



Avaya Solution & Interoperability Test Lab

Application Notes for Arden Desktop Edition with Avaya Interaction Center – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Arden Desktop Edition to successfully interoperate with Avaya Interaction Center. Arden Desktop Edition allows Avaya end-users and integration partners to rapidly and consistently deploy and manage Avaya Agent Client application with new releases and updates. This solution works by creating and storing a bootable image of an agent desktop PC to a virtual storage created by Arden Desktop Server. This bootable image is then available to multiple PCs with the same hardware to boot remotely using Preboot Execution Environment available in the PC BIOS. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration for the compliance test between Avaya Interaction Center Agent Client and Ardence Desktop Edition.

Ardence Desktop Edition is a client-server software platform, which allows PC administrators to provide consistent operating system (OS) images to desktop PCs.

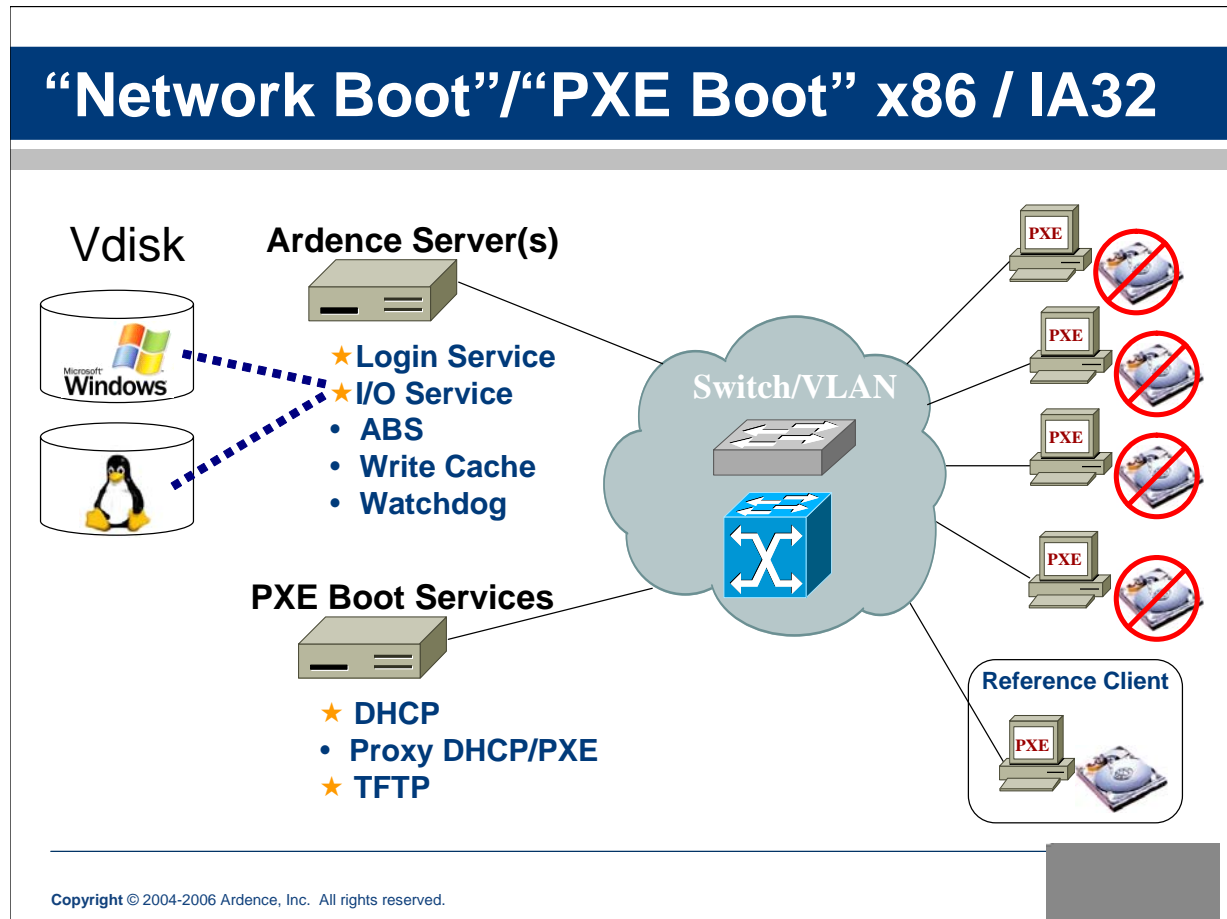


Figure 1: Ardence Client-Server Software Platform

Figure 1 provides an architectural overview of the Ardence client-server software platform. In the lower right corner, there is the initial Reference Client, which must have a hard drive. On this hard drive, the PC administrators must install the OS, which can be either Windows (2000 or XP) or certain distributions of Linux.

The installation of the Ardence Client includes a software tool which captures the contents of the hard drive (OS and applications) into the Ardence Vdisk, also called virtual disk. On the Ardence Server, the Vdisk is a file. After the client PC disk image is saved into the Vdisk, other

PCs can boot from this Vdisk, or copies of this Vdisk. When the client PC is booted from the Ardence Vdisk, it can use all local peripherals, and treats the local hard drive as another local peripheral. Windows Operating System typically assigns the local hard drive a drive letter like D:\ or E:\ when the client PC is booted from the Ardence Server.

Ardence Client requires the Preboot Execution Environment (PXE), which is a specification originally published by Intel in 1997 as a part of the Wired for Management 1.0 initiative, and since then has become widely adopted by the industry. The PXE firmware must be present either in the BIOS or the NIC chipset. In order to configure a client to boot using the PXE firmware, the PC administrator needs to enter the BIOS Setup utility and set the PXE or “Network Boot” device to be the first choice in boot sequence.

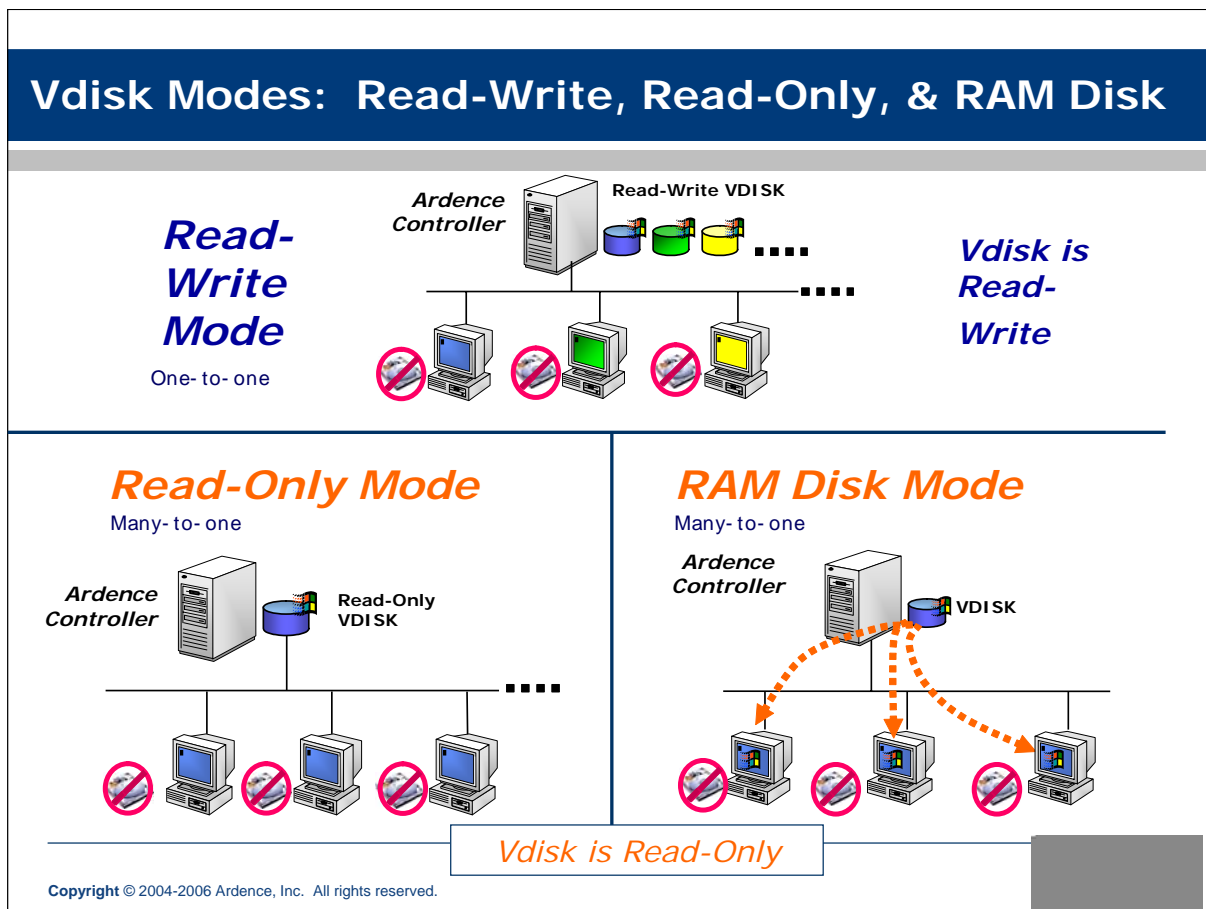


Figure 2: Vdisk Modes

Figure 2 shows the three different modes for the Ardence Vdisk. By default, a newly created Vdisk is in the Read-Write mode, which is sometimes also called the “Private Image Mode.” This is also called the “administrative mode,” which allows permanent changes into the Ardence Vdisk. PC administrators can also decide to put the Ardence Vdisk in Read-Only Mode. In this mode, the Ardence Server prevents the Vdisk from changing. If PCs boot in the Standard Image Mode and need to write data to the C:\ drive, the data is stored in a Write Cache. Ardence

provides several places to store this cache: Server-side Hard Drive Write Cache, Client-side RAM Write Cache, and Client-side Disk Cache.

The RAM Disk mode is rarely used. In this mode, Gigabit Ethernet to the desktop PC is highly recommended because the entire Vdisk (typically greater than 3.5GB) is loaded to the PC's physical RAM. Only customers that require intense high performance computing or data-collection in environments, which are subjected to intense vibrations, use the Ardence RAM Disk Mode. It is important to note that in the other two Vdisk Modes, Read-Write and Read-Only, roughly 70 MB of data is transferred from the Ardence Server to the PC in order to launch the Windows or Linux Desktop. After that, Ardence Server only transmits data from the Vdisk to the PC on a per-needed basis such as launching an application.

