Microsoft *TechNet*

Windows XP Professional Resource Kit
Multilingual Solutions for Global Business

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A large number of corporations do business internationally, have employees or customers that communicate using more than one language, or have a need to create a single global corporate desktop image or a single code base to develop and test applications. To meet the needs of today's global business environment, Microsoft Windows XP Professional includes desktop configurations and application support designed to ensure multilingual compatibility.

For information on how to obtain the Windows XP Professional Resource Kit in its entirety, please see http://www.microsoft.com/mspress/books/6795.asp.

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- For more information about supporting mobile users, see Chapter 7, "Supporting Mobile Users."

- For more information about configuring remote desktops, see Chapter 8, "Configuring Remote Desktop."

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Overview

Windows XP Professional supports companies that need to allow users (employees or customers) to work in more than one language. Typically, these companies:

- Operate internationally and must support different regional options, such as time zones, currencies, or date formats.

- Have employees or customers who speak different languages or require language-dependent keyboards or input devices.

- Develop internal line-of-business applications that must run internationally or in more than one language.

In This Article

Table 3-1 presents an overview of the most common problems that multilingual and international organizations face, and it outlines the possible solutions that you can apply to your Windows XP Professional deployment.

Table 3-1 Problems and Solutions for Global Business

Problem	Solution
Users need to edit documents that contain multiple languages.	All versions of Windows XP Professional contain support for editing documents in multiple languages. Some versions might require the installation of additional language collections. For advanced multilingual support—such as localized language user interface elements, dictionaries, and proofing tools—deploy Microsoft Windows XP Professional Multilingual User Interface Pack (MUI Pack) together with the Microsoft Office XP Multilingual User Interface Pack.
Regional offices need automatic operating system deployments with the correct language and regional options, such as the default input language, date, time, and currency formats.	Determine each office's language and regional needs to help reduce the number of unique setup scripts. For each unique setup script, specify the appropriate [RegionalSettings] values in the answer file, and use new keywords to set the default standards and formats and input language/keyboard layout combination for the default user account for new users.
Roaming users need to log on anywhere in their native languages.	Consider using Windows XP Professional MUI Pack for desktops if roaming users must log on in a native language user interface. Use Active Directory directory service and Group Policy to publish MUI Pack language packages to users so that they can install the correct user interface language wherever they log on.
Multiple users need to log on to the same computer in different languages.	Consider using Windows XP Professional MUI Pack for desktops if users must log on in a native language user interface. Use Terminal Services Client to support different language sessions for different users sharing computers connected to a Microsoft Windows 2000 Server MultiLanguage Version–based computer running Terminal Services.
Users need language-specific keyboards, Input Method Editors, or alternative input devices.	Windows XP Professional contains built-in support for a variety of keyboard layouts and input methods and devices. Install additional language collections and input languages as needed. Place the On-Screen Keyboard on desktops where the physical keyboard might not match the operating system language version in use.
Existing line-of-business applications must accommodate language and regional differences.	Ensure proper code page support for applications developed under older operating systems; test applications by changing the language for non-Unicode programs and default input languages.
Application developers want to create single code-based applications	Deploy Windows XP Professional MUI Pack internationally as the desktop standard; develop applications in Unicode that support the

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that run in the correct local language.	multilingual user interface. Write applications that check for the default user interface language and follow world-ready software development guidelines.
Sites on the corporate intranet must account for language and regional differences.	Use the Location setting to configure desktop browsers to receive appropriate local content, such as local weather or news.
IT wants to do simultaneous worldwide rollouts of hotfixes, patches, and Service Packs.	Deploy Windows XP Professional MUI Pack as the global desktop standard.
Users need to share folders or files containing text in other languages.	Ensure that only Unicode characters are used for Active Directory and other folder and file names; install the Complex Script and Right-to-Left or East Asian Language Collections as needed.

New Multilingual Features in Windows XP Professional

Windows XP Professional includes technologies that enhance your company's ability to do business in multiple languages and/or across multiple countries/regions.

Support for 160 locales

Versions of Microsoft Windows earlier than Windows XP Professional support up to 126 locales. Windows XP Professional adds support for ten additional locales, and Service Pack 2 for Windows XP adds support for an additional 24 locales, bringing the total up to 160 locales.

Built-in language support

Each language version of Windows XP Professional provides built-in support for editing documents in hundreds of languages, grouped into three language collections. The Basic Language Collection, which is always installed, supports most Western languages. The Complex Script and Right-to-Left Language Collection can be installed to support languages such as Arabic, Hebrew, Indic, or Thai, and the East Asian Language Collection can be installed to support Simplified or Traditional Chinese, Japanese, or Korean.

Users can change input languages, keyboard layouts, and other regional options (except for the language for non-Unicode programs) without restarting the computer for the changes to take effect. Administrators can customize the desktop with new tools, such as the Language Toolbar, to simplify switching languages, keyboard layouts, and other regional options.

Redesigned Regional and Language Options Control Panel

The Control Panel for regional and language options has been redesigned to make it easier to add and change input languages and keyboard layouts; change standards and formats for displaying dates, amounts, and currencies; set the default location for Web content; and change the language for non-Unicode programs. The most frequently used options are now easier to find and use.

New, simplified terminology

The terminology used in versions of Windows earlier than Windows XP Professional has been updated to simpler, more descriptive terms:

- *Standards and Formats*, which determines the formats used to display dates,

times, currency, numbers, and the sorting order of text, was previously called the *User Locale*.

- *Input Language*, which specifies the combination of the language and keyboard layout used to enter text, was previously called the *Input Locale*.

- *Language for Non-Unicode Programs*, which specifies the default code pages and fonts for running non-Unicode programs, was previously called the *System Locale*.

Additional answer file and Unattended mode Setup options

Windows XP Professional includes four new language keys that you can use in the [RegionalSettings] section of answer files. These keys make it easier for administrators to customize language settings, such as the default input language for new user accounts. Other features provide more options for customizing Unattended mode setups and silent configurations after setup.

Updated multilingual troubleshooter

The Multilingual Document Consultant in Windows XP Professional Help and Support Center can assist you in diagnosing and resolving problems with displaying or entering different languages.

Improved Windows XP Professional Multilingual User Interface Pack

The Windows XP Professional Multilingual User Interface Pack (MUI Pack) ensures that most of the operating system user interface—including the Start and Programs menus, alerts and dialog boxes, and the Windows XP Professional Help and Support Center—appears in the localized language that has been selected as the default. (In Microsoft Windows 2000 Professional MultiLanguage Version, for example, a user who switches the user interface language to German might still find some user interface elements displayed in English.)

Although it is based on the code of the Microsoft Windows XP Professional International English language version, the MUI Pack also includes more localized components that make it easier to develop multilingual applications. New Windows Installer MUI language packages reduce storage space requirements on network servers or CD images and make it easier for administrators to set up, and for users to install, additional user interface languages. The MUI Pack also includes improved local language drivers, makes roaming easier, and simplifies remote administration over a corporate network.

Note The Windows XP Professional MUI Pack is available only through Volume Licensing programs and OEMs. The MUI Pack is not available through retail channels. The Windows XP Tablet PC Edition 2005 MUI Pack is available directly to end users via download from http://www.microsoft.com/downloads/details.aspx?FamilyID=ac1c6f5a-bace-425b-bc60-f8d3331c89a3&displaylang=en.

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Multilingual Features in Windows XP Professional

This section introduces some key features, concepts, and terms you need to understand as you work with a multilingual or international deployment of Windows XP Professional. Included are discussions of basic concepts, such as language collections, the use of alternative keyboard layouts, Input Method Editors, and Unicode, as well as descriptions of new terms introduced with Windows XP Professional.

Note On a Microsoft Tablet PC, you can select the language you want your keyboard to recognize. In addition, the Microsoft Windows XP Tablet PC Edition 2005 includes the Tablet PC Multilingual User Interface Pack. The MUI Pack lets

you convert ink and speech to typed text in multiple languages. For more information, see "Windows XP Tablet PC Edition Multilingual User Interface Product Guide" at http://www.microsoft.com/windowsxp/tabletpc/evaluation/muiprodguide.mspx.

Built-In Language Support

Each language version of Windows XP Professional supports hundreds of languages through 17 *language groups*, which are organized into three separately installable *language collections*, as shown in Table 3-2.

Note In Windows XP Professional—unlike Microsoft Windows 2000 Professional—you cannot install individual language groups. You must install the appropriate language collection as described in Table 3-2, which includes support for all language groups in that language collection.

