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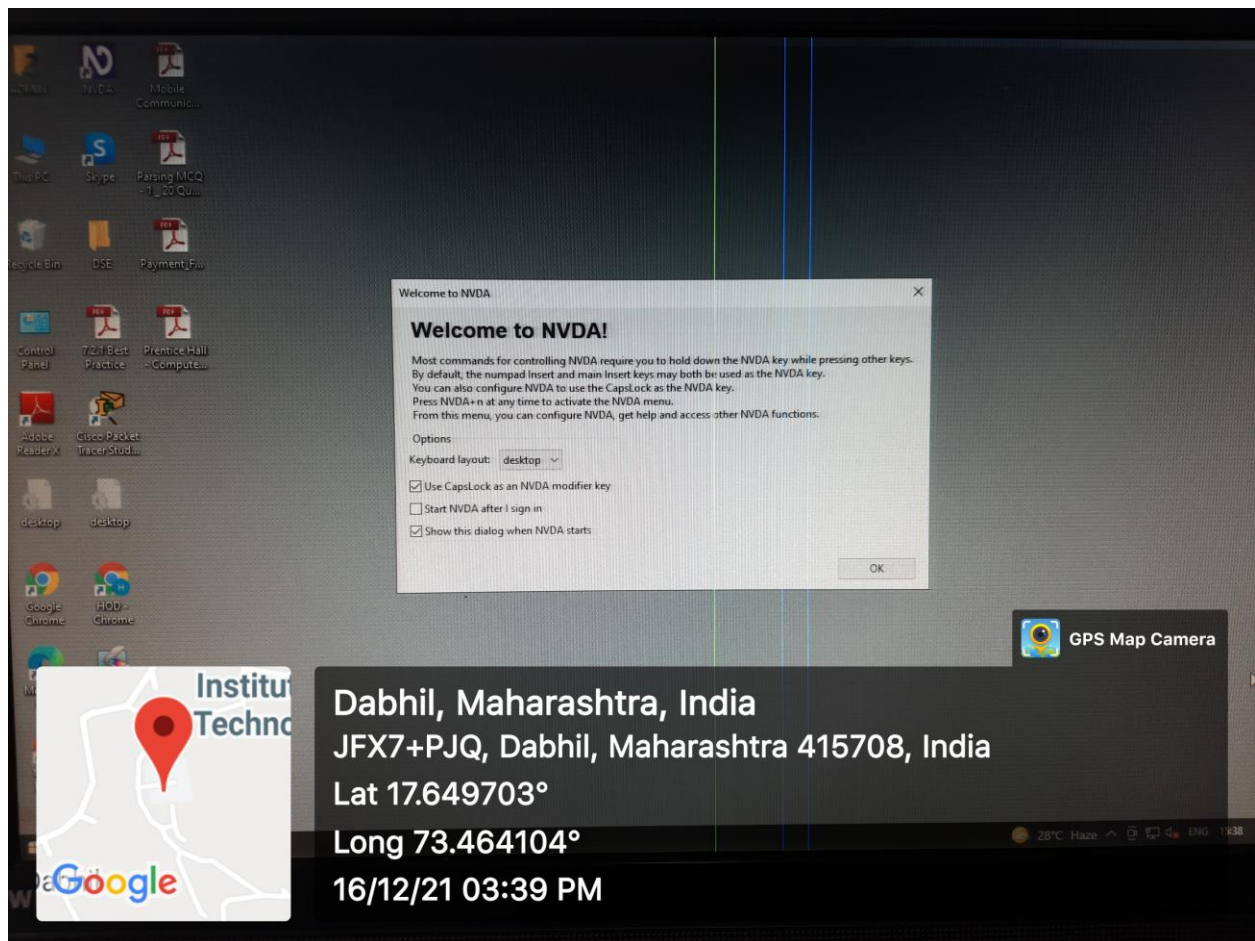

NAAC

Criteria VII

7.1.7 Details of the Software procured for providing the assistance

NVDA 2021

NVDA 2021.3 User Guide

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1. Introduction

Welcome to NVDA!

NonVisual Desktop Access (NVDA) is a free and open source screen reader for the Microsoft Windows operating system. Providing feedback via synthetic speech and Braille, it enables blind or vision impaired people to access computers running Windows for no more cost than a sighted person. NVDA is developed by NV Access, with contributions from the community.

1.1. General Features

NVDA allows blind and vision impaired people to access and interact with the Windows operating system and many third party applications.

Major highlights include:

- Support for popular applications including web browsers, email clients, internet chat programs and office suites
- Built-in speech synthesizer supporting over 80 languages
- Reporting of textual formatting where available such as font name and size, style and spelling errors
- Automatic announcement of text under the mouse and optional audible indication of the mouse position
- Support for many refreshable braille displays, including the ability to detect many of them automatically as well as braille input on braille displays with a braille keyboard
- Ability to run entirely from a USB flash drive or other portable media without the need for installation
- Easy to use talking installer
- Translated into 54 languages
- Support for modern Windows Operating Systems including both 32 and 64 bit variants
- Ability to run during Windows sign-in and at secure screens
- Announcing controls and text while using touch gestures
- Support for common accessibility interfaces such as Microsoft Active Accessibility, Java Access Bridge, IAccessible2 and UI Automation
- Support for Windows Command Prompt and console applications
- The ability to highlight the system focus

1.2. Internationalization

It is important that people anywhere in the world, no matter what language they speak, get equal access to technology. Besides English, NVDA has been translated into 54 languages including: Afrikaans, Albanian, Amharic, Arabic, Aragonese, Bulgarian, Burmese, Catalan, Chinese (simplified and traditional),

Croatian, Czech, Danish, Dutch, Farsi, Finnish, French, Galician, Georgian, German (Germany and Switzerland), Greek, Hebrew, Hindi, Hungarian, Icelandic, Irish, Italian, Japanese, Kannada, Korean, Kyrgyz, Lithuanian, Macedonian, Mongolian, Nepali, Norwegian, Polish, Portuguese (Brazil and Portugal), Punjabi, Romanian, Russian, Serbian, Slovak, Slovenian, Spanish (Colombia and Spain), Swedish, Tamil, Thai, Turkish, Ukrainian and Vietnamese.

1.3. Speech Synthesizer Support

Apart from providing its messages and interface in several languages, NVDA can also enable the user to read content in any language, as long as they have a speech synthesizer that can speak that language.

NVDA is bundled with eSpeak NG, a free, open-source, multi-lingual speech synthesizer.

Information about other speech synthesizers that NVDA supports can be found in the Supported Speech Synthesizers section.

1.4. Braille support

For users that own a refreshable braille display, NVDA can output its information in braille. Both uncontracted and contracted braille input via a braille keyboard is also supported. Furthermore, NVDA will detect many braille displays automatically by default. Please see the Supported Braille Displays section for information about the supported braille displays.

NVDA supports braille codes for many languages, including contracted, uncontracted and computer braille codes.

1.5. License and Copyright

NVDA is copyright 2006-2021 NVDA contributors.

NVDA is available under the GNU General Public License version 2, with two special exceptions. The exceptions are outlined in the license document under the sections "Non-GPL Components in Plugins and Drivers" and "Microsoft Distributable Code". NVDA also includes and uses components which are made available under different free and open source licenses. You are free to share or change this software in any way you like as long as it is accompanied by the license and you make all source code available to anyone who wants it. This applies to both original and modified copies of this software, plus any derivative works.

For further details, you can [view the full license.](#) For details regarding exceptions, access the license document from the NVDA menu under the "help" section.

2. System Requirements

- Operating Systems: all 32-bit and 64-bit editions of Windows 7, Windows 8, Windows 8.1, Windows 10, Windows 11, and all Server Operating Systems starting from Windows Server 2008 R2.
  - For Windows 7, NVDA requires Service Pack 1 or higher.
  - For Windows Server 2008 R2, NVDA requires Service Pack 1 or higher.
- at least 150 MB of storage space.

3. Getting and Setting Up NVDA

If you have not yet got a copy of NVDA, you can download it from the [NV Access website](#).

Go to the download section and you will find a link to download the latest version of NVDA.

Running the file you have just downloaded will start a temporary copy of NVDA. You will then be asked if you want to install NVDA, create a portable copy or just continue using the temporary copy.

If you plan to always use NVDA on this computer, you will want to choose to install NVDA. Installing NVDA will allow for additional functionality such as automatic starting after sign-in, the ability to read the Windows sign-in and security screens (which cannot be done with portable and temporary copies) and creation of Start Menu and desktop shortcuts. The installed copy is also able to create a portable copy itself at any time.

If you want to take NVDA with you on a USB thumb drive or other writable media, then you should choose to create a portable copy. The portable copy also has the ability to install itself on any computer at a later time. However, if you wish to copy NVDA onto read-only media such as a CD, you should just copy the download package. Running the portable version directly from read-only media is not supported at this time.

Using the temporary copy of NVDA is also an option (e.g. for demonstration purposes), though starting NVDA in this way each time can become very time consuming.

3.1. Portable and Temporary Copy Restrictions

Apart from the inability to automatically start during and/or after log-on, the portable and temporary copies of NVDA also have the following restrictions:

- The inability to interact with applications running with administrative privileges, unless of course NVDA itself has been run also with these privileges (not recommended).
- The inability to read User Account Control (UAC) screens when trying to start an application with administrative privileges.
- Windows 8 and later: the inability to support input from a touchscreen.
- Windows 8 and later: the inability to provide features such as browse mode and speaking of typed characters in Windows Store apps.
- Windows 8 and later: audio ducking is not supported.

3.2. Installing NVDA

If installing NVDA directly from the NVDA download package, press the Install NVDA button. If you have already closed this dialog or are wanting to install from a portable copy, please choose the Install NVDA menu item found under Tools in the NVDA menu.

The installation dialog that appears will confirm whether you wish to install NVDA and will also tell you whether this installation will be updating a previous install. Pressing the Continue button will start installing NVDA. There are also a few options in this dialog which are explained below. Once the installation has completed, a message will appear telling you that it was successful. Pressing OK at this point will restart the newly installed copy of NVDA.

3.2.1. Incompatible add-ons warning

If you have add-ons already installed there may also be a warning that incompatible add-ons will be disabled. Before you're able to press the Continue button you will have to use the checkbox to confirm that you understand that these add-ons will be disabled. There will also be a button present to review the add-ons that will be disabled. Refer to the incompatible add-ons dialog section for more help on this button.

3.2.2. Use NVDA during sign-in

This option allows you to choose whether or not NVDA should automatically start while at the Windows sign-in screen, before you have entered a

password. This also includes User Account Control and other secure screens. This option is enabled by default for fresh installations.

3.2.3. Create Desktop Shortcut (ctrl+alt+n)

This option allows you to choose whether or not NVDA should create a shortcut on the desktop to start NVDA. If created, this shortcut will also be assigned a shortcut key of control+alt+n, allowing you to start NVDA at any time with this keystroke.

3.2.4. Copy Portable Configuration to Current User Account

This option allows you to choose whether or not NVDA should copy the user configuration from the currently running NVDA into the configuration for the currently logged on user, for the installed copy of NVDA. This will not copy the configuration for any other users of this system nor to the system configuration for use during Windows sign-in and other secure screens. This option is only available when installing from a portable copy, not when installing directly from the downloaded Launcher package.

3.3. Creating a Portable Copy

If creating a portable copy directly from the NVDA download package, simply press the Create Portable Copy button. If you have already closed this dialog or you are running an installed copy of NVDA, choose the Create Portable copy menu item found under Tools in the NVDA menu.

The Dialog that appears allows you to choose where the portable copy should be created. This can be a directory on your hard drive or a location on a USB thumb drive or other portable media. There is also an option to choose whether NVDA should copy the logged on user's current NVDA configuration for use with the newly created portable copy. This option is only available when creating a portable copy from an installed copy, not when creating from the download package. Pressing Continue will create the portable copy. Once creation is complete, a message will appear telling you it was successful. Press OK to dismiss this dialog.

4. Getting started with NVDA

4.1. Launching NVDA

If you have installed NVDA with the installer, then starting NVDA is as simple as either pressing control+alt+n, or choosing NVDA from the NVDA menu under Programs on the Start Menu. Additionally you can type NVDA into the

Run dialog and press Enter. If NVDA is already running, it will be restarted. You can also pass some command line options which allows you to quit (-q), disable add-ons (--disable-addons), etc.

For installed copies, NVDA stores the configuration in the roaming application data folder of the current user by default (e.g. "C:\Users\<user>\AppData\Roaming"). It is possible to change this in a way that NVDA loads its configuration from the local application data folder instead. Consult the section about system wide parameters for more details.

To start the portable version, go to the directory you unpacked NVDA to, and press enter or double click on nvda.exe. If NVDA was already running, it will automatically stop before starting the portable version.

As NVDA starts, you will first hear an ascending set of tones (telling you that NVDA is loading). Depending on how fast your computer is, or if you are running NVDA off a USB key or other slow media, it may take a little while to start. If it is taking an extra-long time to start, NVDA should say "Loading NVDA. Please wait..."

If you don't hear any of this, or you hear the Windows error sound, or a descending set of tones, then this means that NVDA has an error, and you will need to possibly report a bug to the developers. Please check out the NVDA website for how to do this.

4.1.1. Welcome Dialog

When NVDA starts for the first time, you will be greeted by a dialog box which provides you with some basic information about the NVDA modifier key and the NVDA menu. (Please see further sections about these topics.) The dialog box also contains a combo box and three checkboxes. The combo box lets you select the keyboard layout. The first checkbox lets you control if NVDA should use the Caps Lock as an NVDA modifier key. The second specifies whether NVDA should start automatically after you log on to Windows and is only available for installed copies of NVDA. The third lets you control if this Welcome dialog should appear each time NVDA starts.

4.1.2. Data usage statistics dialog

Starting from NVDA 2018.3, the user is asked if they want to allow usage data to be sent to NV Access in order to help improve NVDA in the future. When starting NVDA for the first time, a dialog will appear which will ask you if you want to accept sending data to NV Access while using NVDA. You can read more info about the data gathered by NV Access in the general settings

section, Allow the NVDA project to gather NVDA usage statistics. Note: pressing on "yes" or "no" will save this setting and the dialog will never appear again unless you reinstall NVDA. However, you can enable or disable the data gathering process manually in NVDA's general settings panel. For changing this setting manually, you can check or uncheck the checkbox called Allow the NVDA project to gather NVDA usage statistics.

4.2. About NVDA keyboard commands

4.2.1. The NVDA Modifier Key

Most NVDA-specific keyboard commands consist of pressing a particular key called the NVDA modifier key in conjunction with one or more other keys. Notable exceptions to this are the text review commands for the desktop keyboard layout which just use the numpad keys by themselves, but there are some other exceptions as well.

NVDA can be configured so that the numpad Insert, Extended Insert and/or Caps Lock key can be used as the NVDA modifier key. By default, both the numpad Insert and Extended Insert keys are set as NVDA modifier keys.

If you wish to cause one of the NVDA modifier keys to behave as it usually would if NVDA were not running (e.g. you wish to turn Caps Lock on when you have set Caps Lock to be an NVDA modifier key), you can press the key twice in quick succession.

4.2.2. Keyboard Layouts

NVDA currently comes with two sets of key commands (known as keyboard layouts): the desktop layout and the laptop layout. By default, NVDA is set to use the Desktop layout, though you can switch to the Laptop layout in the Keyboard category of the NVDA Settings dialog, found under Preferences in the NVDA menu.

The Desktop layout makes heavy use of the numpad (with Num Lock off). Although most laptops do not have a physical numpad, some laptops can emulate one by holding down the FN key and pressing letters and numbers on the right-hand side of the keyboard (7, 8, 9, u, i, o, j, k, l, etc.). If your laptop cannot do this or does not allow you to turn Num Lock off, you may want to switch to the Laptop layout instead.

4.3. NVDA Touch Gestures

If you are running NVDA on a device with a touchscreen and running Windows 8 or higher, you can also control NVDA directly via touch commands. While NVDA is running, unless touch interaction support is disabled, all touch input will go directly to NVDA. Therefore, actions that can be performed normally without NVDA will not work. To toggle touch interaction support, press NVDA+control+alt+t. You can also enable or disable touch interaction support from the Touch Interaction category of the NVDA settings.

4.3.1. Exploring the Screen

The most basic action you can perform with the touch screen is to announce the control or text at any point on the screen. To do this, place one finger anywhere on the screen. You can also keep your finger on the screen and move it around to read other controls and text that your finger moves over.

4.3.2. Touch Gestures

When NVDA commands are described later in this user guide, they may list a touch gesture which can be used to activate that command with the touchscreen. Following are some instructions on how to perform the various touch gestures.

Taps

Tap the screen quickly with one or more fingers.

Tapping once with one finger is simply known as a tap. Tapping with 2 fingers at the same time is a 2-finger tap and so on.

If the same tap is performed one or more times again in quick succession, NVDA will instead treat this as a multi-tap gesture. Tapping twice will result in a double-tap. Tapping 3 times will result in a triple-tap and so on. Of course, these multi-tap gestures also recognize how many fingers were used, so it's possible to have gestures like a 2-finger triple-tap, a 4-finger tap, etc.

Flicks

Quickly swipe your finger across the screen.

There are 4 possible flick gestures depending on the direction: flick left, flick right, flick up and flick down.

Just like taps, more than one finger can be used to perform the gesture. Therefore, gestures such as 2-finger flick up and 4-finger flick left are all possible.

4.3.3. Touch Modes

As there are many more NVDA commands than possible touch gestures, NVDA has several touch modes you can switch between which make certain subsets of commands available. The two modes are text mode and object mode. Certain NVDA commands listed in this document may have a touch mode listed in brackets after the touch gesture. For example, flick up (text mode) means that the command will be performed if you flick up, but only while in text mode. If the command does not have a mode listed, it will work in any mode.

To toggle touch modes, perform a 3-finger tap.

4.3.4. Touch keyboard

The touch keyboard is used to enter text and commands from a touchscreen. When focused on an edit field, you can bring up the touch keyboard by double-tapping the touch keyboard icon on the bottom of the screen. For tablets such as Microsoft Surface Pro, the touch keyboard is always available when the keyboard is undocked. To dismiss the touch keyboard, double-tap the touch keyboard icon or move away from the edit field.

While the touch keyboard is active, to locate keys on the touch keyboard, move your finger to where the touch keyboard is located (typically at the bottom of the screen), then move around the keyboard with one finger. When you find the key you wish to press, double-tap the key or lift your finger, depending on options chosen from the Touch Interaction Settings category of the NVDA Settings.

4.4. Input Help Mode

Many NVDA commands are mentioned throughout the rest of this user guide, but an easy way to explore all the different commands is to turn on input help.

To turn on input help, press NVDA+1. To turn it off, press NVDA+1 again. While in input help, performing any input gesture (such as pressing a key or performing a touch gesture) will report the action and describe what it does (if anything). The actual commands will not execute while in input help mode.

4.5. The NVDA menu

The NVDA menu allows you to control NVDA's settings, access help, save/revert your configuration, Modify speech dictionaries, access additional tools and exit NVDA.

To get to the NVDA menu from anywhere in Windows while NVDA is running, press NVDA+n on the keyboard or perform a 2-finger double-tap on the touch screen. You can also get to the NVDA menu via the Windows system tray. Either right-click on the NVDA icon located in the system tray, or access the system tray by pressing the Windows logo key+B, DownArrow to the NVDA icon and press the applications key located next to the right control key on most keyboards. When the menu comes up, You can use the arrow keys to navigate the menu, and the enter key to activate an item.

4.6. Basic NVDA commands

Name	Desktop key	Laptop key	Touch	Description
Starts or restarts NVDA	Control+alt+n	Control+alt+n	none	Starts or restarts NVDA from the Desktop, if this Windows shortcut is enabled during NVDA's installation process. This is a Windows specific shortcut and therefore it cannot be reassigned in the input gestures dialog.
Stop speech	Control	control	2-finger tap	Instantly stops speaking
Pause Speech	shift	shift	none	Instantly pauses speech. Pressing it again will continue speaking where it left off (if pausing is supported by the current synthesizer)
NVDA Menu	NVDA+n	NVDA+n	2-finger double-tap	Pops up the NVDA menu to allow you to access preferences, tools, help, etc.
Toggle Speech Mode	NVDA+s	NVDA+s	none	Toggles speech mode between speech, beeps and off.
Toggle Input Help Mode	NVDA+1	NVDA+1	none	Pressing any key in this mode will report the key, and the description of any NVDA command associated with it
Quit NVDA	NVDA+q	NVDA+q	none	Exits NVDA
Pass next key through	NVDA+f2	NVDA+f2	none	Tells NVDA to pass the next key press straight through to the active application - even if it is normally treated as an NVDA key command

| Toggle application sleep mode on and off | NVDA+shift+s | NVDA+shift+z | none | sleep mode disables all NVDA commands and speech/braille output for the current application. This is most useful in applications that provide their own speech or screen reading features. Press this command again to disable sleep mode - note that NVDA will only retain the Sleep Mode setting until it is restarted. |

4.7. Reporting System Information

Name	key	Description
Report date/time	NVDA+f12	Pressing once reports the current time, pressing twice reports the date
Report battery status	NVDA+shift+b	Reports the battery status i.e. whether AC power is in use or the current charge percentage.
Report clipboard text	NVDA+c	Reports the Text on the clipboard if there is any.