Figure 3 illustrates the network configuration that was used for the compliance test. The Windows 2000 Server hosting the DNS, DHCP, and Ardence TFTP server resides on a 192.45.100.X subnet and Avaya Interaction servers and agent PCs reside on the 192.45.145.X subnet. The router was configured to accept BOOTP and DHCP protocol.

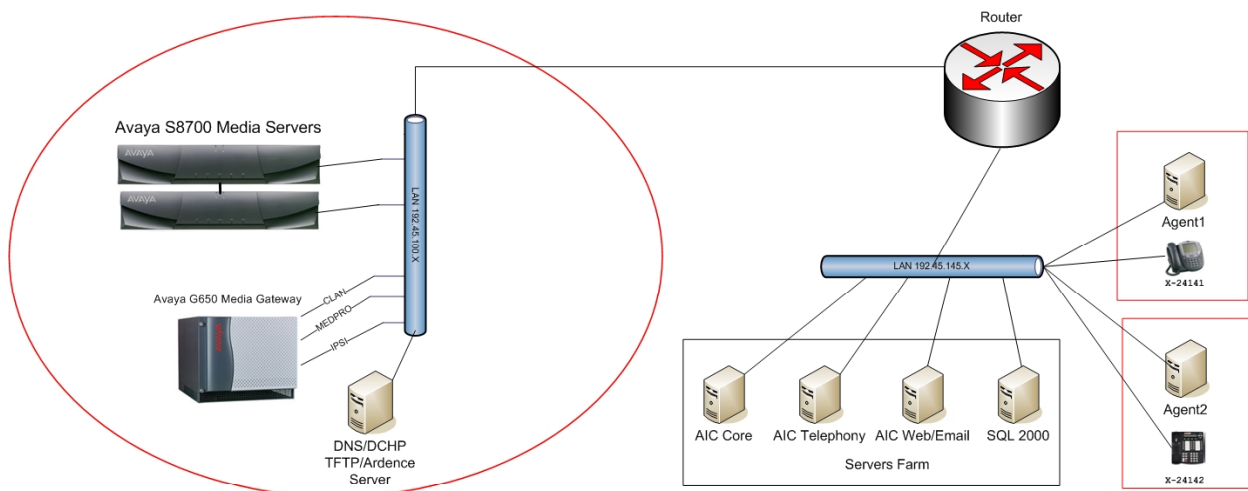


Figure 3: Compliance Test Configuration

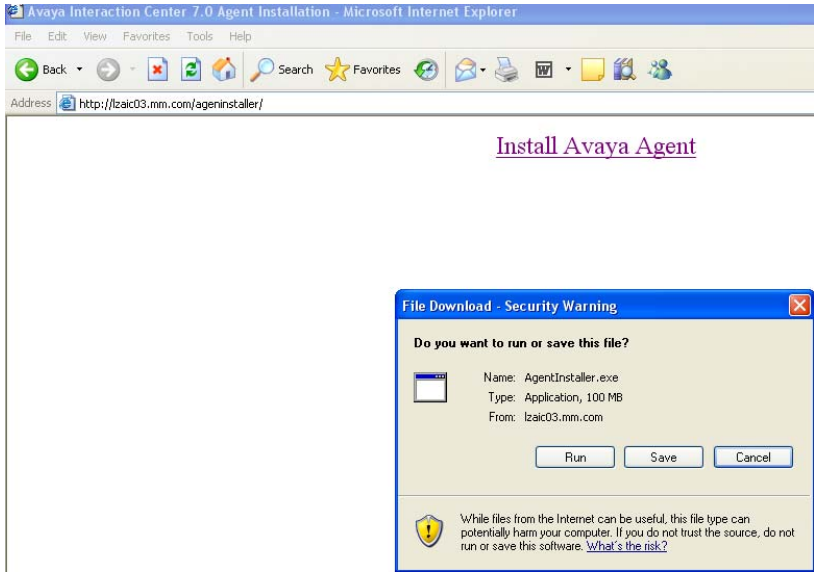
2. Equipment and Software Validated

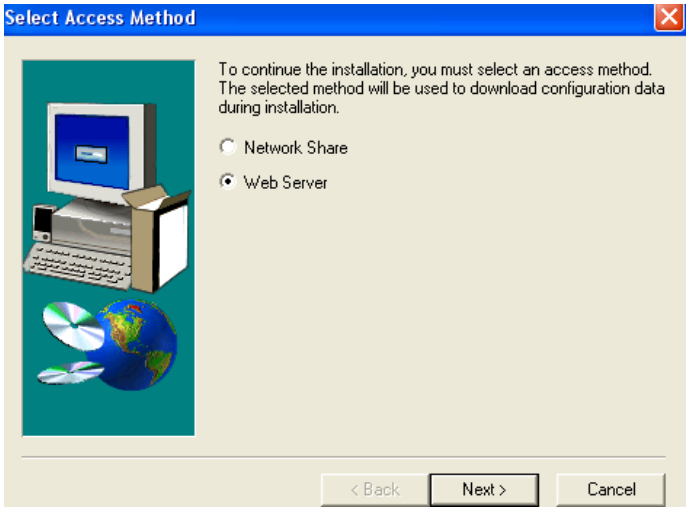
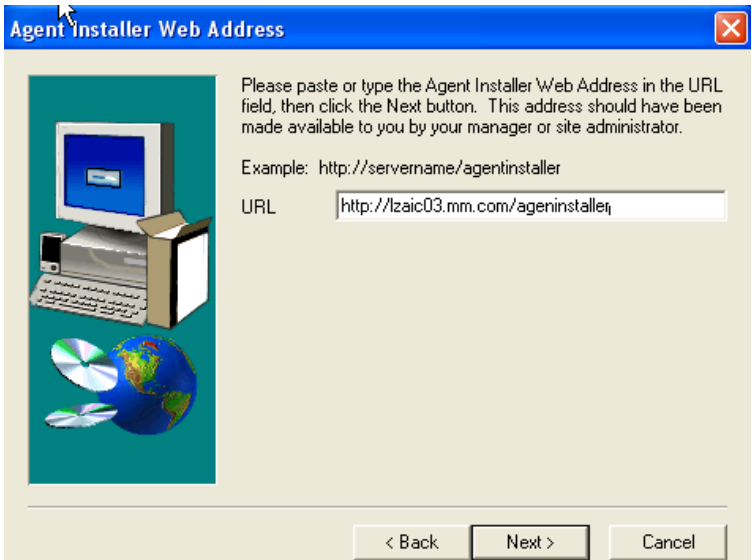
The following equipment and software/firmware were used for the test configuration provided.

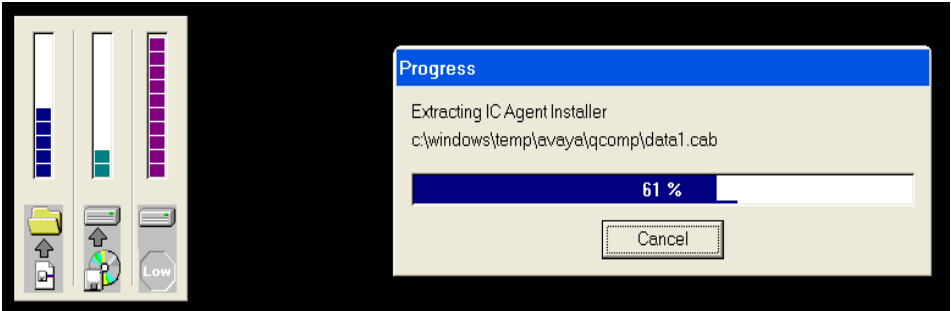
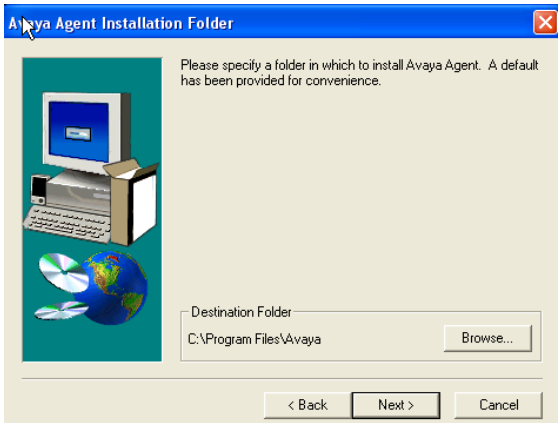
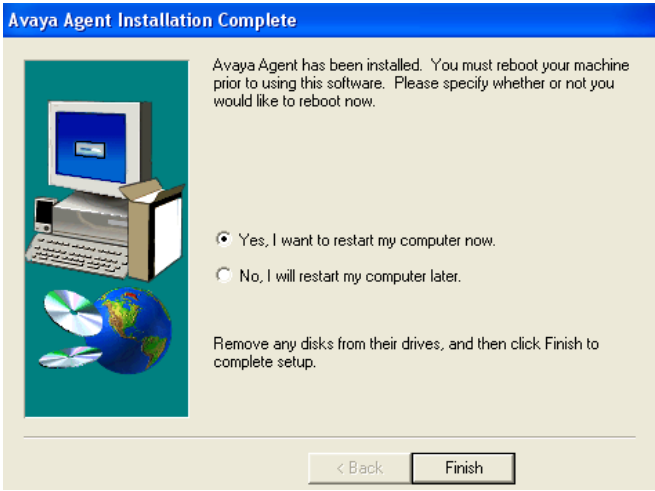
Equipment	Software/Firmware
Avaya S8700 Media Server with G650 Media Gateway	Communication Manager 3.0.1
Avaya Interaction Center	7.0
Avaya Interaction Center Agent Client	7.0
Avaya Agent Client PC with Windows XP SP2	-
Avaya 4620 IP Phone	Release 2.3
Avaya 4624 IP Phone	Release 2.3
Ardence Desktop Edition with Windows 2000	3.5

3. Configure Avaya Agent

This section describes the standard procedure for installing Avaya Agent Client.

