MICROSOFT OFFICIAL COURSE

Module 8

Configuring Wireless Network Connections

Module Overview

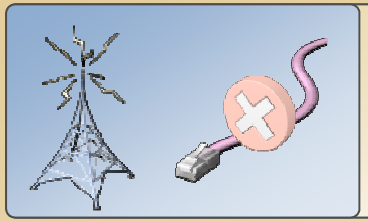
- Overview of Wireless Networks
- Configuring a Wireless Network

Lesson 1: Overview of Wireless Networks

- What Is a Wireless Network?
- Wireless Network Technologies
- Security Protocols for a Wireless Network

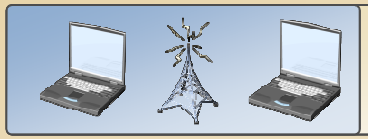
What Is a Wireless Network?

A wireless network:

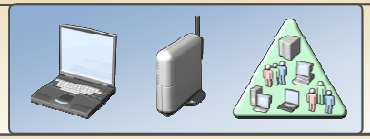


Interconnected devices connected by radio waves instead of wires or cables

Two modes:



Ad hoc



Infrastructure

Advantages

- Extends or replaces wired infrastructure (wire-free)
- Increases productivity for mobile employees
- Provides access to internet in public places

Disadvantages

- Possible interference
- Potential security risk
- Additional management

Wireless Network Technologies

Standard	Maximum bit rate	Range of frequencies	Usage
802.11a	54 Mbps	C-Band ISM (5.725 to 5.875 GHz)	Not widely used
802.11b	11 Mbps	S-Band ISM (2.4 to 2.5 GHz)	Widely used
802.11g	54 Mbps	S-Band ISM	Gaining popularity
802.11n	600 Mbps	C-Band and S-Band ISM	Gaining popularity, not yet finalized

Windows 7 provides built-in support for all standards, but also depends on:

- ✓ The wireless network adapter
- ✓ The wireless network adapter driver

Security Protocols for a Wireless Network

Security standard	Authentication methods	Encryption methods	Remarks
IEEE 802.11	Open system and shared key	WEP	Weak authentication and encryption. Use is highly discouraged
IEEE 802.1X	EAP authentication methods	WEP	Strong EAP methods provide strong authentication
WPA-Enterprise	802.1X	TKIP / AES	• Strong authentication (with strong EAP method) and strong (TKIP) or very strong (AES) encryption • Used for medium and large organizations
WPA-Personal	PSK	TKIP / AES	• Strong authentication (with strong PSK) and strong (TKIP) or very strong (AES) encryption • Used for home networks or small offices
WPA2-Enterprise	802.1X	TKIP / AES	• Strong authentication (with strong EAP method) and strong (TKIP) or very strong (AES) encryption • Used for medium and large organizations
WPA2-Personal	PSK	TKIP / AES	• Strong authentication (with strong PSK) and strong (TKIP) or very strong (AES) encryption. • Used for home networks or small offices

Lesson 2: Configuring a Wireless Network

- Configuring Hardware for Connecting to a Wireless Network
- Wireless Network Settings
- Demonstration: Connecting to a Wireless Network
- Improving the Wireless Signal Strength
- Process for Troubleshooting a Wireless Network Connection

Configuring Hardware for Connecting to a Wireless Network

- ✓ **Connect and configure a Wireless Access Point**
- ✓ **Configure a wireless network adapter in the client computer**

