Nuance Communications, Inc.

Nuance Speech Suite Installation Guide

NUANCE

Contents

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Nuance Speech Suite 11.0
Installation Guide

Published by Nuance Communications, Inc.
One Wayside Road, Burlington, Massachusetts 01803 U.S.A.
Last updated: Wednesday, July 3, 2019

Installation checklist

Nuance® Speech Suite provides advanced speech recognition and text-to-speech (TTS) capabilities. It is supported on Windows and Linux. See the *Release Notes* for the supported versions.

Note: Speech Suite has important dependencies, and the combination of products on different hosts can be complex. If you plan the installation in advance and follow the step-by-step instructions in order, the installation completes smoothly. Alternatively, your installation if dependency is installed incorrectly or unavailable at the correct time.

The Speech Suite installation involves completing these main tasks in order:

	Installation tasks	Documentation topics
1	Basic deployment decisions	Decide the number of hosts needed and which Speech Suite components to install and run on each. You can skip this step and install all components on one host, but be aware you might need more hardware and processing power.
2	Prepare hosts before installation	Required. Install third-party software, configure the operating system, and set permissions.
3	Run the installer	Required. Install components on all hosts.
4	After the installation	Required. Complete the configuration.
5	Start services	If using Management Station, see "Testing the installation with Management Station" in the online documentation. If not using Management Station, see "Starting services without Management Station" in the online documentation.

Installed components

You can install these components on any host in your network:

- **Nuance License Manager:** You must install on one or more hosts.
- **Nuance speech products**: You must install on one or more hosts.
- **Nuance Management Station:** Optional tool for configuring, deploying, administering, and managing voice services.

Nuance Speech Product components:

Components	Description
Nuance Automation Assist	Optional tool for human-assisted recognition data-collection for tuning purposes.
Dragon Voice	Performs speech recognition while supporting open-dialog, virtual assistant applications and other natural language capabilities. Components:

Components	Description
	Krypton recognition engine — Enables raw recognition and open-dialog (large vocabulary continuous speech) recognition. Natural Language Engine (NLE) — Provides semantic processing and meaning extraction. Nuance Text Processing Engine (NTpE) — Provides a framework for tokenization and normalization of text. Natural Language Processing service (NLP service) — Manages Dragon Voice components. Nuance Resource Manager — Optimizes Dragon Voice resources by managing traffic and service requests.

Required hardware and memory

This section lists the processor, memory, and storage requirements for a Nuance speech system in development and deployment environments.

Note: Nuance recommends more powerful machines for large deployments with high port densities and heavy call volumes.

Note: Nuance recommends explicitly configuring the date and time of all host machines in the network. Having all hosts use a common date and time simplifies log collection, licensing, troubleshooting, and comparing logs.

Processors for speech software hosts

Suggested processor requirements for speech software hosts are:

- **Minimum:** Dual-core Intel Xeon 2.0 GHz or Dual-Core AMD Opteron 2216 2.4 GHz
- **Recommended:** Dual Quad-Core Intel Xeon E5410 2.33 GHz

Processors for Krypton hosts

Suggested processor requirements for hosts running the Krypton recognition engine:

- **Minimum:** Dual Quad-Core Intel Xeon E5410 2.33 GHz
- **Recommended:** 16 core Intel Xeon E5 Family v4 (Broadwell)

Requirements for development environment

For demos, prototyping, and small deployments (not more than 10 ports), you can install all Nuance products, including Management Station, if used, on a single host. Suggested configuration requirements are:

- **Memory:** 16 GB
- **Processor:** Dual Quad-Core Intel Xeon E5410 2.33 GHz
- **Storage:** Varies according to the port density. The range is between 10 to 40 GB.

Requirements for deployment environments

If using Management Station, install Management Station and Nuance speech software on separate hosts.

Management Station hosts

Memory and storage requirements vary depending on the volume of data you plan to collect and store. Recommended configuration requirements are:

Memory	Storage
• 2 GB minimum	• 50 GB minimum
• 4 GB recommended	• 200 GB recommended

Speech software hosts

This table shows the minimum and recommended memory and storage requirements for speech software hosts performing moderate logging and single-language recognition. Any host running Nuance speech software must provision for storing call log files, utterances, and whole-call recordings (if enabled).

Memory	Storage
• 4 GB minimum	• 100 GB minimum
• 32 GB recommended	• 250 GB recommended

Krypton and NTpE hosts

Memory and storage guidelines for dedicated hosts running the Krypton recognition engine performing moderate logging and single-language recognition:

Memory	Storage
• 16 GB minimum	• 100 GB minimum
• 32 GB recommended	• 250 GB recommended

On Linux, you must configure at least 3 GB of shared memory on any host running Krypton or NTpE. For example:

```
> mount -o remount,size=3G /dev/shm
```

Adding memory for multilingual deployments

Multilingual deployments must make sure they have enough physical memory and per-process user address space.

- Minimum physical memory for a Nuance speech software host with more than one language: 4 GB
- Per-process user space on a 64-bit Linux host running 32-bit applications: 4 GB

Hosts running the Krypton recognition engine use a single port-per-process architecture for efficient memory management. Memory provisioning for the hosts is dependent on the number of ports provisioned with a recommended 512 MB of memory per port.

When provisioning languages, voices, grammars, and data packs, you must ensure they do not exceed the user space limit. In addition, reserve about 500 MB of extra space to allow for events such as dynamic grammars, acoustic adaptation, and call log cleanup.

In deployment environments, Nuance recommends loading a maximum of two languages on a Nuance speech software host. Doing this helps to respect the user space limit of 4 GB with 500 MB of extra space. However, this recommendation is flexible depending on the hardware. For example:

- You can load a third language on a 64-bit Linux host with more than 4 GB of physical memory (for example, 8 GB).
- To run more than three languages, you must provision appropriately. For example, a host with five languages and three recognition service instances needs about 12 GB of physical memory (including shared-memory).

Basic deployment decisions

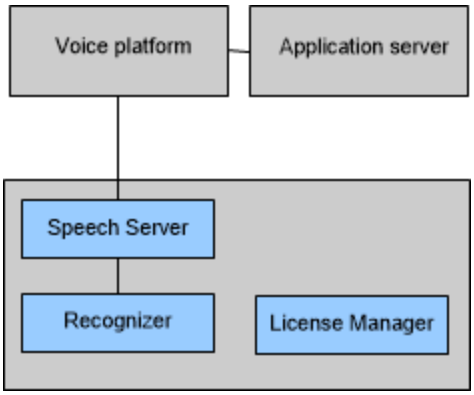
Before installation, you must know how many hosts are needed in your Nuance network and which components to run on each. Your design gets incorporated into your license file: if you change the deployment architecture in the future, it is likely you'll need to re-generate the license file.

Basic decisions	Description
Minimal installation	Install all components on a single host. This is called an All-in-one architecture on the facing page. This deployment is good for initial testing, beginning development, and small deployments. For this architecture, you do not need additional planning: proceed to Install third-party software on page 26.
Expanding capacity	Install components on multiple hosts, and run different components to on each. This deployment expands capacity for optimal performance, and for larger volumes of traffic. For this architecture, determine the number of hosts and which components to run on each. See Distributed architecture on page 13. In addition, you can expand capacity by running more instances of any component on any host. (This does not require additional installations.)
Managing the system	Decide how to administer and operate the system. You can provide your own tools or install the Nuance Management Station.
Estimating load	Be aware of the load placed by each component on each host, especially when preparing for testing and production. See Required hardware and memory on page 6.

Note: Most customers design their installations with help from Nuance. The Professional Services organization can estimate memory, processing power, and network loads based on your application's purpose and estimated volumes. Further, you might evolve the topography after testing the application and conducting phased deployments. The important factor is that you have a plan to run specific components on specific hosts. Having this plan gives you the host and port information needed to connect the components together.

All-in-one architecture

For a basic system, you prepare, install, and run all components on a single host. This is the simplest installation scenario, and it is good for learning, application development, testing, and small-to-medium application deployments (1-2 channels).



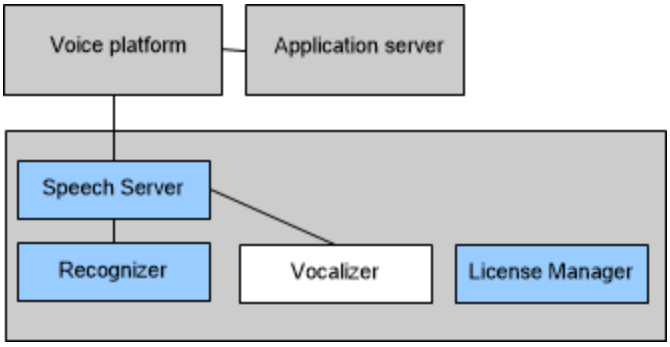
The Voice platform and Application server are not part of the Speech Suite installation. You are responsible for providing those (necessary) ingredients for a complete system. They can reside on any host in your network.

Tip: If using Management Station, you can configure the above architecture using role file *1 NSS, 1 NRS, SC, & FTS*.

All components are available after installation

The installation puts all Nuance speech products onto the host, and you decide which ones to run. (You have the option of NOT including the License Manager and Management Station on every host. For descriptions, see Deploying the License Manager on page 22 and Deploying the Management Station on page 16.)

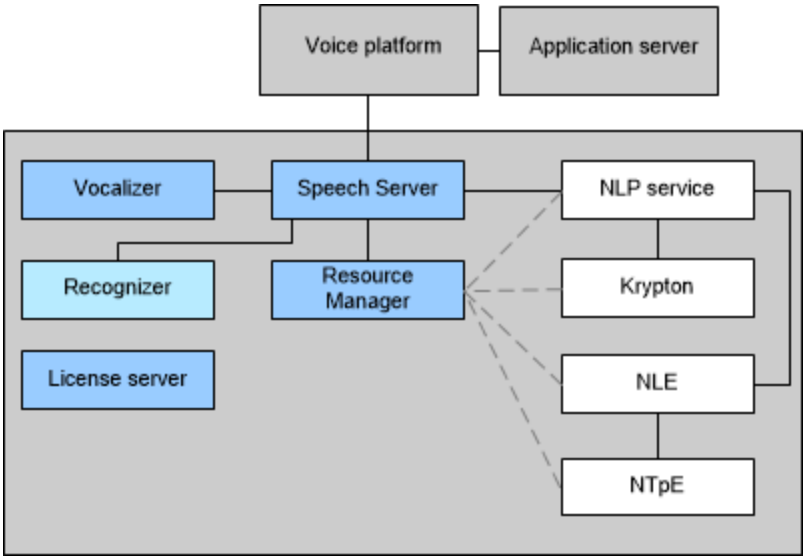
Here, Nuance Vocalizer provides access to text-to-speech (TTS) and pre-recorded files. Most applications use a combination of both. This enables using professionally recorded audio for static information that is known in advance and TTS for dynamic information that is not known in advance (and thus not appropriate for pre-recording).



Tip: If using Management Station, you can configure this sample architecture using this role file: *1 NSS, 1 NRS, 1 NVS, SC, & FTS*. Roles are provided to support multiple instances of each service as well.

All-in-one with Dragon Voice

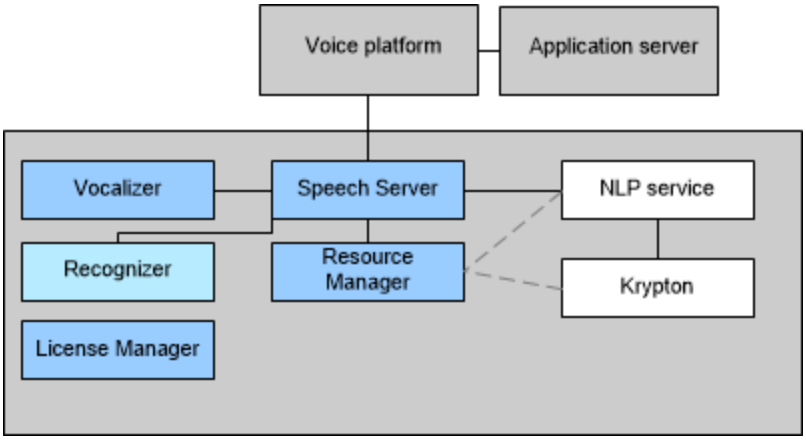
This example shows the components of Dragon Voice running in an all-in-one configuration. Dragon Voice is included with every installation of Nuance speech products, but whether you run it depends on the purpose of your applications and your Nuance license. (You must run the Nuance recognition service when using Dragon Voice even if you don't use Nuance Recognizer.)



Tip: If using Management Station, you can configure this sample architecture using this role file: *1 NSS, 1 NRS, 1 NVS, 1 NLPS, 2 KRYPTON, 1 NLE, 1 NTpE, 1 NRM, SC & FTS*. The statistic collector service (SC) and file transfer service (FTS) are Management Station services that collect data for purposes such as billing, capacity monitoring, and call logging.

All-in-one with Krypton-only

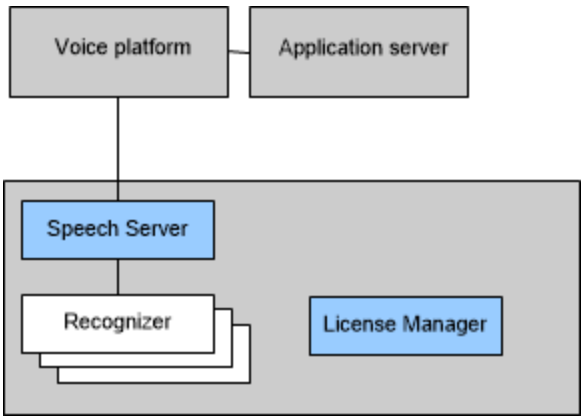
You can run the Krypton engine without running the semantic understanding components of Dragon Voice. This enables applications to get literal speech recognition results (see Dragon Voice features):



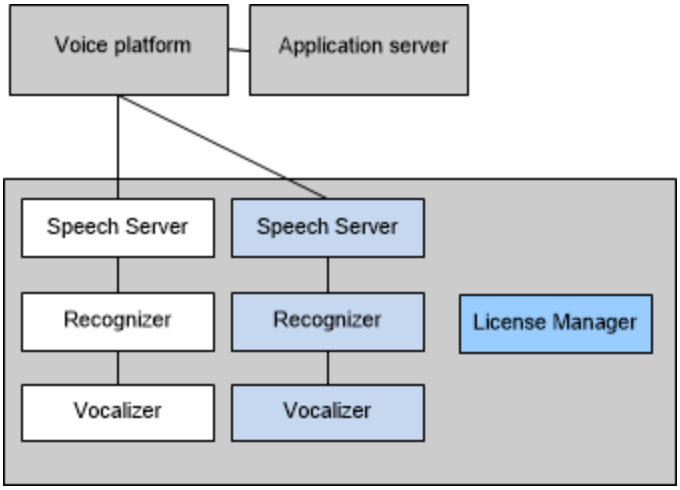
(You must run the Nuance recognition service when using Dragon Voice even if you don't use Nuance Recognizer.)

Expanding capacity by running more instances of components

You can expand the capacity of any deployment by running additional instances of components. Here, we have more than one recognition service:

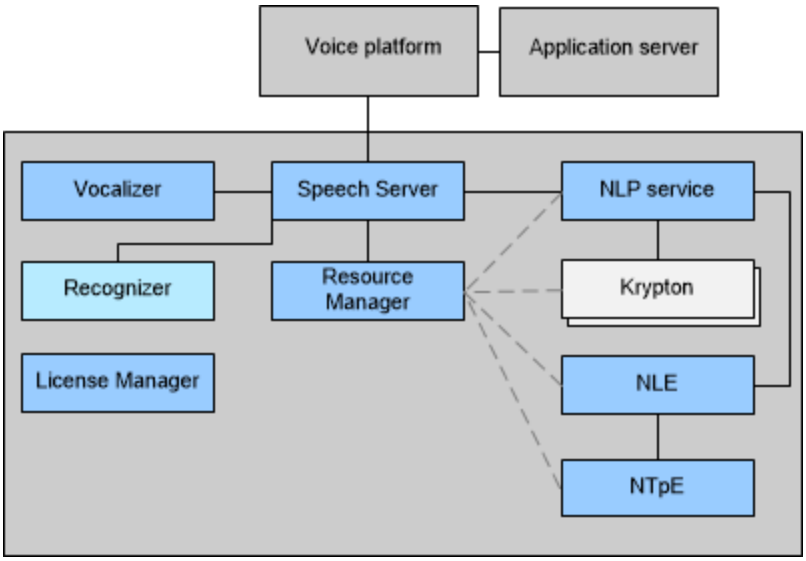


Below, each Speech Server communicates with a specific Nuance Recognizer and Nuance Vocalizer. You can configure additional Speech Server, Nuance Recognizer, and Nuance Vocalizer instances, depending on the number of ports you wish to support.



Tip: If using Management Station, you can configure the above architecture using role file *2 NSS, 2 NRS, SC, & FTS*.

The next example runs Dragon Voice with two instances of Krypton to expand its capacity. The combinations are endless, and you could running additional components missing from this example. (You must run at least one License Manager, either on this host or elsewhere in the network.)

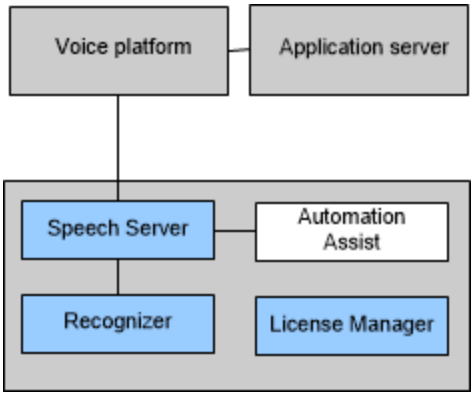


(You must run the Nuance recognition service when using Dragon Voice even if you don't use Nuance Recognizer.)

Tip: If using Management Station, you can configure this sample architecture using this role file: *1 NSS, 1 NRS, 1 NVS, 1 NLPS, 2 KRYPTON, 1 NLE, 1 NTpE, 1 NRM, SC & FTS*. The statistic collector service (SC) and file transfer service (FTS) are Management Station services that collect data for purposes such as billing, capacity monitoring, and call logging.

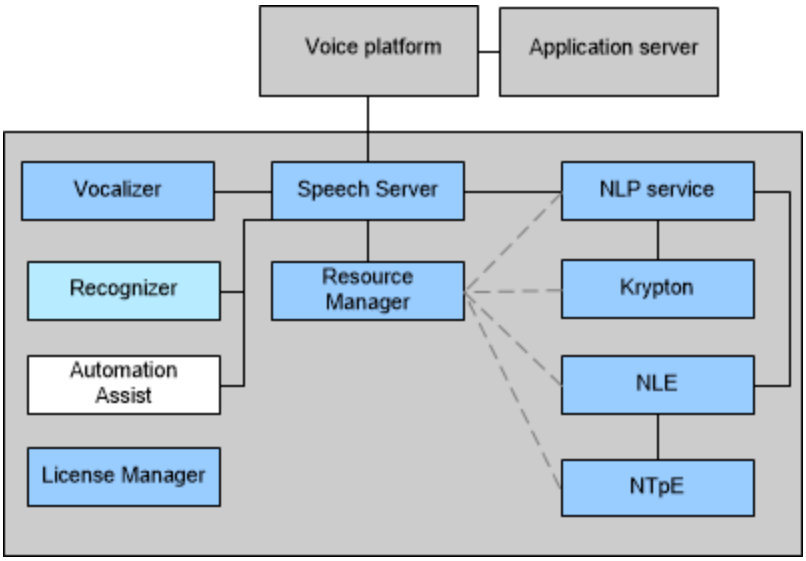
All-in-one with Automation Assist

These examples add Nuance Automation Assist to an all-in-one network:



Tip: If using Management Station, you can configure this sample architecture using this role file: *1 NSS, 1 NRS, 1 NAA, SC & FTS*. Roles are provided to support multiple instances of each service as well.

Here is Nuance Automation Assist with Dragon Voice. (You must run the Nuance recognition service when using Dragon Voice even if you don't use Nuance Recognizer.)



Tip: If using Management Station, you can configure this sample architecture using this role file: *1 NSS, 1 NRS, 1 NVS, 1 NLPS, 1 KRYPTON, 1 NLE, 1 NTpE, 1 NAA, 1 NRM, SC & FTS*. A separate role is provided that excludes Nuance Vocalizer (NVS) from this configuration.

Distributed architecture

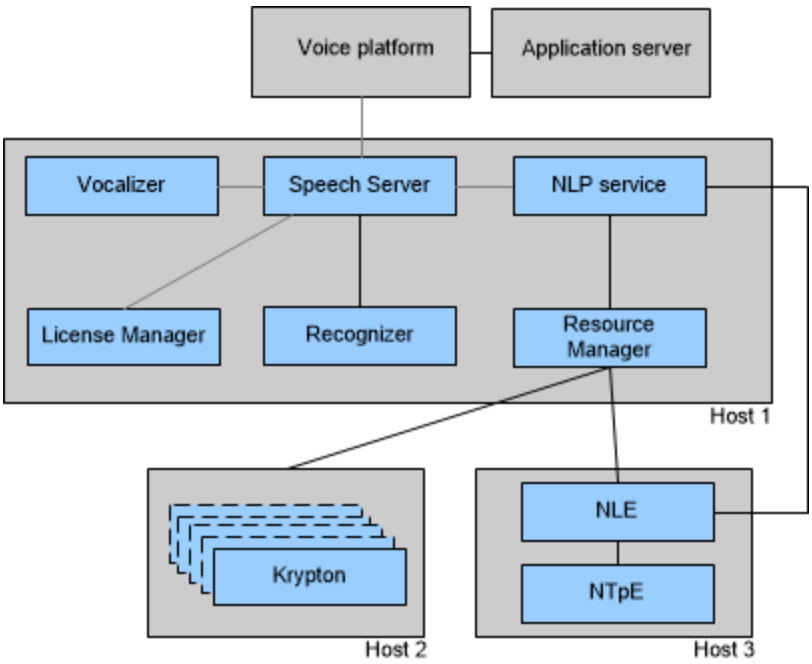
You can scale from an all-in-one system to a sophisticated network with more than one host. The distributed architecture improves the capacity, redundancy, flexibility, and responsiveness of the system. You can add more hosts, dedicate hosts to running specific components, and run additional instances of Nuance speech products as needed.

Note: Use one operating system (Linux or Windows) for all hosts in your Speech Suite network. Nuance does not support inter-operation of mixed clusters.

A multi-host deployment for Dragon Voice

Here is a Speech Suite installation on three hosts with all licensed components sharing a single License Manager. (To avoid a single point of failure, you could run an additional License Manager on another host. For ideas, see Deploying the License Manager on page 22.)

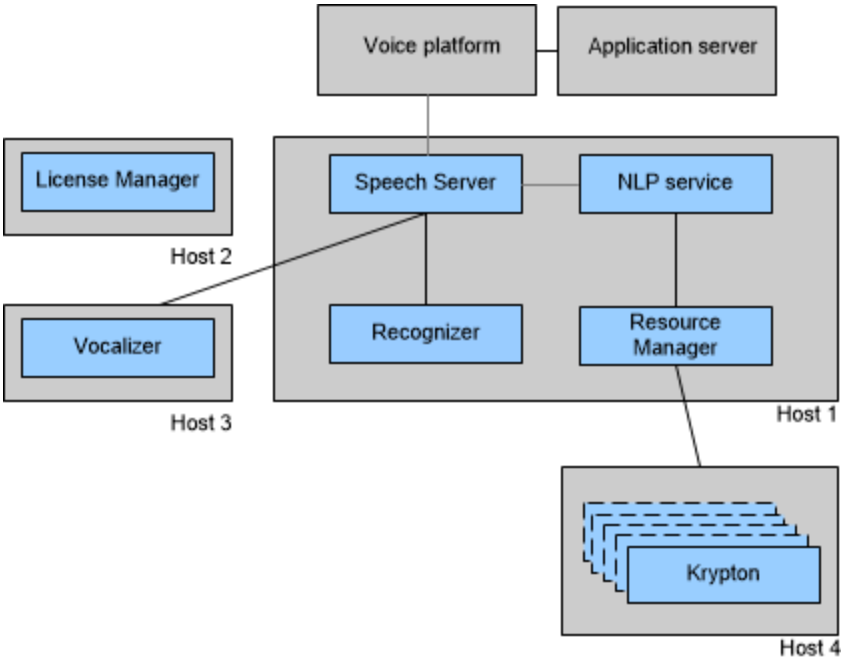
This example is for Dragon Voice. (You must run the Nuance recognition service when using Dragon Voice even if you don't use Nuance Recognizer.)



The Voice platform and Application server are not part of the Speech Suite installation. You are responsible for providing those (necessary) ingredients for a complete system. They can reside on any host in your network.

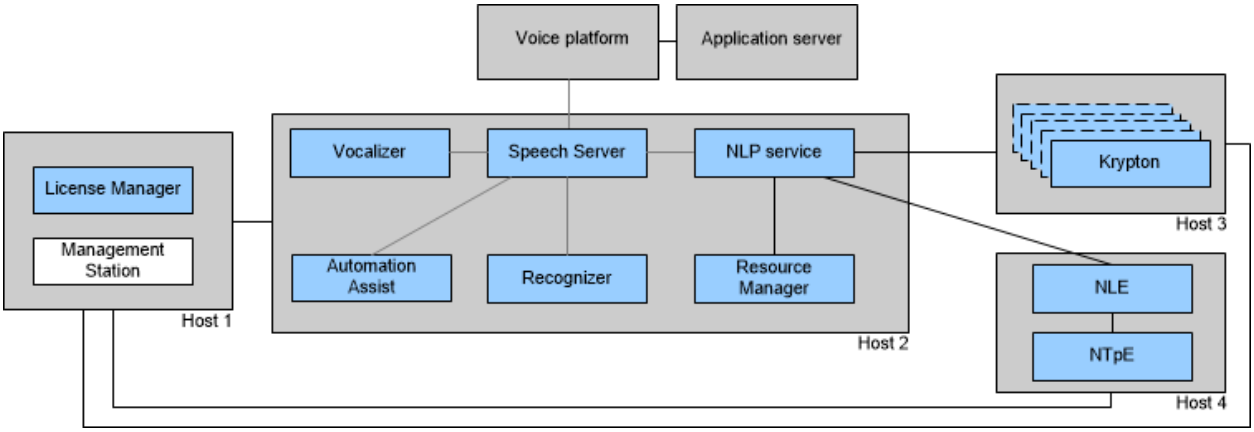
A multi-host deployment for Krypton-only

Here is a Speech Suite installation on four hosts. All licensed components sharing a License Manager on a dedicated host. This example is for Krypton-only (literal speech recognition without semantic interpretation). It's the same as a Dragon Voice deployment except you don't need to run NLE, or NTpE.



