.

Q Can ImageCast image a Novell server?

A Yes, but destination server must be booted to a Client diskette first.

- Q** How large of a drive can ImageCast handle? 4 gig? 9 gig?
- A** We have imaged up to 6 GB drives. It should work with up to 8.4 GB drives, questions remain when going above that level with IDE. In theory, the software is capable of a 24 GB drive, but not tested.
- Q** Will ImageCast overcome DOS, older versions of Windows 95 and old UNIX partition limit of 2 GB/ 8 GB?
- A** No. Whatever the limitations of the operating systems are will remain the same.
- Q** What are the average image transfer times to be expected with ImageCast?
- A** Transfer times will depend on the specific operation and the hardware being used. Throughput bottlenecks can occur anywhere from the hard drive to the network. There are many different scenarios possible but here is an example:

File compression	44%
Image file creation & upload	18:38
Multicast to single Client	7:44
Multicast to 25 Clients	10:34

The model system had 179 MB of data on a 210 MB Hard Drive.
10-Base-T Ethernet, 75 MHz Pentium Clients.

- Q** What amount of compression can I expect on an image?
- A** Between 40% and 55% using maximum compression, on average, depending on the data in the image.

Obtaining Assistance

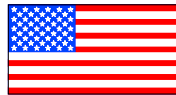
The Help file contains extensive troubleshooting information. To access Help, press F1 within the Controller utility, or go to the ImageCast program group and select ImageCast Help.

If you have any problems with this product, please E-mail us at imagecast@microhouse.com, or use the Controller's Help file to print out a Problem Report form and fax it to us.

Please ensure the following before calling Micro House Software Support:

- Double-check that you have correctly installed all hardware. Ensure that any software used to boot a DOS client to a network server is installed properly. The examples provided in this manual apply to a specific network. Refer to the documentation provided by your network software vendor for correct installation instructions. We can only offer support on the ImageCast program, not on the installation of network hardware and software components.
- You must have your ImageCast serial number on hand. We can only give support to valid customers. The serial number can be found on the license certificate.
- Send in your registration card today! Registration ensures that you get prompt support and lets us keep you informed about the latest product updates. You can also register directly via the World Wide Web at www.solutions.microhouse.com/register/.

Contacting Micro House



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Visit the Micro House Solutions website at www.solutions.microhouse.com for the latest information on ImageCast, as well as information on our other products.

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