

 **DIRECTORY UPDATE**

v1.3.0

2 January 2007

Table of Contents

Overview.....	6
Directory Update - The Basics.....	6
Feature Updates	7
Limitations	12
Requirements	13
Windows Server Requirements.....	13
Service Accounts and Least Permissions.....	13
Installation and Configuration	17
License Keys.....	17
Selecting a Domain Controller.....	17
Installing Directory Update.....	17
Changing the Configuration.....	21
Updating Directory Settings and Licensing Information.....	21
Installing a Second Copy of Directory Update.....	23
Customization	24
Tips For Editing XML Files	27
Style Sheet	27
Directory Update Banner	27
Page Title	27
Log Off URL.....	28
Form Title	28
Help Desk Note.....	28
Customizable Help Pop-up Window	29
Completion Confirmation Message	30
Attribute Labels	31
Manager, Secretary, and Assistant Fields.....	31
Telephone Number Format Validation	34
Required Fields	35
Hiding Fields.....	35
Hiding Sections.....	37
Editable Fields	38
Validated Drop-Down Lists.....	39
Changing Drop-Down Lists to Text Fields.....	39
Changing Text Fields to Drop-Down Lists.....	40
Name Fields	40
Telephone Number Note Message.....	41
Custom Attributes	41
Integrated Windows Authentication	43
Authentication Timeout	44
Support and Custom Versions	44
Troubleshooting	45
Check the Console	45

APPSETTINGS.XML file	47
NET Framework	47
ASP.NET Version.....	47
Supported Attributes	52
Sample Directory Update APPSETTINGS.XML File	54

Table of Figures

Figure 1: Directory Update application logon page.....	6
Figure 2: Directory Update main screen.....	7
Figure 3: Customized interface including employee ID and employee type fields.....	9
Figure 4: User Information form with custom attributes.....	10
Figure 5: Another customized Directory Update page.....	11
Figure 6: Selecting the user or group for the Delegation of Control Wizard.....	14
Figure 7: Delegating permissions only to User objects.....	15
Figure 8: Selecting permissions assigned for least permissions service account.....	16
Figure 9: Setup Installation Address options.....	18
Figure 10: Setup Directory Settings options.....	18
Figure 11: Customer Information screen.....	19
Figure 12: Installing an evaluation version.....	19
Figure 13: ASP.NET version must be the 2.0 version.....	20
Figure 14: Permissions for Temporary ASP.NET Files.....	21
Figure 15: Updating Directory Settings.....	22
Figure 16: License Key Update utility.....	23
Figure 17: Key customizable features of the Directory Update application.....	24
Figure 18: General information attributes.....	25
Figure 19: Organization section.....	25
Figure 20: Telephone number section.....	25
Figure 21: Address information.....	26
Figure 22: Additional information including description and web page.....	26
Figure 23: Additional notes that can be entered about a user.....	26
Figure 24: Adding a custom link to the Help Desk Note.....	28
Figure 25: Customizable Help Screen.....	29
Figure 26: Editing the HELP.ASPX file.....	30
Figure 27: Confirmation message.....	30
Figure 28: Confirmation pop-up.....	31
Figure 29: Manager, Secretary, and Assistant attributes.....	32
Figure 30: Searching for a manager.....	32
Figure 31: APPSETTINGS.XML settings for Manager, Assistant, and Secretary.....	33
Figure 32: Active Directory Users and Computers and the Manager field.....	33
Figure 33: Different view of the data that is presented in the Manager field.....	34
Figure 34: Telephone number section of the APPSETTINGS.XML file.....	34
Figure 35: Phone number section with validation and example enabled for Office Phone.....	35

Figure 36: Validation error example.....	35
Figure 37: Hiding the IP Phone and Home Phone fields	36
Figure 38: Telephones section with two hidden fields	36
Figure 39: Hiding multiple fields on the User Information form	37
Figure 40: Result of hiding an entire section	38
Figure 41: Making the Company and Office fields not editable	39
Figure 42: Allowing the user to update the Display Name field	41
Figure 43: Telephone number note message below the phone number fields.....	41
Figure 44: Custom Attributes revealed.....	42
Figure 45: Indication the Web site is in the Local Intranet zone	43
Figure 46: Logging on without forms-based authentication.....	44
Figure 47: Error viewed remotely.....	46
Figure 48: Viewing an error locally.....	46
Figure 49: Confirming that the .NET Framework v2.0 is installed.....	47
Figure 50: Application Server components must include enabling ASP.NET.....	48
Figure 51: Enabling the ASP.NET v2.0.50727 web service extensions.....	48
Figure 52: Setting the correct version of ASP.NET on the /DirectoryUpdate virtual directory...	49

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Document Revision History

August 3, 2006 - JWM - Review 1.0 documentation and start updates
August 4 - JWM - Document hidden field information
August 10 - JWM - Include new hidden section documentation
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December 12 - MP - Testing review
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January 2, 2007 - JWM - Address editorial concerns, update document after v1.3.0 beta testing

Overview

In medium and large businesses, users rely on their Microsoft Exchange/Outlook Global Address List (GAL) to provide them with information (telephone number, address, department, etc....) about other users within their organization. This information is maintained for each user in Microsoft's Active Directory. If that information is not maintained and kept up-to-date, then users are frustrated and are less productive.

In the past, the only way a user could update their existing information was to use a utility such as Microsoft's GALMOD utility from the Microsoft BackOffice Resource Kit or the Exchange Resource Kit, however; this utility had to be installed on each user's desktop. The alternative was for the user to request the updates to be made to the user account by an administrator thus placing an additional burden on the IT Department. Otherwise, a third-party utility had to be purchased. The current third-party utilities on the market are full-blown, user provisioning systems that are very expensive and have far more features than are required for simple everyday updates.

Directory Update - The Basics

Directory Update is a .NET web application written in C# that provides an authenticated user the ability to update some of their Active Directory attributes, such as address or telephone number. The administrator can customize which attributes the user is allowed to update and can specify for each attribute a valid list of data that can be entered via a drop-down list.

When the user connects to the web site hosting **Directory Update**, they are challenged for their Windows domain logon credentials. The logon page is shown in Figure 1.

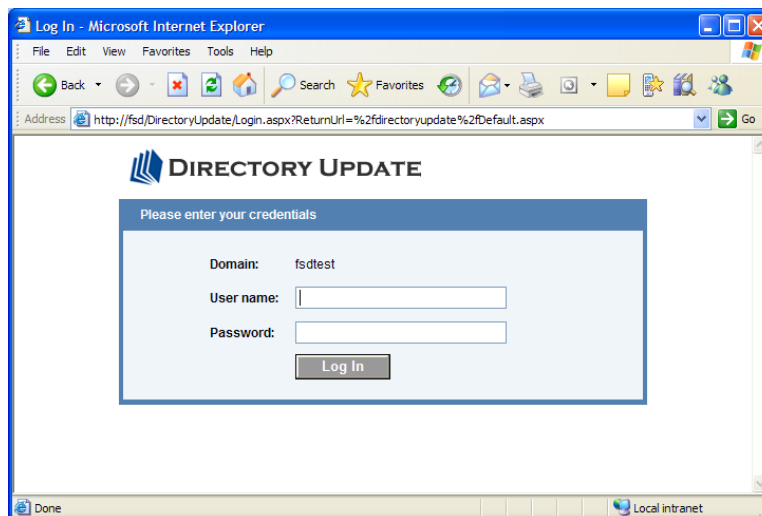


Figure 1: Directory Update application logon page

After the user authenticates, they are presented with the **Directory Update** main screen (shown in Figure 2) and are shown their attributes from Active Directory. The user can only update their

attributes; the administrator can specify validated information for some attributes and prevent users from changing others.

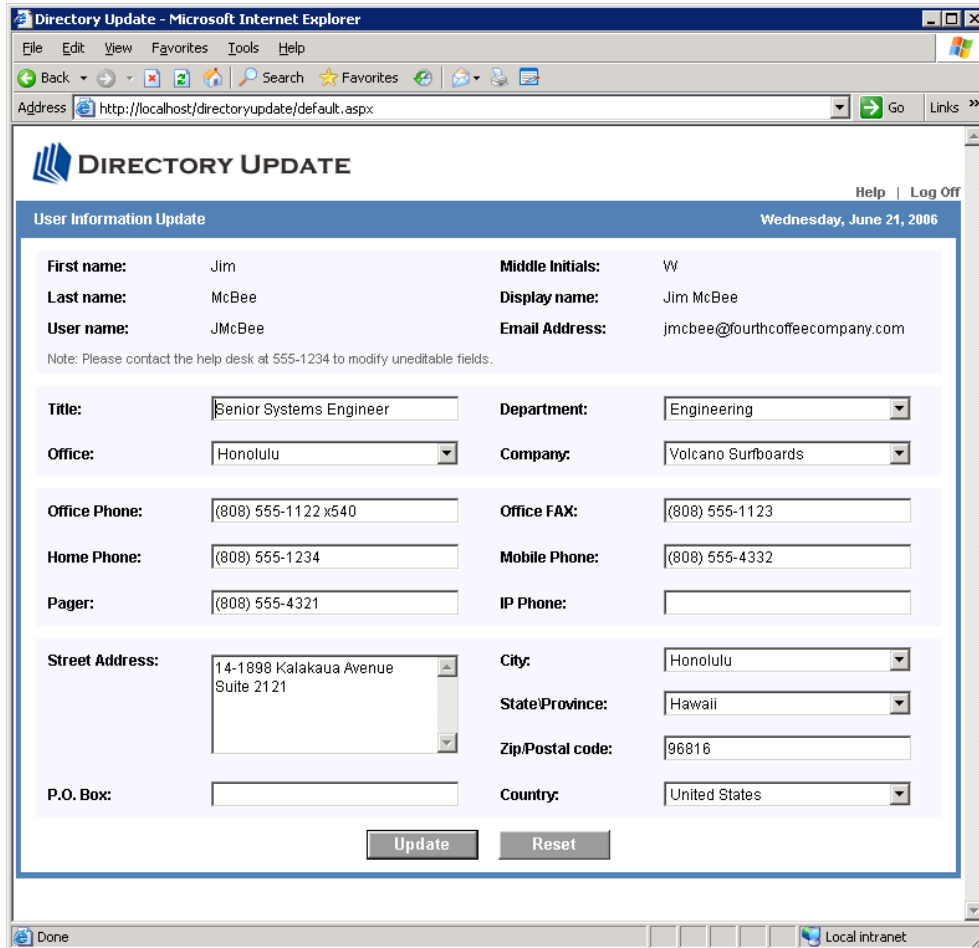


Figure 2: Directory Update main screen

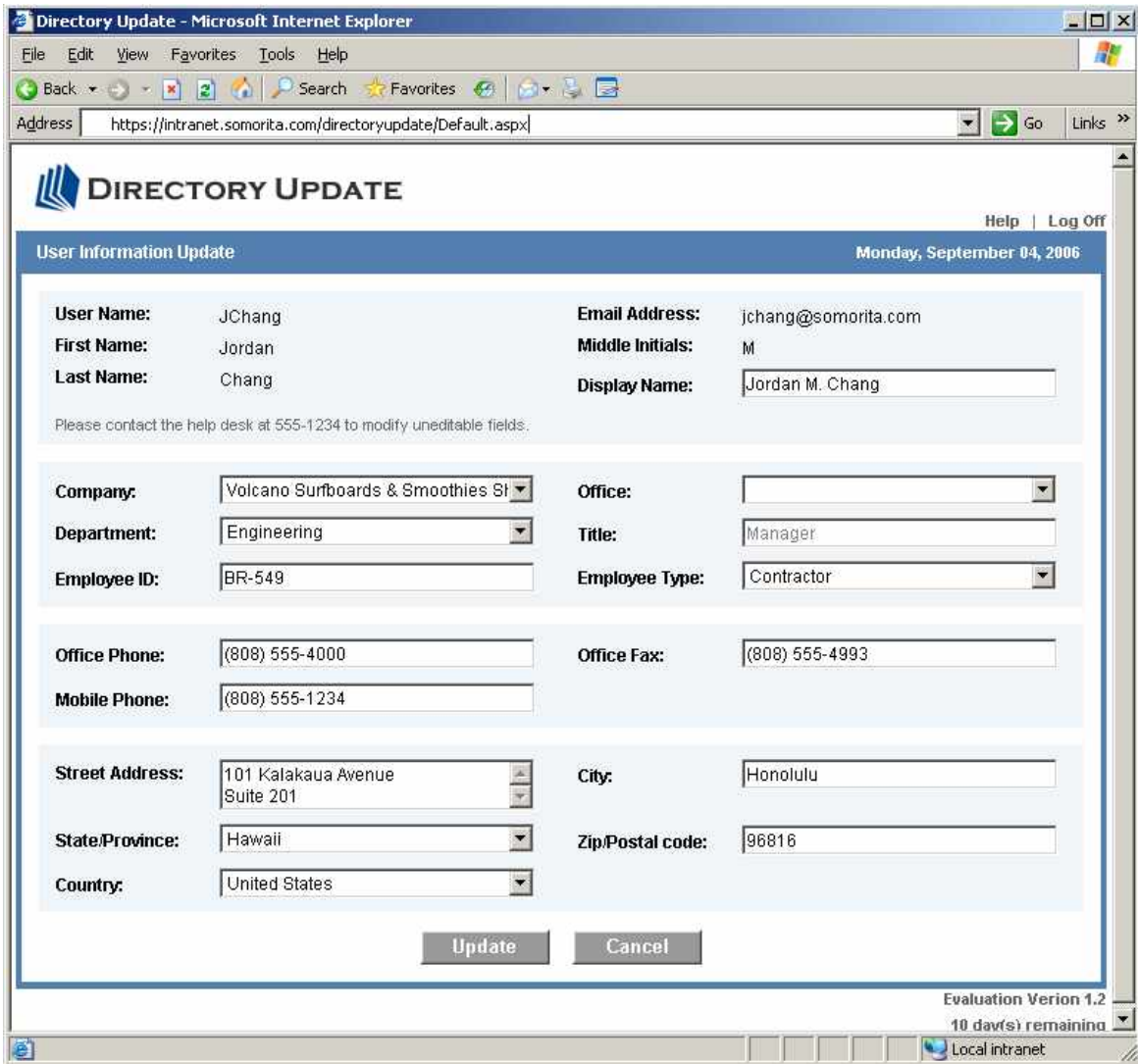
Feature Updates

Starting in Directory Update v1.2, we have included a number of different features that have been requested by our customers. These includes:

- Fields and sections have been arranged in a more logical layout
- Fields can be selectively hidden
- Down lists can now be converted to text boxes and *vice versa*
- Ability to convert text-boxes to drop-down lists
- Adding Custom Attributes 1 through 10 (hidden by default)
- Adding Employee Type field (hidden by default)
- Adding Employee ID field (hidden by default)
- Adding Employee Number field (hidden by default)
- Adding Web page field (hidden by default)
- Adding Description field (hidden by default)

- Adding Notes field (hidden by default)
- Adding additional telephone number fields including Other Telephone, Other Fax Number, Other Mobile, and Assistant Telephone; these are hidden by default
- Forms-based authentication or Integrated Windows Authentication is supported
- The company's domain name can now be securely hidden on the logon screen
- The "update confirmation" message can now be customized and implemented as a pop-up or a push screen
- Manager, Secretary, and Assistant fields support lookups that allow for pop-up selection from the Active Directory
- Telephone number format validation is now done using regular expressions (REGEX)

All of these features are customized in the APPSETTINGS.XML file. These new features give an organization more flexibility when configuring and customizing **Directory Update**. For example, Figure 3 shows an example of a User Information form that has been scaled back so that there are fewer visible fields. Notice also in Figure 3 that the Employee ID and Employee Type fields are now visible. ~~Notice~~, and that the Display Name field has been enabled to be edited.



Directory Update - Microsoft Internet Explorer

Address: <https://intranet.somorita.com/directoryupdate/Default.aspx>

DIRECTORY UPDATE Help | Log Off

User Information Update Monday, September 04, 2006

User Name: JChang **Email Address:** jchang@somorita.com
First Name: Jordan **Middle Initials:** M
Last Name: Chang **Display Name:** Jordan M. Chang

Please contact the help desk at 555-1234 to modify uneditable fields.

Company: Volcano Surfboards & Smoothies St **Office:**
Department: Engineering **Title:** Manager
Employee ID: BR-549 **Employee Type:** Contractor

Office Phone: (808) 555-4000 **Office Fax:** (808) 555-4993
Mobile Phone: (808) 555-1234

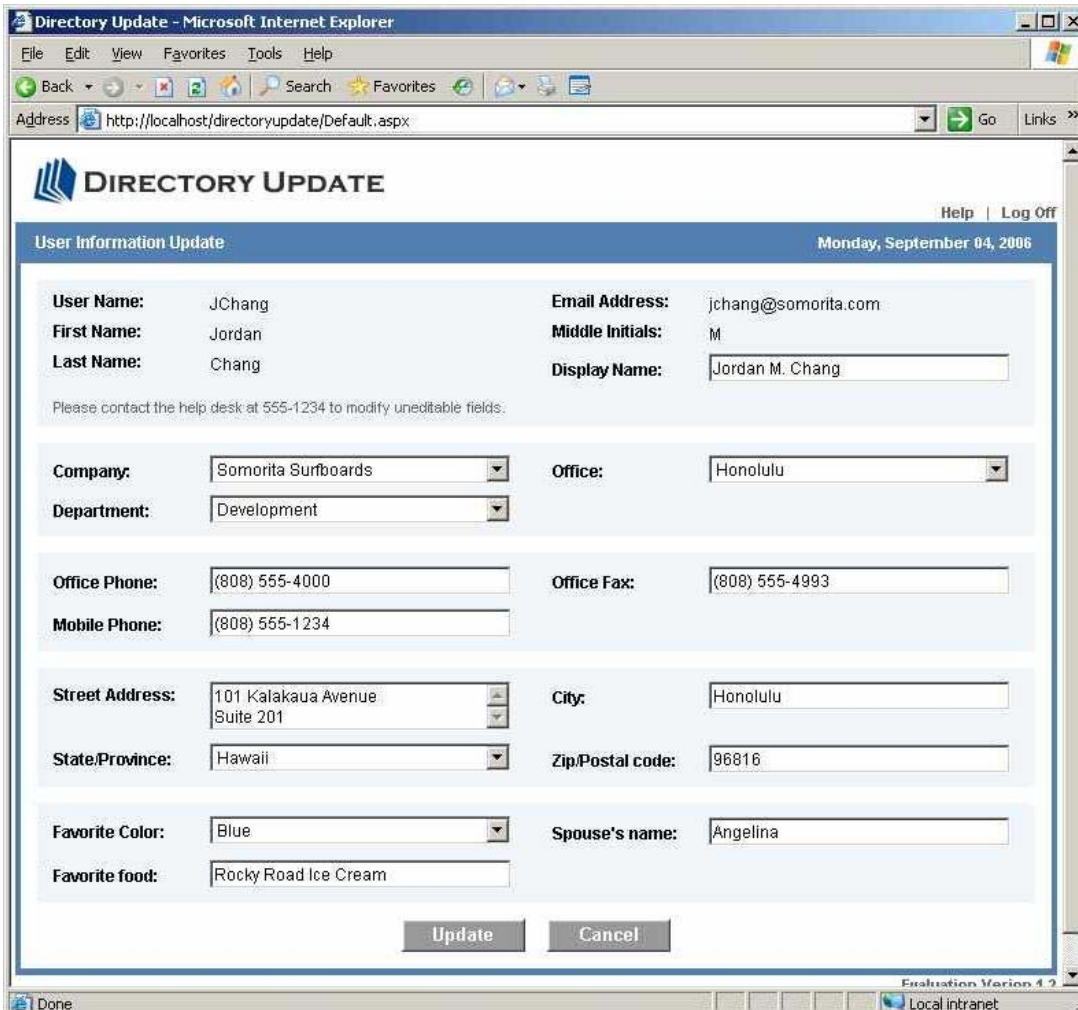
Street Address: 101 Kalakaua Avenue Suite 201 **City:** Honolulu
State/Province: Hawaii **Zip/Postal code:** 96816
Country: United States

Update **Cancel**

Evaluation Verion 1.2
 10 day(s) remaining
 Local intranet

Figure 3: Customized interface including employee ID and employee type fields

Another example (shown in Figure 4) shows this interface expanded to include the three of the custom attributes fields. One of the custom attribute fields has been converted to a drop-down list box; all three have had their labels customized.