Adding Management Station

This example adds a host for the optional Management Station, and runs the License Manager on the same host.

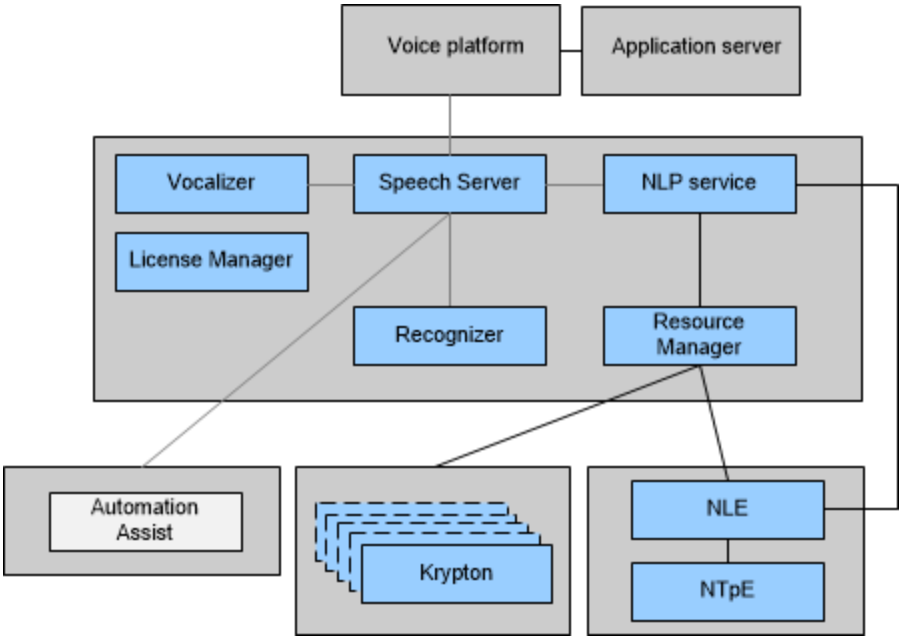


For addition deployment options, see Deploying the Management Station on the next page.

Tip: If using Management Station, you can configure this sample architecture using this role file: *1 NSS, 1 NRS, 1 NVS, 1 NLPS, 1 NRM, FTS, SC; 1 NLE & 1 NTpE*; and *n KRYPTON* (where *n* indicates configuration options that include 1 instance, 10 instances, 25, 50, 75, or 100).

Adding Automation Assist

Here is a larger system with the optional Automation Assist running on a dedicated host in a network that also includes Dragon Voice components:



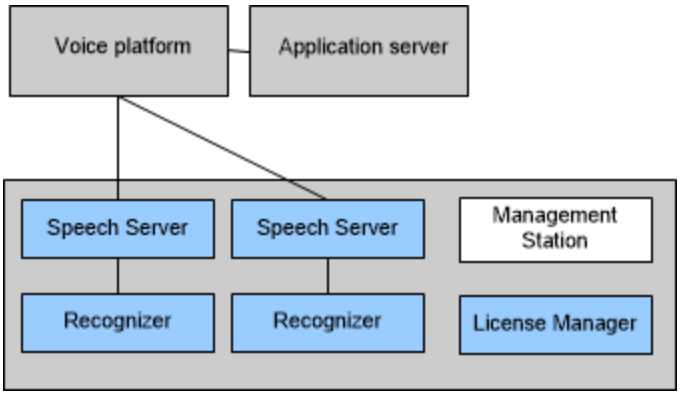
Tip: If using Management Station, you can configure this sample architecture using this role file:*NAA & SC role*

Deploying the Management Station

The Nuance Management Station is an optional component for central management of the services in a network of Nuance speech products.

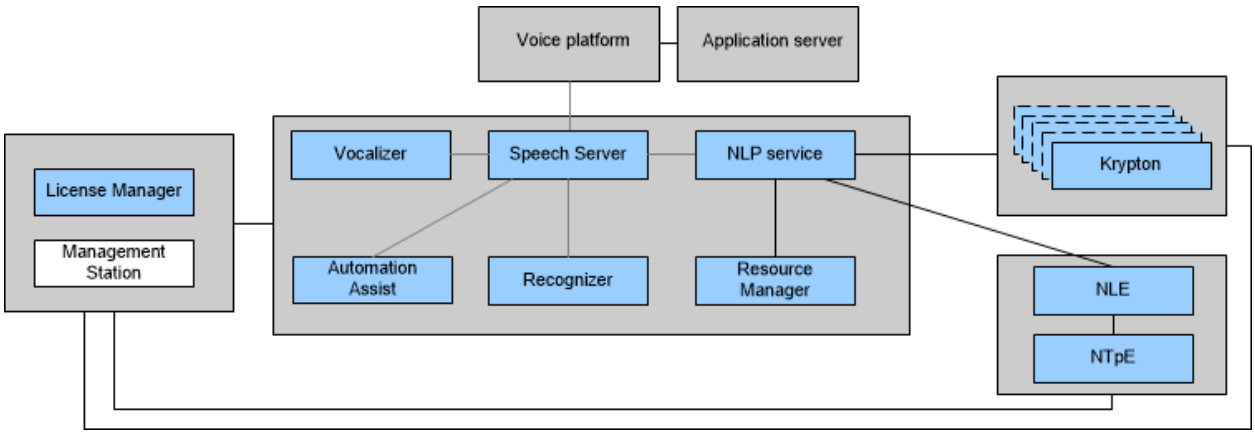
All-in-one with Management Station

For any small-scale, all-in-one deployment, you can install License Manager, Management Station, and licensed products on the same host.

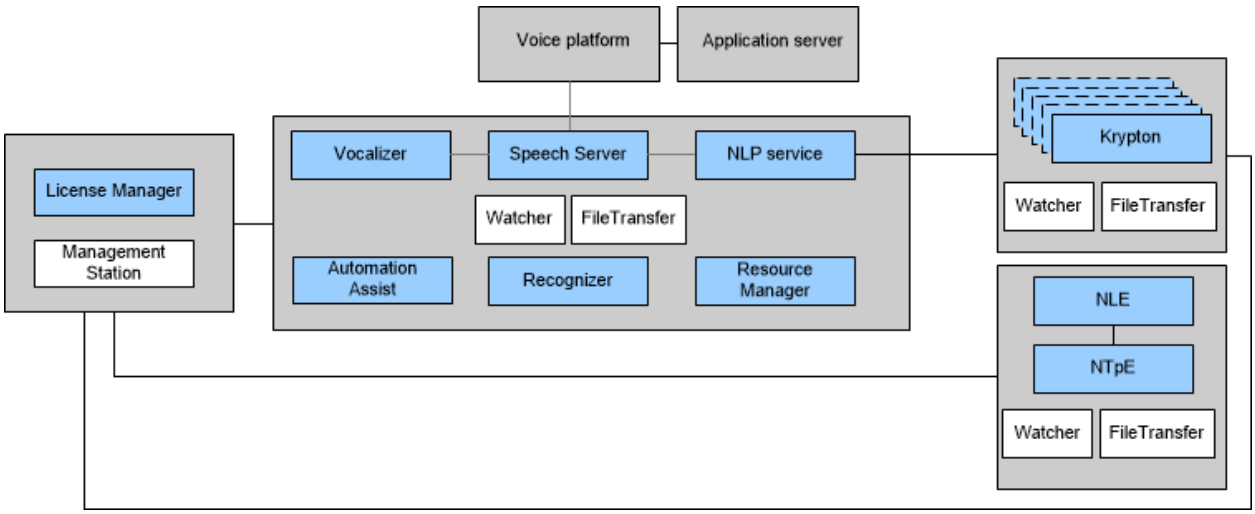


A typical and robust deployment

Production environments usually deploy a distributed architecture with one host dedicated to the Management Station. This example also run the License Manager on the administrator's host:



The Management Station relies on the watcher service and file transfer service to manage local functions on each host. The installer creates these services transparently (with no action needed by you) when you install Nuance speech software:

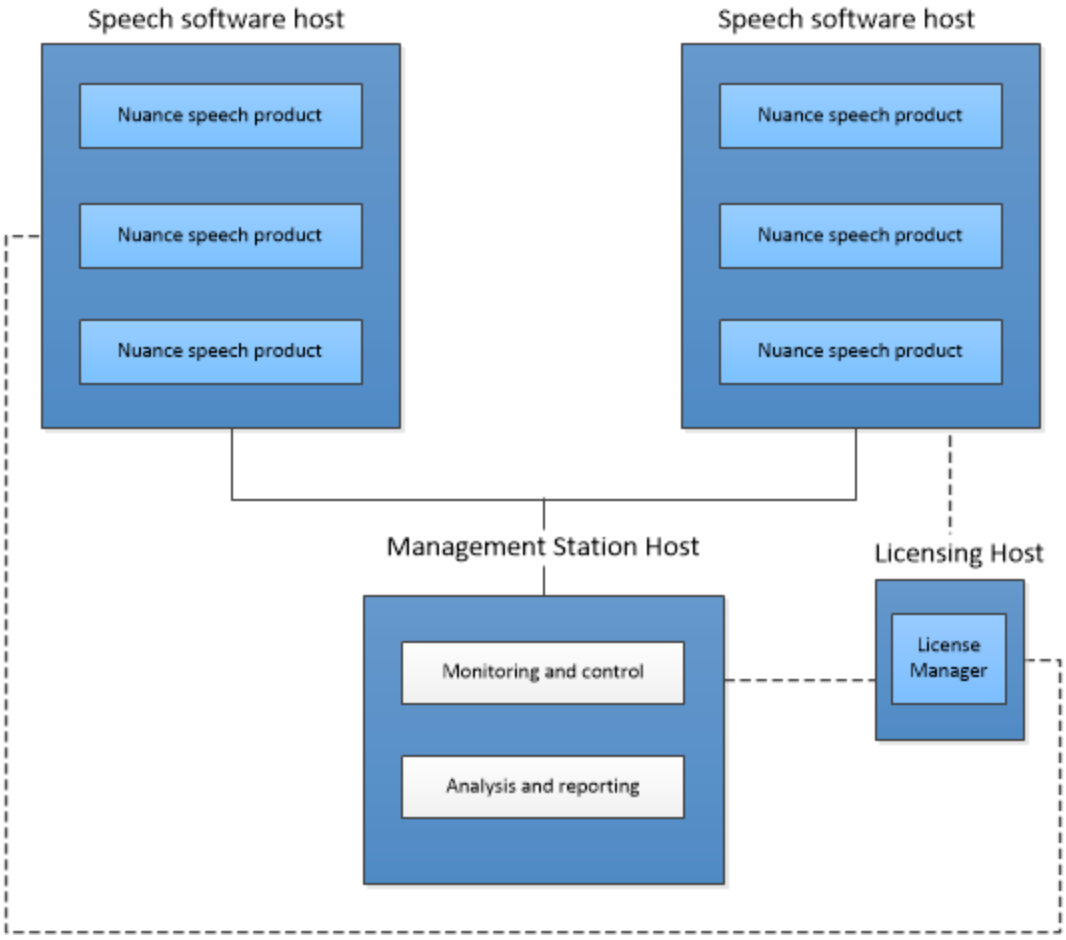


The Watcher and File transfer service are communication gateways between the Management Station and the services running on hosts in the network. The file transfer service collects call logs and recorded utterances on the local host and sends the data to Management Station. Similarly, the watcher service runs on each host and performs these tasks:

- Starts and monitors all services running on the host. If a service terminates abnormally, the watcher restarts it.
- Sends service status and vital sign statistics to Management Station.
- Relays alarms from services to the Management Station in real time.
- Logs all management activities performed on the host and stores the log files on the local drive.

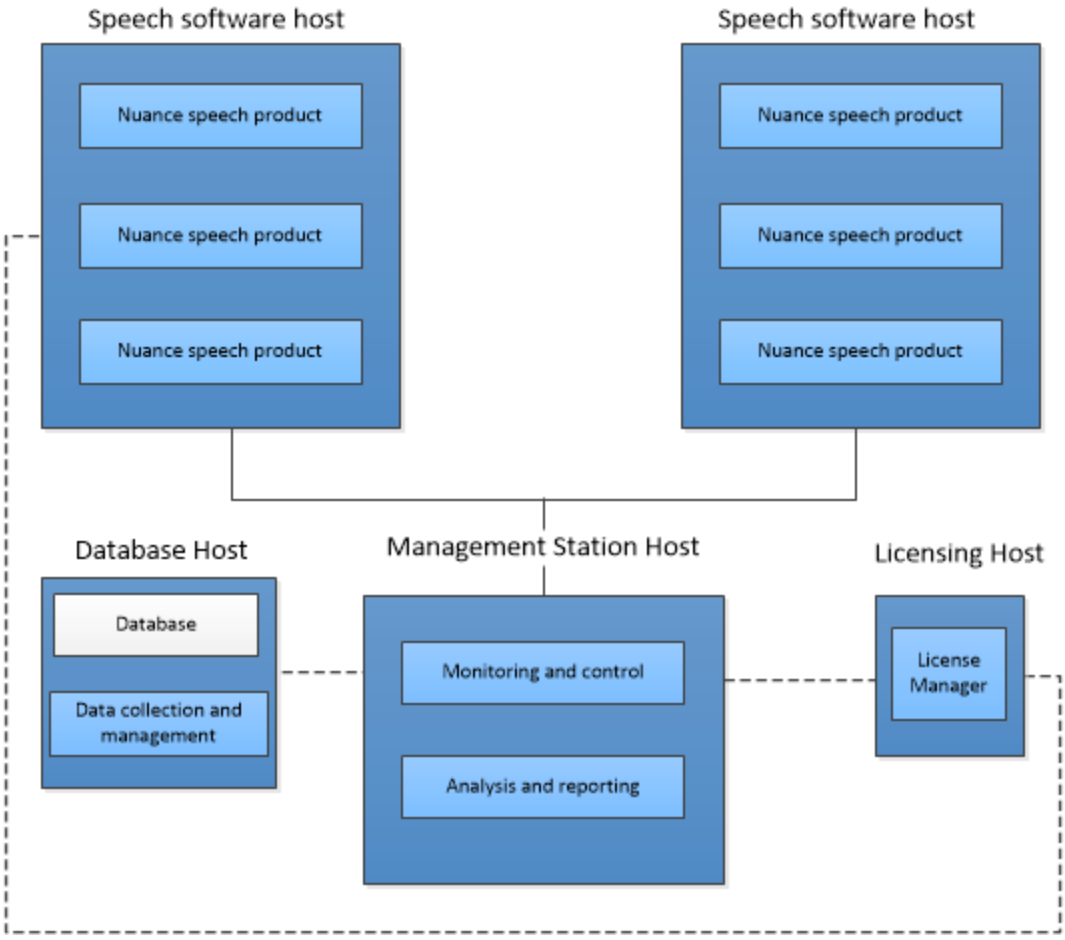
Install the Management Station on any host

Install the Management Station on a dedicated host or on a host with other speech components. This example shows a dedicated host:



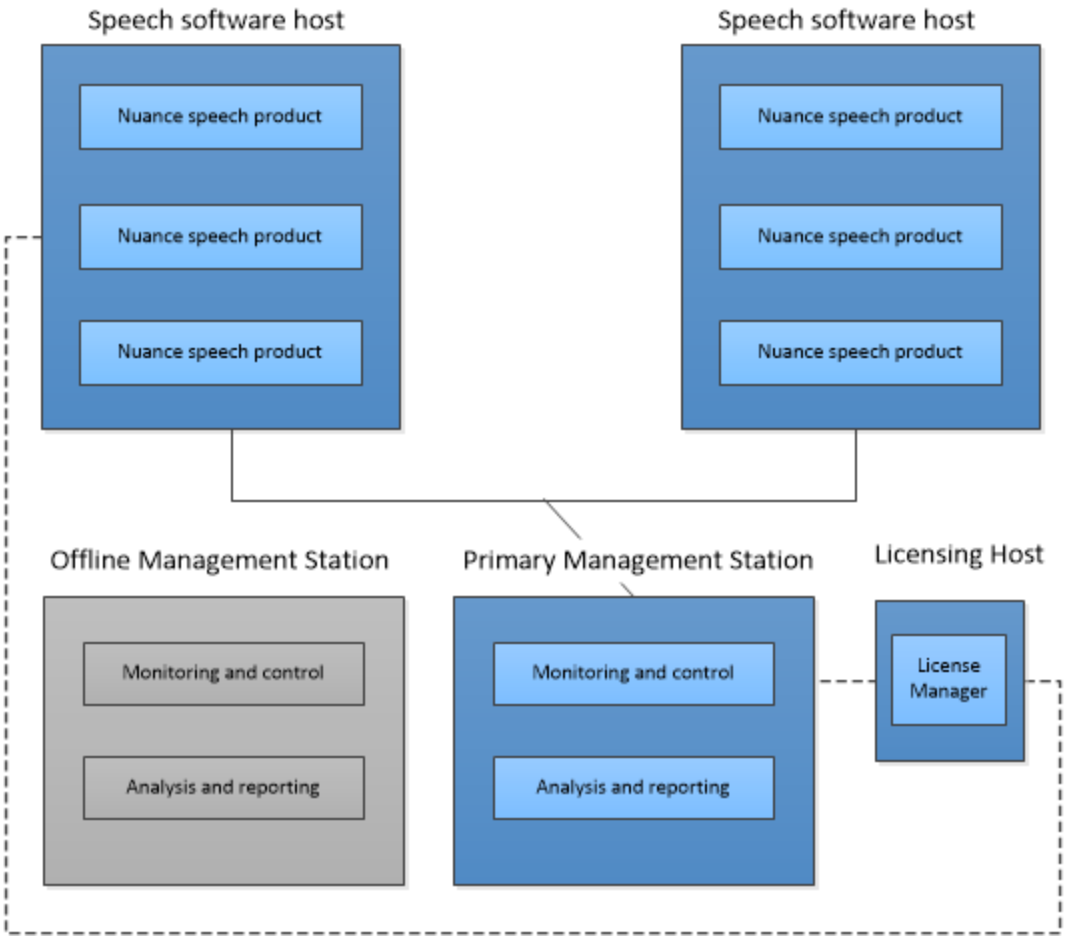
Install the database on any host

You must install a Management Station database. You can install it on any host in the network. For details, see Install a database on page 31. Here is a database on a dedicated host:



Install a standby Management Station

You can only run one Management Station at a time. However, it is possible to prepare an offline installation and bring it online manually during emergency situations.



During installation, supply identical Management Station configurations. There is no difference except that one is always offline.

Note: You must configure the location of the standby Management Station on every host where Nuance speech products are installed (except when both are on the same host). See Configuring a standby Management Station.

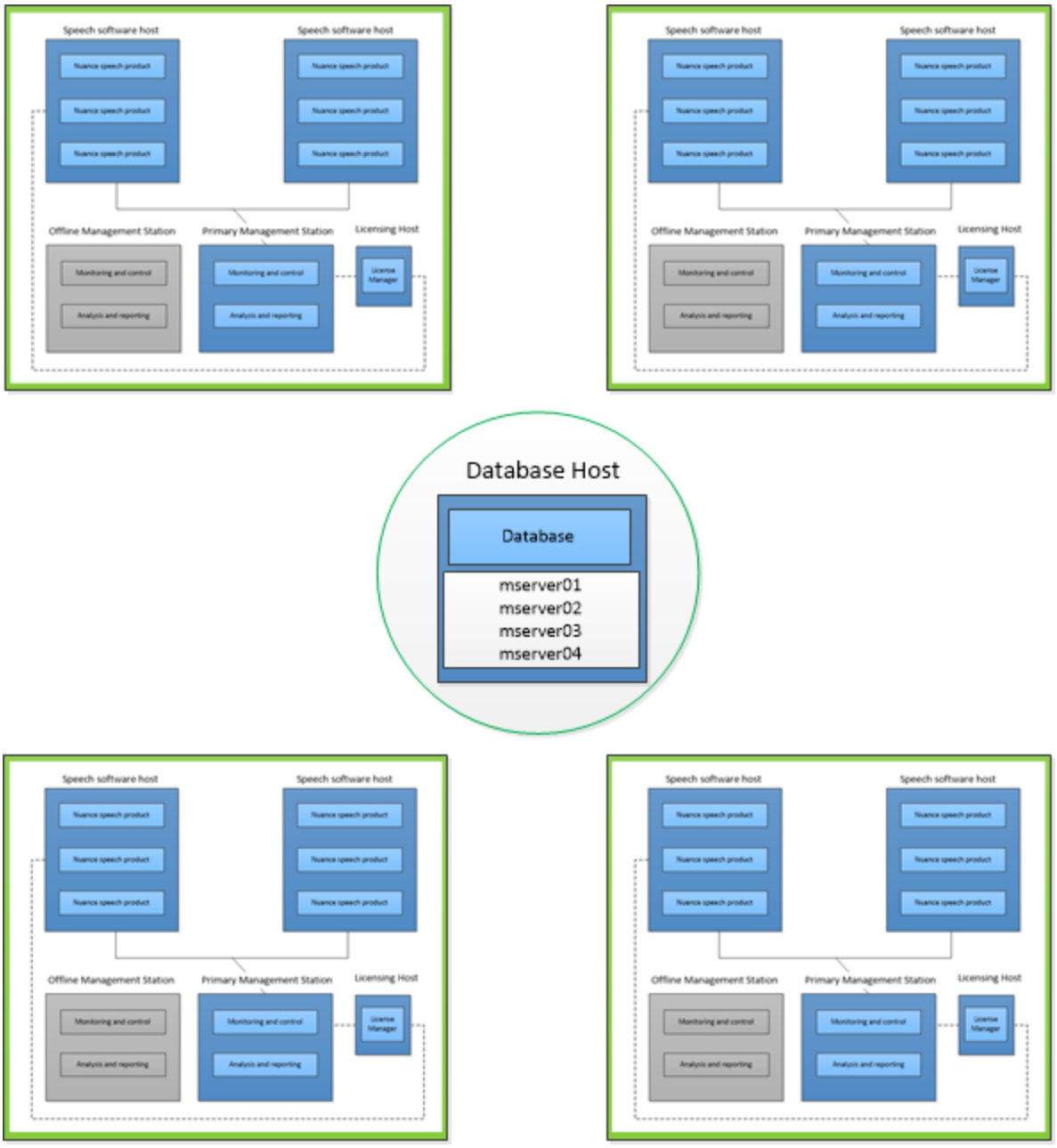
Large sites need one Management Station per network

The Management Station controls a single Speech Suite network. If you host a large site with multiple networks, install a separate Management Station for each:

Large networks with a shared database server

Note: This is NOT a recommended deployment. In most cases this will overwhelm disk storage, memory, and might create a bottleneck in your network.

You can share the database installation in a multi-network deploy if you create separate database tables (for example `mserver01`, `mserver02`, `mserver03`, and `mserver04`) for each Management Station:



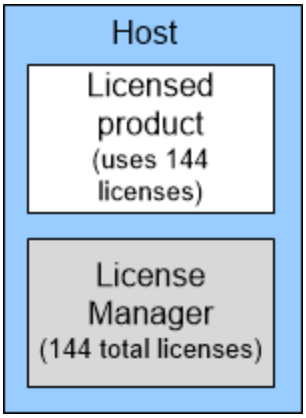
Deploying the License Manager

You must install at least one License Manager. For robust availability, you can install License Manager on more than one host (for example, to provide operational backup with a redundant License Manager). In addition:

- You must load one license file into each License Manager. (The Speech Suite installer automatically loads the file if you provide it during License Manager installation.)
- If the License Manager and licensed products are on different hosts, you must configure licensing after running the installer. See Setting up licenses on page 58.

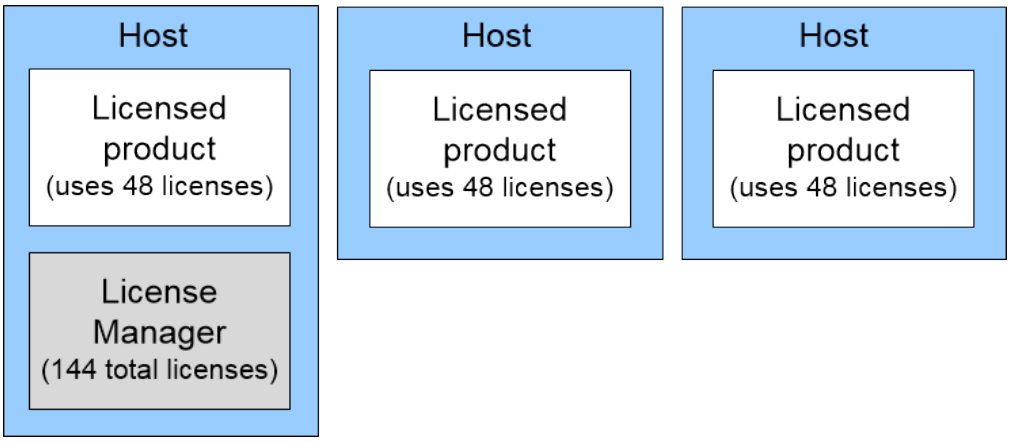
Using a license manager with an all-in-one deployment

By default Nuance speech products install the License Manager and all licensed components on a single host. This is the minimal, all-in-one configuration:



Using a remote license manager

Alternatively, you can install and run the License Manager on any host in the network so long as it is accessible to all hosts that need it. For example:



When License Manager starts, it creates a pool of licenses (144 in the example). It allocates individual licenses to ports controlled by licensed products on a first-come, first-served basis. License Manager maintains a count of allocated licenses across the network. (When claiming licenses, licensed products exhaust licenses on all configured license managers before returning an error.) The license manager does not monitor port usage on a per-host basis. This allows it to manage licenses on different hosts without knowing the hostid for each host.

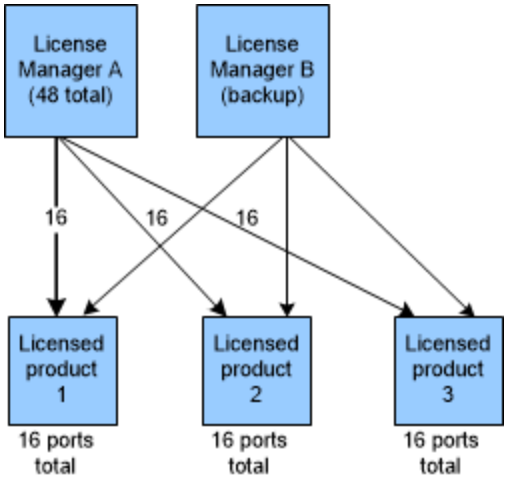
Adding security with multiple license managers

Optionally, you can have more than one License Manager. This scenario helps ensure availability to your site: if any license manager fails the others can provide the licenses.

- If you have redundant license managers, Nuance recommends **client-configured redundancy**, especially for redundancy across a Wide Area Network (WAN). In the FLEXnet documentation, this configuration is called "**server redundancy via file list**."

