PXE Boot Process

Paul Burns
What is PXE Boot?

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- Intel standard
- Allows network boot independent of hard drives or installed operation systems
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Why PXE Boot?

- Retrofit Hardware
- Expand Hardware Offerings
- Speed the Commissioning of new Thin Clients
- Save Labor in Production
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Thin Client BIOS & PXE Boot

**ThinManager Ready**
- Thin client contains ACP BIOS Extension
- No hard drive
- Static or DHCP

**ThinManager Compatible**
- Thin client contains PXE BIOS Extension
- No hard drive
- DHCP Only
Thin Client BIOS & PXE Boot

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Thin Client Boot Sequence

- Firmware Downloaded
- Firmware Expanded
- Configuration Download
Thin Client Boot Sequence

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PXE Requirements

- ThinManager Compatible Thin Clients
- XLi Licensing
- The PXE Server be turned on in ThinManager
- UDP-67 and UDP-69 need to be opened
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Three PXE Options In ThinManager
PXE Boot Modes

Enable PXE Server in ThinManager

- Using standard DHCP server
- Using standard DHCP server with Boot Options
- Not using standard DHCP server
PXE Server Modes

• Using standard DHCP server
  – Uses existing DHCP server
  – ThinManager handles the rest

• Standard DHCP server with Boot Options
  – Uses Option 066 and 067

• Not using standard DHCP server
  – Configures ThinManager to assign IP addresses for PXE boot clients
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- Standard DHCP server with Boot Options*
  - Uses Option 066 and 067
- Not using standard DHCP server
  - Configures ThinManager to assign IP addresses for PXE boot clients

*Note: If the ThinServer is installed on the DHCP server you must use Option 066 and Option 067 since only one process can bind Port 67
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DHCP Boot
IP Address Variations

Setup

- DHCP Server
- ThinManager Server
- Laptop with operating system
- ThinManager Compatible PXE boot thin client
Normal DHCP Request

Normal Boot
- DHCP Request sent
Normal DHCP Request

Normal Boot
• IP address sent
PC with a ThinManager Providing IP Addresses
ThinManager IP Assignments

Not using standard DHCP server

- Other device boots and requests an IP address
- DHCP isn’t configured
- ThinManager ignores request
- Device fails to get IP address
Not using standard DHCP server

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Using Standard DHCP Server
PXE Boot – Option 1

Using standard DHCP server

- Thin Client makes a DHCP/PXE Request
- DHCP Server handles IP assignment
- ThinManager handles PXE options
- Thin Client receives firmware and boots
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DCHP With Boot Options
Using standard DHCP server with Boot Options

- DHCP Server configured with Option 066 and 067
- Thin Client makes a DHCP/PXE Request
- DHCP Server handles IP assignment and Boot Server Option
- ThinManager is not involved in IP assignments
- ThinManager sends firmware for booting
Using standard DHCP server with Boot Options

- DHCP Server configured with Option 066 and 067
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PXE Boot – Option 2

Using standard DHCP server with Boot Options

- DHCP Server configured with Option 066 and 067
- Thin Client makes a DHCP/PXE Request
- DHCP Server handles IP assignment and Boot Server Option
- ThinManager is not involved in IP assignments
- ThinManager sends firmware for booting
PXE Boot – Option 2

Using standard DHCP server with Boot Options

- DHCP Server configured with Option 066 and 067
- Thin Client makes a DHCP/PXE Request
- DHCP Server handles IP assignment and Boot Server Option
- ThinManager is not involved in IP assignments
- ThinManager sends firmware for booting
Using standard DHCP server with Boot Options

- DHCP Server configured with Option 066 and 067
- Thin Client makes a DHCP/PXE Request
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Using standard DHCP server with Boot Options

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- DHCP Server handles IP assignment and Boot Server Option
- ThinManager is not involved in IP assignments
- ThinManager sends firmware for booting
Using ThinManager Instead of Standard DHCP Server
Not using standard DHCP server

- ThinManager is configured to assign IP addresses
- PXE client requests IP addresses
- ThinManager responds with IP address and PXE options
- DHCP isn’t involved
- Thin Client receives firmware and boots
PXE Boot – Option 3

Not using standard DHCP server

- ThinManager is configured to assign IP addresses
- PXE client requests IP addresses
- ThinManager responds with IP address and PXE options
- DHCP isn’t involved
- Thin Client receives firmware and boots
PXE Boot – Option 3

**Not using standard DHCP server**

- ThinManager is configured to assign IP addresses
- PXE client requests IP addresses
- ThinManager responds with IP address and PXE options
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Not using standard DHCP server

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PXE Errors
PXE Error Codes

- **PXE-E32: TFTP open timeout**
  - Using a standard DCHP server with boot options: verify option 67 is set to acpboot.bin
  - Check that acpboot.bin is located in the ThinManager installation directory
  - Verify that there is not a firewall preventing the client from downloading the boot file

- **PXE-E51: No DHCP or proxyDHCP offers were received**
  - Not using a standard DHCP server: check that there is not a firewall preventing the client to connect
  - Make sure the client has a connection to the network with where the DHCP server resides

- **PXE-E52: proxyDHCP offers were received. No DHCP offers were received.**
  - Verify that the standard DHCP server is functioning correctly
  - Configure the ThinManager PXE Server to not use a standard DHCP server.

- **PXE-E53: No boot filename received.**
  - Using a relay agent: verify that the relay agent is configured properly
  - Using a standard DHCP server with boot options: verify that option 67 is set to acpboot.bin

- **PXE-E55: ProxyDHCP service did not reply to request on port 4011**
  - Install the latest service pack for your version of ThinManager

- **PXE-E61: Media test failure, check cable**
  - Make sure the client has a physical connection to the network

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Paul Burns’ Reoccurring Error

- Use the correct network card
- Some machines have multiple virtual networks
Any Questions?
Thank You

Contact Info:
Name: Paul Burns
Phone Number: (678) 990-0945 x304
Email: pburns@thinmanager.com