

# System Requirements for Online Testing 2017–2018

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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 2017–2018 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. For optimal performance, AIR expects all systems to have the latest minor updates and patches installed. Major updates including new versions require review and 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> 7 (Professional and Enterprise) 8.0 (Professional and Enterprise) 8.1 (Professional and Enterprise) 10 (Professional, Educational, and Enterprise) Server 2008, 2012, 2016 (thin client)	1.1 GHz Processor 512 MB of RAM 200 MB hard drive space	1.4 GHz Processor 2 or more GB RAM 16 or more GB hard drive space
<b>Mac OS X</b> 10.7–10.13	1.1 GHz Processor 512 MB of RAM 200 MB hard drive space	1.4 GHz Processor 2 or more GB RAM 16 or more GB hard drive

Supported Operating Systems	Minimum Requirements	Recommended Specifications
<b>Linux</b> Fedora 25-26 <sup>a</sup> LTS (Gnome) Ubuntu 14.04, 16.04 LTS (Gnome)	1.1 GHz 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>	1.4 GHz Processor 2 or more GB RAM 16 or more GB hard drive space 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> This operating system is not available at the beginning of the school year. Support for this version in 2017–2018 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
<b>iOS (iPads)</b> 9.2, 9.3, 10.2, 10.3, 11.1-11.3	iPad 2 iPad 3 4 <sup>th</sup> Generation (Retina Display) 5 <sup>th</sup> Generation (Retina Display) iPad Air iPad Air 2
<b>Android</b> 5.1, 6.0, 7.1	Google Nexus 10 Asus Transformer Pad Asus Memo Pad Dell Venue 10 HP Pro Slate 10 Samsung Galaxy Tab 4 Education

Supported Operating Systems	Supported Tablets
<b>Windows</b> 8 (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.



#### **Warning: Guidelines for Configuring iPads**

During testing, iOS devices must be placed in Autonomous Single App Mode (ASAM) to restrict certain features and 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 or ASAM can be found in the *Technical Specifications Manual*.

## Chromebooks and Chromebases

[Table 3](#) lists the supported operating systems for Chromebooks and Chromebases. See the *Secure Browser Installation Manual* for information about installing the secure browser in kiosk mode, a requirement for online testing.



#### **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	Minimum Requirements	Recommended Specifications
<b>Chrome OS</b> 60+	1.1 GHz Processor 2 GB of RAM 16 GB SSD	1.4 GHz Processor 4 GB of RAM 16 GB SSD

## 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 Server 2008 R2	vSpace Server 8.4	L300, firmware version 1.11.xx
Windows Server 2012 R2	vSpace PRO 10	
Windows Server 2016 R2		
Windows 10		

### 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, 2016	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 2017–2018 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
<b>Windows</b>				
7 (Professional and Enterprise)	Chrome 60+	✓	✓	✓
	Firefox 52+	✓	✓	✓
	Internet Explorer 11	✓		✓
8 RT	Internet Explorer 11	✓		✓
8 (Professional and Enterprise) 8.1 (Professional and Enterprise)	Chrome 60+	✓	✓	✓
	Firefox 52+	✓	✓	✓
	Internet Explorer 11	✓		✓
10 (Professional, Educational, and Enterprise)	Chrome 60+	✓	✓	✓
	Firefox 52+	✓	✓	✓
	Internet Explorer 11, Edge	✓		✓
10 S	Edge	✓		✓
<b>Mac OS X</b>				
10.7–10.8	Chrome 60+	✓	✓	✓
	Firefox 45	✓	✓	✓
	Safari 7+	✓		✓

