



Nuance Speech Products

Installing Recognizer

Notice

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Installation procedure

This installation procedure includes the Nuance Recognizer engine and Nuance recognition server.

Here are the basic steps:

- 1 Required. Verify that the target system meets the [Hardware requirements](#) and [Software requirements](#).
- 2 Required. Remove previous releases of Nuance products. See the appropriate section:
[Uninstalling previous releases on Linux](#)
[Uninstalling previous releases on Windows](#)
- 3 Required. Install Nuance Recognizer and one or more languages. See the appropriate sections:
[Installing the recognizer on Linux](#).
[Installing languages on Linux](#)
[Installing the recognizer on Windows](#)
[Installing languages on Windows](#)
- 4 Required. Create an XML file for configuring licensing and other parameters. See [Creating a user configuration file](#).
- 5 Required. Install and configure a license server with license files. You can set up licensing for all licensed products at the same time. See [Setting up licenses \(required\)](#).
- 6 Required. Finish the configuration. See [Configuring the system \(required\)](#).
- 7 Optional. See [Configuring shared memory](#).
- 8 Required. Start recognition server(s). See [Starting Nuance recognition servers](#).
- 9 Optional. Test the Nuance Recognizer installation. See [Testing the Nuance Recognizer installation](#).

Hardware requirements

Here are the minimum requirements for the recognizer:

- The host must be based on one of the following chips:
 - Intel Pentium III or later (single, dual and quad-core processors). The processor must support streaming SIMD extensions.
 - AMD Opteron (single and dual-core processors).
- 2 GB RAM.
- 75 MB of free disk space for the recognizer's run-time software (includes 8 MB for documentation).

- Sufficient free disk space for at least one language. A typical language requires 75–150 MB. US English is not typical, it requires about 250 MB.
- 20 MB of free disk space for the tuning data directory (1 GB recommended).

Note: If using a system with minimum capacity, you can set up a small-footprint installation by turning off certain recognizer features. See [Setting up a small-footprint system](#).

Software requirements

Nuance Recognizer runs on various Linux and Windows systems.

Required accounts for installing, running, and stopping

To install or remove Nuance speech products on Windows, you must be logged in as Administrator. To run or stop Nuance products, you need an account with proper rights to directory `NUANCE_DATA_DIR` and subdirectories: modify, read, write. This account can be the user Administrator, a user in the group Administrators, or a standard user with these rights for the folder.

To install or remove Nuance speech products on Linux, you must be root or a “sudoer.” Processes can run under any user member of group “nuance.”

Note: When using starting scripts provided by Nuance, processes (for example, `Speech_Server/server/start` or `/etc/init.d/nuance-licmgr`) are started as the nuance user.

Supported operating systems

Nuance Recognizer is available only in a 64-bit version.

This product runs on Linux and Windows. You can run these operating systems on VMware. When designing your system, anticipate more CPU usage for virtual environments. Do not use nested VMware systems. Please see the *Release Notes* for supported versions.

Nuance currently tests and supports this product on hosts set to the en-US locale. Running on other locales might affect recognition accuracy and application performance. Nuance Recognizer uses C locale standards for file processing regardless of the machine's current locale setting. For example, this applies to configuration files, diagnostic logs, and call logs.

Additional software

For networking, Nuance speech products support HTTP 1.1 and HTTPS.

Nuance Recognizer requires licenses, languages, and a Speech Server:

- You must acquire licenses and run license servers as described in *Licensing with Nuance License Manager*. For an overview, see [Setting up licenses \(required\)](#).
- You must install at least one language. See the appropriate section:
[Installing languages on Linux](#)
[Installing languages on Windows](#)
- You must install Speech Server on your network.

Installing on Linux

To install Nuance Recognizer, use the *install.sh* script. You can run it in interactive or silent mode. The installer includes the runtime engine and the Nuance recognition server. After installing the software, you must install a language.

For an installation overview, see [Installation procedure](#).

Upgrading Nuance Recognizer

Service packs are cumulative. You can install any 10.2 service pack over the GA version or an earlier service pack. Note that the upgrade overwrites configuration settings in your *rec_config.xml*. To keep changes in this file, copy it under a different name before performing the upgrade, for example, *rec_config_save.xml*. Reapply your changes after the upgrade.

Uninstalling previous releases on Linux

Note: Nuance recommends keeping version 9.0.x on a separate host for migration purposes (because the migration tool uses 9.0.x for regression testing).