Table 3-2 Language Support in Windows XP Professional

Language Collection	Installation Status	Language Group ID and Name
Basic	Always installed on every language version.	1. Western Europe and United States 2. Central Europe 3. Baltic 4. Greek 5. Cyrillic 6. Turkic
Complex Script and Right-to-Left	Always installed on the Arabic language version and the Hebrew language version; optionally installed on all other language versions.	1. Thai 2. Hebrew 3. Arabic 4. Vietnamese 5. Indic 6. Georgian 7. Armenian
East Asian	Always installed on the Simplified Chinese, Traditional Chinese, Japanese, and Korean language versions; optionally installed on all other language versions.	1. Japanese 2. Korean 3. Traditional Chinese

		4. Simplified Chinese

Locales

A *locale* is a collection of Windows XP Professional operating system settings that reflects a specific country's/region's language and cultural conventions. For example, the English (Canadian), English (United Kingdom), and English (United States) locales reflect different countries/regions that share a common language but use different dialects, currencies, and so on. Windows XP Professional supports a total of 135 locales.

Standards and Formats (User Locales)

The Standards and Formats section of the Regional and Language Options Control Panel in Windows XP Professional, formerly called the *user locale*, determines the formats used to display dates, times, currency, numbers, and the sorting order of text. On a given computer, each user account can have its own unique Standards and Formats setting. The Standards and Formats setting does not affect any language settings other than the language used to display the names of days and months, and time and date formats.

For example, an English-speaking salesperson from the Boston office logs on to a desktop in the Milan office. The Milan desktop uses the International English language version of Windows XP Professional. The salesperson selects a Standards and Formats setting of Italian (Italy), which immediately changes the currency to Lira and the date format to dd/MM/yyyy—without restarting the computer.

Input Method Editors, Input Languages, and Keyboard Layouts

For a computer to support a given language, the computer must be able to display the language on screen using the correct alphabet, characters, and fonts. The computer must also be able to accept input typed on a specific language keyboard or specialized input device. The appropriate language collection must be installed, and the default input language and keyboard layout determine how characters entered on the keyboard will be displayed on the screen.

Languages such as Japanese use an *Input Method Editor (IME)* so that a user can enter Asian text in programs by converting the keystrokes into Asian characters. The IME interprets the keystrokes as characters and then gives the user the opportunity to insert the correct interpretation into the program being worked in. Windows XP Professional contains IMEs for Simplified and Traditional Chinese, Japanese, and Korean.

The Input Language setting of the Regional and Language Options Control Panel, formerly called an *input locale*, specifies the combination of the language being entered and the keyboard layout, IME, speech-to-text converter, or other device being used to enter it. Input languages are added to a computer user by user; each user can add multiple input languages, enabling multiple-language document editing, viewing, and printing. When you change input languages, some programs (such as Microsoft Office XP and Office 2003) offer additional features, such as fonts or spelling checkers designed for different input languages.

For example, a user in the Tokyo office who wants to write an e-mail message in both Japanese and Russian would need to install Russian as an input language to enter and display the Russian language using a Japanese

keyboard. The user can then change between the Japanese and Russian languages while composing the message.

Keyboard Layouts

Each input language that Windows XP Professional supports has a default keyboard layout associated with it. Some languages also have alternative keyboard layouts.

For example, a standard U.S. English language keyboard has 101 keys, while a typical keyboard for the Japanese localized language version of Windows XP Professional has 106 keys.

In these situations—where the physical keyboard might not match the language being entered, or a difference in the number of characters and keys makes it difficult to type—administrators or users can add layouts for additional keyboards. Also, by using the On-Screen Keyboard, users can enter text by selecting characters on the appropriate language version On-Screen Keyboard, as shown in Figure 3-1.

Figure 3-1 On-Screen Keyboard for French
See full-sized image

Tip Administrators can make it easier for users to change input languages and keyboard layouts by placing the Language Toolbar on the desktop or in the Taskbar, or by enabling keyboard sequences or "hot keys." For more information, see "Simplifying Multiple Language Access on Desktops" later in this chapter.

Unicode and Code Pages

Unicode is an international standard for representing the characters in common use in the most widely used languages. Unicode provides a universal character set that can accommodate most known scripts, meaning that the text used in documents, files, and applications created in one operating system language (such as Japanese) display correctly in a different operating system language (such as English). Windows XP Professional supports Unicode as its base character encoding.

Windows XP Professional supports code pages to ensure backward compatibility and comprehensive language support for legacy documents and applications. A *code page* is an ordered set of characters in which a numeric index (code point) is associated with each character of a particular writing system. There are separate code pages for different writing systems, such as Western European and Cyrillic. In a code page–based environment, each set of characters from a specific language has its own table of characters.

Because a code page is a much smaller ordered set of characters than Unicode, code pages have limited abilities to display the characters of another code page's language. Documents based on the code page of one operating system rarely transfer successfully to an operating system that uses another code page, resulting in unintelligible text or characters. For example, if someone in Boston using the International English language version of Microsoft Windows 98 with the Latin code page opens a file created in the Japanese language version of Windows 98, the code points of the Japanese code page are mapped

to unexpected or nonexistent characters in the Latin script.

To ensure that new applications being written for Windows XP Professional can function in any language, use Unicode as the base character encoding. Do not use code pages.

For a complete list of code pages and their associated code points, see the Microsoft OEM Code Reference link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources. For a complete listing of Unicode control characters, see "Unicode Control Characters" in Windows XP Professional Help and Support Center.

Language for Non-Unicode Programs (System Locale)

The Language for non-Unicode Programs, previously called the *system locale*, specifies the default code pages and associated bitmap font files for a given computer and affects all of that computer's users. The default code pages and fonts enable non-Unicode applications to run as they do on a system localized to the language of the Language for non-Unicode Programs. If an application displays question marks (???) instead of the expected alphanumeric characters, the Language for non-Unicode Programs probably needs to be switched to the language in which the application was developed. Switching the Language for non-Unicode Programs to match an older application's language affects other operating system settings that will improve overall application and system compatibility.

For example, assume that a data entry clerk in the Tokyo office is using the International English language version of Windows XP Professional. If the clerk wants to run a non-Unicode accounting application designed for the Japanese localized language version of Windows 98, the clerk needs to change the Language for non-Unicode Programs of the computer to Japanese and restart the computer. Otherwise, Kanji characters would be displayed as question marks.

Note Changing the Language for non-Unicode Programs alone does not change the language of the Windows XP Professional user interface elements, such as the system menus and dialog box display languages. Only the Windows XP Professional MUI Pack allows a user to change the language of the user interface.

User Interface Language Options (MUI Pack Only)

Using the Windows XP Professional MUI Pack, users can change the language of the user interface—such as the names of menu options, choices in dialog boxes, and Help system—to any of the localized language versions of Windows XP Professional. Administrators can also specify the default user interface language by using setup scripts or silent configurations, and they can restrict users' abilities to change the user interface language by using Group Policy settings.

Windows XP Professional Language Versions

Windows XP Professional is available in three different language versions: International English, individual localized language versions, and the MUI Pack. Understanding the differences between the language versions that are available will help you to choose the language version that best meets your company's specific language and international needs.

Table 3-3 shows the user needs that each language version supports.

Table 3-3 Differences Between Windows XP Professional Language Versions

User Needs	International English Version of Windows XP Professional	Localized Language Versions of Windows XP Professional	Windows XP Professional MUI Pack
Ability to read and write documents in multiple languages	X	X	X
Language and regional support for over 135 locales	X	X	X
Language and regional support for supported localized language versions			X
Localized language user interface		X	X
Ability to transact business primarily in one or more languages besides English		X	X
Ability to transact business mostly in English, but have access to additional languages	X	X	X
Extensive support for localized language applications compatibility		X	X *
Extensive support for localized language drivers	X	X	X *
Legacy DOS and BIOS support		X	
Single code base for application development	X	X	X
Single code base for application testing in different user interface languages			X
Ability to log on anywhere in any language			X
Single, simultaneous worldwide rollouts for hotfixes, patches, and Service Packs			X

*Support for local language drivers and language applications is usually not as extensive as for localized language versions.

Windows XP Professional International English Version

The International English version of Windows XP Professional is designed for companies that do business mostly in English but have some users with additional language needs. This version provides complete language and regional support for over 135 locales, allowing users to read and write documents in almost any language.

The Windows XP Professional user interface, however, is in English. If you require the user interface to appear in a language other than English, a localized language version or the MUI Pack is a more appropriate choice.

Windows XP Professional Localized Language Versions

Each localized language version of Windows XP Professional contains the same language and regional support that is included in the International English version, meaning that users can read and write documents in almost any language. However, the operating system user interface appears only in the localized language instead of English.

A localized language version contains more extensive application compatibility than the International English version of Windows XP Professional, as well as extra local language drivers and legacy DOS and BIOS support. If your company or a particular office or division of your company operates primarily in a language other than English, or if it requires that the operating system user interface is in a language other than English, a localized language version of Windows XP Professional is an appropriate choice. The 24 fully localized versions of Windows XP Professional include Arabic, Chinese Hong Kong, Chinese Simplified, Chinese Traditional, Czech, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Brazil), Portuguese (Portugal), Russian, Spanish, Swedish, and Turkish.