- You must decide which license managers are backups and the number of licenses they provide. You must also decide whether the license managers load copies of a single license file or different license files.
- Products get all their licenses from a single, primary license manager, but because they point to *all license managers* (see Pointing products to a remote License Manager on page 59), they can change to a backup when failures occur.

In the following example, the license products get licenses from license manager A. If that manager becomes inaccessible, they get licenses from B.



Note: Avoid having more than 3 license managers for each licensed product host. Otherwise, it becomes difficult to troubleshoot problems.

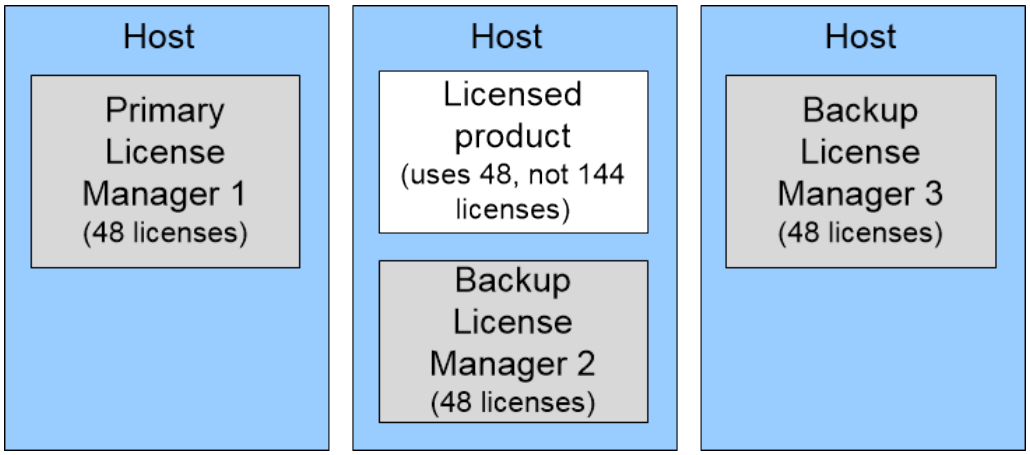
Using quorum redundancy

The quorum configuration is an alternative to client-configured redundancy. It uses three license managers on different hosts to share a single license pool known as a quorum.

Note: Do not use this configuration to distribute license managers across a WAN if there is a risk of network interruptions or delays of heartbeat messages can might interrupt the licensing service.

- Each license manager in the quorum must be on a separate host running the same operating system.
- All license managers load the same license file.
- The entire license pool remains available as long as a quorum of two of the original three license managers are available.

For example:



Note: Configure the primary License Manager on a host that is not running a licensed product. (You can run other processes on that host, but be aware that they reduce the available memory and CPU cycles, and that their failure could affect the functioning of the primary license manager.)

Any three hosts can be formed into a quorum:

- When obtaining the license file from the fulfillment website, enter the hostid for all three hosts. In the illustration, the quorum is consists of hosts 1, 2, and 3 for a total of 48 ports.
- The size of the license pool is determined by the number of licenses available and not the sum of licenses for all three servers.
- When configuring the License Manager list, enter the three hosts in the same order as in the license file.

For example, if your quorum hostnames are LicenseManager1, LicenseManager2, and LicenseManager3, and this is their order in the license file, then they appear like the following port:hostname pairs in the License Manager list:

```
28000@LicenseManager1:28000@LicenseManager2:28000@LicenseManager3
```

Above, the order of the entries is critical. 28000 is the port used to communicate with the license managers. (Typically, the default port for a single license manager is 27000, and the default for the quorum is 28000.) To change the port, see Changing the License Manager port on page 63.

Note: The delimiter is a semi colon on Windows and a colon on Linux.

How License Managers recover from failures

Licensed products and license managers periodically communicate via a "heartbeat" mechanism. Recognizer, Vocalizer, and Natural Language Engine send a heartbeat message to the License Managers every 30 seconds, while Krypton and Nuance Text Processing Engine send a message every 60 seconds.

If Nuance Recognizer or Nuance Vocalizer for Enterprise suddenly lose communication with their license manager, they continue processing normally for a period of one day and attempt to reconnect during this time. If the server returns during that period, operation continues normally. If these licensed products fail to reconnect, please contact Nuance Network at *https://network.nuance.com*.

Prepare hosts before installation

You must complete these tasks before installing Speech Suite on any host:

	Installation tasks	Documentation topics
1	Install third-party software below	You must acquire and install third-party software **on each host** before installing or running Nuance Speech Suite,
2	Configure hosts on page 28	You must configure the operating system **on each host** before installing Speech Suite.
3	Configure Java security on page 29	You must install Java **on each host**, and enable unlimited cryptography. Otherwise, key Speech Suite services will not start.
4	Configure Tomcat: Linux on page 30	You must install Apache Tomcat software **on each Linux host** where you run Speech Suite components..
5	Get a license file on page 30	Recommended. Get a license file before running the Speech Suite installer, and store it on every host where you will install the License Manager. Doing this allows the installer to load the license manager on your behalf, and this is easier than configuring it manually after the installation.
6	Install a database on page 31	Required if using Management Station: you must install a MySQL or SQL Server database. Ignore this topic if not using Management Station.

Install third-party software

You must acquire and install third-party software before installing or running Nuance Speech Suite,

Note: The best practice is to acquire all needed software and store it in a central location that is accessible to all hosts. Then, install the necessary pieces on each host. (You might not need all required software on all hosts. To determine which pieces are needed on which hosts, see Basic deployment decisions on page 8.)

Software	Description
Java	Required **on each host** where you install any Speech Suite software. (Exception: not required on a License Manager host if there are no other Speech Suite components.) Download and install the supported 64-bit version of the Java JRE or JDK. See the *Release Notes* for the supported versions. If you choose a JDK, ensure this is allowed by your organization's security policy.
Apache Tomcat	Required if using Management Station. Download and extract Apache Tomcat on the designated Management Station host and make a note of the Tomcat location for the Speech Suite installation. If you already have Tomcat set up, you are not required to remove it. See the *Release Notes* for the supported versions.

Software		Description
		Note: It's important that you download, and extract, a Tomcat package file, such as a *zip* or *tar.gz* (on Linux). If you use an executable file, which installs Tomcat as an application, you might encounter issues, such as port availability, during the Speech Suite installation. Before installing or upgrading Speech Suite on Linux: • Run this command to enable write permissions on the Tomcat logs directory: `> chmod a+w Tomcat_location/logs` where, *Tomcat_location* is the path to your Tomcat directory. • For Tomcat 8.5 or higher on Linux, see Configure Tomcat: Linux on page 30. If you upgrade Tomcat after installing Speech Suite, you need to configure Management Station to use the new Tomcat installation. See the online documentation.
Apache ZooKeeper		Required if using Dragon Voice. You can set up ZooKeeper before or after installing Speech Suite. See Setting up ZooKeeper on page 73. Download Apache ZooKeeper (see zookeeper.apache.org/releases.html). See the *Release Notes* for the supported versions.

Management Station database
 	
(One of these database products is required if you are using Management Station.)
	MySQL	You can choose this database product when installing Management Station on Windows or Linux hosts. See the *Release Notes* for the supported versions.
		
		Note: Nuance requires MySQL Enterprise Edition when your license agreement stipulates that you generate billing reports.
		
		1. Download and install the supported 64-bit version of MySQL for the Management Station database. See Installing MySQL on page 31.
		2. Download and save the MySQL Connector/J JAR file to a location accessible to the Speech Suite installer. See Install the Connector/J on page 32.
		3. Download and install the MySQL Connector/C on hosts on which you plan to run the Nuance statistics collector service. See Install the MySQL Connector/C on page 34.
		
		Note: If using Linux CentOS 6.*x*, your system might include the *mysql-libs* package, which conflicts with the MySQL packages. If this is the case, you must remove the package. For example, use the command:
		
		`> rpm -e mysql-libs --nodeps`
		
		Verify that the MySQL service is started:
		
		`For CentOS 6`
		
		`> system mysqld`

Software		Description
		For CentOS 7 `> systemctl start mysqld`
	SQL Server	You can choose this database product when installing Management Station on Windows hosts. See the *Release Notes* for the supported versions. 1. Download and install SQL Server for the Management Station database. See Installing SQL Server on page 38. 2. Download and save the SQL Server Connector/J JAR file to a location accessible to the Speech Suite installer. See Install SQL Server on page 38. 3. Download and install the SQL Connector/C library (ODBC Driver) on hosts on which you plan to run the Nuance statistics collector service. See Install the ODBC Driver on page 41.

Configure hosts

You must configure the operating system **on each host** before installing Speech Suite.

Note: The requirements for each host depend on which Speech Suite services you run, the volume and processing load of calls to those services. See Required hardware and memory on page 6.

On Linux

1. Confirm the DNS and hostname:
   - `> hostname` (returns the hostname)
   - `> hostname -f` (returns the fully qualified hostname)
   - `> hostname -i` (returns the IP address)
2. Disable the firewall.
3. Remove the *mariadb-libs* package. (This is only required if using Management Station. It prevents conflicts when installing MySQL.)

   ```
   > yum remove mariadb-libs
   ```
4. If using RHEL 7, ensure you have access to all packages from the Optional channel. Do either of the following:
   - Enable the Optional channel in the host's RHEL subscription.
   - Enter the following command (which requires a licensed copy of RHEL) on your host to include the necessary repository.

     ```
     > yum-config-manager --enable rhel-7-server-optional-rpms
     ```
5. Ensure that all required packages are installed with the following commands. (There is no harm entering these commands if the specified packages are already installed.)

   ```
   > yum install perl-Data-Dumper redhat-lsb-core.x86_64 glibc.x86_64 glibc.i686
   compat-libstdc++-33.i686 libstdc++.x86_64 libstdc++.i686 openssl libaio.x86_64
   ```

```
libaio.i686 ncurses-libs httpd.x86_64 unzip -x postfix -x mariadb-libs zlib.i686
zlib.x86_64
```

On Windows

- Disable the firewall capabilities. From the Control Panel, select Windows Firewall and click Off.
- If installing Nuance speech products to a drive other than the boot drive (C:), you must enable 8.3 naming format on that drive.

Avoiding a PowerShell issue on Windows Server

If using Windows Server 2012 R2, you can perform this procedure before installing or upgrading to avoid a PowerShell issue that might cause errors during the Speech Suite installation.

To avoid a PowerShell issue on Windows Server:

1. Back up your Windows host in case you need to roll back.
2. Launch Windows PowerShell ISE. If you see errors, install Windows Management Framework 5.1 to attempt to resolve them. If you do not see errors, continue to the next step.
3. Launch the Speech Suite installer and proceed with the installation. If you did not complete Step 2, and you see errors during the Speech Suite installation, use the installer to remove all Speech Suite components, or roll back the host to a previous state. Then, retry the installation.

Note: Nuance recommends explicitly configuring the date and time of all host machines in the network. Having all hosts use a common date and time simplifies log collection, licensing, troubleshooting, and comparing logs.

Configure Java security

You must install Java **on each host**, and enable unlimited cryptography. Otherwise, key Speech Suite services will not start.

After installing Java, you must configure Java security settings to enable call-log encryption and ensure the speech software works correctly after you install Speech Suite. Optionally, you can configure random number generation on Linux systems to prevent Java processes from causing speech software to perform slowly.

Repeat this procedure on each Speech Suite host:

1. Edit the file *$JAVA_HOME/jre/lib/security/java.security* (The configuration file is created with the 64-bit Java installation.)
2. Uncomment this line to enable unlimited cryptography: `crypto.policy=unlimited`
3. On Linux only, run this command to determine if your Java installation might cause a potential performance issue:

   ```
   > head -n 1 /dev/random
   ```

   If the command returns immediately, there might not be an issue. If the command does not return immediately, you might need to configure another setting in the security file. See https://docs.oracle.com/cd/E13209_01/wlcp/wlss30/configwlss/jvmrand.html.
4. Save *java.security*.

Configure Tomcat: Linux

You must install Apache Tomcat software **on each Linux host** where you run Speech Suite components..

If you are running Apache Tomcat 8.5 or higher on Linux, you must enable read and execute permissions (recursively) on Tomcat directories before installing Management Station. (If the permissions are wrong, Management Station services fail to start.)

Repeat this procedure on each Speech Suite host:

1. Log in to the Tomcat host as root.
2. Run this command to enable permissions on the Tomcat directory:

   ```
   > chmod -R o+rX Tomcat_location
   ```

   where, *Tomcat_location* is the path to your Tomcat directory.

Get a license file

To use Nuance products you must load licenses into a License Manager. The Speech Suite installation procedure is easier if you acquire a license file before software installation. Otherwise, you must manually load the file after the installation. If you already have a license file (for example, an Evaluation license), ignore this topic.

Note: Speech Suite documentation does not provide complete information about License Manager capabilities and administration. This is because your licenses are dependent on factors such as your license agreement with Nuance, the products you intend use, the expected capacity of your system, and the design of your deployment architecture. In most cases, you will work directly with Nuance to design the License Manager installation and to generate the files. For complete licensing documentation, see the Enterprise Speech Licensing Central website (described below).

When you complete your sales agreement purchase order with Nuance, you receive a License Authorization Code (LAC). You use the LAC to generate your license file on the Enterprise Speech Licensing Central website.

To get a license:

1. Plan the installation architecture—You must decide where (which hosts) to run licensed components and the License Manager. See Basic deployment decisions on page 8 and Deploying the License Manager on page 22.
2. Go to the Enterprise Speech Licensing Central website: http://licensing.nuance.com.
3. Click *Nuance Licensing*.
4. Get instructions on generating your license file by clicking *User Guide*, on the Nuance Licensing Login page,
5. Generate the license file and copy to the License Manager host (the host where you intend to run the License Manager). If you plan more than one License Manager, each requires a license file.
6. Run the Speech Suite installer on that host (see Run the installer on page 42), install the License Manager, and provide the license file location when prompted.

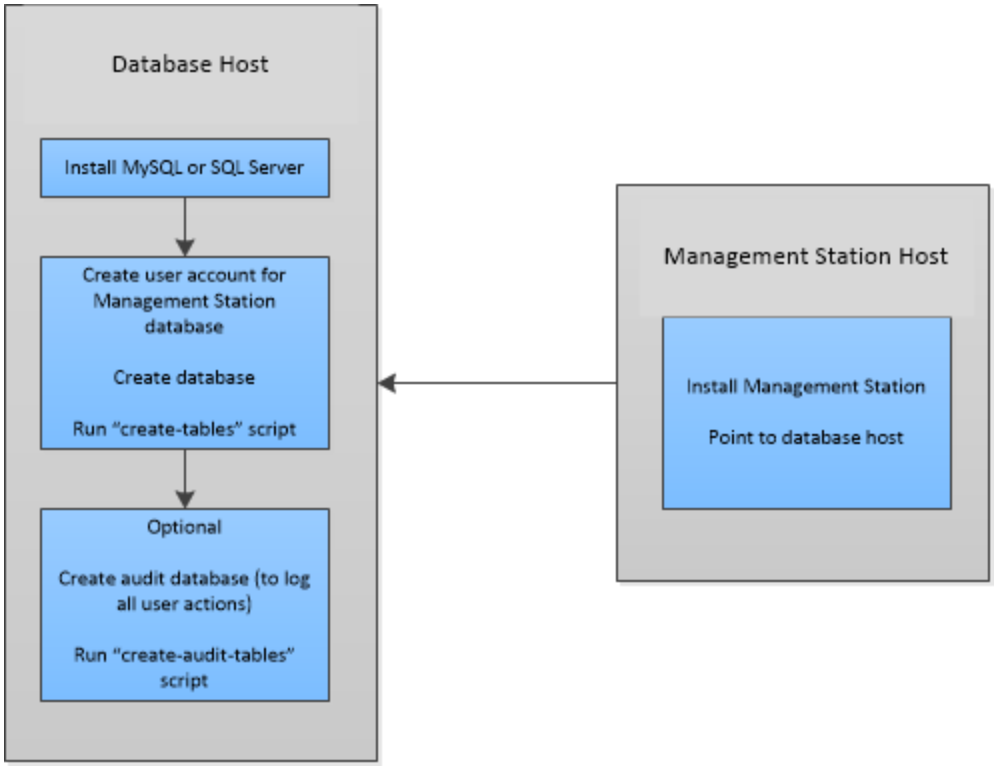
Install a database

Required if using Management Station: you must install a MySQL or SQL Server database. Ignore this topic if not using Management Station.

Note: You can install the Management Station and database on separate hosts, but both hosts must use the same operating system.

The *mserver* database stores operational and system configuration information collected from managed hosts. This data includes imported call log files, utterances, vital signs, and alarms generated by services. Optionally, you can create an audit database (*mserver_audit*), which logs all user actions on Management Station. After creating a database, you run a script to create the underlying database tables.

The step-by-step procedure for installing the database:



Installing MySQL

Required if using Management Station: you must install a MySQL or SQL Server database. Ignore this topic if not using Management Station.

Except for these instructions, there are no special Nuance requirements and you can follow the vendor instructions for a normal database installation, and take advantage of all tools, features, and deployment architectures. If you have already installed the database, you can confirm the settings and reconfigure if necessary.

Complete these tasks in order, and then continue to Run the installer on page 42.

Download required MySQL software

The Management Station supports open-source and commercial MySQL, 64-bit versions. See the *Release Notes* for the supported versions. These instructions use open-source MySQL as an example.

1. Download the supported MySQL Community Server package for your platform to a temporary location on the designated database host.

   Note: On Linux, download the package from the yum repository.

2. Extract the file.
3. You must install the Connector/J on the Management Station host. See Install the Connector/J below.
4. You must install the Connector/C on each host running Nuance speech software. See Install the MySQL Connector/C on page 34.

Install the Connector/J

You must install the Connector/J on the designated Management Station host. See the *Release Notes* for the supported versions.

On Linux

1. Download the Connector/J from the MySQL downloads site to the designated Management Station host.
2. Extract the package. It contains many files you can ignore. The important file (which you point to during the Management Station installation) is *mysql-connector-java-*`version`*-bin.jar*.

On Windows

On Windows, the Connector/J is included in the MySQL installation package, which you obtain from the MySQL downloads site.

1. Run the custom MySQL installation on the designated Management Station host and select only the Connector/J.
2. Remember the location for the Management Station installation.

Install MySQL

Install MySQL on the designated database host.

On Linux

To install MySQL on Linux:

1. Verify that you don't have another non-supported version of MySQL installed. Remove it if you do.
2. Install the product using the `yum` install command.
3. Start the MySQL service. MySQL generates a temporary root password that you need to change.
4. Enter this command to locate the temporary root password:

   ```
   > cat /var/log/mysqld.log | grep 'temporary password' | cut -d ":" -f4- | sed -e
   's/ //' | tee tmppswd
   ```

   If *mysqld.log* is empty, look in */var/log/messages* for the temporary password.

5. Reset the temporary root password using either the SET PASSWORD or ALTER USER command.
6. Continue to Create a MySQL user account below.

On Windows

To install MySQL on Windows:

1. Verify that you don't have another non-supported version of MySQL installed. Remove it if you do.
2. Run the executable and choose a Custom setup type.

   Note: Ensure you install an InnoDB storage engine.
3. Select the MySQL Server (x64), Connector/J, and Connector/C.
4. **Note:** You install each component on the appropriate host. For example, MySQL on the dedicated database host, the Connector/J on the Management Station host, and the Connector/C on the Nuance speech software host.
5. Follow the prompts on the screen and install MySQL. Make a note of the Connector/J location and filename for the Management Station installation.
6. When the installation is complete, continue with the product configuration:
   a. Type and Networking:
      i. For version 5.6: Select Config Type: Server Machine. Leave the remaining default settings.
      ii. For version 5.7.20 or later: Select Standalone MySQL Server/Classic MySQL Replication, click Next, then select Config Type: Server Machine. Leave the remaining default settings.
   b. Accounts and Roles:
      i. Create the root account.
      ii. Make a note of the account password for the Management Station installation.
   c. Windows Service: Accept the defaults.
   d. Plugins and Extensions: Accept the defaults.
   e. Apply Server Configuration: Click Execute.
7. Click Finish. The MySQL installation and configuration is now complete.
8. Continue to Create a MySQL user account below.

Create a MySQL user account

You must create a user account with specific privileges for the Management Station. (Later, you specify this account during the Management Station installation.)

To create a MySQL user account, use the MySQL client installed on your Windows or Linux host running MySQL:

1. Log in to the MySQL client as root.
2. Create a MySQL user account for the Management Station database:

   ```
   mysql> CREATE USER 'username'@'MS_hostname' IDENTIFIED WITH MYSQL_NATIVE_PASSWORD
   BY 'password';
   ```

   - Nuance recommends using *ms* as the username (because this is the default name used by the Management Station), but you can specify any value.

The Management Station installation does *not* support database passwords that contain these characters:

Character	Name
|	Pipe
`	Back quote (grave accent)
\	Backslash
[	Open bracket
]	Close bracket
{	Open curly brace
}	Close curly brace
!	Exclamation
"	Double quote

- The *MS_hostname* is where you intend to install the Management Station. Provide a fully-qualified domain name (FQDN).
- Remember the username and password. You need them for the Management Station installation. What you specify depends on how the host was installed and configured. If the host was set up with a fully-qualified domain name, such as MyHost.nuance.com, you must use that. If the host was set up as “localhost,” then you must use that. Otherwise, the Management Station installation could fail.

3. Grant all privileges on this user:

   ```
   mysql> GRANT ALL PRIVILEGES ON *.* TO 'username'@'MS_hostname' WITH GRANT OPTION;
   ```

4. Flush all privileges:

   ```
   mysql> FLUSH PRIVILEGES;
   ```

5. Verify that this user has all privileges on the MySQL database:

   ```
   mysql> SELECT create_priv FROM mysql.user WHERE user='username' AND host='MS_
   hostname';
   ```

6. If you need to install the Connector/C on this host, continue to Install the MySQL Connector/C below. Otherwise, continue to Create the databases on page 36.

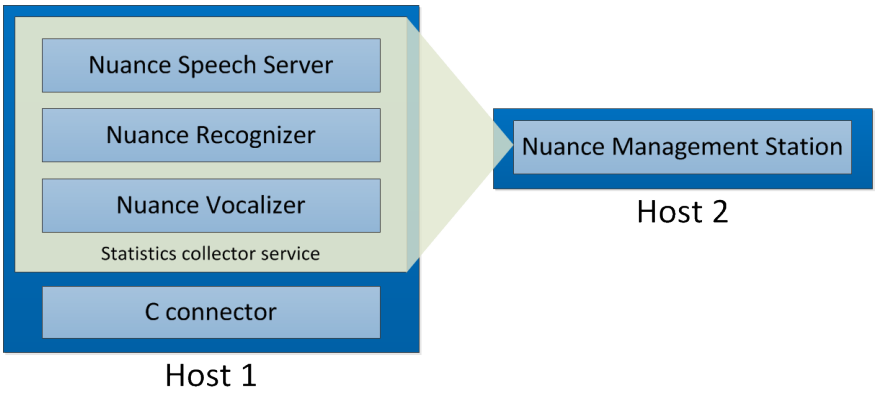
Install the MySQL Connector/C

You must install the Connector/C on each host that runs Nuance speech software with the Nuance statistics collector service.

Note: Do not install the Connector/C on the MySQL database host. (In this scenario, the connector is already installed.)

The statistics collector service uses the Connector/C to deliver billing information to the Management Station database. (The service is included in all provided role files that configure hosts running Nuance speech software.)

For example:



To install the Connector/C, run the downloaded MySQL package (see Download required MySQL software on page 32):

On Windows

1. Run the *msi* program
2. Select Custom installation type→MySQL Connector/C.*version*

On Linux

1. Install the *rpm* file. For example: *mysql-connector-c-shared-version.x86_64.rpm*
2. Create a symbolic link to the C connector library file *libsmysqlclient.so.xx*, where *.xx* is the version number:

   ```
   > ln -s /usr/lib64/mysql/libmysqlclient.so.xx /usr/lib64/libmysqlclient.so
   ```

   Note: Speech Server requires the C connector library to send statistics to MySQL. The symbolic link ensures Speech Server can locate the library file.
3. If you create the symbolic link after installing Speech Suite, restart the statistics collector service in Management Station.

Remove legacy databases

If you have a prior Speech Suite installation with a Management Station database, you can re-use the database with the new Speech Suite installation: the installer allows you to specify existing *mserver* and audit databases from the previous installation. Alternatively, you can replace the legacy databases. In this case, Nuance recommends backing up and removing the legacy Management Station databases before installing Speech Suite.

To remove a database, open a command-prompt window and use this command:

```
> mysql -h hostname -u mserver_username -pmserver_password -e "drop database mserver;"
```

For example, with *hostname* mtl-venus.nuance.com, *mserver_username* ms, and *mserver_password* msp, the command is:

```
> mysql -h mtl-venus.nuance.com -u ms -pmsp -e "drop database mserver;"
```

To remove a saved audit database, use the same command and substitute the audit username, password, and database name.

Create the databases

You must create or reuse a Management Station database (*mserver*) and its underlying tables. Optionally, you can create or reuse an audit database for logging Management Station user actions.

By default, the database installs to these locations:

- **On Windows:** *C:\ProgramData\MySQL\MySQL Server x.x\data\mserver*
- **On Linux:** */var/lib/mysql/mserver*

Management Station database

To create the Management Station database:

1. Get the *create-tables.sql* script from the external_db_scripts directory in the Management Station download package.
2. Copy the scripts to the MySQL host.
3. Change directory to the location of the SQL script files for creating the database tables.
4. Log in to the MySQL client as root.
5. Create the database. By convention the name is *mserver*, but you can use any name:

   ```
   mysql> create database mserver;
   ```
6. Make a note of the database name for the Management Station installation.
7. Specify the name of the Management Station database to use:

   ```
   mysql> USE MS_database_name;
   ```
8. Create the tables in the Management Station database:

   ```
   mysql> SOURCE create-tables.sql;
   ```

Audit database: optional

To create the audit database:

1. Get the *create-audit-tables.sql* script from the external_db_scripts directory in the Management Station download package.
2. Copy the scripts to the MySQL host.
3. Log on to the database host as root or Administrator (or as a user with root/administrator privileges).
4. Log in to the database as root.
5. Create the database and give it a name. For example, *mserver_audit*.
6. Make a note of the audit database name for the Management Station installation.
7. Create the audit user with all privileges. You can skip this step and just use the MySQL user account for the Management Station database.
8. Change directory to the location of the SQL script files for creating the database tables.
9. Create the tables in the audit database:

   ```
   mysql> SOURCE create-audit-tables.sql;
   ```

Continue to Configure database performance on the facing page.

Configure database performance

Configure MySQL to ensure optimal performance with the Management Station, especially if your deployment takes a high volume of calls during peak busy hours. This requires creating a *my.* configuration file with specific settings.

