

Personal Cybersecurity:

*How can I tell if I
am secure
online?*

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About Me

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How can I tell if I'm secure when online?



Basically, you can't !!



What can I do?:

- Learn about the internet
- Know the risks and dangers
 - Know what to do
 - Know what NOT to do

Let's compare the internet to electricity

- I can't see electricity
- But I can feel it!
 - I know better than to stick a knife into a receptacle or to use a hair dryer in the tub
 - I take precautions, and I don't take risks
 - I learn about the science and physics and how to be safe, so I can work on very high voltage robots and factory machines safely



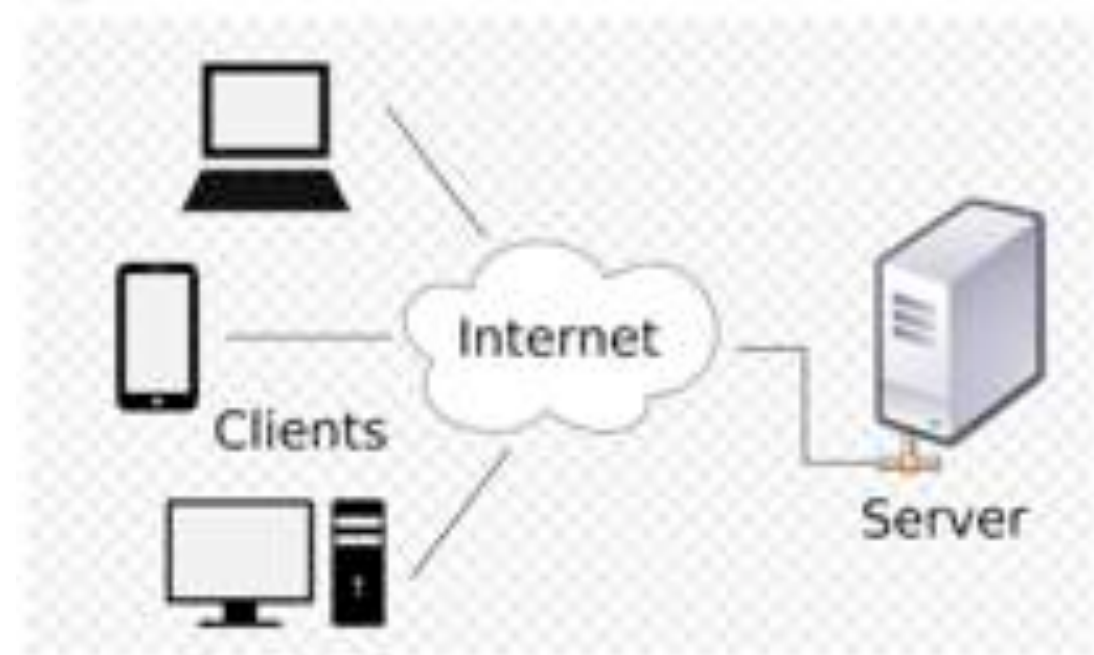
Why am I unsafe online?

- The internet is wide open
- Security and safety are add-on layers that must be built in and used
- Anyone can use a program to steal your information (credit card details, passwords, personal information)
- *The odds are stacked against us:*
 - The bad guy has to 'win' only once, and can fail a lot
 - We must protect ourselves all the time and cannot fail once!

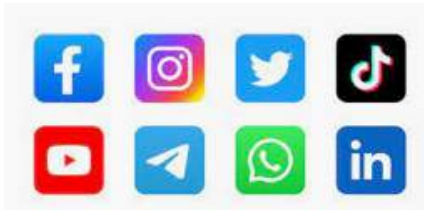


The architecture of Internet applications is really simple (*but the implementation is very complex!*)

- The Client/Server model is helpful to keep in mind
- Client:
 - A web site
 - A mobile application
- Server:
 - Every service or "back-end" provider, like Google, Facebook, BeReal, TikTok, etc



