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| Acronyms and Initialisms Used in the Technical Specifications for Online Testing Manual |
|---------------------------------|-----------------------------------------------------------------------------------|
| AES                             | Advanced Encryption Standard                                                        |
| AIR                             | American Institutes for Research                                                    |
| CAASPP                          | California Assessment of Student Performance and Progress                          |
| CalTAC                          | California Technical Assistance Center                                              |
| CRL                             | Certificate Revocation List                                                         |
| DNS                             | Domain Name System                                                                 |
| ELA                             | English language arts/literacy                                                      |
| FQDNs                           | fully qualified domain names                                                        |
| IP                              | Internet Protocol                                                                  |
| JAWS                            | Job Access with Speech®                                                            |
| LAN                             | local area network                                                                 |
| LEA                             | local educational agencies                                                          |
| Mbps                            | megabits per second                                                                |
| SoX                             | Sound eXchange                                                                     |
| TA                              | Test Administrator                                                                 |
| TCP                             | Transmission Control Protocol                                                       |
| UI                              | user interface                                                                      |
| WAP                             | wireless access points                                                             |
| WPA2                            | Wi-Fi Protected Access II                                                           |
Introduction to the Technical Specifications Manual

This manual provides information, tools, and recommended configuration details to help technology staff prepare computers to be used with the California Assessment of Student Performance and Progress (CAASPP) implementation of the Smarter Balanced test administration.

Manual Content

This document provides technical information in five sections, as follows.

- **Section I, Internet and Network Requirements**, provides information about bandwidth, wireless networking, network configuration, and diagnostic tools.
- **Section II, Hardware Requirements**, contains information regarding supported tablets, keyboards, headphones, and printers.
- **Section III, Software Requirements**, provides information about pop-up blockers, installing the Verdana font on Linux machines, and how to disable the Fast User Switching feature in Windows-based computers.
- **Section IV, Text-to-Braille**, contains hardware and software requirements for student and Test Administrator computers.
- **Section V, Text-to-Speech and Voice Packs**, contains instructions for ensuring that text-to-speech is enabled on supported operating systems.
- The **Appendixes** contain URLs and Internet Protocol (IP) addresses that technology staff at schools and local educational agencies (LEAs) can use to ensure student computers are correctly set up for testing.

**Table 1. Key symbols and elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Warning]</td>
<td><strong>Warning:</strong> This symbol accompanies important information regarding actions that may cause fatal errors.</td>
</tr>
<tr>
<td>![Important]</td>
<td><strong>Important:</strong> This symbol accompanies important information regarding a task that may cause minor errors.</td>
</tr>
<tr>
<td>![Note]</td>
<td><strong>Note:</strong> This symbol accompanies additional information about the topic.</td>
</tr>
<tr>
<td>[text]</td>
<td><strong>[text]</strong> Bold text in brackets is used to indicate a link or button that is selectable.</td>
</tr>
<tr>
<td>![TIP]</td>
<td>This symbol accompanies user tips.</td>
</tr>
</tbody>
</table>

Other Resources

This manual **does not** contain information about installing secure browsers. The **Secure Browser Installation Manual**, and other CAASPP user guides for online systems, are posted to the CAASPP Portal ([http://www.caaspp.org](http://www.caaspp.org)).

Additional Support

If you need information that is not provided in this manual, on the Smarter Balanced Assessment Consortium Web site ([www.smarterbalanced.org](http://www.smarterbalanced.org)) or the CAASPP Portal ([http://caaspp.org](http://caaspp.org)), or from your local educational agency (LEA) Technical Coordinator or LEA staff, your LEA CAASPP Coordinator should contact the California Technical Assistance Center (CalTAC) at 800-955-2954 or by using the other contact information listed on the **User Support** page at the end of this document.
Section I. Network and Internet Requirements

A stable, high-speed (wired or wireless) Internet connection is required for online testing. The response time for each assessment depends on the reliability and speed of your school’s Internet network.

If your Internet connection is not working or stops working, students will be logged off and the test will automatically be paused; students will need to complete their tests at a later time or on another day.

If the students were working on a computer adaptive test at the time of an outage, the following rules apply after they have logged on to resume testing:

- **If the page contains at least one unanswered item**, a student is presented with the page containing the item(s) he or she was working on when the assessment was paused.

- **If all items on the previous page were answered**, a student is presented with the next page and is not permitted to review or change any previously answered items, even if they are marked for review (with the exception of items on a page that contains at least one item that was not answered yet).

If the students were working on a performance task at the time of an outage, a student can return to the section and continue entering his or her responses. However, any highlighted text and notes on the digital notepad will not be saved.

For the online testing applications to work properly, you may need to verify your network settings. If you are not sure whether your network is properly configured or you have questions, contact your network administrator or technology specialist to find the right contact person in your area. Local educational agency (LEA) California Assessment of Student Performance and Progress (CAASPP) Coordinators may also contact the California Technical Assistance Center (CalTAC).

<table>
<thead>
<tr>
<th>Important notes about network configuration settings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network configuration settings should include the following:</td>
</tr>
<tr>
<td>- Firewalls and proxy servers should be configured to allow traffic to the URLs, IP addresses, and ports without content filtering. (See Appendix A.)</td>
</tr>
<tr>
<td>- Session timeouts on proxy servers and other devices should be set to values greater than the average scheduled testing time. If testing sessions are scheduled for 60 minutes, consider session timeouts of 65–70 minutes. This will help limit network interruptions during testing.</td>
</tr>
<tr>
<td>- Configure Web proxy servers not to cache data from the test delivery system.</td>
</tr>
<tr>
<td>- If your client network uses any device(s) that performs traffic shaping, packet prioritization, or Quality of Service, the URLs and IP addresses in Appendix A should be given a high priority to guarantee the highest level of performance.</td>
</tr>
<tr>
<td>- Maintain good bandwidth.</td>
</tr>
</tbody>
</table>

Common Network Performance Bottlenecks

All network communications are accomplished using the IP protocol suite. The LAN (local area network) must be able to route IP traffic to and from the Internet. The test delivery system is delivered directly through the Internet. Students must access their tests using the appropriate secure browser. (See the Secure Browser Installation Manual for more information.) For testing to take place, all workstations where tests will be administered must have reliable Internet connectivity.
In general, the performance of the test delivery system will depend on a number of factors, including bandwidth, total number of students simultaneously testing, size of test content, secure browser installation, proxy server (if used), and the wireless networking solution (if used).

**Bandwidth**

Bandwidth is the measure of the capacity of a network. Utilized bandwidth measures the amount of data traveling across the network at a given point in time. Bandwidth performance can be affected by either internal network (LAN) traffic and/or Internet traffic from the router. Regardless of hardware or network topology, the LAN should be analyzed to determine the potential for traffic bottlenecks.

Table 2 displays the estimated average bandwidth used by the secure browser for testing. (Note that there is a one-time exception to these averages; during initial secure browser startup, the load can be greater.) All numbers provided are based on rigorous testing using Wireshark.

<table>
<thead>
<tr>
<th>Number of Students Testing Concurrently in School/Building</th>
<th>Average Estimated Bandwidth Consumed During Subsequent Startup of Secure Browser*</th>
<th>Average Estimated Bandwidth Consumed During Testing**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8K bits/second</td>
<td>5–15K bits/second</td>
</tr>
<tr>
<td>50</td>
<td>400K bits/second</td>
<td>250–750K bits/second (0.25–0.75M bits/second)</td>
</tr>
<tr>
<td>100</td>
<td>800K bits/second</td>
<td>500–1500K bits/second (0.5–1.5M bits/second)</td>
</tr>
</tbody>
</table>

* The bandwidth consumed when opening the secure browser and accessing a test for the first time is significantly higher than when opening the secure browser and accessing a test subsequently because the initial launch of the secure browser downloads nonsecure cacheable content (not test content) that can be immediately accessed upon opening the secure browser at a later time.

** Bandwidth will vary during a student’s testing experience as some test pages contain low-bandwidth content, such as selected-response items, and other pages contain higher-bandwidth content, such as animations, audio clips, or American Sign Language videos. Consequently, the estimated average values in this column are based on computing averages from multiple tests and test subjects.

**Determining Bandwidth Requirements**

Schools need to factor the bandwidth requirements of each test along with all other non–test-related Internet traffic in order to determine how many concurrent test sessions the schools’ Internet connections can support.

- The online test includes animations and interactive item types. These may increase the bandwidth required, but the bandwidth should not exceed the peak usage experienced when the test initially loads. **You are encouraged to run the diagnostics on your network to determine how many students at a time you can reasonably test.** Refer to the Network Diagnostics Tools section for information about running diagnostics on your network.