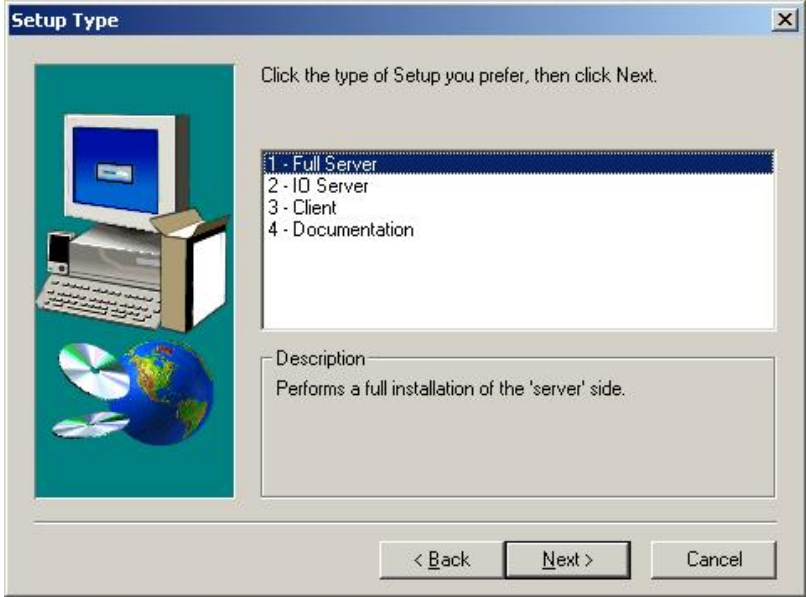
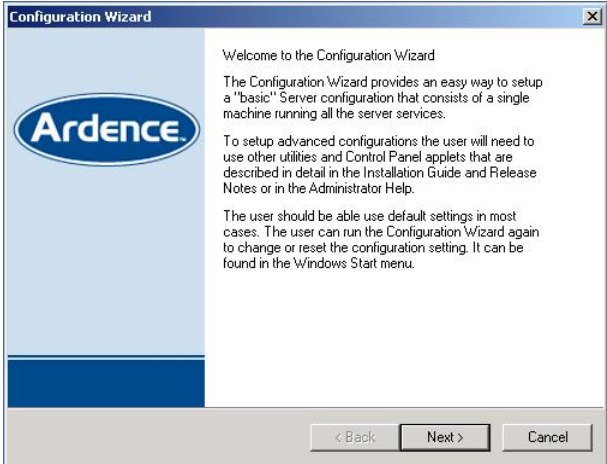
Step	Description
1.	<p>From the agent PC, open the browser or map to the network drive where the Avaya Agent Client software is stored and run the setup file.</p> 


Step	Description
2.	<p>Select the location where the configuration data is stored. If Avaya Interactive Center configuration file is available from the web server, then select Web Server. Click Next.</p> 
3.	<p>Specify the server URL. Click Next.</p> 


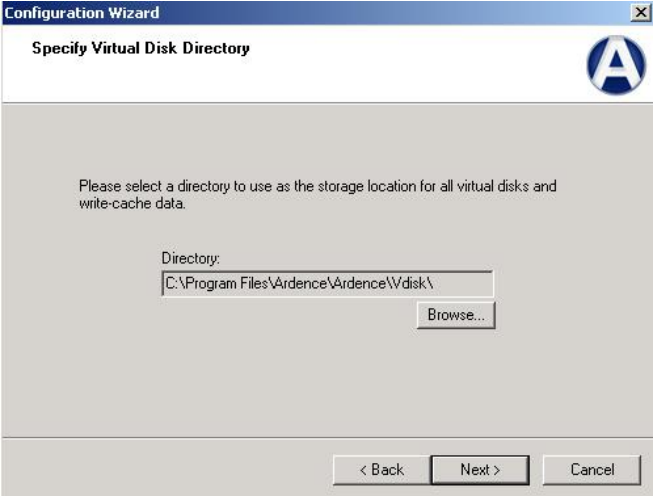
Step	Description
4.	<p>Wait for the extracting progress to complete.</p> 
5.	<p>Select the folder to install the Avaya Agent Client. Click Next.</p> 
6.	<p>Select Yes, I want to restart my computer now. Click Finish.</p> 

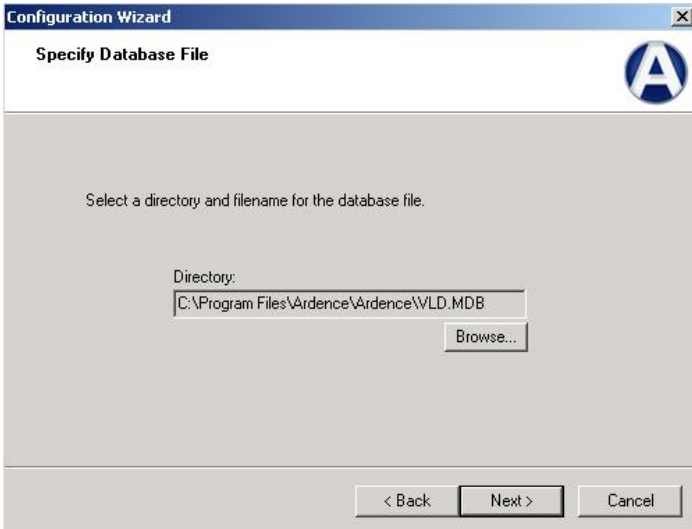
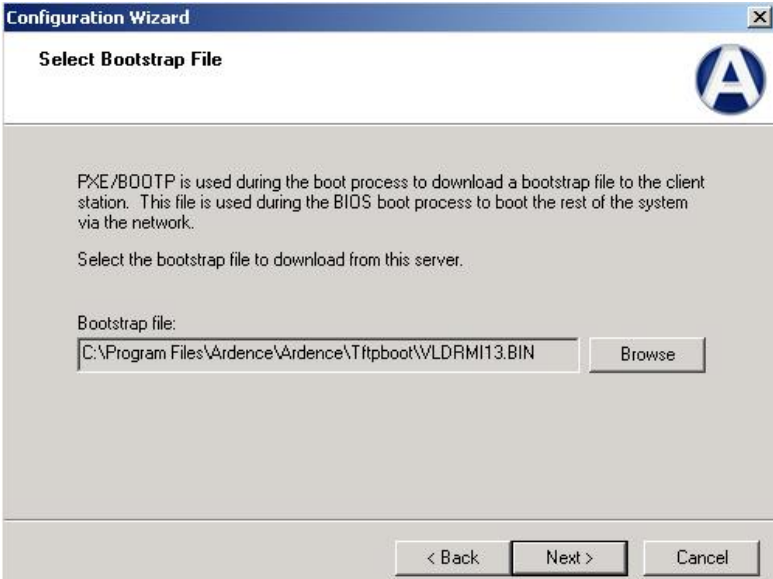
4. Configure Ardence 3.5 Desktop Edition

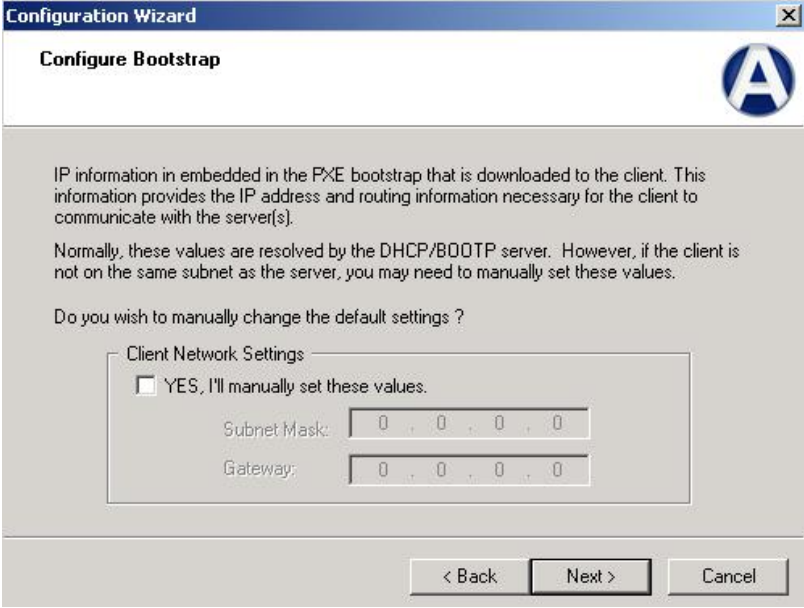

This section describes how to install and configure Ardence 3.5 Desktop Server.

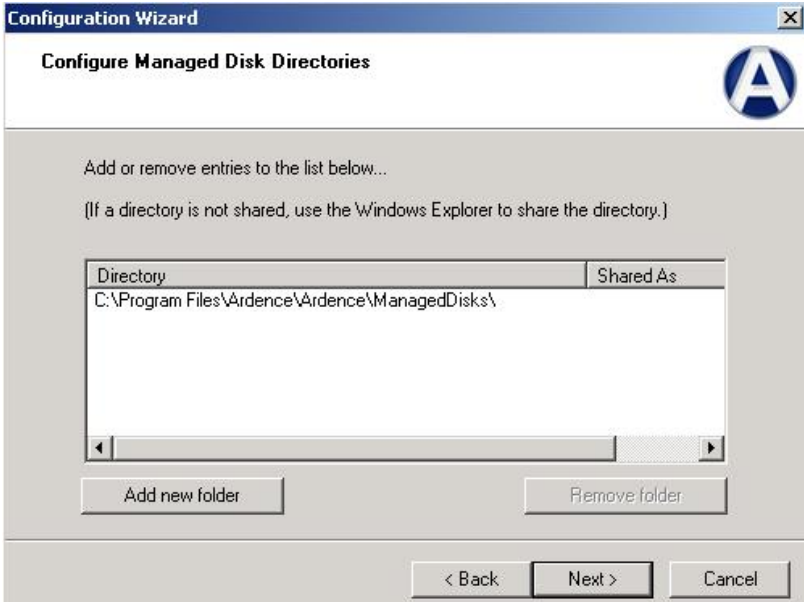
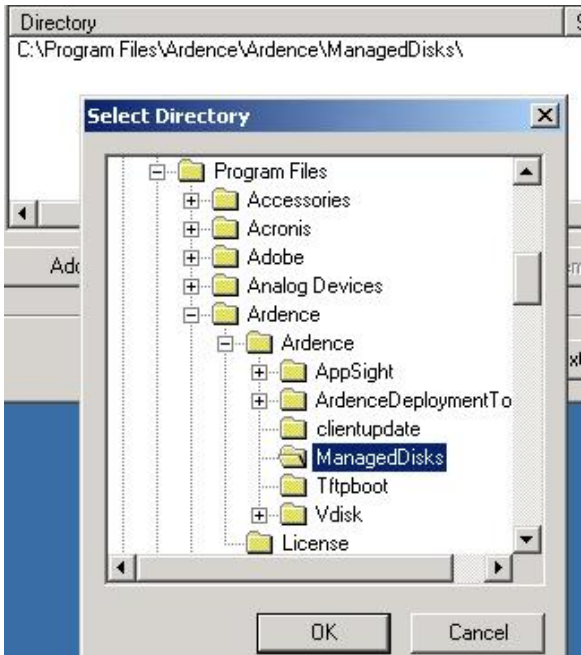
Step	Description
1.	<p>Run the Ardence installation program and select Ardence Full Server option. This procedure installed the Ardence server in the server that hosted the DHCP server.</p> 
2.	<p>After completing the “Full Server” installation, run the Ardence Configuration Wizard: Start → Programs → Ardence → Configuration Wizard. Click Next in the Configuration Wizard screen.</p> 