Windows XP Professional MUI Pack

The Windows XP Professional MUI Pack allows users to change the language of the operating system user interface to any of the supported localized language versions (including English). This version is well suited for companies that:

- Want to deploy and maintain a single operating system standard or desktop image worldwide

- Want to maintain a single code base for international application development

- Want to do single, simultaneous worldwide rollouts for hotfixes, patches, and Service Packs

- Have multilingual offices where different language speakers must share computers

- Have users who need to be able to log on anywhere in any language

The Multilingual User Interface Pack is based on the International English version of Windows XP Professional. Although the user interface can be switched to any of the supported languages, compared to a localized language version of Windows XP Professional, some parts of the operating system are not localized in the MUI Pack. These include:

- 16-bit code

- Bitmaps

- Some registry keys and values

- INF files

- Some system components, including:

  - Narrator

  - MSN Explorer

  - NetMeeting

  - Internet Connection Wizard

For more information about the Windows XP Professional MUI Pack, see the Locales and Language link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources.

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Planning a Multilingual Deployment

To deploy the appropriate language versions of Windows XP Professional and configure regional support based on your organization's current geographic and IT infrastructure, you need to determine your language and regional requirements, as well as your hardware requirements and limitations. You also need to take into account the needs of roaming users in your organization and whether you are upgrading an earlier localized language version of Windows. Also, consider whether your organization requires a single global image and whether you will require specific regional builds for different offices in your organization.

Determining Language and Regional Requirements

If you do business in multiple languages or have multilingual office environments, you need to know which languages or dialects your organization must support and whether these languages require IMEs or alternative keyboards or input devices.

If you do business internationally, you need to know which countries/regions your organization must support and which languages or dialects are used in each. You must determine whether currency, time zone, or calendar formats vary between the different countries and regions. Additionally, you must determine which line-of-business applications you have that must accommodate such regional differences.

A four-column planning table can help you determine your language and regional needs. You can organize the table as follows:

- In column one, list your offices or divisions.

- In column two, list the languages or dialects used in those offices or divisions.

- In column three, note the corresponding Windows XP Professional language collections and locales that support those languages or dialects. For tables listing Windows XP Professional language collections and locales, see the Global Software Development List of Locale IDs and Language Groups link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources.

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  In column four, note any special standards and formats settings, input language support, or default languages for non-Unicode programs required for your offices or divisions.

  Tip You can use the resulting worksheet to plan your physical deployment and complete the [RegionalSettings] section of your answer files. For more information about completing your answer file, see "Using Unattended and

Silent Installations" later in this chapter.

Assessing Hardware Requirements for Multilingual Support

Supporting multiple languages can affect your hardware requirements in two areas:

- Hard disk space.

  Some languages require more hard-disk storage space than others. The more languages installed on a computer, the more hard-disk space consumed. In addition, the Windows XP Professional MUI Pack requires more disk space for each user interface language installed or supported.

- Specialized hardware devices.

  Some languages or users require special keyboards, IMEs, or alternative input devices.

  Note Installing a language collection enables you to view text in those languages in a document, on a Web page, and so on. However, to input text in a given language, you must also add that language as an input language. For more information about adding input languages, see "Configuring Desktops" later in this chapter.

Disk Space Requirements

If a workstation needs to support users who speak multiple languages, that workstation must have enough space on the hard disk for the appropriate language resources. The amount of disk space that you need depends, in part, on the Windows XP Professional language version that you deploy.

Language support requirements

Every language version of Windows XP Professional comes with support for all the languages in the Basic Language Collection, which is installed by default. Table 3-4 lists the estimated hard drive space that you need to install additional language support. In addition, every additional language installed will require approximately 115 MB of extra disk space.

Table 3-4 Disk Space Requirements for Language Support

Language Collection	Installation Status	Space Required in Megabytes (MB)
Basic	Always installed on every language version.	N/A
Complex Script and Right-to-Left	Always installed on the Arabic language version and the Hebrew language version; optionally installed on all other language versions.	10
East Asian	Always installed on the Simplified Chinese, Traditional Chinese, Japanese, and Korean language versions; optionally installed on all other language versions.	250

User interface language requirements (MUI Pack only)

The Windows XP Professional MUI Pack contains Windows Installer packages that allow users to install the user interface languages on demand. Because they are compressed, Windows Installer packages require less storage space

on a network server or CD image.

Tip If your organization uses regional or customized builds or a CD-based deployment, include the appropriate Windows Installer packages on the custom image or CD to ensure that support for those user interface languages is available. This ensures that the specific user interface languages that each office needs are available either for unattended installations during deployment or for on-demand installations by users post-deployment.

Providing on-demand installation also saves storage space on desktops because users can install only the user interface languages that they need, when they need them. For a list of the storage space required on a client computer for each user interface language that is installed, see the Locales and Language link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources

For more detailed information about using Windows Installer packages with the Windows XP Professional MUI Pack, see "Using Windows Installer Packages for On-Demand Installations (MUI Pack Only)" later in this chapter.

Specialized Hardware Needs

If your language requirements require you to use special keyboards, IMEs, or alternative input devices, your hardware must meet minimum hardware compatibility requirements. You can find the minimum hardware compatibility requirements at http://www.microsoft.com/windowsxp/pro/evaluation/sysreqs.mspx.

Determining Roaming User Needs

If you have many roaming users who need to log on from different locations and edit documents in several languages, you must ensure that the appropriate language files are either installed or installable on demand on those users' workstations. You can also install Terminal Services so that users can sign on to unique Terminal Services sessions in different languages.

If your roaming users need to log on from different locations in their native-language user interface version of the operating system, you must install the Windows XP Professional MUI Pack as appropriate.

Tip If you have deployed a Windows 2000 Server MultiLanguage Version or Windows Server 2003 with the Multilingual Language Interface, you can extend the lifecycles of old desktops and functionality of thin clients for use as multilingual workstations. By installing Terminal Services on clients connected to a computer running Windows 2000 Server MultiLanguage Version or Windows Server 2003 with the Multilingual Language Interface, you effectively permit the client to function as a Windows XP Professional MUI Pack–based workstation that allows users to change user interface languages easily.

Upgrading from Earlier Versions of Windows

A localized language version of a Windows-based client cannot be upgraded to a different language version of Windows XP Professional or to the Windows XP Professional MUI Pack. For example, you cannot upgrade a Japanese localized language version of Windows 2000 Professional to either the International English language version or MUI Pack of Windows XP Professional.

Warning To replace any other language versions of Windows with the Windows XP Professional MUI Pack, you must remove the previous Windows version and perform a clean installation of the Windows XP Professional MUI Pack.

You can upgrade to the Windows XP Professional MUI Pack only from an International English language version of Windows or from the Microsoft

Windows 2000 Professional MultiLanguage Version. Table 3-5 shows which of these earlier versions of Windows clients can be upgraded to the Windows XP Professional MUI Pack.

Table 3-5 Upgrade Matrix for Windows XP Professional MUI Pack

International English or MultiLanguage Version of Windows	Windows XP Professional MUI Pack
Microsoft Windows NT Workstation version 3.51	
Microsoft Windows NT Workstation version 4.0	X
Windows 98	X
Microsoft Windows Millennium Edition (Me)	X
Windows 2000 Professional	X
Windows 2000 Professional MultiLanguage Version	X
Microsoft Windows XP Home Edition	

Deploying a Single Global Image

The Windows XP Professional MUI Pack enables a global organization's IT department to deploy and maintain a single global desktop image. In this way, your company can create a single build that includes user interface language support for all the languages in which you do business. The build can also include world-ready applications such as Office XP or Office 2003.

For example, if your company supports user interfaces in English, French, Italian, Spanish, Japanese, Simplified Chinese, and Traditional Chinese, you can create a single global image that includes user-interface support for those seven languages. You can also make support for those languages available for on-demand installation after deployment by using Windows Installer packages.

Tip Deploying and maintaining a single global image can significantly improve IT efficiency and help lower many costs. It enables single-code-base application development and testing, simplifies releasing hotfixes and service patches, and reduces end-user support calls.

Creating Regional Builds

You can further customize Windows XP Professional deployments by creating specific regional builds tailored to each office's multilingual and international needs. For each office or site, you can create a regional build that specifies the appropriate language version of the operating system, the default input language, and the standards and formats appropriate to that region. You can also include the appropriate localized language versions of third-party applications, such as virus-checking utilities, as well as other specialized drivers and applications required by that office.

For example, you might create the following four unique regional builds for North America:

● Two Canadian builds for the Vancouver, B.C., and Montreal offices to deploy the International English version of Windows XP Professional, with English and French (Canada) set as the default input languages, and Canada set as the default for standards and formats. English is the default input language in Vancouver, and French is the default input language in Montreal.