- For wired networks, internal bandwidth is typically not a problem, because new switches generally operate at speeds of between 100M bits per second and 1000M bits per second. However, LAN performance can be hindered in cases where hubs are used instead of switches. A hub device will allow broadcast signals from various network devices to propagate across the network, potentially saturating the network and causing traffic competition and/or collisions of data.
Section I. Network and Internet Requirements

Wireless Networking

- For Internet networks, the most common bottleneck is the Internet Service Provider’s router connection, which typically operates at speeds of between 1.5M bits per second and 100M bits per second. Network administrators should spend time prior to test administration determining whether their Internet infrastructure has the capacity to accommodate current and future growth.

**TIP**

Determining whether infrastructure is capable of current and future growth involves a number of steps, including, but not limited to: (1) the analysis of the current number of users; (2) current day-to-day Internet bandwidth statistics; and (3) the desired response time for applications.

**Total Number of Students Simultaneously Testing**

As the number of students testing at one time increases, competition for network bandwidth increases. Network bandwidth resembles highway traffic; as the number of cars traveling on a given road increases, the speed of traffic flow decreases.

**Size of the Test Content**

The size of the test is determined by two factors: (1) the number of items on the test; and (2) the average size of each item. The more items a test contains and the larger the average size of a test item, the higher the bandwidth requirement for a given test. For example, English-language arts/literacy (ELA) tests typically deliver all items associated with a passage at one time, which may slightly increase the bandwidth for these tests.

**Note:** ELA assessments will require more bandwidth.

**Secure Browser Installation**

The recommended installation of the secure browser(s) is local installation on each individual testing workstation. It is possible to install the secure browser on a network or shared drive and then have the testing workstations run the secure browser from that drive, but there may be some performance impacts under this configuration. There will be competition for network bandwidth, and the network or shared disk drive will also be subject to some resource competition as there will be multiple clients reading from the network drive, thus slowing the overall processing speed.

See the Secure Browser Installation Manual for more information about installing and configuring the secure browser.

**Wireless Networking**

Over the past several years, there have been several revisions to wireless networking technology.

- 802.11n is the fastest and most recent Institute of Electrical and Electronic Engineers wireless standard, with a throughput of up to 300M bits per second.
- 802.11g has a theoretical throughput of up to 54M bits per second.
- 802.11b has a theoretical throughput of 11M bits per second.

**Wireless Security**—Due to the sensitivity of test-related data, it is highly recommended that wireless traffic use Wi-Fi Protected Access II/Advanced Encryption Standard (WPA2/AES) data encryption. Because encryption/decryption is part of the data exchange process, there may be a slight decrease in the overall speed of the network. A properly configured wireless network should provide adequate bandwidth for the testing applications.
Wireless Access Points (WAP)
It is recommended that schools maintain a ratio of wireless systems to wireless access points (WAPs) of no more than 20 to 1. Typically, the test performance begins to deteriorate after that threshold has been reached. In some instances, older WAPs may also see performance degradation when more than 15 devices are attached concurrently.

Table 3 contains recommendations on the optimal number of student workstations per wireless connection. The optimal (or maximum) number of student workstations (computers and tablets) supported by a single wireless connection will depend on the type of networking standard being used for the connection. The two most common networking standards are 802.11g (54 megabits per second [Mbps]) and the newer and faster standard, 802.11n (300Mbps). Both the access point, which emits the wireless signal, and the computer’s wireless card, which receives the signal, will use one of these two standards. The recommendations in Table 3 are based on the standard in use.

<table>
<thead>
<tr>
<th>Wireless Access Points</th>
<th>802.11g Access Point</th>
<th>802.11n Access Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>802.11g Wireless Cards</td>
<td>20 workstations or devices</td>
<td>40 workstations or devices</td>
</tr>
<tr>
<td>802.11n Wireless Cards</td>
<td>20 workstations or devices</td>
<td>40 workstations or devices</td>
</tr>
<tr>
<td>Mix of 802.11g and 802.11n Wireless Cards</td>
<td>20 workstations or devices</td>
<td>40–50 workstations or devices (depending on the ratio of wireless cards used)</td>
</tr>
</tbody>
</table>

Note: Refer to your WAP documentation for specific recommendations and guidelines. Networks using wireless standards other than 802.11g and 802.11n may also work, but early testing using the practice and training tests is recommended.

Network Diagnostic Tools
A performance analysis of the LAN/Internet infrastructure is recommended in order to identify any bottlenecks that may impact test performance. Identifying the diagnostic tool most appropriate for a network depends on the testing operating system, the network administrator’s knowledge base, and the desired level of network analysis. The Internet offers a number of network diagnostic tools, including, but not limited to, the following:

American Institutes for Research’s (AIR’s) Network/Bandwidth Diagnostic Tool
American Institutes for Research (AIR) provides a diagnostic tool that can be directly accessed from the CAASPP Portal (http://caaspp.org).

1. Select the [Bandwidth Checker Tool] link in the “Additional Resources” section of the CAASPP Portal.
2. Within the Network Diagnostics tool, select a test.
3. Select the approximate number of students who may take that test at one time.
4. Select the [Run Network Diagnostics Tests] button.

The results will display your current upload and download speed as well as a general idea of whether you can reliably test the given number of students (the number entered in step 3). You may want to run this test several times throughout the day to verify that your upload and download speeds remain relatively consistent.
Microsoft Windows–Specific Tools

Paessler Router Traffic Grapher Traffic Grapher (www.paessler.com/prtg)

This Windows software monitors bandwidth usage and other network parameters via Simple Network Management Protocol. It also contains a built-in packet sniffer. A freeware version is available.

NTttcp (www.microsoft.com/whdc/device/network/TCP_tool.mspx)

NTttcp is a multithreaded, asynchronous application that sends and receives data between two or more endpoints and reports the network performance for the duration of the transfer.

Pathping

Pathping is a network utility included in the Windows operating system. It combines the functionality of Ping with that of Traceroute (Windows filename: “tracert”) by providing details of the path between two hosts and Ping-like statistics for each node in the path based on samples taken over a time period.

Mac OS X–Specific Tools

Network Utility.app

This tool is built into Mac OS X software (10.4 or greater).

Multi-Platform Tools

Wireshark (www.wireshark.org)

Wireshark (formerly Ethereal) is a network protocol analyzer. It has a large feature set and runs on most computing platforms including Windows, OS X, Linux, and UNIX.

TCPDump (http://sourceforge.net/projects/tcpdump)

TCPdump is a common packet sniffer that runs under the command line and is compatible with most major operating systems (UNIX, Linux, Mac OS X). It allows the user to intercept and display data packets being transmitted or received over a network.

A Windows port WinDump is also available (www.winpcap.org/windump/).

Ping, NSLookup, Netstat, Traceroute (in Windows: tracert)

This is a set of standard UNIX network utilities. Versions of these utilities are included in all major operating systems (UNIX, Linux, Windows, and Mac OS X).

Iperf (http://sourceforge.net/projects/iperf/)

Iperf measures maximum Transmission Control Protocol (TCP) bandwidth, allowing the tuning of various parameters and User Datagram Protocol characteristics. Iperf reports bandwidth, delay jitter, and datagram loss.

Network Configuration

Protocols

All communication with the test delivery system takes place over the following Internet port/protocol combinations. Please ensure that the following ports are open for these systems.

<table>
<thead>
<tr>
<th>Port/Protocol</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>80/tcp</td>
<td>HTTP (initial connection only)</td>
</tr>
<tr>
<td>443/tcp</td>
<td>HTTPS (secure connection)</td>
</tr>
</tbody>
</table>
Domain Name Resolution
All system URLs must be resolvable by all client hosts attempting to connect to the test delivery system. This means that the client workstations should be able to convert the friendly names (URLs) to their corresponding IP address by requesting the information from the Domain Name System (DNS) server.

For a list of all URLs and IP addresses, refer to Appendix A.

Firewall, Content Filter, and Proxy Servers
Content filters, firewalls, and proxy servers should be configured to allow traffic on the protocols listed above to the applications’ servers. In addition, session timeouts on proxy servers and other devices should be set to values greater than the average duration it takes a student to complete a given test. For more information, contact your LEA Technology Coordinator or ask your LEA CAASPP Coordinator to contact CalTAC.

Schools will need to make sure that information is not blocked in their content filters and that data are not cached. Please ensure that access to the domains listed in Appendix A is open for these systems.

Quality of Service (QoS)/Traffic Shaping
If the client network utilizes any device(s) that performs traffic shaping, packet prioritization, or Quality of Service, the IP addresses should be given a high level of priority in order to guarantee the highest level of performance.

Certificate Revocation List
Schools should open their firewalls to allow the secure browser to check the certificate authenticity at Symantec VeriSign’s Certificate Revocation List (CRL) at http://crl.verisign.com/. Firewalls should be opened to allow access to this site by the secure browser, which then checks the site certificate against the revocation list as a background process.

Symantec VeriSign Recommendations
Note: Information in this section was retrieved and adapted from Symantec: https://knowledge.verisign.com/support/mpki-for-ssl-support/index?page=content&id=AD660&actp.