5. Navigating with NVDA

NVDA allows you to explore and navigate the system in several ways, including both normal interaction and review.

5.1. Objects

Each Application and the operating system itself consist of many objects. An object is a single item such as a piece of text, button, checkbox, slider, list or editable text field.

5.2. Navigating with the System Focus

The system focus, also known simply as the focus, is the object which receives keys typed on the keyboard. For example, if you are typing into an editable text field, the editable text field has the focus.

The most common way of navigating around Windows with NVDA is to simply move the system focus using standard Windows keyboard commands, such as pressing tab and shift+tab to move forward and back between controls, pressing alt to get to the menu bar and then using the arrows to navigate menus, and using alt+tab to move between running applications. As you do

this, NVDA will report information about the object with focus, such as its name, type, value, state, description, keyboard shortcut and positional information. When Visual Highlight is enabled, the location of the current system focus is also exposed visually.

There are some key commands that are useful when moving with the System focus:

Name	Desktop key	Laptop key	Description
Report current focus	NVDA+tab	NVDA+tab	announces the current object or control that has the System focus. Pressing twice will spell the information
Report title	NVDA+t	NVDA+t	Reports the title of the currently active window. Pressing twice will spell the information. Pressing three times will copy it to the clipboard
Read active window	NVDA+b	NVDA+b	reads all the controls in the currently active window (useful for dialogs)
Report Status Bar	NVDA+end	NVDA+shift+end	Reports the Status Bar if NVDA finds one. Pressing twice will spell the information. Pressing three times will copy it to the clipboard

5.3. Navigating with the System Caret

When an object that allows navigation and/or editing of text is focused, you can move through the text using the system caret, also known as the edit cursor.

When the focus is on an object that has the system caret, you can use the arrow keys, page up, page down, home, end, etc. to move through the text. You can also change the text if the control supports editing. NVDA will announce as you move by character, word and line, and will also announce as you select and unselect text.

NVDA provides the following key commands in relation to the system caret:

Name	Desktop key	Laptop key	Description
Say all	NVDA+downArrow	NVDA+a	Starts reading from the current position of the system caret, moving it along as it goes
Read	NVDA+upArrow	NVDA+l	Reads the line where the system

current line			caret is currently situated. Pressing twice spells the line. Pressing three times spells the line using character descriptions.
Read current text selection	NVDA+Shift+upArrow	NVDA+shift+s	Reads any currently selected text
Report text formatting	NVDA+f	NVDA+f	Reports the formatting of the text where the caret is currently situated. Pressing twice shows the information in browse mode
Next sentence	alt+downArrow	alt+downArrow	Moves the caret to the next sentence and announces it. (only supported in Microsoft Word and Outlook)
Previous sentence	alt+upArrow	alt+upArrow	Moves the caret to the previous sentence and announces it. (only supported in Microsoft Word and Outlook)

When within a table, the following key commands are also available:

Name	Key	Description
Move to previous column	control+alt+leftArrow	Moves the system caret to the previous column (staying in the same row)
Move to next column	control+alt+rightArrow	Moves the system caret to the next column (staying in the same row)
Move to previous row	control+alt+upArrow	Moves the system caret to the previous row (staying in the same column)
Move to next row	control+alt+downArrow	Moves the system caret to the next row (staying in the same column)

5.4. Object Navigation

Most of the time, you will work with applications using commands which move the focus and the caret. However, sometimes, you may wish to explore the current application or the Operating System without moving the focus or caret. You may also wish to work with objects that cannot be accessed normally using the keyboard. In these cases, you can use object navigation.

Object navigation allows you to move between and obtain information about individual objects. When you move to an object, NVDA will report it similarly to

the way it reports the system focus. For a way to review all text as it appears on the screen, you can instead use screen review.

Rather than having to move back and forth between every single object on the system, the objects are organized hierarchically. This means that some objects contain other objects and you must move inside them to access the objects they contain. For example, a list contains list items, so you must move inside the list in order to access its items. If you have moved to a list item, moving next and previous will take you to other list items in the same list. Moving to a list item's containing object will take you back to the list. You can then move past the list if you wish to access other objects. Similarly, a toolbar contains controls, so you must move inside the toolbar to access the controls in the toolbar.

The object currently being reviewed is called the navigator object. Once you navigate to an object, you can review its content using the text review commands while in Object review mode. When Visual Highlight is enabled, the location of the current navigator object is also exposed visually. By default, the navigator object moves along with the System focus, though this behaviour can be toggled on and off.

Note: Braille following Object Navigation can be configured via Braille Tether.

To navigate by object, use the following commands:

Name	Desktop key	Laptop key	Touch	Description
Report current object	NVDA+numpad5	NVDA+shift+o	none	Reports the current navigator object. Pressing twice spells the information, and pressing 3 times copies this object's name and value to the clipboard.
Move to containing object	NVDA+numpad8	NVDA+shift+upArrow	flick up (object mode)	Moves to the object containing

				the current navigator object
Move to previous object	NVDA+numpad4	NVDA+shift+leftArrow	flick left (object mode)	Moves to the object before the current navigator object
Move to next object	NVDA+numpad6	NVDA+shift+rightArrow	flick right (object mode)	Moves to the object after the current navigator object
Move to first contained object	NVDA+numpad2	NVDA+shift+downArrow	flick down (object mode)	Moves to the first object contained by the current navigator object
Move to focus object	NVDA+numpadMinus	NVDA+backspace	none	Moves to the object that currently has the system focus, and also places the review cursor at the position of the System caret, if it is showing
Activate current navigator object	NVDA+numpadEnter	NVDA+enter	double-tap	Activates the current navigator object (similar to clicking with the mouse or pressing space when it has the system focus)
Move System	NVDA+shift+numpadMinus	NVDA+shift+backspace	none	pressed once Moves the

focus or caret to current review position				System focus to the current navigator object, pressed twice moves the system caret to the position of the review cursor
Report review cursor location	NVDA+numpadDelete	NVDA+delete	none	Reports information about the location of the text or object at the review cursor. For example, this might include the percentage through the document, the distance from the edge of the page or the exact screen position. Pressing twice may provide further detail.
Move review cursor to status bar	none	none	none	Reports the Status Bar if NVDA finds one. It also moves the navigator object to this location.

Note: numpad keys require the Num Lock to be turned off to work properly.

5.5. Reviewing Text

NVDA allows you to read the contents of the screen, current document or current object by character, word or line. This is mostly useful in places (including Windows command consoles) where there is no system caret. For example, you might use it to review the text of a long information message in a dialog.

When moving the review cursor, the System caret does not follow along, so you can review text without losing your editing position. However, by default, when the System caret moves, the review cursor follows along. This can be toggled on and off.

Note: Braille following the review cursor can be configured via Braille Tether.

The following commands are available for reviewing text:

Name	Desktop key	Laptop key	Touch	Description
Move to top line in review	shift+numpad7	NVDA+control+home	none	Moves the review cursor to the top line of the text
Move to previous line in review	numpad7	NVDA+upArrow	flick up (text mode)	Moves the review cursor to the previous line of text
Report current line in review	numpad8	NVDA+shift+.	none	Announces the current line of text where the review cursor is positioned. Pressing twice spells the line. Pressing three times spells the line using character descriptions.
Move to next line in review	numpad9	NVDA+downArrow	flick down (text mode)	Move the review cursor to the next line of text
Move to bottom line in review	shift+numpad9	NVDA+control+end	none	Moves the review cursor to the bottom line of text
Move to previous word in review	numpad4	NVDA+control+leftArrow	2-finger flick left (text mode)	Moves the review cursor to the previous word in the text

Report current word in review	numpad5	NVDA+control+.	none	Announces the current word in the text where the review cursor is positioned. Pressing twice spells the word. Pressing three times spells the word using character descriptions.
Move to next word in review	numpad6	NVDA+control+rightArrow	2-finger flick right (text mode)	Move the review cursor to the next word in the text
Move to start of line in review	shift+numpad1	NVDA+home	none	Moves the review cursor to the start of the current line in the text
Move to previous character in review	numpad1	NVDA+leftArrow	flick left (text mode)	Moves the review cursor to the previous character on the current line in the text
Report current character in review	numpad2	NVDA+.	none	Announces the current character on the line of text where the review cursor is positioned. Pressing twice reports a description or example of that character. Pressing three times reports the numeric value of the character in decimal and hexadecimal.
Move to next character in review	numpad3	NVDA+rightArrow	flick right (text mode)	Move the review cursor to the next character on the current line of text
Move to end of line in review	shift+numpad3	NVDA+end	none	Moves the review cursor to the end of the current line of text
Say all with	numpadPlus	NVDA+shift+a	3-	Reads from the

review			finger flick down (text mode)	current position of the review cursor, moving it as it goes
Select then Copy from review cursor	NVDA+f9	NVDA+f9	none	Starts the select then copy process from the current position of the review cursor. The actual action is not performed until you tell NVDA where the end of the text range is
Select then Copy to review cursor	NVDA+f10	NVDA+f10	none	On the first press, text is selected from the position previously set as start marker up to and including the review cursor's current position. If the system caret can reach the text, it will be moved to the selected text. After pressing this key stroke a second time, the text will be copied to the Windows clipboard
Move to marked start for copy in review	NVDA+shift+f9	NVDA+shift+f9	none	Moves the review cursor to the position previously set start marker for copy
Report text formatting	NVDA+shift+f	NVDA+shift+f	none	Reports the formatting of the text where the review cursor is currently situated. Pressing twice shows the information in browse mode
Report current symbol replacement	None	None	none	Speaks the symbol where the review cursor is positioned. Pressed twice, shows

				the symbol and the text used to speak it in browse mode.

Note: numpad keys require the Num Lock to be turned off to work properly.

A good way to remember the basic text review commands when using the Desktop layout is to think of them as being in a grid of three by three, with top to bottom being line, word and character and left to right being previous, current and next. The layout is illustrated as follows:

Previous line	Current line	Next line
Previous word	Current word	Next word
Previous character	Current character	Next character

5.6. Review Modes

NVDA's text review commands can review content within the current navigator object, current document or screen, depending on the review mode selected. Review modes are a replacement for the older Flat Review concept found in NVDA.

The following commands switch between review modes:

Name	Desktop key	Laptop key	Touch	Description
Switch to next review mode	NVDA+numpad7	NVDA+pageUp	2-finger flick up	switches to the next available review mode
Switch to previous review mode	NVDA+numpad1	NVDA+pageDown	2-finger flick down	switches to the previous available review mode

5.6.1. Object Review

While in object review mode, you are able to only review the content of the current navigator object. For objects such as editable text fields or other basic text controls, this will generally be the text content. For other objects, this may be the name and/or value.

5.6.2. Document Review

When the navigator object is within a browse mode document (e.g. web page) or other complex document (e.g. a Lotus Symphony document), it is possible

to switch to the document review mode. The document review mode allows you to review the text of the entire document.

When switching from object review to document review, the review cursor is placed in the document at the position of the navigator object. When moving around the document with review commands, the navigator object is automatically updated to the object found at the current review cursor position.

Note that NVDA will switch to document review from object review automatically when moving around browse mode documents.

5.6.3. Screen Review

The screen review mode allows you to review the text of the screen as it appears visually within the current application. This is similar to the screen review or mouse cursor functionality in many other Windows screen readers.

When switching to screen review mode, the review cursor is placed at the screen position of the current navigator object. When moving around the screen with review commands, the navigator object is automatically updated to the object found at the screen position of the review cursor.

Note that in some newer applications, NVDA may not see some or all text displayed on the screen due to the use of newer screen drawing technologies which are impossible to support at this time.

5.7. Navigating with the Mouse

When you move the mouse, NVDA by default reports the text that is directly under the mouse pointer as the pointer moves over it. Where supported, NVDA will read the surrounding paragraph of text, though some controls may only read by line.

NVDA can be configured to also announce the type of object under the mouse as it moves (e.g. list, button, etc.). This may be useful for totally blind users, as sometimes, the text isn't enough.

NVDA provides a way for users to understand where the mouse is located relative to the dimensions of the screen by playing the current mouse coordinates as audio beeps. The higher the mouse is on the screen, the higher the pitch of the beeps. The further left or right the mouse is located on the screen, the further left or right the sound will be played (assuming the user has stereo speakers or headphones).

These extra mouse features are not turned on by default in NVDA. If you wish to take advantage of them, you can configure them from the Mouse settings category of the NVDA Settings dialog, found in the NVDA Preferences menu.

Although a physical mouse or trackpad should be used to navigate with the mouse, NVDA provides some commands related to the mouse:

Name	Desktop key	Laptop key	Touch	Description
Left mouse button click	numpadDivide	NVDA+[	none	Clicks the left mouse button once. The common double click can be performed by pressing this key twice in quick succession
Left mouse button lock	shift+numpadDivide	NVDA+control+[	none	Locks the left mouse button down. Press again to release it. To drag the mouse, press this key to lock the left button down and then move the mouse either physically or use one of the other mouse routing commands
Right mouse click	numpadMultiply	NVDA+]	tap and hold	Clicks the right mouse button once, mostly used to open context menu at the location of the mouse.
Right mouse button lock	shift+numpadMultiply	NVDA+control+]	none	Locks the right mouse button down. Press again to release it. To drag the mouse, press this key to lock the right button down and then move the mouse either physically or use one of the other mouse routing commands
Move mouse to current navigator object	NVDA+numpadDivide	NVDA+shift+m	none	Moves the mouse to the location of the current navigator object and review cursor

Navigate to the object under the mouse	NVDA+numpadMultiply	NVDA+shift+n	none	Set the navigator object to the object located at the position of the mouse

6. Browse Mode

Complex read-only documents such as web pages are browsed in NVDA using browse mode. This includes documents in the following applications:

- Mozilla Firefox
- Microsoft Internet Explorer
- Mozilla Thunderbird
- HTML messages in Microsoft Outlook
- Google Chrome
- Microsoft Edge
- Adobe Reader
- Foxit Reader
- Supported books in Amazon Kindle for PC

Browse mode is also optionally available for Microsoft Word documents.

In browse mode, the content of the document is made available in a flat representation that can be navigated with the cursor keys as if it were a normal text document. All of NVDA's system caret key commands will work in this mode; e.g. say all, report formatting, table navigation commands, etc. When Visual Highlight is enabled, the location of the virtual browse mode caret is also exposed visually. Information such as whether text is a link, heading, etc. is reported along with the text as you move.

Sometimes, you will need to interact directly with controls in these documents. For example, you will need to do this for editable text fields and lists so that you can type characters and use the cursor keys to work with the control. You do this by switching to focus mode, where almost all keys are passed to the control. When in Browse mode, by default, NVDA will automatically switch to focus mode if you tab to or click on a particular control that requires it. Conversely, tabbing to or clicking on a control that does not require focus mode will switch back to browse mode. You can also press enter or space to switch to focus mode on controls that require it. Pressing escape will switch back to browse mode. In addition, you can manually force focus mode, after which it will remain in effect until you choose to disable it.

Name	Key	Description
Toggle browse/focus modes	NVDA+space	Toggles between focus mode and browse mode
Exit focus mode	escape	Switches back to browse mode if focus mode was previously switched to automatically
Refresh browse mode document	NVDA+f5	Reloads the current document content (useful if certain content seems to be missing from the document. Not available in Microsoft Word and Outlook.)
Find	NVDA+control+f	Pops up a dialog in which you can type some text to find in the current document. See searching for text for more information.
Find next	NVDA+f3	Finds the next occurrence of the text in the document that you previously searched for
Find previous	NVDA+shift+f3	Finds the previous occurrence of the text in the document you previously searched for
Open long description	NVDA+d	Opens a new window containing a long description for the element you are on if it has one.

6.1. Single Letter Navigation

While in browse mode, for quicker navigation, NVDA also provides single character keys to jump to certain fields in the document. Note that not all of these commands are supported in every type of document.

The following keys by themselves jump to the next available element, while adding the shift key causes them to jump to the previous element:

- h: heading
- l: list
- i: list item
- t: table
- k: link
- n: nonLinked text
- f: form field
- u: unvisited link
- v: visited link
- e: edit field
- b: button
- x: checkbox
- c: combo box

- r: radio button
- q: block quote
- s: separator
- m: frame
- g: graphic
- d: landmark
- o: embedded object (audio and video player, application, dialog, etc.)
- 1 to 6: headings at levels 1 to 6 respectively
- a: annotation (comment, editor revision, etc.)
- w: spelling error

To move to the beginning or end of containing elements such as lists and tables:

Name	Key	Description
Move to start of container	shift+comma	Moves to the start of the container (list, table, etc.) where the caret is positioned
Move past end of container	comma	Moves past the end of the container (list, table, etc.) where the caret is positioned

Some web applications such as Gmail, Twitter and Facebook use single letters as shortcut keys. If you want to use these while still being able to use your cursor keys to read in browse mode, you can temporarily disable NVDA's single letter navigation keys. To toggle single letter navigation on and off for the current document, press NVDA+shift+space.

6.2. The Elements List

The elements list provides access to a list of various types of elements in the document as appropriate for the application. For example, in web browsers, the elements list can list links, headings, form fields, buttons or landmarks. Radio buttons allow you to switch between the different types of elements. An edit field is also provided in the dialog which allows you to filter the list to help you search for a particular item on the page. Once you have chosen an item, you can use the provided buttons in the dialog to move to or activate that item.

Name	Key	Description
Browse mode elements list	NVDA+f7	Lists various types of elements in the current document

6.3. Searching for text

This dialog allows you to search for terms in the current document. In the "Type the text you wish to find" field, the text to be found can be entered. The "Case sensitive" checkbox makes the search consider uppercase and lowercase letters differently. For example, with "Case sensitive" selected you can find "NV Access" but not "nv access". Use the following keys for performing searches:

Name	Key	Description
Find text	NVDA+control+f	Opens the search dialog
Find next	NVDA+f3	searches the next occurrence of the current search term
Find previous	NVDA+shift+f3	searches the previous occurrence of the current search term

6.4. Embedded Objects

Pages can include rich content using technologies such as Oracle Java and HTML5, as well as applications and dialogs. Where these are encountered in browse mode, NVDA will report "embedded object", "application" or "dialog", respectively. You can quickly move to them using the o and shift+o embedded object single letter navigation keys. To interact with these objects, you can press enter on them. If it is accessible, you can then tab around it and interact with it like any other application. A key command is provided to return to the original page containing the embedded object:

Name	Key	Description
Move to containing browse mode document	NVDA+control+space	Moves the focus out of the current embedded object and into the document that contains it

7. Reading Mathematical Content

Using MathPlayer 4 from Design Science, NVDA can read and interactively navigate supported mathematical content. This requires that MathPlayer 4 is installed on the computer. MathPlayer is available as a free download from: https://www.dessci.com/en/products/mathplayer/

NVDA supports the following types of mathematical content:

- MathML in Mozilla Firefox, Microsoft Internet Explorer and Google Chrome.
- Design Science MathType in Microsoft Word and PowerPoint. MathType needs to be installed in order for this to work. The trial

version is sufficient. It can be downloaded from https://www.dessci.com/en/products/mathtype/

- MathML in Adobe Reader. Note that this is not an official standard yet, so there is currently no publicly available software that can produce this content.
- Math in Kindle for PC for books with accessible math.

When reading a document, NVDA will speak any supported mathematical content where it occurs. If you are using a braille display, it will also be displayed in braille.

7.1. Interactive Navigation

If you are working primarily with speech, in most cases, you will probably wish to examine the expression in smaller segments, rather than hearing the entire expression at once.

If you are in browse mode, you can do this by moving the cursor to the mathematical content and pressing enter.

