Using DHCP and XML to Transfer Files to an Intermec Mobile Computer

Introduction
This document is intended for use by systems and network administrators who are responsible for the deployment of Intermec mobile computers. The reader should have basic knowledge of xml, networking, DHCP servers and device addressing, understand the network setup and configuration for DHCP servers inside your enterprise network, have access to the configuration file or application to be moved to Intermec mobile computers, and documentation of the current network settings and the DHCP server product being used before beginning.

The SmartSystems client ships on Intermec mobile computers. The SmartSystems client (SSRef 3.30 and above[1]) supports setting configuration values and loading files onto Intermec mobile computers via a DHCP server that supports vendor options. TFTP is used as the file transfer protocol to download the specified XML configuration file and any files referenced in that XML file.

This feature is useful for deploying applications and/or settings to your Intermec Mobile computer.[2] When the computer connects to the DHCP server, the designated software will be loaded.

Unlike a device management system, this approach to file transfer does not require a separate device management server, nor does it offer the same level of administrator interaction and control. Utilizing this file transfer approach requires administrative access to a DHCP server and the network expertise to configure the server.

This feature should not be used to upgrade the operating system (or SSPB) of an Intermec mobile computer. There are other tools available to do this, such as SmartSystems Foundation.

Supporting Vendor Options
This document assumes a TFTP server is already configured and that the DHCP server exists but is not yet configured to use the Intermec vendor options.

The following instructions explain how to define Vendor Options for SmartSystems DHCP Auto Configuration in a Microsoft Windows Server 2003 environment.[3]

SmartSystems DHCP Auto Configuration uses vendor options 66 and 67 to specify a TFTP server and a file to download.

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[1] Available for download on the Intermec download site for specific mobile computers.
[2] For more information on general programming tips and how to package, launch, and deploy applications for your Intermec computers, please see the Intermec Developer Library (IDL) Resource Kit Developer's Guide located at http://epsfiles.intermec.com/eps_files/eps_man/934-006.pdf.
[3] Other DHCP servers that support Vendor Options may also be used; however, you must consult your specific DHCP Server guide for steps on how to define Vendor Classes and Vendor Options.

Define a Vendor Class

1. From Administrative Tools, select **DHCP**.
2. Select the DHCP server you want to manage.
3. From the Action menu, select **Define Vendor Classes**. The DHCP Vendor Classes window opens.
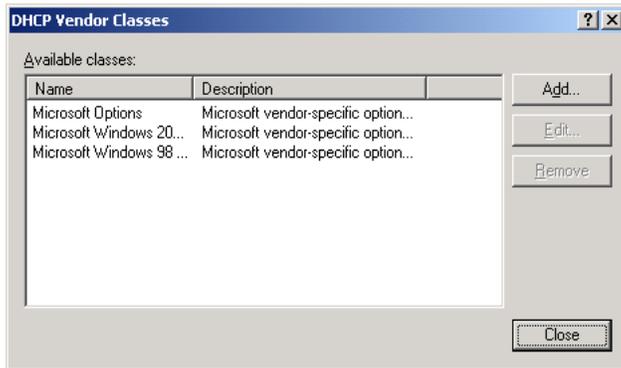
4. Click **Add**. The New Class window opens.
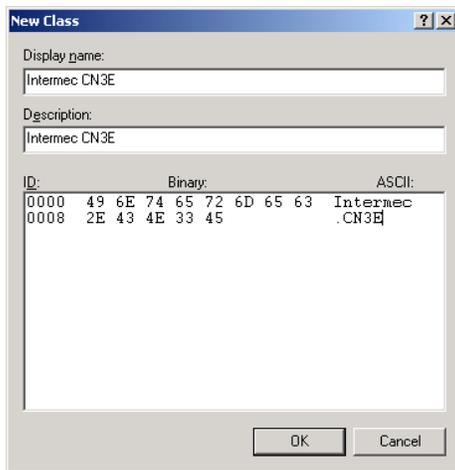
5. In the **Display name** field, enter a name describing your vendor class: for example, Intermec CN3E. This will be the vendor class that includes all Intermec CN3E computers.