It is strongly recommended that any firewall policies and/or access control devices use URLs and not IP addresses. Symantec can change these IP addresses at any time without notification. If possible, white list the following entries on your firewall policies and/or access control devices to ensure seamless access to Symantec’s Online Certificate Status Protocol services:

*.thawte.com
*.geotrust.com
*.ws.symantec.com

Note: If white listing wildcard entries is not permitted, you can white list the following specific fully qualified domain names (FQDNs):
oscp.ws.symantec.com
oscp.geotrust.com
oscp.thawte.com

If your firewall is configured to allow only a certain set of IP addresses to be accessed from your network, you will need to take the following actions:

2. Install or add the IP addresses to your existing list—do not replace the old IP addresses; your existing rules for Symantec OSCP IP addresses should not be deleted.
Section II. Hardware Requirements

Smarter Balanced Technology Requirements

Please ensure that your school’s computers meet the requirements indicated in the Smarter Balanced Technology Requirements (www.smarterbalanced.org/smarter-balanced-assessments/technology/). The information in this section provides information regarding supported operating systems and related hardware recommendations as well as requirements for monitors/screens, printers, keyboards, and headphones.

Table 5 organizes requirements and recommended specifications for each supported operating system for desktops and laptops. Table 6 provides information regarding supported mobile tablets.

Table 5. Hardware and operating system requirements for desktops and laptops

<table>
<thead>
<tr>
<th>Supported Operating Systems</th>
<th>Minimum Requirements</th>
<th>Recommended Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP (Service Pack 3)</td>
<td>Pentium 233 MHz</td>
<td>1.3 GHz processor</td>
</tr>
<tr>
<td></td>
<td>128 MB RAM</td>
<td>1 GB RAM</td>
</tr>
<tr>
<td></td>
<td>52 MB hard drive free space</td>
<td>80 GB hard drive</td>
</tr>
<tr>
<td>Windows Vista, 7, 8.0, 8.1</td>
<td>Pentium 4 or newer processor that supports SSE2</td>
<td>Pentium 4 or newer processor that supports SSE2</td>
</tr>
<tr>
<td>Server 2003, 2008 (thin client)</td>
<td>512 MB of RAM</td>
<td>2 GB+ RAM</td>
</tr>
<tr>
<td></td>
<td>200 MB of hard drive space</td>
<td>80 GB+ hard drive</td>
</tr>
<tr>
<td>Mac OS X (PowerPC) 10.5</td>
<td>PowerPC G3, G4, or G5 processor</td>
<td>1.3 GHz processor</td>
</tr>
<tr>
<td></td>
<td>128 MB RAM</td>
<td>2 GB+ RAM</td>
</tr>
<tr>
<td></td>
<td>200 MB hard drive</td>
<td>80+ GB hard drive</td>
</tr>
<tr>
<td>Mac OS X (Intel) 10.5</td>
<td>Intel x86 processor</td>
<td>1 GHz or faster processor</td>
</tr>
<tr>
<td></td>
<td>512 MB of RAM</td>
<td>1 GB+ RAM</td>
</tr>
<tr>
<td></td>
<td>200 MB hard drive</td>
<td>80+ GB hard drive</td>
</tr>
<tr>
<td>Mac OS X (Intel) 10.6–10.10</td>
<td>Intel x86 processor</td>
<td>Pentium 4 or newer processor</td>
</tr>
<tr>
<td></td>
<td>512 MB of RAM</td>
<td>2+ GB RAM</td>
</tr>
<tr>
<td></td>
<td>200 MB hard drive</td>
<td>80+ GB hard drive</td>
</tr>
<tr>
<td>Linux Fedora 16, 17, 18, 19, 20 openSUSE 13.1</td>
<td>Intel x86 processor</td>
<td>Pentium 4 or newer processor</td>
</tr>
<tr>
<td></td>
<td>512 MB of RAM</td>
<td>2 GB RAM</td>
</tr>
<tr>
<td></td>
<td>200 MB hard drive</td>
<td>80 GB hard drive</td>
</tr>
<tr>
<td></td>
<td>Required Libraries/Packages:</td>
<td>Recommended Libraries/Packages:</td>
</tr>
<tr>
<td></td>
<td>GTK+ 2.18 or higher</td>
<td>NetworkManager 0.7 or higher</td>
</tr>
<tr>
<td></td>
<td>GLib 2.22 or higher</td>
<td>DBus 1.0 or higher</td>
</tr>
<tr>
<td></td>
<td>Pango 1.14 or higher</td>
<td>HAL 0.5.8 or higher</td>
</tr>
<tr>
<td></td>
<td>X.Org 1.0 or higher (1.7+ recommended)</td>
<td>GNOME 2.16 or higher</td>
</tr>
<tr>
<td></td>
<td>libstdc++ 4.3 or higher</td>
<td></td>
</tr>
</tbody>
</table>

NComputing and Terminal Services are supported on the following platforms:

- NComputing is supported on computers running Windows XP (Service Pack 3) and Windows 7
- Terminal Services is supported on the Windows 2003 and 2008 servers
Other Hardware Recommendations
The following information is general. Because of the myriad ways school networks and computers can be set up, you are encouraged to verify diagnostics, especially with monitor resolution and headphones.

Monitor/Screen Displays
- Screen Dimensions: 10" class or larger; iPads with a 9.5" display are an accepted part of this class
- Resolution: 1024 x 768 or better

Depending on the screen size, some individuals may need to use vertical and/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.

**Important note about brightness/contrast:**
Some test items include images that are shaded. Because monitors and screens vary widely, it is not guaranteed that the “default” settings that monitors are shipped with are optimal. Monitor settings may need to be adjusted if a student says test items with shaded images (e.g., pie charts) are very light or cannot be seen.

Printers
Test Administrators (TAs) can print out test session information and can approve student requests to print stimuli or test items (for students with the print-on-request accommodation). In order to preserve test security, Test Administrators must follow the test security protocols for printed test materials.

It is strongly suggested that TAs be connected to a single local or network printer in the testing room. Only the TA’s computer should have access to this printer.

**Important note regarding printing support:**
At this time, Apple iOS devices are the only ones that have native printing support (AIR Print, which connects to printers on a wireless network). If users need to print, they must use a computer or mobile device that is connected to a printer.

For information about braille devices, please see Section IV, Text-to-Braille Hardware and Software.

---

**Table 6. Supported mobile operating systems**

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Supported Devices</th>
<th>Browsers for Test Administrator (TA) Sites</th>
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<tr>
<td>iOS 6.0–8.2</td>
<td>iPad 2, 3, 4th Gen (Retina Display) iPad Air</td>
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<tr>
<td>Android 4.0.4–4.4</td>
<td>Google Nexus 10, Motorola Xoom, Samsung Galaxy Note (10.1), Samsung Galaxy Tab 2 (10.1), LearnPad Quarto</td>
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<tr>
<td>Chrome OS 31-41</td>
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<tr>
<td>Windows 8.0, 8.1</td>
<td>Surface Pro, Asus Transformer, Dell Venue</td>
<td>Internet Explorer</td>
</tr>
</tbody>
</table>
Keyboards
Smarter Balanced requires external keyboards for all students testing on tablets.

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. TAs are strongly cautioned against using keyboards that have these shortcut buttons.

Important note for Android tablet users:
The Android mobile secure browser requires the secure browser keyboard to be used because the default tablet keyboard includes a predictive text section (see the Android AIR Secure Test Mobile Secure Browser section in the Secure Browser Manual). Therefore, any external keyboard that has a shortcut button to open the tablet’s default keyboard should not be permitted, as this default keyboard will override the mobile secure browser keyboard. Testing has determined that the EZOWare Slim Full Size Keyboard external keyboard should not be used with Android tablets.

Headphones
All English language arts/literacy (ELA) tests contain several items that have recorded audio. Students with the text-to-speech accommodation can listen to stimuli or test items being read aloud. Students with a braille accommodation can use the Job Access with Speech (JAWS®) screen reading software to listen to mathematics assessments.

Students taking an ELA test or who have a text-to-speech or braille accommodation must be provided with headphones so that they can listen to the audio in these tests (although students may also bring and use their own). You are encouraged to work with your test site coordinator to determine how many students will need headphones, to ensure that you have an adequate supply on hand.

The following headphones are supported:

- 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.

USB headphones are recommended, as they are typically plug-and-play devices. Text-to-speech requires the use of the secure browser. Students who require text-to-speech for the Practice and Training Tests should use the secure browser.

Refer to Section V, About Text-to-Speech and Voice Packs, for specific information on verifying that the headphones are recognized by the computer.