 A U.S. English build so that users in Seattle and other U.S. locations can

- install the International English version of Windows XP Professional, with English (U.S.) set as the default input language, and optional support for the East Asian Language Collection, which includes the font files, font linking, and registry settings needed for Simplified and Traditional Chinese, Japanese, and Korean language support.

- A Boston regional build that installs the U.S. English build along with optional support for the East Asian Language Collection.

The regional build for the Tokyo office, by contrast, might install the Japanese localized language version of Windows XP Professional, as well as the Japanese localized language versions of virus-checking and accounting applications.

Using the Windows XP Professional MUI Pack, global organizations can also take a hybrid approach combining a single global core image, which contains the baseline operating system and applications, with additional regional core images that include localized language applications, settings, and so on. The global IT department develops and maintains the global core; individual countries/regions are responsible for building and maintaining their own regional cores. Local offices can also add a third-tier customization core image for custom stationery or templates, printer drivers, and so on.

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Configuring Desktops

Using Windows XP Professional, you can customize desktops to support your company's specific language and regional needs. You can configure desktops with specific Regional and Language Options, such as a default input language or keyboard layout. You can also configure the browser to receive localized, regional content, and you can add toolbars and keyboard shortcuts to simplify switching between input languages.

Windows XP Professional enables administrators to specify the appropriate input language/keyboard layout combination and standards and formats settings for the default user account on a computer. All subsequent new user accounts created on that computer inherit the specified defaults; existing user accounts are not affected.

Administrators can specify these default settings through the user interface or by using answer files. For more information about specifying the default settings through the user interface, see "Configuring Regional and Language Options" later in this chapter. For more information about specifying the default settings through the answer files, see "Creating Unattended Installations" and "Using Silent Configurations" later in this chapter.

Configuring Regional and Language Options

You can use the Regional and Language Options settings in Control Panel to configure input languages for user accounts, and for the MUI Pack, to specify or change the default user interface language or install or remove user interface language packs.

To install the Complex Script and Right-to-Left Collection or East Asian Language Collection

1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages tab**, and then under **Supplemental language support**, select the check boxes of the language collections that you want to install.

To change the language for non-Unicode programs

1. Log on as an Administrator.

2. In **Control Panel**, double-click **Regional and Language Options** to open it.

3. Click the **Advanced** tab, and then under **Language for non-Unicode programs**, select the language for which the application was developed.

For more information about language collections and languages for non-Unicode programs, see "New Multilingual Features in Windows XP Professional" earlier in this chapter.

Configuring Regional and Language Support for User Accounts
Some language versions of Windows XP Professional might require installing the Complex Script and Right-to-Left Language Collection or the East Asian Language Collection, as well as the appropriate input languages, to properly input and display all characters.

Administrators can specify which input languages are available for user selection at the Windows logon screen, and which are applied to new user accounts, by adding the appropriate input languages to the default user account.

To add an input language for the current user
1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages tab**, and then under **Text services and input languages**, click **Details**.

3. Under **Installed services**, click **Add**.

4. In the **Input Language** box, click the input language that you want to add to enable users to input text in that language.

   This installs the input language with the default keyboard layout/IME listed in the **Keyboard layout/IME** box.

To add an alternative keyboard layout/IME for an input language
1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages** tab, and then under **Text services and input languages**, click **Details**.

3. Under **Installed services**, click **Add**.

4. In the **Keyboard layout/IME** box, click the alternative keyboard layout or IME that you want to add to enable users to input text in the specified input language.

To specify the default input language for the current user
1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages** tab, and then under **Text services and input languages**, click **Details**.

3. Under **Default input language**, select the appropriate input language.

To add an input language for the default user account
1. Log on as an Administrator.

2. In **Control Panel**, double-click **Regional and Language Options** to

open it.

3. Click the **Languages** tab, and then under **Text services and input languages**, click **Details**.

4. Under **Installed services**, click **Add**.

5. In the **Input Language** box, click the input language that you want to add to enable users to input text in that language, and then click **OK**.

   If you want to add more than one input language, repeat this step for each language that you want to add.

6. Click **OK** or **Apply** to close the **Text services and input languages** dialog box.

7. Click the **Advanced** tab, and then select the **Apply all settings to the current user account and to the default user profile** check box.

Configuring the User Interface Language (MUI Pack Only)

The Windows XP MUI Pack allows users to change user interface languages, as long as support for additional user interface languages has been installed and Administrators have not locked down the desktop by using Group Policy settings.

To change the current user interface language

1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages** tab, and then under **Language used in menus and dialogs**, select the language that you want to use.

To specify the user interface language for the default user account

1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages** tab, and then under **Language used in menus and dialogs**, select the language that you want to use.

3. Click the **Advanced** tab, and then select the **Apply all settings to the current user account and to the default user profile** check box.

Configuring Localized Content

You can configure the default location to ensure that a user or group of users receives the appropriate local content, such as news and weather, from Internet or intranet content providers. You can change the default location without affecting other multilingual settings, such as the default standards and formats used for currency, sorting, dates, and so on.

The Location setting of the Regional and Language Options Control Panel enables Web content providers to redirect users to more appropriate regional sites when they visit a generic site. For example, users in the Milan office would want the default location set to Italy to ensure that they connect to the appropriate servers, content providers, and so on.

To configure localized browser content

1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Regional Options** tab, and then under **Location**, click the region or location for which you want customized content.

Simplifying Multiple Language Access on Desktops

Administrators can configure desktops to simplify working in multiple languages. For example, you can add a language toolbar to the desktop or a language icon to the taskbar, making it easier for users to change between different input languages when they need to compose documents in multiple languages. You can also enable specific key sequences that let users quickly change between installed input languages and alternative keyboard layouts/IMEs.

To add the Language bar to the desktop or taskbar

1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages** tab, and then under **Text services and input languages**, click **Details**.

3. In the **Text Services and Input Languages** dialog box, under **Preferences**, click **Language Bar**.

4. In the **Language Bar Settings** dialog box, select the check boxes that correspond to the language bar and taskbar options you want to enable.

To enable or change key sequences for switching input languages or keyboard layouts/IMEs

1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages** tab, and then under **Text services and input languages**, click **Details**.

3. In the **Text Services and Input Languages** dialog box, under **Preferences**, click **Key Settings**.

4. In the **Advanced Key Settings** dialog box, select the options that correspond to the key sequences and actions you want to use to enable a user to change between installed input languages or keyboard layouts/IMEs.

If you want to use the On-Screen Keyboard to input text in a different language, change to the appropriate input language before enabling the On-Screen Keyboard.

To display the On-Screen Keyboard

1. From the **Start** menu, point to **All Programs**, point to **Accessories**, and then point to **Accessibility**.

2. Click **On-Screen Keyboard**.

Entering Special Characters or Code Points

Users can input characters that are not on the keyboard by pressing and holding the **ALT** key and then typing the appropriate decimal code value for that character on the numeric keypad.

- If the first digit typed is 0, the value is recognized as a code point in the current input language. For example, pressing and holding the **ALT** key while typing **0163** produces £, the pound sign (U+00A3 in the format for Unicode encoding), if the default input language is English (U.S.).

- If the first digit typed is any number from 1 through 9, the value is represented as a code point in the operating system's OEM code page. For example, pressing and holding the **ALT** key while typing **163** produces ú, (U+00FA), if the code page is 437 (MSDOS Latin US).

For a complete list of OEM code pages and their associated code points for

numeric keypad input, see the Microsoft OEM Code Reference link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources.

Controlling Desktops by Using Group Policy Settings

Windows XP Professional enables administrators to automate different users' Regional and Language Options, such as the default input language or standards and formats, by using a Group Policy logon script. When a given user logs on to a computer, the Group Policy logon script silently calls the Regional and Language Options Control Panel to specify the correct settings for that user. For more information about using a Group Policy logon script to silently configure desktop settings, see "Using Silent Configurations" later in this chapter.

The Windows XP Professional MUI Pack allows administrators to use Group Policy settings to control users' abilities to change the user interface language. For more information about Group Policy settings, see Chapter 23, "Connecting Clients to Windows Networks."

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Using Unattended and Silent Installations

Windows XP Professional contains keywords and options that simplify creating unattended installations of new computers and silent configurations of existing computers. In addition, when installing and configuring the Windows XP Professional MUI Pack, special considerations must be taken into account.

Creating Unattended Installations

For unattended installations of any language version of Windows XP Professional, you might need to specify additional options for running Winnt32.exe or Winnt.exe. Also, you must specify certain keywords and values in your Unattend.txt or Sysprep.inf answer file.

There are also special considerations for performing unattended installations of the Windows XP MUI Pack.

