



System Requirements for Online Testing

This document contains basic technology requirements for online testing using American Institutes for Research's (AIR) systems for the 2015–2016 test administration. This document contains the following sections:

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

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).

Supported Operating Systems for Student Testing

This section describes the supported operating systems for online testing.



Warning: Support for All Operating Systems on Devices Used for Testing

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
Windows Vista, 7, 8.0 (Professional), 8.1, 10 (Educational and Professional) Server 2003*, 2008, 2012 (thin client)	Pentium 4 or newer processor that supports SSE2 512 MB of RAM 200 MB of hard drive space	Pentium 4 or newer processor that supports SSE2 2 GB+ RAM 80 GB+ hard drive
Mac OS X (Intel) 10.6–10.11	Intel x86 processor 512 MB of RAM 200 MB hard drive space	Pentium 4 or newer processor 2+ GB RAM 80+ GB hard drive
Linux Fedora 20, 21, 22 openSUSE 13.1 Red Hat Enterprise Linux 6.5 Ubuntu (LTS) 12.04, 14.04	Intel x86 processor 512 MB of RAM 200 MB hard drive space Required Libraries/Packages: <ul style="list-style-type: none"> • GTK+ 2.18 or higher • GLib 2.22 or higher • Pango 1.14 or higher • X.Org 1.0 or higher (1.7+ recommended) • libstdc++ 4.3 or higher • libreadline6:i386 (required for Ubuntu only) • GNOME 2.16 or higher 	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"> • NetworkManager 0.7 or higher • DBus 1.0 or higher • HAL 0.5.8 or higher

**This platform is approaching end-of-life and will no longer be supported as of the end of the 2015–2016 school year; AIR recommends migrating to newer platforms.*

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
iOS (iPads) 7.0, 7.1 8.0–8.2 9.2–9.3	iPad 2 iPad 3 Fourth-generation (Retina Display) iPad Air iPad Air 2
Android 4.3, 4.4, 5.0, 5.1	Google Nexus 10 Motorola Xoom Samsung Galaxy Note (2014 edition) Samsung Galaxy Tab 3 and 4 LearnPad Quarto
Windows 8.0 (Professional), 8.1, 10 (Educational and Professional)	AIR supports any tablet running Windows 8.0, 8.1 Pro, and 10, but has done extensive testing only on Surface Pro, Surface Pro 3, Asus Transformer, and Dell Venue.

Chromebooks and Chromebases

[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.

Table 3. Supported Chromebooks

Supported Operating Systems	Related Requirements
Chrome OS 41–49*	See the <i>Secure Browser Installation Manual</i> for information about installing the secure browser in kiosk mode, a requirement for online testing.

*For all versions starting with 43, TTS is supported on practice and training tests on the Chrome non-secure web browser.

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	L300

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 2003, 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 service or remote desktop connection to access a Windows Server or workstation that has the secure browser installed is typically not a secure test environment.

Supported Web Browsers for Online Systems

This section lists the supported web browsers for the 2015–2016 school 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: Test Administrator (TA) Sites, Student Practice Tests, Test Information Distribution Engine (TIDE), Online Reporting System (ORS), and the Teacher Hand Scoring System (THSS). AIR recommends using recent versions of supported web browsers. Each application requires disabling the pop-up blocking software and enabling the JavaScript. Be sure to use the correct combination for the operating system and web browser. For example, Windows 8 requires Internet Explorer 10 or 11.

Table 6. Supported Web Browsers by Operating System

Operating Systems	Browsers	TA Sites	Student Practice Test	TIDE	ORS	THSS
Windows						
Vista	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
7	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Internet Explorer 10–11	✓	✓	✓	✓	✓
8.0 RT	Internet Explorer 10–11	✓	✓			✓
8.0 (Professional), 8.1	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Internet Explorer 11	✓	✓	✓	✓	✓
10 (Educational and Professional)	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Internet Explorer 11	✓	✓	✓	✓	✓
Mac OS X						
10.6	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Safari 5.1.x	✓	✓	✓	✓	✓

System Requirements for Online Testing

Operating Systems	Browsers	TA Sites	Student Practice Test	TIDE	ORS	THSS
10.7	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Safari 5.1.x–6	✓	✓	✓	✓	✓
10.8	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Safari 6	✓	✓	✓	✓	✓
10.9	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Safari 7	✓	✓	✓	✓	✓
10.10	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Safari 8	✓	✓	✓	✓	✓
10.11	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
	Safari 8	✓	✓	✓	✓	✓
Linux						
Fedora 20–22	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
openSUSE 13.1	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
Red Hat Enterprise 6.5	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
Ubuntu (LTS) 12.04, 14.04	Chrome 41–49	✓	✓	✓	✓	✓
	Firefox 10–41	✓	✓	✓	✓	✓
iOS						
7.0, 7.1	Safari 7	✓	✓			✓
8.0–8.2	Safari 8	✓	✓			✓
9.2–9.3	Safari 9	✓	✓			✓

Operating Systems	Browsers	TA Sites	Student Practice Test	TIDE	ORS	THSS
Android						
4.3, 4.4, 5.0, 5.1	Chrome 41–49	✓	✓			✓
Chrome OS						
41–49	Chrome 41–49	✓	✓			✓

