System Requirements for Online Testing

2016–2017

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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 *Test Administrator User Guide*.
- The above resources, as well as secure browsers and user guides for other systems, are available on the Ohio's State Tests portal (http://ohiostatetests.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
Windows 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
Mac OS X (Intel) 10.7–10.12	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
Linux Fedora 23–25[a] 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: • 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: • NetworkManager 0.7 or higher • DBus 1.0 or higher • HAL 0.5.8 or higher

[a] This operating system is not available at the beginning of the school year. Support for this version in 2016-2017 is subject to AIR's policy on major operating system releases during the school year.

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) 8.0–8.4 9.2, 9.3 10.2-10.3	iPad 2 iPad 3 Fourth-generation (Retina Display) iPad Air iPad Air 2
Android 4.4, 5.0, 5.1, 6.0[a]	Google Nexus 10 Motorola Xoom Samsung Galaxy Note (2014 edition) Samsung Galaxy Tab 3 and 4 LearnPad Quarto

Supported Operating Systems	Supported Tablets
Windows 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.

a This operating system is not available at the beginning of the school year. Support for this version in 2016-2017 is subject to AIR's policy on major operating system releases during the school year.

Warning: Guidelines for Configuring iPads

During testing, iOS devices must be placed in Autonomous Single App Mode (ASAM) or Guided Access mode to ensure a secure testing environment. Apple and the Ohio Department of Education recommend using ASAM, although Guided Access is acceptable for devices with iOS 8.0 – 8.1.2. Devices with iOS 8.1.3 or later are required to use ASAM and restrict certain features to ensure a secure testing environment. If you are using iPads with iOS 9.3.2 or later, you can use the automatic assessment configuration that comes with the AIRSecureTest app. Failure to do so can lead to test security violations. Step-by-step instructions for enabling the automatic assessment configuration, ASAM or Guided Access can be found in the *Technology Specifications Manual.*

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 50+	See the *Secure Browser Installation Manual* for information about installing the secure browser in kiosk mode, a requirement for online testing.

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 (non-OELPA), DEI (non-OELPA)	OELPA Student Practice Tests, OELPA DEI	TIDE, ORS
Windows				
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) 8.1 (Professional and Enterprise)	Chrome 50+	✓	✓	✓
	Firefox 45+	✓	✓	✓
	Internet Explorer 11	✓		✓
10 (Professional, Educational, and Enterprise)	Chrome 50+	✓	✓	✓
	Firefox 45+	✓	✓	✓
	Internet Explorer 11, Edge	✓		✓
10 RT	Chrome 50+	✓	✓	✓
	Firefox 45+	✓		✓

Operating Systems	Browsers	TA Sites, Student Practice Tests (non-OELPA), DEI (non-OELPA)	OELPA Student Practice Tests, OELPA DEI	TIDE, ORS
	Internet Explorer 11	✓		✓
Mac OS X				
10.7	Chrome 50+	✓	✓	✓
	Firefox 45+	✓	✓	✓
10.8	Chrome 50+	✓	✓	✓
	Firefox 45+	✓	✓	✓
	Safari 7+	✓		✓
10.9	Chrome 50+	✓	✓	✓
	Firefox 45+	✓	✓	✓
	Safari 7+	✓		✓
10.10	Chrome 50+	✓	✓	✓
	Firefox 45+	✓	✓	✓
	Safari 7+	✓		✓
10.11	Chrome 50+	✓	✓	✓
	Firefox 45+	✓	✓	✓
	Safari 7+	✓		✓
10.12	Chrome 50+	✓	✓	✓
	Firefox 45+	✓	✓	✓
	Safari 7+	✓		✓
Linux				
Fedora 23–25[a]	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+	✓	✓	✓
iOS				
8.0–8.2	Safari 8	✓		

Operating Systems	Browsers	TA Sites, Student Practice Tests (non-OELPA), DEI (non-OELPA)	OELPA Student Practice Tests, OELPA DEI	TIDE, ORS
9.2, 9.3	Safari 9	✓		
10.2, 10.3	Safari 10	✓		
Android				
4.4, 5.0, 5.1, 6.0[a]	Chrome 50+	✓		
Chrome OS				
50+	Chrome 50+	✓	✓	

[a] This operating system is not available at the beginning of the school year. Support for this version in 2016-2017 is subject to AIR's policy on major operating system releases during 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. Districts 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
Windows 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
Mac OS X (Intel) 10.7–10.12	9.0
Linux Fedora 23–25[a] openSUSE 13.1, 13.2 Red Hat Enterprise 6.5 Ubuntu (LTS) 12.04, 14.04, 16.04	9.0

Operating Systems	Secure Browser
iOS (iPads) 8.0–8.4 9.2, 9.3 10.2, 10.3	AIRSecureTest Mobile Secure Browser
Android 4.4–6.0[a]	AIRSecureTest Mobile Secure Browser
Chrome OS 50+	AIRSecureTest kiosk application

[a] This operating system is not available at the beginning of the school year. Support for this version in 2016-2017 is subject to AIR's policy on major operating system releases during the school year.

Web Browser Updates

Manufactures who release their browsers annually (Safari by Apple and Internet Explorer by Microsoft) typically make a significant number of changes. For this reason, AIR blocks new versions of these browsers from accessing the Test Administrator Sites, Student Practice Site and Data Entry Interface until they are tested and all issues are resolved. AIR intends to support a new version of a currently supported web browser within 90 days of official release.

AIR works collaboratively with Google and Mozilla on new versions of Chrome and Firefox, which are released every 6 weeks. We do not block new versions from accessing the site. New versions often work out-of-the-box without software modifications on AIR's side, but occasionally issues will need to be resolved depending on the change from the manufacturer.

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	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[a]	Y[a]	Y[a]	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

[a] 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 strongly recommended for tablets used for testing. 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.

Headsets and Headphones

Students may need headphones to listen to audio in online assessments, and may use headsets to record answers to tests. Below are some scenarios that require headphones or headsets.

- 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 or headset when used for tests that require students to record or listen to audio.
- Students participating in OELPA must have a headset (with a microphone) to record responses to speaking items.

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 and headsets.

Table 9. Supported Headphones and Headsets

Model	Connector	Microphone Included	Hardware
Logitech 390[a]	USB (wired)	Yes	All supported desktops, laptops, and Chromebases with USB port.

Model	Connector	Microphone Included	Hardware
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[a]	3.5 mm[b]	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except Ncomputing terminals.
Senheizer PC 151[a]	3.5 mm[b]	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except Ncomputing terminals.
Plantronics 355[a,c]	3.5 mm[b]	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.

[a] *OELPA audio recording is supported for the identified headsets.*

[b] *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.*

[c] *This headset is orderable through AIR at http://www.airelpa21headsets.org.*

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

Date	Note
8/8/16	Initial 2016-17 version
10/25/16	Clarified version numbers for vSpace server and terminal firmware
10/25/16	Removed reference to Windows 11
10/25/16	Clarified and unified supported editions of Windows
10/25/16	Removed iOS 7 support Added iOS 10 support
10/25/16	Clarified note on operating systems not available at the beginning of the school year
2/6/17	Clarified supported versions of Safari
2/6/17	Added support for iOS 10.2 and Mac OS 10.12
4/10/17	Added support for iOS 10.3