Options for Running Winnt32.exe or Winnt.exe

If your organization requires the installation of East Asian language and locale support, you must specify **/copysource:lang** or **/rx:lang** to copy the necessary language files. If you do not, and the [RegionalSettings] section of your answer file contains East Asian values, Setup will ignore everything in the [RegionalSettings] section.

Note If you install one of the East Asian localized language versions of Windows XP Professional, you do not need to specify the /copysource or /rx parameters because East Asian language and locale support are installed by default.

For Winnt32.exe, the appropriate syntax is:

Note Some parts of the following code snippet have been displayed in multiple lines only for better readability. These should be entered in a single line.

```
winnt32.exe /unattend:"path to answer file"
/copysource:lang /s:"path to install source"
```

To run Winnt.exe from a 16-bit, MS-DOS network startup disk, the appropriate syntax is:

Note Some parts of the following code snippet have been displayed in multiple

lines only for better readability. These should be entered in a single line.

```
winnt.exe /u:"path to answer file"
/rx:lang /s:"path to install source"
```

Note For the MUI Pack, you must specify certain options to run Winnt32.exe. You cannot run Winnt.exe. For more information about specifying options for the MUI Pack, see "Special Considerations for Installing the Windows XP Professional MUI Pack" later in this chapter.

Defining Language and Regional Settings in the Answer File

For unattended installations of Windows XP Professional, you can customize the following sections of the answer file to address specific language and other regional needs:

- [RegionalSettings]

- [GuiUnattended]

- [TapiLocation]

    Warning If you are creating an answer file for a localized language version of Windows XP Professional other than International English, create the answer file using that localized language version. Otherwise, change the language for non-Unicode programs to that of the localized language version, and save the answer file as ANSI text using the appropriate text encoding method for the language version that you are installing. For example, if you are creating an answer file to install the Russian localized language version on a desktop, use the Russian localized language version of Windows XP Professional to create the answer file. Otherwise, change the language for non-Unicode programs to Russian and use the Cyrillic OEM code page to author the answer file.

Specifying [RegionalSettings] options

The [RegionalSettings] section of the answer file specifies multilingual and international settings such as the language collections installed, the input languages installed, and the language for non-Unicode programs. All the [RegionalSettings] values can be specified in either Unattend.txt or Sysprep.inf.

Warning Any [RegionalSettings] values specified in Sysprep.inf will override any values set in Unattend.txt. In addition, if you use Sysprep, all the appropriate additional language files specified must already be installed on the computer.

The following shows the correct syntax for the [RegionalSettings] section:

Note Some parts of the following code snippet have been displayed in multiple lines only for better readability. These should be entered in a single line.

```
[RegionalSettings]
Language="locale ID"
LanguageGroup="language group ID","
language group ID" [, ...]
SystemLocale="locale ID"
UserLocale="locale ID"
InputLocale="locale ID:keyboard layout ID",
"locale ID:keyboard layout ID", ...
UserLocale_DefaultUser="locale ID"
InputLocale_DefaultUser="
locale ID:keyboard layout ID", ...
```

Note The Windows XP Professional MUI Pack requires additional considerations

to ensure consistency among language settings for unattended installations. For more information about creating unattended installations of the MUI Pack, see "Special Considerations for Installing the Windows XP Professional MUI Pack" later in this chapter.

Table 3-6 describes the [RegionalSettings] keys and identifies the corresponding settings in the **Regional and Language Options** Control Panel. For a complete listing of valid values for these keys, see the Locales and Language link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources.

Table 3-6 [RegionalSettings] Keys

Key	Usage	Regional and Language Options Control Panel Settings
Language	Specifies the language installed. If this key is specified, the SystemLocale, UserLocale, and Input Locale keys are ignored.	- Standards and Formats - Input Language - Language for Non-Unicode Programs
LanguageGroup	Specifies the language groups installed on the computer. Installing one language group also installs support for all other language groups in the same language collection. For example, if you install the Korean language group (8), Windows XP Professional installs support for all other language groups in the East Asian Language Collection (for example, Japanese (7), Traditional Chinese (9), and Simplified Chinese (10)). For a list of the language groups installed under each language collection, see "Built-In Language Support" earlier in this chapter.	Same effect as: - Installing support for Complex Script and Right-to-Left languages - Installing support for East Asian languages
SystemLocale	Enables non-Unicode applications to run and display menus and dialog boxes in the localized language.	Language for Non-Unicode Programs
UserLocale	Controls settings for sorting numbers, time, currency, and dates.	Standards and Formats
InputLocale	Specifies input language and keyboard layout combinations. The first keyboard layout specified becomes the system default. Specified combinations must be supported by one of	Input Language(s)

	the languages defined by using either the LanguageGroup key or the default language for the language version of Windows XP Professional being installed. If an available language does not support the specified combination, the default combination is used. This key is ignored if the Language key is specified.	
UserLocale_ DefaultUser*	Controls the formats for numbers, time, currency, and dates for the default user. The specified setting must be supported by one of the languages specified using the LanguageGroup key or the default language for the language version of Windows XP Professional being installed.	Same effect as: ● Setting Standards and Formats ● Selecting Apply all settings to the current user account and to the default user profile check box on the Advanced tab
InputLocale_ DefaultUser*	Sets the input language and keyboard layout combinations for the default user.	Same effect as: ● Specifying Input Languages ● Selecting Apply all settings to the current user account and to the default user profile check box on the Advanced tab

* Denotes new keys added in Windows XP Professional

Note If you specify a Language key, the value associated with it overrides all the values specified in the InputLocale, SystemLocale, and UserLocale keys. Typically, using the Language key is the preferred method for specifying input languages because it prevents the occurrence of incompatible values in the InputLocale, SystemLocale, and UserLocale keys and installs locales appropriate for the specified language and locale combinations.

Specifying [GuiUnattended] options
You must specify the time zone of the computer by using the **TimeZone** key in the [GuiUnattended] section of your answer file. If the **TimeZone** key is not present in Unattend.txt, the user is prompted for a time zone during setup.

To preset time zones
●

In your answer file, add the following entry in the [GuiUnattended] section:

```
[GuiUnattended]
TimeZone="Index"
```

Index specifies the time zone of the computer. For a list of valid Time Zone indices, see Ref.chmin Support\Tools\Deploy.cab on the Microsoft Windows XP Professional operating system CD.

Note If you specify OemPreinstall=Yes in the [Unattended] section of your answer file, you might want to add OemSkipRegional=1 to the [GuiUnattended] section to ensure that setup does not prompt the user for regional information during GUI-mode setup.

Specifying [TapiLocation] options

You can specify dialing rules specific to your country/region by using the [TapiLocation] section of your answer file. These dialing rules specify the default country code and area code that a modem uses when dialing the phone. The [TapiLocation] keys described here are supported in both Unattend.txt and Sysprep.inf, and they are valid only for computers with modems.

To preset telephone dialing rules

- In your answer file, specify the appropriate values in the [TapiLocation] section:

```
[TapiLocation]
CountryCode="CountryCode"
AreaCode="AreaCode"
```

For a complete list of country codes to use for telephony, search on the Internet for "ISO 3166," or see the International Telecommunication Union link on the Web Resources page at
http://www.microsoft.com/windows/reskits/webresources/

Sample answer file

In the following example, an International English language version of Windows XP Professional is configured with additional support for the East Asian Language Collection installed. English (U.S.) is the default for both the language for non-Unicode programs (the **SystemLocale**) and the standards and formats (the **UserLocale**). Additional input languages and keyboard layouts are also installed for Japanese, Chinese (Taiwan), Chinese (People's Republic of China), Korean, and German. The telephone country code is set to U.S., and the area code is 425. The time zone is Redmond (U.S.) Pacific Standard Time.

Note: Some parts of the following code snippet have been displayed in multiple lines only for better readability. These should be entered in a single line.

```
[GuiUnattended]
TimeZone="020"

 [RegionalSettings]
LanguageGroup="1","7","8","9","10"
SystemLocale="0409"
UserLocale="0409"
InputLocale="0409:00000409","0411:e0010411",
"0404:00000404","0804:00000804",
"0412:E0010412","0407:00000407"

[TapiLocation]
CountryCode="US"
AreaCode="425"
```

Special Considerations for Installing the Windows XP Professional MUI Pack

Unattended setup of the Windows XP Professional MUI Pack is slightly different

from that of the Windows XP Professional International English or localized language versions for the following reasons:

- Because the Windows XP Professional MUI Pack requires the use of files from several CD-ROMs, you should carefully review how this affects different deployment methods, including network installation, creating custom images on multiple CD-ROMs using SysPrep, or a combination of CD-ROM and network installation.

- You must specify **OemPreinstall=Yes** and **OemFilesPath="***path to install source***"** in the [Unattended] section of your answer file to point to the location of the user interface language files. If you are installing the MUI Pack from the default location of \i386\OEM, you do not need to specify an **OemFilesPath** value.