   Each type of Intermec mobile computer has a unique Vendor Class name as listed in the table below. Note that the Vendor Class name is made up of the word Intermec, a period, and then the mobile computer's model number.   The models listed in the table below are the only models supported at this time.

Intermec Mobile Computer Model	Vendor Class Name
CN3A	Intermec.CN3A
CN3B	Intermec.CN3B
CN3E	Intermec.CN3E
CV30	Intermec.CV30
CK3	Intermec.CK3
CK32	Intermec.CK32

6. Position the cursor in the ASCII area of the Data Entry group and enter the vendor class name for you Intermec mobile computer model.
7. Click **OK**.
8. In the DHCP Vendor Classes window, click **Close**.

Define Vendor Class Options

1. From the Action menu, select **Set Predefined Options**. The **Predefined Options and Values** window opens.
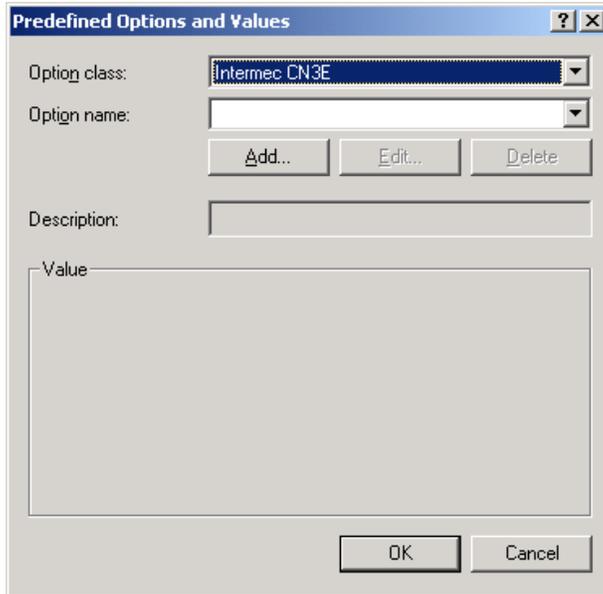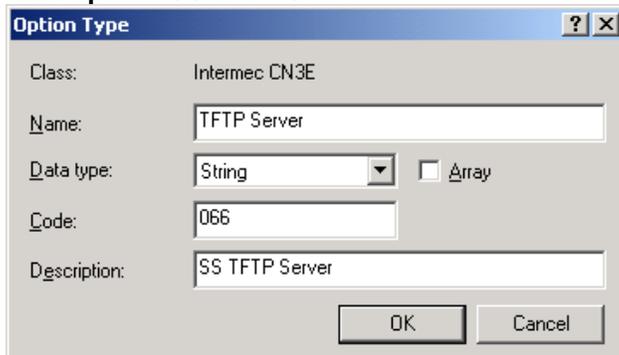

2. Select the Vendor Class you defined above from the **Option class** drop-down list.
3. Click **Add**. The Option Type window opens.
4. Enter the following values as shown below.
   Name: TFTP Server
   Data type: String
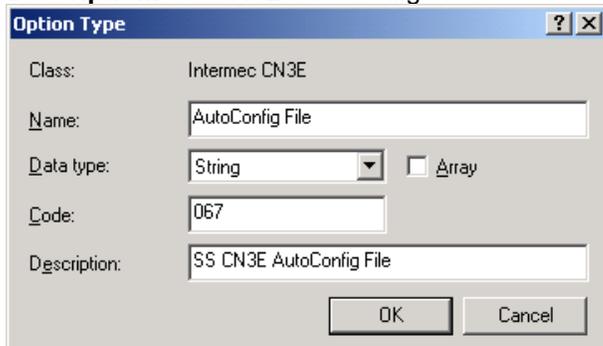   **Code**: 066
   Description: SS TFTP Server

