

Network Requirements

Connection to the Internet

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 network. You will need to verify your network settings.



Wireless Security – Due to the sensitivity of test-related data, encryption is required. It is highly recommended that wireless traffic use 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.

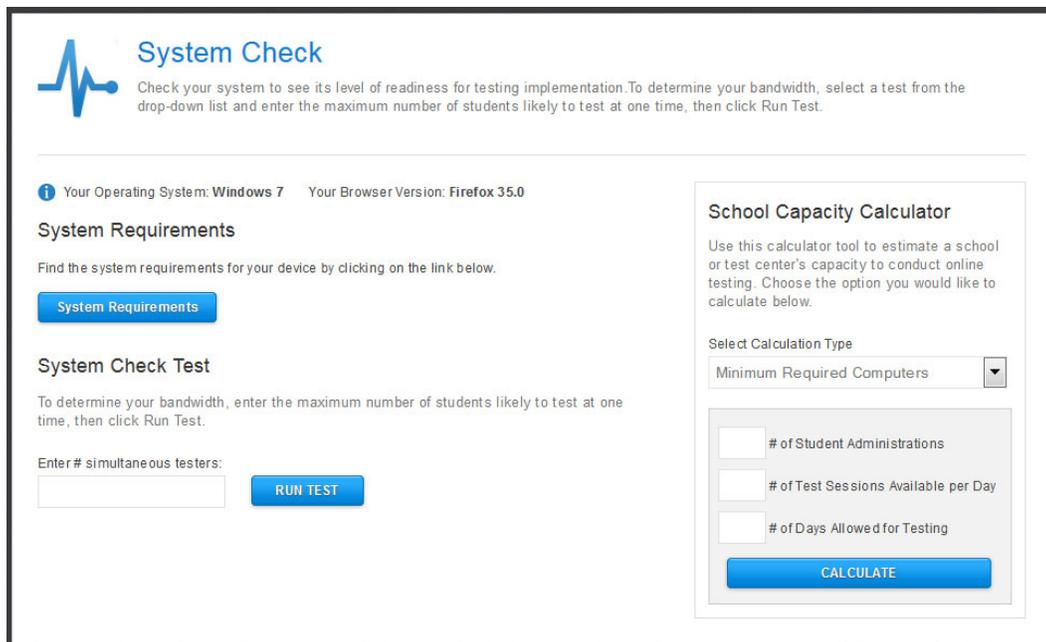
The Local Caching Software (LCS) is an optional tool that can be used to help reduce networking issues and increase your local testing capacity.

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. Available bandwidth is affected by local school network traffic and your Internet connection. Regardless of hardware or network topology, the LAN should be analyzed to determine the potential for traffic bottlenecks.

Network Diagnostic Tools

Below is the tool that can be used to analyze your bandwidth. Run the System Check Test from each connection at different times, different days, different times of day to assess the available bandwidth and network traffic. Your school's bandwidth will vary with usage and traffic levels. For example, the administrative office could be uploading payroll or a class could be making use of videos.



The screenshot shows the 'System Check' web interface. At the top left is a heart icon with a pulse line. The title 'System Check' is in blue. Below it is a paragraph: 'Check your system to see its level of readiness for testing implementation. To determine your bandwidth, select a test from the drop-down list and enter the maximum number of students likely to test at one time, then click Run Test.' Below this is a status bar: 'Your Operating System: Windows 7 Your Browser Version: Firefox 35.0'. The main content is divided into two columns. The left column has 'System Requirements' with a blue button and 'System Check Test' with a text input field and a blue 'RUN TEST' button. The right column is titled 'School Capacity Calculator' and contains a dropdown menu for 'Select Calculation Type' (set to 'Minimum Required Computers') and three input fields for '# of Student Administrations', '# of Test Sessions Available per Day', and '# of Days Allowed for Testing', followed by a blue 'CALCULATE' button.

