



# System Requirements for Online Testing 2016–2017

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*Prepared by the American Institutes for Research®*



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# Section I. Introduction

This document contains basic technology requirements for online testing using American Institutes for Research's (AIR) systems for the 2016–2017 test administration.

## Organization of this Manual

This document contains the following sections:

- [Supported Operating Systems for Student Testing](#)
- [Supported Web Browsers for Online Systems](#)
- [Requirements for Peripheral Equipment](#)

## Other Resources

The following publications provide additional information:

- For information about installing secure browsers, refer to the *Secure Browser Installation Manual*.
- For information about network and Internet requirements, general peripheral and software requirements, and configuring text-to-speech settings, see the *Technical Specifications Manual for Online Testing*.
- For information about securing a computer before a test session, see the *Guide to Navigating the Online HSAP Administration*.
- For information about supported hardware and software for Braille testing as well as information about configuring JAWS, refer to the *Braille Requirements and Testing Manual*.
- The above resources, as well as secure browsers and user guides for other systems, are available on the Hawai'i Statewide Assessment Program portal ([alohahsap.org](http://alohahsap.org)).

## Section II. Supported Operating Systems for Student Testing

This section describes the supported operating systems for online testing.



### **Warning: Support for New Desktop Operating Systems**

Operating systems that become available but do not appear in the following tables are not supported. Do not upgrade to new operating systems on computers that will be used to administer online assessments without ensuring the updates meet the required specifications.

## Desktops and Laptops

[Table 1](#) lists the operating systems and hardware required for student testing. Online testing functions effectively with the minimum requirements listed. However, the recommended specifications provide improved performance.

Table 1. Supported Desktop Operating Systems

Supported Operating Systems	Minimum Requirements	Recommended Specifications
<b>Windows</b> Vista, 7 (Professional and Enterprise) 8.0 (Professional and Enterprise) 8.1 (Professional and Enterprise) 10 (Professional, Educational, and Enterprise) Server 2008, 2012 (thin client)	Pentium 4 or newer processor that supports SSE2 512 MB of RAM 200 MB hard drive space	Pentium 4 or newer processor that supports SSE2 2 GB+ RAM 80 GB+ hard drive
<b>Mac OS X (Intel)</b> 10.7–10.12 <sup>a</sup>	Intel x86 processor 512 MB of RAM 200 MB hard drive space	Pentium 4 or newer processor 2+ GB RAM 80+ GB hard drive

Supported Operating Systems	Minimum Requirements	Recommended Specifications
<b>Linux</b> Fedora 23, 25 <sup>a</sup> openSUSE 13.1, 13.2 Red Hat Enterprise Linux 6.5 Ubuntu (LTS) 12.04, 14.04, 16.04	Intel x86 processor 512 MB of RAM 200 MB hard drive space Required libraries/packages: <ul style="list-style-type: none"> <li>• GTK+ 2.18 or higher</li> <li>• GLib 2.22 or higher</li> <li>• Pango 1.14 or higher</li> <li>• X.Org 1.0 or higher (1.7+ recommended)</li> <li>• libstdc++ 4.3 or higher</li> <li>• libreadline6:i386 (required for Ubuntu only)</li> <li>• GNOME 2.16 or higher</li> </ul>	Pentium 4 or newer processor 2 GB RAM 80 GB hard drive Recommended libraries/packages: In addition to the required libraries listed under minimum requirements, the following should be installed: <ul style="list-style-type: none"> <li>• NetworkManager 0.7 or higher</li> <li>• DBus 1.0 or higher</li> <li>• HAL 0.5.8 or higher</li> </ul>

<sup>a</sup> AIR will support OS X 10.12 and Fedora 25 when they become available.

## Tablets

[Table 2](#) lists the supported tablets, operating systems, and related requirements. See the *Technical Specifications Manual for Online Testing* for information about configuring these devices for online testing.

Table 2. Supported Tablets and Operating Systems

Supported Operating Systems	Supported Tablets
<b>iOS (iPads)</b> 8.0–8.2 9.2, 9.3 10.2, 10.3 <sup>a</sup>	iPad 2 iPad 3 Fourth-generation (Retina Display) Fifth-generation (Retina Display) iPad Air iPad Air 2
<b>Android</b> 4.4, 5.0, 5.1, 6.0 <sup>a</sup>	Google Nexus 10 Motorola Xoom Samsung Galaxy Note (2014 edition) Samsung Galaxy Tab 3 and 4 LearnPad Quarto

Supported Operating Systems	Supported Tablets
<b>Windows</b> 8.0 (Professional and Enterprise) 8.1 (Professional and Enterprise) 10 (Professional, Educational, and Enterprise)	AIR supports any tablet running these versions of Windows, but has done extensive testing only on Surface Pro, Surface Pro 3, Asus Transformer, and Dell Venue.