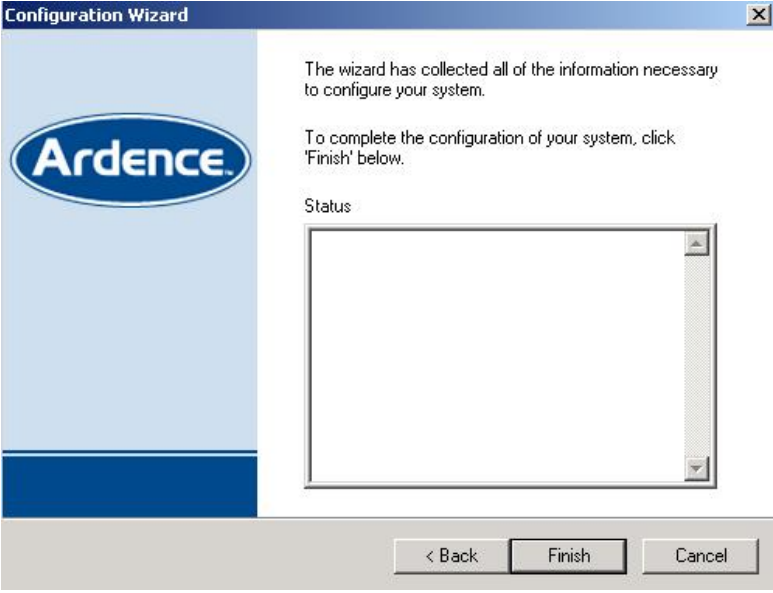
Step	Description
3.	<p>Ardence supports three PXE scenarios for the DHCP Server and an optional Ardence PXE Service: Separated, Co-hosted, and DHCP Alone.</p> <ul style="list-style-type: none"> • A Separated scenario means that the DHCP Service and the optional Ardence PXE Service are running on different physical hosts. • A Co-hosted scenario means that the DHCP Service and the optional Ardence PXE Service are running on the same physical hardware system. • A DHCP Alone scenario means optional Ardence PXE Service is not being used. Instead, the DHCP Server has been configured with the DHCP Option 66 (Bootserver Host Name) and DHCP Option 67 (Bootfile Name). Options 66 and 67 may be configured either as Scope Options or Server Options on the DHCP Server. For more details, see the Ardence Training Materials. <p>These Application Notes describe the configuration using the Co-hosted PXE scenario. As long as the DHCP Service is already running before the installation of the Ardence “Full Server” on the host, the following screen in the Ardence Configuration Wizard will automatically configure Ardence for the Co-hosted Scenario.</p> <p>Since DHCP server is already installed, select option No, A DHCP service is already available on this network. Click Next.</p> 

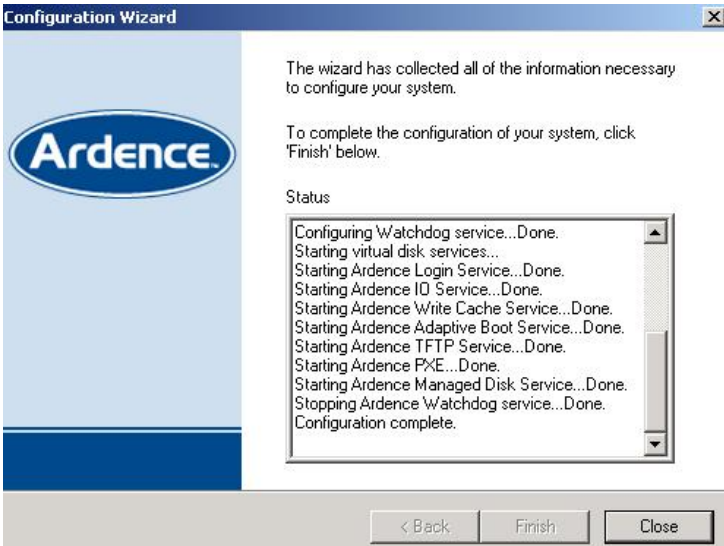
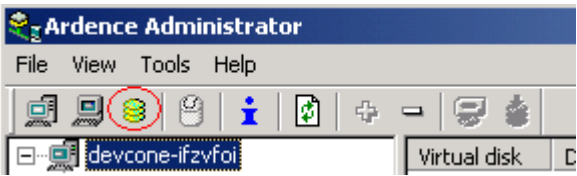
Step	Description
4.	<p>If the server has multiple NICs, select the IP address the Ardence Server listens to the Ardence Client requests.</p> 
5.	<p>Click on the Browse button to specify the directory to store the Vdisk and click Next when complete.</p> 

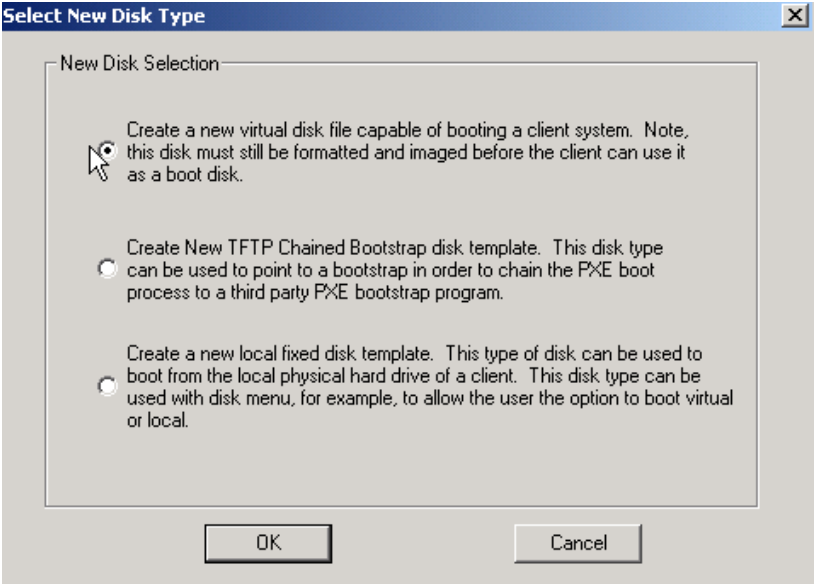
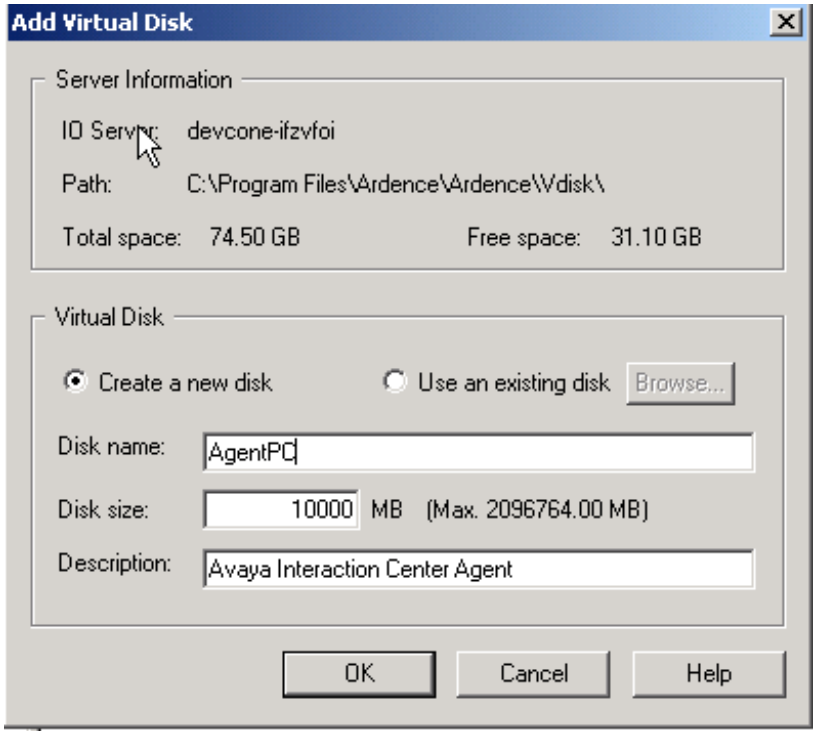
Step	Description
6.	<p>Click on the Browse button to specify the directory to store the Ardence database. Click Next when complete.</p> 
7.	<p>Click on the Browse button to specify the Ardence Bootstrap file (VLDRMI13.BIN), which is installed with Ardence Desktop Server. The Ardence Desktop Server must know the directory of the Ardence bootstrap. If the Ardence software is installed to a different directory, click on the Browse button to specify the location of the Ardence Bootstrap file, then click Next when complete.</p> 

