Technologies that make life better
Class 2
March-15-24

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Fridays 9:45-11:15 Room 3

1

Kara Swisher Burn Book

- Part memoir, part history, *Burn Book* is a necessary chronicle of tech's most powerful players. From "the queen of all media" (Walt Mossberg, *Wall Street Journal*), this is the inside story we've all been waiting for about modern Silicon Valley and the biggest boom in wealth creation in the history of the world.

  When tech titans crowed that they would "move fast and break things," Kara Swisher was moving faster and breaking news. While covering the explosion of the digital sector in the early 1990s, she developed a long track record of digging up and reporting the facts about this new world order. Her consistent scoops drove one CEO to accuse her of "listening in the heating ducts" and prompted Facebook's Sheryl Sandberg to once observe: "It is a constant joke in the Valley when people write memos for them to say, 'I hope Kara never sees this.'"

  While still in college, Swisher got her start at *The Washington Post*, where she became one of the few people in journalism interested in covering the nascent Internet. She went on to work for *The Wall Street Journal*, joining with Walt Mossberg to start the groundbreaking *D: All Things Digital* conference, as well as pioneering tech news sites.

  Swisher has interviewed everyone who matters in tech over three decades, right when they presided over an explosion of world-changing innovation that has both helped and hurt our world. Steve Jobs, Jeff Bezos, Elon Musk, Bill Gates, Sheryl Sandberg, Bob Iger, Larry Page and Sergey Brin, Meg Whitman, Peter Thiel, Sam Altman, and Mark Zuckerberg are just a few whom Swisher made sweat—figuratively and, in Zuckerberg's case, literally.

  Despite the damage she chronicles, Swisher remains optimistic about tech's potential to help solve problems and not just create them. She calls upon the industry to make better, more thoughtful choices, even as a new set of powerful AI tools are poised to change the world yet again. At its heart, this book is a love story to, for, and about tech from someone who knows it better than anyone.

2

The latest technology?

2000

- Landline
- Ethernet Cable
- Antenna, Cable TV
- Vinyl, CDs
- Standalone PC-Windows
- Local Hard Drive
- Wi-Fi version 1
- Wired Internet (DSL, Cable, FIOS)
- USB Type A
- Mechanical Hard Drive
- Sneakernet, Windows File Sharing
- Password login
- Speakers
- Intel Pentium III 9.5 million Transistors

2024

- VOIP-OOMA, Vonage, Google Voice
- Wireless, Wireless Mesh, Extender
- Streaming w YouTube TV, Roku etc.
- Spotify and Pandora, YouTube Music, iTunes
- Chromebook-Chrome OS (Cloud-based), Windows 365
- Google drive, iCloud, One Drive, Personal Cloud Drives
- Wi-Fi 6, Wi-Fi 7 (2024)
- Cellular Internet (Hot Spots, 5G-30,000 Mbps)
- USB-C
- Solid State Drive (SSD)
- Shared Links to files in the Cloud
- Two factor authentication, passkeys (Duo Mobile, Authenticator)
- Speakers that talk back (Alexa, Google Assistant, Apple Home Pod)
- Intel I9 chip 2.95 billion transistors (May the memory of Gordon Moore be a blessing)

3

Buying a new Desktop Computer

- Form Factor
  - Small –no upgrade
  - Large – Upgrade, RAM, storage, power supply etc.
- Internal/External storage
  - Traditional-less expensive
  - Solid State Drive (SSD)
  - RAID 1-Disk Mirroring
  - External drive USB 3.2 up to 20 Gbps
- Ports
  - USB-C
  - Add more ports with a USB Hub
- DVD Drive
  - Available as external USB device
- Screen
  - Touch
  - 4K

5

Laptop (ChatGPT)