<sup>a</sup> Support for this version depends on its availability at the start of the school year.

## Chromebooks and Chromebases



**Warning:** Student monitoring software (such as Hapara, etc.) may not be used during testing. This software may run on the student tablets, such as Chromebooks, when the Secure Browser has been launched in Kiosk mode, but the test coordinator, technology coordinator and/or others who may have access to the parent computer may not use these program(s) during testing. Access to students' screens via student monitoring software during testing is considered to be a test security violation.

Table 3 lists the supported operating systems for Chromebooks and Chromebases.



### About Chrome OS and Automatic Updates

AIR recommends turning off or delaying automatic updates of the Chrome operating system. Doing so allows AIR to review changes from Google and address any updates that pose a potential risk to student testing. The recommended period for delaying automatic updates is two weeks.

Automatic update settings are configured in Google's admin console.



**Warning:** Student monitoring software (such as Hapara, etc.) may not be used during testing. This software may run on the student tablets, such as Chromebooks, when the Secure Browser has been launched in Kiosk mode, but the test coordinator, technology coordinator and/or others who may have access to the parent computer may not use these program(s) during testing. Access to students' screens via student monitoring software during testing is considered to be a test security violation.

Table 3. Supported Chromebooks

Supported Operating Systems	Related Requirements
<b>Chrome OS</b> 50+ <sup>a</sup>	See the <i>Secure Browser Installation Manual</i> for information about installing the secure browser in kiosk mode, a requirement for online testing.

<sup>a</sup> Support for this version depends on its availability at the start of the school year.

## Thin Clients: NComputing and Terminal Servers for Windows

### NComputing

[Table 4](#) lists the supported hardware and software for NComputing solutions.

Table 4. Supported NComputing solutions

Supported Server Host	Supported Server Software	Supported Terminals
Windows 2008 R2	vSpace Server 8.3	L300, firmware version 1.11.xx

### Terminal Servers

[Table 5](#) lists the supported terminal servers for use with a thin client machine.

Table 5. Supported terminal servers

Supported Terminal Servers	Supported Thin Client
Windows Server 2008, 2012	Any thin client that supports a Windows Server.



**Warning: Security Issues with Terminal Services or Remote Desktop Connections to Servers**

Using a terminal services or remote desktop connection to access a Windows Server or workstation that has the secure browser installed is typically not a secure test environment.



## Section III. Supported Web Browsers for Online Systems

This section lists the supported web browsers for the 2016–2017 test year. It also addresses AIR’s secure browsers for student testing.

### Supported Web Browsers by Operating System

[Table 6](#) lists the supported operating systems and corresponding web browsers for each AIR application. AIR recommends using recent versions of supported web browsers. Each application requires disabling pop-up blocking software and enabling JavaScript. Be sure to use the correct combination of operating system and web browser. For example, Windows 10 requires Internet Explorer 11 or Edge.

Table 6. Supported Web Browsers by Operating System

Operating Systems	Browsers	TA Sites, Student Practice Tests , DEI, AVA, THSS	TIDE, ORS
<b>Windows</b>			
Vista	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
7 (Professional and Enterprise)	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
	Internet Explorer 11	✓	✓
8.0 RT	Internet Explorer 11	✓	
8.0 (Professional and Enterprise)	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
8.1 (Professional and Enterprise)	Internet Explorer 11	✓	✓
10 (Professional, Educational, and Enterprise)	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
	Internet Explorer 11, Edge	✓	✓
10 RT	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
	Internet Explorer 11	✓	✓

Operating Systems	Browsers	TA Sites, Student Practice Tests , DEI, AVA, THSS	TIDE, ORS
<b>Mac OS X</b>			
10.7	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
10.8	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
10.9	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
	Safari 7	✓	✓
10.10	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
	Safari 8	✓	✓
10.11, 10.12	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
	Safari 9	✓	✓
<b>Linux</b>			
Fedora 23–25 <sup>a</sup>	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
openSUSE 13.1, 13.2	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
Red Hat Enterprise 6.5	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
Ubuntu (LTS) 12.04, 14.04, 16.04	Chrome 50+	✓	✓
	Firefox 45+	✓	✓
<b>iOS</b>			
8.0–8.2	Safari 8	✓	
9.2, 9.3	Safari 9	✓	
10.2, 10.3	Safari 10	✓	
<b>Android</b>			
4.4, 5.0, 5.1, 6.0 <sup>a</sup>	Chrome 50+	✓	

Operating Systems	Browsers	TA Sites, Student Practice Tests , DEI, AVA, THSS	TIDE, ORS
<b>Chrome OS</b>			
50+ <sup>a</sup>	Chrome 50+	✓	

<sup>a</sup> Support for this version depends on its availability at the start of the school year.