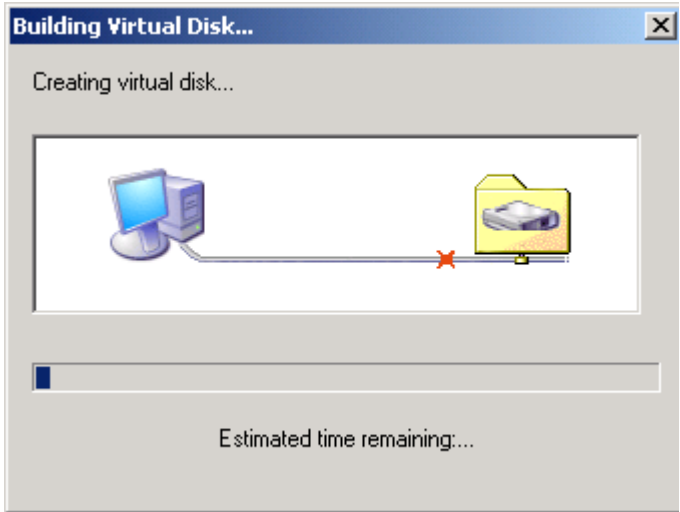
Step	Description
8.	<p>Since the existing DHCP server will assign IP addresses, click Next in the Configure Bootstrap.</p> 
9.	<p>Select Yes, I need to configure Managed Disks directories, and click Next.</p> 

Step	Description
10.	<p>In the Configure Managed Disk Directories, click Add new folder.</p> 
11.	<p>Select a folder and click OK.</p> 

Step	Description
12.	<p>In the Enable the Watchdog Service screen decide whether to enable the Watchdog Service. The Watchdog Service monitors critical Ardenance services, and if for some reason a critical service stops, the Watchdog Service will restart the service. The Watchdog Service is recommended in production settings—particularly for those customers who do not have the Ardenance High Availability Option. This service was not selected for the compliance test. Click Next.</p> 
13.	<p>Click Finish to build the configuration.</p> 


Step	Description
14.	<p>Click on the Close button when the configuration is completed.</p> 
15.	<p>Launch Ardence Administrator: Start → Programs → Ardence → Administrator</p>
16.	<p>From Ardence Administrator, switch to the Server → Disk View from the View menu, and create a new Vdisk by click on the New Disk button as shown in the red circle below.</p> 

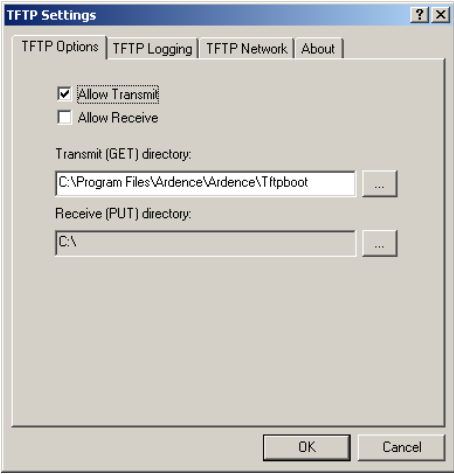
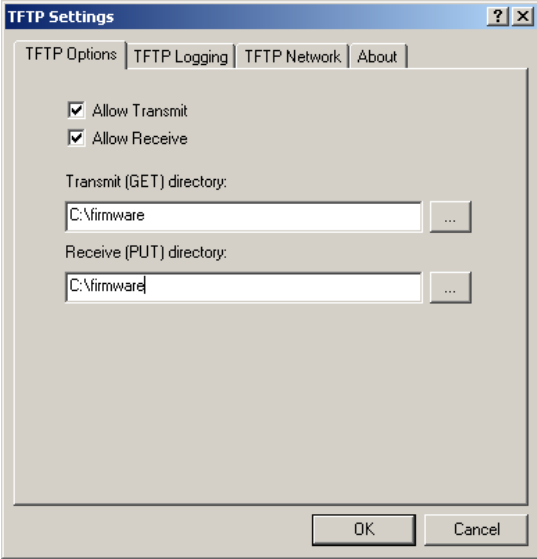
Step	Description
17.	<p>Select the first option and click OK.</p> 
18.	<p>In the Add Virtual Disk, enter the Disk name, Disk size, and Description. Click OK.</p> 

Step	Description
19.	<p>Wait for the Building Virtual Disk to complete.</p> 

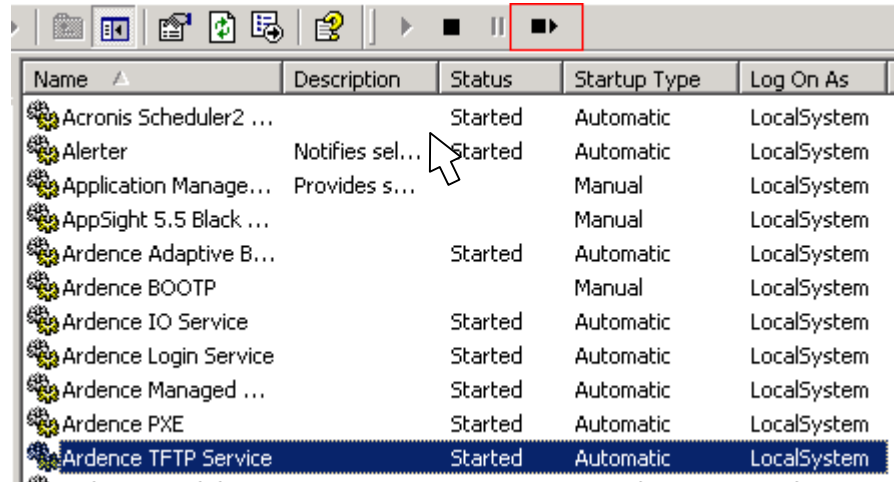
5. Configure BOOTP/DHCP Relay and TFTP Server

The following steps describe how to enable BOOTP/DHCP relay and TFTP server to allow PC to boot from the Ardenne server.

Step	Description
1.	<p>Since the Ardenne Server and PC clients are on different subnets, the router must support BOOTP/DHCP Relay for each of the subnets. Enable BOOTP/DHCP Relay is different for every data switch manufacture. Please refer to the data switch manual to enable BOOTP/DHCP Relay.</p> 

Step	Description
2.	<p>The Ardence Desktop server comes with the TFTP server software, however customers may use their own TFTP server. The Ardence TFTP server is installed with the Ardence server software. To enable the Ardence TFTP service, click on Start → Control Panel → TFTP Service. Notice that by default, the Ardence TFTP Service is configured to TRANSMIT ONLY.</p> 
3.	<p>By default, the Ardence TFTP Service is configured only to send files. However, in order to store the image of the client PC, the Allow Receive option must be checked. Once the image is stored, this option can be unchecked. Enable the TFTP Service with Allow Receive as well as Allow Transmit, and also specify that the Transmit directory is the same as the Receive Directory. In this sample configuration, the “firmware” directory was used to store and push the image to the client PCs.</p> 
Step	Description

4. In order for the changes to take effect, the Ardence TFTP Service needs to restart. Access the Service in the Control Panel and select the Ardence TFTP Service, and click on the restart button highlighted in the red box.



5. Test the Ardence TFTP server, open-up a Command Prompt session and type:

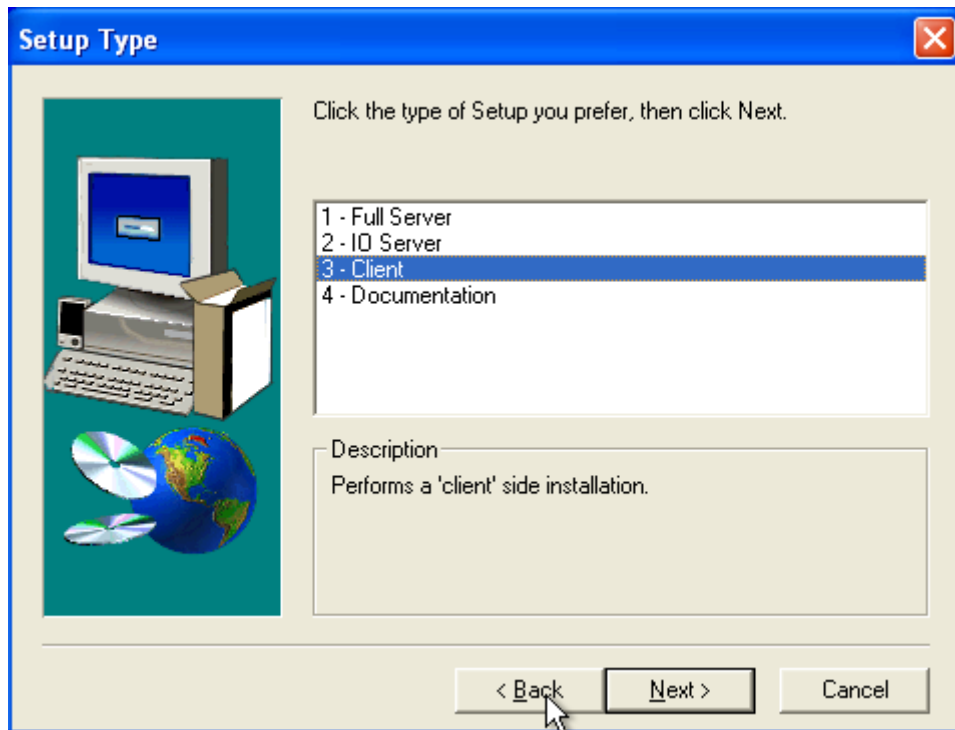
tftp -i <IP_Address_of_TFTP_Server> GET VLDRMI13.BIN