If you are not in browse mode:

1. move the review cursor to the mathematical content. By default, the review cursor follows the system caret, so you can usually use the system caret to move to the desired content.
2. Then, activate the following command:

Name	Key	Description
Interact with math content	NVDA+alt+m	Begins interaction with math content.

At this point, you can use MathPlayer commands such as the arrow keys to explore the expression. For example, you can move through the expression with the left and right arrow keys and zoom into a portion of the expression such as a fraction using the down arrow key. Please see the MathPlayer documentation about navigation commands for further information.

When you wish to return to the document, simply press the escape key.

Sometimes mathematical content might be displayed as a button or other type of element which, when activated, can display a dialog or more information related to the formula. To activate the button or the element containing the formula, press ctrl+enter.

8. Braille

If you own a braille display, NVDA can display information in braille. If your braille display has a Perkins-style keyboard, you can also enter contracted or uncontracted braille. Braille can also be displayed on screen using the Braille Viewer instead of, or at the same time as, using a physical braille display.

Please see the Supported Braille Displays section for information about the supported braille displays. This section also contains information about what displays support NVDA's automatic background braille display detection functionality. You can configure braille using the Braille category of the NVDA Settings dialog.

8.1. Control Type, State and Landmark abbreviations

In order to fit as much information as possible on a braille display, the following abbreviations have been defined to indicate control type and state as well as landmarks.

Abbreviation	Control type
app	application
art	article
bqt	block quote
btn	button
drbtn	drop down button
spnbtn	spin button
splbtn	split button
tgbtn	toggle button
cap	caption
cbo	combo box
chk	checkbox
dlg	dialog
doc	document
edt	editable text field
pwdedt	password edit
embedded	embedded object
enote	end note

fig	figure
fnote	foot note
gra	graphic
grp	grouping
hN	heading at level n, e.g. h1, h2.
hlp	help balloon
lmk	landmark
lnk	link
vlnk	visited link
lst	list
mnu	menu
mnubar	menu bar
mnubtn	menu button
mnuitem	menu item
pnl	panel
prgbar	progress bar
rbtn	radio button
scrlbar	scroll bar
sect	section
stbar	status bar
tabctl	tab control
tbl	table
cN	table column number n, e.g. c1, c2.
rN	table row number n, e.g. r1, r2.
term	terminal
tlbar	tool bar
tltip	tool tip
tv	tree view
tvbtn	tree view button
tvitem	tree view item
lv N	a tree view item has a hierarchical level N|
wnd	window

... .	separator
mrkd	marked content

The following state indicators are also defined:

Abbreviation	Control state
...	displayed when an object supports autocompletion
⠠⠿⠄	displayed when an object (e.g. a toggle button) is pressed
⠠⠤⠄	displayed when an object (e.g. a toggle button) is not pressed
⠿⠿⠿	displayed when an object (e.g. a checkbox) is checked
⠤⠿⠤	displayed when an object (e.g. a checkbox) is half checked
⠤⠤⠤	displayed when an object (e.g. a checkbox) is not checked
-	displayed when an object (e.g. a tree view item) is collapsible
+	displayed when an object (e.g. a tree view item) is Expandable
***	displayed when a protected control or document is encountered
clk	displayed when an object is clickable
cmnt	displayed when there is a comment for a spreadsheet cell or piece of text in a document
frml	displayed when there is a formula on a spreadsheet cell
invalid	displayed when an invalid entry has been made
ldesc	displayed when an object (usually a graphic) has a long description
mln	displayed when an edit field allows typing multiple lines of text such as comment fields on websites
req	displayed when a required form field is encountered
ro	displayed when an object (e.g. an editable text field) is read-only
sel	displayed when an object is selected
nsel	displayed when an object is not selected
sorted asc	displayed when an object is sorted ascending
sorted desc	displayed when an object is sorted descending
submnu	displayed when an object has a popup (usually a sub-menu)

Finally, the following abbreviations for landmarks are defined:

Abbreviation	Landmark

bnnr	banner
cinf	content info
cmpl	complementary
form	form
main	main
navi	navigation
srch	search
rgn	region

8.2. Braille Input

NVDA supports entry of both uncontracted and contracted braille via a braille keyboard. You can select the translation table used to translate braille into text using the Input table setting in the Braille category of the NVDA Settings dialog.

When uncontracted braille is being used, text is inserted as soon as it is entered. When using contracted braille, text is inserted when you press space or enter at the end of a word. Note that translation can only reflect the braille word you are typing and cannot consider existing text. For example, if you are using a braille code that begins numbers with a number sign and you press backspace to move to the end of a number, you will need to type the number sign again to enter additional numbers.

Pressing dot 7 erases the last entered braille cell or character. Dot 8 translates any braille input and presses the enter key. Pressing dot 7 + dot 8 translates any braille input, but without adding a space or pressing enter.

9. Vision

While NVDA is primarily aimed at blind or vision impaired people who primarily use speech and/or braille to operate a computer, it also provides built-in facilities to change the contents of the screen. Within NVDA, such a visual aid is called a vision enhancement provider.

NVDA offers several built-in vision enhancement providers which are described below. Additional vision enhancement providers can be provided in NVDA add-ons.

NVDA's vision settings can be changed in the vision category of the NVDA Settings dialog.

9.1. Visual Highlight

Visual Highlight can help to identify the [system focus](), [navigator object]() and [browse mode]() positions. These positions are highlighted with a coloured rectangle outline.

- Solid blue highlights a combined navigator object and system focus location (e.g. because [the navigator object follows the system focus]()).
- Dashed blue highlights just the system focus object.
- Solid pink highlights just the navigator object.
- Solid yellow highlights the virtual caret used in browse mode (where there is no physical caret such as in web browsers).

When Visual Highlight is enabled in the [vision category]() of the [NVDA Settings]() dialog, you can [change whether or not to highlight the focus, navigator object or browse mode caret]().

9.2. Screen Curtain

As a blind or vision impaired user, it is often not possible or necessary to see the contents of the screen. Furthermore, it might be hard to ensure that there isn't someone looking over your shoulder. For this situation, NVDA contains a feature called "Screen Curtain" which can be enabled to make the screen black.

You can enable the Screen Curtain in the [vision category]() of the [NVDA Settings]() dialog.

When the Screen Curtain is active some tasks directly based on what appears on the screen such as performing [OCR]() or taking a screenshot cannot be achieved.

Due to a change in the Windows Magnification API, Screen Curtain had to be updated to support the newest versions of Windows. Use NVDA 2021.2 to activate Screen Curtain with Windows 10 21H2 (10.0.19044) or later. For security purposes, when using a new version of Windows, get visual confirmation that the Screen Curtain makes the screen entirely black.

10. Content Recognition

When authors don't provide sufficient information for a screen reader user to determine the content of something, various tools can be used to attempt to recognize the content from an image. NVDA supports the optical character recognition (OCR) functionality built into Windows 10 and later to recognize

text from images. Additional content recognizers can be provided in NVDA add-ons.

When you use a content recognition command, NVDA recognizes content from the current navigator object. By default, the navigator object follows the system focus or browse mode cursor, so you can usually just move the focus or browse mode cursor where desired. For example, if you move the browse mode cursor to a graphic, recognition will recognize content from the graphic by default. However, you may wish to use object navigation directly to, for example, recognize the content of an entire application window.

Once recognition is complete, the result will be presented in a document similar to browse mode, allowing you to read the information with cursor keys, etc. Pressing enter or space will activate (normally click) the text at the cursor if possible. Pressing escape dismisses the recognition result.

10.1. Windows OCR

Windows 10 and later includes OCR for many languages. NVDA can use this to recognize text from images or inaccessible applications.

You can set the language to use for text recognition in the Windows OCR category of the NVDA Settings dialog. Additional languages can be installed by opening the Start menu, choosing Settings, selecting Time & Language -> Region & Language and then choosing Add a language.

Windows OCR may be partially or fully incompatible with NVDA vision enhancements or other external visual aids. You will need to disable these aids before proceeding to a recognition.

To recognize the text in the current navigator object using Windows OCR, press NVDA+r.

11. Application Specific Features

NVDA provides its own extra features for some applications to make certain tasks easier or to provide access to functionality which is not otherwise accessible to screen reader users.

11.1. Microsoft Word

11.1.1. Automatic Column and Row Header Reading

NVDA is able to automatically announce appropriate row and column headers when navigating around tables in Microsoft Word. This firstly requires that the Report Table row / column headers option in NVDA's Document Formatting settings, found in the NVDA Settings dialog, be turned on. Secondly, NVDA needs to know which row or column contains the headers in any given table. After moving to the first cell in the column or row containing the headers, use one of the following commands:

Name	Key	Description
Set column headers	NVDA+shift+c	Pressing this once tells NVDA this is the first header cell in the row that contains column headers, which should be automatically announced when moving between columns below this row. Pressing twice will clear the setting.
Set row headers	NVDA+shift+r	Pressing this once tells NVDA this is the first header cell in the column that contains row headers, which should be automatically announced when moving between rows after this column. Pressing twice will clear the setting.

These settings will be stored in the document as bookmarks compatible with other screen readers such as JAWS. This means that users of other screen readers who open this document at a later date will automatically have the row and column headers already set.

11.1.2. Browse Mode in Microsoft Word

Similar to the web, Browse mode can be used in Microsoft Word to allow you to use features such as Quick navigation and the Elements List. To toggle Browse mode on and off in Microsoft Word, press NVDA+space. For further information about Browse mode and Quick Navigation, see the Browse Mode section.

11.1.2.1. The Elements List

While in Browse mode in Microsoft Word, you can access the Elements List by pressing NVDA+f7. The Elements List can list headings, links, annotations (which includes comments and track changes) and errors (currently limited to spelling errors).

11.1.3. Reporting Comments

To report any comments at the current caret position, press NVDA+alt+c. All comments for the document, along with other tracked changes, can also be listed in the NVDA Elements List when selecting Annotations as the type.

11.2. Microsoft Excel

11.2.1. Automatic Column and Row Header Reading

NVDA is able to automatically announce appropriate row and column headers when navigating around Excel worksheets. This firstly requires that the Report Table row / column headers option in NVDA's Document Formatting settings, found in the NVDA Settings dialog, be turned on. Secondly, NVDA needs to know which row or column contains the headers. After moving to the first cell in the column or row containing the headers, use one of the following commands:

Name	Key	Description
Set column headers	NVDA+shift+c	Pressing this once tells NVDA this is the first header cell in the row that contains column headers, which should be automatically announced when moving between columns below this row. Pressing twice will clear the setting.
Set row headers	NVDA+shift+r	Pressing this once tells NVDA this is the first header cell in the column that contains row headers, which should be automatically announced when moving between rows after this column. Pressing twice will clear the setting.

These settings will be stored in the workbook as defined name ranges compatible with other screen readers such as JAWS. This means that users of other screen readers who open this workbook at a later date will automatically have the row and column headers already set.

11.2.2. The Elements List

Similar to the web, NVDA has an Elements List for Microsoft Excel that allows you to list and access several different types of information. To access the Elements List in Excel, press NVDA+f7. The various types of information available in the Elements List are:

- Charts: This lists all charts in the active worksheet. Selecting a chart and pressing enter or the Move to button focuses the chart for navigating and reading with the arrow keys.
- Comments: This lists all cells in the active worksheet containing comments. The cell address along with its comments are shown for each cell. Pressing enter or the Move To button when on a listed comment will move directly to that cell.
- Formulas: This lists all cells in the worksheet containing a formula. The cell address along with its formula are shown for each cell. Pressing

enter or the Move To button on a listed formula will move directly to that cell.

- Sheets: This lists all sheets in the workbook. Pressing f2 when on a listed sheet allows you to rename the sheet. Pressing enter or the Move To button while on the listed sheet will switch to that sheet.
- Form fields: This lists all form fields in the active worksheet. For each form field, the Elements List shows the alternative text of the field along with the addresses of the cells it covers. Selecting a form field and pressing enter or the Move to button moves to that field in browse mode.

11.2.3. Reporting Notes

To report any notes for the currently focused cell, press NVDA+alt+c. In Microsoft 2016, 365 and newer, the classic comments in Microsoft Excel have been renamed to "notes". All notes for the worksheet can also be listed in the NVDA Elements List after pressing NVDA+f7.

NVDA can also display a specific dialog for adding or editing a certain note. NVDA overrides the native MS Excel notes editing region due to accessibility constraints, but the key stroke for displaying the dialog is inherited from MS Excel and therefore works also without NVDA running. To add or edit a certain note, in a focused cell, press shift+f2.

This key stroke does not appear and cannot be changed in NVDA's input gesture dialog.

Note: it is possible to open the note editing region in MS Excel also from the context menu of any cell of the work sheet. However, this will open the inaccessible note editing region and not the NVDA specific note editing dialog.

In Microsoft Office 2016, 365 and newer, a new style comment dialog has been added. This dialog is accessible and provides more features such as replying to comments, etc. It can also be opened from the context menu of a certain cell. The comments added to the cells via the new style comment dialog are not related to "notes".

11.2.4. Reading Protected Cells

If a workbook has been protected, it may not be possible to move focus to particular cells that have been locked for editing. To allow moving to locked cells, switch to Browse Mode by pressing NVDA+space, and then use standard Excel movement commands such as the arrow keys to move around all cells on the current worksheet.

11.2.5. Form Fields

Excel worksheets can include form fields. You can access these using the Elements List or the f and shift+f form field single letter navigation keys. Once you move to a form field in browse mode, you can press enter or space to either activate it or switch to focus mode so you can interact with it, depending on the control. For further information about Browse mode and single letter navigation, see the Browse Mode section.

11.3. Microsoft PowerPoint

Name	Key	Description
Toggle speaker notes reading	control+shift+s	When in a running slide show, this command will toggle between the speaker notes for the slide and the content for the slide. This only affects what NVDA reads, not what is displayed on screen.

11.4. foobar2000

Name	Key	Description
Report remaining time	control+shift+r	Reports the remaining time of the currently playing track, if any.
Report elapsed time	control+shift+e	Reports the elapsed time of the currently playing track, if any.
Report track length	control+shift+t	Reports the length of the currently playing track, if any.

Note: The above shortcuts work only with the default formatting string for foobar's status line.

11.5. Miranda IM

Name	Key	Description
Report recent message	NVDA+control+1-4	Reports one of the recent messages, depending on the number pressed; e.g. NVDA+control+2 reads the second most recent message.

11.6. Poedit

Name	Key	Description
Report Comments Window	control+shift+c	Reports any comments in the comments window.

Report notes for translators	control+shift+a	Reports any notes for translators.

11.7. Kindle for PC

NVDA supports reading and navigating books in Amazon Kindle for PC. This functionality is only available in Kindle books designated with "Screen Reader: Supported" which you can check on the details page for the book.

Browse mode is used to read books. It is enabled automatically when you open a book or focus the book area. The page will be turned automatically as appropriate when you move the cursor or use the say all command. You can manually turn to the next page with the pageDown key and turn to the previous page with the pageUp key.

Single letter navigation is supported for links and graphics, but only within the current page. Navigating by link also includes footnotes.

NVDA provides early support for reading and interactive navigation of mathematical content for books with accessible math. Please see the Reading Mathematical Content section for further information.

11.7.1. Text Selection

Kindle allows you to perform various functions on selected text, including obtaining a dictionary definition, adding notes and highlights, copying the text to the clipboard and searching the web. To do this, first select text as you normally would in browse mode; e.g. by using shift and the cursor keys. Once you have selected text, press the applications key or shift+f10 to show the available options for working with the selection. If you do this with no text selected, options will be shown for the word at the cursor.

11.7.2. User Notes

You can add a note regarding a word or passage of text. To do this, first select the relevant text and access the selection options as described above. Then, choose Add Note.

When reading in browse mode, NVDA refers to these notes as comments.

To view, edit or delete a note:

1. Move the cursor to the text containing the note.
2. Access the options for the selection as described above.

3. Choose Edit Note.

11.8. Azardi

When in the table view of added books:

Name	Key	Description
Enter	enter	Opens the selected book.
Context menu	applications	Opens the context menu for the selected book.

11.9. Windows Console

NVDA provides support for the Windows command console used by Command Prompt, PowerShell, and the Windows Subsystem for Linux. The console window is of fixed size, typically much smaller than the buffer that holds the output. As new text is written, the content scroll upwards and previous text is no longer visible. Text that is not visibly displayed in the window is not accessible with NVDA's text review commands. Therefore, it is necessary to scroll the console window to read earlier text. The following built-in Windows Console keyboard shortcuts may be useful when reviewing text with NVDA:

Name	Key	Description
Scroll up	control+upArrow	Scrolls the console window up, so earlier text can be read.
Scroll down	control+downArrow	Scrolls the console window down, so later text can be read.
Scroll to start	control+home	Scrolls the console window to the beginning of the buffer.
Scroll to end	control+end	Scrolls the console window to the end of the buffer.

12. Configuring NVDA

Most configuration can be performed using dialog boxes accessed through the Preferences sub-menu of the NVDA menu. Many of these settings can be found in the multi-page NVDA Settings dialog. In all dialog boxes, press the OK button to accept any changes you have made. To cancel any changes, press the Cancel button or the escape key. For certain dialogs, you can press the Apply button to let the settings take effect immediately without closing the

dialog. Some settings can also be changed using shortcut keys, which are listed where relevant in the sections below.

12.1. NVDA Settings

The NVDA Settings dialog contains many configuration parameters that can be changed. This dialog contains a list with several categories of settings to choose from. When you select a category, several settings related to this category will be shown in this dialog. These settings can be applied using the apply button, in which case the dialog will stay open. If you want to save your settings and close the NVDA Settings dialog, you can use the OK button.

Some settings categories have dedicated shortcut keys. If pressed, the shortcut key will open the NVDA Settings dialog in that particular category. By default, not all categories can be accessed with keyboard commands. If you wish to access categories which do not have dedicated shortcut keys, use the Input Gestures dialog to add a custom gesture such as a keyboard command or touch gesture for that category.

The settings categories found in the NVDA Settings dialog will be outlined below.

12.1.1. General (NVDA+control+g)

The General category of the NVDA Settings dialog sets NVDA's overall behaviour such as interface language and whether or not it should check for updates. This category contains the following options:

Language

This is a combo box which allows you to select the language that NVDA's user interface and messages should be shown in. There are many languages, however the default option is "User Default, Windows". This option tells NVDA to use the language that Windows is currently set to.

Please note that NVDA must be restarted when changing the language. When the confirmation dialog appears, select "restart now" or "restart later" if you wish to use the new language now or at a later time, respectively. If "restart later" is selected, the configuration must be saved (either manually or using the save on exit functionality).

Save configuration on exit

This option is a checkbox that, when checked, tells NVDA to automatically save the current configuration when you exit NVDA.

Show exit options when exiting NVDA

This option is a checkbox that allows you to choose whether or not a dialog appears when you exit NVDA that asks what action you want to perform. When checked, a dialog will appear when you attempt to exit NVDA asking whether you want to exit, restart, restart with add-ons disabled or install pending updates (if any). When unchecked, NVDA will exit immediately.

Play sounds when starting or exiting NVDA

This option is a checkbox that, when checked, tells NVDA to play sounds when it starts or exits.

Logging level

This is a combo box that lets you choose how much NVDA will log as it's running. Generally users should not need to touch this as not too much is logged. However, if you wish to provide information in a bug report, or enable or disable logging altogether, then it may be a useful option.

The available logging levels are:

- Disabled: Apart from a brief startup message, NVDA will not log anything while it runs.
- Info: NVDA will log basic information such as startup messages and information useful for developers.
- Debug warning: Warning messages that are not caused by severe errors will be logged.
- Input/output: Input from keyboard and braille displays, as well as speech and braille output will be logged.
  - If you are concerned about privacy, do not set the logging level to this option.
- Debug: In addition to info, warning, and input/output messages, additional debug messages will be logged.
  - Just like input/output, if you are concerned about privacy, you should not set the logging level to this option.

Start NVDA after I sign in

If this option is enabled, NVDA will start automatically as soon as you sign in to Windows. This option is only available for installed copies of NVDA.

Use NVDA during sign-in (requires administrator privileges)

If you sign in to Windows by providing a user name and password, then enabling this option will make NVDA start automatically at the sign-in screen

when Windows starts. This option is only available for installed copies of NVDA.