Mice
The following are rules for support of mouse pointing devices:

- **Desktop and laptops**—Wireless or wired mice on desktops and laptops that are compatible with the operating system are supported.
- **Mobile devices**—Mice on mobile devices, regardless of the operating system, are not supported.
Section III. Software Requirements

Please ensure that your school’s computer software meet the requirements indicated in the Smarter Balanced Technology Requirements (www.smarterbalanced.org/smarter-balanced-assessments/technology/).

Disabling Pop-Up Blockers

The Test Administrator Interface requires pop-up windows to be enabled. Your school administrator or IT staff designee may be able to disable pop-up blockers ahead of time. Navigate to the appropriate menu option to disable pop-up blockers.

To disable pop-up blockers:

• **Firefox**: Tools → Options → Content → uncheck “Block pop-up windows”

• **Google Chrome**: Menu → Settings → Show advanced settings (at the bottom of the screen) → Privacy → Content Settings → Pop-ups → select “Allow all sites to show pop-ups”

• **Internet Explorer**: Tools → Pop-up Blocker → Turn Off Pop-up Blocker

• **Safari**: Application Menu (Safari) → Block Pop-Up Windows (make sure this is unchecked)

Installing the Verdana Font on Linux Machines

Some test items use the Verdana font. Please ensure that you have Verdana appropriately installed on all Linux machines that will be used for testing.

Microsoft TrueType fonts like Verdana are freely available for download and installation on computers running Linux. However, the End User License Agreement for these fonts restricts their direct inclusion in Linux distributions. Therefore, these fonts must be installed as an add-on. Please refer to the Linux secure browser installation document for additional information.

• **Fedora, openSUSE, and Red Hat Enterprise**
  Follow the steps in the “How to Install” section of this Web page: http://corefonts.sourceforge.net/. You will need to build an rpm package of the fonts prior to installing them.

• **Ubuntu**
  In a terminal window, enter the following command to install the msttcorefonts package:

```
sudo apt-get install msttcorefonts
```

Special Note for Windows Users: Fast User Switching

Microsoft Windows (XP with Service Pack 3, Vista, 7, 8.0, and 8.1) allows computers to be configured so that multiple users can log on to a computer without requiring one user to log out before another logs in. This feature is called “fast user switching.”

If a student can access multiple user accounts from a single computer, you are strongly encouraged to disable the Fast User Switching function. Instructions for doing so follow.
Disabling Fast User Switching in Windows XP (with Service Pack 3)

2. Select [Change the Way Users Log On or Off].
3. Ensure the “Use the Welcome Screen” option is checked.
4. Ensure the “Use Fast User Switching” option is not checked.
5. Select [Apply Options].

Note: Fast User Switching is not an option if joined to a domain.

Disabling Fast User Switching in Windows Vista or Windows 7

Method A: Access the Group Policy Editor

6. Select [Start], type gpedit.msc in the Start Search dialog box, and then press [Enter].
7. Navigate to the following location:
   Local Computer Policy → Computer Configuration → Administrative Templates → System → Logon
8. Set Hide entry points for Fast User Switching to “Enabled.”

Note: Because the Group Policy Editor does not exist in certain editions of Windows Vista, you may need to configure these settings via the registry if this method is unavailable. See Method B for registry instructions.
Method B: Access the Registry

1. Select [Start], type regedit.exe in the Start Search dialog box, and then press [Enter].

2. Navigate to the following location:
   
   HKEY_LOCAL_MACHINE → SOFTWARE → Microsoft → Windows → CurrentVersion → Policies → System

3. Select the “System” folder in the left pane with your right mouse button.


5. Type HideFastUserSwitching in the “Value name” input field and press [Enter].


7. Type 1 into the Value data field and select [OK].

8. Close the Registry Editor window.

Disabling Fast User Switching in Windows 8.0 and 8.1

9. Navigate to the Search option (from the home screen, mouse to the lower right corner and then select the [Search] icon).

10. Type gedit.msc in the “Search” box.

11. Double-click the [gedit] icon in the Apps pane. The Local Group Policy Editor window will open.

12. Navigate to the following location:
   
   Computer Configuration → Administrative Templates → System → Logon

13. In the “Setting” pane, double-click “Hide entry points for Fast User Switching.”
14. Select “Enabled” and then select [OK].

15. Navigate to the Search option (from the home screen, mouse to the lower right corner and then select the [Search] icon).

16. In the search box, type run and then press [Enter]. The Run dialog box will open.

17. Enter the command `gpupdate /force` into the Run box and then select [OK]. (Note the space before the backslash.)

18. The Windows system command box will open. When you see the message “Computer Policy update has completed successfully,” then Fast User Switching has been successfully disabled.

---

**Mac OS X Requirements**

This section contains information specific to Mac OS X users. These settings can be configured before or after installing the Mac Secure Browser.

- Mission Control and Spaces
- Disabling Spaces and Application Launches from the Command Line
- Disabling Spaces and Application Launches on Remote Machines
- Function Keys and Application Launches

**Mission Control and Spaces**

For security purposes, Spaces must be disabled on computers that students will use for online testing. If Spaces is not disabled, students will be unable to test.
Mission control and spaces must be disabled on computers running Mac OS 10.7, 10.8, and 10.9.

Note: The instructions in this section are for disabling Spaces on individual Mac computers.

Disable Spaces in Mission Control

1. Navigate to Apple ➔ System Preferences.
2. In System Preferences, select the [Keyboard] icon. The Keyboard window will display.
3. Select the [Keyboard Shortcuts] tab. The Keyboard Shortcuts options will display.
   Note: The tab may say “Shortcuts.”
4. In the left panel, select “Mission Control.” The right panel will show all Mission Control options.
5. In the right panel, make sure the boxes for the following are NOT checked:
   a. Move left a space
   b. Move right a space
   c. Switch to Desktop 1 (this may already be unchecked)
6. To re-enable Spaces, follow steps 1–4 again, and check the boxes for spaces.

Disabling Spaces and Application Launches from the Command Line

The sections Mission Control and Spaces and Function Keys and Application Launches describe how to configure OS X through the desktop. This section describes how to perform those configurations from the command line, which can be faster than working through the desktop. To perform this task, you need to be familiar with logging on to OS X machines through Terminal or other terminal emulator.
To disable spaces and application launches from the command line:

1. Log on to the machine as the user that runs the secure browser.

2. Enter the following commands to modify the file

```bash
defaults write com.apple.symbolichotkeys AppleSymbolicHotKeys -dict
add 79 "{enabled = 0; value = {parameters = (65535,123, 262144); type = 'standard'; };

defaults write com.apple.symbolichotkeys AppleSymbolicHotKeys -dict
add 80 "{enabled = 0; value = {parameters = (65535, 123, 393216); type = 'standard'; };

defaults write com.apple.symbolichotkeys AppleSymbolicHotKeys -dict
add 81 "{enabled = 0; value = {parameters = (65535, 124, 262144); type = 'standard'; };

defaults write com.apple.symbolichotkeys AppleSymbolicHotKeys -dict
add 82 "{enabled = 0; value = {parameters = (65535, 124, 393216); type = 'standard'; };
```

You can paste these lines into a text file and run the file from the command line.

3. If you logged on to a computer running OS X 10.8.5 or later, log off and then log back in.

4. If you need to restore Spaces and the default application launchers, repeat steps 1–3. In step 2, change `enabled = 0` to `enabled = 1`.

Disabling Spaces and Application Launches on Remote Machines

The sections Mission Control and Spaces, Function Keys and Application Launches, and Disabling Spaces and Application Launches from the Command Line describe procedures for configuring a secure test environment in OS X. This configuration is stored in the file `~/Library/Preferences/com.apple.symbolichotkeys.plist`. If you have many OS X testing machines, it may be easier to push this file to those machines instead of configuring each one individually.

You can push the configuration file to remote machines using a variety of tools, such as the following:

- File Distributor
- Apple’s Active Directory Client and Directory Utility
- Apple’s Open Directory and Profile Manager
- Centrify & PowerBrokers Identity Enterprise
- Apple Remote Desktop

Function Keys and Application Launches

When students use the secure browser for testing, the test delivery system conducts regular checks to ensure that other applications are not open. These checks help maintain the integrity of the secure test environment.

Some Mac computers are configured to launch iTunes and other applications by pressing the function keys (e.g., [F8]) on the keyboard. This section contains information on how to prevent the function keys from directly launching applications, including iTunes. This action will help prevent students from accidentally pressing a function key instead of a key in the number row.
Note: These instructions are based on Mac 10.9 and should be similar for other supported Macs.

Modifying Function Keys

1. Open System Preferences.

2. In the “Hardware” row, select [Keyboard]. This will open the Keyboard preferences window.

3. In the Keyboard preferences window, you will see an option to “Use all F1, F2, etc. keys as standard function keys.” Make sure this option is checked.

   You should no longer be able to launch applications with just the function keys.

   If you need to launch iTunes or another application, press the [Fn] key and then press the desired function key. This combination will launch the application.