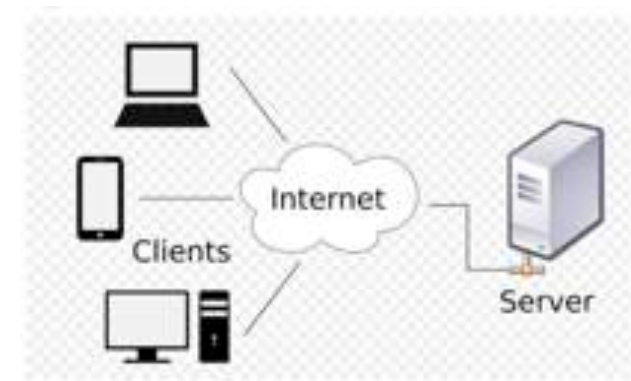
Client/Server Model



Client: Desktop / Tablet / Mobile

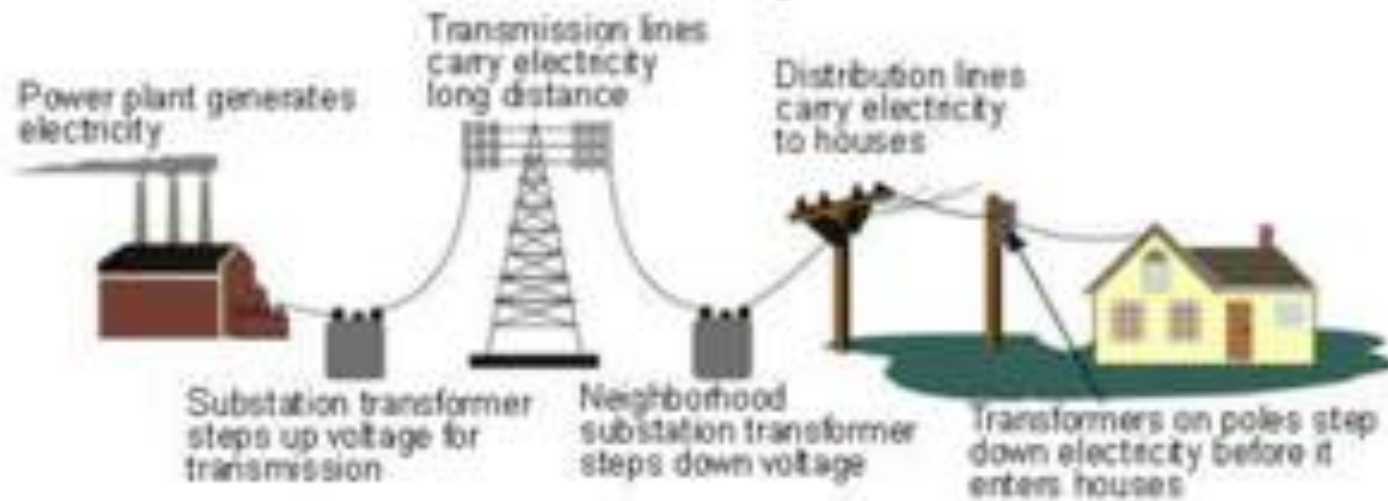


The cloud / internet



Server Computers / Data Centers

Using electricity at home is (somewhat) similar



We learn how to use electricity safely

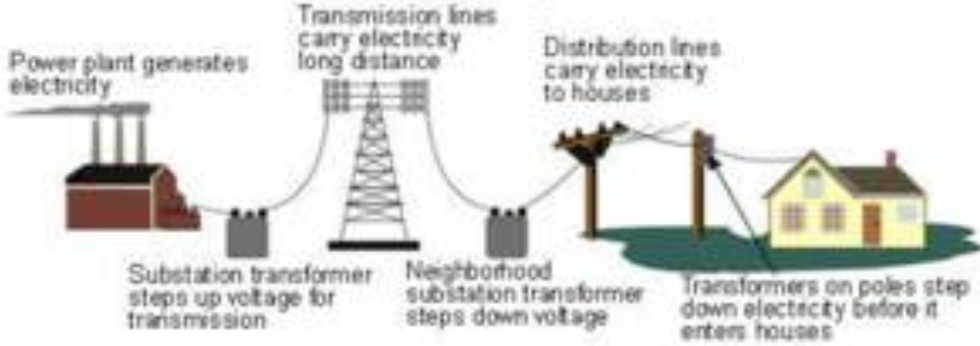


Photo: EIA



You've learned new terms to work with electricity



Quantity	Symbol	Unit of Measurement	Unit Abbreviation
Current	I	Ampere ("Amp")	A
Voltage	E or V	Volt	V
Resistance	R	Ohm	Ω



Voltage
AC / DC
Amps
Watts
120 V
LED
Incandescent
CF Compact Florescent
Lumens

To use electricity safely, we follow warning labels; don't overload devices, etc.