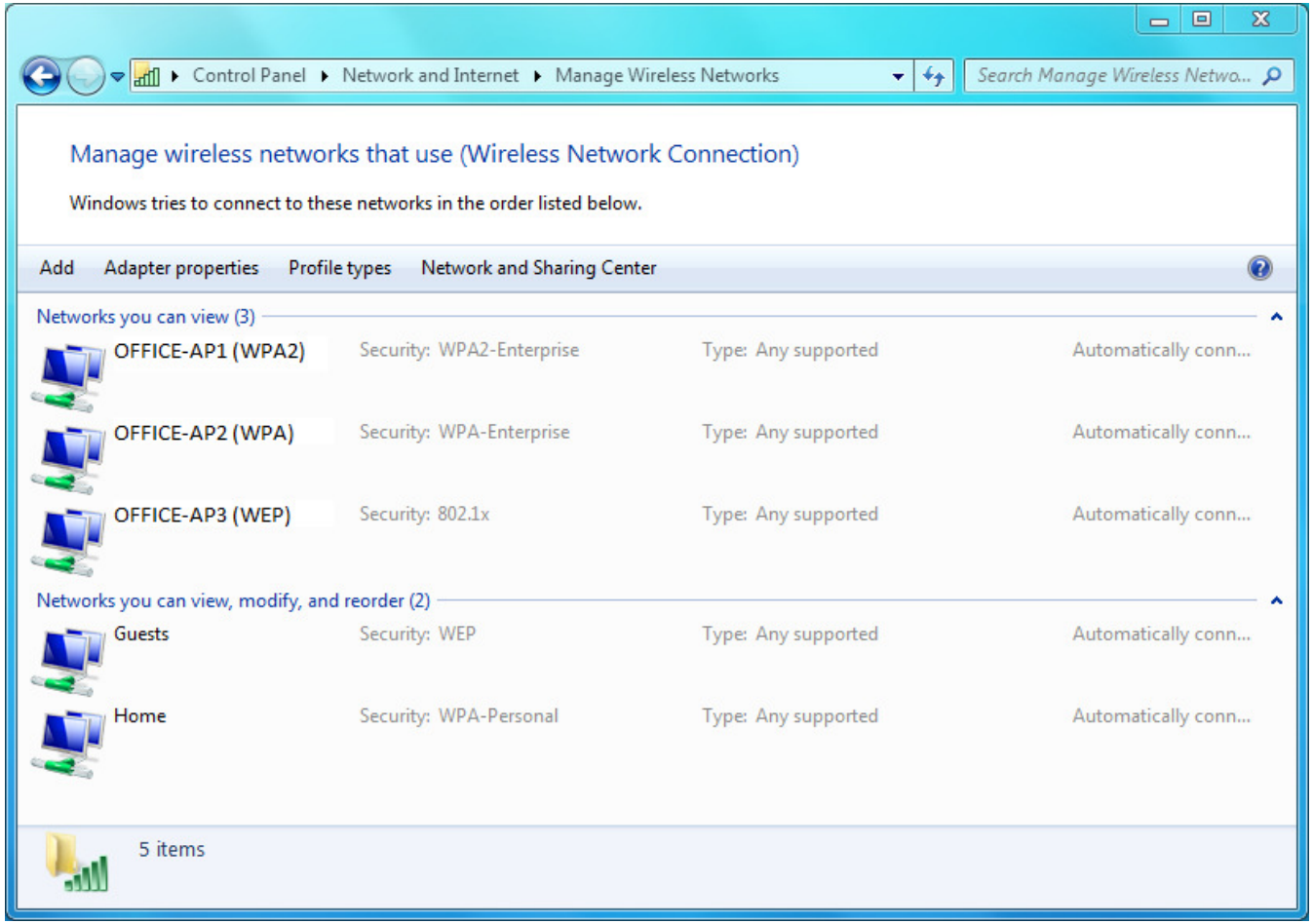
Configuring Client Computers

- Connect to a Network dialog box
- Command line: netsh wlan
- Group policy

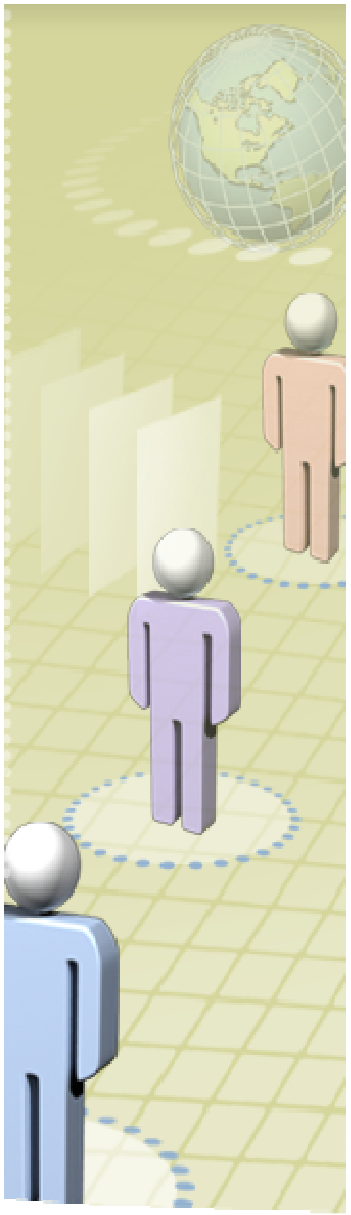
Wireless Network Settings

Control Panel

- **Network and Internet**
  - **Network and Sharing Center**
    - **Manage Wireless Networks**



