
Indicators of Digital Readiness

Indicator	Access Point Signal Saturation
Element	Technology Support & Services
Priority Level	P1
Organizational Level	District

Description of the Indicator

In Wi-Fi network environments, users face many challenges with their experience. Workers are increasingly mobile and want to bring their own devices (BYOD). The sheer quantity of wireless devices on the network is stretching the boundaries of the original design intent. In addition, workers want instant, anywhere, anytime access to the systems and applications that help them be productive.

Why is this indicator important?

In preparing today's students for College and Career Readiness, a sufficient wireless infrastructure will be needed to support the many range of devices that are utilized in today's schools as well as in the future. This includes, but is not limited to, school owned devices as well as students' and staffs' personal devices. The Bandwidth, local network architecture, saturation coverage as well as the wireless throughput to individual devices will affect the connectivity of these classrooms and therefore impact the quality of instruction.

Indicator Rubric

Insufficient Evidence of Implementation (0 Points)	<ul style="list-style-type: none">● Classroom lacks wireless throughput for full class instruction.
Foundational Stage of Implementation (3 Points)	<ul style="list-style-type: none">● Each Classroom can support a 1 to 2 device to student ratio based on the largest class size capacity of that room● Classroom should support a minimum wireless throughput (not per device) of 250Mbps with overhead
Achieving Success in Implementation (6 Points)	<ul style="list-style-type: none">● Each Classroom can support a device per student in the largest class size capacity of that room● Classroom should support a minimum wireless throughput (not per device) of 500Mbps with overhead
Exemplary Success in Implementation (9 Points)	<ul style="list-style-type: none">● Each Classroom can support a minimum 2 device per student ratio in the largest class size capacity of that room● Classroom should support a minimum wireless throughput (not per device) of 750Mbps with overhead● Exemplary schools provide a seamless network connection for all users and all devices anywhere in the building

Who in the school/district should lead and be involved with this indicator?

- Superintendent
- Business Administrator
- Technology Director
- IT Personnel
- School Principal
- District Administration

How to execute the indicator

Wireless Networks should be designed to support the number of devices that you're expecting across multiple classrooms. The only way you can really determine what will be needed is to have a professional wireless survey done in your building. This would be a good practice regardless of your building's materials. A robust wireless network requires a reliable wired network for its backbone. A properly built star network topology connecting switches with a

backbone over 10Gbps fiber (soon to be 40 or 100 Gbps as the prices will become more affordable to schools) is a good example and would provide a healthy fertile ground to start your wireless network.

As a foundation, the wireless network should be designed to support 10 Mbps throughput per device connected to the network. Schools need to ensure that the access points they are buying can handle the capacity of the devices it will support across multiple classrooms. This may begin with an access point in every other classroom, with an understanding that each classroom may not have adequate wireless saturation for a full classroom of devices using the network.

The wireless network should be upgraded as additional devices are added. More access points will be required to meet the needs within the classrooms, and access points should be included to create a ubiquitous wireless network throughout the school: hallways, cafeteria, and all other common areas. Exemplary schools provide a seamless network connection for all users and all devices anywhere in the building. In addition, exemplary schools have wireless networks with room to grow in both number of connected devices and overall network bandwidth.

Evidence to support successful execution of this action

- Wireless and wired survey
- Network maps and diagramming including Intranet, Internet, IDFs, MDF, Data Center, and NOCs
- Equipment inventory including make and model number of anything connecting to the wireless network
- Output from the wireless controller showing connected device type and band
- Speed test results from multiple devices during varying times of the day

Resources schools can use to complete this action successfully

- <http://spectrum.ieee.org/telecom/wireless/why-wifi-stinksand-how-to-fix-it>
- <https://answers.uchicago.edu/22027>
- <http://www.speedtest.net>

Certified Schools Exemplars

1. [Delsea Regional High School, Delsea Regional High School District, 2018 Bronze Certified](#)

Delsea Regional High School maintained a 1:1 technology initiative for more than 4 years which requires a reliable WiFi environment. Students and staff are also allowed to BYOD (Bring Your Own Devices) and each classroom in the process of being upgraded from Smartboards to Promethean Boards. The sheer quantity of these devices within the district puts a huge responsibility on the tech department to maintain an atmosphere that allows for any time, anywhere access. The evidence use to meet this indicator were images of the network maps and diagrams showing the intranet, internet, IDFs, MDF, Data Center, Access Points, and NOCs. We also included links to our wireless equipment inventory and the output from the wireless controller showing connected device types and band.

2. [Long Branch High School, Long Branch, 2018 Bronze Certified](#)

The Long Branch School District has a wireless infrastructure that is robust, reliable, and efficient. This allows teachers and students the freedom they need to be mobile in the classrooms without being tied to a single station or lab. Centered on 8 Cisco wireless controllers, we have over 500 Access Points with nearly all of them functioning on AC technology and the remaining running on N. The majority of our access points are tied to Power-Over-Ethernet switches with dual power supplies to assure constant functionality.

3. [Bunker Hill Middle School, Washington Township School District, 2018 Bronze Certified](#)

One of our strongest technology pieces is our wireless connections. We have access points in every room that require access to wireless devices. Rooms without access points have dedicated hardwired computers available for use. Students are able to move room to room with their 1:1 laptop with no service interruptions. Students can access internet in all common areas as well. Carts of iPads and student assigned iPads also exist easily on these networks. Staff can also connect personal laptops, phones, and tablets to the network. The evidence shows the map of access points, router information, and a snapshot from our wireless clients spreadsheet