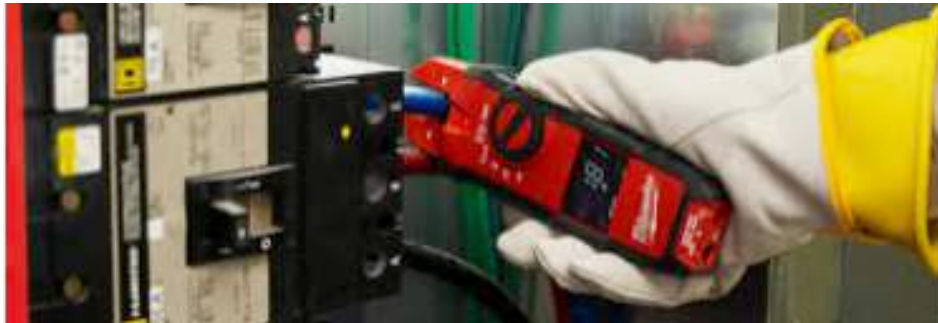


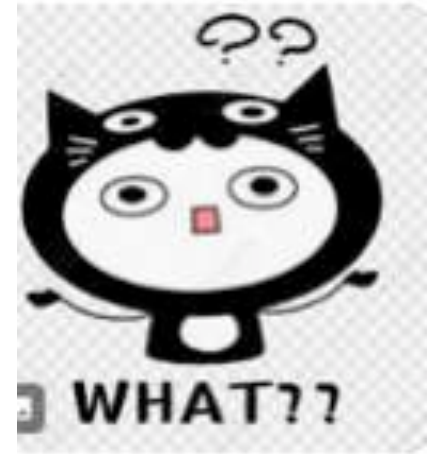
What Wattage Do You Need?

Incandescent	25w	40w	60w	75w	100w
Halogen	18w	30w	40w	55w	70w
CFL	9w	14w	17w	19w	23w
LED	4.5w	7w	12w	15w	18w
High End LED	20w	40w	60w	75w	100w



To use electricity safely, we also have tools

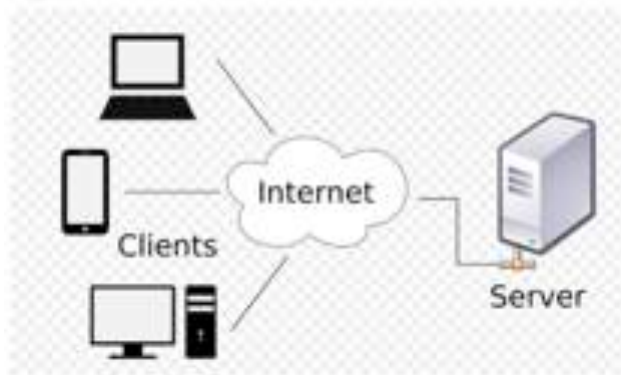
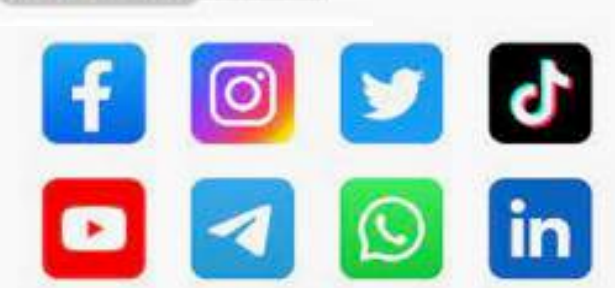




But what does electricity have to do with internet safety ??