Directory Update Help | Log Off
Monday, September 04, 2006

User Information Update

User Name: JChang **Email Address:** jchang@somorita.com
First Name: Jordan **Middle Initials:** M
Last Name: Chang **Display Name:** Jordan M. Chang

Please contact the help desk at 555-1234 to modify uneditable fields:

Company: Somorita Surfboards **Office:** Honolulu
Department: Development

Office Phone: (808) 555-4000 **Office Fax:** (808) 555-4993
Mobile Phone: (808) 555-1234

Street Address: 101 Kalakaua Avenue Suite 201 **City:** Honolulu
State/Province: Hawaii **Zip/Postal code:** 96816

Favorite Color: Blue **Spouse's name:** Angelina
Favorite food: Rocky Road Ice Cream

Figure 4: User Information form with custom attributes

Another example is shown in Figure 5. In this example, some of the default phone number fields have been hidden and additional phone number fields have been revealed. Also, note that the Notes, the Description, and the Web Page fields are now displayed.

User Information Update		Monday, October 16, 2006	
First Name:	Lily	Middle Initials:	
Last Name:	Ebrahimi	Display Name:	Lily Ebrahimi
User Name:	Lily	Email Address:	lily@somorita.com
Please contact the help desk at 555-1234 to modify uneditable fields.			
Company:	Somorita Surfboards	Office:	Honolulu
Department:	Sales & Marketing	Title:	Marketing Lead
Office Phone:	(808) 555-4000	Direct Phone:	(808) 555-4202
Office Fax:	(808) 555-4322	Mobile Phone:	(808) 555-4321
Example: (808) 555-1234			
Street Address:	10991 Kalakaua Avenue Suite 202	City:	Honolulu
State/Province:		Zip/Postal code:	96816
Country:	United States		
Description:	Sales and Marketing	Web Page:	http://www.directory-update.com
Notes:	Created on 04 Apr 2006 per Matt Suriya - Ticket #4018 Created by Jim McBee Updated by Jordan Chang on 10 Oct 2006 per Milan Gross		
Update		Cancel	

Licensed to: ITCS Hawaii

Version: 1.2.

Figure 5: Another customized Directory Update page

Take note **that** in Figure 5 that the Description and Notes fields have been revealed, but they cannot be edited. This can be accomplished in the APPSETTINGS.XML file by setting the “editable” tag to editable=”no”.

Limitations

The **Directory Update** application currently has the following limitations and restrictions:

- The application can update user information only in a single Active Directory domain.
- A user can only update their **own** attributes; they cannot update attributes for other users.
- For attributes that use a drop-down list of approved data (such as the list of valid states or cities), if the current value in Active Directory does not exist in the validated list, the Directory Update application will clear that value from Active Directory.
- **Directory Update** uses a static domain controller / global catalog server name; it does not auto-discover all available domain controllers and global catalog servers in a domain. The Settings Updater application be used to update this information.
- UPN name logons are not supported.
- Telephone number fields have a maximum field length of 40 characters.
- P.O. Box and Postal Code have a maximum field length of 30 characters.
- Street Address has a maximum field length of 250 characters.
- All other fields have a maximum field length of 64 characters.
- The User Information page works best in Internet Explorer, but we have also tested it with Firefox and Safari (on Macintosh). The current version should be acceptable in these browsers.

Requirements

The following section discusses the prerequisites for Directory Update. Please confirm that the system on which Directory Update will be installed meets these prerequisites.

Windows Server Requirements

Prior to installing the **Directory Update** application, the directory administrator must designate a computer on which this web application will be installed. This server can be a domain controller or a member server. The following are the requirements:

- Windows 2003 Server SP1 or Windows 2003 R2
- IIS World Wide Web Service must be installed
- The ASP.NET component of the Windows Application server must be enabled
- The .NET Framework v2.0 must be installed
- ASP.NET v2.0.50727 Web Service Extension must be allowed in the IIS Web Services Extensions container
- The server hosting **Directory Update** must be a member of the Active Directory
- A service account must be created...
 - The service account password should have a strong password
 - The service account password must not expire
 - The account must have the permissions necessary to update the user accounts it will be required to update. The best way to accomplish this is to make the use account a member of the domain's Account Operator's group. Domain Admins group membership will grant excessive permissions- and is not necessary in most cases.
- The administrator installing the **Directory Update** application must be a member of the local Administrators group on the computer on which **Directory Update** is being installed
- SSL is recommended, but not required. If you do not use SSL, then this application should only be visible from within your own Internet, since user information will be passed over your network in clear-text.

While not required, we recommend that the **Directory Update** application be on its own web server. While it should interoperate fine with other web-based applications, all of our testing has been on an IIS server running on a domain controller or a member server and using the Default Web Site.

Service Accounts and Least Permissions

When installing **Directory Update**, you are required to provide a service account. All updates to the Active Directory are made within the security context of this service account, not within the context of the user that is currently logged in. This is by design, as the end user does not have sufficient permissions to accomplish Directory Update's function. However, we also have found that many times Directory Update is configured to use a service account that has more permissions than are necessary (making it a member of, for instance, the domain's Domain

Admins or local Administrators group). For simplicity's sake, we recommend creating a service account and making it a member of the domain's Account Operators group¹.

Note that Account Operator accounts cannot modify attributes of any user account that is a member of any of the operators groups, Administrators, or Domain Admins. This is a built-in security feature of Windows. But then, you should not need to use **Directory Update** for admin-level accounts because they are only used for administrative purposes and do not have mailboxes, right? ☺ The principle of least permissions is inconvenient, but important!

At a bare minimum, the service account only needs permissions to modify the attributes that will be visible in Directory Update. This does not require Account Operator permissions or even permissions to the entire domain. You can configure an account that has only the permissions necessary to modify the attributes that you want users to modify. The following is a quick tutorial on setting up a service account that has only the necessary permissions. The group and user names are just for illustrative purposes; you can use whatever you want.

1. Create an Active Directory security group called *DirectoryUpdateSecurity*
2. Create an Active Directory user called *SVC_DirectoryUpdate*
3. Make the *SVC_DirectoryUpdate* user a member of the *DirectoryUpdateSecurity* group
4. Using Active Directory Users and Computers, highlight the organizational unit (OU) that contains the users that will be using Directory Update. Right click on this OU and run the Delegate Control wizard.
5. Click Next on the welcome page
6. On the Users or Groups page, add the *DirectoryUpdateSecurity* group as shown in Figure 6. Click Next.

[added paragraph return]

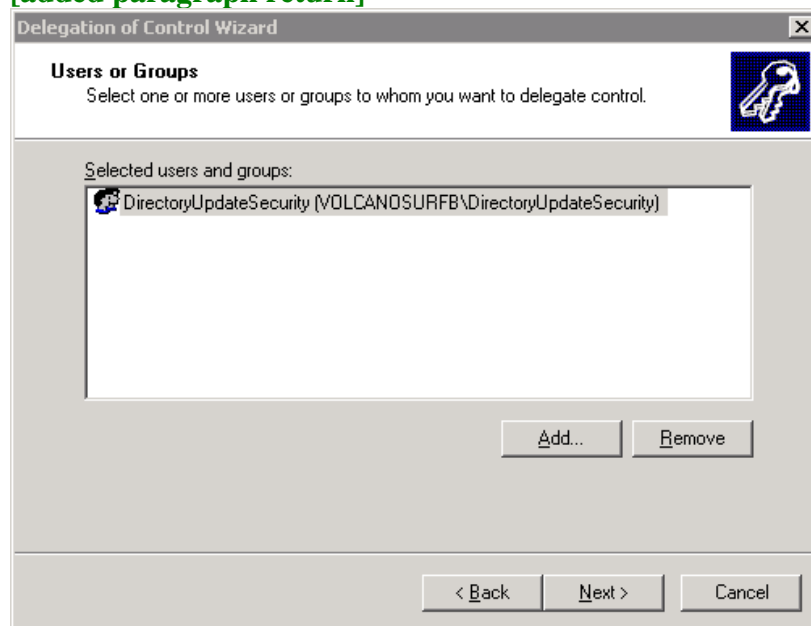


Figure 6: Selecting the user or group for the Delegation of Control Wizard

¹ Members of the Account Operators group have permissions to create and delete users.

7. On the Tasks to Delegate page, select the Create A Custom Task To Delegate radio button.
8. On the Active Directory Object Type page (shown in Figure 7), select the Only The Following Objects In The Folder radio button. Scroll through the list of objects until you find the User object and check the checkbox next to User Objects. **Do not** select the Create Selected Objects In This Folder or the Delete Selected Objects In This Folder. Click Next when finished.

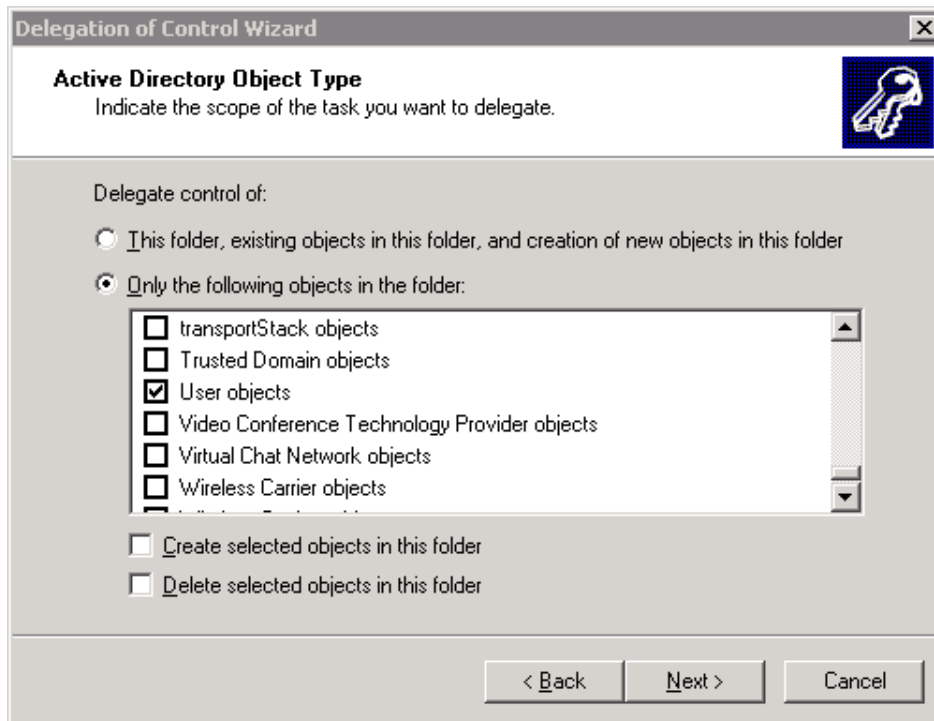


Figure 7: Delegating permissions only to User objects

9. On the Permissions page (shown Figure 8), select the Permission types shown in Table 1. Click Next when finished.

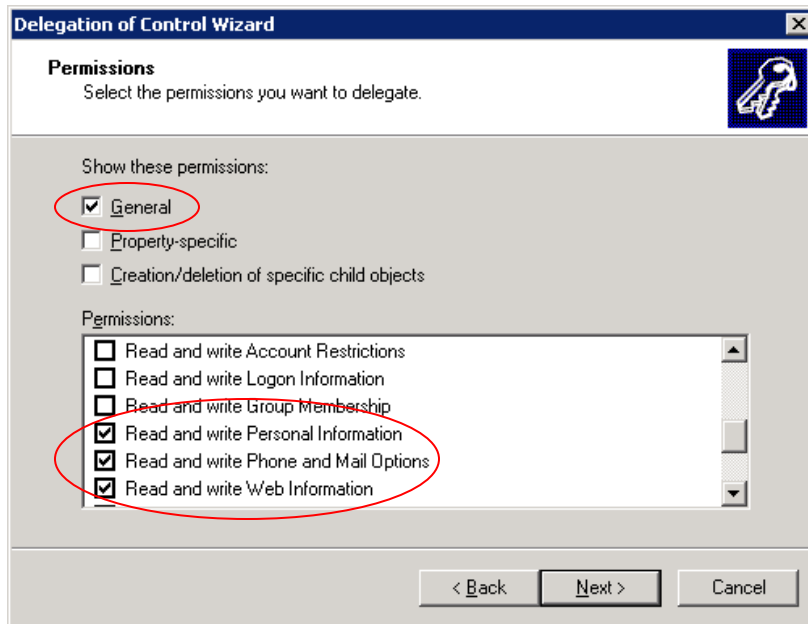


Figure 8: Selecting permissions assigned for least permissions service account

10. Click Finish to complete the Delegation of Control Wizard.
11. Repeat this process for other parent-level OUs in your Active Directory that contain users that will be using **Directory Update**.

Active Directory permissions can also be delegated in groups called Property Sets. Property Sets allow you to delegate a number of individual permissions very easily since the set includes a number of different properties. For more information on Property Sets, see this reference on the Microsoft Developer’s Network: <http://preview.tinyurl.com/yemldt>.

We have included in Table 1 the property sets that we recommend delegating. When you delegate all of these property sets, the service account will have sufficient permissions to update all of the necessary attributes. If you have scaled back the Directory Update user interface so that there is only a few exposed attributes, you will not need all of these property sets. However, if you use additional features of **Directory Update** such as the extension attributes (Custom Attributes), then you may need to delegate more permissions for your implementation of **Directory Update**.

Table 1: Property set permissions used for least permissions assignment

Permission	Property Set Includes
Read and Write General Information	Includes display name and country code
Read and Write Personal Information	Includes address information and all telephone numbers
Read and Write Web Information	Includes web page attribute
Read and Write Public Information	Includes first name, last name, manager, department, and title

Installation and Configuration

Ensure that you meet the system requirements prior to starting; missing prerequisites is the number one reason that **Directory Update** generates errors during or after the installation. The license key, domain controller, and service account information can be changed or updated after installation is completed, but they must be validated during the installation process.

License Keys

You can install **Directory Update** without a license key, however the application will only function for 10 days. After 10 days, you must get a license key to keep using the software. License keys are generated at purchase time and are a combination of the Active Directory's DNS domain name and the organization's name. A license key only works with a specific Active Directory domain. **Directory Update** can be installed as many times as you like in a single Active Directory domain using the same license key.

Selecting a Domain Controller

The installation program requires a domain controller; **Directory Update** does not dynamically discover domain controllers. The domain controller must also be a global catalog server. The domain controller should be on the same network as the web server that hosts **Directory Update**.

Installing Directory Update

Copy the installation file (SETUP.MSI or SETUP.EXE) to a local directory on the server on which you are planning to install, such as the C:\TEMP folder.

1. Double click on the SETUP.MSI
2. Click Next on the Welcome to the Directory Update Setup Wizard screen
3. Review the license agreement, choose I Agree, and click Next.
4. On the Select Installation Address page (Figure 9), specify the name of the virtual directory that will be created in Internet Information Server (IIS) and the default web site. The defaults are DirectoryUpdate and the Default Web Site; these defaults are sufficient for most all installations. When finished, click Next twice.

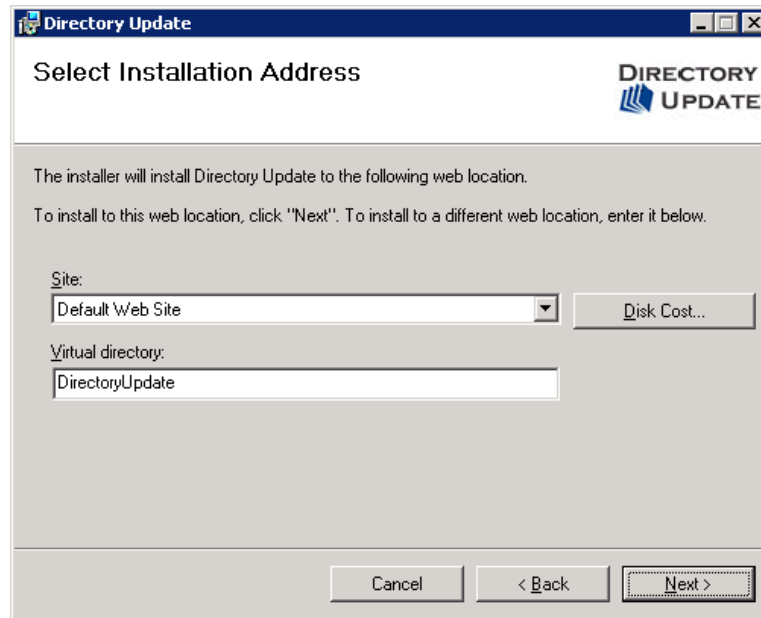


Figure 9: Setup Installation Address options

- On the Directory Settings property page (shown Figure 10), enter the domain controller / global catalog server name, the Active Directory DNS domain name (such as somorita.com or volcanosurf.local), the service account, and the service account password. The service account should include the NetBIOS domain name (pre-Windows 2000 compatible logon name) in front of the service account.