Use currently saved settings during sign-in and on secure screens (requires administrator privileges)

Pressing this button copies your currently saved NVDA user configuration to NVDA's system configuration directory, so that NVDA will use it during sign-in and when running on User Account Control (UAC) and other secure Windows screens. To make sure that all your settings are transferred, make sure to save your configuration first with control+NVDA+c or Save configuration in the NVDA menu. This option is only available for installed copies of NVDA.

Automatically check for updates to NVDA

If this is enabled, NVDA will automatically check for updated versions and inform you when an update is available. You can also manually check for updates by selecting Check for updates under Help in the NVDA menu. When manually or automatically checking for updates, it is necessary for NVDA to send some information to the update server in order to receive the correct update for your system. The following information is always sent:

- Current NVDA version
- Operating System version
- Whether the Operating System is 64 or 32 bit

Allow the NVDA project to gather NVDA usage statistics

If this is enabled, NV Access will use the information from update checks in order to track the number of NVDA users including particular demographics such as Operating system and country of origin. Note that although your IP address will be used to calculate your country during the update check, the IP address is never kept. Apart from the mandatory information required to check for updates, the following extra information is also currently sent:

- NVDA interface language
- Whether this copy of NVDA is portable or installed
- Name of the current speech synthesizer in use (including the name of the add-on the driver comes from)
- Name of the current Braille display in use (including the name of the add-on the driver comes from)
- The current output Braille table (if Braille is in use)

This information greatly aides NV Access to prioritize future development of NVDA.

Notify for pending updates on startup

If this is enabled, NVDA will inform you when there is a pending update on startup, offering you the possibility to install it. You can also manually install the pending update from the Exit NVDA dialog (if enabled), from the NVDA menu, or when you perform a new check from the Help menu.

12.1.2. Speech Settings (NVDA+control+v)

The Speech category in the NVDA Settings dialog contains options that lets you change the speech synthesizer as well as voice characteristics for the chosen synthesizer. For a quicker alternative way of controlling speech parameters from anywhere, please see the Synth Settings Ring section.

The Speech Settings category contains the following options:

Change synthesizer

The first option in the Speech Settings category is the Change... button. This button activates the Select Synthesizer dialog, which allows you to select the active speech synthesizer and output device. This dialog opens on top of the NVDA Settings dialog. Saving or dismissing the settings in the Select Synthesizer dialog will return you to the NVDA Settings dialog.

Voice

The Voice option is a combo box listing all the voices of the current synthesizer that you have installed. You can use the arrow keys to listen to all the various choices. Left and Up arrow take you up in the list, while right and down arrow move you down in the list.

Variant

If you are using the Espeak NG synthesizer which is packaged with NVDA, this is a combo box that allows you to select the Variant the synthesizer should speak with. ESpeak NG's Variants are rather like voices, as they provide slightly different attributes to the eSpeak NG voice. Some variants will sound like a male, some like a female, and some even like a frog. If using a third-party synthesizer, you may also be able to change this value if your chosen voice supports it.

Rate

This option allows you to change the rate of your voice. This is a slider that goes from 0 to 100 - 0 being the slowest, 100 being the fastest.

Rate boost

Enabling this option will significantly increase the speech rate, if supported by the current synthesizer.

Pitch

This option allows you to change the pitch of the current voice. It is a slider which goes from 0 to 100 - 0 being the lowest pitch and 100 being the highest.

Volume

This option is a slider which goes from 0 to 100 - 0 being the lowest volume and 100 being the highest.

Inflection

This option is a slider that lets you choose how much inflection (rise and fall in pitch) the synthesizer should use to speak with.

Automatic Language switching

This checkbox allows you to toggle whether NVDA should switch speech synthesizer languages automatically if the text being read specifies its language. This option is enabled by default.

Automatic Dialect switching

This checkbox allows you to toggle whether or not dialect changes should be made, rather than just actual language changes. For example, if reading in an English U.S. voice but a document specifies that some text is in English U.K., then the synthesizer will switch accents if this option is enabled. This option is disabled by default.

Punctuation/Symbol Level

Key: NVDA+p

This allows you to choose the amount of punctuation and other symbols that should be spoken as words. For example, when set to all, all symbols will be spoken as words. This option applies to all synthesizers, not just the currently active synthesizer.

Trust voice's language when processing characters and symbols

On by default, this option tells NVDA if the current voice's language can be trusted when processing symbols and characters. If you find that NVDA is

reading punctuation in the wrong language for a particular synthesizer or voice, you may wish to turn this off to force NVDA to use its global language setting instead.

Include Unicode Consortium data (including emoji) when processing characters and symbols

When this checkbox is checked, NVDA will include additional symbol pronunciation dictionaries when pronouncing characters and symbols. These dictionaries contain descriptions for symbols (particularly emoji) that are provided by the Unicode Consortium as part of their Common Locale Data Repository. If you want NVDA to speak descriptions of emoji characters based on this data, you should enable this option. However, if you are using a speech synthesizer that supports speaking emoji descriptions natively, you may wish to turn this off.

Note that manually added or edited character descriptions are saved as part of your user settings. Therefore, if you change the description of a particular emoji, your custom description will be spoken for that emoji regardless of whether this option is enabled. You can add, edit or remove symbol descriptions in NVDA's punctuation/symbol pronunciation dialog.

To toggle Unicode Consortium data inclusion from anywhere, please assign a custom gesture using the Input Gestures dialog.

Capital pitch change percentage

This edit field allows you to type the amount that the pitch of the voice will change when speaking a capital letter. This value is a percentage, where a negative value lowers the pitch and a positive value raises it. For no pitch change you would use 0. Usually, NVDA raises the pitch slightly for any capital letter, but some synthesizers may not support this well. In case pitch change for capitals is not supported, consider Say "cap" before capitals and/or Beep for capitals instead.

Say "cap" before capitals

This setting is a checkbox that, when checked, tells NVDA to say the word "cap" before any capital letter when spoken as an individual character such as when spelling.

Beep for capitals

If this checkbox is checked, NVDA will make a small beep each time it encounters a capitalized character by itself.

Use spelling functionality if supported

Some words consist of only one character, but the pronunciation is different depending on whether the character is being spoken as an individual character (such as when spelling) or a word. For example, in English, "a" is both a letter and a word and is pronounced differently in each case. This option allows the synthesizer to differentiate between these two cases if the synthesizer supports this. Most synthesizers do support it.

This option should generally be enabled. However, some Microsoft Speech API synthesizers do not implement this correctly and behave strangely when it is enabled. If you are having problems with the pronunciation of individual characters, try disabling this option.

12.1.3. Select Synthesizer (NVDA+control+s)

The Synthesizer dialog, which can be opened by activating the Change... button in the speech category of the NVDA settings dialog, allows you to select which Synthesizer NVDA should use to speak with. Once you have selected your synthesizer of choice, you can press Ok and NVDA will load the selected Synthesizer. If there is an error loading the synthesizer, NVDA will notify you with a message, and continue using the previous synthesizer.

Synthesizer

This option allows you to choose the synthesizer you wish NVDA to use for speech output.

For a list of the Synthesizers that NVDA supports, please see the Supported Speech Synthesizers section.

One special item that will always appear in this list is "No speech", which allows you to use NVDA with no speech output whatsoever. This may be useful for someone who wishes to only use NVDA with braille, or perhaps to sighted developers who only wish to use the Speech Viewer.

Output device

This option allows you to choose the audio device that NVDA should instruct the selected synthesizer to speak through.

Audio Ducking Mode

Key: NVDA+shift+d

On Windows 8 and above, this option allows you to choose if NVDA should lower the volume of other applications while NVDA is speaking, or all the time while NVDA is running.

- No Ducking: NVDA will never lower the volume of other audio.
- Duck when outputting speech and sounds: NVDA will only lower the volume of other audio when NVDA is speaking or playing sounds. This may not work for all synthesizers.
- Always duck: NVDA will keep the volume of other audio lower the whole time NVDA is running.

This option is only available if NVDA has been installed. It is not possible to support audio ducking for portable and temporary copies of NVDA.

12.1.4. Synth settings ring

If you wish to quickly change speech settings without going to the Speech category of the NVDA settings dialog, there are some NVDA key commands that allow you to move through the most common speech settings from anywhere while running NVDA:

Name	Desktop key	Laptop key	Description
Move to next synth setting	NVDA+control+rightArrow	NVDA+shift+control+rightArrow	Moves to the next available speech setting after the current, wrapping around to the first setting again after the last
Move to previous synth setting	NVDA+control+leftArrow	NVDA+shift+control+leftArrow	Moves to the next available speech setting before the current, wrapping around to the last setting after the first
Increment current synth setting	NVDA+control+upArrow	NVDA+shift+control+upArrow	increases the current speech setting you

			are on. E.g. increases the rate, chooses the next voice, increases the volume
Decrement current synth setting	NVDA+control+downArrow	NVDA+shift+control+downArrow	decreases the current speech setting you are on. E.g. decreases the rate, chooses the previous voice, decreases the volume

12.1.5. Braille

The Braille category in the NVDA Settings dialog contains options that let you change several aspects of braille input and output. This category contains the following options:

Change braille display

The Change... button in the Braille category of the NVDA Settings dialog activates the [Select Braille Display](#) dialog, which allows you to select the active braille display. This dialog opens on top of the NVDA Settings dialog. Saving or dismissing the settings in the Select Braille Display dialog will return you to the NVDA Settings dialog.

Output Table

The next option you will come to in this category is the braille output table combo box. In this combo box, you will find braille tables for different languages, braille standards and grades. The chosen table will be used to translate text into braille to be presented on your braille display. You can move from braille table to braille table in the list by using the arrow keys.

Input Table

Complementary to the previous option, the next setting you will find is the braille input table combo box. The chosen table will be used to translate braille

entered on your braille display's Perkins-style keyboard into text. You can move from braille table to braille table in the list by using the arrow keys.

Note that this option is only useful if your braille display has a Perkins-style keyboard and this feature is supported by the braille display driver. If input is not supported on a display which does have a braille keyboard, this will be noted in the Supported Braille Displays section.

Expand to computer braille for the word at the cursor

This option allows the word that is under the cursor to be displayed in non-contracted computer braille.

Show Cursor

This option allows the braille cursor to be turned on and off. It applies to the system caret and review cursor, but not to the selection indicator.

Blink Cursor

This option allows the braille cursor to blink. If blinking is turned off, the braille cursor will constantly be in the "up" position. The selection indicator is not affected by this option, it is always dots 7 and 8 without blinking.

Cursor Blink Rate (ms)

This option is a numerical field that allows you to change the blink rate of the cursor in milliseconds.

Cursor Shape for Focus

This option allows you to choose the shape (dot pattern) of the braille cursor when braille is tethered to focus. The selection indicator is not affected by this option, it is always dots 7 and 8 without blinking.

Cursor Shape for Review

This option allows you to choose the shape (dot pattern) of the braille cursor when braille is tethered to review. The selection indicator is not affected by this option, it is always dots 7 and 8 without blinking.

Show Messages

This is a combobox that allows you to select if NVDA should display braille messages and when they should disappear automatically.

Message Timeout (sec)

This option is a numerical field that controls how long NVDA messages are displayed on the braille display. The NVDA message is imediately dismissed when pressing a routing key on the braille display, but appears again when pressing a corresponding key which triggers the message. This option is shown only if "Show Messages" is set to "Use timeout".

Tether Braille

Key: NVDA+control+t

This option allows you to choose whether the braille display will follow the system focus / caret, the navigator object / review cursor, or both. When "automatically" is selected, NVDA will follow the system focus and caret by default. In this case, when the navigator object or the review cursor position is changed by means of explicit user interaction, NVDA will tether to review temporarily, until the focus or the caret changes. If you want it to follow the focus and caret only, you need to configure braille to be tethered to focus. In this case, braille will not follow the NVDA navigator during object navigation or the review cursor during review. If you want braille to follow object navigation and text review instead, you need to configure braille to be tethered to review. In this case, Braille will not follow system focus and system caret.

Read by Paragraph

If enabled, braille will be displayed by paragraphs instead of lines. Also, the next and previous line commands will move by paragraph accordingly. This means that you do not have to scroll the display at the end of each line even where more text would fit on the display. This may allow for more fluent reading of large amounts of text. It is disabled by default.

Avoid splitting words when possible

If this is enabled, a word which is too large to fit at the end of the braille display will not be split. Instead, there will be some blank space at the end of the display. When you scroll the display, you will be able to read the entire word. This is sometimes called "word wrap". Note that if the word is too large to fit on the display even by itself, the word must still be split.

If this is disabled, as much of the word as possible will be displayed, but the rest will be cut off. When you scroll the display, you will then be able to read the rest of the word.

Enabling this may allow for more fluent reading, but generally requires you to scroll the display more.

Focus context presentation

This option allows you to choose what context information NVDA will show on the braille display when an object gets focus. Context information refers to the hierarchy of objects containing the focus. For example, when you focus a list item, this list item is part of a list. This list might be contained by a dialog, etc. Please consult the section about object navigation for more information about the hierarchy that applies to objects in NVDA.

When set to fill display for context changes, NVDA will try to display as much context information as possible on the braille display, but only for the parts of the context that have changed. For the example above, this means that when changing focus to the list, NVDA will show the list item on the braille display. Furthermore, if there is enough space left on the braille display, NVDA will try to show that the list item is part of a list. If you then start moving through the list with your arrow keys, it is assumed that you are aware that you are still in the list. Thus, for the remaining list items you focus, NVDA will only show the focused list item on the display. In order for you to read the context again (i.e. that you are in a list and that the list is part of a dialog), you will have to scroll your braille display back.

When this option is set to always fill the display, NVDA will try to show as much context information as possible on the braille display, regardless of whether you have seen the same context information before. This has the advantage that NVDA will fit as much information as possible on the display. However, the downside is that there is always a difference in the position where the focus starts on the braille display. This can make it difficult to skim a long list of items, for example, as you will need to continually move your finger to find the start of the item. This was the default behaviour for NVDA 2017.2 and before.

When you set the focus context presentation option to only show the context information when scrolling back, NVDA never shows context information on your braille display by default. Thus, in the example above, NVDA will display that you focused a list item. However, in order for you to read the context (i.e. that you are in a list and that the list is part of a dialog), you will have to scroll your braille display back.

To toggle focus context presentation from anywhere, please assign a custom gesture using the Input Gestures dialog.

12.1.6. Select Braille Display (NVDA+control+a)

The Select Braille Display dialog, which can be opened by activating the Change... button in the Braille category of the NVDA settings dialog, allows you to select which Braille display NVDA should use for braille output. Once you have selected your braille display of choice, you can press Ok and NVDA will load the selected display. If there is an error loading the display driver, NVDA will notify you with a message, and continue using the previous display, if any.

Braille Display

This combo box presents you with several options depending on what braille display drivers are available on your system. Move between these options with the arrow keys.

The automatic option will allow NVDA to search for many supported braille displays in the background. When this feature is enabled and you connect a supported display using USB or bluetooth, NVDA will automatically connect with this display.

No braille means that you are not using braille.

Please see the Supported Braille Displays section for more information about supported braille displays and which of these support automatic detection in the background.

Port

This option, if available, allows you to choose what port or type of connection will be used to communicate with the braille display you have selected. It is a combo box containing the possible choices for your braille display.

By default, NVDA employs automatic port detection, which means the connection with the braille device will be established automatically by scanning for available USB and bluetooth devices on your system. However, for some braille displays, you may be able to explicitly choose what port should be used. Common options are "Automatic" (which tells NVDA to employ the default automatic port selection procedure), "USB", "Bluetooth" and legacy serial communication ports if your braille display supports this type of communication.

This option won't be available if your braille display only supports automatic port detection.

You may consult the documentation for your braille display in the section Supported Braille Displays to check for more details on the supported types of communication and available ports.

Please note: If you connect multiple Braille Displays to your machine at the same time which use the same driver (E.g. connecting two Seika displays), it is currently impossible to tell NVDA which display to use. Therefore it is recommended to only connect one Braille Display of a given type / manufacturer to your machine at a time.

12.1.7. Vision

The Vision category in the NVDA Settings dialog allows you to enable, disable and configure visual aids.

Note that the available options in this category could be extended by NVDA add-ons. By default, this settings category contains the following options:

Visual Highlight

The check boxes in the Visual Highlight grouping control the behaviour of NVDA's built-in Visual Highlight facility.

- Enable Highlighting: Toggles Visual Highlight on and off.
- Highlight system focus: toggles whether the system focus will be highlighted.
- Highlight navigator object: toggles whether the navigator object will be highlighted.
- Highlight browse mode cursor: Toggles whether the virtual browse mode cursor will be highlighted.

Note that checking and unchecking the "Enable Highlighting" check box wil also change the state of the tree other check boxes accordingly. Therefore, if "Enable Highlighting" is off and you check this check box, the other tree check boxes will also be checked automatically. If you only want to highlight the focus and leave the navigator object and browse mode check boxes unchecked, the state of the "Enable Highlighting" check box will be half checked.

Screen Curtain

You can enable the Screen Curtain by checking the "Make screen black (immediate effect)" check box. A warning that your screen will become black after activation will be displayed. Before continuing (selecting "Yes"), ensure you have enabled speech / braille and will be able to control your computer

without the use of the screen. Select "No" if you no longer wish to enable the Screen Curtain. If you are sure, you can choose the Yes button to enable the screen curtain. If you no longer want to see this warning message every time, you can change this behaviour in the dialog that displays the message. You can always restore the warning by checking the "Always show a warning when loading Screen Curtain" check box next to the "Make screen black" check box.

To toggle the Screen Curtain from anywhere, please assign a custom gesture using the Input Gestures dialog.

By default, sounds are played when the Screen Curtain is toggled. When you want to change this behaviour, you can uncheck the "Play sound when toggling Screen Curtain" check box.

Settings for third party visual aids

Additional vision enhancement providers can be provided in NVDA add-ons. When these providers have adjustable settings, they will be shown in this settings category in separate groupings. For the supported settings per provider, please refer to the documentation for that provider.

12.1.8. Keyboard (NVDA+control+k)

The Keyboard category in the NVDA Settings dialog contains options that set how NVDA behaves as you use and type on your keyboard. This settings category contains the following options:

Keyboard layout

This combo box lets you choose what type of keyboard layout NVDA should use. Currently the two that come with NVDA are Desktop and Laptop.

Select NVDA Modifier Keys

The checkboxes in this list control what keys can be used as NVDA modifier keys. The following keys are available to choose from:

- The Caps Lock key
- The insert key on the number pad
- The extended insert key (usually found above the arrow keys, near home and end)

If no key is chosen as the NVDA key it may be impossible to access certain NVDA commands. Therefore, The NVDA settings dialog will display an error

message if all keys are unselected when pressing Ok or Apply. After dismissing the error message, you must select at least one before being able to press Ok to dismiss the dialog properly.

Speak Typed Characters

Key: NVDA+2

When enabled, NVDA will announce all characters you type on the keyboard.

Speak Typed Words

Key: NVDA+3

When enabled, NVDA will announce all words you type on the keyboard.

Speech interrupt for typed characters

If on, this option will cause speech to be interrupted each time a character is typed. This is on by default.

Speech interrupt for Enter key

If on, this option will cause speech to be interrupted each time the Enter key is pressed. This is on by default.

Allow skim reading in Say All

If on, certain navigation commands (such as quick navigation in browse mode or moving by line or paragraph) do not stop Say All, rather Say All jumps to the new position and continues reading.

Beep if Typing Lowercase Letters when Caps Lock is On

When enabled, a warning beep will be heard if a letter is typed with the shift key while Caps Lock is on. Generally, typing shifted letters with Caps Lock is unintentional and is usually due to not realizing that Caps Lock is enabled. Therefore, it can be quite helpful to be warned about this.

Speak Command Keys

Key: NVDA+4

When enabled, NVDA will announce all non-character keys you type on the keyboard. This includes key combinations such as control plus another letter.

Play sound for spelling errors while typing

When enabled, a short buzzer sound will be played when a word you type contains a spelling error. This option is only available if reporting of spelling errors is enabled in NVDA's Document Formatting Settings, found in the NVDA Settings dialog.

Handle keys from other applications

This option allows the user to control if key presses generated by applications such as on-screen keyboards and speech recognition software should be processed by NVDA. This option is on by default, though certain users may wish to turn this off, such as those typing Vietnamese with the UniKey typing software as it will cause incorrect character input.