Nuance Recognizer 10.2 is not compatible with previous releases of Nuance Recognizer (9.0), OpenSpeech Recognizer (OSR), or Nuance Core Services. To determine what products you have installed, you can use a command such as the following:

```
> rpm -qa | grep NRec-  
> rpm -qa | grep OSR-  
> rpm -qa | grep NCore-
```

1 Remove Nuance Recognizer:

```
> rpm -e NRec-9.0-X
```

Above, replace *x* with the version of your previous installation.

2 Optionally, remove Nuance Recognizer languages. The 10.2 recognizer installation ignores 9.0.x languages. This allows you to keep them on your system if you have custom models that are useful with a repackaged language. For details, see *Migrating Previous Installation of Nuance Speech Products*. To remove languages, use the following command for each language. Replace *xx-YY* with a language code (for example, en-US), and replace *x* with the maintenance version of the language.

```
> rpm -e NRec-yy-ZZ-9.0-X
```

You can also use the following command to remove all languages (and the recognition engine):

```
> rpm -e 'rpm -qa | grep NRec'
```

- 3 Required (if installed). Remove OpenSpeech Recognizer (OSR) releases and all OSR languages:

- a To remove any version of OSR, use the following command. Replace *x* with the version of your release).

```
> rpm -e OSR-3.0-X
```

- b To remove any OSR language, use the following command. Replace *yy-yy* with the language code, such as en-US and replace *x* with the maintenance version of the language.

```
> rpm -e OSR-yy-yy-3.0-X
```

You can also use the following command to remove all languages (and the recognition engine):

```
> rpm -e 'rpm -qa | grep OSR'
```

- 4 Required (if installed). Remove Nuance Core Services 4.0.x releases:

```
> rpm -e NCoreServices-FTA-RES NCoreServices-WATCHER
```

Installing the recognizer on Linux

To install the software:

- 1 Change directory to the location of the downloaded software, and extract the archive:

```
> tar -xzf filename.tar.gz
```

The tar command extracts the installation files to a *Nuance_Recognizer* subdirectory.

- 2 Run the *install.sh* script:

```
> cd Nuance_Recognizer
> ./install.sh
```

During the installation, the script prompts you to accept the default parent directory (*/usr/local*) or to specify an alternative. To accept the default, press Enter. To install to an alternate parent directory, type the name of an existing directory as a fully qualified path and press Enter.

If you accepted the default, the recognizer is installed under */usr/local/Nuance/Recognizer*.

The installation process also sets the environment variable *\$NUANCE_DATA_DIR* to */var/local/Nuance*. If you wish to use another location for storing log files and recordings, you can redefine *\$NUANCE_DATA_DIR* as follows:

- 1 After you have installed Nuance Recognizer, copy the entire folder structure generated under *\$NUANCE_DATA_DIR* to the new desired location (including any contained files).
- 2 Change the value of *\$NUANCE_DATA_DIR* to the new location, using the following steps:
 - a A user with root level permissions must associate the environment variable *\$NUANCE_DATA_DIR* with the path to the alternate location in one of the files */etc/profile.d/100-SETUP-nuance-common-permanent.csh* or

`/etc/profile.d/100-SETUP-nuance-common-permanent.sh`, according to the command shell you are using. For example:

```
NUANCE_DATA_DIR=MyDataDirPath
export NUANCE_DATA_DIR
```

- b** In order to make the new path available immediately, use the source command on the updated file, for example:

```
source /etc/profile.d/100-SETUP-nuance-common-permanent.sh
```

Installing languages on Linux

You must install at least one language after you install the Nuance Recognizer. The first language installed becomes the default language (see the discussion on default languages in *Configuring Nuance Recognizer* for more information).

For some languages, you can download old languages (virtually identical to version 9.0.x) instead of new languages (improved for version 10.2). This is useful when migrating applications from a 9.0.x system to 10.2. For instructions on using language versions, see *Migrating Previous Installation of Nuance Speech Products*. Briefly, here is a comparison:

Default languages ()	Derived Languages (from 9.0.x)
The default languages have significantly better accuracy, but higher CPU and memory costs. They may require a 64-bit operating system running the 64-bit version of the recognizer.	Using the derived languages in Nuance Recognizer 10.2 has the same accuracy, memory, CPU, and confidence scores as the 9.0.x release. They are useful for upgrades to systems with resources sized for those languages, and for tuned applications.

- 1 Change directory to the location of the downloaded software, and extract the archive:

```
> tar -zxvf filename.tar.gz
```

The tar command extracts the installation files to a subdirectory named for the language, for example, *NRec-en-US-10.0.0-10.0.0*.