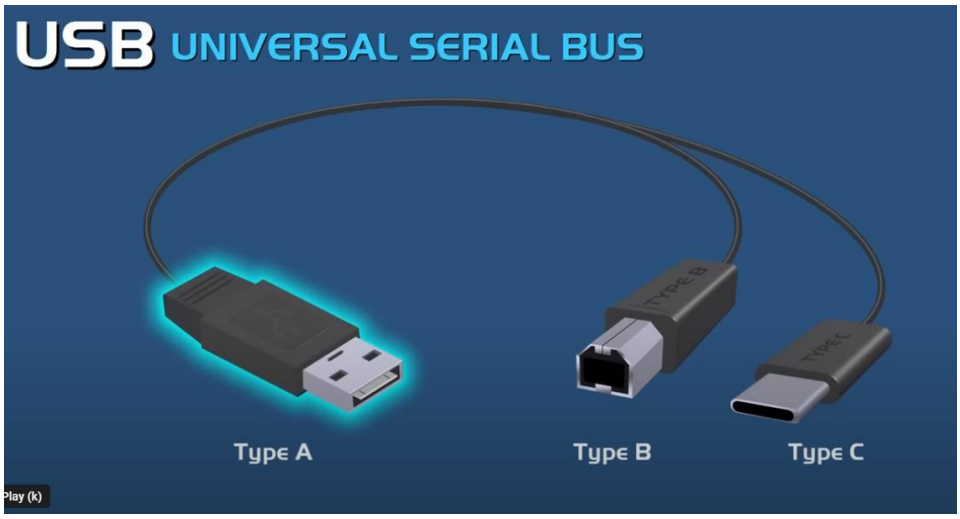
1. **Purpose**: Determine what you'll primarily use the laptop for—work, gaming, multimedia, etc. This will guide your choice in terms of specifications.
2. **Performance**: Look at the processor (CPU), RAM, and storage. For most tasks, an Intel Core i5 or AMD Ryzen 5 processor, 8GB of RAM, and a solid-state drive (SSD) with at least 256GB of storage should suffice. Adjust based on your usage requirements.
3. **Portability**: Consider the laptop's size and weight if you need to carry it around frequently. Thin and light models are ideal for travel.
4. **Battery Life**: Check the estimated battery life, especially if you'll be using the laptop away from power outlets for extended periods.
5. **Display**: Look for a high-resolution display with good color accuracy, especially if you'll be editing photos or videos. Consider whether you prefer a touchscreen or matte/non-glare display.
6. **Graphics**: If you plan to use the laptop for gaming or graphic design, consider a model with a dedicated graphics card (GPU). Integrated graphics might suffice for casual use.
7. **Connectivity**: Ensure the laptop has the necessary ports for your needs, such as USB-A, USB-C, HDMI, headphone jack, etc. Check for features like Wi-Fi 6 and Bluetooth compatibility.
8. **Build Quality**: Look for a durable chassis and reliable build quality, especially if you'll be using the laptop on the go.
9. **Keyboard and Trackpad**: Test the keyboard and trackpad to ensure they're comfortable and responsive, especially if you'll be typing for long periods.
10. **Operating System**: Choose between Windows, macOS, or Chrome OS based on your familiarity and preference.
11. **Budget**: Set a budget and prioritize features accordingly. Remember to consider any additional costs for accessories or extended warranties.

6

Advantages of Intel EVO (ChatGPT)

1. **Performance**: Intel Evo-certified laptops feature powerful processors, typically from Intel's 11th Gen Core series (Tiger Lake). These processors offer excellent performance for everyday computing tasks, multitasking, and even some demanding applications.
2. **Battery Life**: Intel Evo-certified laptops are designed to deliver long battery life. They typically feature efficient components and optimizations that allow for all-day usage on a single charge, making them ideal for users who are frequently on the go or need a laptop for extended periods away from power outlets.
3. **Instant Wake**: Intel Evo laptops support fast wake times, allowing you to quickly resume your work or multimedia activities from sleep mode. This feature enhances productivity by reducing wait times and enabling seamless transitions between tasks.
4. **Fast Charging**: Many Intel Evo-certified laptops support fast charging technologies, allowing you to recharge the battery quickly. This feature is convenient for users who need to quickly top up their laptop's battery before heading out or returning to work.
5. **Thin and Light Design**: Intel Evo-certified laptops prioritize portability and often feature thin and lightweight designs. This makes them easy to carry around, whether you're commuting, traveling, or working from different locations.
6. **High-Quality Displays**: Intel Evo laptops typically come with high-quality displays, offering features such as high resolutions, vibrant colors, and wide viewing angles. These displays enhance the overall user experience, whether you're working on documents, watching videos, or editing photos and videos.
7. **Thunderbolt 4 Support**: Intel Evo laptops often come equipped with Thunderbolt 4 ports, providing high-speed connectivity for peripherals such as external monitors, storage devices, and docking stations. Thunderbolt 4 offers faster data transfer speeds and more versatility than previous generations of Thunderbolt technology.
8. **Wi-Fi 6 Connectivity**: Intel Evo laptops feature Wi-Fi 6 (802.11ax) connectivity, offering faster wireless speeds, improved network efficiency, and better performance in crowded environments. Wi-Fi 6 support ensures a smooth and reliable internet connection for online activities such as streaming, video conferencing, and cloud computing.