To configure performance settings for MySQL:

1. If you are using MySQL for non-Nuance reasons, you might want to back up your databases as a precaution.
2. Stop the MySQL service.
3. Modify the MySQL configuration file with these settings:
   - **Linux:** Modify */etc/my.cnf*
   - **Windows:** Modify *C:\ProgramData\MySQL\MySQL Server x.x\my.ini*, adding any lines shown below not present in the original file.

   Note: For MySQL 5.6.23 and higher, replace default-character-set=latin1 with character-set-server=latin1 and table_cache=512 with table_open_cache=512 (already replaced in example). For MySQL 5.7, remove innodb_additional_mem_pool_size=12M

```
# SERVER SECTION

# ----------------------------------------
[mysqld]
port=3306
wait_timeout=2147482
init_connect='set AUTOCOMMIT=0'
character-set-server=latin1
default-storage-engine=INNODB
sql-mode='NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION'
local-infile=1
max_connections=600
query_cache_size=0
table_open_cache=512
tmp_table_size=103M
thread_cache_size=16

#*** MYISAM Specific options ***
myisam_max_sort_file_size=100G
myisam_sort_buffer_size=205M
key_buffer_size=175M
read_buffer_size=64K
read_rnd_buffer_size=256K

sort_buffer_size=20M

#*** INNODB Specific options ***
innodb_additional_mem_pool_size=12M
innodb_flush_log_at_trx_commit=0
skip-external-locking
innodb_file_per_table
```

```
innodb_log_buffer_size=4M
innodb_buffer_pool_size=1024M
innodb_log_file_size=25M
```

4. Delete the *ib_logfile** files located, by default, under:
   - **On Windows:** *C:\ProgramData\MySQL\MySQL Server x.x\data*
   - **On Linux:** */var/lib/mysql*
5. Restart the MySQL service.

Installing SQL Server

Required if using Management Station: you must install a MySQL or SQL Server database. Ignore this topic if not using Management Station.

Note: For a new SQL Server installation, you must install SQL Server Management Studio and SQL Server Configuration Manager.

Complete these tasks in order, and then continue to Run the installer on page 42.

Install SQL Server

Except for these instructions, there are no special Nuance requirements and you can follow the vendor instructions for a normal database installation, and take advantage of all tools, features, and deployment architectures. If you have already installed the database, you can confirm the settings and reconfigure if necessary.

Install the Connector/J

You must install the Connector/J on the designated Management Station host. See the *Release Notes* for the supported versions.

1. Download SQL Server JDBC Driver from the Microsoft SQL Server downloads site to the designated Management Station host.
2. Extract the package. It contains many files you can ignore. The important file (which you point to during the Management Station installation) is *sqljdbc`number`.jar*.

Configure the database for mixed authentication

You must configure mixed mode authentication for SQL Server, as SQL Server authentication is used between the Management Station application and the database. Configure the database as follows:

1. Configure the database engine for Mixed Mode (SQL Server...) and enter a password for the system administrator account.
2. Click Add Current User and wait for the entry to appear in the administrators list before continuing.
3. Continue with the installation as normal and click Install when prompted.

Ensure TCP/IP is enabled

The Management Station installation connects to the database through TCP port 1433. You can specify a different TCP port and verify that TCP/IP is enabled.

To enable TCP/IP:

1. Run SQL Server Configuration Manager.
2. Select SQL Server Network Configuration→Protocols for MSSQLSERVER.

   Note: MSSQLSERVER is the default. You might see a different name.
3. Verify that TCP/IP is enabled (default).
4. Right-click TCP/IP and select Properties.
5. Select the IP Addresses tab, scroll-down to IPALL, and set the TCP Port value (default is 1433).
6. Make a note of the TCP Port value, if different from the default, for the Management Station installation.

Create a SQL Server user account

You must create a user account with specific privileges for the Management Station. (Later, you specify this account during the Management Station installation.)

Create the user account:

1. Run the SQL Server Management Studio.
2. Connect to SQL Server with the system administrator (*sa*) account. Use SQL Server Authentication.
3. Right-click Security and select New Login …
4. On the General page:
   a. Enter a login name for the database. Nuance recommends using *ms* as the username (because this is the default name used by the Management Station), but you can specify any value.
   b. Select SQL Server authentication.
   c. Enter a password. Nuance recommends using *msp* as the password (because this is the default name used by the Management Station), but you can specify any value.

      The Management Station installation does *not* support database passwords that contain these characters:

Character	Name
|	Pipe
`	Back quote (grave accent)
\	Backslash
[	Open bracket
]	Close bracket
{	Open curly brace
}	Close curly brace
!	Exclamation
"	Double quote

   d. Deselect Enforce password policy.
   e. Remember the username and password. You need them for the Management Station installation.

5. Click Server Roles and assign these roles:
   - dbcreator—This role is required when creating the Management Station database, and when running the SQL scripts provided to create the underlying tables. Once the database and tables are created you can remove this role if so desired.
   - public
6. Click OK.

   You have now created the user login with proper roles for the database.
7. Run SQL Server Configuration Manager.
8. Select SQL Server Services→SQL Server (MSSQLSERVER) and make sure the SQL Server service is running. The SQL Server installation and configuration is now complete.

Remove legacy databases

If you have a prior Speech Suite installation with a Management Station database, you can re-use the database with the new Speech Suite installation: the installer allows you to specify existing *mserver* and audit databases from the previous installation. Alternatively, you can replace the legacy databases. In this case, Nuance recommends backing up and removing the legacy Management Station databases before installing Speech Suite.

To remove an MS SQL Server database:

1. Log in to the sqlcmd interface.
2. drop database mserver
3. go
4. drop database mserver_audit
5. go
6. quit

Create the databases

You must create or reuse a Management Station database (*mserver*) and its underlying tables. Optionally, you can create or reuse an audit database for logging Management Station user actions.

Management Station database

To create the Management Station database:

1. Get the *create-tables-sqlserver.sql* script from the *external_db_scripts* directory in the Management Station download package.
2. Copy the scripts to the SQL Server host.
3. Connect to the SQL Server as the Management Station user. Use SQL Server Authentication.
4. Create the new database and give it a name. By convention the name is *mserver*, but you can use any name.
5. Make a note of the database name for the Management Station installation.
6. Change directory to the location of the SQL script files for creating the database tables.
7. Create the database tables. Change to the location of script files to avoid having to specify the path.

   ```
   > sqlcmd -U ms_user -P ms_pswd -d ms_db -i create-tables-sqlserver.sql
   ```

Audit database: optional

To create the audit database:

1. Get the *create-audit-tables-sqlserver.sql* script from the *external_db_scripts* directory in the Management Station download package.
2. Copy the scripts to the SQL Server host.
3. Connect to SQL Server as the Management Station user. Use SQL Server Authentication.
4. Create the database and give it a name of your choice, for example, `mserver_audit`. You can use the Management Station user as the new audit database user.
5. Make a note of the audit database information for the Management Station installation.
6. Change directory to the location of the SQL script files for creating the database tables.
7. To create the tables in the audit database (if created), run *create-audit-tables.sqlserver*:

```
> sqlcmd -U audit_user -P audit_pswd -d audit_db -i create-audit-tables-
sqlserver.sql
```

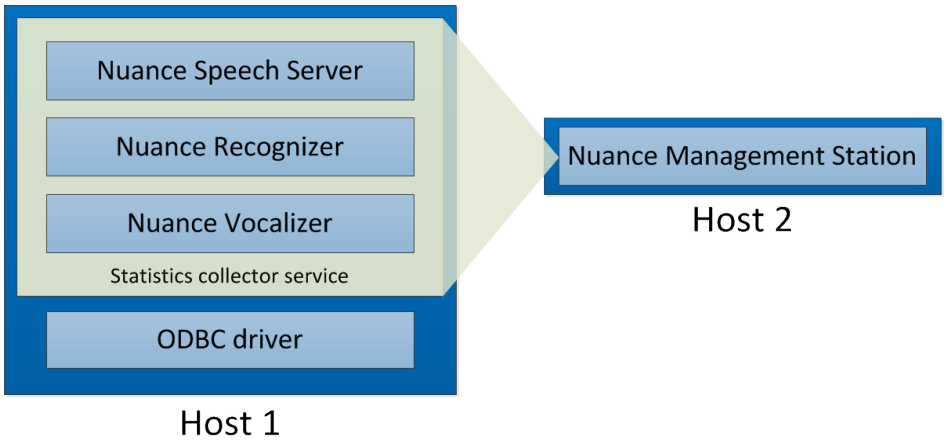
Install the ODBC Driver

The ODBC Driver is required on each host that runs the Nuance statistics collector service. The statistics collector service collects statistics used for billing and is included in all provided role files that configure hosts running Nuance speech software.

The statistics collector service uses the ODBC Driver to communicate with the Management Station database. You install the following ODBC Driver components on all hosts running Nuance speech software:

- ODBC Driver Manager
- ODBC Driver for SQL Server (64 bit)

For example:



To install the ODBC Driver:

1. Download the x64 ODBC Driver from the Microsoft downloads website.
2. Run the msi file and complete the setup wizard.

   Note: On the Feature Selection step of the wizard, make sure you select to install ODBC Driver for SQL Server SDK.
3. Open the Control Panel, select Administrative Tools→Data Sources (ODBC)→System DSN tab.
4. Click Add, select the ODBC Driver, and click Finish.
5. Specify MSERVER (uppercase) as the data source name, specify the MS SQL Server host, and click Next.

   Note: If you use a different name, you must configure the sc.DSN property in Management Station.
6. Select *SQL Server Authentication* and specify the Login ID for the database account that Management Station uses. Optionally, provide the password. This is needed for testing the connection after the database configuration is finished. Then, click Next.
7. Select *Change the default database to*.
8. Select the name of the database from the menu and click Next.
9. Accept the defaults on the next window and click Finish.
10. Test the connection between the ODBC Driver and the database.

Run the installer

Installing or upgrading Speech Suite involves downloading and running an installer for Linux or Windows on each host on which you want to run Speech Suite components. You can also configure a silent installation from a command line.

Note: Before running the Speech Suite installer, ensure you've completed the required preparations. Otherwise, the installation fails. See Installation checklist on page 5.

If you set up components in the following sequence, the installer can automatically configure some components on your behalf. Otherwise, you need to configure them manually after running the installer.

1. License Manager: Sets up the required license on a License Manager host. Once this is done, the installer can automatically configure licensing for subsequent installations on other hosts.
2. Management Station (optional): The Management Station requires license information, and this configuration is easier when the License Manager is already available.
3. Nuance speech software: Configuring and running the remainder of the Speech Suite components is easier when the License Manager and Management Station are already available.

Installing on Linux

This section explains installing Speech Suite on a Linux host.

Downloading installation packages for Linux

Download the required Speech Suite installation packages:

1. Log on to the host as root.
2. Download these files from Nuance Network at *https://network.nuance.com*:
   - Nuance Speech Suite installation package.
   - Recognizer language installation package.
   - Nuance Vocalizer for Enterprise voice installation package.
   - Nuance data pack installation package, required for Dragon Voice components (Krypton recognition engine and Nuance Text Processing Engine).
3. Change to this directory and extract all compressed packages. If you're installing on multiple hosts, you can extract the files to a shared network location. For example:

   ```
   > tar -zxf Nuance_Speech_Suite-version-x86_64-linux.tgz
   > tar -zxf NRec-language.tar
   > unzip NVE_version_locale_voice.zip
   ```

4. Continue to Running the Speech Suite installer on Linux below.

Running the Speech Suite installer on Linux

Use the Speech Suite setup wizard to install Nuance products on each designated host. Alternatively, you can configure a silent installation from a command line (see Running silent installations on Linux on page 46).

Before you begin:

- You must know which components you intend to install on this host. See Basic deployment decisions on page 8.
- You must ensure that each host has the necessary capacity for the components. See Required hardware and memory on page 6.
- You must prepare the host with required software and configuration. See Configure hosts on page 28.
- Recommended. If installing Management Station, ensure this host uses static IP addresses. (If you install it on hosts with dynamic IP addresses, ensure that your network can resolve the hostnames. For example, using `ping`.)
- Recommended. If you are reinstalling Management Station and you do not want to reuse your existing databases, use the `drop` database command to remove them. Do this before running the Speech Suite installer.

On Linux, you must configure at least 3 GB of shared memory on any host running Krypton or NTpE. For example:

```
> mount -o remount,size=3G /dev/shm
```

Running the installer

To run the Speech Suite installer on Linux:

1. Change to the *Nuance_Speech_Suite-version* directory.
2. Enter `./setup.sh` to start the installer.
3. Read the license agreement. You can press Space to scroll through the license text.
4. Enter Y to accept the license agreement.

5. Select the product features to install. The default is all features.

   Note: You can install License Manager, Management Station, and Nuance speech software separately. The speech software includes a collection of sub-components that are installed together (and you control which ones to run). For overviews, see Installed components on page 5.

6. Verify the installation location for the selected products or type a new location.

   If you change the default location, you must ensure all permissions for the root user. For example, log in as root and set full permissions

   ```
   > chmod -R 755 path-to-customlocation
   ```

The remainder of the procedure depends on the features you install. See the topics below.

Configuring the license

If you're installing the License Manager, the installer prompts for the location of your Nuance license file.

Note: It's okay if you do not have your license at this time, but you must load a license later before running services. See Loading license files on page 60

Configuring Java

The installer detects your Java installation. Optionally, specify a different path (for example, if to use a Java installation in a different location).

For details, see Install third-party software on page 26.

Configuring Management Station

Skip this procedure if not installing Management Station.

1. Enter the port@hostname pair of the host(s) running License Manager. The port is always 27000. For example, 27000@localhost.
2. Enter the path to your Apache Tomcat location.
3. Enter the path to your Connector/J JAR file.
4. Enter the following information to connect Management Station to your MySQL database:
   - Host: Machine name or IP address where the database resides.
   - Port: Port reserved for the MySQL database. Default is 3306.
   - Schema: Management Station database name. Default is *mserver*.
   - DB username and password: The MySQL user account you created for the database. The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33.

     Note: For MySQL, your password policy might require a secure password for the Speech Suite installation to complete successfully. If you are using Management Station and the MySQL user account password changes after installing Speech Suite, you need to update Management Station with the new password. See the online documentation.
5. Optionally, enable audit logging to log all Management Station user actions. You must have already created the audit database. You cannot enable it at a later time without re-installing Management Station. If you're unsure, enable it now and then disable or re-enable it at a later time.

If you do not have an existing audit database, enter No (default).

- Audit database: Enter the name of the audit database.
- Enter the audit database user and password (optional). The default is the MySQL user account for the Management Station database. The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33.

Note: To disable audit logging after installation, you can set the AuditLogging property to false in the *mserver_cfg.properties* file, located under *$MSTATION_HOME/mserver/webapps/mserver/config*. Setting it back to true re-enables it.

Troubleshooting: installation fails trying to configure the mserver database

If the installation fails on configuring the Management Station database, possible reasons and solutions include:

- You failed to create the database user account (required on Windows only) using a fully qualified domain name. For example, did you specify *`hostname`* instead of *`hostname.domain.com`*? Try specifying a fully qualified domain name or IP address. The IP address must be resolvable, for example, using `ping`.
- You specified an IP address for the Management Station host during the installation and it may not have been resolvable. Use static IP addresses on Management Station host if possible. If using a dynamic IP address, make sure the hostname is resolvable (for example, by testing with `ping`).

Configuring speech components

This procedure is relevant when installing Nuance speech software on a host. Skip this procedure if only installing Management Station or License Manager.

1. Enter the address:port pair for the the Management Station host. (The hostname can be the hostname or IP address. The port number is always 8080.) If not using Management Station, accept the default value. (The installation will ignore the configuration.)

   Optionally, you can enter the address of an offline, standby Management Station. For example: mtl-venus:8080,mtl-mars:8080. The first entry is the primary and the second entry is the standby.

   Note: To change the Management Station address after installation, modify *$NUANCE/data/oam/mserver_hosts.txt* and enter the *`address:port`* pairs on separate lines.)

2. Enter the directory path to the extracted packages for the Recognizer language, Vocalizer voice, and the datapack for Krypton and the Natural Language Engine.

   You do not have to select the executable files. The installation recursively scans the specified directory to find and run the executables.

   In the following example, the language and voice packages have been extracted and the executables are located in their own subdirectories under *tmp/downloads*. You only enter the */tmp/downloads* directory.

   ```
   -rw-r--r--. 1 root root 240873460 May 30 11:32 NRec-en-US-10.0.2-10.2.0.i686-linux.tar.gz
   -rw-r--r--. 1 root root 918806059 May 30 11:39 NVE_6.0.1_en_US_Samantha_bet1_i686-linux.zip
   ```

   Note: All packages in this location get installed. If, for example, you plan to run Recognizer and Vocalizer on different hosts, or use only one or the other, then put the language and voice in different directories.

Ready to install

Review the installation settings, begin the installation, and wait for the installation to complete.

Source the environment variables

You must open a new shell window to source new environment variables:

1. Open a new session.
2. Change to */usr/local/Nuance/Speech Server/server* and run the command: `. ./SETUP-env.sh` to finish sourcing remaining environment variables.

Next steps

If using Management Station, see "Testing the installation with Management Station" in the online documentation.

If you are not using Management Station, see "Configuring and starting services without Management Station" in the online documentation.

If you are not using Management Station, *and* your License Manager is on its own host, you need to configure your speech software hosts for licensing. See Pointing products to a remote License Manager on page 59.

Tip: For instructions on installing and configuring multiple languages and voices for Recognizer and Vocalizer on a separate dedicated host, see Adding recognizer languages and TTS voices on page 64.

Running silent installations on Linux

You can install Nuance Speech Suite silently with the `-s` option. The silent option allows you to install using a script, for example. You do not need to stop or restart services, which the installer does automatically during the installation.

Before you begin:

- You must know which components you intend to install on this host. See Basic deployment decisions on page 8.
- You must ensure that each host has the necessary capacity for the components. See Required hardware and memory on page 6.
- You must prepare the host with required software and configuration. See Configure hosts on page 28.
- Recommended. If installing Management Station, ensure this host uses static IP addresses. (If you install it on hosts with dynamic IP addresses, ensure that your network can resolve the hostnames. For example, using `ping`.)
- Recommended. If you are reinstalling Management Station and you do not want to reuse your existing databases, use the `drop` database command to remove them. Do this before running the Speech Suite installer.

You can change to the *Nuance_Speech_Suite-`version`* directory and enter `./setup.sh -h` for a list of all options.

Note: If the syntax contains errors, such as incorrect format or invalid values, the installation might switch from silent to standard or not complete successfully.

Required options

With Management Station

These options are required: -f (license), -c (Connector/J), -j (Java), -o (Tomcat), and -V (language, voice, and data pack location), -H (database host:port pair), -Q (MySQL user), -W (MySQL password), -G (database name).

For example:

```
> ./setup.sh -s -f "/tmp/downloads/nuance.lic" -c "/tmp/downloads/mysql-connector-
java-version-bin.jar" -j "/usr/java/version" -o "/tmp/downloads/apache-tomcat-version"
-V "/tmp/downloads" -H "MySQLHost:3306" -Q "ms" -W "msp" -G "mserver"
```

If enabling audit logging and creating the audit database, these options are also required: -A (database name), -B (database username), -S (database password). For example:

```
-A mserver_audit -B ms -S MyPass123!
```

Troubleshooting: installation fails trying to configure the mserver database

If the installation fails on configuring the Management Station database, possible reasons and solutions include:

- You failed to create the database user account (required on Windows only) using a fully qualified domain name. For example, did you specify *hostname* instead of *hostname.domain.com*? Try specifying a fully qualified domain name or IP address. The IP address must be resolvable, for example, using `ping`.
- You specified an IP address for the Management Station host during the installation and it may not have been resolvable. Use static IP addresses on Management Station host if possible. If using a dynamic IP address, make sure the hostname is resolvable (for example, by testing with `ping`).

Without Management Station

These options are required: -f (license), -j (Java), and -V (language, voice, and data pack location).

For example:

```
> ./setup.sh -s -f "/tmp/downloads/nuance.lic" -j "/usr/java/version" -V
"/tmp/downloads"
```

If running Speech Suite components on different hosts, instead of running all components on the same host (the default), the -I on the next page option is required. For example, to install Nuance speech software (NSS), such as Vocalizer and Recognizer, only:

```
> ./setup.sh -s -f "Nuance license location" -j "/usr/java/version" -V "language,
voice, data pack location" -I "NSS"
```

Sourcing environment variables

After the installation has completed successfully, you must complete these steps:

1. Open a new session to source environment variables.
2. Change to */usr/local/Nuance/Speech Server/server* and run the command: `. ./SETUP-env.sh` to finish sourcing remaining environment variables.
3. Continue to one of the following topics:

- If using Management Station, see "Testing the installation with Management Station" in the online documentation.
- Skip this topic if not using Management Station, and see "Configuring and starting services without Management Station" in the online documentation instead.

All silent installation options

The following table describes all options for a silent installation on Linux. Values containing spaces must be enclosed in quotes (" ").

Option	Default	Description
Common		
-h	Not applicable	Displays this usage information.
-I	All	Comma-separated list of Nuance speech products to install. For example, NLM,NMS,NSS. • All = All Nuance speech products (default) • NLM = Nuance License Manager • NMS = Nuance Management Station • NSS = Nuance speech software
-R	Not applicable	Removes all product installation packages (rpms), including language and voice, and a partial installation.
-U	Not applicable	Forces an in-place upgrade of the Nuance Speech Suite.
-s	Not applicable	Installs the Nuance Speech Suite silently (no prompts). You can use this with -R and -U.
-p	/usr/local	Installation path to Nuance directory.
-L	/tmp/nuance-speech-suite.log	Installation log output.
License Manager		
-f	No default	Path and filename of license file.
Management Station		
-l	27000@localhost	Address of the host running the License Manager.
-j	No default	64-bit Java JDK or JRE location.
-o	No default	Apache Tomcat location.
-c	No default	Full path and filename of the Connector/J *JAR* file. For example, *mysql-connector.jar*.
-H	localhost:3306	Machine name or IP address where the Management Station database resides and the reserved port.
-D	root	MySQL admin root username.

Option	Default	Description
		If your root account is not named “root”, you must specify this option on the silent install with the alternate root name, along with -P for the root password.
-P	No default	MySQL admin root account password. Used to create a local Management Station database and database user.
-Q	ms	Username for Management Station database (*mserver*) user account.
-W	msp	Password for Management Station database (*mserver*) user account. For MySQL, your password policy might require a secure password for the Speech Suite installation to complete successfully. If you are using Management Station and the MySQL user account password changes after installing Speech Suite, you need to update Management Station with the new password. See the online documentation. **Note:** The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33. If the password contains $, type \ before each one to escape them. For example, you type password MyPa$$123$ as MyPa\$\$123\$
-A	mserver_audit	Creates an audit database and enables audit logging, which records all user actions in the Management Station.
-B	ms	Audit database username.
-S	msp	Audit database password. **Note:** The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33. If the password contains $, type \ before each one to escape them. For example, you type password MyPa$$123$ as MyPa\$\$123\$
-G	mserver	Name of the Management Station database.
Nuance speech software		
-m	localhost:8080	Comma-separated list of Management Station addresses.
-V	None	Directory containing the extracted language packages for Recognizer, voice packages for Vocalizer, and data packages for Krypton and Natural Language Engine (specifically for NTpE). Speech Suite recursively scans the specified directory for the installation executables.

Installing on Windows

This section explains installing Speech Suite on a Windows host.

Downloading installation packages for Windows

Download the required Speech Suite installation packages:

1. Log on to the host as a user with administrator privileges.
2. Download these files from Nuance Network at *https://network.nuance.com*:
   - Nuance Speech Suite installation package.
   - Recognizer language installation package.
   - Nuance Vocalizer for Enterprise voice installation package.
   - Nuance data pack installation package, required for Dragon Voice components (Krypton recognition engine and Nuance Text Processing Engine).
3. Change to your downloads directory and extract all installation packages. If you're installing on multiple hosts, you can extract the files to a shared network location. However, you must mount the drive using UNC format, *network_file_server**network_shared_directory*.

   For example: *tmp**downloads**installation_pkg*
4. Continue to Running the Speech Suite installer on Windows below.

Running the Speech Suite installer on Windows

Use the Speech Suite setup wizard to install Nuance products on each designated host. Alternatively, you can configure a silent installation from a command line (see Running silent installations on Windows on page 54).

Before you begin:

- You must know which components you intend to install on this host. See Basic deployment decisions on page 8.
- You must ensure that each host has the necessary capacity for the components. See Required hardware and memory on page 6.
- You must prepare the host with required software and configuration. See Configure hosts on page 28.
- Recommended. If installing Management Station, ensure this host uses static IP addresses. (If you install it on hosts with dynamic IP addresses, ensure that your network can resolve the hostnames. For example, using `ping`.)
- Recommended. If you are reinstalling Management Station and you do not want to reuse your existing databases, use the `drop` database command to remove them. Do this before running the Speech Suite installer.

Running the installer

To run the Speech Suite installer on Windows:

1. Run the installer (.exe) as Administrator from the directory where you extracted the files.
2. Review and accept the license agreement.
3. Select the product features to install or install all features (default). Depending on your selections, the installer displays different options.

   Note: You can install License Manager, Management Station, and Nuance speech software separately. The speech software includes a collection of sub-components that are installed together (and you control which ones to run). For overviews, see Installed components on page 5.

The remainder of the procedure depends on the features you install. See the topics below.

Configuring the license

If you're installing the License Manager, the installer prompts for the location of your Nuance license file.

Note: It's okay if you do not have your license at this time, but you must load a license later before running services. See Loading license files on page 60

Configuring Java

The installer detects your Java installation. Optionally, specify a different path (for example, if to use a Java installation in a different location).

For details, see Install third-party software on page 26.

Configuring the database

Skip this procedure if you are not installing Management Station.

Management Station requires a MySQL or SQL Server database for storing the data it collects from managed hosts. The database can reside on the same host as Management Station or on a different host.

1. Select the type of database (MySQL or SQL Server) to use for the Management Station *mserver* database.
2. Enter the following information for connecting Management Station to the *mserver* database:
   - Server Name: Hostname or IP address where the database resides.
   - Server Port: Port reserved for the database. Default is 3306 (MySQL) or 1433 (SQL Server).
   - Database Name: Management Station database name. Default is *mserver*.
   - Instance Name (SQL Server only): Database engine instance specified during the SQL Server installation.

Configuring Management Station

Skip this procedure if not installing Management Station.

1. Enter the port@hostname pair of the host(s) running License Manager. The port is always 27000. For example, 27000@localhost.
2. Select the path to the Apache Tomcat location.
3. Verify the path and filename for the Connector/J JAR file. For MySQL, you install this file during the MySQL installation. For SQL Server, you download the file from the Microsoft website.
4. Enter the username and password for the database admin account. The defaults are *ms* (username) and *msp* (password). The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33 or Create a SQL Server user account on page 39.