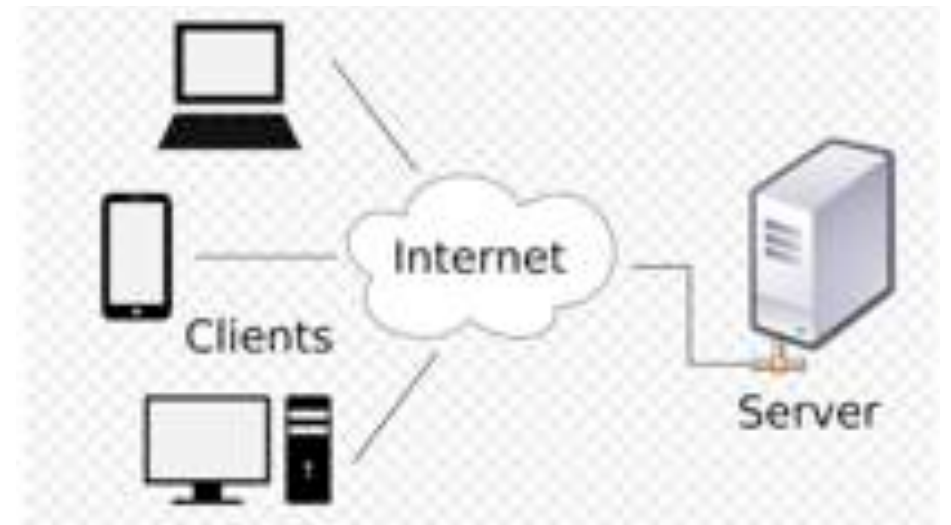


The client/server model with bad guys



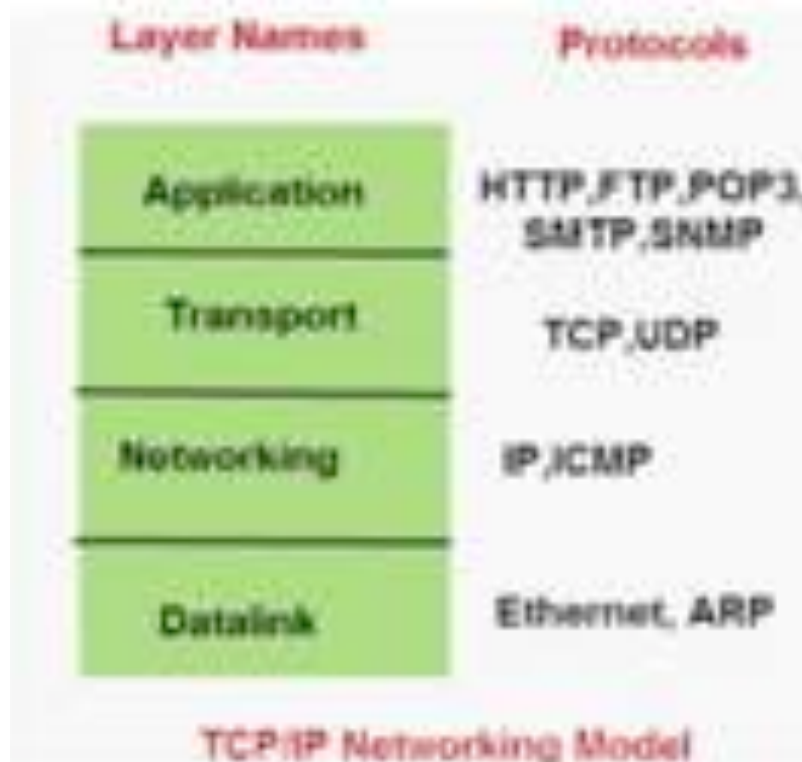
Let's look into the Client/server Model a little deeper

- We need to learn a few more terms
- Client uses HTTP over TCP/IP to communicate with a server
 - Key terms:
 - TCP/IP
 - HTTP/HTTPS
- The Client and Server send messages back and forth over a transmission medium
- The message can be seen by everyone on the network



There are always new terms and abbreviations to learn !