7



8

Here are some of the key advantages of USB-C:

- Reversible Design: USB-C connectors are designed to be reversible, meaning you can plug them in either way without worrying about orientation
- Universal Compatibility: USB-C is a universal standard, which means it can be used with a wide range of devices, including laptops, smartphones, tablets, monitors, docking stations, and more.
- Faster Data Transfer Speeds: USB-C supports high data transfer speeds, including USB 3.1 Gen 1 (up to 5 Gbps) and USB 3.1 Gen 2 (up to 10 Gbps). This makes it ideal for transferring large files quickly.
- Higher Power Delivery: USB-C can deliver more power compared to older USB standards. It supports Power Delivery (PD) technology, which can provide up to 100W of power. This allows you to charge laptops, smartphones, and other devices quickly and efficiently.
- Audio and Video Support: USB-C can carry audio and video signals in addition to data and power. It can support high-resolution displays (up to 4K and beyond) and can transmit audio signals, making it useful for connecting to external monitors, projectors, and headphones.
- Smaller and Slimmer Design
- Single Cable for Multiple Functions: With USB-C, a single cable can handle data transfer, power delivery, and display connections simultaneously. This simplifies cable management and reduces clutter.

9

Solid State Drives (Provided by Chat GPT)

1. **Performance:** SSDs are much faster than HDDs. They offer quicker boot times, faster application loading, and overall snappier system responsiveness. If you want your computer to run faster and more smoothly, upgrading to an SSD can make a noticeable difference.
2. **Durability:** SSDs have no moving parts, which makes them more resistant to shock and vibration. This can be particularly important for laptops or portable devices that may be subjected to movement or impacts.
3. **Reliability:** SSDs tend to be more reliable than HDDs over time. HDDs are more prone to mechanical failures, such as head crashes, which can lead to data loss.
4. **Energy Efficiency:** SSDs consume less power than HDDs, which can result in longer battery life for laptops and less heat generation in desktop computers.
5. **Noise:** SSDs are completely silent since they have no spinning disks or moving parts. This can be an advantage if you prefer a quiet computing environment.
6. **Form Factor:** SSDs are available in various form factors, including 2.5-inch drives (similar to HDDs), M.2 drives, and even smaller options like NVMe drives. This flexibility allows them to fit in a wide range of devices.
7. **Price:** While SSD prices have come down significantly over the years, they are generally more expensive per gigabyte compared to HDDs. However, the cost difference has narrowed, and SSDs are considered a good value for the performance gains they offer.
8. **Capacity:** SSDs are available in a wide range of capacities, from small 128GB drives for basic storage to multi-terabyte options for power users and professionals. Consider your storage needs when choosing an SSD.
9. **Data Backup:** It's important to note that SSDs, like all storage devices, can fail. Regularly backing up your data, regardless of the storage type you use, is crucial to prevent data loss.

10

If programs and data are in the Cloud, why do I need an expensive computer?

- The Ideal Cloud Computer
  https://www.youtube.com/watch?v=yKXXj_dguz0

11

Chromebook/Chromebook Clones
https://www.youtube.com/watch?v=yKXXj_dguz0

Pros

- Inexpensive
  - Hardware
  - $150-$600
- Light Weight
- Includes Google and Android Apps
  - G Suite
- Chrome OS, simpler than Mac or Windows
- Less prone to viruses/attacks
- Integrates with Google Classroom

Cons

- Very limited local storage
- Low end processor
- Depends on reliable Internet Connection
- Depends on Cloud-based software. Unlike Windows, Mac OS or Unix, you can't install programs from a DVD/CD
- Not designed for apps like video editing that requires more specialized hardware resources
- Security of data in Cloud

12

Chromebook versus Raspberry Pi

- Since the Pi runs Unix you can install programs on the micro-SD card and don't need to run cloud-based software and don't need an Internet connection
- Pi has local storage
- Working with Linux may be more difficult than Chrome OS
- Most schools use Chromebooks
- The Pi option is less expensive
- Neither choice is designed for high end computing tasks
- Many reviewers consider the Pi 5 8GB a desktop replacement.

15

Do I still need a Desktop or Laptop?

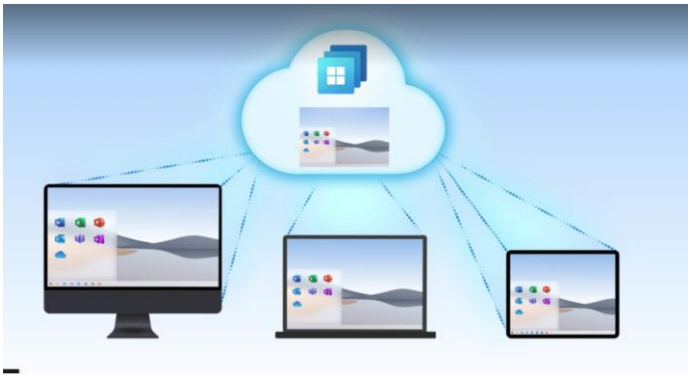
- Phone
  - Multifunction - Mail, Podcast, Video, Messaging, many Apps available on phone
- Tablet
  - Larger Screen, Options for storage, ideal for reading and streaming
- Chromebook
  - Inexpensive, portable