   Important: If a student is testing with the secure browser and presses the [Fn] key and a function key, this action will open the linked application and result in the test being paused.

Source: [http://support.apple.com/kb/ht3399](http://support.apple.com/kb/ht3399)
Section IV. Text-to-Braille Hardware and Software

**Braille Hardware**

The following devices are to be used for students accessing tests with a braille accommodation:

- **For students:** A refreshable braille display. It is recommended that the display have a minimum of 40 cells.
- **For Test Administrators:** ViewPlus Tiger Max Embosser

**Reminder:** All printed test materials for secure tests must be shredded immediately after a test session ends.

**Braille Software**

**Requirements for Student Computers**

- The Student Testing Site currently supports the braille interface on Windows 7 machines only.
- Windows Secure Browser 7.2 must be installed on all machines used for student testing, including tests administered using the braille interface.
- The Job Access with Speech (JAWS®) Screen Reader (version 12, 13, or 14) is required for student computers.
- A refreshable braille display that is compatible with Windows 7 and the version of JAWS that is on the computer is required for student computers; it is recommended that the braille display have a minimum of 40 cells.


The following JAWS configuration must be applied to each student computer prior to administering tests using the Braille Interface:

1. Configure JAWS to recognize the Secure Browser.
2. Apply settings for contracted/uncontracted braille through JAWS.

Instructions for each requirement follow.

**Configure JAWS to Recognize the Secure Browser**

1. Open the “**JAWS ConfigNames.ini**” file.
   - This file is accessible via the Start menu (Start → All Programs → JAWS 12.0 → Explore JAWS → Explore Shared Settings).
2. Locate the line of text that contains “Chrome=Firefox.” Create a line immediately following this text and add the following string:
   
   ```
   CASecureBrowser7.2=Firefox
   ```
3. Save the file upon completion.

   If you receive an error that you do not have permission to save the .ini file to this location, you will first need to save the file to your desktop as “**ConfigNames.ini**.” After saving the updated .ini file, copy it to the folder containing the original .ini file (referenced in step 1). You will need to confirm that you want to replace the original file with the file you created.
Applying Settings for Contracted/Uncontracted Braille

In order for students to use contracted or uncontracted literary braille, the correct JAWS setting must be applied prior to launching the secure browser.

1. Open the **JAWS Settings Center**. The Settings Center is accessible via the JAWS Menu → Utilities.
2. Select **Firefox** from the Application drop-down menu.
3. From the panel on the left side of the window, go to the following option (as pictured):
   
   
   
   **Braille** → **General** → **Translation** → **Contracted Braille Translation**

4. For **Uncontracted Braille**, set the value to “Off.”
5. For **Contracted Braille**, set the value to “Input and Output.”

6. Additionally, ensure that the following three settings are checked (and only these settings are checked):
   - “Active cursor follows Braille display”
   - “Enable Braille Auto Detection”
   - “Enable Word Wrap”

7. Select [Apply].
8. Select [OK].

**Important:**

In addition, the following optional JAWS settings may be adjusted for individual students based on student needs prior to administering their assessments.

- Adjust JAWS voice profile (Optional)
- Adjust JAWS speaking speed (Optional)
- Adjust JAWS punctuation (Optional)

Instructions for each option follow.

If adjusting these optional settings for a student, the steps described for each option must be taken prior to launching the secure browser.
Adjusting JAWS Voice Profile
The JAWS voice profile refers to the voice used by JAWS. Users can adjust the JAWS voice profile by following the instructions below.

1. Go to JAWS Menu → Options.
2. Select Voices → Adjustment.
3. In the Profile section shown in Figure 1, select a Voice Profile from the Name drop-down menu.
4. Select [OK].

Adjusting JAWS Speaking Rate
Users can adjust the rate of speed that JAWS speaks by following the instructions below.

1. Go to JAWS Menu → Options.
2. Select Voices → Adjustment.
3. In the Voice section shown in Figure 1, adjust the “Rate” using the slide-bar.
4. Select [OK].

Adjusting JAWS Punctuation
The default JAWS punctuation setting for which the Braille Interface has been optimized is “Most.” This means that JAWS will read most punctuation that appears on the screen. However, users may adjust the JAWS punctuation based on an individual student’s needs and preferences by following the instructions below.

1. Go to JAWS Menu → Options.
2. Select Voices → Adjustment.
3. In the Voice section shown in Figure 1, select a punctuation setting from the Punctuation drop-down menu. The options include “None,” “Some,” “Most,” and “All.”
4. Select [OK].

Important warning regarding English language arts/literacy (ELA) assessments and text-to-speech and JAWS:
The secure browser is designed to automatically mute audio on ELA assessments. As a result, the sound on the student’s computer will be automatically muted when the student begins the first question on the braille form of the ELA assessment he or she is taking. The sound will automatically turn on again when the student submits the ELA assessment or pauses the test and returns to the logon screen.

As a result, students who use the secure browser to access the practice ELA assessments may be unable to hear listening stimuli associated with items. Students may also require assistance with JAWS navigation because they will not be able to hear the JAWS commands. JAWS will still output all commands and text to the refreshable braille display, even with the sound muted.
If you want students to have access to audio during the practice ELA assessments, it is recommended the students use Firefox instead of the secure browser.

Requirements for Test Administrator Computers
Test Administrators administering tests to students who require braille must have the following software installed on their machine prior to testing. The software is necessary to process these students’ print requests.

- **Duxbury Braille Translator 11.1**
  This software allows printing of items and reading passages (without images) and can be downloaded from [http://www.duxburysystems.com/dbt.asp?product=DBT%20Win](http://www.duxburysystems.com/dbt.asp?product=DBT%20Win).

- **ViewPlus Tiger Max Embosser and the supporting ViewPlus Desktop Embosser driver**
  The Desktop Embosser Driver can be downloaded from [http://downloads.viewplus.com/drivers/desktop-braille-embosser/](http://downloads.viewplus.com/drivers/desktop-braille-embosser/). The download includes the Tiger Viewer software, which is needed to handle print requests for items and passages that contain tactile or spatial components.
Section V About Text-to-Speech and Voice Packs

Using text-to-speech requires voice packs to be pre-installed on computers that will be used for testing. For Windows and Mac operating systems, default voice packs are typically pre-installed. For computers running Linux, voice packs may need to be downloaded and installed.

A number of voice packs for desktops and laptops are available commercially and are researched and tested for compatibility with the secure browsers. Additionally, not all voice packs that come pre-installed with Windows and Mac operating systems are approved, as the quality of some default voice packs is not optimal for testing. The voice packs listed at the end of this section have been tested and approved for use with the secure browser.

How the Voice Packs Work with the Secure Browsers

Desktop Secure Browsers
The desktop secure browsers are configured to recognize several known voice packs to provide the text-to-speech accommodation. The secure browsers detect pre-installed voice packs on the students’ machines. When a student who is using text-to-speech logs on to a test session and has been approved for testing, the secure browser will look for voice packs on the student’s machine. When it recognizes an approved voice pack, the one with the highest priority rating will be used.

If any of the approved voice packs has also been set as the default voice on the computer, then that voice pack will always get the highest priority.

Users are strongly encouraged to test the text-to-speech settings before students take a test. You can check these settings from the diagnostic page:

1. Open the secure browser.
2. Select the [Network Diagnostic Tools] link.
3. Select the [Text-to-Speech Check] button.

AIRSecureTest Mobile Secure Browsers
The mobile secure browser uses either the device’s native voice pack or a voice pack embedded in the secure browser. If additional voice packs are downloaded to a tablet or Chromebook, they will not be recognized by the mobile secure browser.

iOS

Mobile Secure Browser version 2.0
This app includes an embedded NeoSpeech voice pack; the native iOS voice pack is not available for selection.

Mobile Secure Browser version 2.1

• iOS 6.0–6.1: The embedded NeoSpeech voice pack will be used.
• iOS 7.0–8.2: The native iOS voice pack will be used.

Android
The AIRSecureTest app for Android uses the native voice pack available on the supported Android tablet being used.

ChromeOS
The AIRSecureTest kiosk app for Chromebooks uses the native voice pack available on the Chromebook device being used.
Windows: Configuring Text-to-Speech Settings

This section provides information on ensuring that text-to-speech for online testing will work appropriately on computers running Windows XP (Service Pack 3), Vista, 7, 8.0, or 8.1.

The speech feature on Windows operating systems is user-interface (UI) driven. This means that the text-to-speech preferences used to administer the text-to-speech accommodation are located within the computer’s system preferences. Follow the steps below to configure text-to-speech preferences.

As a reminder, text-to-speech is available only when the secure browser is used. Students can access the Practice and Training Tests using the secure browser.

**Note:** The instructions in this section are for computers running Microsoft Windows XP. The process is similar for other Windows operating systems.