Demonstration: Connecting to a Wireless Network

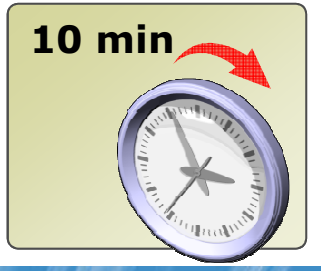


In this demonstration, you will see how to:

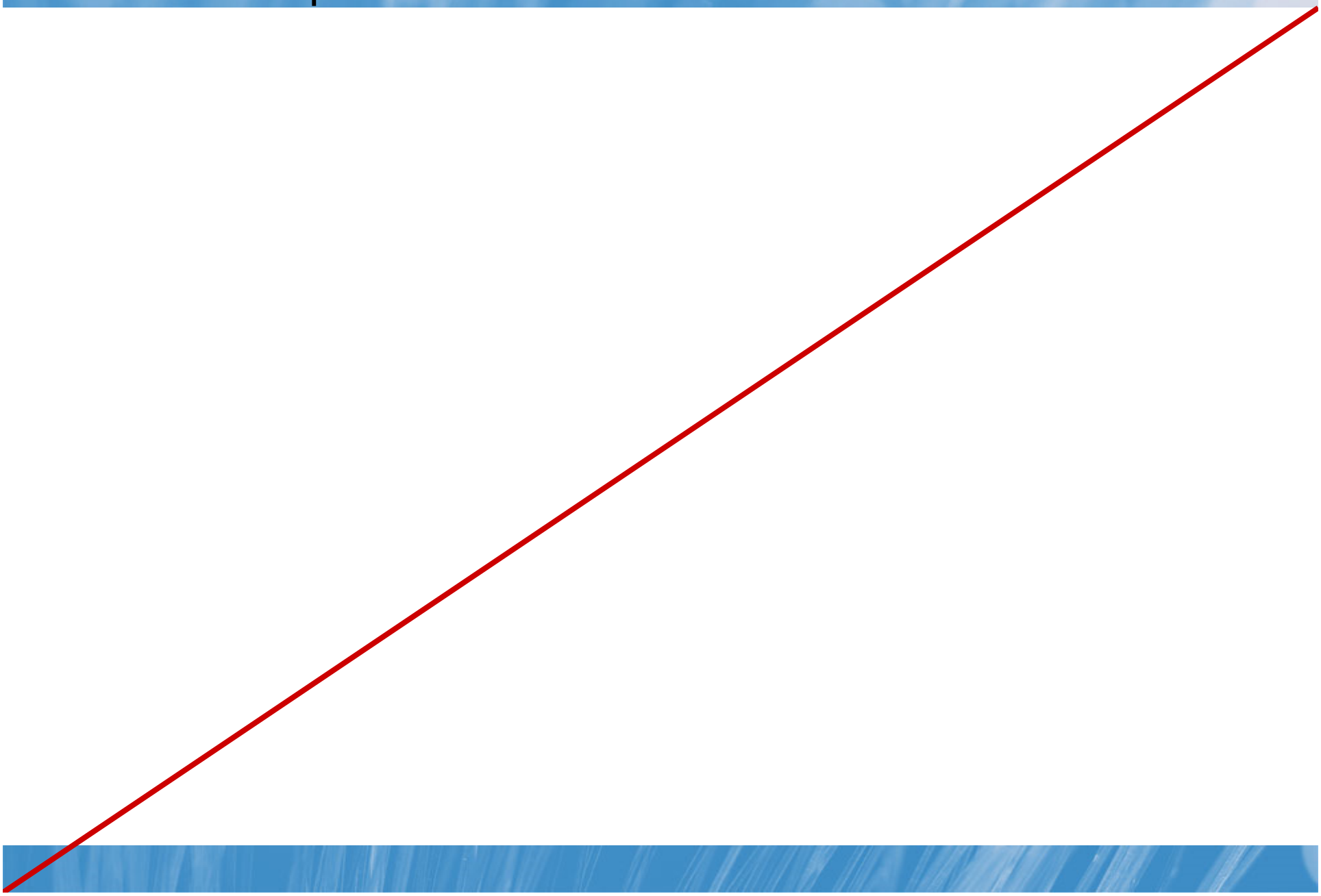
- Connect to the administrative webpage of a wireless AP
- Configure the security settings of the wireless AP