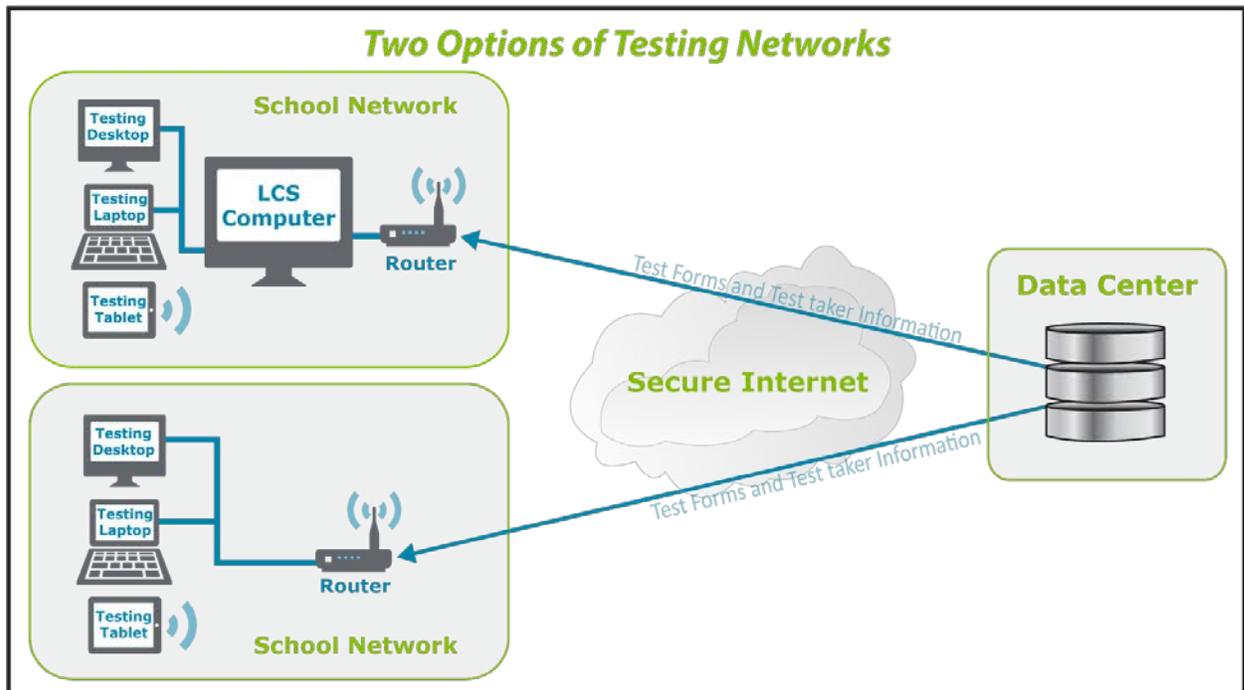
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Local Caching Software

Should your diagnostic tests determine that your systems have: unreliable Internet connectivity, low bandwidth, or a high number of simultaneous testers; a helpful tool that can be used to reduce those bandwidth bottlenecks is the Local Caching Software. The benefits of using the LCS are:

- Reduce the reliance on external Internet bandwidth.
- Increase the number of test-takers you can support.
- Automatic caching (and purging) of test data
- LCS Monitoring Tool
- Easy installation and maintenance

Below is a diagram showing the different ways your school can connect to the Internet.



The Local Caching Software (LCS) is different than a standard web proxy. Web proxy servers or appliances can be configured to cache any resources (files) available over the Internet. Schools administering the Badger Exam should not use web proxy servers for caching test content. However, the LCS was created specifically for the Badger Exam and is an optional component that schools can use to securely cache test content locally. This solution will minimize the use of Internet bandwidth in schools to reduce the possibility for issues and maximize the number of students who can be tested simultaneously.



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When to install the LCS

The LCS will be available for download in time for your preparations listed on the Technology Readiness Checklist. We recommend installing at least a week prior to testing to allow for configuration and testing. The LCS can be installed at any time should your school's network conditions change.

LCS Requirements for Computers	
Operating System	Minimum Requirements
Windows 7 to 8.1 Server 2008 and 2012	Pentium 4 Processor and above 8GB RAM 15 - 30GB available disk space
Mac OS X 10.6 to 10.10	Intel x86 Processor 8GB RAM 15 - 30GB available disk space



Network Requirements

Firewalls and Filters

Ports and Protocols

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

Port/Protocol	Purpose
80/tcp	HTTP (initial connection only)
443/tcp	HTTPS (secure connection)

Firewalls and Filters (continued)

MIME Types

Allow downloading and uploading of these MIME types:

- application/json
- application/octet-stream
- image/png
- multipart/form-data
- printer/prn
- text/html
- text/xml
- video/mp4

URLs

Allow the URLs listed below to be accessed through the firewall:

- http://*.caltesting.org
- https://*.caltesting.org

IP Addresses

If white listing wildcard entries are not permitted, below are the lists of IPs:

Site	URL	IP Addresses
Portal	wdpibadger.caltesting.org	72.4.115.187
Test Delivery	wdpibadger-tss.caltesting.org	72.4.115.186
TOMS	wdpibadger-toms.caltesting.org	72.4.115.185