- The [Commands] section of Cmdlines.txt must be used to specify the execution of Muisetup.exe, the program that installs the user interface languages.

Ensuring consistency within [RegionalSettings]

The MUI Pack requires special attention to ensure consistency within the [RegionalSettings] section of the answer file. You must specify the language groups and locales to install to support the appropriate user interface languages and applications.

The other settings that you specify in the [RegionalSettings] section depend on your workstation configurations:

- For single user systems.

  Set locales to the same value as the default user interface language (specified when running Muisetup.exe). For example, if German is set as the default user interface language, specify one of the German locales in the answer file.

- For shared workstations and in Terminal Services environments.

  Set the default user interface language and the language for non-Unicode programs to English, the administrative language of the MUI Pack. You can set the input language according to individual preferences or requirements. Or, if specified by using the **Language** key, restrict the input language to be the same as the language for non-Unicode programs.

Warning Install the appropriate language groups to ensure support for both the locales and the user interface languages specified. For example, if you install the Japanese (Japan) user interface language, you must also install the East Asian Language Collection to ensure Japanese language and locale support.

The following [RegionalSettings] example installs support for the East Asian Language Collection. English (U.S.) is the default for both the language for non-Unicode programs (the **SystemLocale**) and standards and formats (the **UserLocale**). Additional input language and keyboard layouts are also installed for Japanese, Chinese (Taiwan), Chinese (People's Republic of China), Korean, and German.

Note Some parts of the following code snippet have been displayed in multiple lines only for better readability. These should be entered in a single line.

```
[RegionalSettings]
LanguageGroup="1","7","8","9","10"
SystemLocale="0409"
UserLocale="0409"
```

```
InputLocale="0409:00000409",
"0411:e0010411","0404:00000404","0804:00000804",
"0412:E0010412","0407:00000407"
```

Specifying [Unattended] options
In addition to the [RegionalSettings] options, you must specify the following
settings in the [Unattended] section when installing the MUI Pack:

```
[Unattended]
OemPreinstall="Yes"
OemFilesPath="path to install source"
```

The **OemFilesPath** key points to the installation share that you create to
contain the MUI user interface language files. If you are installing the MUI Pack
from the default location of \i386\OEM, you do not need to specify an
OemFilesPath value.

Specifying [GuiUnattended] options
The [GuiUnattended] section of the answer file lets you disable the OEM
Regional prompt that would otherwise be displayed during setup. Because you
specified **OemPreinstall=Yes** in the [Unattended] section of your answer file,
you might want to add **OemSkipRegional=1** to the [GuiUnattended] section
to ensure that setup does not prompt the user for regional information during
GUI-mode setup.

```
[GuiUnattended]
OemSkipRegional="1"
```

Set the value to 1 to bypass the user prompt.

Creating the installation share
For unattended installations of the Windows XP Professional MUI Pack, you
must copy all the MUI files from CD2 into a temporary directory below the top-
level directory on a network share or CD. In the following example, the
computer name is MUICORE, the share name is OEM, and the temporary
directory is MUIINST.

```
\\MUICORE
    \$OEM$
        \MUIINST
            <...all MUI Pack files>
```

Tip For CD-based deployments, if the MUI Pack files are located on the CD
(and not on a network share), the user might need to change CDs to complete
the installation. This would require user intervention to change CDs, effectively
"breaking" the unattended nature of the installation.

Installing by using a Cmdlines.txt file
For the Windows XP Professional MUI Pack, you must create a Cmdlines.txt file
in the top level of your temporary directory. Cmdlines.txt must contain a
[Commands] section that executes the Muisetup program using the appropriate
parameters and values, using the following syntax:

Note Some parts of the following code snippet have been displayed in multiple
lines only for better readability. These should be entered in a single line.

```
[Commands]
".\temporary directory name\MUISETUP.exe
```

```
[/i LangID LangID...] [/d LangID] /r /s"
```

You must use quotation marks around the command, and the path to Muisetup.exe must specify the temporary directory you created in the installation source. Table 3-7 describes the Muisetup parameters.

Table 3-7 Muisetup Parameters

Key	Description
/i	Specifies the user interface language(s) to be installed. Typically, languages are entered in four-digit hexadecimal LangID values.
/d	Specifies the default user interface language (applied to all new user accounts and used in places such as the Winlogon screen).
/r	Specifies that the restart message not be displayed.
/s	Specifies that the installation complete message not be displayed.

The following Cmdlines.txt answer file is created in the temporary directory specified by the **OemFilesPath** key in your Unattend.txt answer file. (In the example specified earlier, the location is \\MUICORE\$OEM$.) If Unattend.txt does not specify a custom location for OemFilesPath, Cmdlines.txt uses the default location of \i386\$OEM$.

The following specifies that Muisetup install the Japanese (Japan) and German (Germany) user interface languages, and sets Japanese (Japan) as the default user interface language used for the Winlogon screen and applied to all new user accounts.

```
[Commands]
".\MUIINST\MUISETUP.exe /i 0411 0407 /d 0411 /r /s"
```

Installing Windows Installer user interface language packages
You can use Windows Installer (.msi) packages to install additional MUI user interface language support. To do this, you must copy the .msi files for those user interface languages to the installation share, and then invoke Windows Installer in your Cmdlines.txt file to install the user interface languages on the computer. To install multiple user interface languages, repeat the msiexec invocation, specifying the appropriate .msi file for each additional user interface language that you want to install.

In the following example, the German (Germany) user interface language is silently installed from the German .msi package and the Japanese (Japan) user interface language is silently installed from the Japanese .msi package.

```
[Commands]
"msiexec.exe /i 0407.msi /q"
"msiexec.exe /i 0411.msi /q"
```

For more information about Windows Installer packages and parameters for using the **msiexec.exe** command, click the MSDN Library link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources and search for "msiexec".

Additional parameters for installing Windows Installer packages

When installing Windows Installer packages, you can choose whether to set a

particular user interface language for the current user, the default user, or both. You can also specify whether a user language can be uninstalled by any user. Table 3-8 describes these parameters and how to use them.

Table 3-8 Windows Installer Package Parameters

Parameter=value	Description
currentuser=1	Sets the user interface language being installed as the user interface language for the current user. If this is not specified, the user interface language will be installed without changing the current user's user interface language.
Defaultuser=1	Sets the user interface language being installed as the user interface language for the default user account, which affects the logon screen and all new user accounts. If this is not specified, the user interface language will be installed without changing the default user account's user interface language.
allusers=1	Specifies that the user interface language is to be installed per computer, which means that it can be uninstalled by any user of that computer.

In the following example, the German (Germany) and Japanese (Japan) user interface languages are silently installed, and the current user and default user accounts are set to Japanese. In addition, the German .msi package is to be installed per computer, allowing all users of the computer to remove it.

```
[Commands]
"msiexec.exe /i 0407.msi allusers=1 /q"
"msiexec.exe /i 0411.msi defaultuser=1 currentuser=1 /q"
```

Caution Use the allusers=1 parameter carefully because it allows any user to remove a user interface language from a computer—even though that user interface language might be required by another user of the same computer. If you install a given user interface language by using the currentuser=1 and/or defaultuser=1 parameters, do not specify the allusers=1 parameter for the same user interface language.

Using Silent Configurations

You might want to change a computer's Regional and Language Options silently after the initial installation. For example, if your organization locks down the desktop to prevent a group of users from accessing the Control Panel, you can update that group's Regional and Language Options by using a Group Policy–applied logon script.

In these situations, you can use Rundll32.exe to call the Regional and Language Options Control Panel with an answer file that specifies the appropriate settings. The syntax for calling Rundll32.exe from the command line is as follows:

Note: Some parts of the following code snippet have been displayed in multiple lines only for better readability. These should be entered in a single line.

```
Rundll32 shell32,Control_RunDLL intl.cpl,
 ,/f:"c:\unattend.txt"
```

The answer file specified in c:\unattend.txt must contain a [RegionalSettings] section that specifies the appropriate regional and language settings.

Changing Language and Regional Options

The format of the answer file specified in a silent configuration is exactly the same as that used during setup. This means that all the [RegionalSettings] options can be changed silently after the initial installation. The following is an example of a silent configuration that:

- Adds the "German - German" input language for the current user.

- Adds the "German - Swiss German" input language to the list of input languages for the default user.

- Configures the language for non-Unicode programs to German.

```
[RegionalSettings]
InputLocale="0407:00000407"
InputLocale_DefaultUser="0407:00000807"
SystemLocale="0407"
```

If you specify multiple input languages for the **InputLocale** and **InputLocale_DefaultUser** keys, the first value specified will be set as the default for that particular user. In the following example, the **InputLocale** will set "German - German" as the default input language for the current user while also making "German - Swiss German" available as an input language.

```
[RegionalSettings]
InputLocale="0407:00000407", "0407:00000807"
```

Changing MUI Pack Defaults

The Windows XP Professional MUI Pack contains two new keywords that you can use after running setup to perform silent configurations. These keywords are intended for silent configuration after setup, when the specified user interface language has already been installed on the computer. Table 3-9 describes these additional [RegionalSettings] keys. For a complete listing of valid values for these keys, see the Locales and Language link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources.