- 2 Change directory to the language subdirectory, and run the *install.sh* script.

```
> ./install.sh
```

The script installs the language to a version-specific directory in the same path as the recognizer; for example:

- `/usr/local/Nuance/Recognizer/config/en.us/9.0.0`
- `/usr/local/Nuance/Recognizer/config/en.us/10.0.0`
- `/usr/local/Nuance/Recognizer/config/fr.ca/10.0.0`

Note: Optionally, you can associate languages with specific tenants and applications. This is done in *session.xml* when you install Nuance Speech Server. For details, see *Developing with Nuance Speech Server*.

Uninstalling the Linux software

To remove a recognizer installation, remove recognizer components in the following sequence.

- 1 Remove the recognition server.

```
> rpm -e Nuance-NRS64
```

- 2 Remove languages. Repeat this command for each language. Replace *xx-YY* with a language code (for example, en-US), and replace *n.n.n* with the dataset version (for example, 9.0.0 or 10.0.0).

```
> rpm -e NRec-xx-YY-n.n.n
```

You can also use the following command to remove all languages (and the recognition engine):

```
> rpm -e 'rpm -qa | grep NRec'
```

- 3 Remove the recognition engine.

```
> rpm -ve NRec
```

- 4 Use these commands to remove specific modules shared by multiple Nuance speech products:

```
> rpm -e Nuance-OAM
> rpm -e Nuance-Doc
> rpm -e Nuance-Common64
> rpm -e Nuance-Common
```

You can also use the following command to remove all shared modules:

```
> rpm -e 'rpm -qa | grep Nuance'
```

Note: Nuance-OAM, Nuance-Doc, and Nuance-Common are shared modules. You should only remove those modules when removing all speech products.

Installing on Windows

The installation process for the recognizer includes the runtime engine and the Nuance recognition server. For an installation overview, see [Installation procedure](#).

Upgrading Nuance Recognizer

Service packs are cumulative. You can install any 10.2 service pack over the GA version or an earlier service pack. Note that the upgrade overwrites configuration settings in your *rec_config.xml*. To keep changes in this file, copy it under a different name before performing the upgrade, for example, *rec_config_save.xml*. Reapply your changes after the upgrade.

Uninstalling previous releases on Windows

Note: Nuance recommends keeping version 9.0.x on a separate host for migration purposes (because the migration tool uses 9.0.x for regression testing).

You must remove any previous releases of Nuance Recognizer (9.0), OpenSpeech Recognizer (OSR), OSR languages, and Core Services 4.0.x from the target system. Skip this section if your system does not have previous releases. (If uncertain, then follow this procedure.)

To remove previous releases from the target system:

- 1 Select Add/Remove Programs from the Control Panel.
- 2 Click on the recognizer from the list of applications, and click Remove. Repeat for any languages and the Nuance Core Services program.

- 3 Optionally, remove any local grammar/inet cache directories and log files. For information on cache directories, see *Configuring Nuance Recognizer*. For information on log files, see *Logging with Nuance Speech Products*.

Installing the recognizer on Windows

To install the recognizer:

- 1 Unzip the downloaded software, change directory to *Nuance_Recognizer*, and double-click on *Nuance_Recognizer_10.2.exe* to begin the installation. Then follow the on-screen instructions.
- 2 Choose a target directory for the software. The default installation directory is *C:\Program Files\Nuance\Recognizer*.

After installation, the *%SWISRSKD%* environment variable points to the installation location.

The installation process also sets the environment variable *%NUANCE_DATA_DIR%* to *C:\ProgramData\Nuance\Enterprise*. If you wish to use another location for storing log files and recordings, you can redefine *%NUANCE_DATA_DIR%* as follows:

- 1 After you have installed Nuance Recognizer, copy the entire folder structure generated under *%NUANCE_DATA_DIR%* to the new desired location (including any contained files).
- 2 Change the value of *%NUANCE_DATA_DIR%* to the new location using the Control Panel (Control Panel>System>Advanced system settings>Environment Variables). To ensure that the change is effective for future sessions, restart the system after making the change.

Installing languages on Windows

You must install at least one Nuance Recognizer language. After installing a language, you can activate grammars for that language and perform recognitions with no additional configuration needed. The first language installed becomes the default language (see *DefaultLanguage* in *Configuring Nuance Recognizer*).

To install a language:

- 1 Unzip the downloaded software, and change directory to *Nuance_Recognizer*.
- 2 Double-click the executable file and follow the on-screen instructions.