16

Cloud-Based Apps
Office 365 vs Office 2021

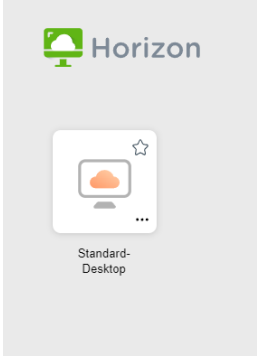
17

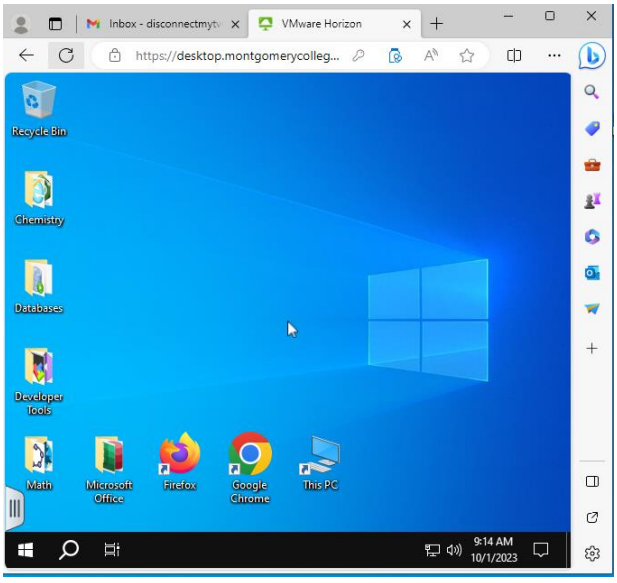
Windows 365 The Virtual Computer
All I need is a browser
You can run Windows from a browser on your Mac



18

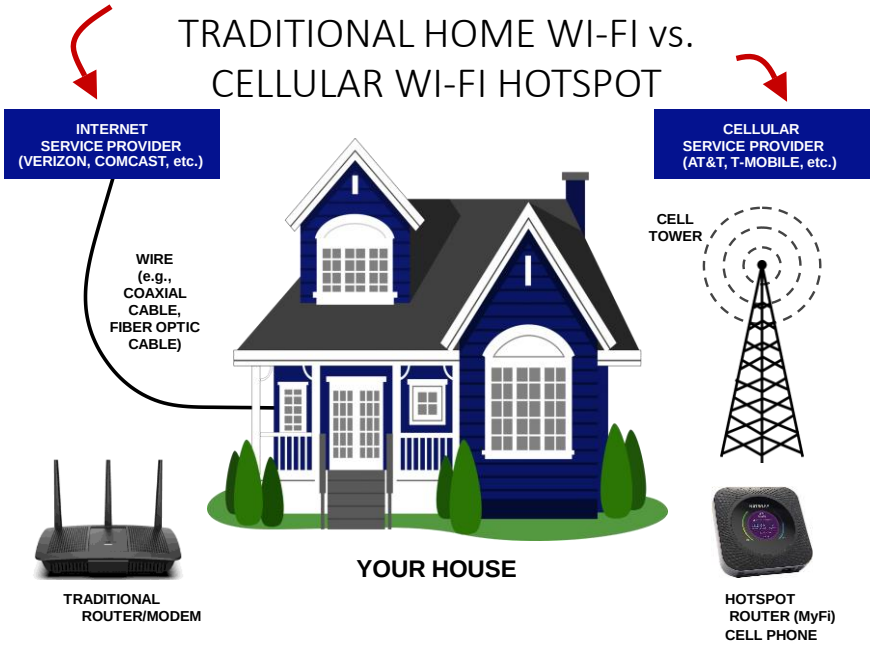
What is a virtual computer?





19

TRADITIONAL HOME WI-FI vs. CELLULAR WI-FI HOTSPOT



20

How to connect to Internet

ISP/Wi-Fi

- Wi-Fi connects you to a wireless router/access point
- Router is connected to your Internet Service Provider (ISP)
- ISP provides connection to the Internet via physical cable
  - Comcast Cable
  - Verizon FIOS
- Your connection speed is dictated by your agreement with ISP (average is 75 Mbps)
- No limit on how much you can use
- Set your phone to use Wi-Fi to avoid cellular data usage
- If you enable Wi-Fi calling you can use your wi-fi to make cellular calls when your have poor signal
- Wi-Fi calling works overseas and allows you to make/receive US phone calls for free