## Secure Browsers for Online Testing

[Table 7](#) lists the AIR secure browsers for each operating system. A secure browser must be downloaded and installed on each computer used for student testing. Schools that installed a secure browser with a version older than the versions listed below must uninstall it before installing the secure browser for the 2016–2017 school year. For instructions on downloading and installing the secure browsers, refer to the *Secure Browser Installation Manual*.

Table 7. Secure Browsers by Operating System

Operating Systems	Secure Browser
<b>Windows</b> Vista 7 (Professional and Enterprise) 8.0 (Professional and Enterprise) 8.1 (Professional and Enterprise) 10 (Professional, Educational, and Enterprise) Server 2008, 2012 (thin client)	9.0
<b>Mac OS X (Intel)</b> 10.7–10.12 <sup>a</sup>	9.0
<b>Linux</b> Fedora 23–25 <sup>a</sup> openSUSE 13.1, 13.2 Red Hat Enterprise 6.5 Ubuntu (LTS) 12.04, 14.04, 16.04	9.0
<b>iOS (iPads)</b> 8.0–8.2 9.2, 9.3 10.2, 10.3	AIRSecureTest Mobile Secure Browser
<b>Android</b> 4.4–6.0 <sup>a</sup>	AIRSecureTest Mobile Secure Browser
<b>Chrome OS</b> 50+ <sup>a</sup>	AIRSecureTest kiosk application

<sup>a</sup> Support for this version depends on its availability at the start of the school year.

## Delaying Firefox Updates

AIR conducts quality assurance on the most recent Firefox versions for each system except the Student Testing Site (which requires the secure browser). You should wait before installing new versions of Firefox, which could impact system performance. Delaying updates allows AIR time to review changes and verify that each system works correctly with the new version.

To learn how to disable auto-updates for Firefox, see <https://support.mozilla.org/en-US/kb/forum-response-turning-auto-update>. You may need to disable auto-updates again after installing a newer version.

## Available Audio Settings by Browser

Some test items play audio files, and some students have the text-to-speech (TTS) accommodation. In either case, the student should be able to adjust the audio settings for those items. Table 8 lists the browsers and their associated capability to modify such settings. Use Table 8 to ensure that you deploy a browser with the required capability.

Table 8. Available Audio Settings by Browser

Operating System	Browser	System Volume	TTS Volume	TTS Pitch	TTS Rate	Pause	Resume
Windows	Secure browser	Y	Y	Y	Y	Y	Y
	IE 11	N	N	N	N	N	N
	Edge	N	N	N	N	N	N
	Chrome <sup>a</sup>	Y	Y	Y	Y	N	N
	Firefox	N	N	N	N	N	N
OS X	Secure browser	Y	Y	Y	Y	Y	Y
	Safari	N	N	N	N	N	N
	Chrome <sup>a</sup>	Y	Y	Y	Y	N	N
Linux	Secure browser	Y	Y	Y	Y	Y	Y
	Firefox	N	N	N	N	N	N
	Chrome <sup>a</sup>	Y	Y	Y	Y	N	N
iOS	Mobile secure browser	N	Y <sup>b</sup>	Y <sup>b</sup>	Y <sup>b</sup>	N	N
	Safari	N	N	N	N	N	N
Android	Mobile secure browser	N	N	N	N	N	N
	Chrome <sup>a</sup>	Y	Y	Y	Y	N	N

<b>Operating System</b>	<b>Browser</b>	<b>System Volume</b>	<b>TTS Volume</b>	<b>TTS Pitch</b>	<b>TTS Rate</b>	<b>Pause</b>	<b>Resume</b>
Chromebook	Secure browser	N	Y	Y	Y	N	N
	Chrome <sup>a</sup>	Y	Y	Y	Y	N	N

<sup>a</sup> TTS features for practice tests are available on Chrome only if the client explicitly enables them.