5. Click **OK**.
6. Click **Add**. The Option Type window opens.
7. Enter the following values as shown below.
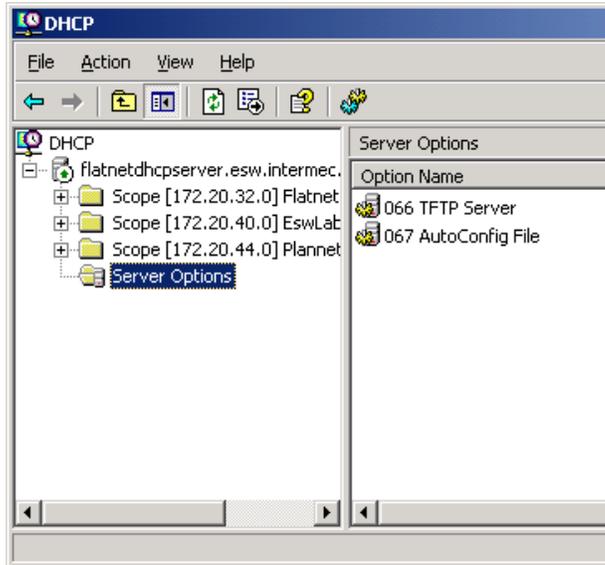   **Name**: AutoConfig File
   Data type: String
   Code: 067
   Description: SS CN3E AutoConfig File

8. Click **OK**.

9. In the **Predefined Options and Values** window, click **OK**.
10. Right-click on **Server Options** and select **Configure Options**. The **Server Options** window opens.

11. Click the **Advanced** tab.
12. In the **Vendor class** dropdown list, select the appropriate vendor class.
13. Check the checkbox for option 066.
14. In the **String value** field, enter the TFTP server's IP address.
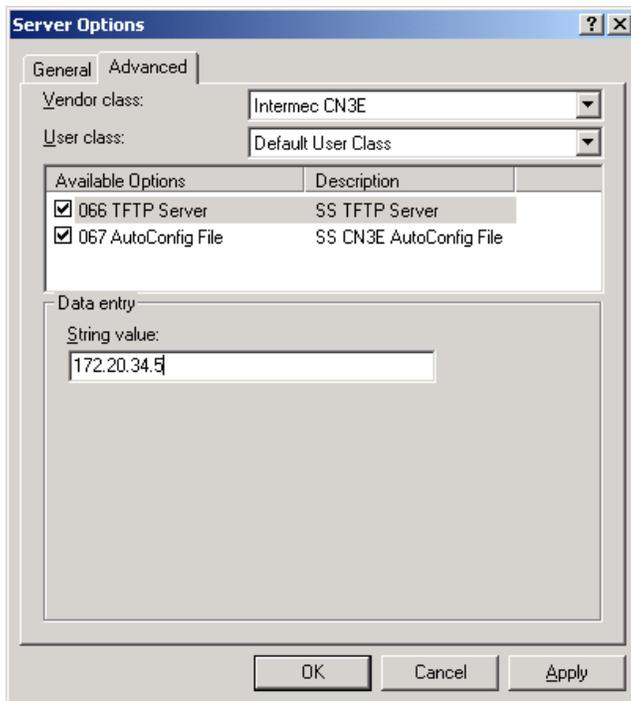
15. Click **OK**.

16. Check the checkbox for option 67.
17. In the **String value** field, enter the file name of the SmartSystems Auto Configuration file on the TFTP server.
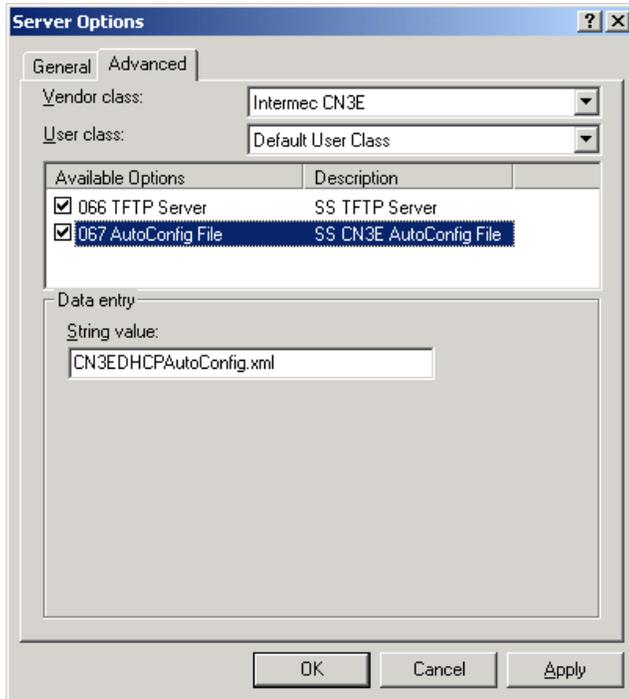
18. Click **Apply**
19. Click OK.