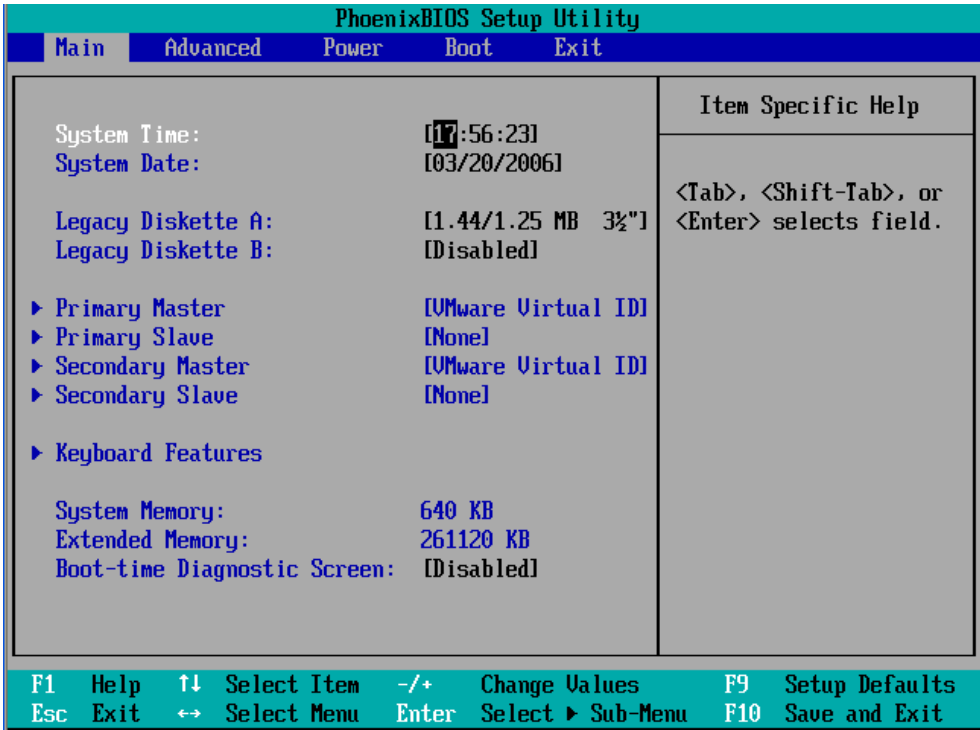
The <IP_Address_of_TFTP_Server> parameter is the Ardence TFTP server IP address. A “success” messages appears if the Ardence TFTP server is working properly.

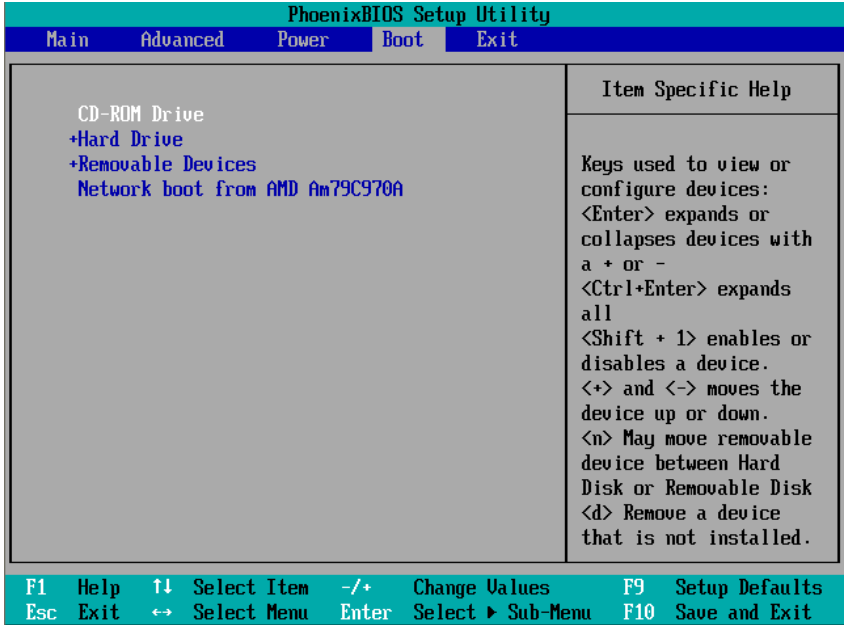
```
C:\Documents and Settings\Administrator>tftp 192.45.100.2 get VLDRMI13.BIN
Transfer successful: 25840 bytes in 1 second, 25840 bytes/s
C:\Documents and Settings\Administrator>_
```

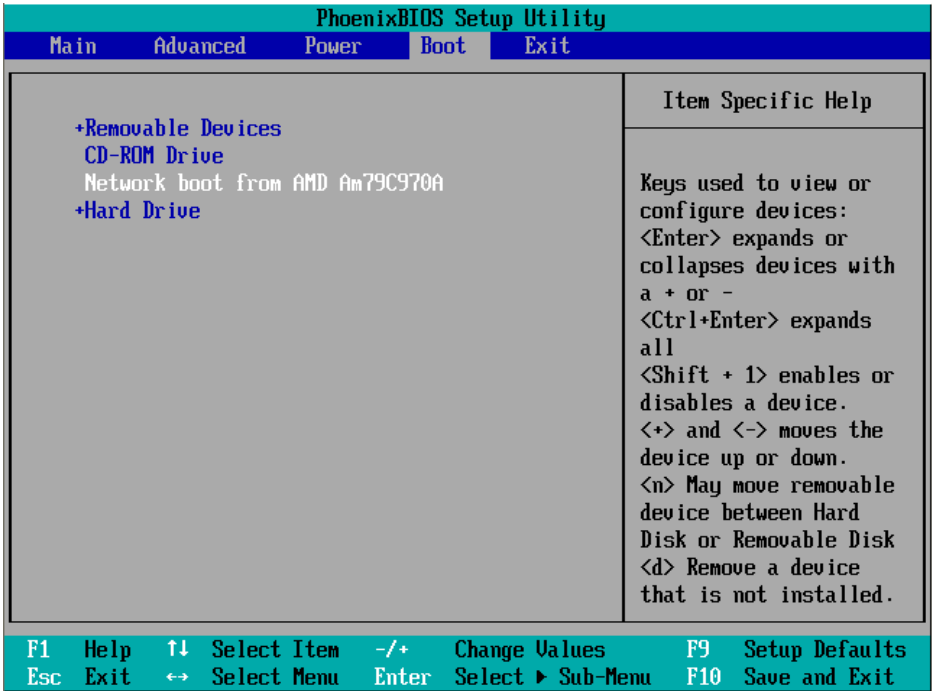

6. Configure Agent PC

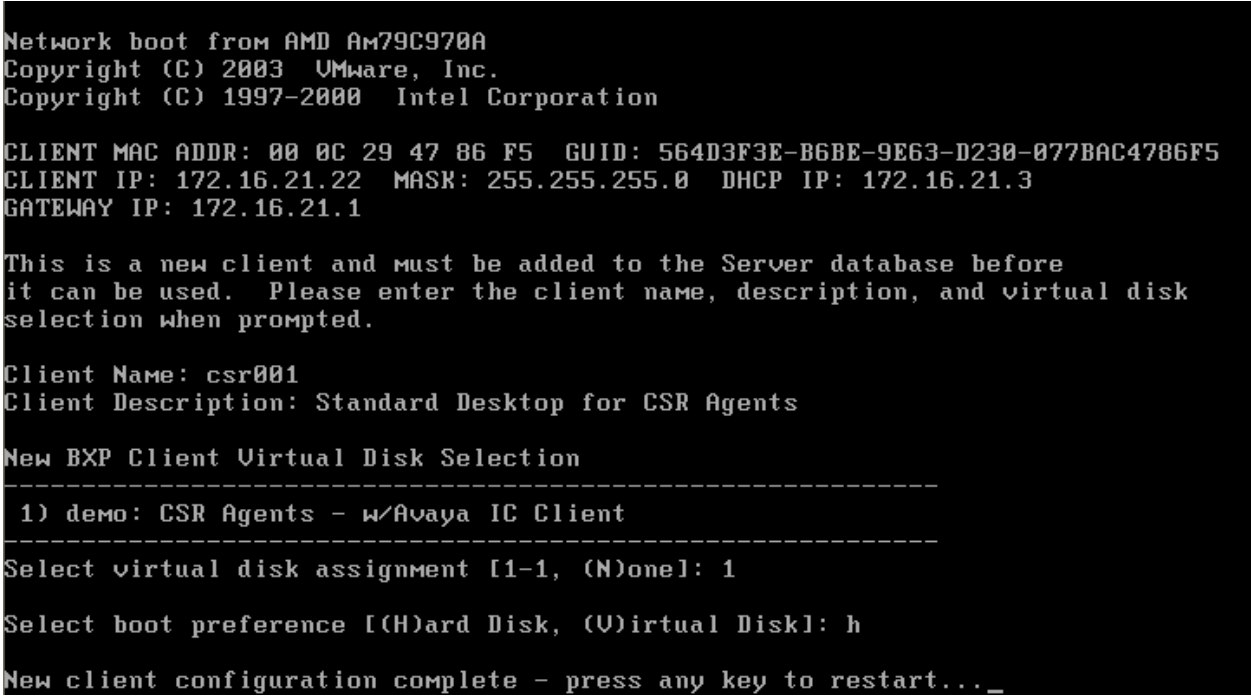
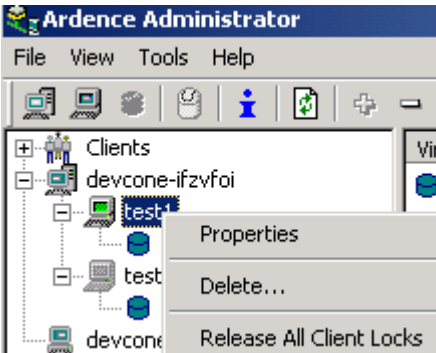
The following steps describe how to install the Ardence Desktop Client and configure the client PC to boot from the Ardence Desktop Server.