https://docs.oracle.com/cd/E18752_01/html/816-4554/ipov-29.html

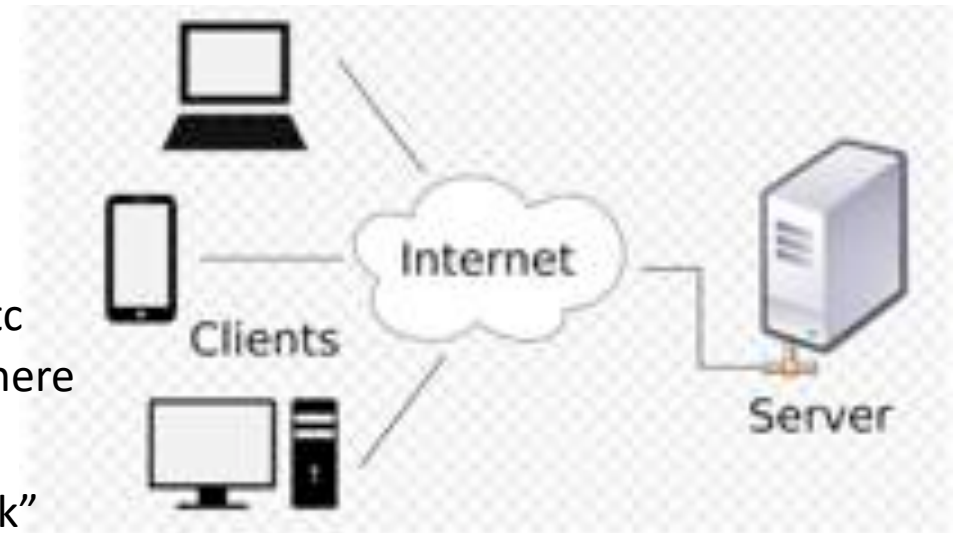


We use applications

At this level:

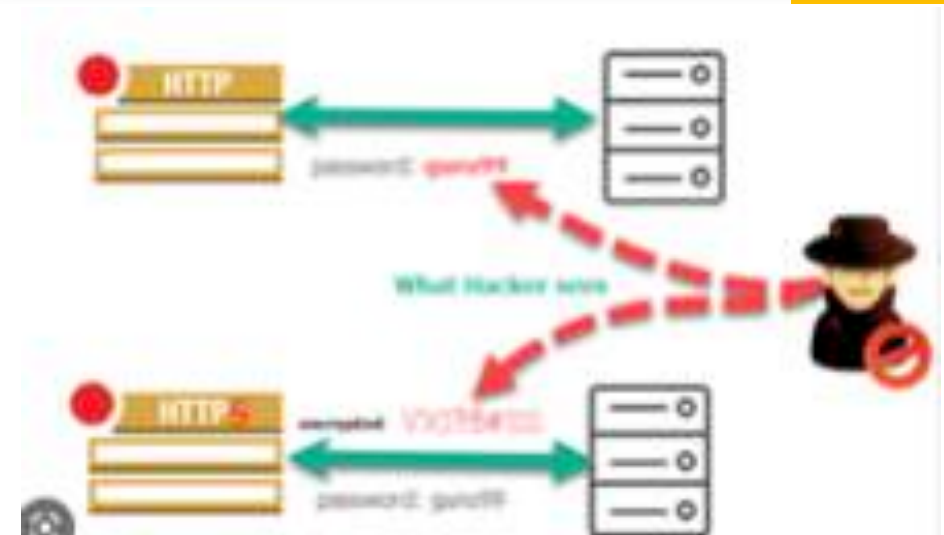
- email / apps / web pages etc
- The HTTP protocol applies here

All the other layers “just work”
(we hope), BUT THEY ARE THERE
And can be exploited



HTTP vs HTTPS

- When you use a web app the data sent back and forth is unencrypted except if you use HTTPS
- Many applications and browsers use HTTPS by default
- Some don't even show it in the address bar
- It is up to you to know if the web page or app is using HTTPS
 - HOW CAN YOU TELL ???





Example: Paying with a credit card

- You would not shout out your credit card number, expiration date, and CVI code in a crowded mall
- Anyone who hears it would just write it down
- You protect it by handing your card to the clerk or swiping it
- The data (message) is protected by encryption on the card, and in the POS terminal

With HTTP (unsecured)

Name: Jane Doe

Type: VISA:

CC #: 1234-5678-9102

Exp Date: 12-24

Code: 321

With HTTPS (secured)