Operating Systems	Browsers	TA Sites, Student Practice Tests (non-OELPA), DEI (non-OELPA)	OELPA Student Practice Tests, OELPA DEI	TIDE, ORS
10.9 – 10.13	Chrome 60+	✓	✓	✓
	Firefox 52+	✓	✓	✓
	Safari 7+	✓		✓
<b>Linux</b>				
Fedora 25–26 <sup>a</sup> LTS (Gnome)	Chrome 60+	✓	✓	✓
	Firefox 52+	✓	✓	✓
Ubuntu 14.04, 16.04 LTS (Gnome)	Chrome 60+	✓	✓	✓
	Firefox 52+	✓	✓	✓
<b>iOS</b>				
9.2, 9.3	Safari 9	✓		
10.2, 10.3	Safari 10	✓		
11.1+	Safari 11	✓		
<b>Android</b>				
5.1, 6.0, 7.1	Chrome 60+	✓		
<b>Chrome OS</b>				
60+	Chrome 60+	✓	✓	

## 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 2017–2018 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> 7 (Professional and Enterprise) 8.0 (Professional and Enterprise) 8.1 (Professional and Enterprise) 10 (Professional, Educational, and Enterprise) Server 2008, 2012, 2016 (thin client)	10
<b>Mac OS X</b> 10.7–10.8 10.9–10.2 10.13	9.5 10 10.2
<b>Linux</b> Fedora 25–26 <sup>a</sup> LTS (Gnome) Ubuntu 14.04, 16.04 LTS (Gnome)	10.1
<b>iOS (iPads)</b> 9.2, 9.3 10.2, 10.3 11.1+	AIRSecureTest Mobile Secure Browser
<b>Android</b> 5.1, 6.0, 7.1	AIRSecureTest Mobile Secure Browser
<b>Chrome OS</b> 60+	AIRSecureTest kiosk application

<sup>a</sup> This operating system is not available at the beginning of the school year. Support for this version in 2017–2018 is subject to AIR’s policy on major operating system releases during the school year.

## Web Browser Updates

Manufacturers 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	Y	Y	Y	N	N
OS	Secure browser	Y	Y	Y	Y	Y	Y
	Safari	N	N	N	N	N	N
	Chrome	Y	Y	Y	Y	N	N
Linux <sup>b</sup>	Secure browser	Y	Y	Y	Y	Y	Y
	Firefox	N	N	N	N	N	N
	Chrome	Y	Y	Y	Y	N	N

Operating System	Browser	System Volume	TTS Volume	TTS Pitch	TTS Rate	Pause	Resume
iOS	Mobile secure browser	N	Y <sup>a</sup>	Y <sup>a</sup>	Y <sup>a</sup>	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

<sup>a</sup> Available for mobile secure browser version 3.4 or later.

<sup>b</sup> TTS Tracking is not available on Linux.

## 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 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 <sup>a</sup>	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 <sup>a</sup>	3.5 mm <sup>b</sup>	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except Ncomputing terminals.
Sennheiser PC 151 <sup>a</sup>	3.5 mm <sup>b</sup>	Yes	All supported desktops, laptops, and Chromebases with 3.5 mm port—except Ncomputing terminals.
Plantronics 355 <sup>a,c</sup>	3.5 mm <sup>b</sup>	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.

<sup>a</sup> OELPA audio recording is supported for the identified headsets.

<sup>b</sup> 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.

<sup>c</sup> This headset is orderable through AIR at <http://www.airelpa21headsets.org>.

## Mice

Mice on mobile devices are not supported. Wireless or wired two- or three-buttoned mice that are compatible with the operating system on desktops and laptops are supported. No other mice should be used, especially mice equipped with a “browser back” button that could potentially kick users out of a test.



## Appendix A. Change Log

Date	Note
8/7/17	Initial 2017-2018 version
9/18/17	Updates made to reflect discontinued support of Linux Red Hat and updated version of Secure Browser for Linux from 10 to 10.1
11/8/17	Updates made to reflect support for iOS 11.1 and discontinued support of iOS 8.x
11/30/17	Update to table 8 to reflect TTS Tracking unavailable for Linux
12/27/17	Updated to reflect support for iOS 11.1+
2/20/18	Updated to reflect support for Mac OS 10.12
04/03/18	Updated table 2 to reflect support for iOS 11.3