   Note: For MySQL, your password policy might require a secure password for the Speech Suite installation to complete successfully. If you are using Management Station and the MySQL user account password changes after installing Speech Suite, you need to update Management Station with the new password. See the online documentation.
5. Enter the username and password for the *mserver* database. The default account is *ms* (username) and *msp* (password). The Management Station installation has character restrictions for database

passwords. See the list of unsupported characters in Create a MySQL user account on page 33 or Create a SQL Server user account on page 39.

6. Optionally, select the option to use an audit database, which logs all user actions in Management Station.

   If left unchecked, the audit database is not created and audit logging is disabled. You cannot enable it at a later time without re-installing Management Station. If you're unsure, enable it now and then disable or re-enable it at a later time.

   To disable audit logging after installation, you can set the AuditLogging property to false in the *%MSTATION_HOME%\mserver\webapps\mserver\config\mserver_cfg.properties* file. Set it back to true to re-enable it.

Troubleshooting: installation fails trying to configure the mserver database

If the installation fails on configuring the Management Station database, possible reasons and solutions include:

- You failed to create the database user account (required on Windows only) using a fully qualified domain name. For example, did you specify `hostname` instead of `hostname.domain.com`? Try specifying a fully qualified domain name or IP address. The IP address must be resolvable, for example, using `ping`.
- You specified an IP address for the Management Station host during the installation and it may not have been resolvable. Use static IP addresses on Management Station host if possible. If using a dynamic IP address, make sure the hostname is resolvable (for example, by testing with `ping`).

Configuring speech components

This procedure is relevant when installing Nuance speech software on a host. Skip this procedure if only installing Management Station or License Manager.

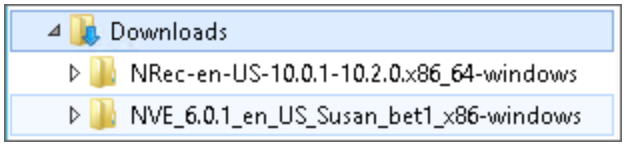
1. Enter the address:port pair for the the Management Station host. (The hostname can be the hostname or IP address. The port number is always 8080.) If not using Management Station, accept the default value. (The installation will ignore the configuration.)

   Optionally, you can enter the address of an offline, standby Management Station. For example: mtl-venus:8080,mtl-mars:8080. The first entry is the primary and the second entry is the standby.

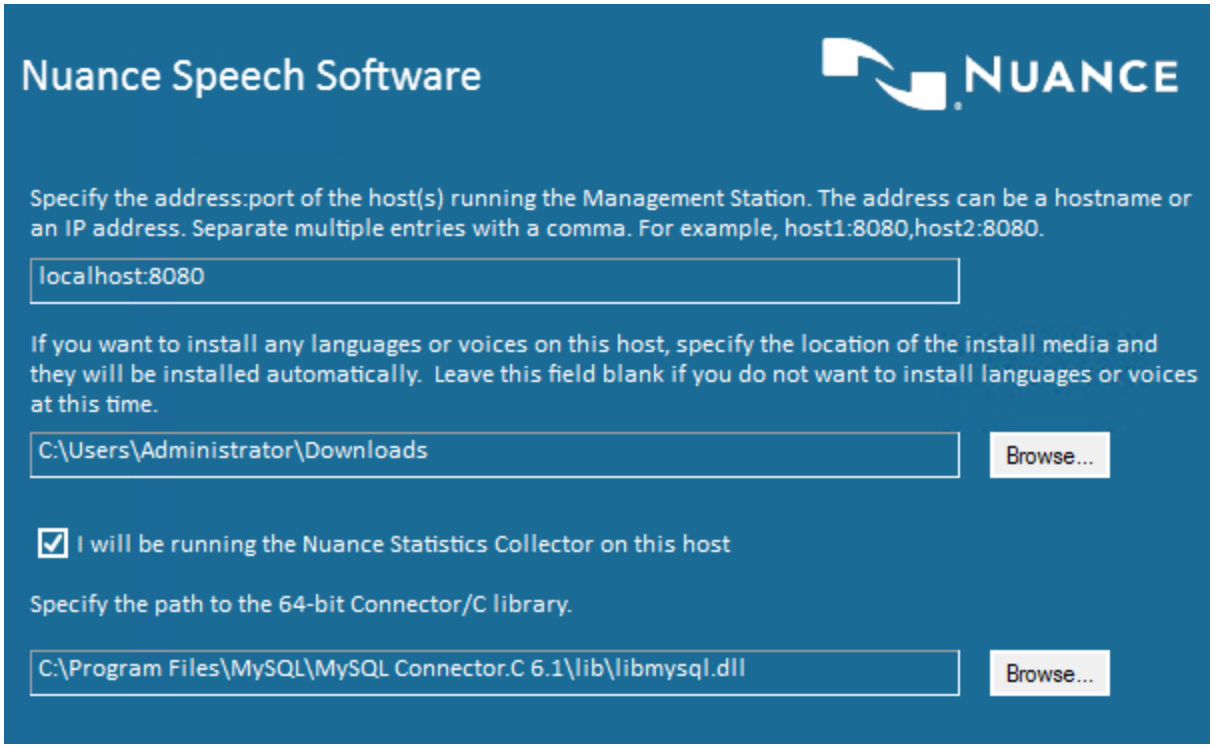
   Note: To change the Management Station address after installation, modify *%NUANCE%\data\oam\mserver_hosts.txt* and enter the `address:port` pairs on separate lines.)

2. Browse to the directory containing the extracted packages for the Recognizer language, Vocalizer voice, and the datapack for Krypton and the Natural Language Engine.
   You do not have to select the executable files. The installation recursively scans the specified directory to find and run the executables.

   In the following example, the language and voice packages have been extracted and the executables are located in their own subdirectories under the *Downloads* directory:



This example shows the path to the *Downloads* directory:



Note: All packages in this location get installed. If, for example, you plan to run Recognizer and Vocalizer on different hosts, or use only one or the other, then put the language and voice in different directories.

3. If using Management Station, select the option to run the Nuance statistics collector service on this host. The installer automatically detects the location of the Connector/C library (which is part of the database installation) and updates the PATH. Optionally, click Browse to select a different location.

Ready to install

Review the installation settings, begin the installation, and wait for the installation to complete.

Next steps

If using Management Station, see "Testing the installation with Management Station" in the online documentation.

If you are not using Management Station, see "Configuring and starting services without Management Station" in the online documentation.

If you are not using Management Station, *and* your License Manager is on its own host, you need to configure your speech software hosts for licensing. See Pointing products to a remote License Manager on page 59.

Tip: For instructions on installing and configuring multiple languages and voices for Recognizer and Vocalizer on a separate dedicated host, see Adding recognizer languages and TTS voices on page 64.

Running silent installations on Windows

You can install the Nuance Speech Suite silently from the command line with the `/silent` option. The silent option allows you to install using a script, for example. You do not need to stop or restart services, which the installer does automatically during the upgrade.

Before upgrading, check:

Before you begin:

- You must know which components you intend to install on this host. See Basic deployment decisions on page 8.
- You must ensure that each host has the necessary capacity for the components. See Required hardware and memory on page 6.
- You must prepare the host with required software and configuration. See Configure hosts on page 28.
- Recommended. If installing Management Station, ensure this host uses static IP addresses. (If you install it on hosts with dynamic IP addresses, ensure that your network can resolve the hostnames. For example, using `ping`.)
- Recommended. If you are reinstalling Management Station and you do not want to reuse your existing databases, use the `drop` database command to remove them. Do this before running the Speech Suite installer.

Note: If the syntax contains errors, such as incorrect format or invalid values, the installation might switch from silent to standard or not complete successfully.

Required options

With Management Station

These options are required:

LICENSE=, TOMCAT_HOME=, JAVA_HOME=, CONNECTORJ=, CONNECTORC=, MSSQL_INSTANCE=, MS_DBTYPE=, MS_DBSERVICE=, MS_DBHOST=, MS_DBPORT=, MS_DBSCHEMA=, MS_DBUSER=, MS_DBPASS=, and SUPPLEMENTSPATH=.

For example (using a SQL Server database):

Note: The use (or lack) of spaces in the examples is intentional.

```
> "C:\tmp\downloads\Nuance Speech Suiteversion.exe"
/debuglog"C:\tmp\downloads\install.log" /log"C:\tmp\downloads" /silent
LICENSE="C:\tmp\downloads\nuance.lic" TOMCAT_HOME="C:\tmp\downloads\apache-tomcat-
version" JAVA_HOME="C:\Program Files\Java\version"
CONNECTORJ="C:\tmp\downloads\sqljdbc.jar" CONNECTORC="C:\Program Files\Microsoft SQL
Server\Client SDK\ODBC\version\KeyFile\1033" MSSQL_INSTANCE=MSSQLSERVER MS_
DBTYPE=sqlserver MS_DBSERVICE=sqlserver MS_DBHOST=SQLServerHost MS_DBPORT=1433 MS_
DBSCHEMA=mserver MS_DBUSER=ms MS_DBPASS=msp SUPPLEMENTSPATH="C:\tmp\downloads"
```

If enabling audit logging and creating the audit database, these options are also required: MS_AUDITDB_ENABLED=, MS_AUDITDB_NAME=, MS_AUDITDB_USER=, MS_AUDITDB_PASS=. For example:

```
MS_AUDITDB_ENABLED=TRUE MS_AUDITDB_NAME=mserver_audit MS_AUDITDB_USER=ms MS_AUDITDB_
PASS=msp
```

Troubleshooting: installation fails trying to configure the mserver database

If the installation fails on configuring the Management Station database, possible reasons and solutions include:

- You failed to create the database user account (required on Windows only) using a fully qualified domain name. For example, did you specify *hostname* instead of *hostname.domain.com*? Try specifying a fully qualified domain name or IP address. The IP address must be resolvable, for example, using `ping`.
- You specified an IP address for the Management Station host during the installation and it may not have been resolvable. Use static IP addresses on Management Station host if possible. If using a dynamic IP address, make sure the hostname is resolvable (for example, by testing with `ping`).

Without Management Station

These options are required:

LICENSE=, JAVA_HOME=, and SUPPLEMENTSPATH=.

For example (using a SQL Server database):

Note: The use (or lack) of spaces in the examples is intentional.

```
> "C:\tmp\downloads\Nuance Speech Suiteversion.exe"
/debuglog"C:\tmp\downloads\install.log" /log"C:\tmp\downloads" /silent
LICENSE="C:\tmp\downloads\nuance.lic" JAVA_HOME="C:\Program Files\Java\version"
SUPPLEMENTSPATH="C:\tmp\downloads"
```

If running Speech Suite components on different hosts, instead of running all components on the same host (the default), the ISFeatureInstall= on the next page option is required. For example, to install Nuance speech software (NSS), such as Vocalizer and Recognizer, only:

```
> "C:\tmp\downloads\Nuance Speech Suite 11.0.exe"
/debuglog"C:\tmp\downloads\install.log" /log"C:\tmp\downloads" /silent LICENSE="Nuance
license location" JAVA_HOME="C:\Program Files\Java\version" SUPPLEMENTSPATH="language
and voice location" ISFeatureInstall="NSS"
```

If you are running a silent installation or upgrade in a script file, prefix the call to the installation or upgrade command with `start "" /wait`. The prefix ensures that the command completes before returning execution back to the script. For example:

```
> start "" /wait "C:\tmp\downloads\Nuance Speech Suiteversion.exe" rest of command...
```

After the installation has completed successfully, continue to one of the following topics:

- If using Management Station, see "Testing the installation with Management Station" in the online documentation.
- If not using Management Station, see "Configuring and starting services without Management Station" in the online documentation.

Summary of silent installation options

The following table describes all options for a silent installation on Windows. Values with spaces must be enclosed in double quotes (" ").

Option	Default	Description
Common		
/silent	Not applicable	Installs the Nuance Speech Suite silently (no prompts).
/debuglog	No default	Creates a debug log for the suite installer.
/log	No default	Creates logs for each installed product.
ISFeatureInstall=	(install all products)	Comma-separated list of one or more specific products to install. For example, NLM, NMS, NSS. By default, all products are installed. • NLM = Nuance License Manager • NMS = Nuance Management Station • NSS = Nuance speech software
INSTALLPATH=	C:\Program Files	Installation path to the Nuance directory. This doesn't affect installation of Windows Common Files and location of 32-bit features.
License Manager		
LICENSE=	No default	Path and filename of license file.
Management Station		
LICADDRESS=	27000@localhost	Address of the host running the License Manager.
JAVA_HOME=	No default	64-bit Java JRE or JDK location. If not specified, Speech Suite locates the installed Java and sets the property to this location.
TOMCAT_HOME=	No default	Tomcat location. If the path contains spaces, enclose the path in double quotes.
CONNECTORJ=	No default	The full path and filename of the installed Connector/J. If not specified, Speech Suite attempts to find the installed Connector/J and set the CONNECTORJ property to this location. As a precaution, always specify CONNECTORJ with a silent install.
MS_DBTYPE=	mysql	Type of database to use for the Management Station: mysql for MySQL or sqlserver for SQL Server.
MS_DBHOST=	localhost	Name of the Management Station database host.
MS_DBPORT=	3306	Port for accessing the database host. Default is 3306 (MySQL) or 1433 (SQL Server).
MS_DBSERVICE=	mysql	Service type for the Management Station database: mysql for

Option	Default	Description
		MySQL or sqlserver for SQL Server.
MS_DBUSER=	ms	Username for the Management Station database (*mserver*) user account.
MS_DBPASS=	msp	Password for the Management Station database (*mserver*) user account. For MySQL, your password policy might require a secure password for the Speech Suite installation to complete successfully. If you are using Management Station and the MySQL user account password changes after installing Speech Suite, you need to update Management Station with the new password. See the online documentation. **Note:** The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33 or Create a SQL Server user account on page 39.If the password contains the following characters, type ^ before each one to escape them: ^ & < >. For example, you type password My<Pass>123^ as My^<Pass^>123^^
MS_AUDITDB_ ENABLED=	FALSE	Boolean to enable audit logging, which records all user actions on the Management Station. Set to TRUE to enable.
MS_AUDITDB_NAME=	mserver_audit	Name of audit database to be created.
MS_AUDITDB_USER=	ms	Audit database username.
MS_AUDITDB_PASS=	msp	Audit database password. **Note:** The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33 or Create a SQL Server user account on page 39.If the password contains the following characters, type ^ before each one to escape them: ^ & < >. For example, you type password My<Pass>123^ as My^<Pass^>123^^
MSSQL_INSTANCE=	No default	Instance name for an MS SQL database if the instance name is different from the name of the default instance.
MS_DBSCHEMA=	mserver	Name of the schema for the Management Station database.
Nuance speech software		
MSADDRESS=	localhost:8080	Comma-separated list of Management Station addresses.
SUPPLEMENTSPATH=	No default	Directory containing the extracted language packages for Recognizer, voice packages for Vocalizer, and data packages for Krypton and and Natural Language Engine (specifically for NTpE). Speech Suite recursively scans the specified directory for the installation executables.

Option	Default	Description
CONNECTORC=	No default	Full path and filename of the Connector/C library (DLL) to use with the statistics collector service: • MySQL: Path and filename for the MySQL Connector/C. For example: *C:\Program Files\MySQL\MySQL Connector.C\lib\libmysql.dll* • SQL Server: Path and filename for the ODBC Driver. For example: *C:\Program Files\Microsoft SQL Server\Client SDK\ODBC\version\KeyFile\1033\sqlodbc_keyfile.dll* If not specified, the Speech Suite installer attempts to find the installed Connector/C and set the CONNECTORC property to this location. As a precaution, always specify CONNECTORC with a silent install.

After the installation

After running the installer, the next steps depend on the deployment architecture you chose and the components you installed:

Post-Installation tasks	Description
Setting up licenses below	Required and optional tasks after running the Speech Suite installer.
Adding recognizer languages and TTS voices on page 64	If using Nuance Recognizer and Nuance Vocalizer you can set up a multi-lingual environment. Ignore this topic if not using those components.
Testing installations with Management Station on page 68	To verify that you've installed successfully, log in to Management Station, create a Nuance Network of managed resources, and start the services running on the hosts. Skip this topic if not using Management Station.
Configuring Dragon Voice on page 73	If using Dragon Voice, you must configure and manage its components. Skip this topic if not using Dragon Voice.
Activating Automation Assist on page 79	If using Nuance Automation Assist, you must configure it before starting services. Otherwise, services may fail to start. Skip this topic if not using Nuance Automation Assist.
Upgrading Speech Suite software on page 89	Optional. You can update the installation when Nuance releases new versions of the software.
Removing Speech Suite on page 96	Optional. You can remove the software from hosts.

Setting up licenses

These components require a license:

- Nuance Management Station
- Nuance Recognizer
- Nuance Vocalizer
- Nuance Speech Server (if using the optional encryption)
- Nuance Automation Assist
- Dragon Voice

Required and optional tasks after running the Speech Suite installer:

Licensing tasks	Description
Pointing products to a remote License Manager below	If you run a licensed product and License Manager on different hosts, you must point the speech product to the License Manager location.
Loading license files on the next page	Optional. You can replace license files in License Manager at any time.
Configuring license checkouts on page 62	Required. Allocate ports used by each service in your deployment.
Changing the License Manager port on page 63	Optional. You can change the communications port used by the License Manager.
Starting and stopping License Manager on page 63	Optional. You can manually stop and start the license manager for troubleshooting purposes.

Pointing products to a remote License Manager

If you run a licensed product and License Manager on different hosts, you must point the speech product to the License Manager location. (Exception: you do not need to point Management Station to a remote License Manager because this is taken care of during installation.) For a list, see Setting up licenses on the previous page.

Note: Ignore this procedure for licensed speech products on the same host as a License Manager.

To point licensed products to a License Manager host:

1. Set the parameters for the speech products to point to a License Manager host.
   The format of the parameter value is `port`@`host`, where `host` is the hostname or IP address. The default value is 27000@localhost.

   Note: If you are not using Management Station, you must set the path to a License Manager for the watcher service in the Recognizer configuration file. If you do not, the services for your speech products might not start.

   #### *Automation Assist*

   Set naa.licensehost in the Automation Assist configuration file. For example, *$NAA_HOME/naa-*

server/config/application.properties.

Dragon Voice engines

a. **Krypton**: license : path
   - In Management Station, set on the Settings tab for each instance of the Krypton recognition engine.
   - If not using Management Station, set in each instance of the Krypton configuration file. For example, *$NUANCE_DATA_DIR/system/config/User-krypton01.yaml*

b. **Nuance Text Processing Engine**: licensePath
   - In Management Station, set on the Settings tab for each instance of the Nuance Text Processing Engine.
   - If not using Management Station, set in each instance of the NTpE configuration file. For example, *$NUANCE_DATA_DIR/system/config/User-ntpe01.yaml*

c. **Natural Language Processing service**: licenseManager.address
   - In Management Station, set on the Settings tab for each instance of the Nuance Text Processing Engine.
   - If not using Management Station, set in each instance of the NLP service configuration file. For example, *$NUANCE_DATA_DIR/system/config/User-nlps01.properties*

     Note: The NLP service checks out licenses on behalf of the core engines, including for the Natural Language Engine.

d. **Natural Language Engine**: SWILicenseServerList

   Set in the NLE configuration file *$MEE_HOME/config/SpeechWorks.cfg*.

Recognizer

For Recognizer: SWILicenseServerList

Note: The watcher service also requires this setting if you are not using Management Station.

Set in the *$SWISRSDK/config/SpeechWorks.cfg* configuration file.

Speech Server encryption

If you have purchased a Speech Server encryption license, set server.licenseManager.Address in the *$NSSSVRSDK/config/NSSserver.cfg* configuration file.

Vocalizer

For Vocalizer: license_servers:

a. If using Management Station, set on the Settings tab for each instance of the Nuance vocalizer service.

b. If not using Management Station, set in the *$VOCALIZER_SDK/config/baseline.xml* configuration file.

2. Start, or restart, the services to apply the parameter changes.

Loading license files

Optional. You can replace license files in License Manager at any time.

- If you didn't provide a license during installation, Speech Suite loaded a temporary license that you must replace before running licensed products.
- If you loaded an evaluation license, you can replace it with a permanent one.
- In the future, you can load new license files. For example, you could generate a license to cover new products or a different number of licenses, or you might manually edit a license file.

Replacing a license on Windows

1. Log on to the License Manager host as a user with administrator or root privileges.
2. Copy the new license to: *%NUANCE_LICMGR%\license*
3. Configure the License Manager to point to the new license.
   a. From the *Start* menu, run *Licensing Tools*. The LMTOOLS window appears.
   b. Ensure that *Configuration using Services* is enabled, then select *Nuance Licensing Service* from the list.
   c. Change to the *Config Services* tab and set the *Path to the license file* field to point to the new license file. Click Save Service to save any changes.
   d. Click the *Start/Stop/Reread* tab and click *Yes* in the confirmation dialog to save the new setting.
   e. Restart the license server: on the *Start/Stop/Reread* tab, select the *Force Server Shutdown* check box and click *Stop Server*. Then click *Start Server*. This step adds the file and path to the Windows registry for all subsequent restarts of the service.
4. Reboot the licensing host for the change to take effect.

If you prefer to restart individual processes instead of rebooting the host, follow these steps:

1. If using Management Station use the Windows Services Manager to restart the Management Station, statistics analyzer, and data collection services.
2. If the number of ports in the new license has *decreased*, you also must restart the Speech Server service and Nuance recognition service. There is no need to restart these services if the number of ports has increased, if more components have been added to the license, or if the expiration date has changed.

Replacing a license on Linux

1. Log on to the License Manager host as a user with administrator or root privileges.
2. */var/local/Nuance/*
3. Change the ownership of the license file to `nuance:nuance` and make sure it is readable by all users.
4. Reconfigure the License Manager to point to the valid license.
   a. Change to *usr/local/Nuance/license_manager/components*.
   b. Run the *set-new-lic-file.sh* script, specifying the full path to the license. For example:

      ```
      > ./set-new-lic-file.sh /var/local/Nuance/filename.lic
      ```

      The script resets the License Manager to use the new license.
5. Restart the Nuance Licensing Service. See Starting and stopping License Manager on page 63.
6. Reboot the licensing host for the change to take effect.

If you prefer to restart individual processes instead of rebooting the host, follow these steps:

1. If NOT using Management Station, restart the watcher service, and then restart all services.
2. If using Management Station restart the Management Station, statistics analyzer, and data collection services:

   ```
   On CentOS 6
   > service initScriptmserver.sh restart
   > service initScriptmserverdc.sh restart
   > service initScriptmserversa.sh restart
   On CentOS 7
   > systemstl restart initScriptmserver.sh
   > systemstl restart initScriptmserverdc.sh
   > systemstl restart initScriptmserversa.sh
   ```

3. If the number of ports in the new license has *decreased*, restart the Speech Server service and Nuance recognition service. (There is no need to restart these services if the number of ports has increased, if more components have been added to the license, or if the expiration date has changed.)

Configuring license checkouts

You must configure the number of ports used by each instance of each licensed service. This applies to whichever services you plan to run: Speech Server, Vocalizer, Nuance Recognizer, and the NLP service (needed for Dragon Voice).

Your license file specifies the total number of ports allowed for each service. If you run more than one instance of a service, set allocate ports so the sum equals the total allowed by your license. (The sum of all service instances must not exceed the total number allowed by the license file.) For example:

- If the license allows 100 ports of Nuance Recognizer, and you run one instance of the recognizer, assign 100 ports.
- If you run two instances, assign any combination that totals 100 ports. For example, configure 50 ports for each instance.

Each licensed service has a configuration parameter to specify the number of ports used:

Service	Parameter
Nuance recognition service	swirec_license_ports and swiep_license_ports Specify the same value for both except when using the MRCP recorder feature. Otherwise, (if using MRCP recorder), specify two swi**ep** licenses for each swi**rec** license. For example, if you have a total of 200 Recognizer and 400 endpointer licenses, and are running two recognition services: set swirec_license_ ports to 100 and set swiep_license_ports to 200 on each service instance.
Speech Server	server.mrcp2.sip.maxCountOfSession Specify the maximum number of concurrently active SIP sessions. Best practice—Set each Speech Server instance to the same value number of endpointer licenses configured on each recognition service. The sum for all Speech Server instances should equal the number of available endpointer licenses allowed by your license. For example, if you have a total of 400 endpointer licenses, and are running two Speech Server instances, set this parameter to 200 on each service.

Service	Parameter
vocalizer service	tts_license_ports and optionally tts_license_ports_overdraft_thresh
NLP service	numberOfLicenses

Note: After setting these parameters, restart the services for the changes to take effect.

See the online documentation for information on managing license ports at runtime (using Management Station), and updating service properties from the command line.

Changing the License Manager port

Optional. You can change the communications port used by the License Manager.

License Manager uses a single host port to communicate with the licensed products that use it:

Port	Description
Port 27000	Typical default for a single License Manager
Port 28000	Typical default a quorum

Reasons you might need to change the default port:

- When the default port is unavailable on the host, you need to assign a different port. For example, if other software is using the default port.
- When you create a merged license file for two or more products, and you load that file into more than one License Manager, you must choose a single communication port for those license managers to service licenses to the licensed products.
- For Linux, if you run Nuance License Manager and license managers from different vendors on the same host, each license manager requires a different port.

To change the port:

1. Choose any available communication port number.
2. Edit the license file on the License Manager host. (Locate the SERVER line near the top of the license file.)
3. If you have more than one License Manager, repeat the edit on each host.
4. **Note:** If using the three-server redundancy configuration, edit the license file once and copy to each host in the quorum.
5. Load the new license files into each License Manager. See Loading license files on page 60.
6. On each Speech Suite host running a licensed product, edit all License Manager lists to specify the new port number. (There is one list for each licensed product.)

Starting and stopping License Manager

When you install the License Manager with the Speech Suite installer, the automatically runs whenever you restart the host. If necessary, you can manually stop and restart License Manager. For example, this is useful to troubleshoot an issue with License Manager or after modifying a license file.

On Linux

For CentOS 6, run:

```
> service nuance-licmgr stop
> service nuance-licmgr start
> service nuance-licmgr restart
```

For CentOS 7, run:

```
> systemctl stop nuance-licmgr
> systemctl start nuance-licmgr
> systemctl restart nuance-licmgr
```

On Windows

1. Select Start, Licensing Tools. The LMTOOLS window appears.
2. Click the Start/Stop/Reread tab, select the Force Server Shutdown check box, and click Stop Server.
3. Click Start Server.