Vrg7YhJmki12+8jY4Yisg==

zswOV7JthE6+VEIDkJf+CQ==

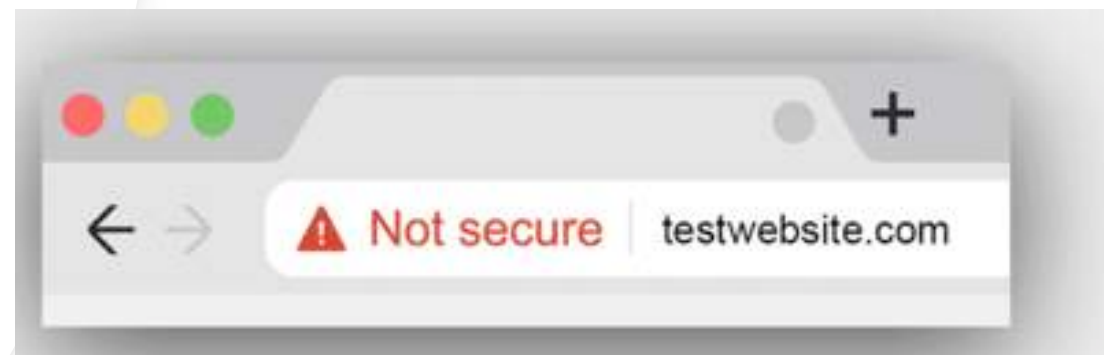
+Z0+K+GOW0aj48MdxGQapg==

R/A3aukNkUW4QP7wq9HKmg==

9datW88+pEedFyzTVVxlnA==

How do I know the web site or app is using HTTPS

- What feedback do you get on the screen?
- Are there any error messages?
- Can you change any of your app or browser settings?
- Is there any other app or web site you can use?
- When in doubt, do not use!



There are many tools you can use, but each requires more knowledge to use effectively

- Simple:
 - Using the Browser console
 - Viewing the source of the web page
- Advanced:
 - Using network analyzers
 - Setting up DMZ and loggers

Using the browser console to monitor activity

- EG: Chrome: Developer Tools



Using the “View Source” option in your

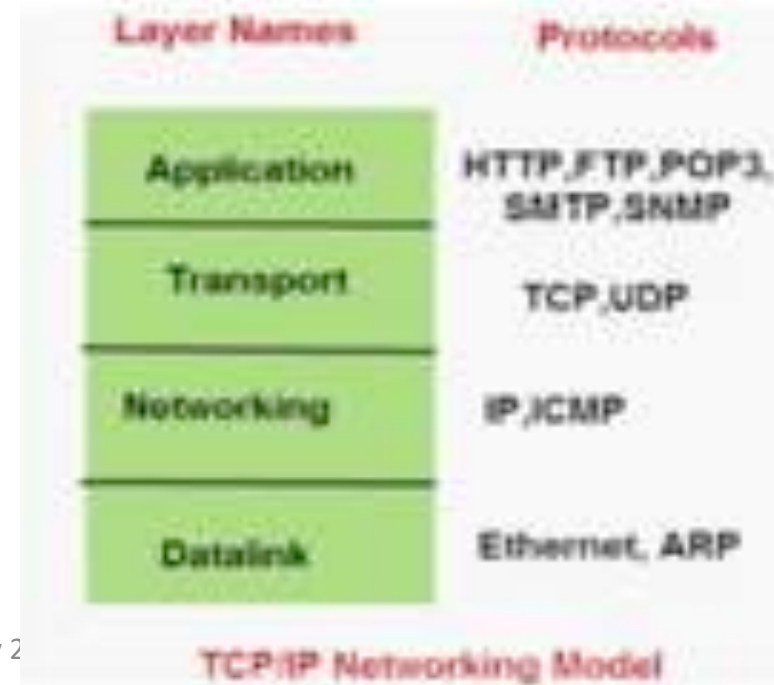
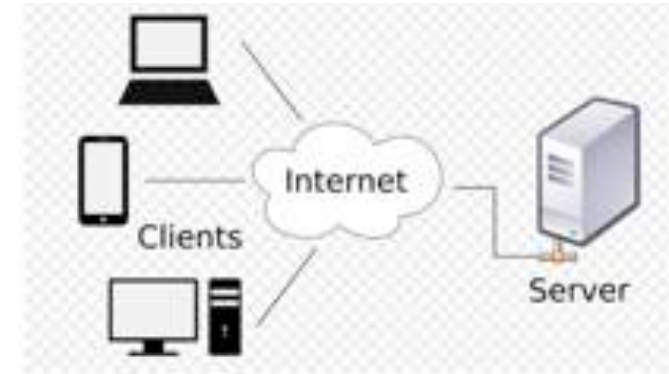


To understand the source code,
You will need to know how to
Read HTML, CSS, and Javascript

Check out [w3schools.com](https://www.w3schools.com)