Languages are installed in version-specific directories in the same path as the recognizer. For example:

- *%SWISRSKD%\config\en.us\9.0.0*
- *%SWISRSKD%\config\en.us\10.0.0*
- *%SWISRSKD%\config\fr.ca\10.0.0*

Installing Nuance recognition server as a Windows service

By default, administrators start Nuance recognition server from the command line as described in [Starting Nuance recognition servers](#). Optionally, administrators can install recognition server as a Windows service using the programs *nrs-win-service-init.exe* and *nrs-win-service.exe*. To create the Windows service:

- 1 Select the command prompt and right click to select "Run as administrator".
- 2 Change the directory to *C:\Program Files\Nuance\Recognizer\Recognizer Service\amd64\bin*.
- 3 Execute this command:

```
> nrs-win-service-init.exe -i path -servlet nrs -port number [-options...]
```

Where:

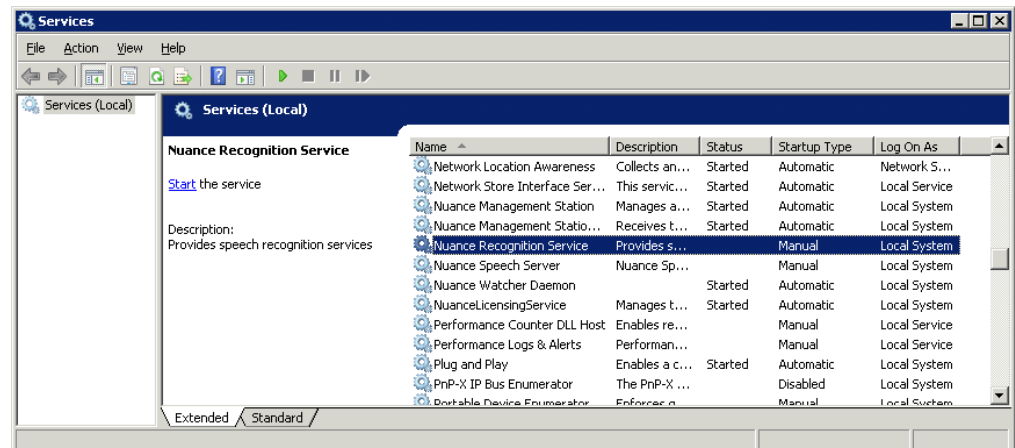
Option	Description
-i <i>path</i>	<p>Path and filename to <i>nrs-win-service.exe</i>. The path is required. This must be the short path (without spaces). For example:</p> <pre>-i "C:\Progra~1\Nuance\Recognizer\Recogn~1\amd64\bin\nrs-win-service.exe"</pre> <p>In this example, Progra~1 is the short path of Program Files, and Recogn~1 is the short path of Recognition Service. For more information, see Finding the short path.</p>
-servlet nrs	Required syntax.
-port <i>number</i>	An available port on the host. Nuance recommends port 8200.
-options...	<p>Any of the command line options described in <i>Configuring Nuance Recognizer</i>.</p> <p>Note: When specifying any of the -D options, omit double quotes around the value and do not include spaces in any path values. If a path contains spaces, specify the Windows short form instead. For example:</p> <p>Instead of -DDiagFileName="myPath~1", use -DDiagFileName=myPath~1</p> <p>For more information, see Finding the short path.</p>

For example:

```
> nrs-win-service-init.exe -i  
"C:\Progra~1\Nuance\Recognizer\Recogn~1\amd64\bin\nrs-win-service.exe"  
-servlet nrs -port 8200 -nthreads 2
```

This command creates the Nuance Recognition Service running on port 8200 with two distinct threads. The service is stopped by default. The startup type is manual.

- 4 To check that the service has been added, display the Services and verify that the Nuance Recognition Server appears in the list:



Note: The new service may not appear immediately. If you do not see it, use the Action > Refresh option in the main menu to refresh the display a few times.

- 5 Start the service (right-click and select Start from the pop-up menu).

Finding the short path

To determine the short path for any directory with a space in the name:

- 1 Open a Command Prompt window.
- 2 Change to the parent directory of the directory for which you need the short path.
- 3 Use the `dir /x` command.