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 an older version than the versions listed below must uninstall it before installing the secure browser for the 2015–2016 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
Windows Vista, 7, 8.0, 8.1, 10 (Education and Professional Server 2003, 2008, 2012)	8.0
Mac OS X (Intel) 10.6–10.11	8.0
Linux Fedora 20–22 openSUSE 13.1 Red Hat Enterprise 6.5 Ubuntu 12.04, 14.04 (LTS)	8.1
iOS (iPads) 7.0, 7.1 8.0–8.2 9.2–9.3	AIRSecureTest Mobile Secure Browser
Android 4.3–5.1	AIRSecureTest Mobile Secure Browser
Chrome OS 41–49	AIRSecureTest kiosk application

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 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 10	N	N	N	N	N	N
	IE 11	N	N	N	N	N	N
	Chrome	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**	Y	Y	Y	Y	N	N
Linux	Secure browser	Y	Y	Y	Y	Y	Y
	Firefox	N	N	N	N	N	N
	Chrome	Y	Y	Y	Y	N	N
iOS	Mobile secure browser	N	Y*	Y*	Y*	N	N
	Safari	N	N	N	N	N	N
Android	Mobile secure browser	N	N	N	N	N	N
	Chrome	Y	Y	Y	Y	N	N
Chromebook	Secure browser	N	Y	Y	Y	N	N
	Chrome	Y	Y	Y	Y	N	N

*Available for mobile secure browser version 3.1 or later.

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 tests 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.

- Students with the text-to-speech feature can listen to stimuli or test items being read aloud.
- Students with the enhanced accessibility mode feature can use the Job Access with Speech (JAWS®) or other similar screen reading software.

Test Coordinators should determine how many students will need headphones prior to testing to ensure that there is an adequate supply on hand.

The following headphones and headsets are supported:

- Logitech 390 USB wired (includes microphone)
- Panasonic standard headset RP-HT21
- Logitech Analog (stereo headset for iOS and Android; includes microphone)
- Air USB wired headset (includes microphone)
- Plantronics 326 (includes microphone)
- Senheizer 151 (Analog; includes microphone)
- Plantronics Audio 355 (includes microphone)

System Requirements for Online Testing

- Wired headphones with a 3.5 mm connector.
- USB headphones with a wired or wireless connection.
- The following Bluetooth headphones: Logitech H800, SoundBot SB270, and ECO Sound ECO-V300.

Wired headphones with a 3.5 mm connector or USB headphones (wired or wireless) are recommended over Bluetooth, as they provide better clarity and accuracy.

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.

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 Chrome 45 and Firefox 40 support	Table 6. Supported Web Browsers by Operating System	9/23/2015
Updated Windows 10 support	Table 1. Supported Desktop Operating Systems	9/23/2015
Updated language of Warning to include all operating systems on devices used for testing	Supported Operating Systems for Student Testing	9/23/2015
Updated Firefox 41	Table 6. Supported Web Browsers by Operating System	10/14/2015
Specified Windows 10 Educational and Professional	Table 1. Supported Desktop Operating Systems Table 2. Supported Tablets and Operating Systems	10/14/2015
SB 8.1 for Linux	Table 7. Secure Browsers by Operating System	10/14/2015
Changed Safari 5 to 5.1.x	Table 6. Supported Web Browsers by Operating System	10/14/2015
Changed latest Fedora to 22	Table 1. Supported Desktop Operating Systems Table 3. Supported Chromebooks Table 6. Supported Web Browsers by Operating System Table 7. Secure Browsers by Operating System	10/14/2015
Updated Chrome support to 46	Table 3. Supported Chromebooks Table 6. Supported Web Browsers by Operating System Table 7. Secure Browsers by Operating System	10/20/2015
Clarified supported versions for TTS and TTS tracking on Chrome OS	Table 3. Supported Chromebooks Table 6. Supported Web Browsers by Operating System Table 7. Secure Browsers by Operating System	3/1/2016
Updated Chrome support to include 41-48	Table 3. Supported Chromebooks Table 6. Supported Web Browsers by Operating System Table 7. Secure Browsers by Operating System	3/7/2016

System Requirements for Online Testing

Change	Section	Date
Edited note to indicate versions 43-48 support TTS on the Chrome non-Secure Browser.	Table 3. Supported Chromebooks	3/7/2016
Edited note to clarify TTS as available on practice and training tests.	Table 3. Supported Chromebooks	3/8/2016
New Section	Available Audio Settings by Browser	3/22/2016
Added iOS 9.2	Table 2. Supported Tablets and Operating Systems Table 6. Supported Web Browsers by Operating System Table 7. Secure Browsers by Operating System	3/24/2016
Added update for OS X 10.11	Table 1. Supported Desktop Operating Systems Table 6. Supported Web Browsers by Operating System Table 7. Secure Browsers by Operating System	3/24/2016
Clarified versions of Windows 8.0	Table 1. Supported Desktop Operating Systems Table 2. Supported Tablets and Operating Systems Table 6. Supported Web Browsers by Operating System	3/24/2016
Added update for Windows 10	Table 1. Supported Desktop Operating Systems Table 2. Supported Tablets and Operating Systems Table 6. Supported Web Browsers by Operating System Table 7. Secure Browsers by Operating System	3/24/2016
Updated screen size of iPad to 9.7"	Screen Dimensions	3/24/2016
Added support for Chrome 49 and iOS 9.3	Throughout	3/31/2016