12.1.9. Mouse (NVDA+control+m)

The Mouse category in the NVDA Settings dialog allows NVDA to track the mouse, play mouse coordinate beeps and sets other mouse usage options. This category contains the following options:

Report Mouse Shape Changes

A checkbox, that when checked means that NVDA will announce the shape of the mouse pointer each time it changes. The mouse pointer in Windows changes shape to convey certain information such as when something is editable, or when something is loading etc.

Enable mouse tracking

Key: NVDA+m

When enabled, NVDA will announce the text currently under the mouse pointer, as you move it around the screen. This allows you to find things on the screen, by physically moving the mouse, rather than trying to find them through object navigation.

Text unit resolution

If NVDA is set to announce the text under the mouse as you move it, this option allows you to choose exactly how much text will be spoken. The options are character, word, line and paragraph.

To toggle text unit resolution from anywhere, please assign a custom gesture using the Input Gestures dialog.

Report role when mouse enters object

If this checkbox is checked, NVDA will announce the role (type) of object as the mouse moves inside it.

Play audio coordinates when mouse moves

Checking this checkbox makes NVDA play beeps as the mouse moves, so that the user can work out where the mouse is in regards to the dimensions of the screen. The higher the mouse is on the screen, the higher the pitch of the beeps. The further left or right the mouse is located on the screen, the further left or right the sound will be played (assuming the user has stereo speakers or headphones).

Brightness controls audio coordinates volume

If the "play audio coordinates when mouse moves" checkbox is checked, then checking this checkbox means that the volume of the audio coordinates beeps is controlled by how bright the screen is under the mouse. This setting is unchecked by default.

Ignore mouse input from other applications

This option allows the user to ignore mouse events (including mouse movement and button presses) generated by other applications such as TeamViewer and other remote control software. This option is unchecked by default. If you check this option and you have the "Enable mouse tracking" option enabled, NVDA will not announce what is under the mouse if the mouse is moved by another application.

12.1.10. Touch Interaction

This settings category, only available on computers running Windows 8 and later with touch capabilities, allows you to configure how NVDA interacts with touchscreens. This category contains the following options:

Enable touch interaction support

This checkbox enables NVDA's touch interaction support. If enabled, you can use your fingers to navigate and interact with items on screen using a touchscreen device. If disabled, touchscreen support will be disabled as though NVDA is not running. This setting can also be toggled using NVDA+control+alt+t.

Touch typing mode

This checkbox allows you to specify the method you wish to use when entering text using the touch keyboard. If this checkbox is checked, when you

locate a key on the touch keyboard, you can lift your finger and the selected key will be pressed. If this is unchecked, you need to double-tap on the key of the touch keyboard to press the key.

12.1.11. Review Cursor

The Review Cursor category in the NVDA Settings dialog is used to configure NVDA's review cursor behaviour. This category contains the following options:

Follow System Focus

Key: NVDA+7

When enabled, The review cursor will always be placed in the same object as the current system focus whenever the focus changes.

Follow System Caret

Key: NVDA+6

When enabled, the review cursor will automatically be moved to the position of the System caret each time it moves.

Follow mouse cursor

When enabled, the review cursor will follow the mouse as it moves.

Simple Review mode

When enabled, NVDA will filter the hierarchy of objects that can be navigated to exclude objects that aren't of interest to the user; e.g. invisible objects and objects used only for layout purposes.

To toggle simple review mode from anywhere, please assign a custom gesture using the Input Gestures dialog.

12.1.12. Object Presentation (NVDA+control+o)

The Object Presentation category in the NVDA Settings dialog is used to set how much information NVDA will present about controls such as description, position information and so on. These options don't typically apply to browse mode. These options typically apply to focus reporting and NVDA object navigation, but not reading text content e.g. browse mode.

Report tooltips

A checkbox that when checked tells NVDA to report tooltips as they appear. Many Windows and controls show a small message (or tooltip) when you move the mouse pointer over them, or sometimes when you move the focus to them.

Report notifications

This checkbox, when checked, tells NVDA to report help balloons and toast notifications as they appear.

- Help Balloons are like tooltips, but are usually larger in size, and are associated with system events such as a network cable being unplugged, or perhaps to alert you about Windows security issues.
- Toast notifications have been introduced in Windows 10 and appear in the notification centre in the system tray, informing about several events (i.e. if an update has been downloaded, a new e-mail arrived in your inbox, etc.).

Report Object Shortcut Keys

When this checkbox is checked, NVDA will include the shortcut key that is associated with a certain object or control when it is reported. For example the File menu on a menu bar may have a shortcut key of alt+f.

Report object position information

This option lets you choose whether you wish to have an object's position (e.g. 1 of 4) reported when moving to the object with the focus or object navigation.

Guess Object Position Information when unavailable

If reporting of object position information is turned on, this option allows NVDA to guess object position information when it is otherwise unavailable for a particular control.

When on, NVDA will report position information for more controls such as menus and toolbars, however this information may be slightly inaccurate.

Report Object descriptions

Uncheck this checkbox if you don't wish to have the description reported along with objects (i.e. search suggestions, reporting of whole dialog window right after the dialog opens, etc.).

Progress bar output

Key: NVDA+u

This option controls how NVDA reports progress bar updates to you.

It has the following options:

- Off: Progress bars will not be reported as they change.
- Speak: This option tells NVDA to speak the progress bar in percentages. Each time the progress bar changes, NVDA will speak the new value.
- Beep: This tells NVDA to beep each time the progress bar changes. The higher the beep, the closer the progress bar is to completion.
- Beep and speak: This option tells NVDA to both beep and speak when a progress bar updates.

Report background progress bars

This is an option that, when checked, tells NVDA to keep reporting a progress bar, even if it is not physically in the foreground. If you minimize or switch away from a window that contains a progress bar, NVDA will keep track of it, allowing you to do other things while NVDA tracks the progress bar.

Report dynamic content changes

Key: NVDA+5

Toggles the announcement of new content in particular objects such as terminals and the history control in chat programs.

Play a sound when auto-suggestions appear

Toggles announcement of appearance of auto-suggestions, and if enabled, NVDA will play a sound to indicate this. Auto-suggestions are lists of suggested entries based on text entered into certain edit fields and documents. For example, when you enter text into the search box in Start menu in Windows Vista and later, Windows displays a list of suggestions based on what you typed. For some edit fields such as search fields in various Windows 10 apps, NVDA can notify you that a list of suggestions has appeared when you type text. The auto-suggestions list will close once you move away from the edit field, and for some fields, NVDA can notify you of this when this happens.

12.1.13. Input Composition

The Input Composition category allows you to control how NVDA reports the input of Asian characters, such as with IME or Text Service input methods. Note that due to the fact that input methods vary greatly by available features and by how they convey information, it will most likely be necessary to configure these options differently for each input method to get the most efficient typing experience.

Automatically report all available candidates

This option, which is on by default, allows you to choose whether or not all visible candidates should be reported automatically when a candidate list appears or its page is changed. Having this option on for pictographic input methods such as Chinese New ChangJie or Boshiami is useful, as you can automatically hear all symbols and their numbers and you can choose one right away. However, for phonetic input methods such as Chinese New Phonetic, it may be more useful to turn this option off, as all the symbols will sound the same and you will have to use the arrow keys to navigate the list items individually to gain more information from the character descriptions for each candidate.

Announce Selected Candidate

This option, which is on by default, allows you to choose whether NVDA should announce the selected candidate when a candidate list appears or when the selection is changed. For input methods where the selection can be changed with the arrow keys (such as Chinese New Phonetic) this is necessary, but for some input methods it may be more efficient typing with this option turned off. Note that even with this option off, the review cursor will still be placed on the selected candidate allowing you to use object navigation / review to manually read this or other candidates.

Always include short character descriptions for candidates

This option, which is on by default, allows you to choose whether or not NVDA should provide a short description for each character in a candidate, either when it's selected or when it's automatically read when the candidate list appears. Note that for locales such as Chinese, the announcement of extra character descriptions for the selected candidate is not affected by this option. This option may be useful for Korean and Japanese input methods.

Report changes to the reading string

Some input methods such as Chinese New Phonetic and New ChangJie have a reading string (sometimes known as a precomposition string). You can choose whether or not NVDA should announce new characters being typed

into this reading string with this option. This option is on by default. Note some older input methods such as Chinese ChangJie may not use the reading string to hold precomposition characters, but instead use the composition string directly. Please see the next option for configuring reporting of the composition string.

Report changes to the composition string

After reading or precomposition data has been combined into a valid pictographic symbol, most input methods place this symbol into a composition string for temporary storage along with other combined symbols before they are finally inserted into the document. This option allows you to choose whether or not NVDA should report new symbols as they appear in the composition string. This option is on by default.

12.1.14. Browse Mode (NVDA+control+b)

The Browse Mode category in the NVDA Settings dialog is used to configure NVDA's behaviour when you read and navigate complex documents such as web pages. This category contains the following options:

Maximum Number of Characters on One Line

This field sets the maximum length of a line in browse mode (in characters).

Maximum Lines Per Page

This field sets the amount of lines you will move by when pressing page up or page down while in browse mode.

Use screen layout

Key: NVDA+v

This option allows you to specify whether content in browse mode should place content such as links and other fields on their own line, or if it should keep them in the flow of text as it is visually shown. If the option is enabled then things will stay as they are visually shown, but if it is disabled then fields will be placed on their own line.

Enable browse mode on page load

This checkbox toggles whether browse mode should be automatically enabled when loading a page. When this option is disabled, browse mode can still be manually activated on pages or in documents where browse mode is supported. See the Browse Mode section for a list of applications supported by

browse mode. Note that this option does not apply to situations where browse mode is always optional, e.g. in Microsoft Word. This option is enabled by default.

Automatic Say All on page load

This checkbox toggles the automatic reading of a page after it loads in browse mode. This option is enabled by default.

Include layout tables

This option affects how NVDA handles tables used purely for layout purposes. When on, NVDA will treat these as normal tables, reporting them based on Document Formatting Settings and locating them with quick navigation commands. When off, they will not be reported nor found with quick navigation. However, the content of the tables will still be included as normal text. This option is turned off by default.

To toggle inclusion of layout tables from anywhere, please assign a custom gesture using the Input Gestures dialog.

Configuring reporting of fields such as links and headings

Please see the options in the Document Formatting category of the NVDA Settings dialog to configure the fields that are reported when navigating, such as links, headings and tables.

Automatic focus mode for focus changes

This option allows focus mode to be invoked if focus changes. For example, when on a web page, if you press tab and you land on a form, if this option is checked, focus mode will automatically be invoked.

Automatic focus mode for caret movement

This option, when checked, allows NVDA to enter and leave focus mode when using arrow keys. For example, if arrowing down a web page and you land on an edit box, NVDA will automatically bring you into focus mode. If you arrow out of the edit box, NVDA will put you back in browse mode.

Audio indication of Focus and Browse modes

If this option is enabled, NVDA will play special sounds when it switches between browse mode and focus mode, rather than speaking the change.

Trap non-command gestures from reaching the document

Enabled by default, this option allows you to choose if gestures (such as key presses) that do not result in an NVDA command and are not considered to be a command key in general, should be trapped from going through to the document you are currently focused on. As an example, if enabled and the letter j was pressed, it would be trapped from reaching the document, even though it is not a quick navigation command nor is it likely to be a command in the application itself. In this case NVDA will tell Windows to play a default sound whenever a key which gets trapped is pressed.

Automatically set system focus to focusable elements

Key: NVDA+8

Disabled by default, this option allows you to choose if the system focus should automatically be set to elements that can take the system focus (links, form fields, etc.) when navigating content with the browse mode caret. Leaving this option disabled will not automatically focus focusable elements when they are selected with the browse mode caret. This might result in faster browsing experience and better responsiveness in browse mode. The focus will yet be updated to the particular element when interacting with it (e.g. pressing a button, checking a check box). Enabling this option may improve support for some websites at the cost of performance and stability.

12.1.15. Document Formatting (NVDA+control+d)

Most of the checkboxes in this category are for configuring what type of formatting you wish to have reported as you move the cursor around documents. For example, if you check the report font name checkbox, each time you arrow onto text with a different font, the name of the font will be announced.

The document formatting options are organized into groups. You can configure reporting of:

- Font
  - Font name
  - Font size
  - Font attributes
  - Superscripts and subscripts
  - Emphasis
  - Highlighted (Marked) text
  - Style
  - Colours
- Document information

- o Comments
- o Editor revisions
- o Spelling errors
- Pages and spacing
  - o Page numbers
  - o Line numbers
  - o Line indentation reporting (Off, Speech, Tones, Both Speech and Tones)
  - o Paragraph indentation (e.g. hanging indent, first line indent)
  - o Line spacing (single, double, etc.)
  - o Alignment
- Table information
  - o Tables
  - o Row/column headers
  - o Cell coordinates
  - o Cell borders (Off, Styles, Both Colours and Styles)
- Elements
  - o Headings
  - o Links
  - o Graphics
  - o Lists
  - o Block quotes
  - o Groupings
  - o Landmarks
  - o Articles
  - o Frames
  - o Clickable

To toggle these settings from anywhere, please assign custom gestures using the Input Gestures dialog.

Report formatting changes after the cursor

If enabled, this setting tells NVDA to try and detect all the formatting changes on a line as it reports it, even if doing this may slow down NVDA's performance.

By default, NVDA will detect the formatting at the position of the System caret / Review Cursor, and in some instances may detect formatting on the rest of the line, only if it is not going to cause a performance decrease.

Enable this option while proof reading documents in applications such as WordPad, where formatting is important.

Line indentation reporting

This option allows you to configure how indentation at the beginning of lines is reported. The Report line indentation with combo box has four options.

- Off: NVDA will not treat indentation specially.
- Speech: If speech is selected, when the amount of indentation changes, NVDA will say something like "twelve space" or "four tab."
- Tones: If Tones is selected, when the amount of indentation changes, tones indicate the amount of change in indent. The tone will increase in pitch every space, and for a tab, it will increase in pitch the equivalent of 4 spaces.
- Both Speech and Tones: This option reads indentation using both of the above methods.

12.1.16. Windows OCR Settings

The settings in this category allow you to configure Windows OCR. This category contains the following options:

Recognition language

This combo box allows you to choose the language to be used for text recognition.

12.1.17. Advanced Settings

Warning! The settings in this category are for advanced users and may cause NVDA to not function correctly if configured in the wrong way. Only make changes to these settings if you are sure you know what you are doing or if you have been specifically instructed to by an NVDA developer.

Making changes to advanced settings

In order to make changes to the advanced settings, the controls must be enabled by confirming, with the checkbox, that you understand the risks of modifying these settings

Restoring the default settings

The button restores the default values for the settings, even if the confirmation checkbox is not ticked. After changing settings you may wish to revert to the default values. This may also be the case if you are unsure if the settings have been changed.

Enable loading custom code from Developer Scratchpad Directory

When developing add-ons for NVDA, it is useful to be able to test code as you are writing it. This option when enabled, allows NVDA to load custom appModules, globalPlugins, brailleDisplayDrivers and synthDrivers, from a special developer scratchpad directory in your NVDA user configuration directory. Previously NVDA would load custom code directly from the user configuration directory, with no way of disabling this. This option is off by default, ensuring that no untested code is ever run in NVDA with out the user's explicit knowledge. If you wish to distribute custom code to others, you should package it as an NVDA add-on.

Open Developer Scratchpad Directory

This button opens the directory where you can place custom code while developing it. This button is only enabled if NVDA is configured to enable loading custom code from the Developer Scratchpad Directory.

Enable selective registration for UI Automation events and property changes

This option changes how NVDA registers for events fired by the Microsoft UI Automation accessibility API. When this option is disabled, NVDA registers for many UIA events that are processed and discarded within NVDA itself. This has a major negative impact on performance, especially in applications like Microsoft Visual Studio. Therefore, when this option is enabled, NVDA will limit event registration to the system focus for most events. If you suffer from performance issues in one or more applications, We recommend you to try this functionality to see whether performance improves.

Use UI automation to access Microsoft Word document controls when available

When this option is enabled, NVDA will try to use the Microsoft UI Automation accessibility API in order to fetch information from Microsoft Word document controls. This includes Microsoft Word itself, and also the Microsoft Outlook message viewer and composer. For the most recent versions of Microsoft Office 2016/365 running on Windows 10 and later, UI Automation support is complete enough to provide access to Microsoft Word documents almost equal to NVDA's existing Microsoft Word support, with the added advantage that responsiveness is majorly increased. However, There may be some information which is either not exposed, or exposed incorrectly in some versions of Microsoft Office, which means this UI automation support cannot always be relied upon. We still do not recommend that the majority of users turn this on by default, though we do welcome users of Office 2016/365 to test this feature and provide feedback.

Use UI Automation to access the Windows Console when available

When this option is enabled, NVDA will use a new, work in progress version of its support for Windows Console which takes advantage of accessibility improvements made by Microsoft. This feature is highly experimental and is still incomplete, so its use is not yet recommended. However, once completed, it is anticipated that this new support will become the default, improving NVDA's performance and stability in Windows command consoles.

Speak passwords in UIA consoles

This setting controls whether characters are spoken by speak typed characters or speak typed words in situations where the screen does not update (such as password entry) in the Windows Console with UI automation support enabled. For security purposes, this setting should be left disabled. However, you may wish to enable it if you experience performance issues or instability with typed character and/or word reporting while using NVDA's new experimental console support.

Use UIA with Microsoft Edge and other Chromium based browsers when available

Allows specifying when UIA will be used when it is available in Chromium based browsers such as Microsoft Edge. UIA support for Chromium based browsers is early in development and may not provide the same level of access as IA2. The combo box has the following options:

- Default (Only when necessary): The NVDA default, currently this is "Only when necessary". This default may change in the future as the technology matures.
- Only when necessary: When NVDA is unable to inject into the browser process in order to use IA2 and UIA is available, then NVDA will fall back to using UIA.
- Yes: If the browser makes UIA available, NVDA will use it.
- No: Don't use UIA, even if NVDA is unable to inject in process. This may be useful for developers debugging issues with IA2 and want to ensure that NVDA does not fall back to UIA.

Annotations

This group of options is used to enable features which add experimental support for ARIA annotations. Some of these features may be incomplete. The following options exist:

- "Report details in browse mode": enables reporting if an object has details in browse mode. Reporting the summary of those details can be done by assigning a gesture using the Input Gestures dialog.

- "Report aria-description always": When the source of `accDescription` is aria-description, the description is reported. This is useful for annotations on the web. Note:
  - There are many sources for `accDescription` several have mixed or unreliable semantics. Historically AT has not been able to differentiate sources of `accDescription` typically it wasn't spoken due to the mixed semantics.
  - This option is in very early development, it relies on browser features not yet widely available.
  - Expected to work with Chromium 92.0.4479.0+

Use UI automation to access Microsoft Excel spreadsheet controls when available

When this option is enabled, NVDA will try to use the Microsoft UI Automation accessibility API in order to fetch information from Microsoft Excel Spreadsheet controls. This is an experimental feature, and some features of Microsoft Excel may not be available in this mode. For instance, NVDA's Elements List for listing formulas and comments, and Browse mode quick navigation to jump to form fields on a spreadsheet features are not available. However, for basic spreadsheet navigating / editing, this option may provide a vast performance improvement. We still do not recommend that the majority of users turn this on by default, though we do welcome users of Microsoft Excel build 16.0.13522.10000 or higher to test this feature and provide feedback. Microsoft Excel's UI automation implementation is ever changing, and versions of Microsoft Office older than 16.0.13522.10000 may not expose enough information for this option to be of any use.

Use the new typed character support in Windows Console when available

This option enables an alternative method for detecting typed characters in Windows command consoles. While it improves performance and prevents some console output from being spelled out, it may be incompatible with some terminal programs. This feature is available and enabled by default on Windows 10 versions 1607 and later when UI Automation is unavailable or disabled. Warning: with this option enabled, typed characters that do not appear onscreen, such as passwords, will not be suppressed. In untrusted environments, you may temporarily disable speak typed characters and speak typed words when entering passwords.

Diff algorithm

This setting controls how NVDA determines the new text to speak in terminals. The diff algorithm combo box has three options:

- Automatic: as of NVDA 2021.2, this option is equivalent to "allow Diff Match Patch".
- allow Diff Match Patch: This option causes NVDA to calculate changes to terminal text by character. It may improve performance when large volumes of text are written to the console and allow more accurate reporting of changes made in the middle of lines. However, it may be incompatible with some applications, so Diff Match Patch is not always used. This feature is supported in Windows Console on Windows 10 versions 1607 and later. Additionally, it may be available in other terminals on earlier Windows releases.
- force Difflib: this option causes NVDA to calculate changes to terminal text by line. It is identical to NVDA's behaviour in versions 2020.4 and earlier.