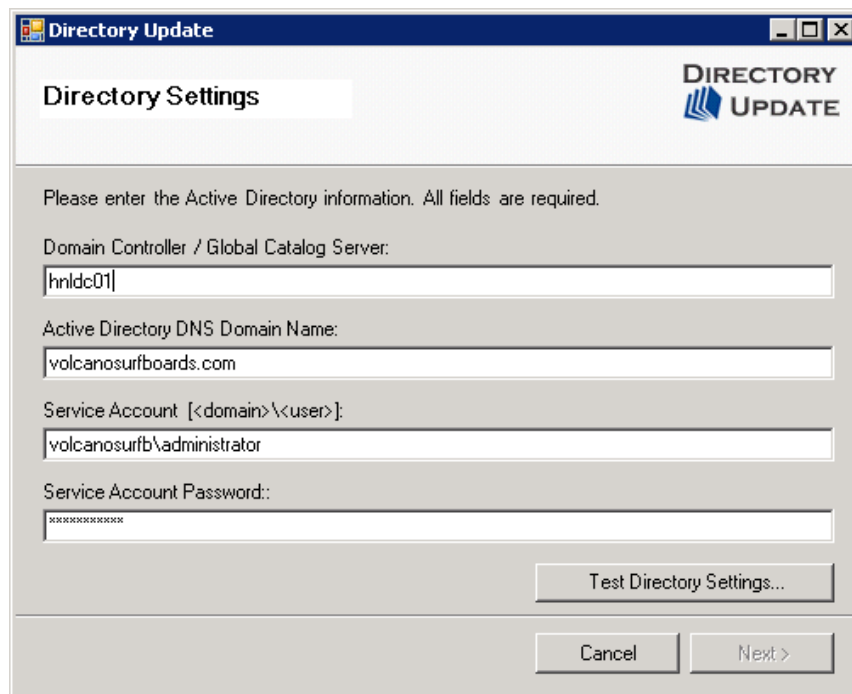


Figure 10: Setup Directory Settings options

- Click Test Directory Settings to verify that the service account is a member of appropriate groups and that the domain controller is responding. Click Next when completed.
- If installing a licensed version, on the Customer Information Screen (see Figure 11), enter your organization name and the license key that you received when you purchased your software. It is best to cut and paste this information in order to ensure that the license key and the organization name are entered exactly as they were issued.

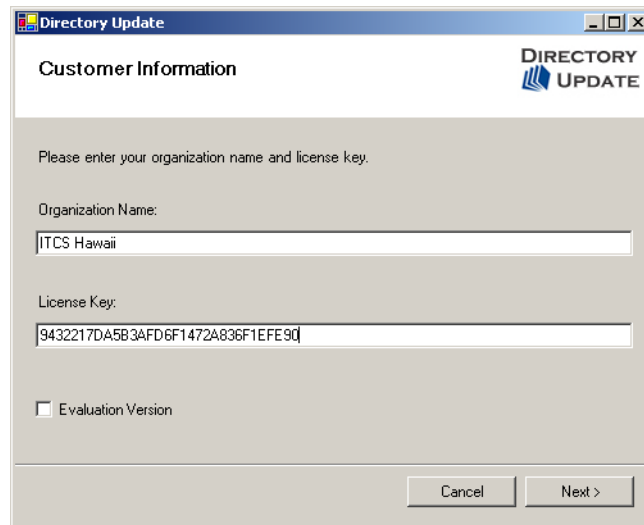


Figure 11: Customer Information screen

- If installing an evaluation version, enter your organization name and leave the license key blank and check the Evaluation Version checkbox as shown in Figure 12.

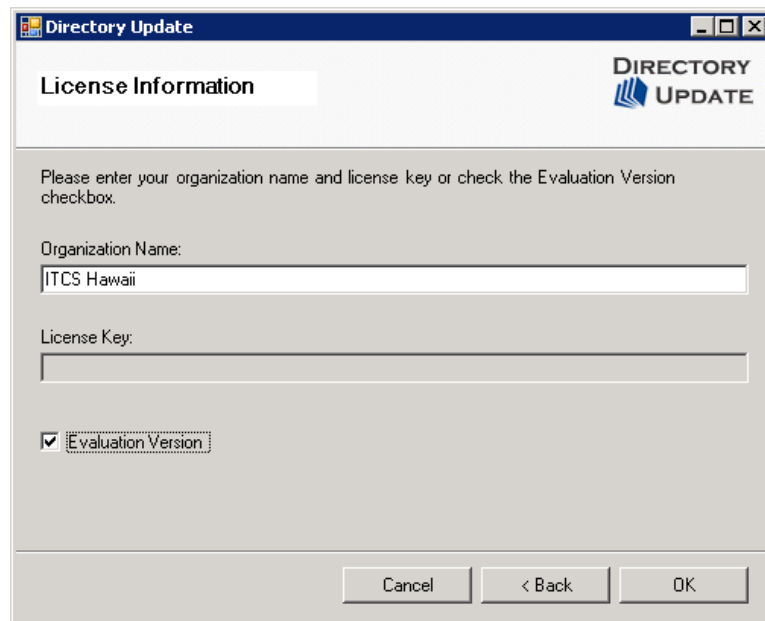


Figure 12: Installing an evaluation version

- When installation is completed, click Close.

- Open IIS Manager, open the web site on which the Directory Update application has been installed and display the properties of the DirectoryUpdate virtual directory. Examine the ASP.NET property page (shown in Figure 13) and **confirm** that the ASP.NET version is 2.0.50727. If it is not, change it in the drop-down list.

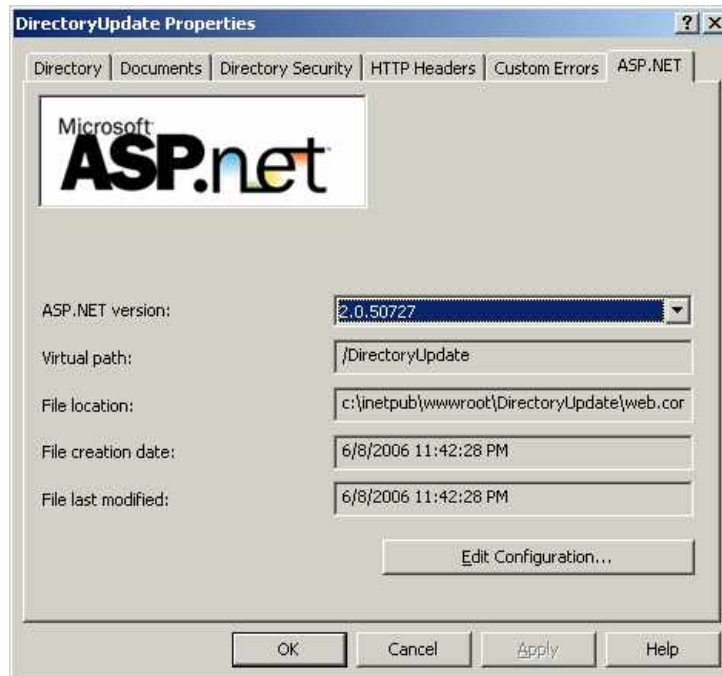


Figure 13: ASP.NET version must be the 2.0 version

- [This step is necessary if you are installing Directory Update on a Domain Controller!]* Browse to the C:\WINDOWS\Microsoft.NET\Framework\v2.0.50727 folder in Windows Explorer. Assign the NETWORK SERVICE account Modify permissions to the Temporary ASP.NET Files folder.

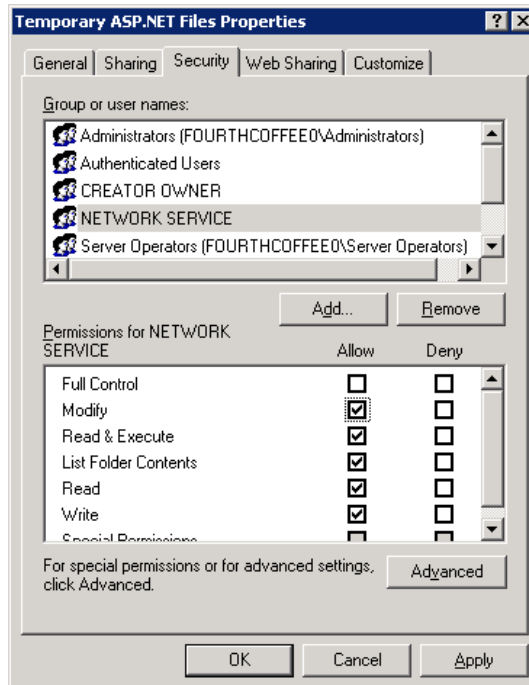


Figure 14: Permissions for Temporary ASP.NET Files

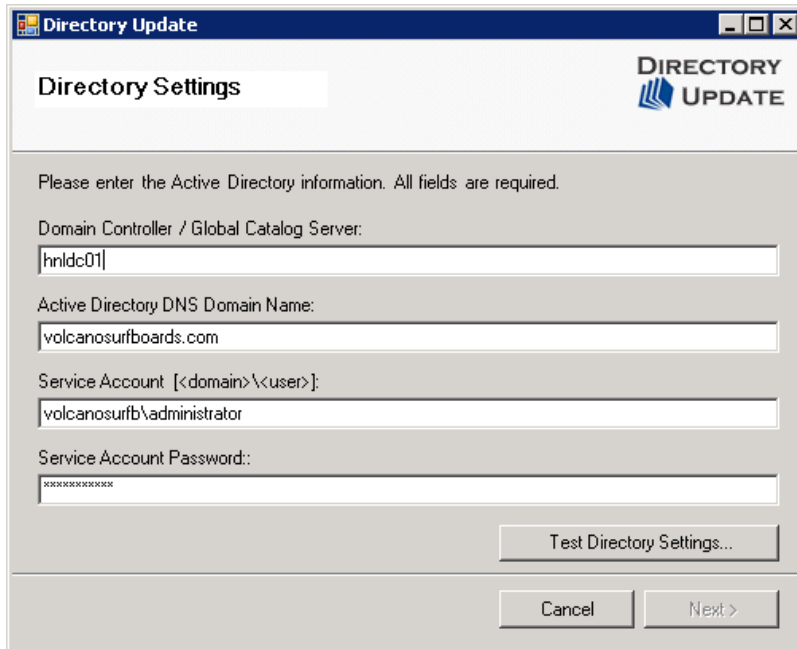
12. Apply customizations to the APPSETTINGS.XML file.

Changing the Configuration

Directory Update includes a separate utility that allow you to customize or change the basic configuration after the installation has been completed. These utilities are in to the Directory Settings application. These allow you to update your domain controller/global catalog server, service account and license key. .

Updating Directory Settings and Licensing Information

The Directory Settings application is found on the Program Files menu under **Directory Update**. You should only run this utility if the software has been properly installed. When you run this utility, it will display the current configuration for the domain controller, domain name, and service account (shown in Figure 15.)



The screenshot shows a Windows-style dialog box titled "Directory Update". The main heading is "Directory Settings". Below the heading, there is a message: "Please enter the Active Directory information. All fields are required." The dialog contains four text input fields: "Domain Controller / Global Catalog Server:" with the value "hnlcdc01"; "Active Directory DNS Domain Name:" with the value "volcanosurfboards.com"; "Service Account [<domain>\<user>]:" with the value "volcanosurfboards\administrator"; and "Service Account Password:" with a masked password "xxxxxxxxxx". At the bottom right, there are three buttons: "Test Directory Settings...", "Cancel", and "Next >".

Figure 15: Updating Directory Settings

When you have completed updating the domain controller, DNS domain name, and/or service account information, you must click the Test Directory Settings button before proceeding. Once you have verified the directory settings are correct, you can click OK and the settings will be updated.

Remember that license keys are created using the organization name and the Active Directory name. You must use the Active Directory DNS domain name and organization name that were provided when you purchased the software.

If you have downloaded the evaluation version and gotten it configured, you may wish to simply update license key once you have received it. Rather than re-installing the application, you can run the second screen on the Directory Settings utility found in Program Files -> Directory Update will update your license key. This utility will not read your current license key information (see Figure 16), you must provide updated information (or click cancel).

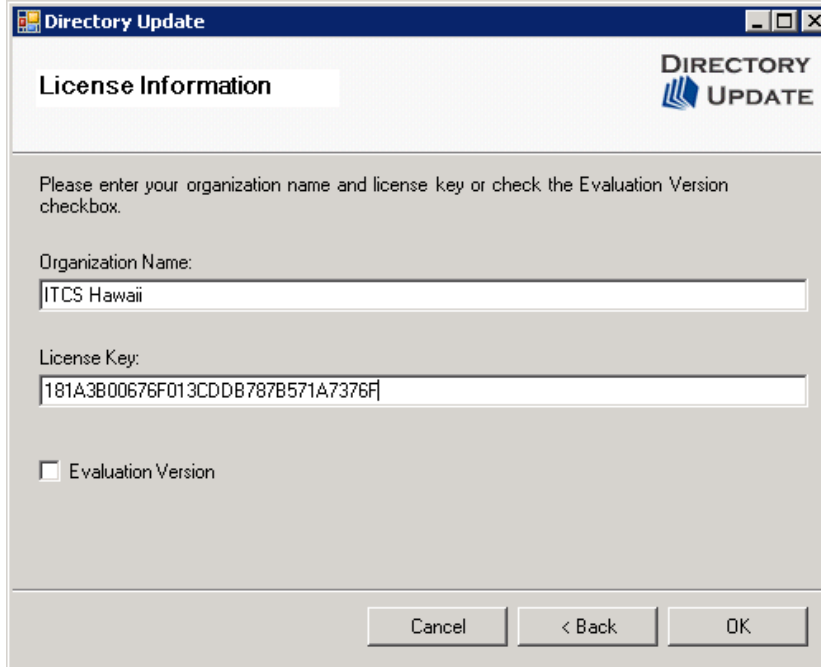


Figure 16: License Key Update utility

Installing a Second Copy of Directory Update

Frequently our customers need to install a second copy of Directory Update on the same Internet Information server. This is usually because they have a second set of settings (for a different set of Directory Update users) in a different APPSETTINGS.XML file. This is possible as long as all copies on the same machine are using the same Active Directory domain name and the same service account.

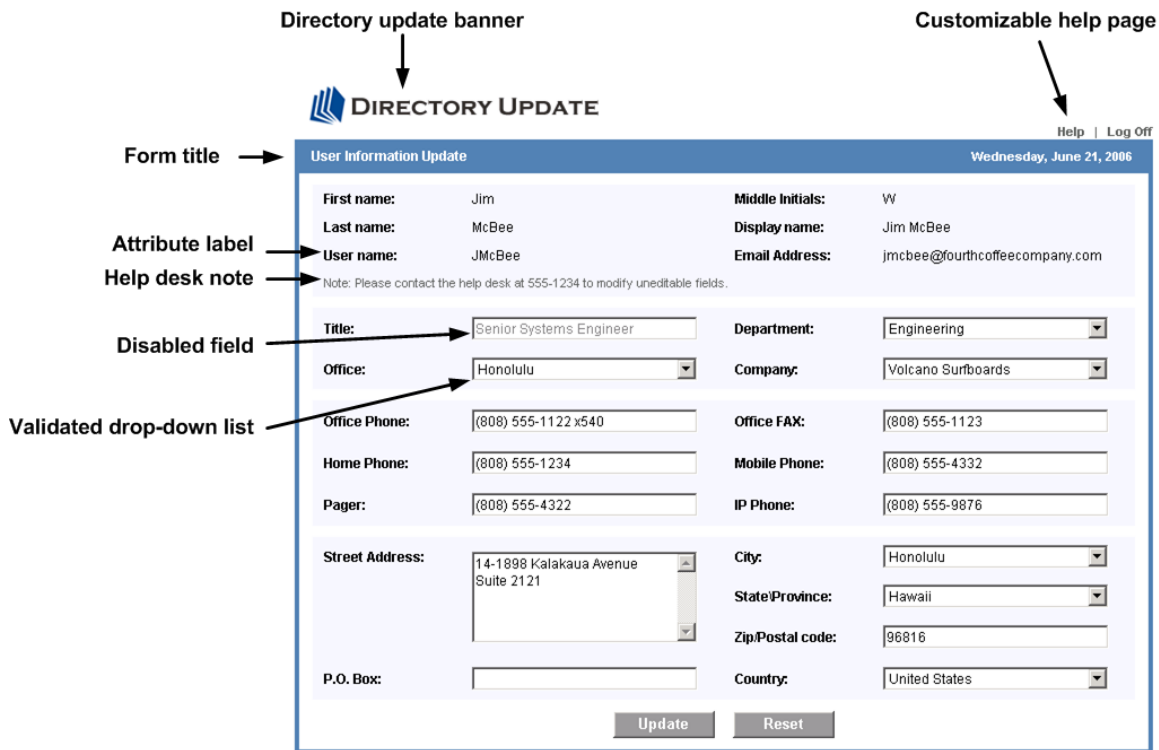
If you have additional Active Directory domains, you need additional licensed copies of Directory Update installed on additional Internet Information Server machines.

To accomplish getting a second copy of **Directory Update** running on the same IIS server, you need to create an additional folder, such as `\inetpub\wwwroot\directoryupdate2` and then copy all of the files from the `\inetpub\wwwroot\directoryupdate` folder in to that directory. Then, in IIS Admin, on the default web site, create an additional virtual directory for the `\inetpub\wwwroot\directoryupdate2` folder. Confirm that this additional virtual directory is using ASP.NET 2.0 (on the ASP.NET property page). Finally, for users that need the second Directory Update application, direct their web links to the correct URL on the second server (example: <http://servername/directoryupdate2>).

Customization

The intention of the Directory Update application is to be generic enough for any organization to use while allowing the administrator the maximum degree of customization. The original design was fixed as far as the field labels and which fields actually were displayed on the User Information form. In order to make the application as flexible as possible, much of the User Information form can now be customized or localized.

The main User Information form along with the components are shown in Figure 17.



The screenshot shows the 'User Information Update' form with the following components and annotations:

- Directory update banner:** Points to the 'DIRECTORY UPDATE' logo at the top of the page.
- Customizable help page:** Points to the 'Help | Log Off' links in the top right corner.
- Form title:** Points to the 'User Information Update' header.
- Attribute label:** Points to the 'First name', 'Last name', 'User name', 'Middle Initials', 'Display name', and 'Email Address' fields.
- Help desk note:** Points to the note: 'Note: Please contact the help desk at 555-1234 to modify uneditable fields.'
- Disabled field:** Points to the 'Title' field, which is disabled.
- Validated drop-down list:** Points to the 'Office' field, which is a validated drop-down list.