**Step 1. Access the Control Panel.**

1. Select the [Start] button and then select the **Control Panel** link, as shown in Figure 2.

![Figure 2. Start → Control Panel](image)

**Step 2. Access Speech Options.**

1. In the Control Panel window, select the [Speech] icon, as shown in Figure 3. This will bring up the **Speech Properties** window.

![Figure 3. Control Panel → Speech icon](image)

**Step 3. Set Speech Preferences.**

1. From the **Speech Properties** window (shown in Figure 4), select your desired **Voice Selection** from the drop-down menu. (You may have only one voice available.)

2. Select [Preview Voice] to verify that you can hear the voice.

3. Set the desired Voice speed; select [Audio Output] to listen to the settings. You can adjust the settings as desired.

4. When you are done, select [OK] to save your settings, and then select the Red [X] at the top right of the screen to close the window.
Mac OS X: Configuring Text-to-Speech Settings

This section provides information on ensuring that the text-to-speech accommodation for online testing will work appropriately on computers running Mac OS X 10.4–10.10.

The speech on Mac operating systems is UI driven. This means that the text-to-speech preferences used to administer the text-to-speech accommodation are located within the computer’s system preferences. Follow the steps below to configure audio preferences to enable the text-to-speech accommodation.

As a reminder, text-to-speech is available only when the secure browser is used. Students can access the Practice and Training Tests using the secure browser.

Note: The instructions in this section are for computers running Mac 10.6. The process is similar for other Mac operating systems.

Step 1. Access System Preferences.

1. Select the [Apple] icon and then select “System Preferences,” as shown in Figure 5.
1. In the System Preferences screen, select the [Speech] icon. (This icon typically appears in the “System” row, shown in Figure 6.)

![Figure 6. Access Mac Speech Options](image)

Step 3. Set Speech Preferences.
1. In the Speech window (shown in Figure 7), make sure the [Text to Speech] tab is active (it should be blue). You may need to select it to view this screen.
2. Select your desired System Voice from the drop-down menu.
3. Set the desired Speaking Rate. Select [Play] to listen to the settings. You can adjust the settings as desired. Note: The speaking rate selected applies to all voices installed on the system.
4. When you are done, select the red [X] at the top left of the screen to save your preferences and close the window.

![Figure 7. Mac Speech Preferences window](image)

**Linux: Enabling Text-to-Speech and Default Settings**

This section provides information for Technology Coordinators on how to ensure that text-to-speech for online testing will work appropriately on computers running supported Linux systems.

Linux is a modular kernel operating system, which means that specific non-used kernel modules may not load when the system is booted up. *If the required kernel modules are not already built in or installed*, this document will not provide you with the information that you need.

As a reminder, text-to-speech is available only when the secure browser is used. Students can access the Practice and Training Tests using the secure browser.

**Important:**
The commands provided in this section require you to be logged in as “root.”
Other Software
In addition to downloading the Linux secure browser, you will also need to download two software programs: Festival and Sound eXchange (SoX). These programs will ensure that students can hear the audio in the online tests.

- To download Festival, access this Web page: http://www.cstr.ed.ac.uk/projects/festival/. Instructions for ensuring that Festival works properly are included in this document section.
- To download SoX, access this Web site: http://sox.sourceforge.net. This Web site also contains information on installing and configuring SoX.

About Sound Cards and ALSA Drivers
You can determine what kind of sound card is configured on your Linux system. These file types typically are as follows:

- /dev/dsp
- /dev/dsp1 or /dev/dsp2 or /dev/dsp3, and so on
- /dev/snd
- /dev/asound.conf

The first three types are device files. You cannot read from or write to these files. However, if you have a MIDI file, you can use that to directly test the sound card. Use the following string to write the MIDI file to your computer’s sound card:

```
cat [MIDI file name] > /dev/dsp
```

Linux provides two tools to configure your sound card:

- system-config-soundcard (UI tool)
- alsamixer (text-mode tool)

This document provides instructions using the system-config-soundcard tool. If you choose to use alsamixer to configure your sound card, the steps are very similar.

Checking Sound on Your Computer
If you discover that audio is not working properly on your system, follow the steps in this section.

**Step 1. Verify that your audio playback devices—e.g., headphones and/or speakers—are connected properly to the sound card.**

As shown in the sample device in Figure 8, the green jack should always be plugged in to the green port (the "Front Left/Right & Headphones" callout) or a port marked with a [Headphone] icon  

Step 2. **Check whether */dev/snd* exists on your computer.**

1. In the command prompt, enter the following command: `ls -la /dev/snd`
   a. If it does not exist, continue to **Step 3**.
   b. If it does exist, skip to **Step 5**.

Step 3. **Load ALSA drivers.**

   If */dev/snd* does not exist, it is possible that the ALSA audio drivers were not installed or loaded properly when the system booted up.

   1. In the command prompt, enter the following command: `modprobe snd-seq`. This command should run without any errors.

Step 4. **Recheck whether */dev/snd* exists on your computer.**

   1. In the command prompt, enter the following: `ls -la /dev/snd`.
      a. If it exists, then use the secure browser to go to the Diagnostics page and check whether the audio works.
         i. If the audio playback works *without any errors or issues*, skip to **Step 7**.
         ii. If the audio playback *has errors or issues*, continue to **Step 5**.

   2. If you still cannot find */dev/snd* on your computer, please consult your system administrator for assistance. *Do not continue with the instructions in this document.*

Step 5. **At the command prompt, enter: system-config-soundcard.**

   This will display a graphic user interface like the one in Figure 9 that you can use to fix sound card problems.
Figure 9. Audio Configuration Window

1. In the [Sound test] tab, select the [Play] icon [play].
   a. If you hear audio, then your sound card is working correctly. Continue to step 3.
   b. If you did not hear audio, continue to step 2 below.

2. Select the [System] tab.
   a. Select [Reload Audio Drivers] (this step will reinitialize the drivers).
   b. Select the [Sound Test] tab and select the [Play] icon [play] again.
      i. If you hear the audio, then your sound card is now working correctly.
      ii. If the audio is still not working, consult your system administrator for assistance. Do not continue with the instructions in this document.

3. Select the [Settings] tab.
   a. In the section called “Audio Cards Indexer,” look at the first and second columns. The first column is the Index column and contains a number (e.g., 0 or 1). The second column is the name of the sound card installed at the index.
   b. Note the index number in the first column, and continue to Step 6.

Step 6. If the index number in Step 5/3 is 0, then your computer should have a /dev/dsp sound file.

1. Try the audio playback on the secure browser again.
2. If the index number in Step 5/3 is anything other than 0, you need to create a link from the index file to the /dev/dsp file.
   a. Open the command prompt and type the following command:
      
      \texttt{ln -s /dev/dsp[index] /dev/dsp} (where [index] is the index number)
   b. Try the audio playback on the secure browser again.

Testing Festival for Use with the Text-to-Speech Accommodation

By default, Linux operating systems use Festival for speech synthesis. Be sure that you have already downloaded and installed Festival appropriately before completing the following steps. These steps will determine whether Festival is configured correctly to work with text-to-speech. (Festival can be downloaded at \url{http://www.cstr.ed.ac.uk/projects/festival/}.)
Step 1. **At the command prompt, type `festival`.**

1. The Festival command line will display on the next row.
2. Enter the following text and then press [Enter]: `SayText “hello”`.
3. If you hear the word “hello” being spoken, then Festival is installed properly.

Step 2. **In the next Festival command prompt, type the command `libdir` and press [Enter].**

The output will display the path name where Festival is installed. For example:

```
/usr/share/festival
```

1. Make a note of this path name.
2. Navigate to this directory path and look for the file named “audsp.”

   **Note:** If this file is not found, then there may be an issue with your Festival installation. If that is the case, do not continue with the instructions in this document until you resolve the installation issue.

Step 3. **Add file “audsp” to the list of folders where the operating system searches for executables and other necessary files.**

   It is identified by a system variable called `PATH`.

1. To view the current list, type the following into the command prompt: `echo $PATH`.
2. You will also need to run the following command to ensure that the “audsp” file is easily found:

   ```
   ln -s <audsp path> /bin/audsp
   ```
3. Replace the `<audsp path>` with your computer’s path to “audsp” displayed in Step 2. For example, if `audsp` is located in

   ```
   /usr/share/festival/etc/unknown_RedHatLinux/
   ```

   then the full command prompt should be:

   ```
   ln -s /usr/share/festival/etc/unknown_RedHatLinux/audsp /bin/audsp
   ```

   This step creates a symbolic link to the “audsp” file found in the Festival installation directory from any folder that is known to be on the path. (In this case, `/bin` was the primary path.) You may choose any other folder as long as it is known to be a common path for all users.

**Setting Defaults for Voice, Reading Speed, and Volume**

This section provides an overview of how to change the default settings in Festival. These instructions assume that you have already downloaded and installed the requisite voice packs.