Attempt to cancel speech for expired focus events

This option enables behaviour which attempts to cancel speech for expired focus events. In particular moving quickly through messages in Gmail with Chrome can cause NVDA to speak outdated information. This functionality is enabled by default as of NVDA 2021.1.

Caret move timeout (in MS)

This option allows you to configure the number of milliseconds NVDA will wait for the caret (insertion point) to move in editable text controls. If you find that NVDA seems to be incorrectly tracking the caret E.g. it seems to be always one character behind or is repeating lines, then you may wish to try increasing this value.

Report transparency for colors

This option enables reporting when colors are transparent, useful for addon/appModule developers gathering information to improve user experience with a 3rd party application. Some GDI applications will highlight text with a background color, NVDA (via display model) attempts to report this color. In some situations, the text background may be entirely transparent, with the text layered on some other GUI element. With several historically popular GUI APIs, the text may be rendered with a transparent background, but visually the background color is accurate.

Debug logging categories

The checkboxes in this list allow you to enable specific categories of debug messages in NVDA's log. Logging these messages can result in decreased performance and large log files. Only turn one of these on if specifically

instructed to by an NVDA developer e.g. when debugging why a braille display driver is not functioning correctly.

Play a sound for logged errors

This option allows you to specify if NVDA will play an error sound in case an error is logged. Choosing Only in test versions (default) makes NVDA play error sounds only if the current NVDA version is a test version (alpha, beta or run from source). Choosing Yes allows to enable error sounds whatever your current NVDA version is.

12.2. miscellaneous Settings

Besides the NVDA Settings dialog, The Preferences sub-menu of the NVDA Menu contains several other items which are outlined below.

12.2.1. Speech dictionaries

The speech dictionaries menu (found in the Preferences menu) contains dialogs that allow you to manage the way NVDA pronounces particular words or phrases. There are currently three different types of speech dictionaries. They are:

- Default: rules in this dictionary affect all speech in NVDA.
- Voice: rules in this dictionary affect speech for the synthesizer voice currently being used.
- Temporary: rules in this dictionary affect all speech in NVDA, but only for the current session. These rules are temporary and will be lost if NVDA is restarted.

You need to assign custom gestures using the Input Gestures dialog if you wish to open any of these dictionary dialogs from anywhere.

All dictionary dialogs contain a list of rules which will be used for processing the speech. The dialog also contains Add, Edit and Remove buttons.

To add a new rule to the dictionary, press the Add button, and fill in the fields in the dialog box that appears and then press Ok. You will then see your new rule in the list of rules. However, to make sure your rule is actually saved, make sure to press Ok to exit the dictionary dialog completely once you have finished adding/editing rules.

The rules for NVDA's speech dictionaries allow you to change one string of characters into another. For example, you could create a rule which causes

NVDA to say the word "frog" instead of "bird" whenever the word "bird" is encountered. In the Add rule dialog, the easiest way to do this is to type the word bird in the Pattern field, and the word frog in the Replacement field. You may also want to type a description of the rule in the Comment field (something like: changes bird to frog).

NVDA's speech dictionaries however are much more powerful than simple word replacement. The Add rule dialog also contains a checkbox to say whether or not you want the rule to be case sensitive (meaning that NVDA should care whether the characters are uppercase or lowercase. NVDA ignores case by default).

Finally, a set of radio buttons allows you to tell NVDA whether your pattern should match anywhere, should only match if it is a complete word or should be treated as a "Regular expression". Setting the pattern to match as a whole word means that the replacement will only be made if the pattern does not occur as part of a larger word. This condition is met if the characters immediately before and after the word are anything other than a letter, a number, or an underscore, or if there are no characters at all. Thus, using the earlier example of replacing the word "bird" with "frog", if you were to make this a whole word replacement, it would not match "birds" or "bluebird".

A regular expression is a pattern containing special symbols that allow you to match on more than one character at a time, or match on just numbers, or just letters, as a few examples. Regular expressions are not covered in this user guide. For an introductory tutorial, please refer to [https://docs.python.org/3.7/howto/regex.html].

12.2.2. Punctuation/symbol pronunciation

This dialog allows you to change the way punctuation and other symbols are pronounced, as well as the symbol level at which they are spoken.

The language for which symbol pronunciation is being edited will be shown in the dialog's title. Note that this dialog respects the "Trust voice's language for processing symbols and characters" option found in the Speech category of the NVDA Settings dialog; i.e. it uses the voice language rather than the NVDA global language setting when this option is enabled.

To change a symbol, first select it in the Symbols list. You can filter the symbols by entering the symbol or a part of the symbol's replacement into the Filter by edit box.

- The Replacement field allows you to change the text that should be spoken in place of this symbol.
- Using the Level field, you can adjust the lowest symbol level at which this symbol should be spoken.
- The Send actual symbol to synthesizer field specifies when the symbol itself (in contrast to its replacement) should be sent to the synthesizer. This is useful if the symbol causes the synthesizer to pause or change the inflection of the voice. For example, a comma causes the synthesizer to pause. There are three options:
  - never: Never send the actual symbol to the synthesizer.
  - always: Always send the actual symbol to the synthesizer.
  - only below symbols' level: Send the actual symbol only if the configured speech symbol level is lower than the level set for this symbol. For example, you might use this so that a symbol will have its replacement spoken at higher levels without pausing, while still being indicated with a pause at lower levels.

You can add new symbols by pressing the Add button. In the dialog that appears, enter the symbol and press the OK button. Then, change the fields for the new symbol as you would for other symbols.

You can remove a symbol you previously added by pressing the Remove button.

When you are finished, press the OK button to save your changes or the Cancel button to discard them.

In the case of complex symbols, the Replacement field may have to include some group references of the matched text. For instance, for a pattern matching a whole date, \1, \2, and \3 would need to appear in the field, to be replaced by the corresponding parts of the date. Normal backslashes in the Replacement field should thus be doubled, e.g. "a\\b" should be typed in order to get the "a\b" replacement.

12.2.3. Input Gestures

In this dialog, you can customize the input gestures (keys on the keyboard, buttons on a braille display, etc.) for NVDA commands.

Only commands that are applicable immediately before the dialog is opened are shown. For example, if you want to customize commands related to browse mode, you should open the Input Gestures dialog while you are in browse mode.

The tree in this dialog lists all of the applicable NVDA commands grouped by category. You can filter them by entering one or more words from the command's name into the Filter by edit box in any order. Any gestures associated with a command are listed beneath the command.

To add an input gesture to a command, select the command and press the Add button. Then, perform the input gesture you wish to associate; e.g. press a key on the keyboard or a button on a braille display. Often, a gesture can be interpreted in more than one way. For example, if you pressed a key on the keyboard, you may wish it to be specific to the current keyboard layout (e.g. desktop or laptop) or you may wish it to apply for all layouts. In this case, a menu will appear allowing you to select the desired option.

To remove a gesture from a command, select the gesture and press the Remove button.

The Emulated system keyboard keys category contains NVDA commands that emulate keys on the system keyboard. These emulated system keyboard keys can be used to control a system keyboard right from your braille display. To add an emulated input gesture, select the Emulated system keyboard keys category and press the Add button. Then, press the key on the keyboard you wish to emulate. After that, the key will be available from the Emulated system keyboard keys category and you will be able to assign an input gesture to it as described above.

Note:

- Emulated keys must have gestures assigned in order to persist when saving / closing the dialog.
- An input gesture with modifier keys may not be able to be mapped to an emulated gesture without modifier keys. For instance, setting the emulated input 'a' and configuring an input gesture of 'ctrl+m', may result in the application receiving 'ctrl+a'.

When you are finished making changes, press the OK button to save them or the Cancel button to discard them.

12.3. Saving and Reloading the configuration

By default NVDA will automatically save your settings on exit. Note, however, that this option can be changed under the general options in the preferences menu. To save the settings manually at any time, choose the Save configuration item in the NVDA menu.

If you ever make a mistake with your settings and need to revert back to the saved settings, choose the "revert to saved configuration" item in the NVDA menu. You can also reset your settings to their original factory defaults by choosing Reset Configuration To Factory Defaults, which is also found in the NVDA menu.

The following NVDA key commands are also useful:

Name	Desktop key	Laptop key	Description
Save configuration	NVDA+control+c	NVDA+control+c	Saves your current configuration so that it is not lost when you exit NVDA
Revert configuration	NVDA+control+r	NVDA+control+r	Pressing once resets your configuration to when you last saved it. Pressing three times will reset it back to factory defaults.

12.4. Configuration Profiles

Sometimes, you may wish to have different settings for different situations. For example, you may wish to have reporting of indentation enabled while you are editing or reporting of font attributes enabled while you are proofreading. NVDA allows you to do this using configuration profiles.

A configuration profile contains only those settings which are changed while the profile is being edited. Most settings can be changed in configuration profiles except for those in the General category of the NVDA Settings dialog, which apply to the entirety of NVDA.

Configuration profiles can be manually activated either from a dialog or using custom added gestures. They can also be activated automatically due to triggers such as switching to a particular application.

12.4.1. Basic Management

You manage configuration profiles by selecting "Configuration profiles" in the NVDA menu. You can also do this using a key command:

* NVDA+control+p: Show the Configuration Profiles dialog.

The first control in this dialog is the profile list from which you can select one of the available profiles. When you open the dialog, the profile you are currently editing is selected. Additional information is also shown for active

profiles, indicating whether they are manually activated, triggered and/or being edited.

To rename or delete a profile, press the Rename or Delete buttons, respectively.

Press the Close button to close the dialog.

12.4.2. Creating a Profile

To create a profile, press the New button.

In the New Profile dialog, you can enter a name for the profile. You can also select how this profile should be used. If you only want to use this profile manually, select Manual activation, which is the default. Otherwise, select a trigger which should automatically activate this profile. For convenience, if you haven't entered a name for the profile, selecting a trigger will fill in the name accordingly. See below for more information about triggers.

Pressing OK will create the profile and close the Configuration Profiles dialog so you can edit it.

12.4.3. Manual Activation

You can manually activate a profile by selecting a profile and pressing the Manual activate button. Once activated, other profiles can still be activated due to triggers, but any settings in the manually activated profile will override them. For example, if a profile is triggered for the current application and reporting of links is enabled in that profile but disabled it in the manually activated profile, links will not be reported. However, if you have changed the voice in the triggered profile but have never changed it in the manually activated profile, the voice from the triggered profile will be used. Any settings you change will be saved in the manually activated profile. To deactivate a manually activated profile, select it in the Configuration Profiles dialog and press the Manual deactivate button.

12.4.4. Triggers

Pressing the Triggers button in the Configuration Profiles dialog allows you to change the profiles which should be automatically activated for various triggers.

The Triggers list shows the available triggers, which are as follows:

- Current application: Triggered when you switch to the current application.
- Say all: Triggered while reading with the say all command.

To change the profile which should be automatically activated for a trigger, select the trigger and then select the desired profile from the Profile list. You can select "(normal configuration)" if you don't want a profile to be used.

Press the Close button to return to the Configuration Profiles dialog.

12.4.5. Editing a Profile

If you have manually activated a profile, any settings you change will be saved to that profile. Otherwise, any settings you change will be saved to the most recently triggered profile. For example, if you have associated a profile with the Notepad application and you switch to Notepad, any changed settings will be saved to that profile. Finally, if there is neither a manually activated nor a triggered profile, any settings you change will be saved to your normal configuration.

To edit the profile associated with say all, you must manually activate that profile.

12.4.6. Temporarily Disabling Triggers

Sometimes, it is useful to temporarily disable all triggers. For example, you might wish to edit a manually activated profile or your normal configuration without triggered profiles interfering. You can do this by checking the Temporarily disable all triggers checkbox in the Configuration Profiles dialog.

To toggle disabling triggers from anywhere, please assign a custom gesture using the Input Gestures dialog.

12.4.7. Activating a profile using input gestures

For every profile you add, you are able to assign one or more input gestures to activate it. By default, configuration profiles do not have input gestures assigned. You can add gestures to activate a profile using the Input Gestures dialog. Every profile has its own entry under the configuration profiles category. When you rename a profile, any gesture you added previously will still be available. Removing a profile will automatically delete the gestures associated with it.

12.5. Location of Configuration files

Portable versions of NVDA store all settings and add-ons in a directory called userConfig, found in the NVDA directory.

Installed versions of NVDA store all settings and add-ons in a special NVDA directory located in your Windows user profile. This means that each user on the system can have their own NVDA settings. To open your settings directory from anywhere you can use Input Gestures dialog to add a custom gesture. In addition for an installed version of NVDA, on the start menu you can go to programs -> NVDA -> explore user configuration directory.

Settings for NVDA when running during sign-in or on UAC screens are stored in the systemConfig directory in NVDA's installation directory. Usually, this configuration should not be touched. To change NVDA's configuration during sign-in or on UAC screens, configure NVDA as you wish while signed into Windows, save the configuration, and then press the "use currently saved settings during sign-in and on secure screens" button in the General category of the NVDA Settings dialog.

13. Extra Tools

13.1. Log Viewer

The log viewer, found under Tools in the NVDA menu, allows you to view all the logging output that has occurred up until now from when you last started NVDA. Using NVDA+F1 will open the log viewer and display developer information about the current navigator object.

Apart from reading the content, you can also Save a copy of the log file, or refresh the viewer so that it shows the most recent output since the Log viewer was opened. These actions are available under the viewer's Log menu.

13.2. Speech Viewer

For sighted software developers or people demoing NVDA to sighted audiences, a floating window is available that allows you to view all the text that NVDA is currently speaking.

To enable the speech viewer, check the "Speech Viewer" menu item under Tools in the NVDA menu. Uncheck the menu item to disable it.

The speech viewer window contains a check box labelled "Show speech viewer on startup". If this is checked, the speech viewer will open when NVDA is started. The speech viewer window will always attempt to re-open with the same dimensions and location as when it was closed.

While the speech viewer is enabled, it constantly updates to show you the most current text being spoken. However, if you click or focus inside the viewer, NVDA will temporarily stop updating the text, so that you are able to easily select or copy the existing content.

To toggle the speech viewer from anywhere, please assign a custom gesture using the Input Gestures dialog.

13.3. Braille Viewer

For sighted software developers or people demoing NVDA to sighted audiences, a floating window is available that allows you to view braille output, and the text equivalent for each braille character. The braille viewer can be used at the same time as a physical braille display, it will match the number of cells on the physical device. While the braille viewer is enabled, it constantly updates to show you the braille that would be displayed on a physical braille display.

To enable the braille viewer, check the "Braille Viewer" menu item under Tools in the NVDA menu. Uncheck the menu item to disable it.

Physical braille displays typically have buttons to scroll forwards or backwards, to enable scrolling with the braille viewer tool use the Input Gestures dialog to assign keyboard shortcuts which "Scrolls the braille display back" and "Scrolls the braille display forward"

The braille viewer window contains a check box labelled "Show braille viewer on startup". If this is checked, the braille viewer will open when NVDA is started. The braille viewer window will always attempt to re-open with the same dimensions and location as when it was closed.

The braille viewer window contains a check box labeled "Hover for cell routing", the default is unchecked. If checked, hovering the mouse over a braille cell will enable trigger the "route to braille cell" command for that cell. This is often used to move the caret or trigger the action for a control. This can be useful for testing NVDA is able to correctly reverse map a from braille cell. To prevent unintentionally routing to cells, the command is delayed. The mouse must hover until the cell turns green. The cell will start as a light yellow colour, transition to orange, then suddenly become green.

13.4. Python Console

The NVDA Python console, found under Tools in the NVDA menu, is a development tool which is useful for debugging, general inspection of NVDA

internals or inspection of the accessibility hierarchy of an application. For more information, please see the NVDA Developer Guide.

13.5. Add-ons Manager

The Add-ons Manager, accessed by selecting Manage add-ons under Tools in the NVDA menu, allows you to install, uninstall, enable and disable add-on packages for NVDA. These packages are provided by the community and contain custom code that may add or change features in NVDA or even provide support for extra Braille displays or speech synthesizers.

The Add-ons Manager contains a list that displays all the add-ons currently installed in your NVDA user configuration. Package name, status, version and author are shown for each add-on, though further information such as a description and URL can be viewed by selecting the add-on and pressing the About add-on button. If there is help available for the selected add-on, you can access it by pressing the Add-on help button.

To browse and download available add-ons online, press the Get add-ons button. This button opens the NVDA Add-ons page. If NVDA is installed and running on your system, you can open the add-on directly from the browser to begin the installation process as described below. Otherwise, save the add-on package and follow the instructions below.

To install an Add-on you previously obtained, press the Install button. This will allow you to browse for an add-on package (.nvda-addon file) somewhere on your computer or on a network. Once you press Open, the installation process will begin.

When an add-on is being installed, NVDA will first ask you to confirm that you really wish to install the add-on. As the functionality of add-ons is unrestricted inside NVDA, which in theory could include accessing your personal data or even the entire system if NVDA is an installed copy, it is very important to only install add-ons from sources you trust. Once the add-on is installed, NVDA must be restarted for the add-on to start running. Until you do, a status of "install" will show for that add-on in the list.

To remove an add-on, select the add-on from the list and press the Remove button. NVDA will ask if you really wish to do this. As with installing, NVDA must be restarted for the add-on to be fully removed. Until you do, a status of "remove" will be shown for that add-on in the list.

To disable an add-on, press the "disable" button. To enable a previously disabled add-on, press the "enable" button. You can disable an add-on if the

add-on status indicates it is "enabled", or enable it if the add-on is "disabled". For each press of the enable/disable button, add-on status changes to indicate what will happen when NVDA restarts. If the add-on was previously "disabled", a status will show "enabled after restart". If the add-on was previously "enabled", a status will show "disabled after restart". Just like when you install or remove add-ons, you need to restart NVDA in order for changes to take effect.

The manager also has a Close button to close the dialog. If you have installed, removed or changed the status of an add-on, NVDA will first ask you if you wish to restart so that your changes can take effect.

Some older add-ons may no longer be compatible with the version of NVDA that you have. When using an older version of NVDA, some new add-ons may not be compatible either. Attempting to install an incompatible add-on will result in an error explaining why the add-on is considered incompatible. To inspect these incompatible add-ons, you can use the "view incompatible add-ons" button to launch the incompatible add-ons manager.

To access the Add-ons Manager from anywhere, please assign a custom gesture using the Input Gestures dialog.

13.5.1. Incompatible Add-ons Manager

The Incompatible Add-ons Manager, which can be accessed via the "view incompatible add-ons" button in the Add-on manager, allows you to inspect any incompatible add-ons, and the reason they are considered incompatible. Add-ons are considered incompatible when they have not been updated to work with significant changes to NVDA, or when they rely on a feature not available in the version of NVDA you are using. The Incompatible add-ons manager has a short message to explain its purpose as well as the version of NVDA. The incompatible add-ons are presented in a list with the following columns:

1. Package, the name of the add-on
2. Version, the version of the add-on
3. Incompatible reason, an explanation of why the add-on is considered incompatible

The Incompatible add-ons manager also has an "About add-on..." button. This dialog will provide you with the full details of the add-on, which is helpful when contacting the add-on author.

13.6. Create portable copy

This will open a dialog which allows you to create a portable copy of NVDA out of the installed version. Either way, when running a portable copy of NVDA, in the extra tool sub menu the menu item will be called "install NVDA on this PC" instead of "create portable copy).

The dialog to create a portable copy of NVDA or to install NVDA on this PC will prompt you to choose a folder path in which NVDA should create the portable copy or in which NVDA should be installed.

In this dialog you can enable or disable the following:

- Copy current user configuration (this includes the files in %appdata%\roaming\NVDA or in the user configuration of your portable copy and also includes add-ons and other modules)
- Start the new portable copy after creation or start NVDA after installation (starts NVDA automatically after the portable copy creation or the installation)

13.7. Run COM registration fixing tool...

Installing and uninstalling programs on a computer can, in certain cases, cause COM DLL files to get unregistered. As COM Interfaces such as IAccessible depend on correct COM DLL registrations, issues can appear in case the correct registration is missing.

This can happen i.e. after installing and uninstalling Adobe Reader, Math Player and other programs.

The missing registration can cause issues in browsers, desktop apps, task bar and other interfaces.