Advanced tools: network analysis



Internet/Online: How to stay secure

1

Only use secure sites and apps that use HTTPS

2

Learn to use tools such as the browser console to monitor they traffic behind the scenes

3

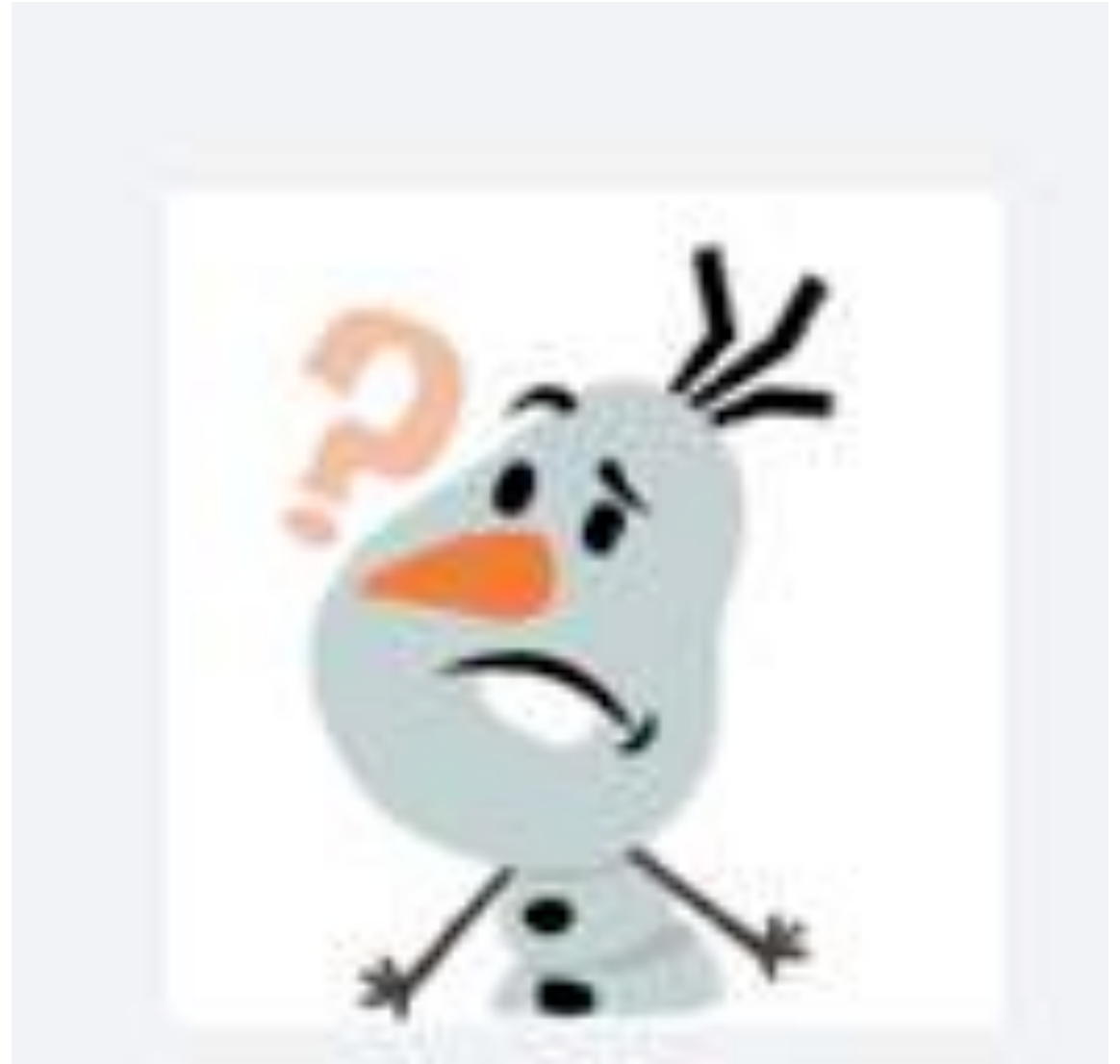
Continue to learn how web pages and apps work, to become aware of the insecure components and how the bad guys can use them to their advantage

4

Talk to your friends, family, and teachers about the dangers of unsecure apps, how the bad guys are trying to steal your information, and what you can do to stay safe

Questions & Additional Resources

- Any questions?



Thank you !!