Changing the default settings as described in each section will change the settings for all users.

**Default Voice Settings**

**Step 1.** In the command prompt, enter `festival`, and then execute the following commands exactly as shown:

Note that the outputs for the commands `libdir, voice.list, and voice_default` may be different based on your installation.
festival>libdir
“/usr/share/festival” (Note: This output line may be different)

festival>(voice.list)
(cepstral_miguel
 cmu_us_slt_arctic_hts
 cmu_us_bdl_arctic_hts
 cmu_us_awb_arctic_hts
 ked_diphone
 kal_diphone)

festival>voice_default
ked_diphone

**Step 2.** Make a note of the output for the command `libdir` in the step above. Change to that directory.

In the previous example, the directory is `/usr/share/festival`.

**Step 3.** Open the file `init.scm` for editing.

**Step 4.** Select any voice from the `voice.list` output in Step 1.

To set up your selection as the default voice, use the following commands:

```scheme
(set! Voice_default 'voice_<voice name from the list>)
```

If you chose “cmu_us_slt_arctic_hts,” this line would look like:

```scheme
(set! Voice_default 'voice_cmu_us_slt_arctic_hts)
```

**Default Reading Speed**

Depending on the specific needs of the individual students who will use the text-to-speech accommodation, a slower reading speed may be desirable. This also has the effect of making the voice sound deeper.

**Step 1.** Open the file “init.scm” for editing.

To locate the file, follow steps 1 and step 2 from the Default Voice Settings section.

**Step 2.** Append the following line to the end of “init.scm.”

```scheme
(Parameter.set ‘Duration_Stretch <number>)
```

Acceptable values are any number greater than 1. However, experiments have shown that numbers higher than 2 are too slow.

For example, if a slower reading speed is desired, then you can set `<number>` to 1.5 or 2.0.

**Default Volume Setting**

A default volume may be set by running `system-config-soundcard` or `alsamixer` from the command prompt.
Voice Packs Recognized by Secure Browser
Table 7, Table 8, and Table 9 display the voice packs for each operating system (Windows, Mac and Linux) that are currently recognized by the secure browser.

Windows and Mac OS X computers typically ship with at least one default voice pack. Many of these default voice packs are recognized by the secure browser.

Table 7. Voice Packs for Windows XP, Vista, 7, 8.0, 8.1

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Voice Pack</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows (pre-installed)</td>
<td>Julie</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>Kate</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>Michael</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>Michelle</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>MSAnna</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>MS_EN-GB_HAZEL</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>MS_EN-US_DAVID</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>MS_EN-US_ZIRA</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>MSMary</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>MSMike</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>MSSam</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>Paul</td>
<td>English</td>
</tr>
<tr>
<td>Windows (pre-installed)</td>
<td>Violeta</td>
<td>Spanish</td>
</tr>
<tr>
<td>Cepstral (commercial)</td>
<td>Cepstral_David</td>
<td>English</td>
</tr>
<tr>
<td>Cepstral (commercial)</td>
<td>Cepstral_Marta</td>
<td>Spanish</td>
</tr>
<tr>
<td>Cepstral (commercial)</td>
<td>Cepstral_Miguel</td>
<td>Spanish</td>
</tr>
<tr>
<td>NeoSpeech (commercial)</td>
<td>VW Julie</td>
<td>English</td>
</tr>
</tbody>
</table>

Table 8. Voice Packs for Mac OS X

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Voice Pack</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac (pre-installed)</td>
<td>Agnes</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Alex</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Bruce</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Callie</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>David</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Fred</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Jill</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Junior</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Kathy</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Princess</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Ralph</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Samantha</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Tom</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Vicki</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Victoria</td>
<td>English</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Diego</td>
<td>Spanish</td>
</tr>
<tr>
<td>Vendor</td>
<td>Voice Pack</td>
<td>Language</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Javier</td>
<td>Spanish</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Marta</td>
<td>Spanish</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Monica</td>
<td>Spanish</td>
</tr>
<tr>
<td>Mac (pre-installed)</td>
<td>Paulina</td>
<td>Spanish</td>
</tr>
<tr>
<td>Infovox (commercial)</td>
<td>Heather Infovox iVox HQ</td>
<td>English</td>
</tr>
<tr>
<td>Infovox (commercial)</td>
<td>Rosa Infovox iVox HQ</td>
<td>Spanish</td>
</tr>
</tbody>
</table>

Table 9. Voice Packs for Linux

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Voice Pack</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Festvox (commercial)</td>
<td>cmu_us_awb_arctic.hts</td>
<td>English</td>
</tr>
<tr>
<td>Festvox (commercial)</td>
<td>cmu_us_bdl_arctic.hts</td>
<td>English</td>
</tr>
<tr>
<td>Festvox (commercial)</td>
<td>cmu_us_jmk_arctic.hts</td>
<td>English</td>
</tr>
<tr>
<td>Festvox (commercial)</td>
<td>cmu_us_slt_arctic.hts</td>
<td>English</td>
</tr>
<tr>
<td>Festvox (commercial)</td>
<td>kal_diphone</td>
<td>English</td>
</tr>
<tr>
<td>Festvox (commercial)</td>
<td>ked_diphone</td>
<td>English</td>
</tr>
</tbody>
</table>

Refer to the [Linux: Enabling Text-to-Speech and Default Settings](#) section for more information on configuring Linux and testing the audio preferences for text-to-speech. For additional information about the Festvox voices, go to the Festvox Web site at [http://festvox.org/dbs/index.html](http://festvox.org/dbs/index.html).
Appendix A: IP Addresses and URLs for Testing Systems

URLs to Be White Listed for California Testing Systems

Table 10. URLs for California testing systems

<table>
<thead>
<tr>
<th>System</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Assessment of Student Performance and Progress (CAASPP) portal</td>
<td><a href="http://caaspp.org/">http://caaspp.org/</a></td>
</tr>
<tr>
<td>Completion Status Reports (Single Sign-On System)</td>
<td><a href="https://ca.reports.airast.org/">https://ca.reports.airast.org/</a></td>
</tr>
<tr>
<td>Interim Assessment Hand Scoring System</td>
<td><a href="https://ca.tss.airast.org/">https://ca.tss.airast.org/</a></td>
</tr>
<tr>
<td>Secure browser downloads</td>
<td><a href="http://ca.browsers.airast.org/">http://ca.browsers.airast.org/</a></td>
</tr>
<tr>
<td>Smarter Balanced Digital Library</td>
<td>(see link on <a href="http://caaspp.org/">http://caaspp.org/</a>)</td>
</tr>
<tr>
<td>Test Administrator Interface (Single Sign-On System)</td>
<td><a href="https://ca.tds.airast.org/testadmin/">https://ca.tds.airast.org/testadmin/</a></td>
</tr>
<tr>
<td>TA Practice and Training Test Interface (Single Sign-On System)</td>
<td><a href="http://capt.tds.airast.org/testadmin/">http://capt.tds.airast.org/testadmin/</a></td>
</tr>
<tr>
<td>Test Operations Management System (Single Sign-On System)</td>
<td><a href="https://caaspp.caltesting.org/">https://caaspp.caltesting.org/</a></td>
</tr>
</tbody>
</table>

The California Smarter Balanced testing sites use a cloud-based satellite system for optimal load balancing during testing.

**Warning:**

Testing servers and satellites may be added or modified during the school year to ensure an optimal testing experience. As a result, you are strongly encouraged to **WHITELIST AT THE ROOT LEVEL.** This requires using a wildcard.

Table 11. Domains to be whitelisted for student testing

<table>
<thead>
<tr>
<th>System</th>
<th>Top Level Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA and Student Testing Sites</td>
<td>*airast.org</td>
</tr>
<tr>
<td>CAASPP portal</td>
<td>*caaspp.org</td>
</tr>
<tr>
<td>Educational Testing Service</td>
<td>*ets.org</td>
</tr>
<tr>
<td>Embedded Merriam-Webster Dictionary</td>
<td>*media.merriam-webster.com</td>
</tr>
<tr>
<td>Embedded Thesaurus Tool</td>
<td>*dictionaryapi.com</td>
</tr>
</tbody>
</table>
IP Addresses and URLs for Merriam-Webster Dictionary and Thesaurus Tool

The embedded Merriam-Webster Dictionary and Thesaurus tool retrieves content from two URLs. The domains for these URLs should also be open or whitelisted to ensure that students can access dictionary and thesaurus search results.