Adding recognizer languages and TTS voices

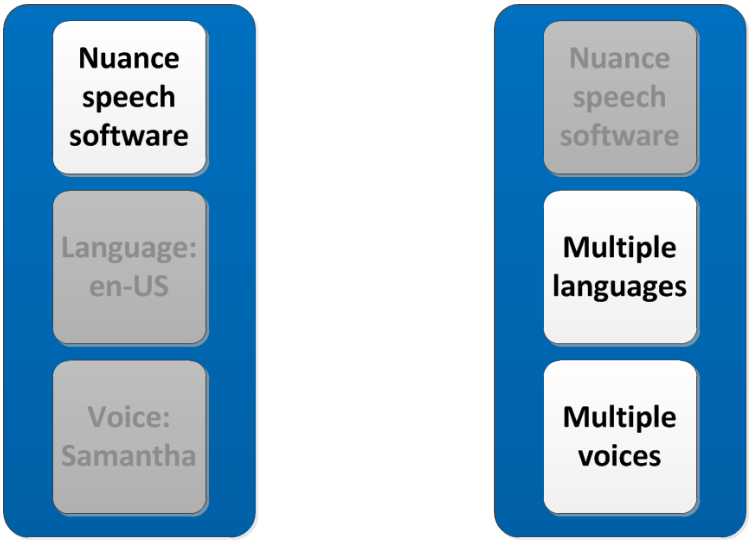
If using Nuance Recognizer and Nuance Vocalizer you can set up a multi-lingual environment. Ignore this topic if not using those components.

The Speech Suite installer includes one language and one text-to-speech voice. Optionally, you can enable a multilingual system that supports applications in different languages by

downloading, installing, and configuring additional languages and voices to a separate, dedicated host.

Note: If using Dragon Voice, you cannot store data packs on a separate dedicated host. You must install them on each Krypton and NTpE host.

For example, you can perform Speech Suite installations on two hosts. One host is the *speech host* with Nuance Speech Suite, one Recognizer language, and one voice (if using TTS). The other host is the *dedicated host* with Speech Suite and any additional languages and voices. At runtime, the speech host runs the Nuance speech software, which retrieves languages and voices from the dedicated host when they are needed.



To set up this configuration, including to configure your Nuance products to retrieve the language and voices from the dedicated host, follow these steps:

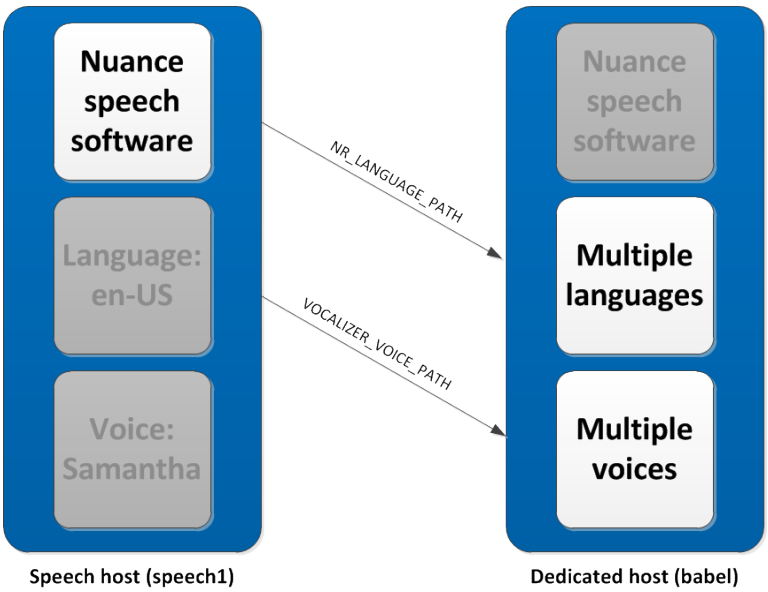
1. Set up your speech host as described in Run the installer on page 42.

   The one language installed on the speech host will be the default language for Recognizer, since it is the first language installed.

2. Download the other languages and voices to a downloads directory on the dedicated host and extract them.
3. Run the installation to install Speech Suite, Recognizer languages, and voices (if using TTS).

   This installs all the languages to *$SWISRSDK/config* and all the voices to *$VOCALIZER_SDK/languages* on this host.

4. Ensure that the language directory and voice directory on the dedicated host are viewable and readable from the network.
5. On the speech host, set NR_LANGUAGE_PATH on the recognition service to point to the *$SWISRSDK/config* directory on the dedicated host.
6. On the speech host, set VOCALIZER_VOICE_PATH on the vocalizer service to point to the *$VOCALIZER_SDK/languages* directory on the dedicated host.



Recognizer on the speech host has access to the language on its own host, and to all languages in the NR_LANGUAGE_PATH location. In cases where a language is not specified, the oldest of these (that is, the language in the directory that has the oldest timestamp) serves as the default. In the order given above this default language is the language installed on the speech host, as this language is installed before the languages on the dedicated host.

Vocalizer on the speech host has access to the voice on its own host and to all voices in the VOCALIZER_VOICE_PATH location. In cases where a voice is not specified, the first of these alphabetically (that is, the voice whose three-letter language code comes earliest in the alphabet) serves as the default.

You can add more languages and voices to the dedicated host later by installing them separately, without using the Speech Suite installer.

Example 1: Setting up one speech host and one dedicated host

You decide to set up a deployment with a Nuance speech software host (*speech1*), and to put several languages and voices on a single dedicated host (in this case, a Linux host called *babel*). The speech host will have the US English language and a US English voice, Samantha. The dedicated host will offer Canadian French, Mexican/US Spanish, and standard German (de-DE) languages. It will also offer the Canadian French voice Amelie, the Mexican Spanish voice Angelica, and the standard German voice Petra.

1. On the *speech1* host, download the en-US language and the en-US voice Samantha to a temporary directory (for example, *C:\temp*) and extract them.
2. Install Speech Suite on the speech host (see Run the installer on page 42). When the installation prompts you for language and voice location, specify the *C:\temp* directory where the installation can find the extracted language and voice.
3. On the *babel* host, download the other languages (fr-CA, es-MX, and de-DE) and voices (Amelie, Angelica, and Petra) to a temporary directory (for example, *C:\temp*) and extract them.
4. Install Speech Suite on the dedicated host. When the installation prompts you for the language and voice location, specify the *C:\temp* directory.

The installation installs all languages and voices it finds in the directory. The languages are installed by default to the *C:\Program Files\Nuance\Recognizer\config* directory, and the voices to the *C:\Program Files\Nuance\Vocalizer for Enterprise\languages* directory.

5. Verify that these directories are both visible and readable from the network, so the speech host will be able to use them.
6. Configure each recognition service and vocalizer service:
   a. For each recognition service, set NR_LANGUAGE_PATH to */usr/local/Nuance/Recognizer/config*.
   b. For each vocalizer service display the Setting tab, set VOCALIZER_VOICE_PATH to *\\babel\Program Files\Nuance\Vocalizer for Enterprise\languages*.

You can use any of these languages and voices in your applications by specifying them in the session configuration file (*session.xml*) or in the VoiceXML for any application that uses the Nuance speech software on the *speech1* host.

- The default language is US English (en-US), because this was installed on the *speech1* host before any languages were installed on the *babel* host.
- The default voice is Samantha because the directory containing the voice is named with the three-letter language code for US English (enu), which comes first in the alphabet before the codes for Canadian French (frc), Mexican Spanish (spm), or standard German (ged).

Having set up the languages and voices on the *babel* host, you can use it as a language and voice resource for other speech hosts. On the additional speech hosts, you can install Speech Suite and configure the NR_LANGUAGE_PATH and VOCALIZER_VOICE_PATH on the services to point to the correct directories on the *babel* host.

Example 2: Adding a new language on the dedicated host

After setting up the *speech1* and *babel* hosts, you later decide to add a new language and voice for an application that uses Mandarin Chinese.

1. On the *babel* host, download the zh-CN language and the Mandarin Chinese voice Tian-Tian to your downloads directory (*C:\temp*), and extract them.
2. In the extracted language directory, run the installer.
3. In the extracted voice directory, navigate to the *voice_installer* subdirectory and run the installer.

The new language and voice are available to applications running on the *speech1* host.

- The default language continues to be en-US.
- The default voice continues to be Samantha, because the three-letter language code for US English (enu) still comes before the code for Mandarin Chinese (mnc). However, the default voice changes if you install a new language with a code that comes before US English (for example, dad for Danish or ena for Australian English).

Example 3: Adding a new speech host to the configuration

After setting up the *speech1* and *babel* hosts and adding Mandarin Chinese to the *babel* host, you decide to add a second *speech2* speech host to your configuration.

1. On the *speech2* host, download the en-US language and the en-US voice Samantha to a temporary directory (for example, *C:\temp*) and extract them.

2. Install Speech Suite on the speech host (see Run the installer on page 42). When the installation prompts you for language and voice location, specify the *C:\temp* directory where the installation can find the extracted language and voice.
3. Use the Management Station to configure the recognition services and vocalizer services on the *speech2* host:
   a. For each recognition service, display the Setting tab, and set NR_LANGUAGE_PATH to *\\babel\Program Files\Nuance\Recognizer\config*.
   b. For each vocalizer service, display the Setting tab, and set VOCALIZER_VOICE_PATH to *\\babel\Program Files\Nuance\Nuance Vocalizer for Enterprise\language*.

Testing installations with Management Station

If you installed Management Station, you can use it to verify the success of the entire installation by logging in, creating a Nuance Network of managed resources, and starting the services running on the hosts as follows:

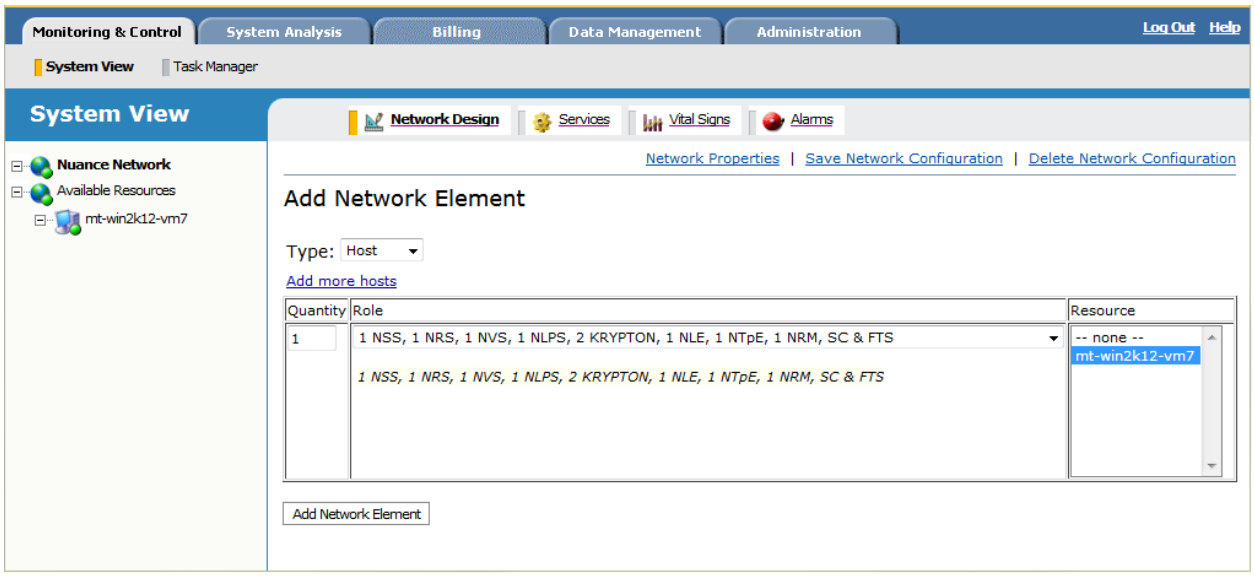
1. Open a browser window and enter the URL *http://`MS_hostname`:8080/mserver.* The `MS_hostname` can be a name or IP address.
2. Log in to Management Station with *Administrator* (user) and *changeit* (password). Change to a more secure password when prompted.
3. **Note:** As a security precaution, the Management Station locks out a user after five unsuccessful login attempts. To resolve this situation, see "managing users" in the online documentation.
4. Select Nuance Network in the left frame to display the Add Network Element page.

   The hosts that this Management Station is managing appear in the left frame under Available Resources. They were configured to point to this Management Station during the installation.
5. Select Host from the Type menu.
6. Select a role from the Role menu and then select a host under Resource.

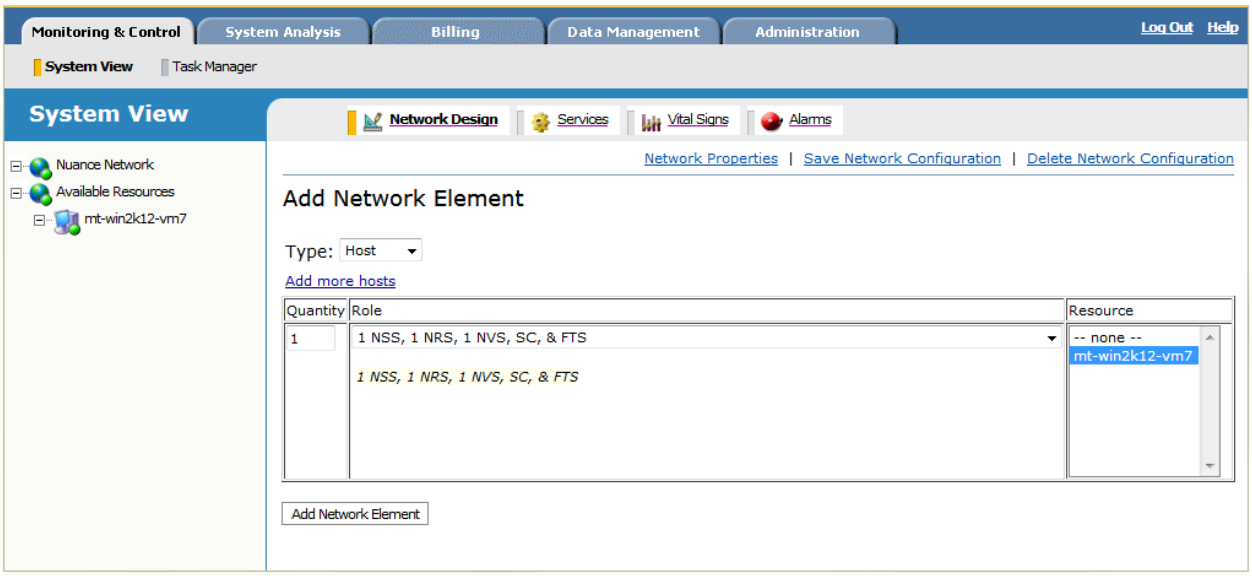
   Resources are hosts configured during installation that you manage using Management Station. A role configures the host to run certain services.

   Note: If you select a role that assigns Dragon Voice services, it's important that you review and, if necessary, configure the required service properties or the services can fail to start. See Configuring Dragon for Management Station on page 75.

   For example, to choose an "all-in-one" role that runs all services with the exception of Nuance Automation Assist:



For example, to choose a role that runs the standard set of Nuance speech software (Speech Server, Recognizer, and Vocalizer):



Note: If you don't see any hosts, you may have to start the watcher service on these hosts, or you may not have configured them to point to this Management Station. See the online documentation.

7. Click Add Network Element. The selected host moves from Available Resources to Nuance Network.
8. Make sure the host is selected in the network view, then select Services from the toolbar.
9. Click Start All to start all services on the selected host. If all services start without errors, the installation was successful.
10. Continue to "Managing Nuance Networks" in the online documentation for instructions on performing these tasks with Management Station:

- Configure your Nuance Network with additional hosts running speech services.
- Configure service initialization.
- Start, stop, and restart services.
- Receive alarms from services.
- Generate reports.

Troubleshooting: services fail to start

You must run ZooKeeper before starting the Nuance Resource Manager and Dragon Voice engines. Otherwise, Management Station displays alarms as Dragon Voice engines attempt to register. If services still do not start, reboot the host, which restarts the services, and make sure that ZooKeeper is running. On Linux hosts, you might notice that some services fail to start, appear twice, or appear under the wrong host. You can modify the *etc/hosts* file for a host experiencing these problems.

You must install at least one language pack for Nuance Recognizer, a voice pack for Nuance Vocalizer, and a data pack for the Krypton engine. If you did not install languages/voices/data packs during the installation process, you can download, extract, and install them now.

Note: If you're installing your first data pack after having installed Speech Suite, you must first stop the watcher service on the host (Krypton and NTpE); otherwise, the system may not be able later to locate the newly installed data pack. For instructions on manually starting and stopping services, see the online documentation.

If using Nuance Automation Assist and the Natural Language Engine, you must enable unlimited cryptography. See Configure Java security on page 29.

You must set full permissions on directories where logs are written to disk. Otherwise, services fail to start because they can't begin logging. Set permissions on the *NUANCE_DATA_DIR* directory, the parent location for all logging.

Windows

To check the permissions:

1. Open Explorer.
2. Right-click the *%NUANCE_DATA_DIR%* directory and select Properties.
3. Select the Security tab.

   The Name box must contain one of either "Everyone" or "SYSTEM" with full permissions (all Allow boxes must be checked).
4. If either of these names aren't named, then click Add.
5. Choose Entire Directory for the Look In: field.
6. Add either of these names and click OK.

Linux

To check the permissions, log in as root and set full permissions on *$NUANCE_DATA_DIR;* by default, *var/local/Nuance*. For example:

```
> chmod -R 755 NUANCE_DATA_DIR
```

It's important that only the root user have full permission to avoid allowing other users to modify files.

Troubleshooting: some services fail to start or appear twice (Linux)

Due to a possible Linux operating system installation problem, you may notice some services fail to start, or they may appear twice or under the wrong host in Management Station tree view. Follow these steps:

1. Open the */etc/hosts* file.
2. Change the following line:

   ```
   127.0.0.1   hostname   localhost.localdomain
   ```

   To:

   ```
   127.0.0.1   localhost  localhost.localdomain
   ```

   ```
   ipAddresshostname
   ```

   Where:

   ipAddress is the IP address of the managed host

   hostname is the name of the managed host

   For example:

   ```
   127.0.0.1   localhost   localhost.localdomain
   ```

   ```
   11.2.3.4    myhost
   ```

3. Restart Management Station services. See Starting and stopping Management Station manually. You might also want to restart the watcher service on the managed host. See Starting and stopping the watcher service manually.

Troubleshooting: Management Station fails to detect hosts

If the Management Station fails to detect hosts where a Nuance product was installed, verify the following:

- Check for any network problems. Is a connection down? Has the network configuration changed?
- Verify that the watcher service is running on these hosts. This service (which runs as a Windows service or Unix daemon) initiates and maintains connectivity with Management Station. If necessary, restart the watcher service.

  On Windows, use the Windows Services Control Panel (Administrative Tools→Services→Nuance Watcher Daemon).

  On Linux systems, determine whether the watcher service is running. If it is not, log in as root and start it. Commands:

  ```
  > ps -ef | grep watcher
  ```

  ```
  On CentOS 6
  ```

  ```
  > service nuance-watcher start
  ```

  ```
  On CentOS 7
  ```

  ```
  > systemctl start nuance-watcher
  ```

- Verify the information in the *mserver_hosts.txt* file (displayed with Start→All Programs→ Nuance Voice Platform→Configure Management Station Addresses on Windows).

  On Linux hosts, open the *mserver_hosts.txt* file, located in *$NUANCE/data/oam*:

- Is the hostname for Management Station correct?
- Is the hostname resolvable by the network? Depending on your network settings you may need to specify the IP address of the Management Station host instead of the hostname, especially if you have a mix of Windows and Linux systems.
- If you have changed the IP address on any Linux host, make sure to update the */etc/hosts* system file with the change; otherwise, the host may appear offline to Management Station. Restart the watcher service on these hosts and the Management Station service afterwards:On CentOS 6
- `> service nuance-watcher restart`
- `On CentOS 7`
- `> systemctl restart nuance-watcher`

- Management Station will not be able to communicate with hosts that are named using non-standard characters, including the underscore (_). Only alphanumeric characters and the dash (-) character are allowed for Internet host names. The period is allowed for delimiting components of domain style names. See *rfc952.txt*.
- Does this file contain multiple Management Station addresses? Only one connection can be active. Ensue the primary Management Station is first in the list. (Once a host connects to a secondary Management Station, it does not attempt to connect to the primary.)

Troubleshooting: Management Station reports fail to display correctly

This topic is about a potential problem with the Management Station interface where the display of charts is confused by missing fonts. It's relevant when you install the following software on a host:

- Management Station
- OpenJDK
- CentOS

Management Station requires default fonts (from the operating system) to render charts for various report in the GUI. If the fonts are missing, the display is unreadable or shows signs of corruption.

This procedure detects the problem:

1. Install fontconfig to enable the fc command:

   ```
   yum install fontconfig
   ```

2. Detect the installed fonts:

   ```
   fc-list
   ```

   If there's no list, there are no fonts installed.

The Management Station installation includes a font package to remedy this problem. Follow this procedure:

1. Enter these commands:

   ```
   cp $MSTATION_HOME/mserver/webapps/mserver/fonts/mstation-default-fonts.tar.gz
   /usr/share/fonts/.
   ```

   ```
   cd /usr/share/fonts/
   ```

   ```
   gunzip /mstation-default-fonts.tar.gz
   ```

```
tar xvf mstation-default-fonts.tar
rm -rf mstation-default-fonts.tar.gz
```

2. Detect the newly installed fonts:

   fc-list

   The command should return a list similar to this:

```
Liberation Sans:style=Regular
Liberation Sans:style=Bold
Liberation Sans:style=Bold Italic
Liberation Sans:style=Italic
```

3. Restart the Management Station service:

   service initScriptsmserver.sh restart

Configuring Dragon Voice

If using Dragon Voice, you must configure and manage its components. Skip this topic if not using Dragon Voice.

The Speech Suite installer adds Dragon Voice components to your system, and you can use them if you've acquired the necessary licenses.

Setting up ZooKeeper

When using Dragon Voice services (engines), you must install Apache ZooKeeper and configure it to connect to Resource Manager and the engines.

- You can install ZooKeeper on any host. This includes hosts with no Speech Suite components. The host must communicate with the Resource Manager host.
- For redundancy, you can install multiple Zookeeper instances on multiple hosts. Use the Zookeeper instructions to configure interoperation among the Zookeeper servers. Typically this means having an odd number of servers for “election” purposes (for example, 1, 3, 5, and so on). For testing and development purposes, a single ZooKeeper host is sufficient. For production environments, Nuance (and Apache) recommends at least three ZooKeeper hosts to ensure that the ZooKeeper service stays active.

Note: You cannot connect the one Zookeeper to two different Speech Suite installations.

Before you begin:

- Download the Apache ZooKeeper package on each host and extract it.
- Use the Apache ZooKeeper documentation for full instructions, including system requirements.
- Install 64-bit Java on each ZooKeeper host. If installing Zookeeper on a Speech Suite host, see the Speech Suite release notes for details about sharing the Java JRE.

On Linux

Repeat these steps on every Zookeeper host:

1. Make a copy of the provided configuration file: */zookeeper/conf/zoo_sample.cfg*

2. Rename your copy of the configuration file. For example: *zoo.cfg*
3. Create a data directory, using a name of your choosing, in the installation directory.
4. Edit these settings in *zoo.cfg*:
   a. `dataDir`: Enter the path to your data directory. For example: `dataDir=/zookeeper/zookeeperDataDir`
   b. `server.1`: Enter the hostname of your ZooKeeper host. For example: `server.1=zookeeper-server-name:2888:3888`

      Note: If you have more than one ZooKeeper host, you can add additional `server.x` settings, incrementing the *.x* value for each host.
   c. `clientPort`: Enter the listening port for client connections.
5. Save *zoo.cfg*.
6. Start the ZooKeeper server:

   ```
   > /zookeeper/bin ./zkServer.sh start
   ```

   Tip: You can check this log file for any errors */zookeeper*`/bin/zookeeper.out`
7. Start the ZooKeeper client, which switches to the ZooKeeper prompt:

   ```
   > ./zkCli.sh
   ```
8. Run these commands to create the zNodes for Resource Manager, the Dragon Voice engines, and to register them with ZooKeeper:

   ```
   > create /RM []
   > create /Engines []
   > create /Engines/KRYPTON []
   > create /Engines/NLE []
   > create /Engines/NTPE []
   ```

   Note: After running each command, the ZooKeeper output shows CONNECTED, which means that ZooKeeper has *registered* Resource Manager and the engines, *but it has not actually connected to them*.
9. Type `quit` to exit the client. The ZooKeeper configuration is now complete.
10. Configure the zookeeper : servers property of the Nuance Resource Manager service to point to the IP address and port (default 2181) of each ZooKeeper host.

    Note: The list of ZooKeeper addresses must match the list of ZooKeeper hosts for Resource Manager to successfully connect to them.

On Windows

Repeat these steps on every Zookeeper host:

1. Make a copy of the provided configuration file *\zookeeper\conf\zoo_sample.cfg*
2. Rename your copy of the configuration file. For example: *zoo.cfg*
3. Create a data directory, using a name of your choosing, in the installation directory. For example: *C:\zookeeper\zookeeperDataDir*

4. Edit these settings in *zoo.cfg*:
   a. `dataDir`: Enter the path to your data directory. For example: `dataDir=C:\zookeeper\zookeeperDataDir`
   b. `server.1`: Enter the hostname of your ZooKeeper host. For example: `server.1=zookeeper-hostname:2888:3888`

      Note: If you have more than one ZooKeeper host, you can add additional `server.x` settings, incrementing the *.x* value for each host.
   c. `clientPort`: Enter the listening port for client connections.
5. Save *zoo.cfg*.
6. Open the Environment Variables dialog.
7. Click New, under System Variables, and add the following variable, where the value is the path to your ZooKeeper directory: `ZOOKEEPER_HOME = C:\zookeeper`
8. Select Path, under System Variables, click Edit and add the following value to the list: `%ZOOKEEPER_HOME%\bin;`
9. Open a command prompt.
10. Type `zkServer.cmd` to start the ZooKeeper server and do not close the command prompt, which stops the ZooKeeper server.

    Note: The command prompt window must remain open for the ZooKeeper server to stay active.
11. Open a new command prompt.
12. Type `zkCli.cmd` to start the ZooKeeper client.
13. Run these commands to create the zNodes for Resource Manager, the Dragon Voice engines, and to register them with ZooKeeper:

    ```
    > create /RM []
    > create /Engines []
    > create /Engines/KRYPTON []
    > create /Engines/NLE []
    > create /Engines/NTPE []
    ```

    Note: After running each command, the ZooKeeper output shows CONNECTED, which means that ZooKeeper has *registered* Resource Manager and the engines, *but it has not actually connected to them*.
14. Type `quit` to exit the client. The ZooKeeper configuration is now complete.
15. Configure the zookeeper : servers property of the Nuance Resource Manager service to point to the IP address and port (default 2181) of each ZooKeeper host.