Directory names appear in the last column of the output, and the short form in the next to last column. For example, to find the short path for Recognizer Service:

```
> cd C:\Program Files\Nuance\Recognizer\
> dir /x
Volume in drive C has no label.
Volume Serial Number is 08E5-2D1F

Directory of C:\Program Files\Nuance\Recognizer

04/05/2012  08:30 AM    <DIR>          .
04/05/2012  08:30 AM    <DIR>          ..
04/05/2012  08:27 AM    <DIR>          amd64
04/05/2012  11:15 AM    <DIR>          config
04/05/2012  08:27 AM    <DIR>          data
04/05/2012  08:30 AM    <DIR>          DOCUME~1    documentation
04/05/2012  08:27 AM    <DIR>          include
04/05/2012  08:27 AM    <DIR>          LICENS~1    license_agreements
04/05/2012  08:28 AM    <DIR>          RECOGN~1    Recognizer Service
04/05/2012  08:27 AM    <DIR>          samples
04/05/2012  08:28 AM    <DIR>          version
04/05/2012  08:27 AM    <DIR>          x86

               0 File(s)                0 bytes
             12 Dir(s)  15,530,500,096 bytes free
```

Note: In this example, the short paths are shown in all capital letters. However, the Command Prompt in Windows is case-insensitive.

Removing the Nuance Recognition Service

To remove the Nuance Recognition Service, run this command supplying the `-u` or `-uf` (force uninstall) option. You must stop the service before using `-u`.

```
> nrs-win-service-init.exe -u
```

Running silent installations on Windows

Optionally, you can use the command line to perform installations. When you do this, the procedure does not display questions or ask for confirmation.

- 1 Change directory to the unzipped installation files, and start the installation:

```
> start "" /wait Nuance_Recognizer_10.2.exe /s /v/qn
```

- 2 Install a language:

```
> start /wait Lang_installer_exe_name /s /v/qn
```

The system restarts automatically after a silent installation. To prevent the automatic restart, add `REBOOT=Suppress` to the installation command. For example:

```
> start "" /wait Nuance_Recognizer_10.2.exe /s /v"/qn REBOOT=Suppress"
```

You must still restart before running the recognizer. Restarting is not needed to install languages, or to remove the Nuance Recognizer or a language.

Uninstalling the recognizer on Windows

Remove the recognizer using Add/Remove Programs in the Control Panel:

- 1 Click the program you want to remove.
- 2 Choose the Remove maintenance option.
- 3 Manually remove local grammar/inet cache directories, log files, and your own files.

Note: If you installed the Nuance recognition server as a Windows service, see [Removing the Nuance Recognition Service](#) for more information.

Starting Nuance recognition servers

Start Nuance recognition servers after starting Nuance Speech Server and any Nuance resource managers. You can use the command line to start Nuance recognition servers on Linux or Windows. (See [Command line startup](#).) Alternatively, in some circumstances, you can start the recognition server Windows service. (See [Starting Nuance recognition servers on Windows](#).)

- For a simple system, start one Nuance recognition server. This results in an architecture with one Speech Server and one recognizer.
- For a high-capacity system, use the [Command line startup](#) to start more than one Nuance recognition server. This results in an architecture with one Speech Server and many recognizers, and requires running Nuance resource manager (provided with the Nuance Speech Server release). Also, Nuance strongly recommends increasing system capacity as described in [Configuring shared memory](#).
- Recommended. Set up your system to automatically restart Nuance recognition servers whenever the host reboots.

- Recommended. When hosting or running more than one application, set the per-company diagnostic logging feature on the command line.

Command line startup

To start Nuance recognition server from the command line, use the nuance-server servlet container with the appropriate options.

The supported options are:

Options	Description
-servlet nrs	Required. The value must be nrs.
-port <i>port_number</i>	<p>Required. An available port number.</p> <ul style="list-style-type: none"> ▪ When running a single recognition server, Nuance recommends using port 8200 (the default assumed by server.nrs.serverAddress in the Speech Server configuration). ▪ When running more than one recognition server, each startup command must specify a different port. <p>Note: Increment each additional recognition server by 10 to avoid potential port conflicts. For example, for the second instance, assign 8210, for the third, 8220, and so on.</p>
-nthreads <i>num_threads</i>	<p>Optional. Number of compute and audio threads. Default is 4.</p> <p>When running more than one recognition server, specify the same value for each. (Different values are allowed, but not recommended.)</p> <p>The optimal number of threads depends on the types of speech grammars used, and the expected number of simultaneous recognition channels. Here is a general guideline:</p> $num_threads = 1.2 * number_of_channels$ <p>Note: The extra 20% provides threads for administrative tasks</p> <p>Costs—Each thread uses 512KB memory, and each thread adds a small amount of CPU overhead for switching between contexts.</p>
nrs.DiagLogPerCompany= <i>boolean</i>	<p>Recommended when running more than one application on the system. This argument separates diagnostic logs into separate subdirectories for each company_name defined at the Speech Server level. The default is FALSE.</p> <p>nrs.DiagLogPerCompany=TRUE</p> <p>When using this argument, you must also set server.log.diagLogPerCompany in <i>NSSserver.cfg</i> (see <i>Installing Nuance Speech Server</i>).</p>