Table 3-9 [RegionalSettings] Keys for Silently Configuring MUI Pack Defaults

Key	Usage
MUILanguage	Sets the user interface language for the current user
MUILanguage_DefaultUser	Sets the user interface language for the default user account, including the logon screen and the user interface language applied to all new user accounts

Using Windows Installer Packages for On-Demand Installations (MUI Pack Only)

The Windows XP Professional MUI Pack includes Windows Installer packages

that allow users to install user interface languages on demand. For companies that support one global image, on-demand installation enables smaller and faster setups and images. If you do regional builds or CD-based deployments, include on a CD or network share the Windows Installer package for each specific user interface language your company needs to support.

To enable on-demand installations, you can publish a Windows Installer (.msi) package for each user interface language that your company supports in Active Directory. The Windows Installer packages are then listed as additional user interface languages in the appropriate users' Add or Remove Programs Control Panel. If you publish the .msi packages with the **Maximum UI** option, users can choose whether to install and set a specific user interface language for the current user, the default user, or both. Alternatively, to set the user account settings automatically, you can publish the .msi packages with the **Basic UI** option and then apply transforms to the packages.

For example, assume that your company supports 12 different languages worldwide. Your IT department publishes those 12 Windows Installer user interface language packages in the global Active Directory. A clerk in the Boston office, using Windows XP Professional MUI Pack with English (U.S.) as the default user interface language, can then install Italian and Japanese user interface language support when it is needed. All that the user needs to do is open the Add or Remove Programs Control Panel and select the Italian and Japanese user interface language support packages.

For more information about Windows Installer packages and parameters for using the **msiexec.exe** command, click the MSDN Library link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources and search for "msiexec".

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Supporting Multilingual Applications

In a multilingual environment, it is important to ensure that your existing line-of-business applications run properly under any language version of Windows XP Professional. Multilingual and international considerations can affect legacy application support, as well as the development of new applications and the authoring of Web sites for international companies.

When you deploy Windows XP Professional in a global environment, it is important to ensure that all your current and future applications and Web technologies are compatible with the language versions that you support.

Supporting World-Ready Applications

All versions of Windows XP Professional are built from a single world-ready source code. This simplifies supporting multilingual applications because an application developed on any language version of Windows XP Professional following world-ready guidelines runs correctly on any other language version of Windows XP Professional. For example, a clerk in the Boston office using the International English language version of Windows XP Professional can run an application developed in the Tokyo office on a Japanese localized language version of Windows XP Professional, as long as the Boston client computer has installed the East Asian Language Collection (for Simplified and Traditional Chinese, Japanese, and Korean language support).

Supporting Non-Unicode Applications

In many organizations, legacy line-of-business applications were not developed according to world-ready guidelines. Older applications might not be Unicode-enabled, relying instead on the use of a particular code page for character encoding. These non-Unicode applications might not run correctly if the

language of the application does not match the language version of the operating system (for example, running a non-Unicode, Japanese order-tracking system on the International English language version of Windows XP Professional). In these situations, one of two problems commonly occurs:

- The application fails to load.

- The application loads, but text strings do not display correctly in the application's user interface.

In most cases, setting the language for non-Unicode programs of the Windows XP Professional–based computer to match the language in which the application was developed solves the problem. In the previous example, if the Boston clerk sets the Windows XP Professional–based computer's language for non-Unicode programs to Japanese, the strings in the legacy, non-Unicode, Japanese order-tracking system's user interface will be correctly displayed in Kanji.

Note The language for non-Unicode programs can be set to only one language at a time. If you need to run non-Unicode applications in a variety of languages, you might want to consider porting the applications to Unicode through the Microsoft Layer for Unicode (MSLU).

The Microsoft Layer for Unicode

Another solution for porting a non-Unicode application to Unicode involves using the Microsoft Layer for Unicode™ (MSLU) on computers running Windows 98 and Windows Me. MSLU is easy to integrate into applications and requires little more than recompiling the application as a Unicode component and including the MSLU library along with the other libraries used by the program. MSLU is available and fully documented in the Windows XP Professional Platform SDK, found at http://msdn.microsoft.com/library/en-us/sdkintro/sdkintro/windows_xp.asp.

Determining the Compatibility of Your Current Applications

Before deploying Windows XP Professional, you need to test your internally developed line-of-business applications, and any third-party applications (such as antivirus tools), under each language version of Windows XP Professional that your organization supports in order to determine potential problems with multilingual or international compatibility. For example, if you intend to deploy the Japanese localized language version of Windows XP Professional as well as the Simplified Chinese localized language version and the MUI Pack, be sure to test your existing applications under all three configurations.

It is also important to test applications developed for one language version to see how they function while emulating the native language under a different language version of the operating system. For example, test any applications developed using the Japanese localized language version of Windows XP Professional (or earlier versions of Microsoft Windows) on computers running the International English language version of Windows XP Professional, after making sure that those computers have the East Asian Language Collection installed.

Basic differences in application support and backward compatibility exist between the localized language versions of Windows XP Professional and the Windows XP Professional MUI Pack. Some 16-bit applications developed on localized language versions run better on those localized language versions of Windows XP Professional than on the Windows XP Professional MUI Pack. For example, the Japanese language version of Windows 2000 supports DOS/V applications, and the Korean language version of Windows NT supports HBIOS applications, whereas the Windows XP Professional MUI Pack does not.

To determine whether a specific third-party application (such as an antivirus tool) is certified as compatible with Windows XP Professional, see the Windows Catalog at http://www.microsoft.com/windows/catalog.

Developing Multilingual Applications

The Microsoft Global Software Development Web site provides extensive information to help application developers create products that take full advantage of the multilingual and international compatibility features of Windows XP Professional. For information about how and what it means to globalize an application, see the Globalization: Step-by-Step link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources.

For more information about creating world-ready software, see the Microsoft Global Software Development link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources

Developing Multilingual Web Sites

Developers authoring Web sites in global organizations typically require a first-time site visitor to select a preferred language, which is then stored in a client-side cookie on the visitor's computer or as a property in the visitor's profile. Thereafter, site content always appears in the user's specified language.

An alternative approach involves using a script that detects the client computer's default browser language, and then serves the appropriate language version of the Web site to the client.

The key to developing a single Web site that can serve multiple language visitors is to properly structure the following two common language-dependent strings:

- Product information or other data, such as the product name, description, and price

- Site information, such as content in navigation bars, banner ads, and search results

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Ensuring Compatibility

Multilingual compatibility issues can arise when you use Windows XP Professional with naming of Active Directory objects, with Terminal Services, or in mixed operating system environments. Also, special considerations arise when you use the multilingual versions of Office XP or Office 2003 and Windows XP Professional together. You will need to be aware of these and other global compatibility issues as you prepare to deploy Windows XP Professional in a multilingual environment.

Multilingual Compatibility with Active Directory Objects, Clients, and Domain Controllers

Because Active Directory uses Unicode, there are few multilingual compatibility problems with Active Directory in any language version of Windows XP Professional. Typically, if Active Directory objects are named using Unicode characters, and both the Complex Script and Right-to-Left Language Collection and the East Asian Language Collection are installed, no problems occur in displaying Active Directory object names that combine different languages and fonts.

If you use Active Directory in a mixed operating system environment, consider the following limitations when implementing multilingual features:

- Active Directory supports a single sort order, which might not be the sort order specified by the default language version or settings of the server. If you store objects that have localized names, the returned sort order might not be what you expect.

- If your Active Directory domain controller uses a different language from that of a client computer that is a member of the same domain, you can use only the character sets common to both code pages in Active Directory naming conventions. Otherwise, the two computers might not be able to initialize a trust relationship.

- If an Active Directory client computer does not have the correct language support and fonts installed to interpret localized names in a different language used for objects stored in the directory, the client might not be able to render the names.

  For example, if an Active Directory client computer in Boston does not have the East Asian Language Collection installed, it might not be able to display the Kanji characters in the Japanese name of an object stored in an Active Directory server in Tokyo.

- Localized language domain and computer names might not be supported by Windows 98, Windows NT 3.51, and legacy DNS servers because those systems do not support UTF-8.

For more information about Active Directory, see Chapter 23, "Connecting Clients to Windows Networks." For more information about authentication, see Chapter 16, "Understanding Logon and Authentication."

Using Office XP or Office 2003 and Windows XP Professional Together

Like Windows XP Professional, the English (U.S.) versions of Office XP and Office 2003 are built on an international core, meaning that it combines support for different language versions into a single product that you can run worldwide. Also like Windows XP Professional, Office XP and Office 2003 are available in the International English and other localized language versions, and with the Multilingual User Interface Pack.