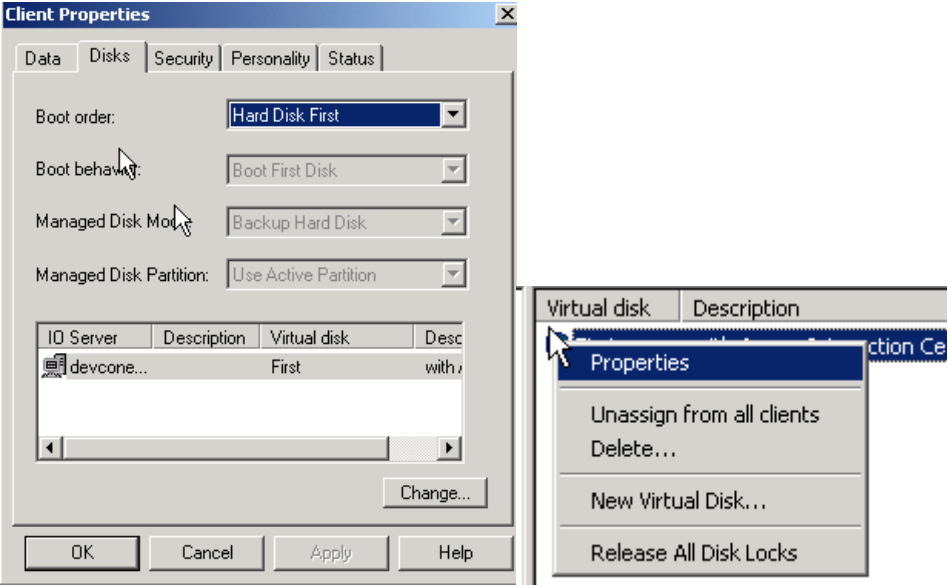
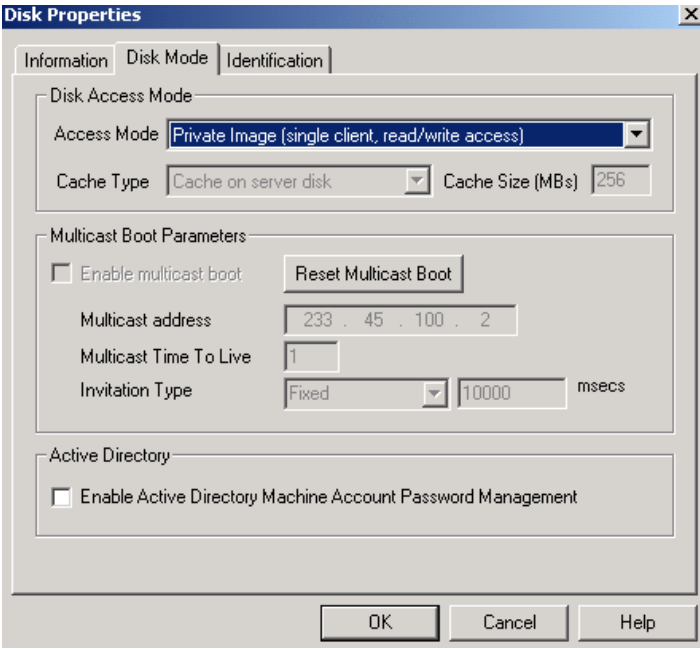
Step	Description
1.	<p>Install the Ardence Client Software.</p> <p>Use the same self-extracting installer, which installed the Ardence Full Server to install on the client PC. Instead of selecting “Full Server,” select “Client” to install the Ardence Client.</p> <div data-bbox="438 604 1388 1329"></div> <p>After installing the Ardence Client software, shutdown the PC.</p>

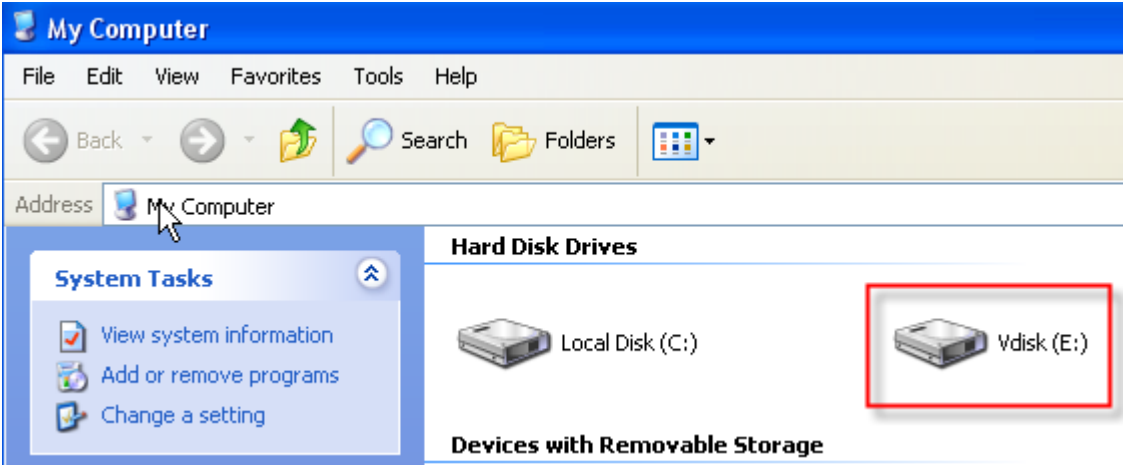
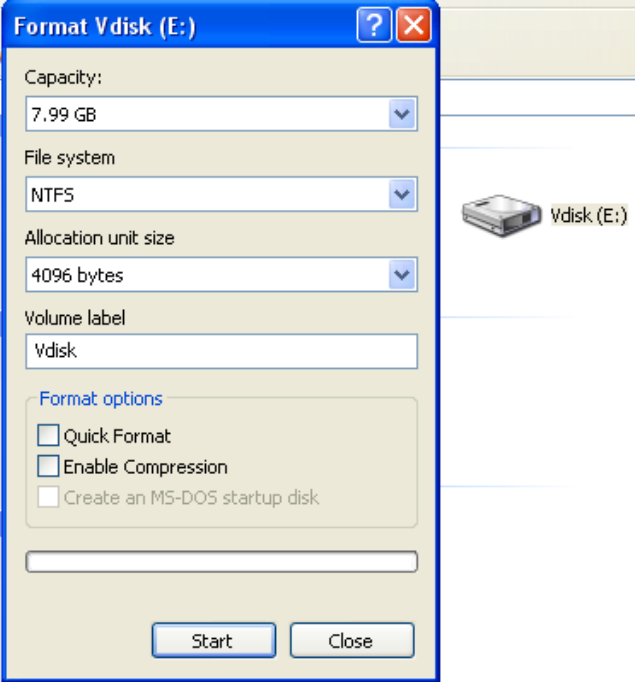
Step	Description
2.	<p>In order to configure the client PC to boot from the network using the PXE, the PXE or boot from network option must set before the local hard drive in the Boot Order menu in the BIOS Setup Utility. Different PC vendors use different keys to enter the BIOS Setup Utility. On HP Systems, the key is usually F9. On Dell Systems, the key is usually F2. Within few seconds of pushing the power button, press the appropriate key to enter the BIOS Setup Utility. Please note that the BIOS Setup Utility screen will appear differently for different systems. Below is an example of a BIOS Setup Utility Menu.</p> 

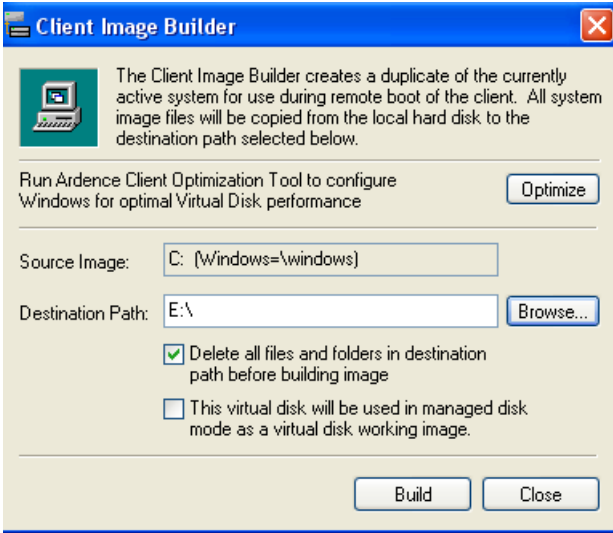
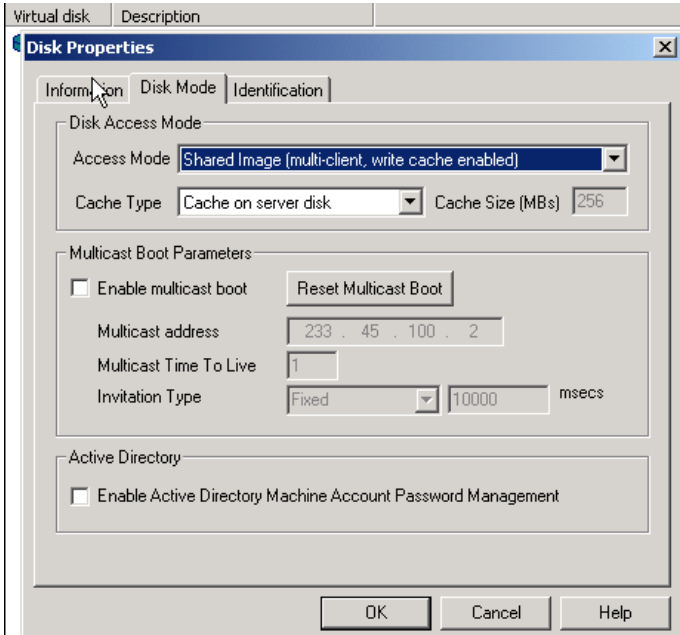
Step	Description
3.	<p>Find the sub menu of the BIOS Setup Utility, which specifies the Boot Order. Notice that the (PXE) Network Boot is below the Hard Drive as shown below. This is the typical boot sequence. Look for one of the following alternative terms for network boot:</p> <ul style="list-style-type: none"> • Network Boot • LAN Boot • IBA (Intel® Boot Agent) • MBA (ManagedPC Boot Agent®) • PXE 
4.	<p>The PXE needed to activate on the PC before it will appear as a choice in the Boot Order sub-menu. Activation of the PXE is available in the Network Interface Controller setting in the BIOS Setup Utility. Refer to the PC manual to set the Network Interface Controller with PXE. In most cases, the Network Interface Controller is indicated as “On”. Typically there are three choices for the NIC.</p> <ul style="list-style-type: none"> • Off • On • On w/PXE <p>Select the option with “On w/PXE.” This will enable the PXE firmware for the integrated NIC on the PC. If this is the very first time, which PXE has been enabled on the integrated NIC, save the changes and reboot the PC. Re-enter the BIOS Setup.</p>