Options	Description
<code>rm.Addresses=<i>servers</i></code>	<p>Required when running more than one recognition server, which also requires running the Nuance resource manager. (Ignored when running a single recognition server.)</p> <p>Specifies the locations of one or two resource managers (usually two):</p> <ul style="list-style-type: none"> Specify identical values for each recognition server. In the Nuance Speech Server configuration, specify the identical value for <code>rm.Addresses</code>. See <i>Installing Nuance Speech Server</i>. <p>Set the parameter with a comma-separated list of servers using the <code>host:port</code> format (the port is optional):</p> <p><code>host[:port][,host[:port]]*</code></p> <p>Examples: 10.3.12.123:7777,10.3.12.124:7777</p>
<code>-DDiagFileName=<i>path</i></code>	<p>Required when running more than one recognition server. Each server requires a separate diagnostic file. By convention, use the naming pattern <code>nrs1.log</code>, <code>nrs2.log</code>, and so on.</p> <p><code>-DDiagFileName=%NUANCE_DATA_DIR%/system/diagnosticLogs/nrs1.log</code></p>

To start more than one Nuance recognition server, repeat the command with different port values. This example starts two servers:

```
nuance-server -servlet nrs -port 8200 -nthreads 96
rm.Addresses=localhost:7777,localhost:7787
-DDiagFileName=%NUANCE_DATA_DIR%/system/diagnosticLogs/nrs1.log

nuance-server -servlet nrs -port 8210 -nthreads 96
rm.Addresses=localhost:7777,localhost:7787
-DDiagFileName=%NUANCE_DATA_DIR%/system/diagnosticLogs/nrs2.log
```

Nuance recommends you increment each additional port by 10, as this example shows. The reason for this is that each Nuance recognition server actually uses two ports: port `port_number`, port `port_number + 1`. So the first server uses 8200 and 8201. Incrementing by 10 avoids port conflicts.

Starting Nuance recognition servers on Windows

The installer installs Nuance recognition server files you can use to run the server as a command-line process or to install it as a Windows service after installation. Administrators must choose which server to run:

- Do not run both servers simultaneously.
- Use the Windows service if running a single Nuance recognition server. The service name is “Nuance Recognition Service”, and it installs in Manual mode. You can start manually or change to Automatic mode with the Windows Services tool.
- Use the command-line server if running more than one Nuance recognition server or if using the Nuance Watcher Service. To start the Nuance recognition server from the command line, you can be Administrator or a user in the Administrator security group. Also, a standard (non-administrative) user can run Speech Server from the command line if these rights are set for `C:\ProgramData\Nuance`:

- Modify
- Read and execute
- List folder contents
- Write

Creating a user configuration file

Create a recognizer configuration file for setting up licensing and other parameters. The procedure is not required at the time of installation, but every host requires a user-defined configuration eventually, and Nuance recommends creating the file during installation. (If migrating from a previous release, you can re-use an existing file.)

A *rec_config.xml* configuration file is a user-created XML document that overrides recognizer default settings. The filename *rec_config.xml* is a convention (previously, the convention was *user.xml*). To create the file:

- 1 Create an XML file named *rec_config.xml* in a location outside of the recognizer's installation path. See [File structure for rec_config.xml files](#).
- 2 Point the recognizer to find the file. See [Activating a rec_config.xml file](#).

You must restart the recognition server after adding or changing parameters in the file.

File structure for *rec_config.xml* files

Here is a sample *rec_config.xml* with a single parameter:

```
<?xml version="1.0"?>
<SWIrecConfig version="1.0.0">

  <lang name="default">

    <param name="swirec_disk_cache_enabled">
      <value>1</value>
    </param>

  </lang>
</SWIrecConfig>
```

The header contains the XML declaration, XML stylesheet instruction, and the opening `<SWIrecConfig>` element. The header is fixed, and you must use them exactly as follows:

```
<?xml version="1.0"?>
<SWIrecConfig version="1.0.0">
```

The main body of a *rec_config.xml* file consists of parameters and their values, listed in the default `<lang>` section:

```
<lang name="default">
  <param name="swirec_extra_nbest_keys">
    <value>SWI_meaning</value>
    <value>SWI_literal</value>
    <value>SWI_grammarName</value>
  </param>
</lang>
```

Any incomplete paths in the *rec_config.xml* file are relative to the `%SWISRSDK%` environment variable.