Cellular Data Connectivity

- You can access the Internet through your cellular carrier (via Cell Towers)
  - Verizon Wireless
  - AT&T
- Usage(amount you use) is measured in Gigabits (GB) and priced accordingly
- Typical monthly usage plans are 1 to 30 GB
- Cellular connectivity is much slower than Wi-Fi or wired link to your router
- 5G technology will improve cellular speeds
- If you enable the Hot Spot feature on your phone your phone provider becomes your ISP
- Cellular providers offer unlimited data plans
- Cellular ISPs are now offering alternatives to wired Internet access (whole house wireless) Verizon and T-Mobile

21

TRADITIONAL HOME WI-FI vs. CELLULAR WI-FI HOTSPOT

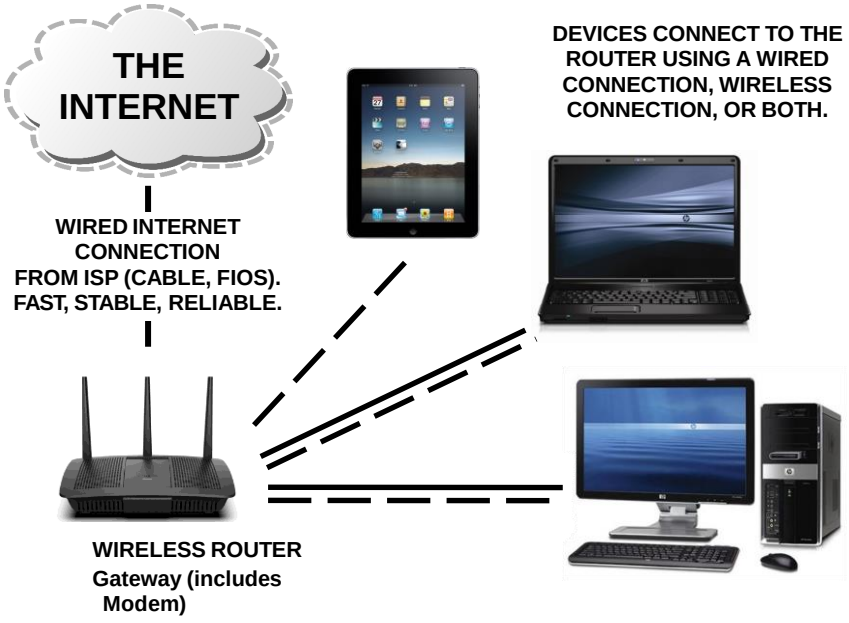
TRADITIONAL. **For many years, we've set up a home wireless network (known as "Wi-Fi") by connecting a wired internet connection (e.g., cable, Fios) from an internet service provider to a wireless router in our home.**

HOTSPOT. **In 2024, you have another option for setting up a home Wi-Fi network – using a permanent Wi-Fi hot spot.**

- **Unlike most traditional home Wi-Fi networks, a hot spot relies on a wireless cellular signal from a cellular provider (e.g., T-Mobile, AT&T,Verizon), not a wired internet connection from your ISP.**
- **You'll need a router; a strong, fast, and reliable cellular connection (4G or 5G); and a cellular plan that supports hotspots.**
- **With this type of set-up, you may be able to (1) save money, (2) improve the quality of your home Wi-Fi signal, and (3) use a single carrier for both your home internet connection and cell phone.**