SmartSystems XML Auto-Configuration File

SmartSystems DHCP Auto-Configuration uses an XML file to specify one or more files to download onto an Intermec mobile computer.[4]

- To apply Intermec Settings, download a configuration file[5] to the \SmartSystems\SSConfigDir directory on the mobile computer.
- To install an application, download and execute the cab files on the mobile computer.
- Files can also simply be copied to the mobile computer

The files or settings on the TFTP server are processed according to the instructions in the DHCP AutoConfig xml file when the mobile computer is booted and an IP address is applied via DHCP.

Explanation of the DHCPAutoConfig XML Tags and Attributes

<DHCPAutoConfig> - No Attributes

<DHCPAutoConfig> SubElements

    <Files> No attributes

    <Files> Sub Elements

        <File>

        Attributes:

        Src (required) In URL format, this is the location to download the file from. Currently only the tftp protocol is supported for file download.

        Example: Src="tftp:\\filename.cab"

        Dest (required) The destination directory and filename on the mobile computer.

        Example: Dest="\directory\filename.cab"

        FileId (required) Functions as a file version. After the initial download of the file, if the value of FileId is changed, then the specified file will be downloaded and/or run on the next warm boot of the unit. If the value of FileID remains the same, then the specified file is ignored on the next warm boot of the unit. If the file on the unit is deleted or changed on the device, and the FileId did not change in the xml, then the file will not be processed.

        Example: FileId="3.30.03.0390"

        StartIn (optional) The directory where the executable provided in the Run attribute should be started.

        Run (optional) Loads the specified program and executes it.

        Example: Run="\2577\autocab.exe"

        CmdLine (optional) Command line for the executable provided in the Run attribute.

        Example: CmdLine=" -FILE='\directory\filename.cab' -FORCE"

        Wait (optional) Variable that determines if processing of the file waits for the executable to be finished before continuing. true/false.

        Example: Wait="false"

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[4] For more information on general programming tips and how to package, launch, and deploy applications for your Intermec computers, please see the Intermec Developer Library (IDL) Resource Kit Developer's Guide located at http://epsfiles.intermec.com/eps_files/eps_man/934-006.pdf.

[5] For more information on how to create a configuration file, please see the Intermec Developer Library (IDL) Device Management Resource Kit. The Intermec Developer Library Resource Kits (IDL) are separate install kits, available at www.Intermec.com/IDL or from www.intermec.com/support/downloads.

XML File Example

Remember, XML is case-sensitive; so if a file will not download, check the XML tags, attributes, and filenames for proper use of upper and lower case.

This example downloads the SSRefClient cab file and the resetmeplease flag file to the Flash File Store directory on the mobile computer, extracts and installs the .cab file using the AutoCab utility, and then performs a warm boot.[6] The CN3E_DHCPAutoConfig.xml, __resetmeplease__.txt, and SSRefClient_WM50_ARMV4I.CAB files are already in the root directory of the TFTP server specified in the Vendor Class options of the DHCP server.

```xml
<?xml version="1.0" ?>
<!--   This is the Intermec CN3E_DHCPAutoConfig.xml file.
  It is automatically downloaded to the CN3E's on the network each time they perform a warm boot.
  This file is placed in the root directory of the TFTP Server that is specified in the
  DHCP Server's "Intermec CN3E" Vendor class, option 066. This filename matches the filename
  specified in the DHCP Server's "Intermec CN3E" Vendor class, option 067.
  Any files specified in the <Files> tag are also placed in the root directory of the TFTP Server.-->
<DHCPAutoConfig>
<Files>
  <File Src="tftp://__resetmeplease__.txt"
        Dest="\Flash File Store\__resetmeplease__.txt"
        FileId="1.0">
  </File>
  <File Src="tftp://SSRefClient_WM50_ARMV4I.CAB"
        Dest="\Flash File Store\SSRefClient_WM50_ARMV4I.CAB"
        FileId="3.30.03.0390"
        Run="\2577\autocab.exe"
        CmdLine="-FILE=&quot;\Flash File Store\SSRefClient_WM50_ARMV4I.CAB&quot; -FORCE -SHOW=2 -
CHKRST=1">
  </File>
</Files>
</DHCPAutoConfig>
```