<sup>b</sup> Available for mobile secure browser version 3.1 or later.

## **Section IV. Requirements for Peripheral Equipment**

This section describes the requirements for peripheral equipment: monitors, screens, keyboards, and headphones.

### **Monitors and Screen Display Requirements**

All supported computers, laptops, netbooks, and tablets must meet the following requirements.

#### **Screen Dimensions**

Screen dimensions must be 10" or larger (iPads with a 9.7" display are included). This means the following devices are **not** supported:

- Apple iPad Mini
- Google Nexus 7 and similar-sized Android tablets
- Netbooks with screen dimensions smaller than 10"

#### **Screen Resolution**

All devices must meet the following minimum resolution. Larger resolutions can be applied as appropriate for the monitor or screen being used.

- Desktops, laptops, and tablets: 1024 × 768
- Netbooks: 1024 × 600

Depending on the screen size, students may need to use vertical or horizontal scroll bars to view all test-related information. Students may also use the Zoom tool in the online test to enlarge the content on the screen.

## Keyboards

External keyboards are required for tablets used for testing except for the Hawai'i State Alternate Assessments administered on an iPad or other tablet. Students may use mechanical, manual, and Bluetooth-based keyboards. Some external keyboards have additional "shortcut" buttons that can create security issues. These buttons may allow students to open another application or the tablet's default on-screen keyboard. AIR strongly cautions against using keyboards that have these shortcut buttons.

### Keyboards with the Android

The Android mobile secure browser requires the secure browser keyboard to disable predictive text. Therefore, any external keyboard that has a shortcut button to open the tablet's default keyboard is not permitted, as this default keyboard will override the mobile secure browser keyboard.

AIR has determined that the EZOWare Slim Full Size Keyboard contains a shortcut button that opens the default keyboard and should NOT be used with Android tablets.

## Headphones

Students may need headphones to listen to audio in online assessments. Below are some scenarios that require headphones.

- Students with the text-to-speech accommodation can use headphones to listen to stimuli or to test items being read aloud.
- Students with the enhanced accessibility accommodation can use headphones along with Job Access with Speech (JAWS®) or other screen reading software to complete online tests.
- Each NComputing terminal must have a USB headphone when used for tests that require students to listen to audio.

Test Coordinators should determine how many students will need headphones to ensure that there are enough available at the time of a test.

Table 9 lists the supported headphones

Table 9. Supported Headphones

Model	Connector	Microphone Included	Hardware
Logitech 390	USB (wired)	Yes	All supported desktops, laptops, and Chromebases with USB port.
Panasonic RP-HT21	XBS	No	All supported desktops, laptops, and Chromebases with XBS port.

Logitech analog	3.5 mm	No	iOS, Android tablets with 3.5 mm port.
Plantronics 326	3.5 mm*	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except NComputing terminals.
Sennheiser PC 151	3.5 mm*	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except NComputing terminals.
Plantronics 355	3.5 mm*	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except NComputing terminals.
Generic headphones	3.5 mm	No	All supported desktops, laptops, and Chromebases with 3.5 mm port—except NComputing terminals.
Generic headphones	USB (wired)	No	All supported desktops, laptops, and Chromebases with USB port.

\*These models have two connectors, one each for headphone and microphone. They require a 3.5 mm headphone splitter when used with a computer having a single speaker-microphone port.

Note: Microphones are not needed for HSAP administration.

## Mice

Mice on mobile devices are not supported. Wireless or wired mice on desktops and laptops that are compatible with the operating system are supported.



## Appendix A. Change Log

This Change Log can be used to identify specific changes that are made to any of the information included in the original document throughout the current school year.

Change	Section	Date
Updated supported versions of Chrome to 50+, clarified supported versions of Safari.	Tables 3, 6, 7	9/26/16
Clarified and unified supported editions of Windows and other operating systems.	Tables 1, 2, 6, 7	10/28/16
Removed references to iOS 7.0; removed footnotes indicating iOS 10.0 will be supported.	Throughout	12/22/16
Added support for iOS 10.2.	Tables 2, 6, and 7	12/22/16
Added information about the prohibited use of student monitoring software.	Chromebooks and Chromebases	12/22/16
Removed support for Safari 6.	Table 6	4/4/17
Added support for iOS 10.3.	Tables 2, 6, and 7	4/11/17
Updated supported hardware and software for NComputing solutions.	Table 4	4/11/17
Added support for iPad 5 <sup>th</sup> generation.	Table 2	4/28/17