In addition to the main body, there can be language-specific sections (`lang=langcode`).

Each `<lang>` section indicates the language for which the parameter settings apply. The name is either “default”, or a language code indicating another installed language (for example, en-US for US English).

Section in <code>rec_config.xml</code>	Description
<code>Lang=default</code>	Parameters override recognizer defaults.
<code>Lang=langcode</code>	Parameters override language-specific defaults.

Activating a `rec_config.xml` file

To activate a `rec_config.xml` file, specify the file’s full path using one of the following techniques:

- Specify SWIUSERCFG parameter in `%SWISRSdk%\config\SpeechWorks.cfg`.
- Define the path as the value of a SWIUSERCFG environment variable.

Setting up licenses (required)

Nuance Recognizer and other Nuance products require a license server with a valid license file. You can set up licensing for all products at the same time using a single server and license file.

For complete instructions, see *Licensing with Nuance License Manager*.

Configuring the system (required)

The recognizer host requires initial configuration after installation:

- [Configuring the recognizer on Linux](#)
- [Configuring the recognizer on Windows](#)

Configuring the recognizer on Linux

Source the following file to define environment variables for the recognizer:

```
install_dir/Nuance/Recognizer/SETUP-env.sh.
```

The script creates these required variables:

Environment variable	Action to perform
SWISRSKD	Point SWISRSKD to the Nuance Recognizer installation directory. For example (assuming csh or tcsh): <code>setenv SWISRSKD /usr/local/Nuance/Recognizer</code>
LD_LIBRARY_PATH	Create or modify the LD_LIBRARY_PATH variable. For Red Hat Enterprise Server 3.0, create the LD_LIBRARY_PATH variable: <code>setenv LD_LIBRARY_PATH /lib/i686:\$SWISRSKD/lib</code> Or, add the path to the existing variable: <code>setenv LD_LIBRARY_PATH /lib/i686:\$SWISRSKD/lib:\$LD_LIBRARY_PATH</code> For other Red Hat versions of Linux and for Solaris installations, use this path: <code>setenv LD_LIBRARY_PATH \$SWISRSKD/lib</code> Or, add the path to the existing variable: <code>setenv LD_LIBRARY_PATH \$SWISRSKD/lib:\$LD_LIBRARY_PATH</code>
PATH	Add <code>\$SWISRSKD/bin</code> to your PATH. This allows you to run Nuance Recognizer programs without specifying the full path to the bin directory. For example (assuming csh or tcsh): <code>setenv PATH "\$SWISRSKD/bin:\$PATH"</code>
NUANCE_DATA_DIR	Set automatically during installation. Specifies the path for logging. Default: <code>/var/local/Nuance</code>

Configuring the recognizer on Windows

In addition to the configuration below, you must configure a license server.

Windows Server 2008 contains a feature called the Windows Security Center. Some consideration for the Security Center components must be made when configuring Nuance Recognizer.

The Security Center has these components:

- [Windows firewall](#)
- [Automatic updates](#)

- [Virus protection](#)

A note about Security Center shield colors

The typical user of Nuance Recognizer can ignore some Security Center tools. By default, all security settings are set to optimal, which displays the respective shield icons with the color green.

The color is a Microsoft design decision, and running a computer with yellow or red shield colors does not necessarily indicate a problem. To operate your system so that shield colors remain green:

- Windows Firewall must be ON and "dangerous" ports must not be in the exception.
 - Automatic Updates must be set to "download and install updates automatically".
 - Virus Protection must have a virus software program installed, automated, and registered with eTrust.
-

Windows firewall

In addition to ports needed by your platform, the firewall must allow access to any TCP ports needed by remote Nuance Recognizer hosts that connect to the firewalled host.

The default green shield settings for Windows Firewall will block license enforcement operations for any license client connections from a remote host. Therefore, changes to the Windows Firewall are required: if the host will act as a licensing server for remote Nuance Recognizer license connections, then you must open its TCP port (or ports) to allow the Nuance Recognizer license client to communicate with the server.