The form contains the following data:

First name:	Jim	Middle Initials:	W
Last name:	McBee	Display name:	Jim McBee
User name:	JMcBee	Email Address:	jmcbee@fourthcoffeecompany.com
Title:	Senior Systems Engineer	Department:	Engineering
Office:	Honolulu	Company:	Volcano Surfboards
Office Phone:	(808) 555-1122 x540	Office FAX:	(808) 555-1123
Home Phone:	(808) 555-1234	Mobile Phone:	(808) 555-4332
Pager:	(808) 555-4322	IP Phone:	(808) 555-9876
Street Address:	14-1898 Kalakaua Avenue Suite 2121	City:	Honolulu
P.O. Box:		State/Province:	Hawaii
		Zip/Postal code:	96816
		Country:	United States

Figure 17: Key customizable features of the Directory Update application

The User Information form is broken up into six sections. These six sections are:

- General - Contains general information about the user such as first name, last name, display name, user name, and middle initial. By default, none of this information can be edited by the user, however the Last name, Middle initial, First name, and Display Name fields can be enabled for editing. The user name and the e-mail address cannot be edited. We recommend against allowing users to change their name information. An example of the General section is shown in Figure 18.

First Name:	John	Middle Initials:	
Last Name:	Galt	Display Name:	John Galt
User Name:	John.Galt	Email Address:	John.Galt@somorita.com

Please contact the help desk at 555-1234 to modify uneditable fields.

Figure 18: General information attributes

- **Organization** - Contains information such as the user’s title, office location, department, company name, employee ID, employee number, and employee type. These fields are visible and editable by default, however any of these fields as well as the entire section can be hidden. The office, department, and company fields are drop-down lists by default, but the administrator can switch these to text boxes. This section also has the manager assistant, and secretary fields. The employee type, employee number, and employee ID fields are hidden by default. An example of this section is shown in Figure 19.

Company:	Somorita Surfboards	Office:	Honolulu
Department:	Engineering	Title:	President
Employee ID:	BR-549	Employee Type:	Full Time
Manager:	Paleafei, Matt	Assistant:	Jim McBee
Secretary:	Chang, Jordan		

To search for a manager, secretary, or assistant, type the first few characters of the person's first name and select the correct name from the list.

Figure 19: Organization section

- **Telephones** - Contains telephone numbers associated with the user. All telephone number fields are visible and editable by default. The administrator can prevent any of these from being edited as well as hiding individual fields or the entire telephone number section. By default, these fields are text-boxes, but the administrator can switch them to drop-down lists. An example of the telephone section is shown in Figure 20.

Office Phone:	(808) 555-1234	Other Office Phone:	(808) 555-4321
Office Fax:	(808) 555-2233	Other Office Fax:	
Mobile Phone:	(808) 555-4321	Other Mobile Phone:	
Home Phone:	(808) 555-3221	Pager:	(808) 281-2898
IP Phone:	65-8766	Assistant Phone:	(808) 555-4000 x291

Example: (808) 123 4567 or 808-555-1234

Figure 20: Telephone number section

- Address - Contains the street address, city, state, postal code, country and post office box. These are all visible and editable by default. The administrator can hide any of these fields, make a field non-editable, as well as hiding the entire section from the User Information form. The city, state, and postal code fields are drop-down list boxes by default, but the administrator can convert them to text boxes if desired. The country drop-down list box cannot be converted to a text box and should be left as is. The address attributes are shown in Figure 21.

Street Address:	1019 Kalakaua Avenue Suite 201	P.O. Box:	
State/Province:	Hawaii	City:	Honolulu
Country:	United States	Zip/Postal code:	96815

Figure 21: Address information

- Additional Information – Additional Information is hidden by default. The administrator can enable the Additional Information section so that it is visible and then customize and make visible Custom Attributes 1 through 10, the Description field, and the Web site field. Any of these can be converted from a text box to a drop-down list box. The additional information attributes are shown in Figure 22.

Frequent Flyer:	Delta	Frequent Flyer #:	987654321
Significant Other:	Angelina	Ext Attribute 4:	
Description:	Research and development	Web Page:	http://www.somorita.com

Figure 22: Additional information including description and web page

- Notes – The Notes section contains a larger field in which notes or additional information about the user can be entered. This field is found in Active Directory Users and Computers under the user's Telephones properties. In Directory Update, this is shown in the User Information section as shown in Figure 23.

Notes:	Created on June 1, 2005 per the request of Ms. Rand.
---------------	--

Figure 23: Additional notes that can be entered about a user

Most customization to **Directory Update** are performed in the *APPSETTINGS.XML* file that is found in the Directory Update folder found in the website's root folder (example: *C:\inetpub\wwwroot\DirectoryUpdate* folder). **In almost cases**, if you are upgrading from an earlier version of **Directory Update**, you **cannot** keep your old version of the

APPSETTINGS.XML file. When upgrading you will need to copy and paste the information from the old file in to the new version's APPSETTINGS.XML file.

Note: Always make a backup copy of the APPSETTINGS.XML file prior to making changes.

Tips For Editing XML Files

If you are new to editing XML files, here are some tips to keep in mind that will help you to make the necessary customizations:

- All XML “tags” must have an “open” tag and a “close” tag.
- Make backup copies of the file you are editing
- Make a few changes at a time, then check your work
- Some APPSETTINGS.XML and STYLE.CSS changes require that you logout and log back in to see the changes take effect.
- If all else fails and you have completely messed up your XML file, look in the same folder as your APPSETTING.XML file is found. We have included an original XML file that allows you to start over without re-installing. This copy is called APPSETTINGS_TEMPLATE.XML.
- You can use Internet Explorer to check and see if your XML file has all of the necessary “close” tags for each “open” tag. Just open the file in Internet Explorer. If you seen an error that includes “End tag ‘xxxxxx’ does match the start tag ‘xxxxx’”, then you know you have an open tag without a corresponding close tag.

Style Sheet

The STYLE.CSS file can be found in the *C:\inetpub\wwwroot\DirectoryUpdate\styles* folder. In this file you can customize the colors and fonts.

Directory Update Banner

The Directory Update logo is a GIF (*directory_update_logo.gif*) file that is in the *C:\inetpub\wwwroot\DirectoryUpdate\images* folder. It is 350 pixels wide by 60 pixels high. You can replace this file or specify an alternate one in the APPSETTINGS.XML file. The default setting tag for the image location is:

```
<logo path="images/directory_update_logo.gif" />
```

Page Title

The page title is the title that is found on the top of the web browser window. The page title is found in the APPSETTINGS.XML file and is changed by locating the *<pagetitle>* tag. The default page title tag is:

```
<page title="Directory Update" />
```

Log Off URL

The **Log Off** button is ineffective if you enable Integrated Windows Authentication. For this reason, the `<logOffURL>` tag allows you to put a customized URL in the tag that redirects the user to an external web page. A sample of using the logoff URL is as follows:

```
<logOff url="http://intra.company.com/page.html"/>
```

The default Log Off URL tag is as follows:

```
<logOff url=""/>
```

Form Title

The form title is found under the Directory Update Banner. You can customize this in the `APPSETTINGS.XML` file. This can be changed by locating the `<form Title>` tag.

```
<form title="User Information Update"/>
```

Help Desk Note

The Help Desk Note field is a short note that is found directly below the fields that cannot be edited by the user. The default is simply a note indicating that some fields cannot be changed by the user. This should be customized for your organization. To change this, locate the `<note>` tag in the `APPSETTINGS.XML` file.

```
<note visible="yes" message="Please contact the help desk at 555-1234 to modify uneditable fields."/note>
```

If you desire, the Help Desk Note can be hidden from view. This is done in the `<note>` tag. Change `<note visible="yes">` to `<note visible="no">`

One common question is whether the Help Desk Note can have a link to an external Web page inserted. Yes, with a little trickery with the XML file, you can insert a link. The problem is that you cannot insert the greater than and less than symbols within an XML tag, so you must use `>` and `<` instead of greater than (`>`) and less than (`<`). An example of embedding a link is shown in Figure 24.

User Name:	jmcbec	Email Address:	jmcbec@somorita.com
First Name:	Jim	Middle Initials:	
Last Name:	McBee	Display Name:	Jim McBee

Visit the [Somorita Help Desk page](#) for more information.

Figure 24: Adding a custom link to the Help Desk Note

To insert the above link (and have it open in to a new Web browser window), the following tag was used:

```
<note visible="yes" message="Visit the &lt;a href="http://helpdesk.somorita.local" target="_blank"&gt;Somorita Help Desk page &lt;/a&gt; for more information."/note>
```

Customizable Help Pop-up Window

In the upper right-hand corner of the User Information form, there is a Help link that launches a modal dialog box. Your organization can further customize the message shown on that screen. In the APPSETTINGS.XML file, locate the <help> tag. You can insert a custom message for your users and change the title.

For example, the following XML tag will yield the results shown in Figure 25. Notice that to achieve a Carriage Return / Line Feed function from within the XML tag, the < and > (less than and greater than strings must be used along with the HTML “BR” tag.

```
<help title="Help Information" message="Somorita Surfboards IT Department is open from 8:00AM until 5:00PM. <BR> Please call us at (808) 555-4411 for assistance."/>
```

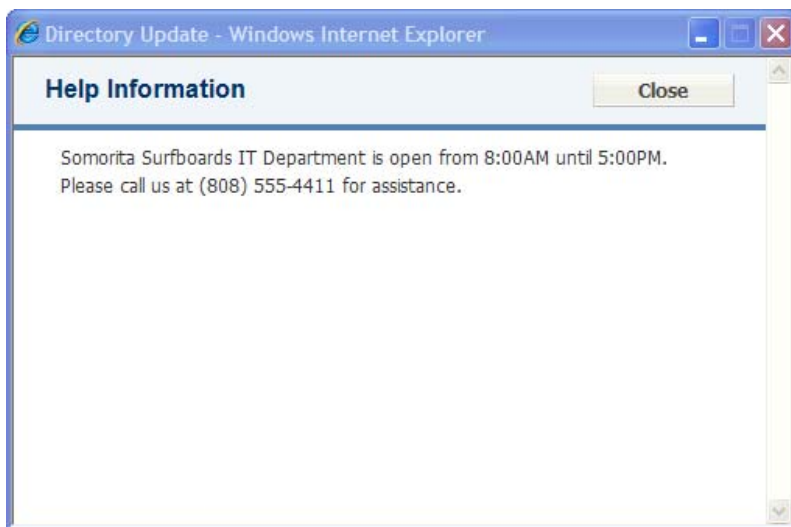


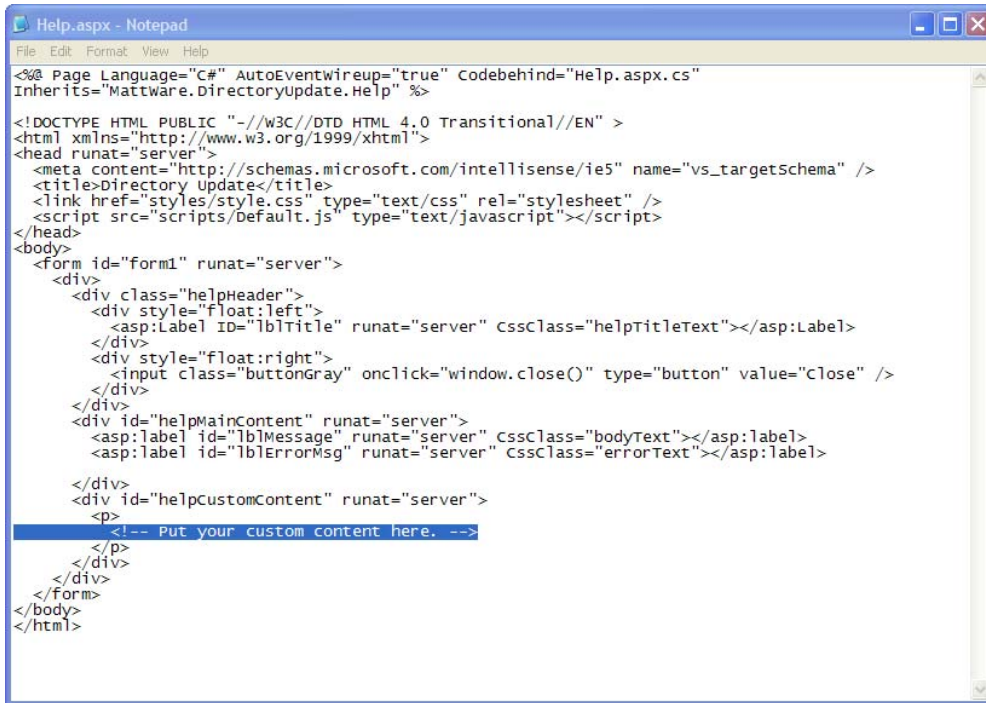
Figure 25: Customizable Help Screen

If users have previously viewed an old Help Window message, their cache must be cleared for the new message to be appear properly. In earlier versions the limit of a maximum number of six lines of text when customizing your help message, but this limit has been removed.

If you want to further customize this pop-up Help window such as inserting links or images, the actual help file is HELP.ASPX. There are two steps to this process. The first is that you need is to make sure that in the APPSETTINGS.XML file that the message option is cleared. Here is an example:

```
<help title="Help Information" message="" />
```

Next you can edit the HELP.ASPX file; this file is shown in Figure 26. Custom content can be included within the section <!--Put your custom content here.-->.



```

Help.aspx - Notepad
File Edit Format View Help
<%@ Page Language="C#" AutoEventWireup="true" Codebehind="Help.aspx.cs"
Inherits="MattWare.DirectoryUpdate.Help" %>
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN" >
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
  <meta content="http://schemas.microsoft.com/intellisense/ie5" name="vs_targetSchema" />
  <title>Directory Update</title>
  <link href="styles/style.css" type="text/css" rel="stylesheet" />
  <script src="scripts/Default.js" type="text/javascript"></script>
</head>
<body>
  <form id="form1" runat="server">
    <div>
      <div class="helpHeader">
        <div style="float:left">
          <asp:Label ID="lblTitle" runat="server" CssClass="helpTitleText"></asp:Label>
        </div>
        <div style="float:right">
          <input class="buttonGray" onclick="window.close()" type="button" value="close" />
        </div>
      </div>
      <div id="helpMainContent" runat="server">
        <asp:Label id="lblMessage" runat="server" CssClass="bodyText"></asp:Label>
        <asp:Label id="lblErrorMsg" runat="server" CssClass="errorText"></asp:Label>
      </div>
      <div id="helpCustomContent" runat="server">
        <p>
          <!-- Put your custom content here. -->
        </p>
      </div>
    </div>
  </form>
</body>
</html>
  
```

Figure 26: Editing the HELP.ASPX file

Completion Confirmation Message

When the user clicks the Update button, the default is they are directed to a separate screen where they see a confirmation message. Directory Update v1.3 was updated to redirect to a different page in order to get around the problems that our customers reported with pop-ups and pop-up blockers. The logout page is shown in Figure 27.

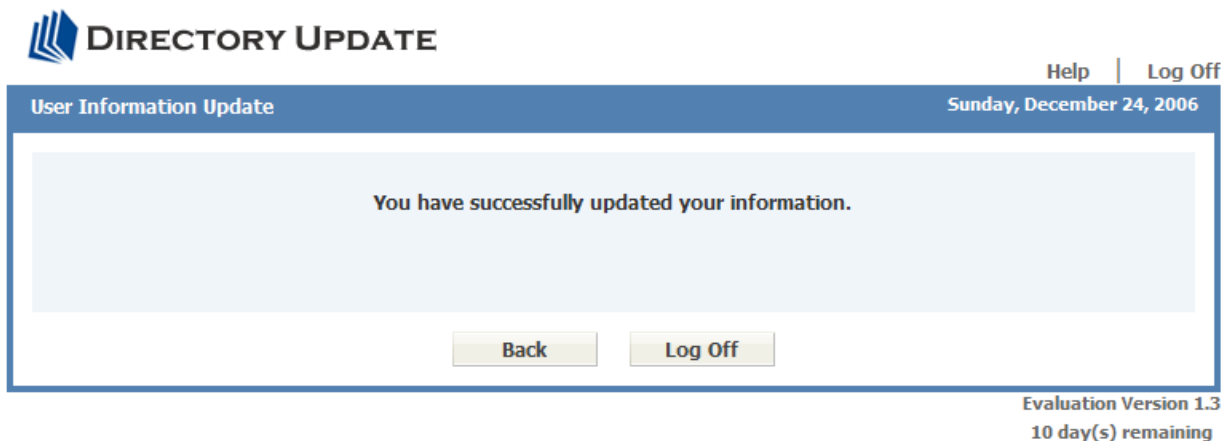


Figure 27: Confirmation message

The confirmation message can be customized or localized like most of the rest of the interface. This is customized using the `updateConfirmation` tag that is found in the `APPSETTINGS.XML` file. Below is an example:

```

<updateConfirmation message="You have successfully updated your information."
popup="no"/>
  
```

If you are using the original pop-up message with no problems and just can't part with it, then change the `popup="no"` option to `popup="yes"`. The original pop-up message can also be customized in this XML tag and is shown in Figure 28.

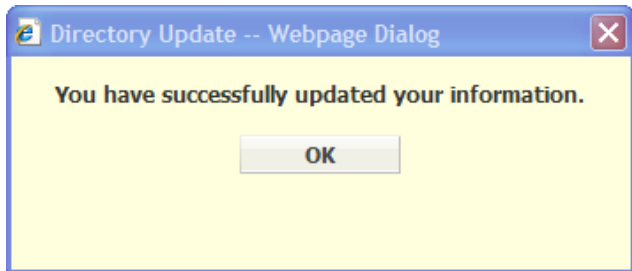


Figure 28: Confirmation pop-up

Attribute Labels

Attribute labels can be updated to suit your organization. The attribute labels are the same ones that are used in Active Directory, but they can be customized in the APPSETTINGS.XML file. Locate the section of the XML file for the attribute you are interested in changing. All field labels and application validation information is found within the `<directory>` section of the XML file.