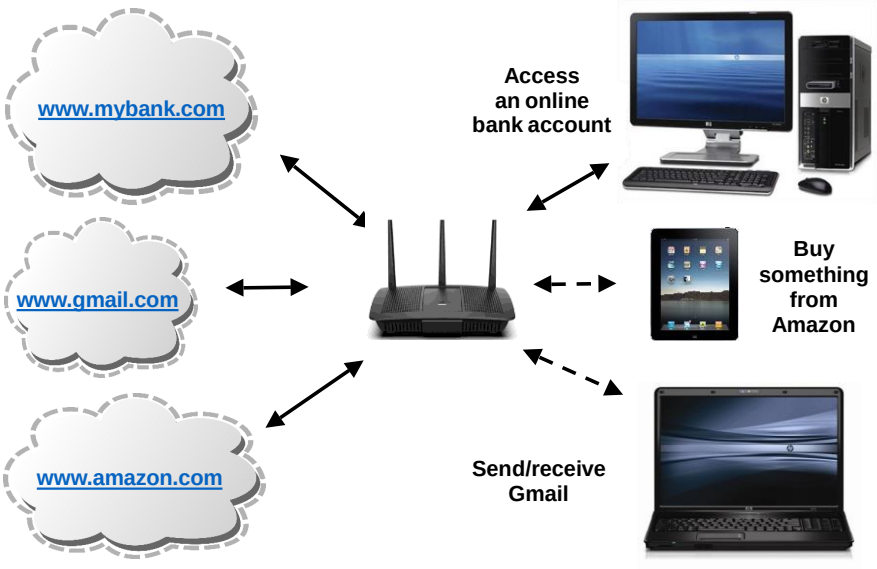
22

TRADITIONAL HOME WIRELESS NETWORK



24

ROUTERS ROUTE INTERNET TRAFFIC TO/FROM NETWORK-CONNECTED DEVICES



26

COMMONLY-USED WIRELESS TECHNOLOGIES

NAME	RANGE	SIGNAL	RADIO FREQUENCY
	LONG RANGE		
SHORT WAVE	Hundreds of miles	One-way or two-way	1,800 to 30,000 kHz
BROADCAST RADIO AND TV	Miles	One-way	540 to 1,610 kHz (AM) 87.5 to 108.0 MHz (FM) 54 to 890 MHz (TV)
CELLULAR	Miles	Two-way	700 MHz and 800 MHz bands (AT&T, Verizon) PCS band (Sprint) PCS and AWS bands (T-Mobile)
SATELLITE (navigation, telecommunications)	Hundreds of miles	Two-way	1,000 to 40,000 MHz
	SHORT RANGE		
WI-FI *	100 to 200 feet	Two-way	2.4 GHz, 5 GHz, and 6 GHz
BLUETOOTH *	30 to 300 feet	Two-way	2.4 to 2.485 GHz

*** Range varies based on the Wi-Fi or Bluetooth standard and other factors, e.g., the strength of the transmitter, the nature of physical obstructions to and radio signal interference with the signal, and antenna orientation.**

28

PROS AND CONS OF WIRELESS NETWORKS

PROS

- **No wires. (Wireless routers support wired connections if desired.)**
- **Can connect mobile devices to the internet that don't have built-in cellular (e.g., tablets, laptops, watches).**

CONS

- **A wireless connection is generally slower, less stable, and less reliable than a wired connection.**
- **Because wireless networks are potentially accessible to any user within range, securing the network is VERY IMPORTANT. Encryption.**

30

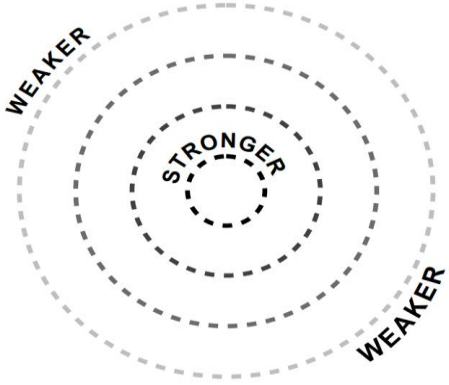
What is encryption?

- An encrypted wireless signal refers to the data transmitted over a wireless network (like Wi-Fi) being encrypted or scrambled to protect its confidentiality and integrity.
- The purpose of encrypting wireless signals is to prevent eavesdropping and unauthorized access to the wireless network traffic. Without encryption, anyone in range can potentially capture and read the wireless data being transmitted, posing major security and privacy risks.

31

CHARACTERISTICS OF RADIO SIGNALS THAT AFFECT QUALITY OF TRANSMISSION

- SIGNALS WEAKEN WITH DISTANCE (Attenuation)
- PHYSICAL OBJECTS CAN OBSTRUCT OR ATTENUATE SIGNALS
- SIGNALS CAN INTERFERE WITH SIGNALS WITH THE SAME FREQUENCY