In this example, a custom settings.xml file is downloaded to the \SmartSystems\SSConfigDir. This file sets the values of the specified Intermec Settings fields.[7]

```xml
<?xml version="1.0" ?>
<!--
  This is the Intermec CN3E_DHCPAutoConfig.xml file.
  It is automatically downloaded to the CN3E's on my network each time they perform a warm boot.
  This file is placed in the root directory of the TFTP Server that is specified in the
  DHCP Server's "Intermec CN3E" Vendor class, option 066. This filename matches the filename
  specified in my DHCP Server's "Intermec CN3E" Vendor class, option 067.
  Any files specified in the <Files> tag are also placed in the root directory of the TFTP Server.
-->
<DHCPAutoConfig>
<Files>
  <File Src="tftp://MyCN3Settings.xml"
        Dest="\SmartSystems\SSConfigDir\MyCN3Settings.xml"
        FileId="1.4">
  </File>
</Files>
</DHCPAutoConfig>
```

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[6] For more information on general programming tips and how to package, launch, and deploy applications for your Intermec computers, please see the Intermec Developer Library (IDL) Resource Kit Developer's Guide located at http://epsfiles.intermec.com/eps_files/eps_man/934-006.pdf.

[7] For more information on how to create a configuration file, please see Using the SmartSystems API in the Intermec Developer Library (IDL) Device Management Resource Kit. The Intermec Developer Library Resource Kits (IDL) are separate install kits, available at www.Intermec.com/IDL or from www.intermec.com/support/downloads.

The following XML is the contents of the MyCN3Settings.xml file used in the example above.[8] In this example, the SmartSystems Server resides on a different subnet than the CN3, so the Associated Server IP must be manually set to the IP Address of the SmartSystems Server. Power Mode on the Radio is disabled to enhance network performance, although this increases battery usage. The Power Management profile is set to "Phone" and the backlight is set to "always on."[9]

```xml
<?xml version="1.0" ?>
<DevInfo Action="Set" Persist="true">
  <Subsystem Name="IQueue">
    <Field Name="Associated Server IP">192.168.0.5</Field>
  </Subsystem>
  <Subsystem Name="Funk Security">
    <Group Name="Profile" Instance="Profile_1">
      <Field Name="SSID">MyCompany</Field>
      <Field Name="PSMode">Disabled(CAM)</Field>
      <!--Power Mode= Disabled(CAM) {Continuous access mode} provides the best
      network performance (data throughput) but draws the most power.-->
      <Field Name="Association">WPA</Field>
      <Field Name="Encryption">TKIP</Field>
      <Field Name="PreSharedKey">MyPreShared</Field>
    </Group>
  </Subsystem>
  <Subsystem Name="Device Settings">
    <Group Name="Power Management">
      <Field Name="Power Profiles">1</Field>
    </Group>
    <Group Name="Display">
      <Group Name="Backlight">
        <Group Name="External Power">
          <Field Name="Backlight turns off after">0</Field>
        </Group>
      </Group>
    </Group>
  </Subsystem>
</DevInfo>
```

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[8] For more information on how to create a configuration file, please see the Intermec Developer Library (IDL) Device Management Resource Kit. The Intermec Developer Library Resource Kits (IDL) are separate install kits, available at www.Intermec.com/IDL or from www.intermec.com/support/downloads.

[9] For more information on configuring your Intermec Computer, please see the Intermec Computer Command Reference Manual located at http://epsfiles.intermec.com/eps_files/eps_man/073529.zip. Use this manual in combination with your Intermec computer user's manual to configure your Intermec Computer.

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