Specifically, following issues can be solved by running this tool:

- NVDA reports "unknown" when navigating in browsers such as Firefox, Thunderbird etc.
- NVDA fails to switch between focus mode and browse mode
- NVDA is very slow when navigating in browsers while using browse mode
- And possibly other issues.

13.8. Reload plugins

This item, once activated, reloads app modules and global plugins without restarting NVDA, which can be useful for developers.

14. Supported Speech Synthesizers

This section contains information about the speech synthesizers supported by NVDA. For an even more extensive list of free and commercial synthesizers that you can purchase and download for use with NVDA, please see the extra voices page.

14.1. eSpeak NG

The eSpeak NG synthesizer is built directly into NVDA and does not require any other special drivers or components to be installed. On Windows 7, 8 and 8.1, NVDA uses eSpeak NG by default (Windows OneCore is used in Windows 10 and later by default). As this synthesizer is built into NVDA, this is a great choice for when running NVDA off a USB thumb drive on other systems.

Each voice that comes with eSpeak NG speaks a different language. There are over 43 different languages supported by eSpeak NG.

There are also many variants which can be chosen to alter the sound of the voice.

14.2. Microsoft Speech API version 4 (SAPI 4)

SAPI 4 is an older Microsoft standard for software speech synthesizers. NVDA still supports this for users who already have SAPI 4 synthesizers installed. However, Microsoft no longer support this and needed components are no longer available from Microsoft.

When using this synthesizer with NVDA, the available voices (accessed from the Speech category of the NVDA Settings dialog or by the Synth Settings Ring) will contain all the voices from all the installed SAPI 4 engines found on your system.

14.3. Microsoft Speech API version 5 (SAPI 5)

SAPI 5 is a Microsoft standard for software speech synthesizers. Many speech synthesizers that comply with this standard may be purchased or downloaded for free from various companies and websites, though your system will probably already come with at least one SAPI 5 voice preinstalled. When using this synthesizer with NVDA, the available voices (accessed from the Speech category of the NVDA Settings dialog or by the Synth Settings Ring) will contain all the voices from all the installed SAPI 5 engines found on your system.

14.4. Microsoft Speech Platform

The Microsoft Speech Platform provides voices for many languages which are normally used in the development of server-based speech applications. These voices can also be used with NVDA.

To use these voices, you will need to install two components:

- Microsoft Speech Platform - Runtime (Version 11) , x86: https://www.microsoft.com/download/en/details.aspx?id=27225
- Microsoft Speech Platform - Runtime Languages (Version 11): https://www.microsoft.com/download/en/details.aspx?id=27224
  - This page includes many files for both speech recognition and text-to-speech. Choose the files containing the TTS data for the desired languages/voices. For example, the file MSSpeech_TTS_en-US_ZiraPro.msi is a U.S. English voice.

14.5. Windows OneCore Voices

Windows 10 and later includes voices known as "OneCore" or "mobile" voices. Voices are provided for many languages, and they are more responsive than the Microsoft voices available using Microsoft Speech API version 5. On Windows 10 and later, NVDA uses Windows OneCore voices by default (eSpeak NG is used in other releases).

To add new Windows OneCore voices, go to "Speech Settings", within Windows system settings. Use the "Add voices" option and search for the desired language. Many languages include multiple variants. "United Kingdom" and "Australia" are two of the English variants. "France", "Canada" and "Switzerland" are French variants available. Search for the broader language (such as English or French), then locate the variant in the list. Select any languages desired and use the "add" button to add them. Once added, restart NVDA.

Please see this Microsoft article for a list of available voices: https://support.microsoft.com/en-us/windows/appendix-a-supported-languages-and-voices-4486e345-7730-53da-fcfe-55cc64300f01

15. Supported Braille Displays

This section contains information about the Braille displays supported by NVDA.

15.1. Displays supporting automatic detection in the background

NVDA has the ability to detect many braille displays in the background automatically, either via USB or bluetooth. This behaviour is achieved by selecting the Automatic option as the preferred braille display from NVDA's Braille Settings dialog. This option is selected by default.

The following displays support this automatic detection functionality.

- Handy Tech displays
- Baum/Humanware/APH/Orbit braille displays
- HumanWare Brailliant BI/B series
- HumanWare BrailleNote
- SuperBraille
- Optelec ALVA 6 series
- HIMS Braille Sense/Braille EDGE/Smart Beetle/Sync Braille Series
- Eurobraille Esys/Esytime/Iris displays
- Nattiq nBraille displays
- Any Display that supports the Standard HID Braille protocol

15.2. Freedom Scientific Focus/PAC Mate Series

All Focus and PAC Mate displays from Freedom Scientific are supported when connected via USB or bluetooth. You will need the Freedom Scientific braille display drivers installed on your system. If you do not have them already, you can obtain them from https://support.freedomscientific.com/Downloads/Focus/FocusBlueBrailleDisplayDriver. Although this page only mentions the Focus Blue display, the drivers support all Freedom Scientific Focus and Pacmate displays.

By default, NVDA can automatically detect and connect to these displays either via USB or bluetooth. However, when configuring the display, you can explicitly select "USB" or "Bluetooth" ports to restrict the connection type to be used. This might be useful if you want to connect the focus display to NVDA using bluetooth, but still be able to charge it using USB power from your computer. NVDA's automatic braille display detection will also recognize the display on USB or Bluetooth.

Following are the key assignments for this display with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	topRouting1 (first cell on display)
Scroll braille display forward	topRouting20/40/80 (last cell on display)

Scroll braille display back	leftAdvanceBar
Scroll braille display forward	rightAdvanceBar
Toggle braille tethered to	leftGDFButton+rightGDFButton
Toggle left wiz wheel action	leftWizWheelPress
Move back using left wiz wheel action	leftWizWheelUp
Move forward using left wiz wheel action	leftWizWheelDown
Toggle right wiz wheel action	rightWizWheelPress
Move back using right wiz wheel action	rightWizWheelUp
Move forward using right wiz wheel action	rightWizWheelDown
Route to braille cell	routing
shift+tab key	brailleSpaceBar+dot1+dot2
tab key	brailleSpaceBar+dot4+dot5
upArrow key	brailleSpaceBar+dot1
downArrow key	brailleSpaceBar+dot4
control+leftArrow key	brailleSpaceBar+dot2
control+rightArrow key	brailleSpaceBar+dot5
leftArrow	brailleSpaceBar+dot3
rightArrow key	brailleSpaceBar+dot6
home key	brailleSpaceBar+dot1+dot3
end key	brailleSpaceBar+dot4+dot6
control+home key	brailleSpaceBar+dot1+dot2+dot3
control+end key	brailleSpaceBar+dot4+dot5+dot6
alt key	brailleSpaceBar+dot1+dot3+dot4
alt+tab key	brailleSpaceBar+dot2+dot3+dot4+dot5
alt+shift+tab key	brailleSpaceBar+dot1+dot2+dot5+dot6
windows+tab key	brailleSpaceBar+dot2+dot3+dot4
escape key	brailleSpaceBar+dot1+dot5
windows key	brailleSpaceBar+dot2+dot4+dot5+dot6
space key	brailleSpaceBar
windows+d key (minimize all	brailleSpaceBar+dot1+dot2+dot3+dot4+dot5+dot6

applications)	
Report Current Line	brailleSpaceBar+dot1+dot4
NVDA menu	brailleSpaceBar+dot1+dot3+dot4+dot5

For newer Focus models that contain rocker bar keys (focus 40, focus 80 and focus blue):

Name	Key
Move braille display to previous line	leftRockerBarUp, rightRockerBarUp
Move braille display to next line	leftRockerBarDown, rightRockerBarDown

For Focus 80 only:

Name	Key
Scroll braille display back	leftBumperBarUp, rightBumperBarUp
Scroll braille display forward	leftBumperBarDown, rightBumperBarDown

15.3. Optelec ALVA 6 series/protocol converter

Both the ALVA BC640 and BC680 displays from Optelec are supported when connected via USB or bluetooth. Alternatively, you can connect an older Optelec display, such as a Braille Voyager, using a protocol converter supplied by Optelec. You do not need any specific drivers to be installed to use these displays. Just plug in the display and configure NVDA to use it.

Note: NVDA might be unable to use an ALVA BC6 display over Bluetooth when it is paired using the ALVA Bluetooth utility. When you have paired your device using this utility and NVDA is unable to detect your device, we recommend you to pair your ALVA display the regular way using the Windows Bluetooth settings.

Note: while some of these displays do have a braille keyboard, they handle translation from braille to text themselves by default. This means that NVDA's braille input system is not in use in the default situation (i.e. the input braille table setting has no effect). For ALVA displays with recent firmware, it is possible to disable this HID keyboard simulation using an input gesture.

Following are key assignments for this display with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key

Scroll braille display back	t1, etouch1
Move braille display to previous line	t2
Move to current focus	t3
Move braille display to next line	t4
Scroll braille display forward	t5, etouch3
Route to braille cell	routing
Report text formatting under braille cell	secondary routing
Toggle HID keyboard simulation	t1+spEnter
Move to top line in review	t1+t2
Move to bottom line in review	t4+t5
Toggle braille tethered to	t1+t3
Report title	etouch2
Report status bar	etouch4
shift+tab key	sp1
alt key	sp2, alt
escape key	sp3
tab key	sp4
upArrow key	spUp
downArrow key	spDown
leftArrow key	spLeft
rightArrow key	spRight
enter key	spEnter, enter
Report date/time	sp2+sp3
NVDA Menu	sp1+sp3
windows+d key (minimize all applications)	sp1+sp4
windows+b key (focus system tray)	sp3+sp4
windows key	sp1+sp2, windows
alt+tab key	sp2+sp4
control+home key	t3+spUp
control+end key	t3+spDown
home key	t3+spLeft
end key	t3+spRight

control key	control

15.4. Handy Tech Displays

NVDA supports most displays from Handy Tech when connected via USB, serial port or bluetooth. For older USB displays, you will need to install the USB drivers from Handy Tech on your system.

The following displays are not supported out of the box, but can be used via Handy Tech's universal driver and NVDA add-on:

- Braillino
- Bookworm
- Modular displays with firmware version 1.13 or lower. Please note that the firmware of this displays can be updated.

Following are the key assignments for Handy Tech displays with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	left, up, b3
Scroll braille display forward	right, down, b6
Move braille display to previous line	b4
Move braille display to next line	b5
Route to braille cell	routing
shift+tab key	esc, left triple action key up+down
alt key	b2+b4+b5
escape key	b4+b6
tab key	enter, right triple action key up+down
enter key	esc+enter, left+right triple action key up+down, joystickAction
upArrow key	joystickUp
downArrow key	joystickDown
leftArrow key	joystickLeft
rightArrow key	joystickRight
NVDA Menu	b2+b4+b5+b6

Toggle braille tethered to	b2
Toggle the braille cursor	b1
Toggle focus context presentation	b7
Toggle braille input	space+b1+b3+b4 (space+capital B)

15.5. MDV Lilli

The Lilli braille display available from MDV is supported. You do not need any specific drivers to be installed to use this display. Just plug in the display and configure NVDA to use it.

This display does not support NVDA's automatic background braille display detection functionality.

Following are the key assignments for this display with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display backward	LF
Scroll braille display forward	RG
Move braille display to previous line	UP
Move braille display to next line	DN
Route to braille cell	route
shift+tab key	SLF
tab key	SRG
alt+tab key	SDN
alt+shift+tab key	SUP

15.6. Baum/Humanware/APH/Orbit Braille Displays

Several Baum, HumanWare, APH and Orbit displays are supported when connected via USB, bluetooth or serial. These include:

- Baum: SuperVario, PocketVario, VarioUltra, Pronto!, SuperVario2, Vario 340
- HumanWare: Brailliant, BrailleConnect, Brailliant2
- APH: Refreshabraille
- Orbit: Orbit Reader 20

Some other displays manufactured by Baum may also work, though this has not been tested.

If connecting via USB to displays which do not use HID, you must first install the USB drivers provided by the manufacturer. The VarioUltra and Pronto! use HID. The Refreshabraille and Orbit Reader 20 can use HID if configured appropriately.

The USB serial mode of the Orbit Reader 20 is currently only supported in Windows 10 and later. USB HID should generally be used instead.

Following are the key assignments for these displays with NVDA. Please see your display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	d2
Scroll braille display forward	d5
Move braille display to previous line	d1
Move braille display to next line	d3
Route to braille cell	routing

For displays which have a joystick:

Name	Key
upArrow key	up
downArrow key	down
leftArrow key	left
rightArrow key	right
enter key	select

15.7. hedo ProfiLine USB

The hedo ProfiLine USB from hedo Reha-Technik is supported. You must first install the USB drivers provided by the manufacturer.

This display does not yet support NVDA's automatic background braille display detection functionality.

Following are the key assignments for this display with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	K1
Scroll braille display forward	K3
Move braille display to previous line	B2
Move braille display to next line	B5
Route to braille cell	routing
Toggle braille tethered to	K2
Say all	B6

15.8. hedo MobilLine USB

The hedo MobilLine USB from hedo Reha-Technik is supported. You must first install the USB drivers provided by the manufacturer.

This display does not yet support NVDA's automatic background braille display detection functionality.

Following are the key assignments for this display with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	K1
Scroll braille display forward	K3
Move braille display to previous line	B2
Move braille display to next line	B5
Route to braille cell	routing
Toggle braille tethered to	K2
Say all	B6

15.9. HumanWare Brailliant BI/B Series / BrailleNote Touch

The Brailliant BI and B series of displays from HumanWare, including the BI 14, BI 32, BI 20X, BI 40, BI 40X and B 80, are supported when connected via USB or bluetooth. If connecting via USB with the protocol set to HumanWare, you must first install the USB drivers provided by the manufacturer. USB drivers are not required if the protocol is set to OpenBraille.

The following extra devices are also supported (and do not require any special drivers to be installed):

- APH Mantis Q40
- APH Chameleon 20
- Humanware BrailleOne
- NLS eReader

Following are the key assignments for the Brailliant BI/B and BrailleNote touch displays with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

15.9.1. Key assignments for All models

Name	Key
Scroll braille display back	left
Scroll braille display forward	right
Move braille display to previous line	up
Move braille display to next line	down
Route to braille cell	routing
Toggle braille tethered to	up+down
upArrow key	space+dot1
downArrow key	space+dot4
leftArrow key	space+dot3
rightArrow key	space+dot6
shift+tab key	space+dot1+dot3
tab key	space+dot4+dot6
alt key	space+dot1+dot3+dot4 (space+m)
escape key	space+dot1+dot5 (space+e)
enter key	dot8
windows key	space+dot3+dot4
alt+tab key	space+dot2+dot3+dot4+dot5 (space+t)
NVDA Menu	space+dot1+dot3+dot4+dot5 (space+n)
windows+d key (minimize all applications)	space+dot1+dot4+dot5 (space+d)
Say all	space+dot1+dot2+dot3+dot4+dot5+dot6

15.9.2. Key assignments for Brailliant BI 32, BI 40 and B 80

Name	Key
NVDA Menu	c1+c3+c4+c5 (command n)
windows+d key (minimize all applications)	c1+c4+c5 (command d)
Say all	c1+c2+c3+c4+c5+c6

15.9.3. Key assignments for Brailliant BI 14

Name	Key
up arrow key	joystick up
down arrow key	joystick down
left arrow key	joystick left
right arrow key	joystick right
enter key	joystick action

15.10. HIMS Braille Sense/Braille EDGE/Smart Beetle/Sync Braille Series

NVDA supports Braille Sense, Braille EDGE, Smart Beetle and Sync Braille displays from Hims when connected via USB or bluetooth. If connecting via USB, you will need to install the USB drivers from HIMS on your system. You can download these from here: http://www.himsintl.com/upload/HIMS_USB_Driver_v25.zip

Following are the key assignments for these displays with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Route to braille cell	routing
Scroll braille display back	leftSideScrollUp, rightSideScrollUp, leftSideScroll
Scroll braille display forward	leftSideScrollDown, rightSideScrollDown, rightSideScroll
Move braille display to previous line	leftSideScrollUp+rightSideScrollUp
Move braille display to next line	leftSideScrollDown+rightSideScrollDown
Move to previous line in review	rightSideUpArrow
Move to next line in review	rightSideDownArrow
Move to previous character	rightSideLeftArrow

in review	
Move to next character in review	rightSideRightArrow
Move to current focus	leftSideScrollUp+leftSideScrollDown, rightSideScrollUp+rightSideScrollDown, leftSideScroll+rightSideScroll
control key	smartbeetle:f1, brailleedge:f3
windows key	f7, smartbeetle:f2
alt key	dot1+dot3+dot4+space, f2, smartbeetle:f3, brailleedge:f4
shift key	f5
insert key	dot2+dot4+space, f6
applications key	dot1+dot2+dot3+dot4+space, f8
Caps Lock key	dot1+dot3+dot6+space
tab key	dot4+dot5+space, f3, brailleedge:f2
shift+alt+tab key	f2+f3+f1
alt+tab key	f2+f3
shift+tab key	dot1+dot2+space
end key	dot4+dot6+space
control+end key	dot4+dot5+dot6+space
home key	dot1+dot3+space, smartbeetle:f4
control+home key	dot1+dot2+dot3+space
alt+f4 key	dot1+dot3+dot5+dot6+space
leftArrow key	dot3+space, leftSideLeftArrow
control+shift+leftArrow key	dot2+dot8+space+f1
control+leftArrow key	dot2+space
shift+alt+leftArrow key	dot2+dot7+f1
alt+leftArrow key	dot2+dot7
rightArrow key	dot6+space, leftSideRightArrow
control+shift+rightArrow key	dot5+dot8+space+f1
control+rightArrow key	dot5+space
shift+alt+rightArrow key	dot5+dot7+f1
alt+rightArrow key	dot5+dot7
pageUp key	dot1+dot2+dot6+space

control+pageUp key	dot1+dot2+dot6+dot8+space
upArrow key	dot1+space, leftSideUpArrow
control+shift+upArrow key	dot2+dot3+dot8+space+f1
control+upArrow key	dot2+dot3+space
shift+alt+upArrow key	dot2+dot3+dot7+f1
alt+upArrow key	dot2+dot3+dot7
shift+upArrow key	leftSideScrollDown+space
pageDown key	dot3+dot4+dot5+space
control+pageDown key	dot3+dot4+dot5+dot8+space
downArrow key	dot4+space, leftSideDownArrow
control+shift+downArrow key	dot5+dot6+dot8+space+f1
control+downArrow key	dot5+dot6+space
shift+alt+downArrow key	dot5+dot6+dot7+f1
alt+downArrow key	dot5+dot6+dot7
shift+downArrow key	space+rightSideScrollDown
escape key	dot1+dot5+space, f4, brailleedge:f1
delete key	dot1+dot3+dot5+space, dot1+dot4+dot5+space
f1 key	dot1+dot2+dot5+space
f3 key	dot1+dot4+dot8+space
f4 key	dot7+f3
windows+b key	dot1+dot2+f1
windows+d key	dot1+dot4+dot5+f1
control+insert key	smartbeetle:f1+rightSideScroll
alt+insert key	smartbeetle:f3+rightSideScroll

15.11. Seika Braille Displays

The Seika Version 3, 4 and 5 (40 cells) and Seika80 (80 cells) braille displays from Nippon Telesoft are supported. You can find more information about the displays and the required drivers at https://en.seika-braille.com/down/index.html You must first install the USB drivers provided by the manufacturer.

These displays do not yet support NVDA's automatic background braille display detection functionality.

Following are the key assignments for this display with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	left
Scroll braille display forward	right
Move braille display to previous line	b3
Move braille display to next line	b4
Toggle braille tethered to	b5
Say all	b6
tab	b1
shift+tab	b2
alt+tab	b1+b2
NVDA Menu	left+right
Route to braille cell	routing

15.12. Papenmeier BRAILLEX Newer Models

The following Braille displays are supported:

- BRAILLEX EL 40c, EL 80c, EL 20c, EL 60c (USB)
- BRAILLEX EL 40s, EL 80s, EL 2d80s, EL 70s, EL 66s (USB)
- BRAILLEX Trio (USB and bluetooth)
- BRAILLEX Live 20, BRAILLEX Live and BRAILLEX Live Plus (USB and bluetooth)

These displays do not support NVDA's automatic background braille display detection functionality.

If BrxCom is installed, NVDA will use BrxCom. BrxCom is a tool that allows keyboard input from the braille display to function independently from a screen reader. Keyboard input is possible with the Trio and BRAILLEX Live models.