For example, if you want to change the Title field label from "Title" to "Position", locate the following line:

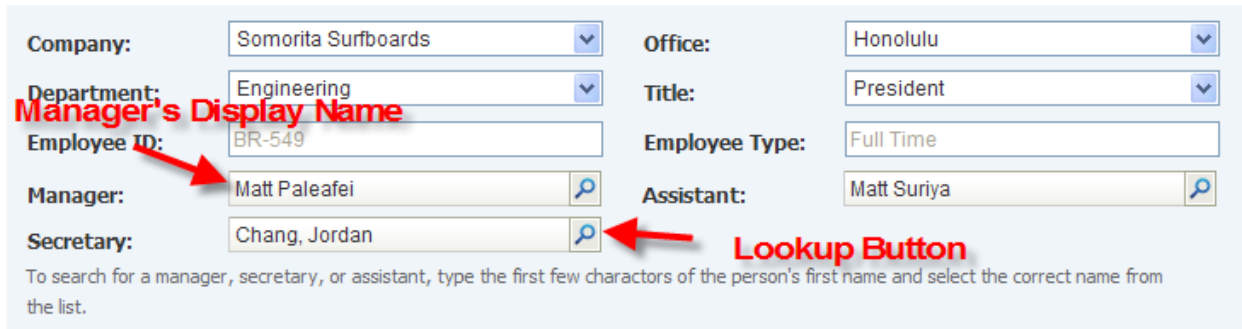
```
<title label="Title" type="text" editable="yes" visible="yes"
required="no" />
```

Change the `label="Title"` to `label="Position"`; the resulting line would look like this:

```
<title label="Position" type="text" editable="yes" visible="yes"
required="no" />
```

Manager, Secretary, and Assistant Fields

Starting with v1.3, we have introduced three new attributes to the User Information form. These are the Manager, Assistant, and Secretary attributes. These were difficult to add to the interface since we must browse the Active Directory for a valid mail-enabled user and then store the data in distinguished name format. These new fields are found in the organization section of the interface and are shown in Figure 29.



Company: Somorita Surfboards
Office: Honolulu
Department: Engineering
Title: President
Employee ID: BR-549
Employee Type: Full Time
Manager: Matt Paleafei
Assistant: Matt Suriya
Secretary: Chang, Jordan

To search for a manager, secretary, or assistant, type the first few characters of the person's first name and select the correct name from the list.

Figure 29: Manager, Secretary, and Assistant attributes

If you have searched through the Active Directory Users and Computers interface looking for the Secretary and Assistant attributes and can't find them, don't worry. These are examples of attributes that are supported by Active Directory but there is not a user interface for managing them. Some organizations do have additional applications such as work flow and forms routing applications that can use this data, though.

Directory Update must have been configured to use a domain controller that is also a global catalog server for the Manager, Secretary, and Assistant fields to work properly.

Figure 29 shows all three of these attributes. The data that is displayed inside the text box is the display name of the user. The lookup button is optional and moves the use's cursor in to the text box. The user looks up the manager, secretary, or assistant name by typing the first few characters of the manager, secretary, or assistant's display name. An example of this is shown in Figure 30; in Figure 30 the user has typed in the characters 'Ma' and the search dialog has displayed all users whose display name starts with "Ma".



Manager: Madela Sadler
Assistant: Jim McBee

Name	Title	Department
Madela Sadler	Superlative Investigations Architect	Investigations
Madelaine Rounsavall	Superlative Claims Plebian	Claims
Madelina Chavasse	Chief Investigations Warrior	Investigations
Madella Arseneau	Supreme Investigations Warrior	Investigations

Secretary: [Empty]
Office Phone: [Empty]
Office Fax: [Empty]
Mobile Phone: [Empty]
Home Phone: (808) 555-3221
Pager: (808) 281-2

Figure 30: Searching for a manager

The only users that show up in the Manager, Secretary, or Assistant boxes are mail-enabled users from the Active Directory.

Also, notice that below the Manager, Secretary, and Assistant fields there is a customizable help message. This is customized in the APPSETTINGS.XML file, as shown in Figure 31.

```

- <employeeType label="Employee Type" type="text" editable="no" visible="yes" required="no">
  <value>Contractor</value>
  <value>Full Time</value>
  <value>Temporary Hire</value>
  <value>Outsource</value>
</employeeType>
<manager label="Manager" type="text" editable="yes" visible="yes" required="no"/>
<assistant label="Assistant" type="text" editable="yes" visible="yes" required="no"/>
<secretary label="Secretary" type="text" editable="yes" visible="yes" required="no"/>
<noteMessage visible="yes">To search for a manager, secretary, or assistant, type the first few characters of the person's
  first name and select the correct name from the list.</noteMessage>
</organization>

```

Figure 31: APPSETTINGS.XML settings for Manager, Assistant, and Secretary

Note that the Manager, Assistant, and Secretary fields can be configured as editable, visible, and required. The only field that is shown by default is the Manager field.

You may notice a difference between how Manager is displayed in Active Directory’s Users and Computers and in **Directory Update**. For example, consider the ADUC user’s properties are shown in Figure 32.

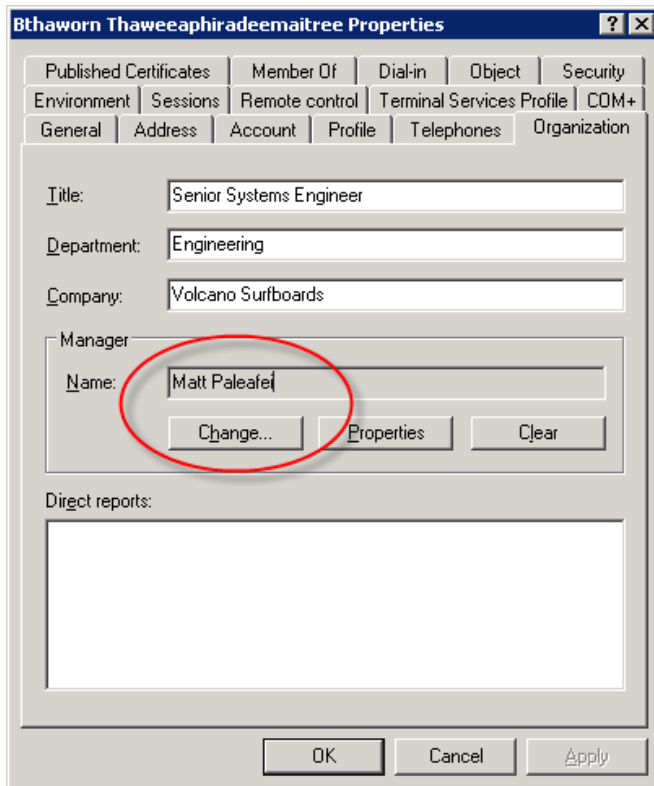


Figure 32: Active Directory Users and Computers and the Manager field

When viewed in Directory Update this information may display differently. An example of this is shown in Figure 33-where-“Matt Paleafei” has become Paleafei, Matt”.

Manager:	<input type="text" value="Paleafei, Matt"/>	<input type="text" value="Assistant:"/>	<input type="text" value="Jim McBee"/>
Secretary:	<input type="text" value="Chang, Jordan"/>		

Figure 33: Different view of the data that is presented in the Manager field

The reason for this is that Active Directory Users and Computers displays the user’s “common name” value that is seen in the name column in ADUC. We selected to display the user’s display name in the User Information form. We felt this was friendlier and what the user was used to seeing in the Exchange global address list

Telephone Number Format Validation

A popular feature is the ability to enforce a specific telephone number format. For example, in the U.S.A., an administrator might want to require all of their users to enter their phone number in this format: (808) 555-1234.

Starting in v1.3, the telephone number format feature is very customizable. It uses a technology called regular expressions (REGEXs) to allow the administrator to describe the patterns of numbers, letters, or special characters that can be put in to a phone number. You can use a selection of built-in regular expressions to describe a telephone format or you can write your own. This is all customized in the APPSETTINGS.XML file. The telephone number section is shown in Figure 34.

```

<!-- TELEPHONE SECTION -->
-<telephones visible="yes">
  <officePhone label="Office Phone" type="text" editable="yes" visible="yes" required="yes" validationFormat="none" showExample="no"/>
  <otherOfficePhone label="Other Office Phone" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <fax label="Office Fax" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <otherFax label="Other Office Fax" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <homePhone label="Home Phone" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <mobile label="Mobile Phone" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <otherMobile label="Other Mobile Phone" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <pager label="Pager" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <ipPhone label="IP Phone" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <assistantPhone label="Assistant Phone" type="text" editable="yes" visible="yes" required="no" validationFormat="none" showExample="no"/>
  <noteMessage visible="yes">Example: (808) 123 4567 or 808-555-1234</noteMessage>
-<validations>
  <validation format="U.S." example="Example: 808-123-4567 or (808)123-4567x123" regularExpression="((\(\d{3}\) )?)(\d{3}-)?\d{3}-\d{4}(x\d*)?"/>
  <validation format="U.K." example="" regularExpression=""/>
  <validation format="Australia" example="" regularExpression=""/>
  <validation format="French" example="" regularExpression="(0(\d| )?)\d\d \d\d(\d | \d\d) \d\d"/>
  <validation format="German" example="" regularExpression="((\(\d\d\d\d\) |(\(\d{3}\) )?)\d\d \d\d \d\d|(\d\d\d\d) \d \d\d-\d\d\d?)"/>
  <validation format="International" example="" regularExpression=""/>
</validations>
</telephones>

```

Figure 34: Telephone number section of the APPSETTINGS.XML file

Notice that below the phone number tags (but still within the <telephones> tag, is a section called <validations>. In addition to assigning the format a format name, we create an expression of the desired telephone format using a regular expression. Here is an example of a validation tag is the U.S. format.

```

<validation format="U.S." example="Example: 808-123-4567 or (808)123-4567x123" regularExpression="((\(\d{3}\) )?)(\d{3}-)?\d{3}-\d{4}(x\d*)?"/>

```

By default, each telephone number tag includes a validationFormat="None" option. To assign a format you specify the format name in the “validationFormat” tag and thereby enable validation. Here is an example of enabling the U.S. format for the Office Phone:-

```
<officePhone label="Office Phone" type="text" editable="yes" visible="yes"
required="yes" validationFormat="U.S." showExample="yes"/>
```

Visit our web site for more information on Regular Expressions, examples, and links.
<http://www.directory-update.com/TechNote Regular Expressions.aspx>

The result is shown in Figure 35. Notice that by enabling the `showExample` option, we can provide an example for each specific telephone field. However, the example option, found in the phone number note tag for that section, could be disabled or changed.

Office Phone: <input type="text" value="(808) 555-1234"/> Example: (808) 123-4567 or 808-123-4567	Office Fax: <input type="text" value="(808) 555-2233"/> Mobile Phone: <input type="text" value="(808) 555-4321"/>
Example: (808) 123 4567 or 808-123-4566	

Figure 35: Phone number section with validation and example enabled for Office Phone

If the user clicks Update without providing a valid phone number format, then an error message shows at the top of the User Information form. The example text is also used in this section as shown in Figure 36.

User Information Update

* Please correct the following error(s):

- Office Phone is invalid. Example: (808) 123-4567 or 808-123-4567
- Mobile Phone is required.

Figure 36: Validation error example

Examples of common telephone numbers and formats are available on our web site-at:
<http://www.directory-update.com/TechNote Regular Expressions.aspx>.

Required Fields

Every field/attribute in v1.3 has a required option. All fields default to `required="no"`, but you can easily change the field values you want to require to `required="yes"`. If a user tries to click Update without providing data for a required field, an error message shows up on the top of the screen similar to the one shown in Figure 36.

Hiding Fields

The most common user attributes that may need to be routinely updated have, by default, been included and made visible and editable on the User Information form, however many of these may not be required in all organizations. For example, IP phone, home telephone number, and P.O. Box are attributes that administrators frequently want removed entirely from the form.

Each attribute has a corresponding tag in the APPSETTINGS.XML file that includes a **visible** option. If this option is set to “yes”, then the field is visible on the User Information form; if this option is set to “no” then the field is not visible. The form will automatically rearrange to accommodate changes in which fields are revealed. Figure 37 shows the APPSETTINGS.XML file with the Telephones section visible. In this example, the visible=’no’ option has been set for IP phone and Home phone.

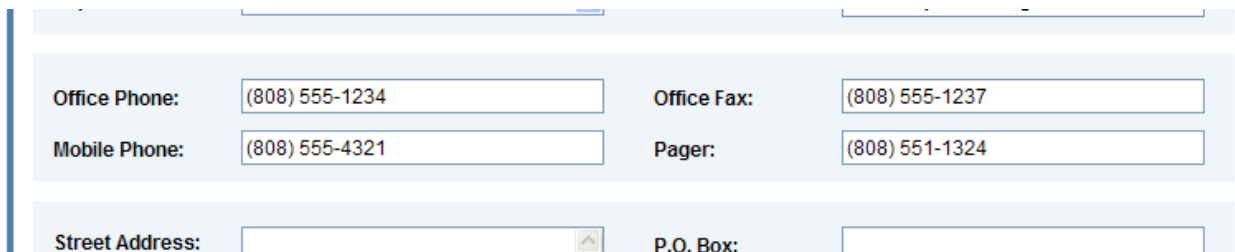
```

<!-- TELEPHONE SECTION -->
-<telephones visible="yes">
  <officePhone label="Office Phone" type="text" editable="yes" visible="yes" required="yes" validationFormat="USA" showExample="yes"/>
  <otherOfficePhone label="Other Office Phone" type="text" editable="yes" visible="no" required="no" validationFormat="" showExample="no"/>
  <fax label="Office Fax" type="text" editable="yes" visible="yes" required="no" validationFormat="" showExample="no"/>
  <otherFax label="Other Office Fax" type="text" editable="yes" visible="no" required="no" validationFormat="" showExample="no"/>
  <mobile label="Mobile Phone" type="text" editable="yes" visible="yes" required="yes" validationFormat="" showExample="no"/>
  <otherMobile label="Other Mobile Phone" type="text" editable="yes" visible="no" required="no" validationFormat="" showExample="no"/>
  <pager label="Pager" type="text" editable="yes" visible="no" required="no" validationFormat="" showExample="no"/>
  <homePhone label="Home Phone" type="text" editable="yes" visible="no" required="no" validationFormat="" showExample="no"/>
  <ipPhone label="IP Phone" type="text" editable="yes" visible="no" required="no" validationFormat="" showExample="no"/>

```

Figure 37: Hiding the IP Phone and Home Phone fields

Once the APPSETTINGS.XML file has been saved, the next time you logon to Directory Update the Telephones section will look like Figure 38.



Office Phone:	<input type="text" value="(808) 555-1234"/>	Office Fax:	<input type="text" value="(808) 555-1237"/>
Mobile Phone:	<input type="text" value="(808) 555-4321"/>	Pager:	<input type="text" value="(808) 551-1324"/>
Street Address:	<input type="text"/>	P.O. Box:	<input type="text"/>

Figure 38: Telephones section with two hidden fields

Once an attribute is hidden, the **editable** option in the XML tag no longer has any effect.

An additional example is shown in Figure 39. Many of the lesser used fields have been removed from the User Information form included Company, Home Phone, IP Phone, Pager, and P.O. Box.

User Information Update Monday, August 21, 2006

First Name: Jordan Last Name: Chang User Name: JChang	Middle Initials: M Display Name: Jordan M. Chang Email Address:
--	--

The Help desk is open from 8:00AM until 5:00PM.

Office: <input type="text"/> Title: <input type="text"/>	Department: <input type="text" value="Engineering"/>
---	---

Office Phone: <input type="text" value="(808) 555-4000"/> Mobile Phone: <input type="text" value="(808) 555-1234"/>	Office Fax: <input type="text" value="(808) 555-4999"/>
--	--

Street Address: <input type="text" value="101 Kalakaua Avenue Suite 201"/>	City: <input type="text" value="Honolulu"/>
State/Province: <input type="text" value="Hawaii"/>	Zip/Postal code: <input type="text" value="96816"/>
Country: <input type="text" value="United States"/>	

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Figure 39: Hiding multiple fields on the User Information form

Hiding Sections

Some organizations may find that they don't need entire sections on the User Information form. If this is the case, you can hide the entire section. For example, if you don't need to see the Organization section (which contains the Company, Department, Office, and Title fields), locate the `<organization visible="yes">` tag in the APPSETTINGS.XML file and change `visible="yes"` to `visible="no"`.

Figure 40 shows the results of hiding an entire section. As you can see the sections are automatically rearranged so that form is smaller.

User Information Update
Monday, August 21, 2006

First Name: Jordan	Middle Initials: M
Last Name: Chang	Display Name: Jordan M. Chang
User Name: JChang	Email Address:

The Help desk is open from 8:00AM until 5:00PM.

Office Phone: <input type="text" value="(808) 555-4000"/>	Office Fax: <input type="text" value="(808) 555-4999"/>
Mobile Phone: <input type="text" value="(808) 555-1234"/>	Pager: <input type="text" value="(808) 555-4321"/>

Street Address: <input type="text" value="101 Kalakaua Avenue Suite 201"/>	P.O. Box: <input type="text"/>
City: <input type="text" value="Honolulu"/>	State/Province: <input type="text" value="Hawaii"/>
Zip/Postal code: <input type="text" value="96816"/>	Country: <input type="text" value="United States"/>

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Figure 40: Result of hiding an entire section

Editable Fields

By default, most of the fields on the [Directory Update](#) User Information form are editable by the user. In some organizations this may not be desirable. The administrator can edit the APPSETTINGS.XML file and disable certain attributes so the user can view them, but not edit them. For any given attribute, you can change the editable option by locating the XML tag for the field and changing the “editable” option from “yes” to “no”.

For example, the Office attribute can be changed from editable to not editable by locating the <office> tag and changing *editable="yes"* to *editable="no"*. Below is an **example of** when the Office attribute is editable:

```
<office label="Office" type="dropdown" editable="yes" visible="yes"
required="no">
```

And here is an example of when the Office attribute has been set so that it cannot be edited.

```
<office label="Office" type="dropdown" editable="no" visible="yes"
required="no">
```

If a field is hidden, then the *editable="yes"* option has no effect. Figure 41 shows an example where the Company and the Office fields are not editable. The Office field is a text field and the Company field is a drop-down list. Notice that you cannot select the Company drop-down list; nor enter the Office text field to enter or change data.

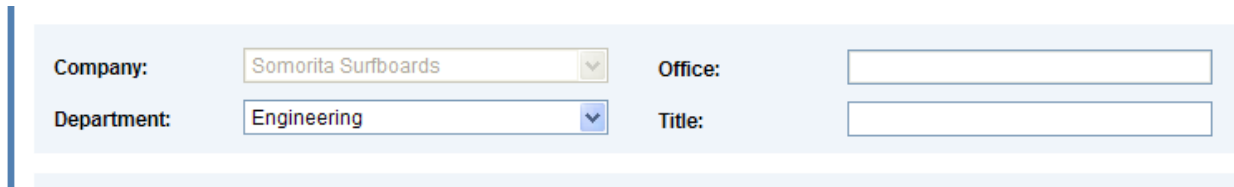


Figure 41: Making the Company and Office fields not editable

Validated Drop-Down Lists

One problem with allowing users the ability enter data into an attribute field is that you will get many different combinations and spellings of data that you may want to keep consistent. For example, in the State field, you may want the state name spelled out such as California.

Directory Update allows the administrator to customize the data that is found in almost all attributes.