The general procedure to access the Firewall is:

- 1 From the Control Panel, click "Security Center".
- 2 Select "Windows Firewall".
- 3 Make the appropriate choices:
 - **Disabling:** If the machine will not be connected to the internet, or an easier installation is desired, disable Windows Firewall. The shield icon will turn red. Disabling the entire Windows Firewall is a potential security risk. Do this only if the machine will not be connected directly to the public internet, or if you already have a site-wide firewall, or if you require the most simple installation.
 - **Open the ports:** click the "Add Port" dialog in the "Exceptions" tab in Windows Firewall to add the ports for licensing operations to the list. See the Nuance Recognizer licensing documentation for the list of ports to use. If useful, the "Advanced" tab in Windows Firewall ("Network Connection Settings" dialog) allows for fine-tuning. Depending on your settings, the shield color for Windows Firewall may turn yellow.
 - **Allow the executables freedom:** if the firewalled host is running a license server, you can add the `lmgrd.exe` and `swilmgrd.exe` programs to enable remote license server connections. Depending on your settings, the shield color for Windows Firewall may turn yellow.
 - **Reactionary:** When a remote host attempts a network connection to a firewalled host, a Windows Security Alert dialog box opens. Click "Unblock" in this dialog to allow the connection. This "reactionary" method requires supervision for the first of each kind of connection, and may cause all calls to fail until the ports are unblocked. Depending on your settings, the shield color for Windows Firewall may turn yellow.

Automatic updates

Disabling automatic updates or taking manual control of the updates will turn the shield's color from green to yellow (manual control) or red (disabled). This will not affect Nuance Recognizer operations.

Virus protection

For optimal performance, do not run virus software on a Nuance Recognizer server.

If the host is not connected to the Internet, this does not introduce risk. Even if the host is connected to the Internet, but is not used for web browsing or reading e-mail and downloading files, there is lesser risk.

When no anti-virus software is registered with Windows, the shield will turn red. This will not affect Nuance Recognizer operations and actually reflects the ideal situation for Nuance Recognizer.

When anti-virus software is registered, but is out-of-date with eTrust, the shield will turn yellow. This will not affect Nuance Recognizer operations.

Note: See the Microsoft documentation provided with Windows Server 2008 for authoritative instructions on Security Center features. Also, while Nuance has not experienced problems with the modified settings described above, Microsoft considers any non-optimal (non-green) shield color to be a security risk.

Setting up a small-footprint system

System administrators can reduce the recognizer's use of memory, CPU, and disk resources with the following settings. This is known as a small-footprint installation.

Benefit	Reduced CPU activity, reduced disk space usage, and slightly reduced memory usage. Reduces memory from approximately 434MB to 228MB for Nuance Speech Products languages, and from 224MB to 112MB for repackaged languages.
Cost	A small-footprint setup slightly reduces recognition accuracy, and prevents the system from adapting (improving) automatically in the future.

To set up a small-footprint installation, configure the following parameters in a language-specific Language section of a *rec_config.xml* before starting the system:

- 1 Turn OFF the secondpass recognition feature by specifying empty values for these parameters:

```
<audio name="audio/L16;rate=22000">
  <environment name="voip">

    ...normal first pass setup...

    <meta name="swirec_secondpass_model_name" content=""/>
    <meta name="swirec_secondpass_global_fsm_name"
      content=""/>
    <meta name="swirec_secondpass_allophone_mapfile_name"
      content=""/>
  </environment>
</audio>
```

- 2 Turn OFF the self-learning feature by setting `wirec_acoustic_adapt_adapt_model` to 0.

See *Configuring Nuance Recognizer* for more information about each configuration parameter.

Configuring shared memory

Optionally, you can optimize system capacity by configuring a region of memory shared by recognition server processes. This is useful when you start more than one recognition server on a host.

The following parameters control shared memory usage in a *rec_config.xml* file. For the simplest configuration, set [swirec_shmem_enabled](#) and accept defaults for the other parameters:

Parameter	Description
swirec_shmem_address	Specifies the base address in memory for recognizers to use for shared memory.
swirec_shmem_enabled	Defines whether or not recognition server processes share memory.
swirec_shmem_resource_load_timeout	Sets the maximum time for a process to wait for a resource in shared memory.
swirec_shmem_size	Specifies the size of the memory region shared by recognition server processes.
swirec_shmem_warn_threshold	Specifies how much shared memory is filled before the system generates warnings.

For complete details on these parameters, see *Configuring Nuance Recognizer*.

Testing the Nuance Recognizer installation

You can test the recognizer installation in two ways.

- Before installing Nuance Speech Server: run the sample application included in the Nuance Recognizer installation
(%SWISRSdk%\samples\swirec_sample\SWIRecSample.exe).
- After installing Nuance Speech Server: install and run the Nuance® UniMRCP Sample Client.
 - a Download the Sample Client from Nuance Network. MRCP Integrations > Nuance Speech Server (NSS) > Nuance MRCP Sample Client 1.0

nuance-unimrcp-sample-client-1.0.zip
Release_Notes.pdf
 - b Follow directions in the Release Notes.