Most devices have an Easy Access Bar (EAB) that allows intuitive and fast operation. The EAB can be moved in four directions where generally each direction has two switches. The C and Live series are the only exceptions to this rule.

The c-series and some other displays have two routing rows whereby the upper row is used to report formatting information. Holding one of the upper

routing keys and pressing the EAB on c-series devices emulates the second switch state. The live series displays have one routing row only and the EAB has one step per direction. The second step may be emulated by pressing one of the routing keys and pressing the EAB in the corresponding direction. Pressing and holding the up, down, right and left keys (or EAB) causes the corresponding action to be repeated.

Generally, the following keys are available on these braille displays:

Name	Key
l1	Left front key
l2	Left rear key
r1	Right front key
r2	Right rear key
up	1 Step up
up2	2 Steps up
left	1 Step left
left2	2 Steps left
right	1 Step right
right2	2 Steps right
dn	1 Step down
dn2	2 Steps down

Following are the Papenmeier command assignments for NVDA:

Name	Key
Scroll braille display back	left
Scroll braille display forward	right
Move braille display to previous line	up
Move braille display to next line	dn
Route to braille cell	routing
Report current character in review	l1
Activate current navigator object	l2
Toggle braille tethered to	r2
Report title	l1+up
Report Status Bar	l2+down

Move to containing object	up2
Move to first contained object	dn2
Move to previous object	left2
Move to next object	right2
Report text formatting under braille cell	upper routing row

The Trio model has four additional keys which are in front of the braille keyboard. These are (ordered from left to right):

- left thumb key (lt)
- space
- space
- right thumb key (rt)

Currently, the right thumb key is not in use. The inner keys are both mapped to space.

Name	Key
escape key	space with dot 7
upArrow key	space with dot 2
leftArrow key	space with dot 1
rightArrow key	space with dot 4
downArrow	space with dot 5
control key	lt+dot2
alt key	lt+dot3
control+escape key	space with dot 1 2 3 4 5 6
tab key	space with dot 3 7

15.13. Papenmeier Braille BRAILLEX Older Models

The following Braille displays are supported:

- BRAILLEX EL 80, EL 2D-80, EL 40 P
- BRAILLEX Tiny, 2D Screen

Note that these displays can only be connected via a serial port. Due to this, these displays do not support NVDA's automatic background braille display detection functionality. You should select the port to which the display is connected after you have chosen this driver in the Select Braille Display dialog.

Some of these devices have an Easy Access Bar (EAB) that allows intuitive and fast operation. The EAB can be moved in four directions where generally each direction has two switches. Pressing and holding the up, down, right and left keys (or EAB) causes the corresponding action to be repeated. Older devices do not have an EAB; front keys are used instead.

Generally, the following keys are available on braille displays:

Name	Key
l1	Left front key
l2	Left rear key
r1	Right front key
r2	Right rear key
up	1 Step up
up2	2 Steps up
left	1 Step left
left2	2 Steps left
right	1 Step right
right2	2 Steps right
dn	1 Step down
dn2	2 Steps down

Following are the Papenmeier command assignments for NVDA:

Devices with EAB:

Name	Key
Scroll braille display back	left
Scroll braille display forward	right
Move braille display to previous line	up
Move braille display to next line	dn
Route to braille cell	routing
Report current character in review	l1
Activate current navigator object	l2
Report title	l1up
Report Status Bar	l2down

Move to containing object	up2
Move to first contained object	dn2
Move to next object	right2
Move to previous object	left2
Report text formatting under braille cell	upper routing strip

BRAILLEX Tiny:

Name	Key
Report current character in review	l1
Activate current navigator object	l2
Scroll braille display back	left
Scroll braille display forward	right
Move braille display to previous line	up
Move braille display to next line	dn
Toggle braille tethered to	r2
Move to containing object	r1+up
Move to first contained object	r1+dn
Move to previous object	r1+left
Move to next object	r1+right
Report text formatting under braille cell	upper routing strip
Report title	l1+up
Report status bar	l2+down

BRAILLEX 2D Screen:

Name	Key
Report current character in review	l1
Activate current navigator object	l2
Toggle braille tethered to	r2
Report text formatting under braille cell	upper routing strip
Move braille display to previous line	up
Scroll braille display back	left
Scroll braille display forward	right

Move braille display to next line	dn
Move to next object	left2
Move to containing object	up2
Move to first contained object	dn2
Move to previous object	right2

15.14. HumanWare BrailleNote

NVDA supports the BrailleNote notetakers from Humanware when acting as a display terminal for a screen reader. The following models are supported:

- BrailleNote Classic (serial connection only)
- BrailleNote PK (Serial and bluetooth connections)
- BrailleNote MPower (Serial and bluetooth connections)
- BrailleNote Apex (USB and Bluetooth connections)

For BrailleNote Touch, please refer to the Brailliant BI Series / BrailleNote Touch section.

Except for BrailleNote PK, both braille (BT) and QWERTY (QT) keyboards are supported. For BrailleNote QT, PC keyboard emulation isn't supported. You can also enter braille dots using the QT keyboard. Please check the braille terminal section of the BrailleNote manual guide for details.

If your device supports more than one type of connection, when connecting your BrailleNote to NVDA, you must set the braille terminal port in braille terminal options. Please check the BrailleNote manual for details. In NVDA, you may also need to set the port in the Select Braille Display dialog. If you are connecting via USB or bluetooth, you can set the port to "Automatic", "USB" or "Bluetooth", depending on the available choices. If connecting using a legacy serial port (or a USB to serial converter) or if none of the previous options appear, you must explicitly choose the communication port to be used from the list of hardware ports.

Before connecting your BrailleNote Apex using its USB client interface, you must install the drivers provided by HumanWare.

On the BrailleNote Apex BT, you can use the scroll wheel located between dots 1 and 4 for various NVDA commands. The wheel consists of four directional dots, a centre click button, and a wheel that spins clockwise or counterclockwise.

Following are the BrailleNote command assignments for NVDA. Please check your BrailleNote's documentation to find where these keys are located.

Name	Key
Scroll braille display back	back
Scroll braille display forward	advance
Move braille display to previous line	previous
Move braille display to next line	next
Route to braille cell	routing
NVDA menu	space+dot1+dot3+dot4+dot5 (space+n)
Toggle braille tethered to	previous+next
Up arrow key	space+dot1
Down arrow key	space+dot4
Left Arrow key	space+dot3
Right arrow key	space+dot6
Page up key	space+dot1+dot3
Page down key	space+dot4+dot6
Home key	space+dot1+dot2
End key	space+dot4+dot5
Control+home keys	space+dot1+dot2+dot3
Control+end keys	space+dot4+dot5+dot6
Space key	space
Enter	space+dot8
Backspace	space+dot7
Tab key	space+dot2+dot3+dot4+dot5 (space+t)
Shift+tab keys	space+dot1+dot2+dot5+dot6
Windows key	space+dot2+dot4+dot5+dot6 (space+w)
Alt key	space+dot1+dot3+dot4 (space+m)
Toggle input help	space+dot2+dot3+dot6 (space+lower h)

Following are commands assigned to BrailleNote QT when it is not in braille input mode.

Name	Key

NVDA menu	read+n
Up arrow key	upArrow
Down arrow key	downArrow
Left Arrow key	leftArrow|
Right arrow key	rightArrow
Page up key	function+upArrow
Page down key	function+downArrow
Home key	function+leftArrow
End key	function+rightArrow
Control+home keys	read+t
Control+end keys	read+b
Enter key	enter
Backspace key	backspace
Tab key	tab
Shift+tab keys	shift+tab
Windows key	read+w
Alt key	read+m
Toggle input help	read+1

Following are commands assigned to the scroll wheel:

Name	Key
Up arrow key	upArrow
Down arrow key	downArrow
Left Arrow key	leftArrow
Right arrow key	rightArrow
Enter key	centre button
Tab key	scroll wheel clockwise
Shift+tab keys	scroll wheel counterclockwise

15.15. EcoBraille

NVDA supports EcoBraille displays from ONCE. The following models are supported:

- EcoBraille 20
- EcoBraille 40
- EcoBraille 80
- EcoBraille Plus

In NVDA, you can set the serial port to which the display is connected in the Select Braille Display dialog. These displays do not support NVDA's automatic background braille display detection functionality.

Following are the key assignments for EcoBraille displays. Please see the EcoBraille documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	T2
Scroll braille display forward	T4
Move braille display to previous line	T1
Move braille display to next line	T5
Route to braille cell	Routing
Activate current navigator object	T3
Switch to next review mode	F1
Move to containing object	F2
Switch to previous review mode	F3
Move to previous object	F4
Report current object	F5
Move to next object	F6
Move to focus object	F7
Move to first contained object	F8
Move System focus or caret to current review position	F9
Report review cursor location	F0
Toggle braille tethered to	A

15.16. SuperBraille

The SuperBraille device, mostly available in Taiwan, can be connected to by either USB or serial. As the SuperBraille does not have any physical typing keys or scrolling buttons, all input must be performed via a standard computer keyboard. Due to this, and to maintain compatibility with other screen readers

in Taiwan, two key bindings for scrolling the braille display have been provided:

Name	Key
Scroll braille display back	numpadMinus
Scroll braille display forward	numpadPlus

15.17. Eurobraille Esys/Esytime/Iris displays

The Esys, Esytime and Iris displays from Eurobraille are supported by NVDA. Esys and Esytime-Evo devices are supported when connected via USB or bluetooth. Older Esytime devices only support USB. Iris displays can only be connected via a serial port. Therefore, for these displays, you should select the port to which the display is connected after you have chosen this driver in the Braille Settings dialog.

Iris and Esys displays have a braille keyboard with 10 keys. Of the two keys placed like a space bar, the left key is corresponding to the backspace key and the right key to the space key.

Following are the key assignments for these displays with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	switch1-6left, l1
Scroll braille display forward	switch1-6Right, l8
Move to current focus	switch1-6Left+switch1-6Right, l1+l8
Route to braille cell	routing
Report text formatting under braille cell	doubleRouting
Move to previous line in review	joystick1Up
Move to next line in review	joystick1Down
Move to previous character in review	joystick1Left
Move to next character in review	joystick1Right
Switch to previous review mode	joystick1Left+joystick1Up
Switch to next review mode	joystick1Right+joystick1Down
Erase the last entered braille cell or character	backSpace

Translate any braille input and press the enter key	backSpace+space
insert key	dot3+dot5+space, l7
delete key	dot3+dot6+space
home key	dot1+dot2+dot3+space, joystick2Left+joystick2Up
end key	dot4+dot5+dot6+space, joystick2Right+joystick2Down
leftArrow key	dot2+space, joystick2Left, leftArrow
rightArrow key	dot5+space, joystick2Right, rightArrow
upArrow key	dot1+space, joystick2Up, upArrow
downArrow key	dot6+space, joystick2Down, downArrow
enter key	joystick2centre
pageUp key	dot1+dot3+space
pageDown key	dot4+dot6+space
numpad1 key	dot1+dot6+backspace
numpad2 key	dot1+dot2+dot6+backspace
numpad3 key	dot1+dot4+dot6+backspace
numpad4 key	dot1+dot4+dot5+dot6+backspace
numpad5 key	dot1+dot5+dot6+backspace
numpad6 key	dot1+dot2+dot4+dot6+backspace
numpad7 key	dot1+dot2+dot4+dot5+dot6+backspace
numpad8 key	dot1+dot2+dot5+dot6+backspace
numpad9 key	dot2+dot4+dot6+backspace
numpadInsert key	dot3+dot4+dot5+dot6+backspace
numpadDecimal key	dot2+backspace
numpadDivide key	dot3+dot4+backspace
numpadMultiply key	dot3+dot5+backspace
numpadMinus key	dot3+dot6+backspace
numpadPlus key	dot2+dot3+dot5+backspace
numpadEnter key	dot3+dot4+dot5+backspace
escape key	dot1+dot2+dot4+dot5+space, l2
tab key	dot2+dot5+dot6+space, l3

shift+tab key	dot2+dot3+dot5+space
printScreen key	dot1+dot3+dot4+dot6+space
pause key	dot1+dot4+space
applications key	dot5+dot6+backspace
f1 key	dot1+backspace
f2 key	dot1+dot2+backspace
f3 key	dot1+dot4+backspace
f4 key	dot1+dot4+dot5+backspace
f5 key	dot1+dot5+backspace
f6 key	dot1+dot2+dot4+backspace
f7 key	dot1+dot2+dot4+dot5+backspace
f8 key	dot1+dot2+dot5+backspace
f9 key	dot2+dot4+backspace
f10 key	dot2+dot4+dot5+backspace
f11 key	dot1+dot3+backspace
f12 key	dot1+dot2+dot3+backspace
windows key	dot1+dot2+dot3+dot4+backspace
Caps Lock key	dot7+backspace, dot8+backspace
num lock key	dot3+backspace, dot6+backspace
shift key	dot7+space, l4
Toggle shift key	dot1+dot7+space, dot4+dot7+space
control key	dot7+dot8+space, l5
Toggle control key	dot1+dot7+dot8+space, dot4+dot7+dot8+space
alt key	dot8+space, l6
Toggle alt key	dot1+dot8+space, dot4+dot8+space
ToggleHID keyboard input simulation	esytime):l1+joystick1Down, esytime):l8+joystick1Down

15.18. Nattiq nBraille Displays

NVDA supports displays from Nattiq Technologies when connected via USB. Windows 10 and later detects the Braille Displays once connected, you may need to install USB drivers if using older versions of Windows (below Win10). You can get them from the manufacturer's website.

Following are the key assignments for Nattiq Technologies displays with NVDA. Please see the display's documentation for descriptions of where these keys can be found.

Name	Key
Scroll braille display back	up
Scroll braille display forward	down
Move braille display to previous line	left
Move braille display to next line	right
Route to braille cell	routing

15.19. BRLTTY

BRLTTY is a separate program which can be used to support many more braille displays. In order to use this, you need to install BRLTTY for Windows. You should download and install the latest installer package, which will be named, for example, brltty-win-4.2-2.exe. When configuring the display and port to use, be sure to pay close attention to the instructions, especially if you are using a USB display and already have the manufacturer's drivers installed.

For displays which have a braille keyboard, BRLTTY currently handles braille input itself. Therefore, NVDA's braille input table setting is not relevant.

BRLTTY is not involved in NVDA's automatic background braille display detection functionality.

Following are the BRLTTY command assignments for NVDA. Please see the BRLTTY key binding lists for information about how BRLTTY commands are mapped to controls on braille displays.

Name	BRLTTY command
Scroll braille display back	fwinlt (go left one window)
Scroll braille display forward	fwinrt (go right one window)
Move braille display to previous line	lnup (go up one line)
Move braille display to next line	lndn (go down one line)
Route to braille cell	route (bring cursor to character)

15.20. Standard HID Braille displays

This is an experimental driver for the new Standard HID Braille Specification, agreed upon in 2018 by Microsoft, Google, Apple and several assistive technology companies including NV Access. The hope is that all future Braille Display models created by any manufacturer, will use this standard protocol which will remove the need for manufacturer-specific Braille drivers.

NVDA's automatic braille display detection will also recognize any display that supports this protocol.

Following are the current key assignments for these displays.

Name	Key
Scroll braille display back	pan left or rocker up
Scroll braille display forward	pan right or rocker down
Move braille display to previous line	space + dot1
Move braille display to next line	space + dot4
Route to braille cell	routing set 1|
Toggle braille tethered to	up+down
upArrow key	joystick up
downArrow key	joystick down
leftArrow key	space+dot3 or joystick left
rightArrow key	space+dot6 or joystick right
shift+tab key	space+dot1+dot3
tab key	space+dot4+dot6
alt key	space+dot1+dot3+dot4 (space+m)
escape key	space+dot1+dot5 (space+e)
enter key	dot8 or joystick center
windows key	space+dot3+dot4
alt+tab key	space+dot2+dot3+dot4+dot5 (space+t)
NVDA Menu	space+dot1+dot3+dot4+dot5 (space+n)
windows+d key (minimize all applications)	space+dot1+dot4+dot5 (space+d)
Say all	space+dot1+dot2+dot3+dot4+dot5+dot6

16. Advanced Topics

16.1. Command Line Options

NVDA can accept one or more additional options when it starts which alter its behaviour. You can pass as many options as you need. These options can be passed when starting from a shortcut (in the shortcut properties), from the Run dialog (Start Menu -> Run or Windows+r) or from a Windows command console. Options should be separated from the name of NVDA's executable file and from other options by spaces. For example, a useful option is --disable-addons, which tells NVDA to suspend all running add-ons. This allows you to determine whether a problem is caused by an add-on and to recover from serious problems caused by add-ons.

As an example, you can exit the currently running copy of NVDA by entering the following in the Run dialog:

nvda -q

Some of the command line options have a short and a long version, while some of them have only a long version. For those which have a short version, you can combine them like this:

| nvda -mc CONFIGPATH | This will start NVDA with startup sounds and message disabled, and the specified configuration |
| nvda -mc CONFIGPATH --disable-addons | Same as above, but with add-ons disabled |

Some of the command line options accept additional parameters; e.g. how detailed the logging should be or the path to the user configuration directory. Those parameters should be placed after the option, separated from the option by a space when using the short version or an equals sign (=) when using the long version; e.g.:

nvda -l 10	Tells NVDA to start with log level set to debug
nvda --log-file=c:\nvda.log	Tells NVDA to write its log to c:\nvda.log
nvda --log-level=20 -f c:\nvda.log	Tells NVDA to start with log level set to info and to write its log to c:\nvda.log

Following are the command line options for NVDA:

Short	Long	Description
-h	--help	show command line help and exit
-q	--quit	Quit already running copy of NVDA
-k	--check-running	Report whether NVDA is running via the exit

		code; 0 if running, 1 if not running
-f LOGFILENAME	--log-file=LOGFILENAME	The file where log messages should be written to
-l LOGLEVEL	--log-level=LOGLEVEL	The lowest level of message logged (debug 10, input/output 12, debug warning 15, info 20, warning 30, error 40, critical 50, disabled 100), default is warning
-c CONFIGPATH	--config-path=CONFIGPATH	The path where all settings for NVDA are stored
-m	--minimal	No sounds, no interface, no start message, etc.
-s	--secure	Secure mode: disables Python console, profile features such as creation, deletion, renaming profiles etc., update check, some checkboxes in the welcome dialog and in general settings category (e.g. Use NVDA during sign-in, save configuration after exit etc.), as well as logviewer and logging features (used often in secure screens). Note also that this command will disable the possibility to save settings in system config and the gesture map will not be saved on the disk.
None	--disable-addons	Add-ons will have no effect
None	--debug-logging	Enable debug level logging just for this run. This setting will override any other log level (--loglevel, -l) argument given, including no logging option.
None	--no-logging	Disable logging altogether while using NVDA. This setting can be overridden if a log level (--loglevel, -l) is specified from command line or if debug logging is turned on.
None	--no-sr-flag	Don't change the global system screen reader flag
None	--install	Installs NVDA (starting the newly installed copy)
None	--install-silent	Silently installs NVDA (does not start the newly installed copy)
None	--enable-start-on-logon=True|False	When installing, enable NVDA's Use NVDA during Windows sign-in
None	copy-portable-config	When installing, copy the portable

		configuration from the provided path (config-path, -c) to the current user account
None	--create-portable	Creates a portable copy of NVDA (starting the newly created copy). Requires --portable-path to be specified
None	--create-portable-silent	Creates a portable copy of NVDA (does not start the newly installed copy). Requires --portable-path to be specified
None	--portable-path=PORTABLEPATH	The path where a portable copy will be created

16.2. System Wide Parameters

NVDA allows some values to be set in the system registry which alter the system wide behaviour of NVDA. These values are stored in the registry under one of the following keys:

- 32-bit system: "HKEY_LOCAL_MACHINE\SOFTWARE\nvda"
- 64-bit system: "HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\nvda"

The following values can be set under this registry key:

Name	Type	Possible values	Description
configInLocalAppData	DWORD	0 (default) to disable, 1 to enable	If enabled, stores the NVDA user configuration in the local application data instead of the roaming application data
serviceDebug	DWORD	0 (default) to disable, 1 to enable	If enabled, disables secure mode on windows secure desktops, allowing the use of the Python console and Log viewer. Due to several major security implications, the use of this option is strongly discouraged

17. Further Information

If you require further information or assistance regarding NVDA, please visit the NVDA web site at https://www.nvaccess.org/. Here, you can find additional documentation, as well as technical support and community resources. This site also provides information and resources concerning NVDA development.