Each validated field has additional entries found at the bottom of the field’s section in the APPSETTINGS.XML file. These entries all use the same <value> keyword tag. For example, to edit the possible values that are listed in the Department drop-down list, locate the <department> tag, and then enter a <value> tag entry for each validated option you want to make available to the user. The following example contains values from the default file:-

```
<department label="Department" type="dropdown" editable="yes"
visible="yes" required="no">
  <value>Accounting</value>
  <value>Development</value>
  <value>Engineering</value>
  <value>Human Resources</value>
  <value>Sales and Marketing</value>
</department>
```

You may add a new line for each department you want to appear in the drop down list. The value must start with the <value> tag and must be closed with the </value> tag. Once the last </value> tag has been entered, remember the field tag must be closed, such as </department> shown above.

Changing Drop-Down Lists to Text Fields

Each of the input fields has a type= option. This can be either type=“dropdown” or type=“text”. Any of the fields in the form (except Country) can be converted to either a text field or a drop-down list. For example, the City field defaults to a drop-down list. If you have extensive list of cities and prefer that the user enter this information without the aid of a drop-down list, you can change it. An example of the City tag is as follows:

```
<city label="City" type="dropdown" editable="yes" visible="yes"
required="no">
  <value>Denver</value>
  <value>Honolulu</value>
  <value>Los Angeles</value>
  <value>San Francisco</value>
  <value>San Diego</value>
```

```
</city>
```

Note that the City tag includes type="dropdown". If the type is set to a drop-down list, then it should followed by <value>CityName</value> tags, before the closing </city> tag. If you no longer want City to be a drop-down list, you can simply change the type="dropdown" to type="text":

You can leave the <value> tags as is. **Directory Update** will ignore the value tags if the type is not set to "dropdown", so the above example will continue to work even after it is no longer configured as a dropdown list, as shown below:

```
<city label="City" type="dropdown" editable="yes" visible="yes"
required="no">
  <value>Denver</value>
  <value>Honolulu</value>
  <value>Los Angeles</value>
  <value>San Francisco</value>
  <value>San Diego</value>
</city>
```

Changing Text Fields to Drop-Down Lists

Just as in converting a drop-down list to a text list, you can change the default text fields to drop-down lists, you have to remember to add <value> tags. Below is an example for the Office Phone field. By default it appears as:

```
<officePhone label="Office Phone" type="text" editable="yes"
visible="yes" required="no"></officePhone>
```

To convert the Office Phone to a validated drop-down list simply add new <value> tags such as:

```
<officePhone label="Office Phone" type="text" editable="yes"
visible="yes" required="no" validationFormat="" showExample="no">
  <value>(808) 555-1234</value>
  <value>(415) 555-1234</value>
  <value>(213) 555-1234</value>
  <value>(310) 555-1234</value>
</officePhone>
```

Name Fields

Below is the text from the portion of the APPSETTINGS.XML file that controls the General section, which is where the name information is found.

```
<!-- GENERAL SECTION - User Name and Email Address cannot be changed by
the user. -->
<general visible="yes">
  <userName label="User Name" visible="yes" required="no" />
  <email label="Email Address" visible="yes" required="no" />
  <firstName label="First Name" editable="no" visible="yes"
required="no" />
```

```

    <initials    label="Middle Initials" editable="no" visible="yes"
required="no" />
    <lastName  label="Last Name"          editable="no" visible="yes"
required="no" />
    <displayName label="Display Name"     editable="yes" visible="yes"
required="no" />
</general>

```

In v1.2, we introduced the ability to enable editing of the First Name, Last Name, Middle Initial, and Display Name. You do this by changing `editable="no"` keyword pair to `editable="yes"`. In most organizations **we do not recommend this**, but it is possible if you require it. The result of this change in the APPSETTINGS.XML file is shown in Figure 42.



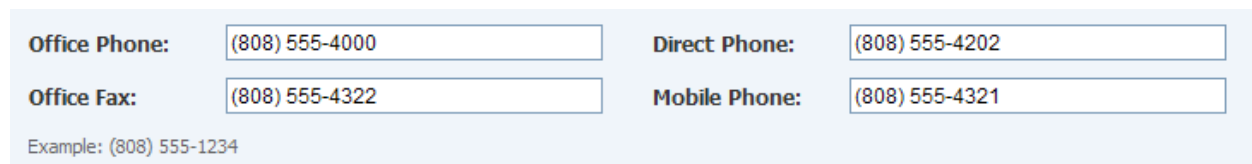
User Name:	JChang	Email Address:	jchang@somorita.com
First Name:	Jordan	Middle Initials:	M
Last Name:	Chang	Display Name:	<input type="text" value="Jordan M. Chang"/>

Please contact the help desk at 555-1234 to modify uneditable fields.

Figure 42: Allowing the user to update the Display Name field

Telephone Number Note Message

If you want to include a note that can help your users when typing in their telephone numbers, there is a tag within the Telephones section called `<note>`. Here you can enter a custom message that that can be displayed following each individual telephone numbers. This is shown in Figure 43.



Office Phone:	<input type="text" value="(808) 555-4000"/>	Direct Phone:	<input type="text" value="(808) 555-4202"/>
Office Fax:	<input type="text" value="(808) 555-4322"/>	Mobile Phone:	<input type="text" value="(808) 555-4321"/>

Example: (808) 555-1234

Figure 43: Telephone number note message below the phone number fields

Here is an example of the `<note>` field in the APPSETTINGS.XML file:

```
<note visible="yes" message="Example: (808) 123 4567 or 808-123-4566"/>
```

Custom Attributes

One of the most commonly requested features in earlier versions of Directory Update was for the ability to place Active Directory custom attributes onto the User Information form. And, of course, for the ability to hide the ones you are not using. The custom attribute section is shown in Figure 44; all of the custom attributes are shown.

Favorite Color:	<input type="text" value="Blue"/>	Spouse's name:	<input type="text" value="Angelina"/>
Favorite food:	<input type="text" value="Rocky Road Ice Cream"/>	Ext Attribute 4:	<input type="text"/>
Ext Attribute 5:	<input type="text"/>	Ext Attribute 6:	<input type="text"/>
Ext Attribute 7:	<input type="text"/>	Ext Attribute 8:	<input type="text"/>
Ext Attribute 9:	<input type="text"/>	Ext Attribute 10:	<input type="text"/>

Evaluation Verion

Figure 44: Custom Attributes revealed

The entire custom attribute section is hidden by default, as is each of the custom attribute fields. You must unhide both the section as well as the fields you want to use. Figure 44 shows all of the Custom Attributes for illustrative purposes. Only the first three have had their labels changed; one of those, Favorite Color, has been switched to a drop-down list.

All of the custom attributes are manipulated using the APPSETTINGS.XML file. Here is an example of the custom attributes section of the XML file:

```
<customAttributes visible="yes">
  <extensionAttribute1 label="Favorite Color" type="dropdown"
  editable="yes" visible="yes" required="no">
    <value>Red</value>
    <value>Blue</value>
    <value>Value 3</value>
  </extensionAttribute1>
  <extensionAttribute2 label="Spouse's name" type="text" editable="yes"
  visible="yes" required="no"></extensionAttribute2>
  <extensionAttribute3 label="Favorite food" type="text" editable="yes"
  visible="yes" required="no"></extensionAttribute3>
  <extensionAttribute4 label="Ext Attribute 4" type="text"
  editable="yes" visible="yes" required="no"></extensionAttribute4>
  <extensionAttribute5 label="Ext Attribute 5" type="text"
  editable="yes" visible="yes" required="no"></extensionAttribute5>
  <extensionAttribute6 label="Ext Attribute 6" type="text"
  editable="yes" visible="yes" required="no"></extensionAttribute6>
  <extensionAttribute7 label="Ext Attribute 7" type="text"
  editable="yes" visible="yes" required="no"></extensionAttribute7>
  <extensionAttribute8 label="Ext Attribute 8" type="text"
  editable="yes" visible="yes" required="no"></extensionAttribute8>
  <extensionAttribute9 label="Ext Attribute 9" type="text"
  editable="yes" visible="yes" required="no"></extensionAttribute9>
  <extensionAttribute10 label="Ext Attribute 10" type="text"
  editable="yes" visible="yes" required="no"></extensionAttribute10>
</customAttributes>
```

Notice in the APPSETTINGS.XML file listing, the entire section is unhidden (i.e. `<customAttributes visible="yes">`) and individual fields have been unhidden by setting the `visible="no"` tag to `visible="yes"`. Notice also that the actual tags are not labeled as 'custom

attributes’, but rather ‘extensionattributes’; this is to match the nomenclature in ~~the~~ Active Directory.

Integrated Windows Authentication

In response to customer requests, starting with **Directory Update** v1.2.5, we have implemented the ability to use Integrated Windows Authentication for user logins. Forms-based authentication remains the default for regular installations, as IWA requires additional customization of the installation process as outlined in this section. Integrated Windows Authentication can only be used in Directory Update v1.2.5 or later.

To enable Integrated Windows Authentication, you must edit the Web.config file that is found in the `\inetpub\wwwroot\DirectoryUpdate` folder (by default). Locate the AUTHENTICATION section and find the `<authentication mode="Forms">` line. Change this so that it reads:

```
<authentication mode="Windows">
```

To ensure that the change was made successfully, run **iisreset** from the command prompt.

Please note that for a user to use Integrated Windows Authentication they must have a computer that is a member of the same Active Directory domain as the Directory Update server and the user must be logged on with their domain account. Further, they must use an Integrated Windows Authentication-enabled browser (currently only the Window’s version of Microsoft’s Internet Explorer, version 6 and above, is known to work), and the browser must be configured to recognize the Directory Update Web site to be in the Local Intranet. (You can confirm this by looking in the lower right hand corner of the Internet Explorer window; see Figure 45.)

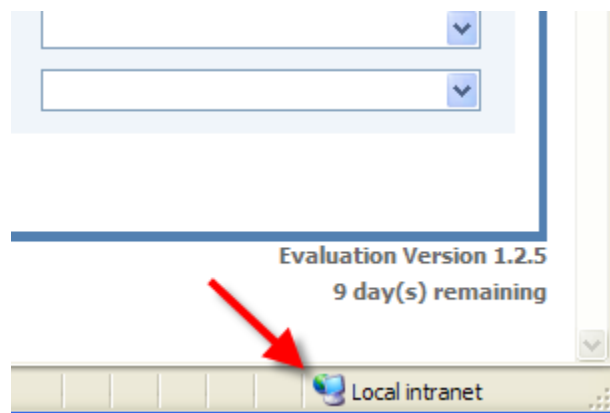


Figure 45: Indication the Web site is in the Local Intranet zone

If the computer on which the user is working is not a member of the Active Directory or if the Local Intranet zone does not include the Directory Update web server, the user will be prompted for their logon credentials with a dialog box similar to Figure 46.

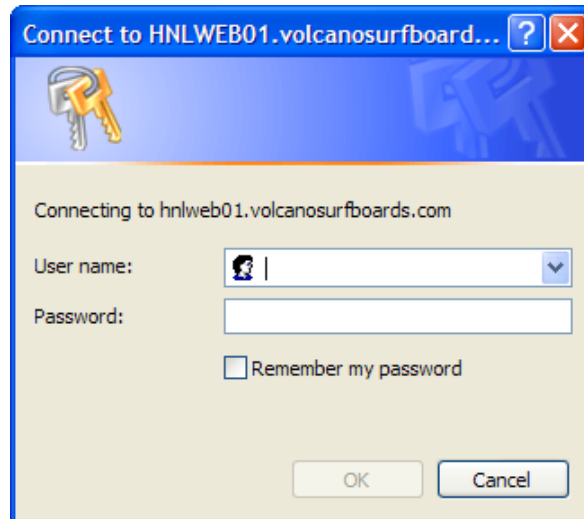


Figure 46: Logging on without forms-based authentication

Authentication Timeout

If users are connected for more than 30 minutes, **Directory Update** will automatically time-out their connection. This is configurable in the **APPSETTINGS.XML** file. Locate the following section in the **APPSETTINGS.XML** file. Change the timeout value to your desired number of minutes. The maximum number of minutes should not exceed 15 minutes.

```
<!-- USER INFORMATION PAGE PROPERTIES -->
<form title="User Information Update" />
<!-- Set a Log Off URL if using Integrated Windows Authentication. -->
<!-- Log off timeout is in minute interval and must be an integer. The
maximum timeout is 15 minutes -->
<logOff URL="" timeout="15" />
```

The time-out only works if the user logs in using forms-based authentication. Timing out a user that has logged in using Integrated Windows Authentication is not possible.

Note that when a user is automatically logged out, the user interface will generate errors if the user tries to use it again after they are disconnected. They should close the browser window, re-open it, connect to **Directory Update** and log back in.

Support and Custom Versions

Support is available for **Directory Update** for free via e-mail only. E-mail questions to support@directory-update.com. Questions are normally answered within **one** business day of receipt. Consulting and customization services are available on an hourly basis.

Troubleshooting

Directory Update is a reasonably simple application to install and configure, provided you have reviewed the installation system requirements and instructions. For users unfamiliar with XML, the APPSETTINGS.XML file's XML format does make things a little more complicated, though. This section will help you through some of the most common configuration problems. We will go into more detail below, but here is a summary list of the most common problems, oversights and suggested steps for resolution:

- Get more exact errors by viewing the error message from the console of the Web Server.
- Start with the APPSETTINGS.XML file that installed with your software
- Ensure that the server is running Windows 2003 (SP1 or R2 is fine).
- Ensure that you have installed the Microsoft .NET Framework v2.0
- Ensure that the /DirectoryUpdate virtual directory's ASP.NET version (on the ASP.NET property page) is set to v2.0.50727.
- Ensure that ASP.NET v2.0.50727 web service extension is enabled in the IIS Admin Web Service Extensions container
- Ensure that the Windows component Application Server's ASP.NET subcomponent is enabled

Check the Console

By default, ASP.NET does not send explicit error messages to the client. This is by design (and default). Therefore, if there is a problem, the error that you see from a browser other than on the web server will be very generic. Figure 47 shows an error in the Web browser window when a client connected to the web server across the network.

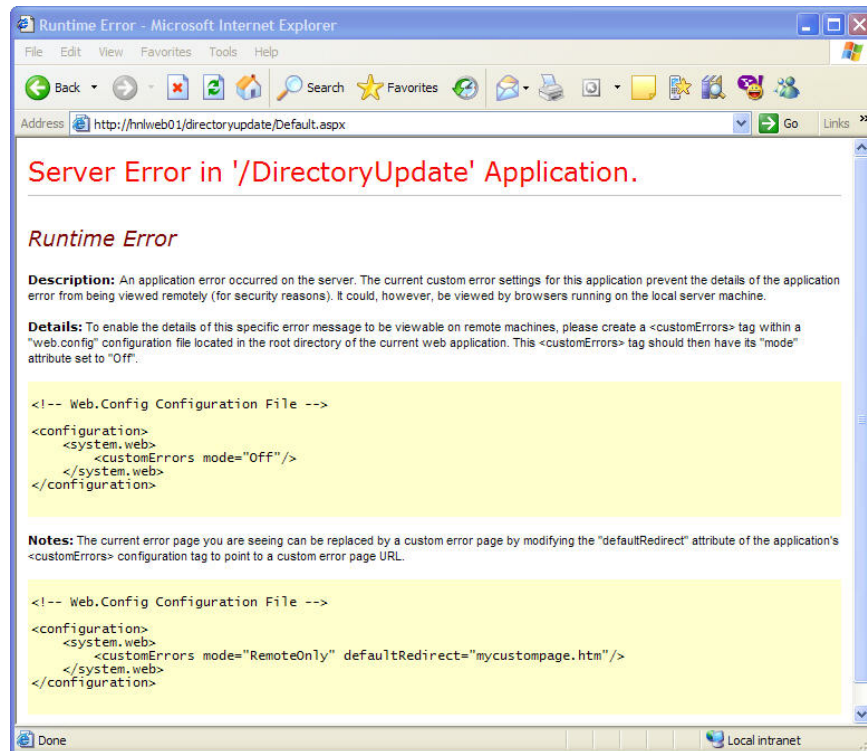


Figure 47: Error viewed remotely

However, if on the same offending web site, you use the web browser from the console of the web server, you will see an entirely different (and improved!) error message. The error shown in Figure 48 is seen from the console of the web server.

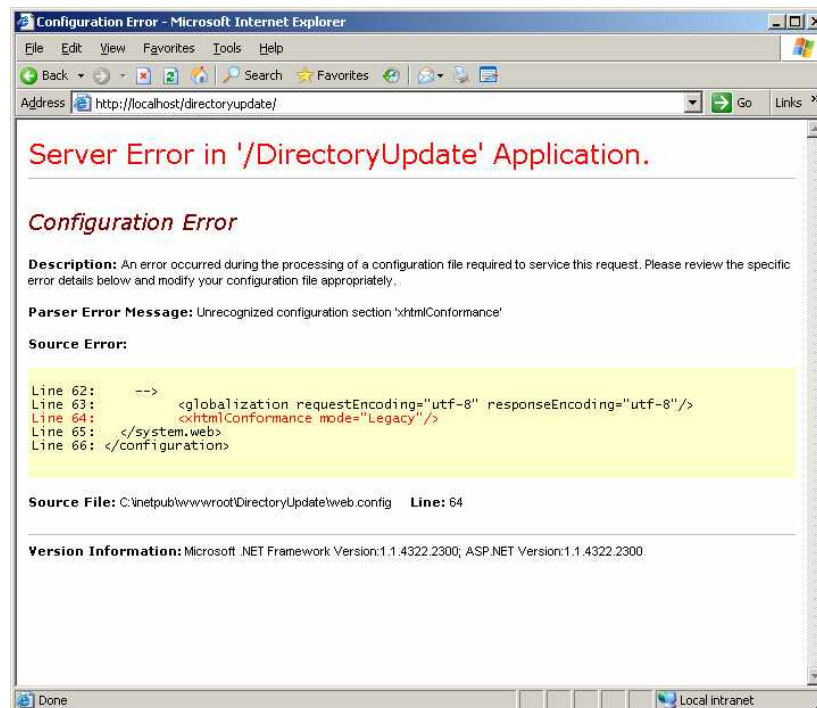


Figure 48: Viewing an error locally

Notice the ASP version information at the bottom of the browser screen? This Directory Update server is mistakenly using ASP.NET v1.1.4322. However, **Directory Update** is an ASP.NET v2.0.50727 application. *Ah ha!* A clue.

APPSETTINGS.XML file

Each version has a unique APPSETTINGS.XML file. When you start configuring **Directory Update**, always start over with the APPSETTINGS.XML file **that was installed** with software. We suggest that you make periodic backups as you customize the application.

NET Framework

The Microsoft .NET Framework **can create a few challenges** because there are a few nit-picky details you need to attend to...