    Note: The list of ZooKeeper addresses must match the list of ZooKeeper hosts for Resource Manager to successfully connect to them.

Configuring Dragon for Management Station

This topic is for sites using Management Station. Skip this topic if not using Management Station, and see "Configuring and starting services without Management Station" in the online documentation instead.

Dragon Voice services have specific configuration requirements depending on your Speech Suite deployment:

- To run all Speech Suite components, including Dragon Voice, on a single host (all-in-one system), there are only a few Dragon Voice service properties you might need to set in Management Station.
- To run Speech Suite components on multiple hosts (high-volume system), such as a dedicated host for the Krypton engine, you might need to configure multiple Dragon Voice services.

All-in-one system

Some Dragon Voice components require post-installation configuration for full functionality:

- Krypton and NTpE require installing one or more data packs (downloaded from Nuance Network separately). If you have not yet completed this step, see Managing data packs on the facing page.

  Krypton and NTpE load all installed data packs by default. No configuration is required **unless** you want to load a subset of the data packs, in which case you will need to specify the data pack names:

  - For Krypton: dataPack : languageData configuration property
  - For NTpE: preloadDataPacks configuration property
- The Nuance Resource Manager requires Apache ZooKeeper to communicate with the Dragon Voice engines. If you have not yet installed ZooKeeper and configured Resource Manager, see Setting up ZooKeeper on page 73.

You must configure the NLP service for the number of ports permitted by your license. See Configuring license checkouts on page 62.

Note: The installation automatically imports the self-signed certificates of Dragon Voice engines into the cacerts trust store of the NLP service, thereby enabling client-server authentication. If the NLP service is unable to connect to the engines, you may need to import the certificates into the truststore. For example, the installation assumes that the truststore is located in the Java Runtime Environment (JRE) *lib/security* directory and uses the default password *changeit*. If you maintain your public key truststore elsewhere, or use another password, you will need to import certificates manually. See the online documentation.

High-volume system

For high-volume systems with different components run on different hosts in predefined configurations called roles, you need to set, or at least verify, the service properties described in the following table:

Tip: For more information on each of the service properties listed below, see the online documentation.

Component	Parameter
Natural Language Processing service	• licenseManager.address • numberOfLicenses **Note:** If the NLP service is running on Linux, you might need to configure the number of supported channels. See the online documentation.
Krypton engine	• license : path • rmRegistration : urls • dataPack : languageData, to specify only those data packs you wish to load, rather than all data packs installed under NDP_HOME. (By default Krypton loads all data packs installed.)

Component	Parameter
Natural Language Engine	• nle.host(ensure value is set to hostname or IP address) • rm.enabled (ensure value is set to true) • rm.uri • ntpe.resourceManagerEnabled (ensure value is set to true)
Nuance Text Processing Engine	• preloadDataPacks, to specify only those data packs you wish to load, rather than all data packs installed under NDP_HOME. (By default NTpE loads all data packs installed.) • licensePath • resourceManager : enabled (ensure value is set to true) • resourceManager : urls • resourceManager : ntpeHost
Nuance Resource Manager	• zookeeper : servers

Tip: For specifying licensing parameters, see Pointing products to a remote License Manager on page 59. For more information on configuring Dragon Voice components to use Nuance Resource Manager and configuring secure connections see the online documentation

Managing data packs

Dragon Voice requires one or more data packs for its Krypton recognition engine and Nuance Text Processing Engine (NTpE) components. It uses the data packs when building models for your applications

Later, when your applications invoke Dragon Voice, they specify the version of data pack used for those models. See the online documentation.

Installing data packs

Typically, you install data packs on every Krypton and NLE-NTpE host during the Speech Suite installation process. You can download data packs from Nuance Network and install them now (see the Notes below for important considerations). Data packs exist as separate installation packages from Nuance Speech Suite.

Notes:

- Install data packs on Krypton and NTpE hosts. Do not create a central repository.
- The data pack installer will not prompt for an installation path. Subsequent installations will use the NDP_HOME environment variable to construct the installation path.
- If you install Speech Suite without a data pack, you must stop the watcher service on the Krypton/NTpE host before installing the first data pack. (Otherwise, the required NDP_HOME environment variable will not be set.) See the online documentation.
- Krypton and NTpE load all data packs installed by default. You only need to configure if want to load a subset or if you installed multiple versions of the same language. See Configuring data packs on the next page.

Install the data packs you need, either by using the Windows installer (.msi file) or on Linux by installing the RPM package.

NDP_HOME

When you install the first data pack on a host, the installer creates the NDP_HOME environment variable:

- Linux: */usr/local/Nuance/Data_Packs*
- Windows: *C:\Program Files\Nuance\Data Packs*

The individual data packs reside in subdirectories beneath NDP_HOME. For example:

- Linux : *$NDP_HOME/ndp-eng-USA-GEN-3.7.1/*
- Windows: *%NDP_HOME%\ndp-eng-USA-GEN-3.7.1*

README file

The installation includes a README text file containing relevant information about the data pack, including:

- Name of the data pack including version number
- Language code (*Lang-LOCALE*), such as eng-USA (American English)
- Topic, such as GEN (Generic)
- Builtins associated with the data pack's base language model, which are used to improve recognition for specific common tasks such as recognition of numbers, dates, and so on
- Supported sampling rates, such as 8000 (8 kHz) and 16000 (16 kHz)
- Supported audio encoding, such as linear pcm 16 bit

Replacing data packs

You cannot upgrade existing data packs. If you have a new version, you install it and both versions are co-installed.

Every data pack has a unique filename and version that cannot be re-used or substituted in any way. For example, if you need to install a new datapack you cannot rename it to match an existing filename and version.

Never replace an installed data pack with a different pack that has an identical name. Doing this causes unpredictable conflicts between the new pack and existing data in the memory cache.

Never rename or move data packs after installation. Doing this causes the Krypton engine "capabilities" to disappear in the Nuance Resource Manager.

Configuring data packs

Dragon Voice engines register their specific capabilities with the Nuance Resource Manager. For example, they register the language, topic, and version of loaded data packs. This registration enables the Resource Manager to allocate the engine best equipped to handle a specific application request.

By default, the Dragon Voice engines load all data packs installed under NDP_HOME. To load a subset, configure these properties:

- **Krypton:** dataPack : languageData
- **NTpE:** preloadDataPacks

Tip: By default these property values are empty. When a property includes one or more entries, only the specified entries are loaded. Therefore, to exclude a data pack, you need to include the list of data packs that you *do* want to load.

Details for configuring the properties:

- Specify the exact name of the data pack; for example, `[ndp-eng-USA-GEN-3.7.1]`. To specify multiple data packs, use a comma-separated list, as follows: `[ndp-eng-USA-GEN-3.7.1,ndp-cmn-CHN-GEN-3.7.1]`.
- Entries must match the corresponding existing directories under NDP_HOME. Data pack names (and directory names) that do not comply with the above naming convention are ignored.
- You can install different versions of the same data pack, but you cannot use them in the same Krypton or NTpE instance. For example, the engines do not support starting and loading both ndp-eng-USA-eng-USA-3.1.1 and ndp-eng-USA-eng-USA-3.7.2. Therefore, to install multiple versions on a host, you must specify the explicitly version to load.

Removing data packs

Uninstall data packs that you no longer need. Use the standard removal mechanism for your operating system (on Windows the Programs and Features Control Panel, and on Linux the `yum erase` *`package_name`* command).

When you uninstall a data pack:

- All data pack installation files are removed (only).
- Any files copied into NUANCE_DATA_DIR via the application, engines, or a user are retained.
- The NDP_HOME environment variable remains set upon data pack removal (even if the last one is removed).

Activating Automation Assist

If using Nuance Automation Assist, you must configure it before starting services. Otherwise, services may fail to start. Skip this topic if not using Nuance Automation Assist.

Nuance Automation Assist is an optional tool that the Speech Suite installer includes on every host. It supports voice applications by escalating difficult caller responses to live agents in real time (without interrupting the flow of the application).

To activate Automation Assist, perform these tasks (in order) after running the Nuance speech software installer:

1. Create the NAA configuration file
2. Create Automation Assist databases
3. Set database parameters
4. Configure Automation Assist for secure connections
5. Integrate Automation Assist with Management Station. Skip this topic if not using Management Station, and see "Configuring and starting services without Management Station" in the online documentation instead.

After completing these configuration tasks, restart the Automation Assist host to ensure that all environment variables are set and all services are started.

Note: If you haven't already, you need to configure Automation Assist to work with Speech Server or your application. See the online documentation. Also, ensure that you have enabled unlimited cryptography. See Configure Java security on page 29.

Creating the NAA configuration file

If using the Automation Assist tool, you must create its configuration file:

1. Go to `$NAA_HOME/naa-server/config/`
2. Copy `application.properties.sample` to `application.properties` (remove .sample from the filename)
3. Edit `application.properties` to override defaults or provide required values as needed.

Note: On Linux, ensure the nuance user has required permissions on this file. If necessary, run this command: `> chmod 644 $NAA_HOME/naa-server/config/application.properties`

Automation Assist properties

- naa.data.dir
- naa.hostname

Billing properties

- billing.ds.driver
- billing.ds.password
- billing.ds.url
- billing.ds.username
- billing.enabled
- billing.failover.ds.driver
- billing.failover.ds.password
- billing.failover.ds.url
- billing.failover.ds.username
- billing.logNotEscalated
- billing.noMatchGlobals
- billing.noMatchIntents
- billing.pingInterval
- billing.timeoutGlobals

Database properties

Required parameters. See Setting database parameters on page 85.

- ds.driver
- ds.password
- ds.url
- ds.username
- reporting.ds.driver
- reporting.enabled
- reporting.ds.password

- reporting.ds.url
- reporting.ds.username

SSL properties

- jetty.context.path
- jetty.http.port
- jetty.https.enabled
- jetty.https.keystore (required, see Setting up server authentication on page 86)
- jetty.https.password
- jetty.https.port
- jetty.https.truststore-location (required, see Setting up server authentication on page 86)
- jetty.https.truststore-password
- jetty.https.want-client-auth

Creating the Automation Assist databases

If using the Automation Assist tool, you must install a database connector and run scripts to create the configuration and the optional reporting databases.

The installer provides scripts to create databases on either MySQL or SQL Server:

Database user: *naa*

Database password: *Changeit1* (MySQL) or *changeit* (SQL server)

Installing the database connector

Automation Assist uses a Java database connector to connect to its databases. You can use the same Java connector used when creating the Management Station database:

1. On the Automation Assist host, create a directory *$NAA_HOME/naa-server/deps*.

   On Linux, make sure nuance user has required permissions on this directory. If necessary, run this command: `> chmod -R 755 $NAA_HOME/naa-server/deps`

2. Copy the connector from the host where you created the Management Station database.
   - On Windows:
     - If Management Station uses a MySQL database, the *mysql-connector-java-version-bin.jar* connector was installed automatically. Copy it from *C:\Program Files (x86)\MySQL\Connector.J 5.1*.
     - If Management Station uses an SQL Server database, you downloaded and extracted the connector to a temporary directory during the installation. Copy the *sqljdbcnumber.jar* file from this temporary directory.

     If the Management Station database is on Linux, you downloaded and extracted the MySQL connector to a temporary directory during the installation. Copy the *mysql-connector-java-version-bin.jar* file from this temporary directory.
3. Paste the connector into the *$NAA_HOME/naa-server/deps* directory on the Automation Assist host.

Creating the configuration database

Once the connector is installed, create the configuration database using provided scripts.

MySQL configuration database

For MySQL:

1. Enter the MySQL root password in the *$NAA_HOME/naa-server/bin/db/mysql_defaults.cnf* file.
2. On Windows, make sure you've added the *MySQL\bin* directory to the *%PATH%* environment variable. Note that the value must be in the *PATH* at the time the script is executed.
3. Open a command-prompt window and run the database creation script:
   - Windows*: %NAA_HOME%\naa-server\bin\create_db.bat*
   - Linux: *$NAA_HOME/naa-server/bin/create_db.sh*

SQL Server configuration database

For SQL Server, open a command-prompt window and run the database creation script:

```
> %NAA_HOME%\naa-server\bin\create_db_sql_win.bat
```

Creating the reporting database (optional)

The reporting database stores information on agents like login times and assigned skills, and interactions like escalation times and outcomes.

MySQL reporting database

For MySQL:

1. Enter the MySQL root password in the *$NAA_HOME/naa-server/bin/db/mysql_defaults.cnf* file.
2. Open a command prompt window and run the database creation script:
   - Windows: *%NAA_HOME%\naa-server\bin\create_reporting_db.bat*
   - Linux: *$NAA_HOME/naa-server/bin/create_reporting_db.sh*

SQL Server reporting database

For SQL Server database, open a command prompt window and run the database creation script:

```
> %NAA_HOME%\naa-server\bin\create_reporting_db_sql_win.bat
```

Agent tables

There are three agent tables: NAA_LOGIN, NAA_LOGOUT, and NAA_LOGIN_SKILL.

NAA_LOGIN and NAA_LOGOUT measure the time that different agents spend on the system by tracking login and logout times:

```
CREATE TABLE NAA_LOGIN
(
    ID                    INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    USERNAME              VARCHAR(128) NOT NULL,
    DOMAIN_ID             INTEGER NOT NULL DEFAULT 0,
    DOMAIN                VARCHAR(32),
    AGENT_LOGIN_TIME_GMT  TIMESTAMP,
    HOST                  VARCHAR(64)
);
CREATE TABLE NAA_LOGOUT
(
```

```
    ID                      INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    LOGIN_ID                INTEGER NOT NULL,
    AGENT_LOGOUT_TIME_GMT   TIMESTAMP,
    INDEX (LOGIN_ID)
);
```

The NAA_LOGIN_SKILL table filters agents by skills:

```
CREATE TABLE NAA_LOGIN_SKILL
(
    ID                INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    LOGIN_ID          INTEGER NOT NULL,
    SKILL_ID          INTEGER NOT NULL
    INDEX (LOGIN_ID)
);
```

Interaction tables

These tables track interactions:

```
CREATE TABLE NAA_INTERACTION
(
    ID                      INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    SESSION_ID              VARCHAR(128) NOT NULL,
    INTERACTION_INDEX       INTEGER NOT NULL,
    DOMAIN_ID               INTEGER NOT NULL DEFAULT 0,
    PLATFORM_SESSION_ID     VARCHAR(64),
    ORGANIZATION_ID         VARCHAR(32),
    APPLICATION_ID          VARCHAR(32),
    CONTEXT_NAME            VARCHAR(32),
    START_TIME_GMT          TIMESTAMP,
    HOST                    VARCHAR(64),
    ANI                     VARCHAR(128),
    DNIS                    VARCHAR(128),
    INTERACTION_ENCRYPTION_ID  INTEGER
    APC                     TINYINT(1) NOT NULL DEFAULT 0
);

CREATE TABLE NAA_INTERACTION_INPUT
(
    ID                      INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    INTERACTION_ID          INTEGER NOT NULL,
    TEXT                    VARCHAR(1024),
    UTTERANCE_URL           VARCHAR(1024),
    INDEX (INTERACTION_ID)
);

CREATE TABLE NAA_INTERACTION_OUTCOME
(
    ID                      INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    INTERACTION_ID          INTEGER NOT NULL,
    END_TIME_GMT            TIMESTAMP,
    DISPOSITION             VARCHAR(32),
    AUDIO_DURATION          INTEGER,
```

```
    ASR_CONFIDENCE          FLOAT,
    ASR_OUTCOME             VARCHAR(2048),
    INDEX(INTERACTION_ID)
);
```

The DISPOSITION field in NAA_INTERACTION_OUTCOME takes these values:

NOT_ESCALATED	Interaction not escalated to agent.
NO_AGENT_AVAILABLE	No agents available to handle the interaction.
USER_CANCELLED	User navigated away or hung up before interaction completed.
AGENT_ASSIGNED	Interaction escalated to an agent.

```
CREATE TABLE NAA_INTERACTION_ENCRYPTION
(
    ID                       INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    ENCRYPTION_KEY_TAG       VARCHAR(128),
    ENCRYPTION_SECRET_KEY    VARCHAR(256)
);

CREATE TABLE NAA_INTERACTION_SKILL
(
    ID                      INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    INTERACTION_ID          INTEGER NOT NULL,
    SKILL_ID                INTEGER NOT NULL,
    INDEX(INTERACTION_ID)
);

CREATE TABLE NAA_ESCALATION
(
    ID                      INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    INTERACTION_ID          INTEGER NOT NULL,
    LOGIN_ID                INTEGER NOT NULL,
    AGENT_START_TIME_GMT    TIMESTAMP,
    AGENT_END_TIME_GMT      TIMESTAMP,
    DISPOSITION             VARCHAR(32),
    INTENT_NAME             VARCHAR(32),
    INTENT_VALUE            VARCHAR(32),
    ESCALATION_OUTCOME_ID   INTEGER
    INDEX(LOGIN_ID)
);
```

The DISPOSITION field in NAA_ESCALATION takes these values:

AGENT_TIMEOUT	Agent was notified but did not submit an outcome before the timeout elapsed.
AGENT_SUCCESS	Agent selected an intent.
USER_CANCELLED	User navigated away or hung up before interaction completed.
AGENT_IN_PROGRESS	Written to the field while the call is taking place, but not after it is completed.

You can use the columns from these tables to calculate the time until an agent answered a request, and the total time required for the agent to handle the request:

- Time until agent answered = AGENT_START_TIME_GMT - START_TIME_GMT
- Time for agent interaction = AGENT_END_TIME_GMT - AGENT_START_TIME_GMT

```
CREATE TABLE NAA_ESCALATION_OUTCOME
(
    ID                  INTEGER NOT NULL AUTO_INCREMENT PRIMARY KEY,
    OUTCOME             VARCHAR(1024)
);
```

Setting database parameters

If using the Automation Assist tool, you must ensure it connects to the configuration database (and optionally to the reporting database).

- You might need to add database parameters in *application.properties*.
- If you change the default database password, you need to provide the new encrypted value.

Encrypting the database password

The default database password is *Changeit1* (MySQL) or *changeit* (SQL Server) and these are already encrypted.

To change the password, change to *$NAA_HOME/naa-server/bin* and run the encrypt tool providing your new password:

```
> naaencrypt new_password
```

The tool returns the encrypted value which you use in setting other database parameters.

Setting configuration database parameters

Automation Assist gets its default configuration from *$NAA_HOME/naa-server/config/application.properties*, which you create from *application.properties.sample.*

- For MySQL, you can accept the defaults (by taking no action). Optionally, you can change values in the configuration file.
- For SQL Server, you *must* update all database parameters in *application.properties*. (The settings in *application.properties.sample* are examples.)

Required parameters:

```
ds.url
ds.username
ds.password
ds.driver (for SQL Server only)
```

Setting reporting database parameters

If using the optional reporting database, you must update the *$NAA_HOME/naa-server/config/application.properties* file.

- For MySQL, you can accept the defaults (by taking no action). Optionally, you can change values in the configuration file.
- For SQL Server, you *must* update all database parameters in *application.properties*. (The settings in *application.properties.sample* are examples.)

Required parameters:

```
reporting.enabled=true (must be true to use the reporting database)
reporting.ds.url
reporting.ds.username
reporting.ds.password
reporting.ds.driver
```

Configuring Automation Assist for secure connections

If using the Automation Assist tool, you must configure secure connections via Transport Layer Security (TLS).

- Server authentication is required.
- Peer-to-peer authentication is optional.

Note: You can use self-signed keys for testing purposes, but not for production environments. These keys are not secure.

Setting up server authentication

Secure connections use server authentication based on an RSA key that has been signed by a recognized Certificate Authority (CA). Server authentication is required as Automation Assist expects the key and certificate be packaged in a keystore file, an encrypted and password-protected file holding the keys and certificates required for secure connections.

At runtime, when Automation Assist receives a secure request, it presents this keystore to identify itself. This keystore is also used by the Automation Assist web pages when an agent or administrator accesses the web page using HTTPS.

The procedure for creating a keystore file and configuring Automation Assist for secure connections is the same on Windows and Linux, with slightly different commands.

1. Obtain a keystore file containing a private key and certificate. Consult your Certificate Authority for details in creating the keys and certificates. The language-neutral keystore format, JKCS #12, is recommended. Make sure you know the password to the keystore. In this scenario, the file is named *naa1_keystore.ks*. For example, this is the initial command using the Java keytool utility:

   ```
   > keytool -keystore naa1_keystore.ks -alias naa -genkey -keyalg RSA -storetype
   pkcs12
   ```

2. After having the certificate signed by your CA, add the signed certificate to your keystore, then copy the keystore into a directory for secure files. A recommended location is:

   $NUANCE_DATA_DIR/system/private/naa1_keystore.ks

3. Change permissions on the keystore to ensure it is only readable by the nuance user or local system account. For example, on Linux:

   ```
   > chown nuance.nuance $NUANCE_DATA_DIR/system/private/naa1_keystore.ks
   > chmod 600 $NUANCE_DATA_DIR/system/private/naa1_keystore.ks
   ```

4. Encrypt the keystore password using the *naaencrypt* utility available in *$NAA_HOME/naa-server/bin*. For example, if your keystore password is changeit:

   ```
   > naaencrypt changeit
   Encrypted password is 96683827eedcccd29fabf68105f55a2f
   ```

5. Enter the keystore location and password in the Automation Assist config file, *$NAA_HOME/naa-server/config/application.properties*. For example:

   ```
   jetty.https.keystore=path/naa1_keystore.ks
   jetty.https.password=96683827eedcccd29fabf68105f55a2f
   ```

   The *path* is *$NUANCE_DATA_DIR/system/private*. For example:

   - Linux: */var/local/Nuance/system/private/naa1_keystore.ks*
   - Windows: *C:/ProgramData/Nuance /Enterprise/system/private/naa1_keystore.ks*. Use forward slashes in the config file for both Linux and Windows.

Setting up peer authentication

You may also optionally enable two-way peer (or client) authentication for Automation Assist's communication with Speech Server.

In server authentication described above, Automation Assist presents its server certificate to clients who request it. In peer authentication, both servers and clients request and present their certificates to each other. Each entity has a keystore containing its own certified identification, plus a truststore containing the certificates of entities it trusts and will work with.

Peer authentication with Speech Server

In peer authentication, Speech Server first requests Automation Assist's certificate, then Automation Assist requests Speech Server's certificate, in a mutual validation process. To configure Automation Assist for peer authentication with Speech Server, you add Speech Server's certificate to Automation Assist's truststore. The steps are the same on Windows and Linux, with the usual differences in directory structure.

1. Obtain the Speech Server certificate. (See Converting files for Speech Server on the next page.) In this scenario, the file is named *nss_cert.cer*.
2. Add the Speech Server certificate to the Automation Assist truststore. The truststore is the list of certificates that Automation Assist will accept when receiving requests from clients such as Speech Server. The truststore created in this example is named *naa_truststore.ks*. If the file already exists, the certificate is added to it.

   ```
   > keytool -import -keystore naa_truststore.ks -file nss_cert.cer -alias nss
   ```

3. Copy the truststore into the Automation Assist directory for secure files, for example:

   $NUANCE_DATA_DIR/system/private/naa_truststore.ks

4. Encrypt the password of the truststore (by default changeit) using the *naaencrypt* utility:

   ```
   > naaencrypt changeit

   96683827eedcccd29fabf68105f55a2f
   ```

5. Add these truststore parameters to the Automation Assist config file, *$NAA_HOME/naa-server/config/application.properties*:

```
jetty.https.truststore-password=96683827eedcccd29fabf68105f55a2f
jetty.https.truststore-location=path/naa_truststore.ks
jetty.https.want-client-auth=true
```

The *path* is *$NUANCE_DATA_DIR/system/private*, for example:

- Linux: */var/local/Nuance/system/private/naa_truststore.ks*
- Windows: *C:/ProgramData/Nuance /Enterprise/system/private/naa_truststore.ks*. Use forward slashes in the config file for both Linux and Windows.

Converting files for Speech Server

Automation Assist uses keystore files to hold private keys and certificates, but Speech Server requires individual key and certificate files in PEM format. (The reason for the difference is that Speech Server is not a Java program so cannot use the Java-specific keystore files.) You may use the Java keytool utility and OpenSSL to convert and extract the required files for each product.

1. Generate a keystore file for Speech Server using the PKCS #12 format. This format is recommended as it works with both Java and non-Java programs. In this scenario, the keystore is named *nss_keystore.ks*. For example, this is the first step in creating the keystore:

   ```
   > keytool -keystore nss_keystore.ks -alias nss -genkeypair -keyalg RSA -storetype
   pkcs12
   ```

2. After having the certificate signed by a CA, extract the certificate from the keystore, naming it *nss_cert.cer* to identify it as the Speech Server certificate. This is the file that Automation Assist adds to its truststore in Peer authentication with Speech Server on the previous page.

   ```
   > keytool -export -keystore nss_keystore.ks -alias nss -file nss_cert.cer
   -storepass changeit
   ```

3. From the same Speech Server keystore, *nss_keystore.ks*, extract the individual key and certificate files in PEM format. These are the files that Speech Server needs on its own machine. This process uses OpenSSL to convert the keystore to a PEM file and extract the individual files.

   ```
   > openssl pkcs12 -in nss_keystore.ks  -out nss_keystore.pem
   > openssl pkey   -in nss_keystore.pem -out nss-key.pem
   > openssl x509   -in nss_keystore.pem -out nss-cert.pem
   ```

4. Copy the resulting PEM files to the Speech Server directory for secure files, for example:

   $NSSSRVSDK/certs/nss-key.pem and *nss-cert.pem*

5. Next obtain the Automation Assist certificate so Speech Server can validate Automation Assist's certificate when presented at runtime. Again use OpenSSL to convert from keystore to PEM.

   ```
   > openssl pkcs12 -in naa1_keystore.ks  -out naa1_keystore.pem
   > openssl x509   -in naa1_keystore.pem -out naa1-cert.pem
   ```

6. Append the Automation Assist certificate to the Speech Server truststore, an existing file named *cert.pem* in the Speech Server directory, *$NSSSRVSDK/certs*:

   ```
   > cat path/naa1-cert.pem >> $NSSSRVSDK/certs/cert.pem
   ```

   The *path* is the directory location of the *naa1_cert.pem* file.