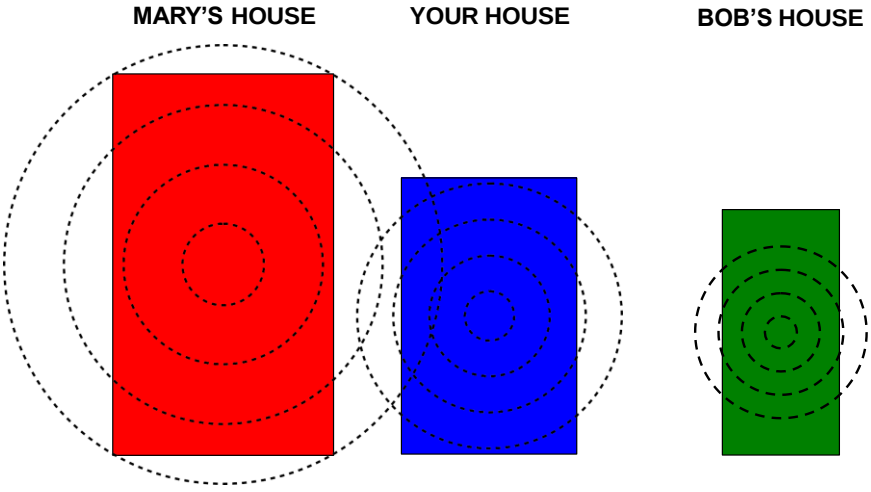
32

PHYSICAL BARRIERS TO TRANSMISSION OF WIRELESS SIGNALS

OBSTRUCTION	DEGREE OF ATTENUATION	EXAMPLES
Open space	None	• Outdoors
Wood	Low	• Joists and studs, office partition, door, floor Wall, ceiling
Plaster	Low	
Synthetic materials	Low	
Cinderblock	Low	• Office partition Inner or outer wall Ceiling
Asbestos	Low	
Glass	Low	
Wire mesh in glass	Medium	• Non-tinted window Door, partition Tinted window
Metal tinted glass	Medium	
Human body	Medium	• Large group of people
Water	Medium	• Damp wood, aquarium, plants
Bricks	Medium	Inner or outer wall, floor
Marble	Medium	
Ceramic	High	• Inner or outer wall, floor, countertops Ceramic tile
Paper	High	• Roll or stack of paper stock, books Floor, outer wall, support pillar Security booth
Concrete	High	
Bulletproof glass	High	
Silvering	Very High	• Mirrors
Metal	Very High	

35

INTERFERENCE FROM NEARBY WIRELESS NETWORKS



MARY'S WIRELESS NETWORK HAS A WIDE RANGE, STRONG SIGNAL, AND USES THE SAME FREQUENCY AS YOURS.

BOB'S WIRELESS NETWORK HAS A SHORTER RANGE AND/OR WEAKER SIGNAL.

37

INTERFERENCE FROM HOUSEHOLD GADGETS THAT EMIT RADIO SIGNALS AT THE SAME FREQUENCY (GENERALLY 2.4 GHz)

MICROWAVE OVEN

CORDLESS PHONE

BABY MONITOR

GARAGE DOOR OPENER

BLUETOOTH DEVICES

RADIO-CONTROLLED TOYS

38

COMMON FIXES TO WI-FI NETWORKS TO IMPROVE QUALITY OF WIRELESS SIGNAL

- **Sometimes all you need to do is move your router or a piece of furniture.**
- **If you have an old router, get a new one.You'll get better signal strength and speed, longer range, and many new features that can improve signal quality. Most are easy to install.**
- **Install a mesh Wi-Fi system. This is a good option for large homes, homes with internal walls constructed of materials that obstruct wireless signals, homes with very long or narrow floor plans (e.g., 3- or 4-story townhouses or ranch homes), and homes that contain lots of objects that obstruct or attenuate wireless signals.**
- **Increase your contract internet speed (e.g., from 25 Mbps to 100 Mbps). This can make a real difference if a lot of people use your Wi-Fi network at the same time, working with large files (e.g., streaming video, online gaming).**
- **Explore using a Wi-Fi hotspot!**

39

WIRELESS ROUTER STANDARDS

	802.11g (2003)	802.11n Wi-Fi 4 (2009)	802.11ac Wi-Fi 5 (2014)	802.11ax Wi-Fi 6 (2020)
Wireless data transfer speed *	54 Mbps	450 Mbps	1300 Mbps	1300 Mbps
Signal range *	100 feet indoors 400 feet outdoors	200 feet indoors 800 feet outdoors	200 feet indoors 800 feet outdoors	200 feet indoors 800 feet outdoors
Frequency	Single-band 2.4 GHz	Single-band 2.4 GHz	Single-band 5 GHz	Dual-band 2.4 and 5 GHz (plus 6 GHz)
Important security features	High-level security software (WPA2), firewall software			
Optional features (found in many 802.11n, 802.11ac, and 802.11ax routers)	Dual-band 2.4/5 GHz, MU-MIMO technology, USB port, guest Wi-Fi network, gigabit ethernet, QoS, beamforming, and more			

*** These are maximum speeds and ranges. What you actually get in your home will vary with the router model and site-specific conditions.**

Router standards are backwards compatible.