- Configure an unlisted wireless network
- Connect to that network

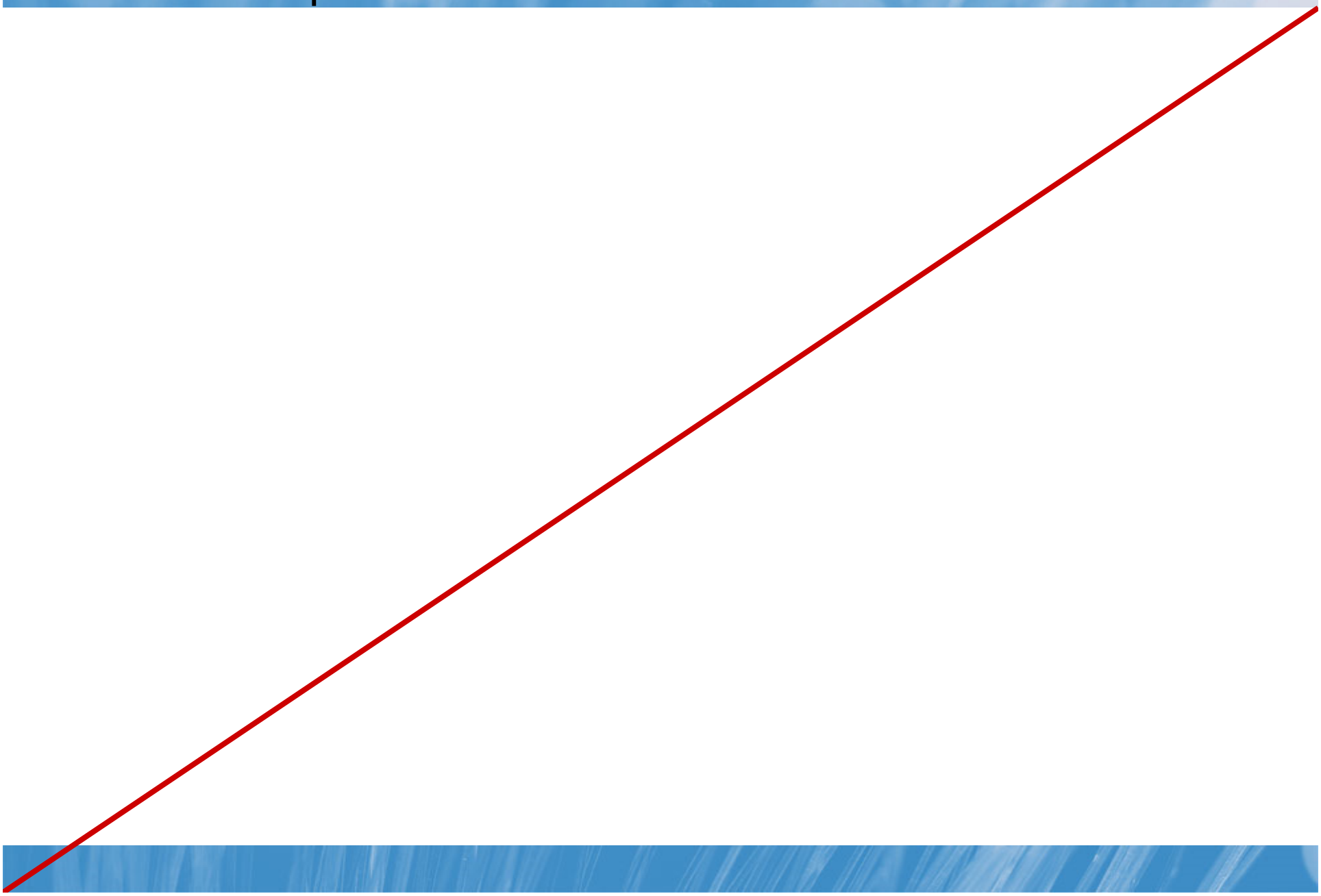
- Connect to a public and open wireless network



Notes Page Over-flow Slide. Do Not Print Slide. See Notes pane.



Notes Page Over-flow Slide. Do Not Print Slide. See Notes pane.



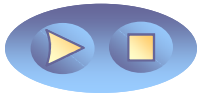
Improving the Wireless Signal Strength

To improve the signal strength:

- ✓ Ensure close proximity to the wireless AP
- ✓ Consider installing an external antenna
- ✓ Check for physical obstructions
- ✓ Add wireless APs
- ✓ Check for devices that may cause interference
- ✓ Consider changing the wireless channel

Process for Troubleshooting a Wireless Network Connection

1. **Attempt to connect to a wireless network**
2. **Diagnose the connection by using Windows Network Diagnostics tool**
3. **Review the diagnostic information**
4. **Identify the problem from the list of problems found**
5. **Resolve the problem that was identified**



Module Review and Takeaways

- Common Issues and Troubleshooting Tips
- Real-World Issues and Scenarios
- Tools