7. Update the Speech Server config file, *$NSSSRVSKD/config/NSSserver.cfg*, with the location of the

PEM files. Use $(NSSSVRSDK) and forward slashes in the config file for both Linux and Windows.

```
server.tls.certificateFile    VXIString   $(NSSSVRSDK)/certs/nss-cert.pem
server.tls.privateKeyFile     VXIString   $(NSSSVRSDK)/certs/nss-key.pem
server.tls.caCertificatesFile VXIString   $(NSSSVRSDK)/certs/cert.pem
server.inet.tls.verify        VXIInteger  1
```

Integrating Automation Assist with Management Station

If using the Automation Assist tool and Management Station, you must do the following:

- Decide which the hosts to run Automation Assist and how other hosts interact with it.
- Use Management Station to assign roles to the those hosts. You must assign a role that includes "NAA" to each host that runs Automation Assist. Roles contain services in predefined configurations that make setting up and configuring a network much simpler, and there are several roles containing NAA. These include a role that runs everything on one host (all-in-one), a role that runs only NAA (dedicated NAA host), and roles that run NAA with different combinations of other Speech Suite services like recognition, TTS, and so on.

Assign the roles that support the recognition technology allowed by your license and platform: either Krypton (and associated services) or NRS.

- For testing and small deployments, assign the all-in-one role. No other configuration is needed. Speech Server is enabled to send audio and recognition results to Automation Assist.
- For production, assign roles to hosts to run services in a distributed environment. Typically, this means creating an Automation Assist host with other hosts running the other services. For a dedicated host, assign the role that runs only NAA, FTS, SC. (There are other roles that run NAA with a combination of services, allowing you to run more than just NAA on these hosts).

  Configure other hosts as needed using the provided roles. Because Krypton is memory and CPU-intensive, there are roles to create dedicated Krypton hosts in different port densities.

Upgrading Speech Suite software

To upgrade Speech Suite software, run the Speech Suite installer on each host in one of the following ways:

- Standard upgrade: Use the installer interface to perform a manual upgrade.
- Silent upgrade: Use the command line to configure a silent upgrade. For example, to use a script.

You do not need to stop or restart services. The installer does this automatically during the upgrade. The installer does not upgrade data packs. To install new data packs, see Managing data packs on page 77.

Note: Schedule the upgrade to run during a time when system use is low to minimize potential impact on callers. Nuance recommends that you upgrade clusters in a single maintenance window, if possible. Otherwise, schedule your maintenance window so that you have enough time to upgrade an entire cluster during each window.

Standard upgrade

On Linux

To upgrade Speech Suite software on Linux:

1. Review the prerequisites before starting. See Preparing for upgrades on page 95.
2. Log on to the host as root.
3. Ensure the correct ownership of any existing log files. See Changing ownership of Management Station logs on page 96.
4. Change to the directory containing the Speech Suite installation package and extract the package.

   Note: If you are upgrading Nuance products on multiple hosts, you can extract the package to a network location that other hosts can access.
5. Change to the *Nuance_Speech_Suite-`version`* directory.
6. Enter `> ./setup.sh` and follow the on-screen instructions.

   The upgrade is similar to a fresh install. See Running the Speech Suite installer on Linux on page 43. To summarize:

   - Ensure your license is valid.
   - Verify the paths to the 64-bit Java JDK or JRE location.
   - Specify the location of the License Manager host and, if used, Management Station database host.
   - Confirm you have a supported version of Apache Tomcat installed and specify its location.
   - Verify the location of the Connector/J.
   - Provide the information for the Management Station database, if used. Management Station reuses the *`mserver`* and audit (if created) databases, but you are required to re-enter the database information to keep audit logging enabled.
     The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33.

     Note: For MySQL, your password policy might require a secure password for the Speech Suite installation to complete successfully. If you are using Management Station and the MySQL user account password changes after installing Speech Suite, you need to update Management Station with the new password. See the online documentation.
   - Specify the location of the Recognizer language pack, Vocalizer voice pack, or Dragon Voice data pack you want to install. If any of these are already installed, you do not need to re-install them.
7. Repeat for the remaining hosts.
8. Log in to Management Station and check that configured services started successfully. Skip this topic if not using Management Station, and see "Configuring and starting services without Management Station" in the online documentation instead.

   Note: If you upgraded from a Speech Suite version earlier than 11.0.3 and you are using Management Station with the Dragon Voice engines, you must reassign the role files to apply new commands for the Watcher service. See Upgrading to Speech Suite 11.0.3 or greater on page 93.

On Windows

To upgrade Speech Suite software on Windows:

1. Review the prerequisites before starting. See Preparing for upgrades on page 95
2. Log on to the host as a user with administrator privileges.
3. Change to the directory containing the Speech Suite installation package and extract the package.

   Note: If you are upgrading Nuance products on multiple hosts, you can extract the package to a network location that other hosts can access.
4. Run the Speech Suite installer (.exe) as Administrator from the directory where you extracted the file.
5. Follow the on-screen instructions.

   The upgrade is similar to a fresh install. See Running the Speech Suite installer on Windows on page 50. To summarize:

   - Ensure your license is valid.
   - Verify the paths to the 64-bit Java JDK or JRE location.
   - Select the database type (MySQL or SQL Server) for Management Station and specify the database host information.
   - Confirm you have a supported version of Apache Tomcat installed and specify its location.
   - Verify the location of the Connector/J.
   - Provide the information for the Management Station database, if used. Management Station reuses the `mserver` and audit (if created) databases, but you are required to re-enter the database information to keep audit logging enabled.
     The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33 or Create a SQL Server user account on page 39.

     Note: For MySQL, your password policy might require a secure password for the Speech Suite installation to complete successfully. If you are using Management Station and the MySQL user account password changes after installing Speech Suite, you need to update Management Station with the new password. See the online documentation.
   - Specify the location of the Recognizer language pack, Vocalizer voice pack, or Dragon Voice data pack you want to install. If any of these are already installed, you do not need to re-install them.
   - Verify the location of the Connector/C, which Management Station requires to receive statistics from the Nuance speech software.
6. Repeat for the remaining hosts.
7. Log in to Management Station and check that configured services started successfully. Skip this topic if not using Management Station, and see "Configuring and starting services without Management Station" in the online documentation instead.

   Note: If you upgraded from a Speech Suite version earlier than 11.0.3 and you are using Management Station with the Dragon Voice engines, you must reassign the role files to apply new commands for the Watcher service. See Upgrading to Speech Suite 11.0.3 or greater on page 93.

Silent upgrade

Review the prerequisites before starting. See Preparing for upgrades on page 95.

For descriptions of the required options, see Running silent installations on Linux on page 46 or Running silent installations on Windows on page 54.

Note: If the syntax contains errors, such as incorrect format or invalid values, the installation might switch from silent to standard or not complete successfully.

On Linux

You use the `-s` option with these required options: -U (upgrade) -f (license), -c (Connector/J), -j (Java), -o (Tomcat), and -V (root location of language, voice, and data packs), -H (database host:port pair), -Q (MySQL user), -W (MySQL password), -G (database name). For example:

```
> ./setup.sh -s -U -f "Nuance license location" -c "MySQL Connector/J location" -j
"/usr/java/JDK or JRE version" -o "Tomcat location" -V "language and voice location" -
H "MySQLHost:3306" -Q "ms" -W "msp" -G "mserver"
```

To keep audit logging enabled, these options are also required: -A (database name), -B (database username), -S (database password). For example:

```
-A mserver_audit -B ms -S MyPass123!
```

Note: The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33. If the password contains $, type \ before each one to escape them. For example, you type password MyPa$$123$ as MyPa\$\$123\$

If running Speech Suite components on different hosts, instead of running all components on the same host (the default), the -I option is required. For example, to upgrade Nuance speech software (NSS), such as Vocalizer and Recognizer, only:

```
> ./setup.sh -s -U -f "Nuance license location" -j "/usr/java/version" -V "language
and voice location" -I "NSS"
```

Note: If you upgraded from a Speech Suite version earlier than 11.0.3 and you are using Management Station with the Dragon Voice engines, you must reassign the role files to apply new commands for the Watcher service. See Upgrading to Speech Suite 11.0.3 or greater on the facing page.

On Windows

Note: The use (or lack) of spaces in the examples is intentional.

You use the `/silent` option with these required options: LICENSE=, TOMCAT_HOME=, JAVA_HOME=, CONNECTORJ=, CONNECTORC=, MSSQL_INSTANCE=, MS_DBTYPE=, MS_DBSERVICE=, MS_DBHOST=, MS_DBPORT=, MS_DBSCHEMA=, MS_DBUSER=, MS_DBPASS=, and SUPPLEMENTSPATH= . For example (using a SQL Server database):

```
> "C:\tmp\downloads\Nuance Speech Suite 11.0.exe"
/debuglog"C:\tmp\downloads\install.log" /log"C:\tmp\downloads" /silent LICENSE="Nuance
license location" TOMCAT_HOME="Tomcat location" JAVA_HOME="C:\Program
Files\Java\version" CONNECTORJ="Connector/J location" CONNECTORC="C:\Program
Files\MySQL\MySQL Connector.C\lib\libmysql.dll" MSSQL_INSTANCE=MSSQLSERVER MS_
DBTYPE=sqlserver MS_DBSERVICE=sqlserver MS_DBHOST=SQLServerHost MS_DBPORT=1433 MS_
DBSCHEMA=mserver MS_DBUSER=ms MS_DBPASS=msp SUPPLEMENTSPATH="language and voice
location"
```

To keep audit logging enabled, these options are also required: MS_AUDITDB_ENABLED=, MS_AUDITDB_NAME=, MS_AUDITDB_USER=, MS_AUDITDB_PASS=. For example:

```
MS_AUDITDB_ENABLED=TRUE MS_AUDITDB_NAME=mserver_audit MS_AUDITDB_USER=ms MS_AUDITDB_
PASS=msp
```

Note: The Management Station installation has character restrictions for database passwords. See the list of unsupported characters in Create a MySQL user account on page 33 or Create a SQL Server user account on page 39. If the password contains the following characters, type ^ before each one to escape them: ^ & < >. For example, you type password My<Pass>123^ as My^<Pass^>123^^

If running Speech Suite components on different hosts, instead of running all components on the same host (the default), the ISFeatureInstall= option is required. For example, to upgrade Nuance speech software (NSS), such as Vocalizer and Recognizer, only:

```
> "C:\tmp\downloads\Nuance Speech Suite 11.0.exe"
/debuglog"C:\tmp\downloads\install.log" /log"C:\tmp\downloads" /silent LICENSE="Nuance
license location" JAVA_HOME="C:\Program Files\Java\JDK or JRE version"
SUPPLEMENTSPATH="language and voice location" ISFeatureInstall="NSS"
```

If you are running a silent installation or upgrade in a script file, prefix the call to the installation or upgrade command with `start "" /wait`. The prefix ensures that the command completes before returning execution back to the script. For example:

```
> start "" /wait "C:\tmp\downloads\Nuance Speech Suiteversion.exe" rest of command...
```

Note: If you upgraded from a Speech Suite version earlier than 11.0.3 and you are using Management Station with the Dragon Voice engines, you must reassign the role files to apply new commands for the Watcher service. See Upgrading to Speech Suite 11.0.3 or greater below.

Upgrading to Speech Suite 11.0.3 or greater

Speech Suite 11.0.3 adds new commands for the Watcher service. To apply the new commands, after upgrading Speech Suite, you need to reassign all role files that contain Nuance Resource Manager, Krypton, Natural Language Engine, or Nuance Text Processing Engine services. If you are using the default role files, you can unassign and then reassign them. For instructions, see the online documentation.

Before reassigning custom role files, which are modified default files, do the following to update each file with the new commands:

1. Log in to Management Station.
2. Select Monitoring & Control > System View.
3. Expand Nuance Network to display the hosts.
4. Select a host that uses a custom role file and then click Network Design.
5. Click Save Host Role to save the current host configuration as a role file. This step ensures that the custom role file you update contains the current settings.
6. Enter a name for the host role file and click OK. Management Station saves the file to *$NUANCE_DATA_DIR/system/customRoles*

   Note: The name you enter only appears in Management Station. The actual role file is XML and the filename is the hostname with timestamp when you saved the file.
7. Log in to the Management Station host as root (Linux) or Administrator (Windows).
8. Locate your custom role file: *$NUANCE_DATA_DIR/system/customRoles*
9. Locate the new role file that contains the same services as your custom role file: *$MSTATION_HOME/mserver/webapps/mserver/config/roles*
10. Open your custom role file and the new role file in separate text editor windows to compare their contents.

11. Locate the <command> element for a service in a new role file. For example:

```
<service type="nle">
...
            <command>
                -envsetLinux   LD_LIBRARY_PATH=%MEE_HOME%/bin%CP_DELIM%%MEE_
HOME%/bin/NR%CP_DELIM%%LD_LIBRARY_PATH%
                               SWISRSDK=%MEE_HOME%
                               DiagFileName=%NUANCE_DATA_
DIR%/system/diagnosticLogs/nmee.log
                               DiagTagMapsPlatform=%MEE_
HOME%/config/defaultTagmap.txt
                -envsetWindows PATH=%MEE_HOME%\bin%CP_DELIM%%MEE_HOME%\bin\NR%CP_
DELIM%%PATH%
                               SWISRSDK=%MEE_HOME%
                               DiagFileName=%NUANCE_DATA_
DIR%\system\diagnosticLogs\nmee.log
                               DiagTagMapsPlatform=%MEE_
HOME%\config\defaultTagmap.txt
                -pa %JAVA_HOME%/bin/java
                -Xms4096m
                -Xmx4096m
                -XX:+DisableExplicitGC
                -Djava.library.path=%NLE_HOME%/native%CP_DELIM%%MEE_HOME%/bin%CP_
DELIM%%MEE_HOME%/bin/NR%CP_DELIM%%NUANCE%/amd64/lib%CP_DELIM%%NUANCE_OAM64%
                -Dfile.encoding=UTF-8
                -
Djasypt.encryptor.password=f5a6dd40341ca5b7c1f44b3f07e9a7d38074cd0e
                -
Djavax.xml.parsers.DocumentBuilderFactory=com.sun.org.apache.xerces.internal.jaxp.D
ocumentBuilderFactoryImpl
                -jar %NLE_HOME%/lib/nle-service.jar
                --logging.config=%NLE_HOME%/config/log4j2.yaml
            </command>

...
</service>
```

12. Replace the entire contents of the <command> elements, including the <command> elements, in your custom role file with the <command> elements for the same service in the new role file.
13. Save your custom role file.
14. Repeat all steps to update other custom role files.

    Note: If you have custom role files not currently assigned to a host, make sure you update those as well in case you do assign them in the future.

15. Reassign your custom role file to the host. See the online documentation.

Troubleshooting: services fail to start

You must run ZooKeeper before starting the Nuance Resource Manager and Dragon Voice engines. Otherwise, Management Station displays alarms as Dragon Voice engines attempt to register. If services still do not start, reboot the host, which restarts the services, and make sure that ZooKeeper is running. On

Linux hosts, you might notice that some services fail to start, appear twice, or appear under the wrong host. You can modify the *etc/hosts* file for a host experiencing these problems.

You must install at least one language pack for Nuance Recognizer, a voice pack for Nuance Vocalizer, and a data pack for the Krypton engine. If you did not install languages/voices/data packs during the installation process, you can download, extract, and install them now.

Note: If you're installing your first data pack after having installed Speech Suite, you must first stop the watcher service on the host (Krypton and NTpE); otherwise, the system may not be able later to locate the newly installed data pack. For instructions on manually starting and stopping services, see the online documentation.

If using Nuance Automation Assist and the Natural Language Engine, you must enable unlimited cryptography. See Configure Java security on page 29.

You must set full permissions on directories where logs are written to disk. Otherwise, services fail to start because they can't begin logging. Set permissions on the *NUANCE_DATA_DIR* directory, the parent location for all logging.

Windows

To check the permissions:

1. Open Explorer.
2. Right-click the *%NUANCE_DATA_DIR%* directory and select Properties.
3. Select the Security tab.

   The Name box must contain one of either "Everyone" or "SYSTEM" with full permissions (all Allow boxes must be checked).
4. If either of these names aren't named, then click Add.
5. Choose Entire Directory for the Look In: field.
6. Add either of these names and click OK.

Linux

To check the permissions, log in as root and set full permissions on *$NUANCE_DATA_DIR;* by default, *var/local/Nuance*. For example:

```
> chmod -R 755 NUANCE_DATA_DIR
```

It's important that only the root user have full permission to avoid allowing other users to modify files.

Preparing for upgrades

Review this list before upgrading the Speech Suite software:

- Get a license for the new Speech Suite version. See Get a license file on page 30.
- Check the prerequisite third-party software and update as needed. See Install third-party software on page 26.
- Download the Speech Suite installation packages. See Downloading installation packages for Linux on page 42 or Downloading installation packages for Windows on page 49.

- If you are using Management Station:
  - Back up the *mserver* database. See Backing up the database.
  - During the upgrade, your previous password and password-security settings are preserved.
  - On Linux, the upgrade for some versions requires changing ownership of all Management Station logs. See Changing ownership of Management Station logs below.
  - If using a MySQL database, check whether the hostname for the MySQL user account has changed since last installing Speech Suite. You might need to update the credentials for the user account. See Create a MySQL user account on page 33.
  - If you upgraded MySQL on Linux, the Connector/C library file, which Speech Server requires for statistics collection, might have moved to a different directory. Create a symbolic link to the file to ensure Speech Server can locate it. See Install the MySQL Connector/C on page 34.

Changing ownership of Management Station logs

If upgrading Management Station from Speech Suite 11.0.2 (or earlier) on Linux, you must change the owner of the log directories to user "nuance". (Changing ownership is not needed when upgrading from Speech Suite 11.0.3.)

1. Log in to the Management Station host as root.
2. Stop the Management Station services: Nuance Management Station, Nuance Management Station Data Collection, Nuance Management Station Stats Analyzer.
3. Run this command to enable write permissions on the Apache Tomcat logs directory:

   ```
   > chmod -R o+rX Tomcat_location
   ```

   where, *Tomcat_location* is the path to your Tomcat directory.
4. Enable write permissions on the Tomcat logs directory:

   ```
   > chmod -R 777 Tomcat_location/logs
   ```
5. Run these commands to change the owner of each log directory to user "nuance":

   ```
   > chown -R nuance:nuance $NUANCE_DATA_DIR/system/diagnosticLogs/*
   > chown nuance:nuance $MSTATION_HOME/mserver/logs/*
   > chown nuance:nuance $MSTATION_HOME/mserverdc/logs/*
   > chown nuance:nuance $MSTATION_HOME/mserversa/logs/*
   > chown -R nuance:nuance $NUANCE_DATA_DIR/system/work
   ```
6. Start the Management Station services.

Removing Speech Suite

When you removing Speech Suite from a host, you remove all installed components, including the language, voice, and data packs. Before removing, you might want to back up user configurations for specific Speech Suite host so you can reuse them after re-installing Speech Suite elsewhere. See the online documentation.

Item	Description
Nuance Speech Suite	Removes Speech Suite from the host including all installed features.

Item	Description
MySQL	Leaves MySQL components intact.
SQL Server	Leaves SQL Server components intact.
Management Station	Saves the current Management Station login usernames and passwords. Also saves the *mserver* and audit database (if created). • *mserver* stores data about call logs, alarms, performance statistics, billing usage, capacity monitoring, and so on collected from Nuance hosts and services. • audit database stores user actions on Management Station. When re-installing Speech Suite, it can reuse the data in these MySQL tables.

On Linux

To remove Speech Suite on Linux:

1. Log on to the host as root and change to */usr/local/Nuance/Speech_Suite/setup*.
2. Enter `nuance-speech-suite -R`

   If this command is not available, change to the installation directory (*Nuance-Speech-Suite-`version`*) and run:

   ```
   > ./setup.sh -R
   ```
3. Follow the on-screen prompts.

On Windows

Administrators (and users with administrator privileges) have these options for removing Speech Suite on Windows:

- Select Nuance Speech Suite in the Windows Control Panel and select Remove to remove the entire suite. Selecting an individual product removes only the selected product.
  - In Add/Remove Programs you see not only "Nuance Speech Suite", but entries for individual components such as License Manager or Management Station. If you uninstall a specific component, you cannot re-install it, unless you re-install the entire Speech Suite.
  - When installing Speech Suite, if you do not select all components, you cannot re-run the installer and add them later. Again, you would need to uninstall and then re-install Speech Suite to change the set of installed components.
- Run the Nuance Speech Suite installer that is the same version, or newer, as the installed suite and select Remove.
- Run this command in a command prompt to launch the Nuance Speech Suite installer and select Remove:

  ```
  > "Nuance Speech Suite version.exe" /remove
  ```
  - Run this command to remove Speech Suite silently, without any prompts:

    ```
    > start "" /wait "C:\Program Files (x86)\InstallShield Installation Information\
    {BE8C03C9-A24D-4A76-BF49-D864B3EB1291}\NuanceSpeech Suite version.exe" /silent
    /remove /runfromtemp /clone_wait
    ```

Reference: Troubleshooting the Management Station display

This topic is about a potential problem with the Management Station interface where the display of charts is confused by missing fonts. It's relevant when you install the following software on a host:

- Management Station
- OpenJDK
- CentOS

Management Station requires default fonts (from the operating system) to render charts for various report in the GUI. If the fonts are missing, the display is unreadable or shows signs of corruption.

This procedure detects the problem:

1. Install fontconfig:

   ```
   yum install fontconfig
   ```

2. Detect the installed fonts:

   ```
   fc-list
   ```

   If there's no list, there are no fonts installed.

The Management Station installation includes a font package to remedy this problem. Follow this procedure:

1. Enter these commands:

   ```
   cp $MSTATION_HOME/mserver/webapps/mserver/fonts/mstation-default-fonts.tar.gz
   /usr/share/fonts/.
   cd /usr/share/fonts/
   gunzip /mstation-default-fonts.tar.gz
   tar xvf mstation-default-fonts.tar
   rm -rf mstation-default-fonts.tar.gz
   ```

2. Detect the newly installed fonts:

   fc-list

   The command should return a list similar to this:

   ```
   Liberation Sans:style=Regular
   Liberation Sans:style=Bold
   Liberation Sans:style=Bold Italic
   Liberation Sans:style=Italic
   ```

Reference: Displaying version information

The installation provides a command-line utility that displays information about installed components. For example, you can see what language is installed and the versions for installed Nuance products and third-party components.

To use, open a command-prompt window and type: `nuance-version -p`. The help screen displays the list of command-line options.

Reference: Environment variables

This topic lists the main environment variables.

Nuance Recognizer

The Nuance Recognizer installation sets the following variable:

Parameter	Default	Description
SWISRSDK	• Linux: /usr/local/Nuance/Recognizer • Windows: C:\Program Files\Nuance\Recognizer	Environment variable pointing to the Recognizer's installation directory.

Nuance Speech Server

The Nuance Speech Server installation sets the following environment variable:

Variable	Default	Description
NSSSVRSDK	• Linux: */usr/local/Nuance/Speech_Server/server* • Windows: *C:\Program Files\Nuance\Speech Server\server*	Installation directory.

Nuance Vocalizer

The Vocalizer installation sets the following environment variable:

Variable	Default	Description
VOCALIZER_SDK	• Linux: */usr/local/Nuance/Vocalizer_for_Enterprise* • Windows: *C:\Program Files\Nuance\Vocalizer for Enterprise*	Installation directory for Vocalizer for Enterprise.

Natural Language Processing service

The NLP service installation sets the following environment variable:

Variable	Default	Description
NLPS_HOME	• Linux: */usr/local/Nuance/nlps* • Windows: *C:\Program Files\Nuance\nlps*	Installation directory.

Krypton recognition engine

The Krypton engine installation sets the following environment variables:

Variable	Default	Description
KR_HOME	• Linux: */usr/local/Nuance/Krypton* • Windows: *C:\Program Files\Nuance\Krypton*	Installation directory.
KR_DATA_DIR	• Linux: */var/local/Nuance/Krypton* • Windows: *C:\ProgramData\Nuance\Krypton*	Directory for storing log and configuration files, SSL certificates, keys, and so on.

Natural Language Engine

The Natural Language Engine installation sets the following environment variables:

Variable	Default	Description
NLE_HOME	• Linux: */usr/local/Nuance/Natural_Language_Engine* • Windows: *C:\Program Files\Nuance\Natural_Language_Engine*	Installation directory.
MEE_HOME	• Linux: */usr/local/Nuance/Meaning_Extraction_Engine* • Windows: *C:\Program Files\Nuance\Meaning_Extraction_Engine*	Installation directory for the Nuance Meaning Extraction Engine, a component of NLE that extracts meaning from text.

Nuance Text Processing Engine

The Nuance Text Processing Engine installation sets the following environment variable:

Variable	Default	Description
TEXTPROC_HOME	• Linux: */usr/local/Nuance/text_proc* • Windows: *C:\Program Files\Nuance\Text Processing Engine*	Installation directory.

Nuance Resource Manager

The Nuance Resource Manager installation sets the following environment variables:

Variable	Default	Description
NRM_HOME	• Linux: */usr/local/Nuance/nrm* • Windows: *C:\Program Files\Nuance\nrm*	Installation directory.

Variable	Default	Description
NRM_DATA_DIR	• Linux: */var/local/Nuance/nrm* • Windows: *C:\ProgramData\Nuance\nrm*	Directory for storing log and configuration files, SSL certificates, and so on.

Nuance Automation Assist

The Nuance Automation Assist installation sets the following environment variable:

Variable	Default	Description
NAA_HOME	• Linux: */var/local/Nuance/naa* • Windows: *C:\Program Files\Nuance\Automation Assist*	Installation directory.

Logs

The system stores call logs, diagnostic logs, and various data files under a base directory (*NUANCE_DATA_DIR*), and sets the environment variable to *C:\ProgramData\Nuance\Enterprise* (Windows) or to */var/local/Nuance* (Linux).

Most diagnostic logs are saved to *$NUANCE_DATA_DIR/system/diagnosticLogs* or *$NUANCE_DATA_DIR/company-name/diagnosticLogs* (if you separate logs for each company you support).

Exceptions — some diagnostic logs are stored elsewhere:

- NLE logs are stored in *$NLE_HOME/logs*
- NTpE logs are stored in *$TEXTPROC_HOME/logs* (or as configured via log : logFileDir)

For information on diagnostic log filenames or call logs, see the online documentation.

Data packs

The first time a data pack is installed, the NDP_HOME environment variable is created. Subsequent data pack installations will use this value to construct the installation path.

Note: If you have not yet installed a data pack and you have already installed Speech Suite, you must stop the watcher service on the Krypton/NTpE host before installing the first data pack; otherwise, the required NDP_HOME environment variable is not set. See the online documentation. You do not need to set NDP_HOME for subsequent data pack installations.

Data packs are required by the Krypton engine and Nuance Text Processing Engine.

The default data pack home is:

- Linux: */usr/local/Nuance/Data_Packs*
- Windows: *C:\Program Files\Nuance\Data Packs*

For example:

- Linux : *$NDP_HOME/ndp-eng-USA-GEN-3.7.0/*
- Windows: *%NDP_HOME%\ndp-eng-USA-GEN-3.7.0*

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