Table 12. IP addresses and URLs for dictionary and thesaurus

<table>
<thead>
<tr>
<th>URL</th>
<th>IP Address</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://media.merriam-webster.com">http://media.merriam-webster.com</a></td>
<td>64.124.231.250</td>
</tr>
<tr>
<td><a href="http://www.dictionaryapi.com">http://www.dictionaryapi.com</a></td>
<td>64.124.231.250</td>
</tr>
</tbody>
</table>
### Appendix B: School Technology Coordinator Checklist

<table>
<thead>
<tr>
<th>Activity</th>
<th>Estimated Time to Complete</th>
<th>Target Completion Date</th>
<th>Reference/Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Responsibilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ 1. Verify that your school’s network and Internet are properly configured for testing.</td>
<td>5–10 hours</td>
<td>3–4 weeks before testing begins in your school</td>
<td>Section I, Network and Internet Requirements Appendix A</td>
</tr>
<tr>
<td>☐ 2. Verify that all of your school’s computers that will be used for online testing meet the minimum hardware requirements.</td>
<td>5–10 hours</td>
<td>3–4 weeks before testing begins in your school</td>
<td>Section II, Hardware Requirements</td>
</tr>
<tr>
<td>☐ 3. Work with technology personnel to:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Download the secure browser(s)</td>
<td>5–10 hours</td>
<td>3–4 weeks before testing begins in your school</td>
<td>Secure Browser Installation Manual Network Diagnostics Tools</td>
</tr>
<tr>
<td>• Conduct network diagnostics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Resolve any technical issues</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ 4. Verify that the secure browser is installed and accessible on all computers that will be used for testing.</td>
<td>5–10 hours</td>
<td>3–4 weeks before testing begins in your school</td>
<td>Secure Browser Installation Manual</td>
</tr>
<tr>
<td>☐ 5. Disable pop-up blockers and install any necessary plug-ins or software.</td>
<td>5–10 hours</td>
<td>1–2 weeks before testing begins in your school</td>
<td>Section III, Software Requirements</td>
</tr>
<tr>
<td>☐ 6. On <strong>Windows</strong> computers, disable Fast User Switching. <strong>Reminder:</strong> If a student can access multiple user accounts from a single computer, you are encouraged to disable the Fast User Switching function.</td>
<td>5–10 hours</td>
<td>1–2 weeks before testing begins in your school</td>
<td>Special Note for Windows Users: Fast User Switching</td>
</tr>
<tr>
<td>☐ 7. On <strong>Mac OS 10.7, 10.8, 10.9, and 10.10</strong> computers, disable Spaces in Mission Control.</td>
<td>5–10 hours</td>
<td>1–2 weeks before testing begins in your school</td>
<td>Secure Browser Installation Manual</td>
</tr>
<tr>
<td>☐ 8. On <strong>iPads</strong>, ensure that Guided Access or ASAM is enabled and that TAs know how to activate it (by triple-pressing the <strong>[Home]</strong> button once the secure browser is launched).</td>
<td>5–10 hours</td>
<td>1–2 weeks before testing begins in your school</td>
<td>Secure Browser Installation Manual</td>
</tr>
<tr>
<td>Activity</td>
<td>Estimated Time to Complete</td>
<td>Target Completion Date</td>
<td>Reference/Resources</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------</td>
<td>------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Direct Responsibilities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Install and verify any required accommodation software onto computers that will be used for testing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Braille hardware and software</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Text-to-Speech and optional voice packs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Work with Test Administrators (TAs) to ensure they know how to close all forbidden applications except those identified as necessary by the local educational agency (LEA) Technology Coordinator.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oversight Responsibilities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Follow up on any technical issues raised by the test site coordinator for resolution.</td>
<td>Throughout testing window</td>
<td></td>
</tr>
</tbody>
</table>
# Appendix C: LEA Technology Coordinator Checklist

## Direct Responsibilities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Estimated Time to Complete</th>
<th>Target Completion Date</th>
<th>Reference/Resources</th>
</tr>
</thead>
</table>
| 1. Work with your local educational agency (LEA) California Assessment of Student Performance and Progress (CAASPP) Coordinator to ensure timely network and computer setup before testing begins in your LEA:  
a. Verify the network is optimized and allows access to the online testing sites.  
b. Download the secure browser(s).  
c. Conduct network diagnostics.  
d. Resolve any technical issues. | 5–10 hours                  | At least two weeks before testing begins in your LEA | Section I, Network and Internet Requirements  
Secure Browser Installation Manual  
Appendix A |

## Oversight Responsibilities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Estimated Time to Complete</th>
<th>Target Completion Date</th>
<th>Reference/Resources</th>
</tr>
</thead>
</table>
| 2. Work with school-based technology staff to ensure timely completion of secure browser installation on computers that will be used for testing. | At least two weeks before testing begins | Secure Browser Installation Manual             | Section I, Network and Internet Requirements  
Secure Browser Installation Manual  
Appendix A |
| 3. With the LEA CAASPP Coordinator, work with school-based technology coordinators to disseminate information and resolve technical problems prior to the start of the testing window. | At least two weeks before testing begins | Section I, Network and Internet Requirements  
Secure Browser Installation Manual  
Appendix A |
| 4. Be available during the testing window for questions and problem solving. | Ongoing throughout testing window |                                           |                                                    |
User Support

California Technical Assistance Center (CalTAC)

For help with all California Assessment of Student Performance and Progress (CAASPP) assessment activities, please contact the best resource according to your role in testing:

- Test Administrators: Contact the test site coordinator for your school.
- CAASPP Test Site Coordinators: Contact your local educational agency (LEA) CAASPP Coordinator.
- LEA Technology Coordinators: Contact your LEA CAASPP Coordinator.
- LEA CAASPP Coordinators: Contact the California Technical Assistance Center (CalTAC).

<table>
<thead>
<tr>
<th>CalTAC Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phone</strong></td>
</tr>
<tr>
<td><strong>Fax</strong></td>
</tr>
<tr>
<td><strong>E-mail</strong></td>
</tr>
<tr>
<td><strong>Web Site</strong></td>
</tr>
<tr>
<td><strong>Hours of Operation</strong></td>
</tr>
</tbody>
</table>
## Change Log

<table>
<thead>
<tr>
<th>Change</th>
<th>Section</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revised document for specificity to California assessments.</td>
<td>Global</td>
<td>October 22, 2014</td>
</tr>
<tr>
<td>Added version 10.10 to lists of supported Mac OS X operating system versions.</td>
<td>Global</td>
<td>December 12, 2014</td>
</tr>
<tr>
<td>Updated the <em>Recommended Specifications</em> column.</td>
<td>Table 5. Hardware Requirements for Desktops and Laptops, page 9.</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Added version Ubuntu 14.04 as a supported operating system.</td>
<td>Table 5. Hardware Requirements for Desktops and Laptops, page 9.</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Added version 8.1 to the range of supported versions of the iOS operating system.</td>
<td>Table 5. Hardware Requirements for Desktops and Laptops, page 9.</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Added the LearnPad Quarto to the list of supported Android devices.</td>
<td>Table 6. Supported Mobile Operating Systems, page 9.</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Added version 39 to the range of supported versions of the Chrome operating system.</td>
<td>Table 6. Supported Mobile Operating Systems, page 9.</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Added Windows 8.0 and 8.1 to the supported mobile operating systems.</td>
<td>Table 6. Supported Mobile Operating Systems, page 9.</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Added recommended headphone types.</td>
<td>Section II. Hardware Requirements</td>
<td>Other Hardware Recommendations</td>
</tr>
<tr>
<td>Added warning: Testing servers and satellites may be added or modified during the school year to ensure an optimal testing experience. As a result, you are strongly encouraged to whitelist at the root level. This requires using a wildcard.</td>
<td>Appendix A: IP Addresses and URLs for Testing Systems, IP Addresses and URLs for California Testing Systems, page 38</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Added Table 11. Domains to be whitelisted for student testing</td>
<td>Appendix A: IP Addresses and URLs for Testing Systems, IP Addresses and URLs for California Testing Systems, page 38</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Added version 8.2 to the range of supported versions of the iOS operating system.</td>
<td>Table 6. Supported Mobile Operating Systems, page 10.</td>
<td>April 16, 2015</td>
</tr>
<tr>
<td>Added version 41 to the range of supported versions of the Chrome operating system.</td>
<td>Table 6. Supported Mobile Operating Systems, page 10, and throughout</td>
<td>April 16, 2015</td>
</tr>
<tr>
<td>Added section on support for computer mice.</td>
<td>Section II. Hardware Requirements</td>
<td>Other Hardware Recommendations</td>
</tr>
</tbody>
</table>
### Change Log

<table>
<thead>
<tr>
<th>Change</th>
<th>Section</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Added a section for “Mac OS X Requirements” that includes instructions on what to do for Mission Control and Spaces and how to modify function keys.</td>
<td>Section III. Software Requirements, Mac OS X Requirements, pages 16–19</td>
<td>May 1, 2015</td>
</tr>
<tr>
<td>Added a checklist item for checking Guided Access or ASAM.</td>
<td>Appendix B: School Technology Coordinator Checklist, page 36</td>
<td>May 1, 2015</td>
</tr>
</tbody>
</table>