When you install Office XP or Office 2003 on a computer running an International English or localized language version of Windows XP Professional, Office detects and uses the same default input language that the Windows XP Professional operating system uses. Office also enables support for scripts created on the Windows XP Professional operating system configuration.

Localized Versions of Office

Licensing localized versions of Microsoft Office, such as Microsoft Office 2003 Spanish Edition, is the best option if you need completely localized functionality and the additional content, such as templates and wizards in Word, that comes with some fully localized versions. Each localized version includes at least two sets of appropriate proofreading tools for the languages you are likely to use most (for example, the Norwegian version includes Norwegian, German, and English proofreading tools). To expand that support to more than 30 languages, you can install the Microsoft Office 2003 Editions Proofing Tools CD together with any localized version.

Organizations that work in very few languages, or that have completely decentralized IT departments that work with only the local languages, might choose to use the localized versions of Office.

Office XP and Office 2003 Editions Multilingual User Interface Pack

The Microsoft Office XP or Office 2003 Editions Multilingual User Interface Pack

adds key multilingual capabilities to those already built into Office by providing localized text for the user interface, online Help, wizards, and templates for Office programs.

If your company uses many languages, deploys Office 2003 worldwide from a central IT group, or needs to support workstations shared by many different language speakers, use the Office 2003 Editions Multilingual User Interface Pack. Windows 2000 Professional and Windows XP Professional are the only operating systems that support all Office 2003 Editions Multilingual User Interface Pack features.

When you install the Office XP or Office 2003 Editions Multilingual User Interface Pack on a computer running the Windows XP Professional MUI Pack, Office detects the default user interface language of the Windows XP Professional MUI Pack and sets that as the default for all Office programs. For example, if you install the Office XP Multilingual User Interface Pack on a computer running the Windows XP Professional MUI Pack and the default user interface language of that computer is set to Spanish, Office XP will also use Spanish as the default user interface language for Office XP applications.

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Troubleshooting

Organizations that support multilingual desktops face unique support issues. Typical problems include characters or fonts that do not display properly, applications that use the wrong currencies or sorting orders, and compatibility problems with line-of-business and third-party applications and drivers. This section summarizes how to solve the most common problems that your Help desk might encounter following a multilingual deployment of Windows XP Professional.

Tools for Troubleshooting Multilingual Issues

The updated Multilingual Document Consultant in Windows XP Professional Help and Support Center is your first resource for diagnosing and resolving most common problems involving inputting or viewing documents written in multiple languages.

To start the Multilingual Document Consultant
1. In **Help and Support Center**, in the **Search** box, type **Multilingual Document Consultant**.

2. In the **Search Results** list, click **Multilingual Document Consultant**.

Problems Inputting or Displaying Multiple Languages

The following are possible solutions for some of the most common problems that users might encounter when inputting or viewing characters from multiple languages.

Characters in Complex Script, Right-to-Left, or East Asian Languages Do Not Display Correctly

If you know that the languages displayed incorrectly are part of the Complex Script and Right-to-Left Collection or the East Asian Language Collection, support for those languages probably has not been installed. Only a user logged on as an Administrator can install this support. Users might require the Microsoft Windows XP Professional operating system CD or access to a network distribution point to complete this procedure.

To install the Complex Script and Right-to-Left Collection or East Asian Language Collection
1. In **Control Panel**, double-click **Regional and Language Options** to

open it.

2. Click the **Languages** tab, and then under **Supplemental language support,** select the check boxes for the language collections that you want to install.

If you install both the Complex Script and Right-to-Left Language Collection and the East Asian Language Collection but the document still does not display those characters correctly, verify that the font being displayed supports multiple character sets. If it does not, change the font to Tahoma or Microsoft Sans Serif.

Characters from Another Language Appear as Question Marks, Black Boxes, or Lines

Some applications might not support multiple languages, or the application might have been developed using a different language version of Windows XP Professional. Try entering characters using another program, such as WordPad, that you know contains multilingual support.

If you know that the application was developed under another language version operating system or if you are using a 16-bit DOS character-based program, close the application, change the default input language as appropriate, and then restart the application.

To change the default input language
1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Languages** tab, and then under **Text services and input languages**, click **Details**.

3. Under **Default input language**, click the input language that you want to use.

If you suspect that the application was not developed using Unicode, you might need to change the language for non-Unicode programs.

To change the language for non-Unicode programs
1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Advanced** tab, and then under **Language for non-Unicode programs**, select the language for which the application was developed.

Finally, if none of these solutions solve the problem, verify that the font being displayed supports multiple character sets. If it does not, change the font to Tahoma or Microsoft Sans Serif.

Characters Typed at the Command Prompt Are Not Correct

The default input language on the computer might require that you use a TrueType font, such as Tahoma, when typing at the command prompt. If you change to a TrueType font and continue to experience problems, check the mapping of your keyboard layout. Some keyboard layouts have MS-DOS keyboard mapping that differs from the normal mapping of characters.

To select a TrueType font to use at the command prompt
1. Open a command prompt window, and then on the **System Menu**, click **Properties**.

2. Click the **Font** tab, and then in the **Font** box, click a TrueType font, such as Lucida Console.

3. In the **Apply Properties to Shortcut** dialog box, do one of the

following:

- To use the TrueType font for this session only, click **Apply properties to current window only**.

- To use the TrueType font as the default for all command prompt windows, click **Modify shortcut that started this window**.

Numbers, Currencies, Dates, or Sorting Orders Are Incorrect

Verify that you are using the correct standards and formats settings for your locale, or customize the settings to your preferences.

To change number, currency, time, date, and sort-order settings

1. In **Control Panel**, double-click **Regional and Language Options** to open it.

2. Click the **Regional Options** tab, and then under **Standards and Formats**, click the country/region whose standards and formats you want to use. If you want to customize individual settings, such as how dates are displayed or numbers are sorted, click **Customize**, and then click the appropriate tabs and options.

Verifying Application Compatibility

If you have a language or regional problem with an application, the language emulation capabilities of Windows XP Professional make it easy for your IT department to verify and test an application's multilingual compatibility issues. You can test an application developed on any other language version of Windows by setting the test computer's language for non-Unicode programs to that of the application.

When testing for application compatibility, be sure to do the following:

- Anywhere that an application accepts user input, verify that any mixture of scripts works and that automated test cases are passing in randomly generated Unicode strings, not just as characters from the ANSI character set.

- For the Windows XP Professional MUI Pack, change the user interface language for one user and run an application. Check to see whether the user interface language of the application changes to match the new setting.

Some common problems you might encounter with applications include:

- Square boxes or dots displayed instead of characters.

  This indicates that the default font does not contain glyphs for the characters being displayed. The solution is to change the font to the appropriate language.

- Question marks displayed instead of characters.

  This indicates that a conversion from Unicode to ANSI was for a Unicode character that does not exist in the ANSI code page. The question mark is the default character returned instead. The solution is to change the language for non-Unicode programs to the native language.

- Formats and sorting orders are incorrect for the locale.

  This indicates that the default standards and formats settings for currency and date formats and for sorting orders might not be set to the correct language.

For more information about resolving these problems, see "Problems Inputting

or Displaying Multiple Languages" earlier in this chapter.

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Additional Resources

These resources contain additional information related to this chapter.

Related Information

- Chapter 7, "Supporting Mobile Users" for more information about supporting mobile users

- Chapter 8, "Configuring Remote Desktop" for more information about configuring remote desktops

- Appendix H, "Accessibility Tools" for more information about alternative input devices and accessibility options

- The Locales and Language link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for a list of locale IDs for use in unattended installations

- The Configuring and Using International Support of the MultiLanguage Version of Windows Operating Systems link on the Web Resources page at http://www.microsoft.com/windows/reskits/ webresources

- The Ask Dr. International link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for more information about developing applications for multilingual or international use

- The Microsoft OEM Code Reference link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for a complete list of code pages and their associated code points

- The Locales and Language link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for a complete list of the localized language versions of Windows XP Professional

- The Global Software Development List of Locale IDs and Language Groups link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for tables listing Windows XP Professional language collections and locales

- The International Telecommunication Union link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for a complete list of country and region codes to use for telephony

- The MSDN Library link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for more information about Windows Installer packages and parameters for using the **msiexec.exe** command (Search for "msiexec")

- The Globalization: Step-by-Step link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for information about how and what it means to globalize an application

- The Microsoft Global Software Development link on the Web Resources page at http://www.microsoft.com/windows/reskits/webresources for more information about creating world-ready software

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  "Unicode Control Characters" in Windows XP Professional Help and Support

Center

- The Windows Catalog at http://www.microsoft.com/windows/catalog for more information about third-party software applications that are certified as compatible with Windows XP Professional

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Manage Your Profile

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