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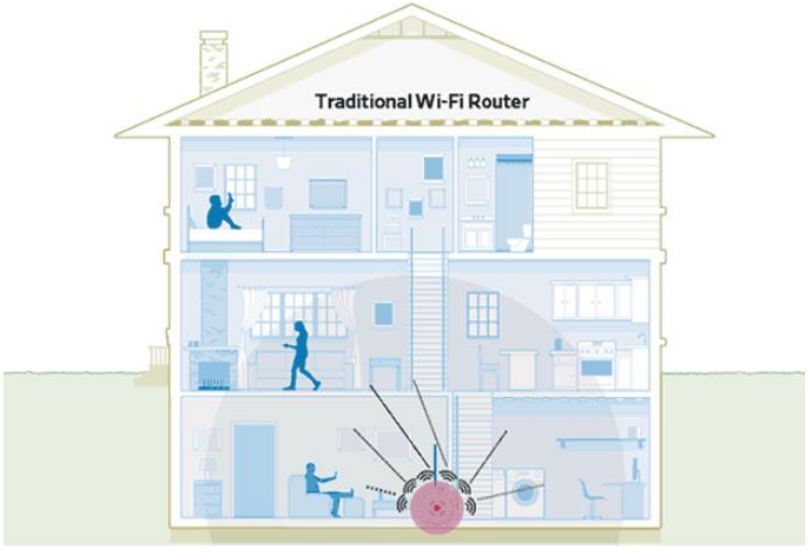
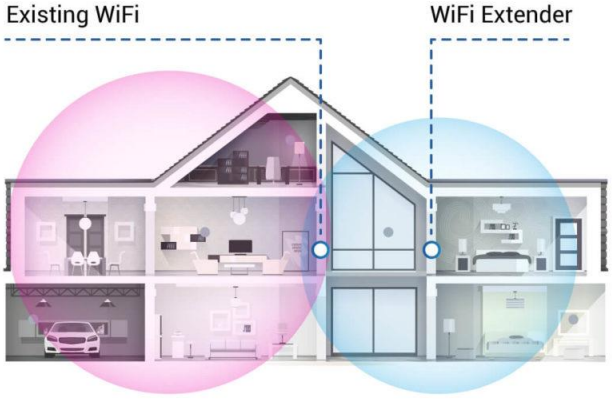


45

Adding Extender to Wi-Fi Network



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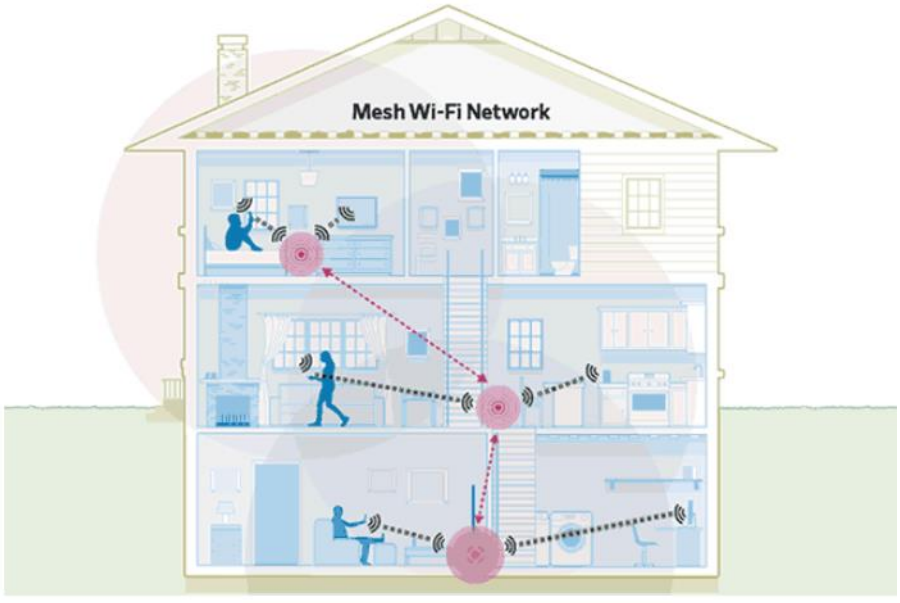
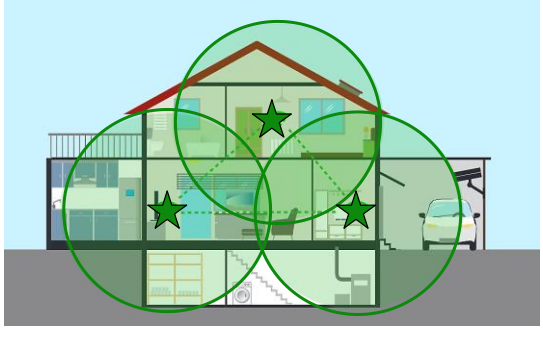


48

MESH WI-FI SYSTEM

USES MULTIPLE CONNECTIVITY DEVICES INSTEAD OF A SINGLE ROUTER. YOU PURCHASE AS MANY AS YOU NEED (MOST COMMON IS A SET OF 3).



STRATEGIC PLACEMENT OF DEVICES THROUGHOUT A HOME CAN PROVIDE VERY GOOD SIGNAL COVERAGE.

49

TEST OUT THE WI-FI CONNECTIONS AROUND YOUR HOME

- **Connect a mobile device that has a web browser to your network. In your web browser, log in to www.speedtest.net, a web site that will tell you the speed of your internet connection. (There's also a Speedtest mobile app.)**
- **Walk around your home and see what internet speed you get at the locations where you want to use your Wi-Fi network.**
  - **If the speed is good everywhere, you're done!**
  - **If it's not, you'll have to figure out a fix.**

50

https://chat.openai.com/
https://www.zdnet.com/article/how-to-use-chatgpt/

51