ASP.NET Version

First and foremost, make sure that the Microsoft .NET Framework v2.0 is installed on the web server that hosts **Directory Update**. You do not need to install the entire developer's kit on the web server, just the Microsoft .NET Framework Version 2.0 Redistributable Package (x86), which can be downloaded from Microsoft's web site. (Note you can check Control Panel -> Add/Remove Programs to discover if it is already installed.) Figure 49 confirms that the Microsoft .NET Framework v2.0 is installed on the web server.

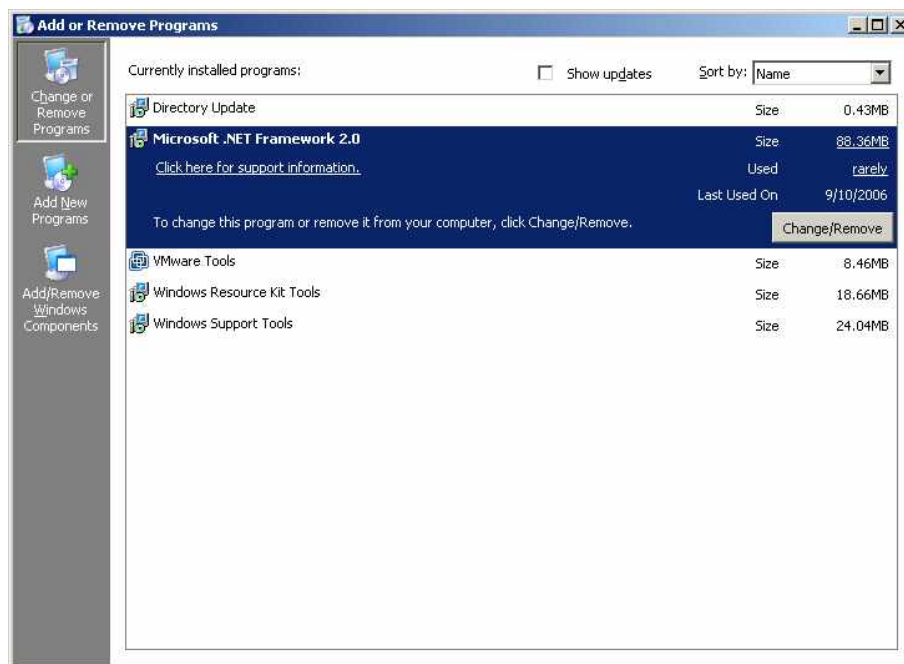


Figure 49: Confirming that the .NET Framework v2.0 is installed

There are a couple of additional places in which you need to confirm that ASP.NET is enabled and working. First, you need to make sure that ASP.NET functions are enabled for the Application Server. You cannot assume that just because you installed the Internet Information Services (IIS) components that the ASP.NET component also got enabled. You can however,

confirm its installation by going to Control Panel -> Add/Remove Programs -> Add/Remove Windows Components -> select Application Server -> and clicking Details. This displays the Application Server components as shown in Figure 50; the checkbox next to ASP.NET must be enabled.

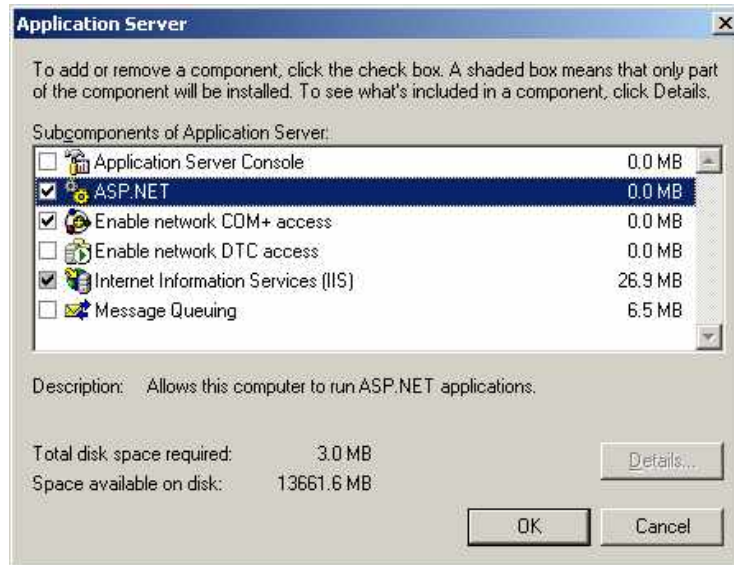


Figure 50: Application Server components must include enabling ASP.NET

Next, in IIS Admin, open the Web Services Extensions folder and confirm that the current version of ASP.NET v2.0 is enabled. The version shown in Figure 51 is v2.0.50727. If it is not enabled, highlight ASP.NET v2.0.50727 and click the Allow button.

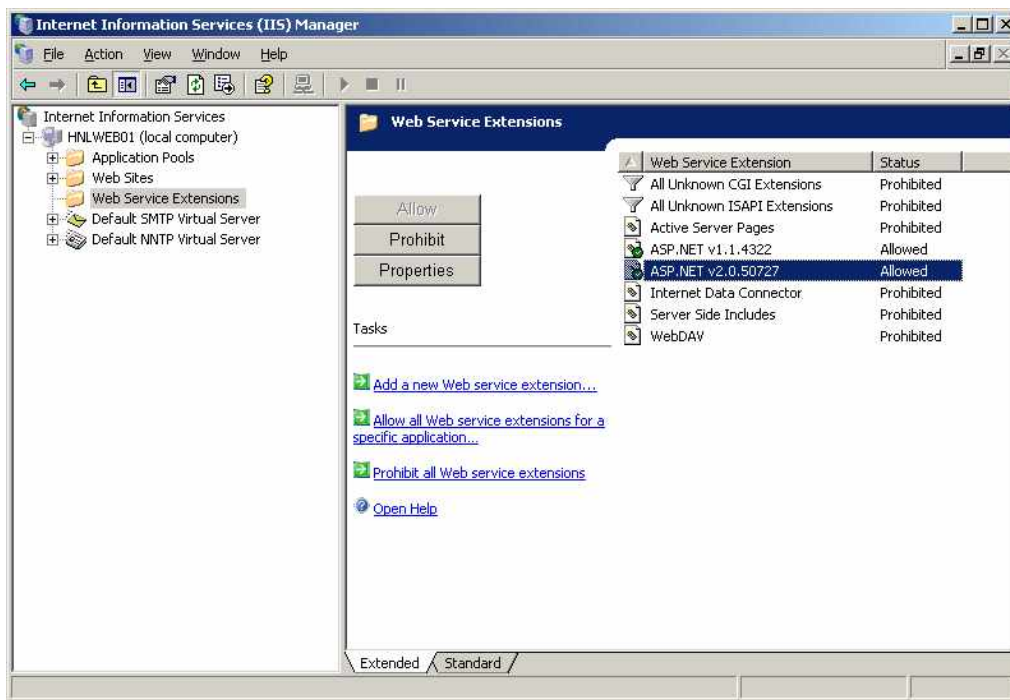


Figure 51: Enabling the ASP.NET v2.0.50727 web service extensions

When managing the web site on which Directory Update is installed, look on the /DirectoryUpdate virtual directory properties to confirm the ASP.NET version. Depending on the default version of ASP.NET that is set for the web site, this may default to v1.1.4322 or earlier. The Directory Update application is specifically written for the Microsoft .NET Framework v2.0; if the supporting APIs are not available and enabled, Directory Update will NOT function.

On the properties of the /DirectoryUpdate virtual directory you will find the ASP.NET property page (shown in Figure 52). Ensure that this is set to 2.0.50727. If a v2.0.50727 selection is not available in the ASP.NET version drop-down list, then ensure that you have installed the Microsoft .NET Framework v2.0.

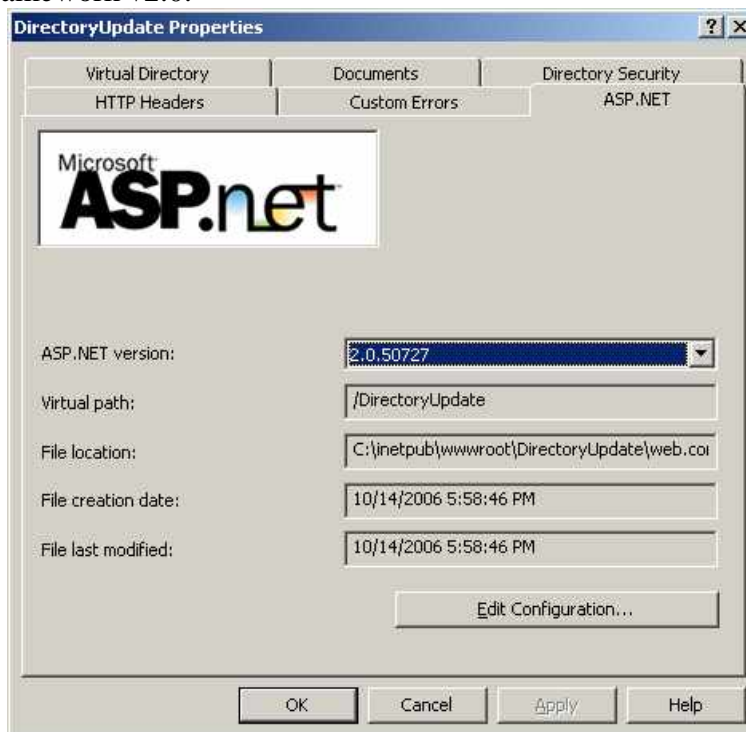


Figure 52: Setting the correct version of ASP.NET on the /DirectoryUpdate virtual directory

Permissions to .NET Framework Temporary Files

In some situations, the NETWORK SERVICE system account will require permissions to write to the .NET Framework temporary files folder. This usually occurs if you are installing **Directory Update** on a domain controller. You must give the NETWORK SERVICE permissions to write to the following folder:

C:\WINDOWS\Microsoft.NET\Framework\v2.0.50727\Temporary ASP.NET Files

This permission is not set automatically by Directory Update. You must do this during the setup. If not, you will get the Server Error shown in Figure 53. Note that the image shown in Figure 53 was taken when viewed at the local server console.

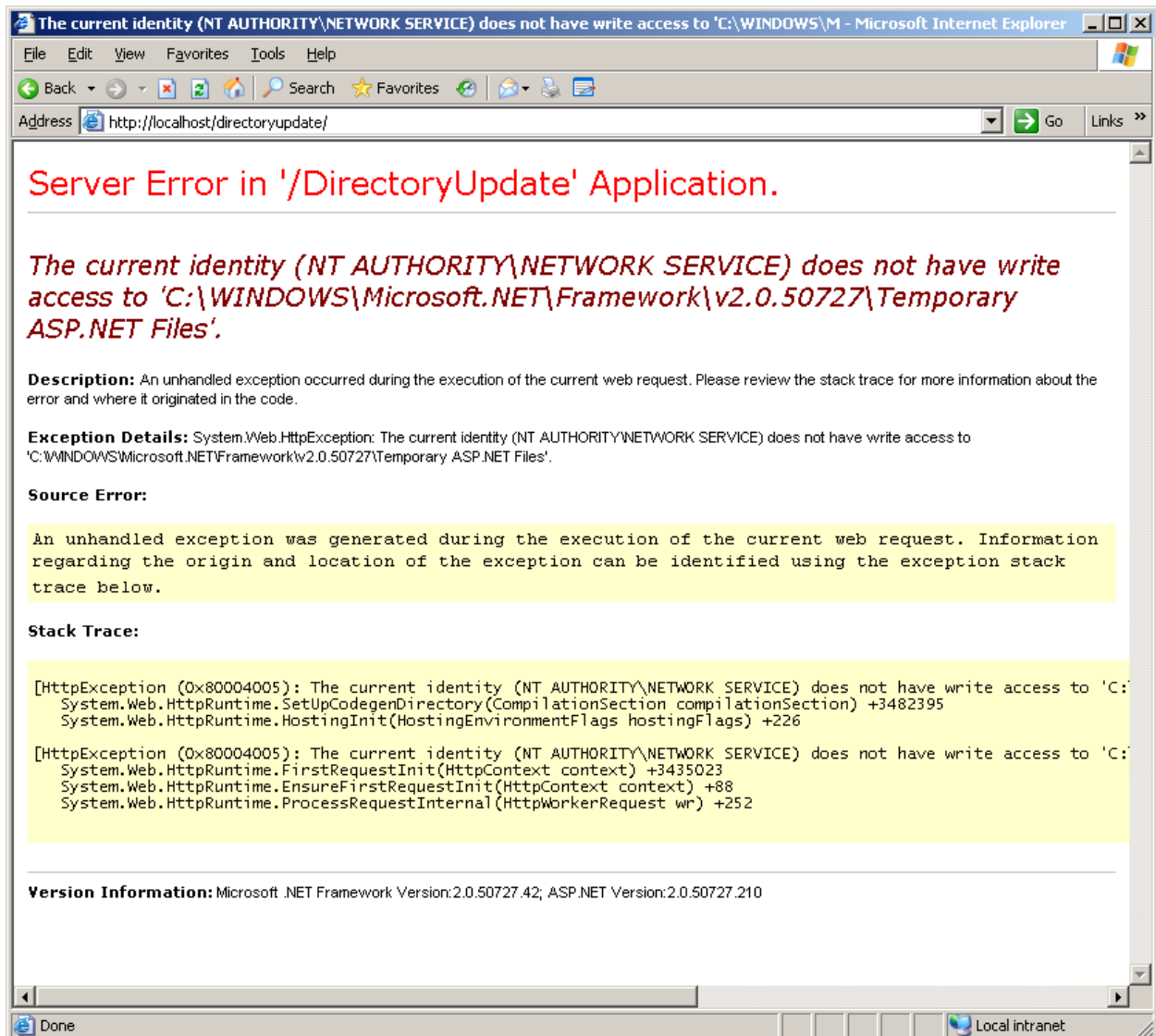


Figure 53: Permissions required to .NET Temporary Files folder

To fix this problem, use Windows Explorer and navigate to the following folder:
 C:\WINDOWS\Microsoft.NET\Framework\v2.0.50727

Select the Temporary ASP.NET Files folder and display its properties. Click on the Security property page. Add the Network Service user to the user list and assign that user Modify, Read & Execute, List Folder Contents, Read, and Write permissions (as shown in Figure 54).

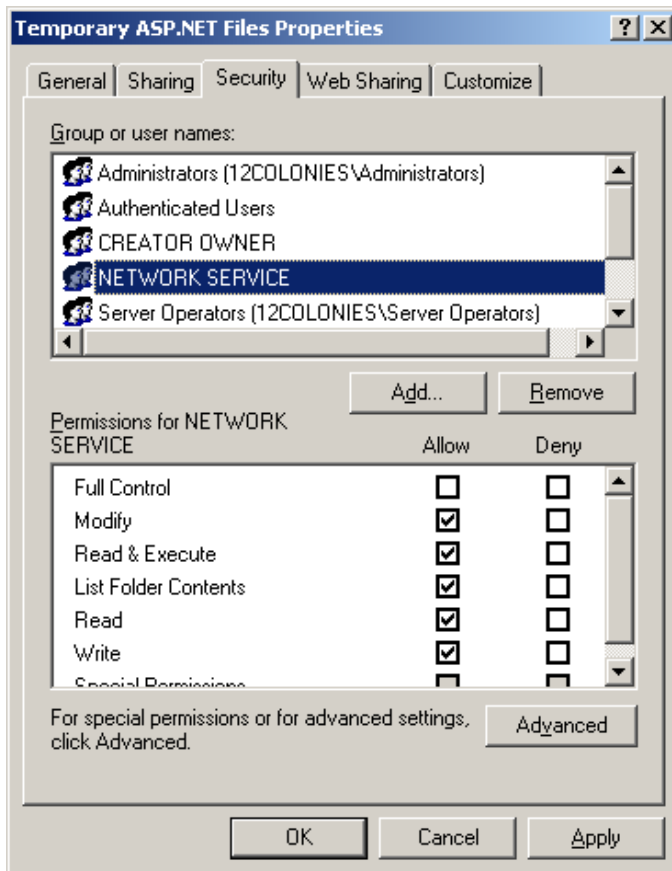


Figure 54: Assigning the NETWORK SERVICE account permissions

Supported Attributes

In all current versions of **Directory Update**, the attributes that we support are hard-coded into the Directory Update DLL. Not all attributes need to be displayed on the User Information form, though. We have tried hard to include every attribute that most company's require. If you have made schema extensions, contact us about custom programming, as we may be able to add your additional attributes to our interface. The following is a list of the attributes (and the corresponding LDAP attribute name for each) that may be displayed on the User Information form.