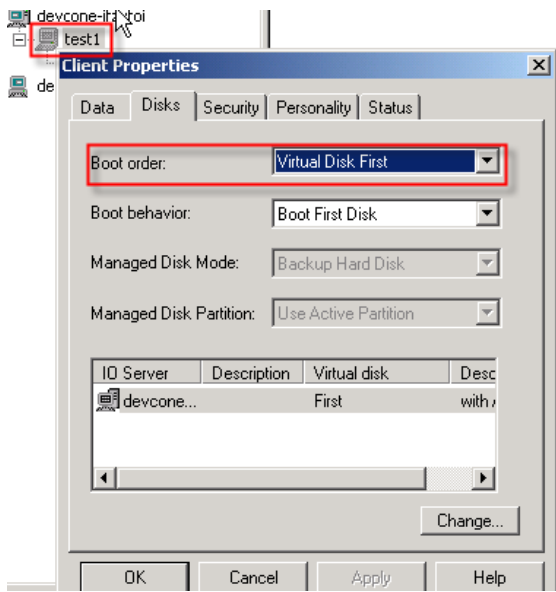
Step	Description
5.	<p>Move the PXE Network Boot choice above the hard drive as shown below. Save and exit the BIOS Setup Utility.</p> 
6.	<p>When the PC boots, the Ardencc Server will prompt the user to create a profile for the PC as shown below. Enter the name for this PC.</p> 

Step	Description
7.	<p>Type the description and press Enter. Because this is the first time the PC is booted from the Ardence Desktop Server, select Hard Disk first. Type h and press Enter.</p> <p>This information does not need to be re-entered each time the client PC boots. Ardence needs to capture the MAC address of the client only once.</p>  <pre> Network boot from AMD Am79C970A Copyright (C) 2003 VMware, Inc. Copyright (C) 1997-2000 Intel Corporation CLIENT MAC ADDR: 00 0C 29 47 86 F5 GUID: 564D3F3E-B6BE-9E63-D230-077BAC4786F5 CLIENT IP: 172.16.21.22 MASK: 255.255.255.0 DHCP IP: 172.16.21.3 GATEWAY IP: 172.16.21.1 This is a new client and must be added to the Server database before it can be used. Please enter the client name, description, and virtual disk selection when prompted. Client Name: csr001 Client Description: Standard Desktop for CSR Agents New BXP Client Virtual Disk Selection ----- 1) demo: CSR Agents - w/Avaya IC Client ----- Select virtual disk assignment [1-1, (N)one]: 1 Select boot preference [(H)ard Disk, (V)irtual Disk]: h New client configuration complete - press any key to restart..._ </pre>
8.	<p>Once the PC profile is created in the Ardence Desktop Server, go to the Ardence Administration and right mouse click on the client PC and select Properties.</p> 

Step	Description
9.	<p>Click on the Disks tab and select Hard Disk First for Boot order. Click Apply and OK.</p> 
10.	Right mouse click on the Virtual disk created in Section 4 Step 18 and select Properties .
11.	<p>Click on the Disk Mode tab, and select Private Image for Access Mode. Click OK.</p> 
12.	Restart the client PC and log into Windows.

Step	Description
13.	<p>Log into Windows, and double click My Computer. Verify Vdisk is listed.</p>  <p>The screenshot shows the 'My Computer' window in Windows. The 'Address' bar shows 'My Computer'. On the left, there is a 'System Tasks' pane with links to 'View system information', 'Add or remove programs', and 'Change a setting'. The main area is titled 'Hard Disk Drives' and shows two drives: 'Local Disk (C:)' and 'Vdisk (E:)', each with a hard disk icon. The 'Vdisk (E:)' drive is highlighted with a red rectangular box. Below this, there is a section for 'Devices with Removable Storage'.</p>
14.	<p>The virtual disk must be formatted to write data to it. Right mouse click on the Vdisk and select Format. Click Start in the format screen. Click Close when complete.</p>  <p>The screenshot shows the 'Format Vdisk (E:)' dialog box. It has a blue title bar with a question mark and a close button. The fields are: Capacity (7.99 GB), File system (NTFS), Allocation unit size (4096 bytes), and Volume label (Vdisk). Under 'Format options', there are three checkboxes: 'Quick Format' (unchecked), 'Enable Compression' (unchecked), and 'Create an MS-DOS startup disk' (unchecked). At the bottom are 'Start' and 'Close' buttons. To the right of the dialog box, a small icon of the 'Vdisk (E:)' is visible.</p>
15.	Run Ardence Image Builder. Start → Programs → Ardence → Image Builder

Step	Description
16.	<p>Click on the Browse button and select the Vdisk Drive for destination path and click Build.</p> 
17.	Shutdown the PC when complete.
18.	<p>Access the Ardence Server Administration application. Right click on the Vdisk and select Properties. Click the Disk Mode tab and select Shared Image for Access Mode.</p> 

Step	Description
19.	<p>Right click on the client PC and select Properties. Click the Disks tab and select Virtual Disk First for Boot order</p>  <p>The screenshot shows the 'Client Properties' dialog box with the 'Disks' tab selected. The 'Boot order' dropdown menu is open, showing 'Virtual Disk First' as the selected option. The 'Boot behavior' is set to 'Boot First Disk', 'Managed Disk Mode' is 'Backup Hard Disk', and 'Managed Disk Partition' is 'Use Active Partition'. Below these settings is a table with columns 'IO Server', 'Description', 'Virtual disk', and 'Desc'. The table contains one entry: 'devcone...' under 'IO Server', 'First' under 'Description', and 'with' under 'Virtual disk'. The 'Desc' column is empty. A 'Change...' button is located at the bottom right of the table area. The 'OK', 'Cancel', 'Apply', and 'Help' buttons are at the bottom of the dialog box.</p>
20.	Restart the client PC.

7. Interoperability Compliance Testing

This Interoperability Compliance Test included feature functionality and serviceability testing. Feature functionality testing focused on verifying Ardence Desktop solution successfully supporting Avaya Agent Client. Serviceability testing verified that client PC is able to recover from adverse conditions, such as rebooting the PC and removing the PC network connection.

7.1. General Test Approach

The general test approach was to verify that Ardence Desktop can create a client PC image with Avaya Agent Client software installed. Also verified Avaya Agent Client successfully supports voice email chat media channels and all media channels. When PC is booted from a disk image serves by Ardence Desktop Server, and the ability for PC to return to normal operation when the network connection is interrupted.

7.2. Test Results

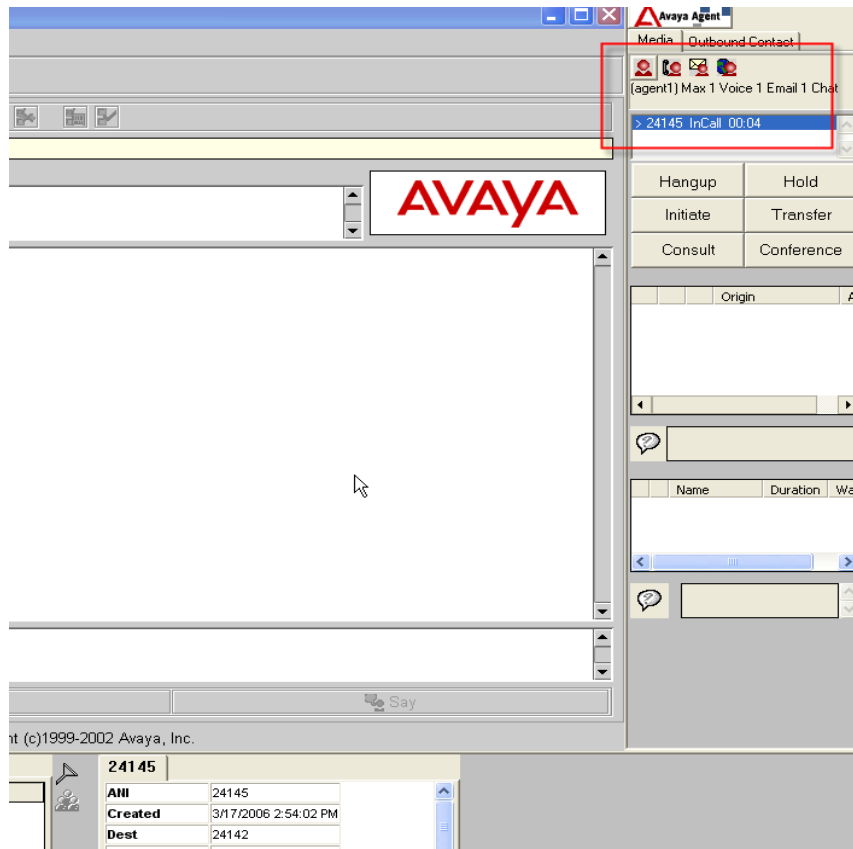
All feature functionality and serviceability test cases passed. Ardence Desktop solution successfully supports Avaya Agent client application. For serviceability testing, the client PC Windows Operating System was interrupted and locked when the network connection is removed, however, PC returned to normal operation when network is back in service.

8. Verification Steps

The following steps were used to verify the configuration.

Step	Description
1.	Restart client PC and boot from the network.
2.	Log into Windows and run the Avaya Agent Client.
3.	Double click on My Computer and verify the C: drive is label as Vdisk
	<p>The screenshot shows the 'My Computer' window in Windows. The 'Hard Disk Drives' section displays two drives: 'Vdisk (C:)' and 'Local Disk (E:)'. The 'Vdisk (C:)' drive is highlighted with a red rectangular box. The 'System Tasks' pane on the left shows options like 'View system information', 'Add or remove programs', and 'Change a setting'.</p>
4.	Log in the agent and verify the Agent Client log in successfully.
	<p>The screenshot shows the 'Avaya Agent' application window. It features a media bar with icons for voice, email, and chat. Below this, it displays '(agent1) Max 0 Voice 0 Email 0 Chat'. The main interface includes a large 'AYA' logo on the left and a grid of buttons on the right: 'Answer', 'Hold', 'Initiate', 'Transfer', 'Consult', and 'Conference'. At the bottom, there is an 'Origin' field.</p>
5.	Place the agent in the ready mode.

Step	Description
6.	Place a call to the voice queue and verify the agent receives the incoming call.



9. Support

Technical support for Ardenne can be obtained by the Ardenne Web Support Portal:
<https://support.ardence.com/>.

10. Conclusion

These Application Notes describe the required configuration steps for Avaya Agent Client and Ardenne Desktop solution. The compliance test verified the features and service functionalities of Ardenne solution have all passed.

11. Additional References

Ardenne product documentation is installed with all versions of the product. Product documentation is available from Ardenne. Visit www.ardence.com for more information.

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