General section

First name - givenName
Middle initial - initials
Last name - sn
Display name - displayName
Email address - email

Organization section

Company name - company
Office - physicalDeliveryOffice
Department - department
Title - title
Employee ID - employeeID
Employee Number - employeeNumber
Employee Type - employeeType
Manager - manager
Secretary - secretary
Assistant - assistant

Telephone section

Office phone - telephoneNumber
Office fax - facsimileTelephoneNumber
Other fax - otherFacsimileTelephoneNumber
Home Phone - homePhone
Mobile Phone - mobile
Other Mobile Phone - otherMobile
Pager - pager
IP Phone - ipPhone
Assistant Phone - telephoneAssistant

Address section

Street Address - streetAddress
Post Office Box - postOfficeBox
City - l
State - st
Zip or Postal Code - postalCode
Country - (Ties to c, co, and countryCode)

Custom Attributes section *(hidden by default)*

Custom Attribute 1 - extensionAttribute1

Custom Attribute 2 - extensionAttribute2
Custom Attribute 3 - extensionAttribute3
Custom Attribute 4 - extensionAttribute4
Custom Attribute 5 - extensionAttribute5
Custom Attribute 6 - extensionAttribute6
Custom Attribute 7 - extensionAttribute7
Custom Attribute 8 - extensionAttribute8
Custom Attribute 9 - extensionAttribute9
Custom Attribute 10 - extensionAttribute10

Additional Info section (*hidden by default*)

Web Page - wWWHomePage
Description – description

Notes section (*hidden by default*)

Notes - info

Sample Directory Update APPSETTINGS.XML File

[Pink text below is possible formatting changes to make settings file more readable. Also see note at end.]

```
<?xml version="1.0" encoding="utf-8" ?>

<!-- DIRECTORY UPDATE - APPSETTINGS.XML file version 1.2.6
All customization for Directory Update are performed in this file.
Entire sections (General, Organization, Telephones, and Address) can be hidden by
changing the visibile="yes"
option to visible="no" in the section tag.
For each attribute:
- The label displayed on the user information page can be changed using the "label="
option.
- The attribute can be hidden by changing visible="yes" option to visible="no".
- The attribute can be visible but not editable by changing editable="yes" option to
editable="no".
- The attribute can be a text box or a dropdown list by setting the type= option to
either "text" or "dropdown".
If an attribute is configured to be a dropdown list, it must include values in the
<value> </value> tags.
-->

<settings>
  <!-- LOG ON PAGE - The domain name can be hidden by changing visible="yes" option to
visible="no". -->
  <domainName visible="yes"></domainName>

  <!-- USER INFORMATION PAGE PROPERTIES -->
  <pageTitle>Directory Update</pageTitle>
  <logoPath>images/directory_update_logo.gif</logoPath>
  <formTitle>User Information Update</formTitle>
  <logOffURL></logOffURL>
  <helpPopup title="Help">Please contact the help desk at 555-1234 to modify
uneditable fields.</helpPopup>
  <confirmationPopup>You have successfully updated your
information.</confirmationPopup>
  <directory>

  <!-- GENERAL SECTION - User Name and Email Address cannot be modified by the user.
-->
  <!-- ##### GENERAL SECTION ##### -->
  <!-- User Name and Email Address cannot be modified by the user. -->
  [added paragraph return]
  <general visible="yes">
    <firstName label="First Name" editable="no" visible="yes" />
    <initials label="Middle Initials" editable="no" visible="yes" />
    <lastName label="Last Name" editable="no" visible="yes" />
    <displayName label="Display Name" editable="no" visible="yes" />
    <userName label="User Name" visible="yes" />
    <email label="Email Address" visible="yes" />
    <noteMessage visible="yes">Please contact the help desk at 555-1234 to modify
uneditable fields.</noteMessage>
  </general>
```

```

<!-- ORGANIZATION SECTION -->
<!-- ##### ORGANIZATION SECTION ##### -->
    [added paragraph return]
<organization visible="yes">
  <company label="Company" type="dropdown" editable="yes" visible="yes">
    <value>Somorita Surfboards</value>
    <value>Volcano Surfboards & Smoothies Shop</value>
    <value>Bob's Boogie Boards</value>
  </company>
  <office label="Office" type="text" editable="yes" visible="yes">
    <value>Denver</value>
    <value>Honolulu</value>
    <value>Los Angeles</value>
    <value>San Francisco</value>
    <value>San Diego</value>
  </office>
  <department label="Department" type="dropdown" editable="yes" visible="yes">
    <value>Accounting</value>
    <value>Development</value>
    <value>Engineering</value>
    <value>Human Resources</value>
    <value>Sales & Marketing</value>
  </department>
  <title label="Title" type="text" editable="yes" visible="yes">
    <value>Manager</value>
    <value>President</value>
    <value>Sale</value>
    <value>Vice President</value>
  </title>
  <!-- Employee ID, Employee Name and Employee Type are not visible by default -->
  <employeeID label="Employee ID" type="text" editable="yes"
visible="no"></employeeID>
  <employeeNumber label="Employee Number" type="text" editable="yes"
visible="no"></employeeNumber>
  <employeeType label="Employee Type" type="text" editable="yes"
visible="no"></employeeType>
</organization>

<!-- TELEPHONE SECTION -->
<!-- ##### TELEPHONE SECTION ##### -->
    [added paragraph return]
<telephones visible="yes">
  <officePhone label="Office Phone" type="text" editable="yes"
visible="yes"></officePhone>
  <otherOfficePhone label="Other Office Phone" type="text" editable="yes"
visible="no"></otherOfficePhone>
  <fax label="Office Fax" type="text" editable="yes"
visible="yes"></fax>
  <otherFax label="Other Office Fax" type="text" editable="yes"
visible="no"></otherFax>
  <homePhone label="Home Phone" type="text" editable="yes"
visible="yes"></homePhone>
  <mobile label="Mobile Phone" type="text" editable="yes"
visible="yes"></mobile>
  <otherMobile label="Other Mobile Phone" type="text" editable="yes"
visible="no"></otherMobile>
  <pager label="Pager" type="text" editable="yes"
visible="yes"></pager>
  <ipPhone label="IP Phone" type="text" editable="yes"
visible="yes"></ipPhone>

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    <assistantPhone label="Assistant Phone" type="text" editable="yes"
visible="no"></assistantPhone>
    <noteMessage visible="yes">Example: +49 8236 123 4567</noteMessage>
</telephones>

<!-- ADDRESS SECTION -->
<!-- ##### ADDRESS SECTION ##### -->
    [added paragraph return]
    <address visible="yes">
        <streetAddress label="Street Address" type="text" editable="yes"
visible="yes"></streetAddress>
        <postOfficeBox label="P.O. Box" type="text" editable="yes"
visible="yes"></postOfficeBox>
        <city label="City" type="text" editable="yes" visible="yes">
            <value>Denver</value>
            <value>Honolulu</value>
            <value>Los Angeles</value>
            <value>San Francisco</value>
            <value>San Diego</value>
        </city>
        <stateOrProvince label="State/Province" type="dropdown" editable="yes"
visible="yes">
            <value>Alabama</value>
            <value>Alaska</value>
            <value>Arizona</value>
            <value>Arkansas</value>
            <value>California</value>
            <value>Colorado</value>
            <value>Connecticut</value>
            <value>Delaware</value>
            <value>District of Columbia</value>
            <value>Florida</value>
            <value>Georgia</value>
            <value>Hawaii</value>
            <value>Idaho</value>
            <value>Illinois</value>
            <value>Indiana</value>
            <value>Iowa</value>
            <value>Kansas</value>
            <value>Kentucky</value>
            <value>Louisiana</value>
            <value>Maine</value>
            <value>Maryland</value>
            <value>Massachusetts</value>
            <value>Michigan</value>
            <value>Minnesota</value>
            <value>Mississippi</value>
            <value>Missouri</value>
            <value>Montana</value>
            <value>Nebraska</value>
            <value>Nevada</value>
            <value>New Hampshire</value>
            <value>New Jersey</value>
            <value>New Mexico</value>
            <value>New York</value>
            <value>North Carolina</value>
            <value>North Dakota</value>
            <value>Ohio</value>
            <value>Oklahoma</value>
            <value>Oregon</value>
            <value>Pennsylvania</value>
            <value>Rhode Island</value>

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```
<value>South Carolina</value>
<value>South Dakota</value>
<value>Tennessee</value>
<value>Texas</value>
<value>Utah</value>
<value>Vermont</value>
<value>Virginia</value>
<value>Washington</value>
<value>West Virginia</value>
<value>Wisconsin</value>
<value>Wyoming</value>
</stateOrProvince>
<zipOrPostalCode label="Zip/Postal code" type="text" editable="yes"
visible="yes"></zipOrPostalCode>
<!-- Country can be only a dropdown. Country codes must not be changed. These
are ISO 3166 codes -->
<!-- See http://userpage.chemie.fu-berlin.de/diverse/doc/ISO\_3166.html for
additional codes -->
<!-- When customizing, if your organization only uses a few of these, you can
delete the unwanted lines -->
<country label="Country" editable="yes" visible="yes">
  <value code="US" countryCode="840">United States</value>
  <value code="GB" countryCode="826">United Kingdom</value>
  <value code="AF" countryCode="004">Afghanistan</value>
  <value code="AS" countryCode="016">American Samoa</value>
  <value code="AR" countryCode="032">Argentina</value>
  <value code="AW" countryCode="533">Aruba</value>
  <value code="AU" countryCode="036">Australia</value>
  <value code="AT" countryCode="040">Austria</value>
  <value code="BS" countryCode="044">Bahamas</value>
  <value code="BH" countryCode="048">Bahrain</value>
  <value code="BB" countryCode="052">Barbados</value>
  <value code="BY" countryCode="112">Belarus</value>
  <value code="BE" countryCode="056">Belgium</value>
  <value code="BM" countryCode="060">Bermuda</value>
  <value code="BO" countryCode="068">Bolivia</value>
  <value code="BA" countryCode="070">Bosnia and Herzegowina</value>
  <value code="BR" countryCode="076">Brazil</value>
  <value code="BG" countryCode="100">Bulgaria</value>
  <value code="KH" countryCode="116">Cambodia</value>
  <value code="CA" countryCode="124">Canada</value>
  <value code="KY" countryCode="136">Cayman Islands</value>
  <value code="CL" countryCode="152">Chile</value>
  <value code="CN" countryCode="156">China</value>
  <value code="CO" countryCode="170">Colombia</value>
  <value code="CR" countryCode="188">Costa Rica</value>
  <value code="CU" countryCode="192">Cuba</value>
  <value code="CY" countryCode="196">Cyprus</value>
  <value code="CZ" countryCode="203">Czech Republic</value>
  <value code="DO" countryCode="214">Dominican Republic</value>
  <value code="EC" countryCode="218">Ecuador</value>
  <value code="EG" countryCode="818">Egypt</value>
  <value code="SV" countryCode="222">El Salvador</value>
  <value code="EE" countryCode="233">Estonia</value>
  <value code="ET" countryCode="231">Ethiopia</value>
  <value code="FJ" countryCode="242">Fiji</value>
  <value code="FI" countryCode="246">Finland</value>
  <value code="FR" countryCode="250">France</value>
  <value code="GE" countryCode="268">Germany</value>
  <value code="GH" countryCode="288">Ghana</value>
  <value code="GI" countryCode="292">Gibraltar</value>
  <value code="GR" countryCode="300">Greece</value>
```

```
<value code="GL" countryCode="304">Greenland</value>
<value code="GU" countryCode="316">Guam</value>
<value code="GT" countryCode="320">Guatemala</value>
<value code="HT" countryCode="332">Haiti</value>
<value code="HN" countryCode="340">Honduras</value>
<value code="HK" countryCode="344">Hong Kong</value>
<value code="HU" countryCode="348">Hungary</value>
<value code="IN" countryCode="356">India</value>
<value code="ID" countryCode="360">Indonesia</value>
<value code="IR" countryCode="364">Iran (Islamic Republic of)</value>
<value code="IQ" countryCode="368">Iraq</value>
<value code="IE" countryCode="372">Ireland</value>
<value code="IL" countryCode="376">Israel</value>
<value code="IT" countryCode="380">Italy</value>
<value code="JM" countryCode="388">Jamaica</value>
<value code="JP" countryCode="392">Japan</value>
<value code="JO" countryCode="400">Jordan</value>
<value code="KZ" countryCode="398">Kazakhstan</value>
<value code="KR" countryCode="410">Korea, Republic of</value>
<value code="KW" countryCode="414">Kuwait</value>
<value code="LA" countryCode="418">Lao People's Democratic Republic</value>
<value code="LV" countryCode="428">Latvia</value>
<value code="LB" countryCode="422">Lebanon</value>
<value code="LR" countryCode="430">Liberia</value>
<value code="LY" countryCode="434">Libyan Arab Jamahiriya</value>
<value code="LI" countryCode="438">Liechtenstein</value>
<value code="LT" countryCode="440">Lithuania</value>
<value code="LU" countryCode="442">Luxembourg</value>
<value code="MO" countryCode="446">Macau</value>
<value code="MK" countryCode="807">Macedonia, The Former Yugoslav Republic
of</value>
<value code="MY" countryCode="458">Malaysia</value>
<value code="MV" countryCode="462">Maldives</value>
<value code="MX" countryCode="484">Mexico</value>
<value code="FM" countryCode="538">Micronesia, Federated States of</value>
<value code="MC" countryCode="492">Monaco</value>
<value code="MN" countryCode="496">Mongolia</value>
<value code="MS" countryCode="500">Montserrat</value>
<value code="MA" countryCode="504">Morocco</value>
<value code="NP" countryCode="524">Nepal</value>
<value code="NL" countryCode="528">Netherlands</value>
<value code="NZ" countryCode="554">New Zealand</value>
<value code="NI" countryCode="558">Nicaragua</value>
<value code="NG" countryCode="566">Nigeria</value>
<value code="NO" countryCode="578">Norway</value>
<value code="OM" countryCode="512">Oman</value>
<value code="PK" countryCode="586">Pakistan</value>
<value code="PS" countryCode="275">Palestian Territory, Occupied</value>
<value code="PA" countryCode="591">Panama</value>
<value code="PG" countryCode="598">Paraguay</value>
<value code="PE" countryCode="604">Peru</value>
<value code="PH" countryCode="608">Philippines</value>
<value code="PL" countryCode="616">Poland</value>
<value code="PT" countryCode="620">Portugal</value>
<value code="PR" countryCode="630">Puerto Rico</value>
<value code="QT" countryCode="634">Qatar</value>
<value code="RO" countryCode="642">Romania</value>
<value code="RU" countryCode="643">Russian Federation</value>
<value code="SA" countryCode="682">Saudia Arabia</value>
<value code="CS" countryCode="891">Serbia and Montenegro</value>
<value code="SG" countryCode="702">Singapore</value>
<value code="SI" countryCode="705">Slovenia</value>
```

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<value code="SO" countryCode="706">Somalia</value>
<value code="ZA" countryCode="710">South Africa</value>
<value code="ES" countryCode="724">Spain</value>
<value code="LK" countryCode="144">Sri Lanka</value>
<value code="SD" countryCode="736">Sudan</value>
<value code="SE" countryCode="752">Sweden</value>
<value code="CH" countryCode="756">Switzerland</value>
<value code="SY" countryCode="760">Syrian Arab Republic</value>
<value code="TW" countryCode="158">Taiwan</value>
<value code="TH" countryCode="764">Thailand</value>
<value code="TO" countryCode="776">Tonga</value>
<value code="TT" countryCode="780">Trinidad and Tobago</value>
<value code="TR" countryCode="792">Turkey</value>
<value code="UA" countryCode="804">Ukraine</value>
<value code="AE" countryCode="784">United Arab Emirates</value>
<value code="UY" countryCode="858">Uruguay</value>
<value code="UZ" countryCode="860">Uzbekistan</value>
<value code="VA" countryCode="336">Vatican City State (Holy See)</value>
<value code="VE" countryCode="862">Venezuela</value>
<value code="VN" countryCode="704">Viet Nam</value>
<value code="887" countryCode="887">Yemen</value>
</country>
</address>

<!-- CUSTOM ATTRIBUTES are not visible by default -->
<!-- ##### CUSTOM ATTRIBUTESW SECTION ##### -->
    [added paragraph return]
    <customAttributes visible="no">
        <extensionAttribute1 label="Ext Attribute 1" type="dropdown" editable="yes"
visible="no">
            <value>Value 1</value>
            <value>Value 2</value>
            <value>Value 3</value>
        </extensionAttribute1>
        <extensionAttribute2 label="Ext Attribute 2" type="text" editable="yes"
visible="no"></extensionAttribute2>
        <extensionAttribute3 label="Ext Attribute 3" type="text" editable="yes"
visible="no"></extensionAttribute3>
        <extensionAttribute4 label="Ext Attribute 4" type="text" editable="yes"
visible="no"></extensionAttribute4>
        <extensionAttribute5 label="Ext Attribute 5" type="text" editable="yes"
visible="no"></extensionAttribute5>
        <extensionAttribute6 label="Ext Attribute 6" type="text" editable="yes"
visible="no"></extensionAttribute6>
        <extensionAttribute7 label="Ext Attribute 7" type="text" editable="yes"
visible="no"></extensionAttribute7>
        <extensionAttribute8 label="Ext Attribute 8" type="text" editable="yes"
visible="no"></extensionAttribute8>
        <extensionAttribute9 label="Ext Attribute 9" type="text" editable="yes"
visible="no"></extensionAttribute9>
        <extensionAttribute10 label="Ext Attribute 10" type="text" editable="yes"
visible="no"></extensionAttribute10>
    </customAttributes>

    <!-- ADDITIONAL INFO SECTION -->
    <!-- ##### ADDITIONAL INFO SECTION ##### -->
        [added paragraph return]
        <additionalInfo visible="no">
            <description label="Description" type="text" editable="yes"
visible="no"></description>

```

```
<webPage label="Web Page" type="text" editable="yes"
visible="no"></webPage>
</additionalInfo>

<!-- NOTE SECTION -->
<!-- ##### NOTES_SECTION ##### -->
      [added paragraph return]
<notes visible="no">
  <notes label="Notes" type="text" editable="yes" visible="no"></notes>
</notes>
</directory>
</settings>
```

.NET web application	6	Firefox.....	12
Account Operators	13	form title.....	30
Active Directory Users and Computers ...	34, 35	forms-based authentication	45
APPSETTINGS.XML	23, 28, 29, 30, 31, 33, 38, 39, 40, 41, 55	GALMOD.....	6
APPSETTINGS_TEMPLATE.XML.....	29	General.....	26
ASP.NET	13	Global Address List	6
assistant.....	34	global catalog	19, 20
Assistant.....	35	hidden.....	5, 27, 30, 38, 40
Attribute labels.....	See field labels	hide.....	28, 39
attributes.....	12, 53	hiding fields	38
authentication mode.....	45	IIS.....	13
authentication timeout.....	46	iisreset	45
BackOffice Resource Kit.....	6	insert a link.....	30
confirmation message	32	install.....	19
Consulting.....	46	installation.....	19
custom attribute.....	9, 44	Integrated Windows Authentication	45
custom attribute section	43	least permission.....	14
Custom Attributes	28	least permissions	13
Customization	26	license key.....	19, 21, 24
customization services	46	license key updater.....	23
default web site	19	limitations	12
delegate control.....	14	localized	26
Delegation of Control Wizard.....	17	Log Off	30
directory settings.....	20	lookup button	34
Directory Settings updater	23	Manager attribute	35
Directory Update Banner	29, 30	maximum field.....	12
DNS domain name	19	maximum field length.....	12
Domain Admins	13	Name Fields	42
domain controller.....	12, 13, 19, 21	NetBIOS domain name	20
dropdown	See drop-down	NETWORK SERVICE.....	22
drop-down.....	6, 12, 27, 28, 40, 41	Organization.....	27
drop-down.....	42	organization name	19, 21
drop-down.....	42	Outlook	6
drop-down.....	42	page title.....	29
Editable Fields	40	pop-up blockers.....	32
Employee ID.....	8	property sets.....	17
Employee Type	8	provisioning systems.....	6
evaluation version.....	21	regular expressions.....	8
Exchange.....	6	required fields	37
Exchange Resource Kit.....	6	restrictions.....	12
extensionattributes	45	Safari.....	12
field labels.....	33	secretary	34
		Secretary	35
		security context.....	13
		service account.....	13, 20

setup	19
Style Sheet	29
Support.....	46
tags	29
time-out.....	46
Troubleshooting	48
User Information.....	26, 28

User Information form	31, 38, 39
Validated Drop-Down Lists.....	41
validated information	7
visible	38
Web.config.....	45
World Wide Web Service	13