



Computer Fundamentals



Today's Topics



- ▶ Servers
- ▶ Databases
- ▶ Big Data
- ▶ Clouds



Kahoot!

Server



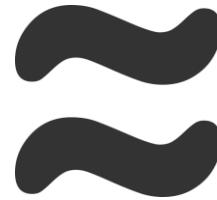
- What is Server



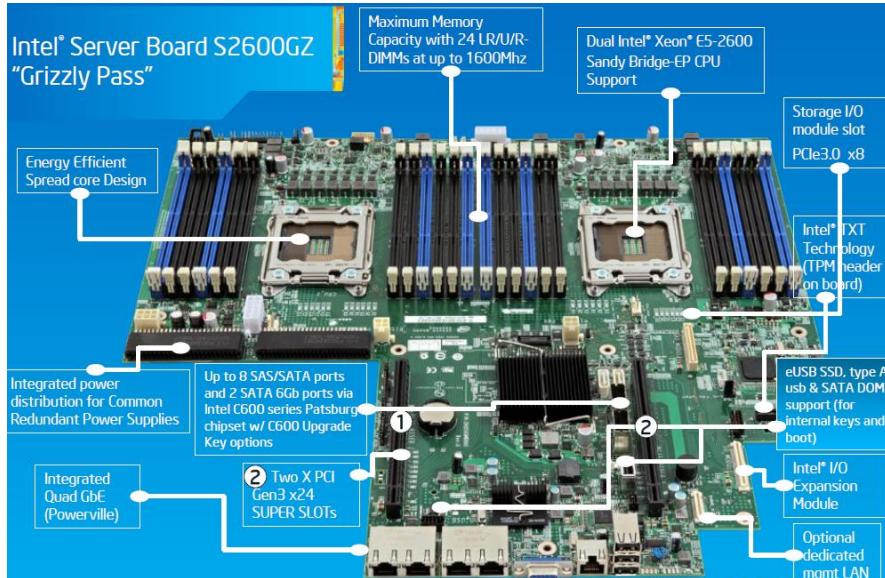
Server



- What are the differences?



Server



Server Mainboard



PC Mainboard



Server





Server

Non
ECC



ECC



Error-checking and Correcting
(ECC)



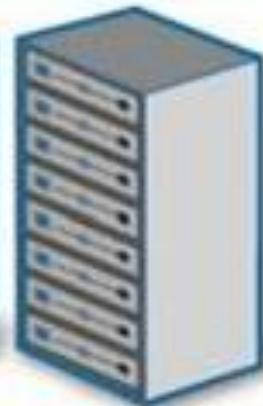
Types of Server



Blade Server



Rack Server



Tower Server

Server



Types Of servers

Web Server

Email Server

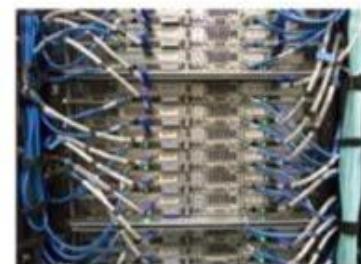
Fax Server

FTP Server

News Server

Internet Relay Chat Server

Application Server



Proxy Server

Database Server

Telnet Server

File Server

List Server

Groupware Server

Server



- High internet connectivity
- Air conditioning
- Backup electrical power
- Fire protection
- Security
- Maintenance



Databases

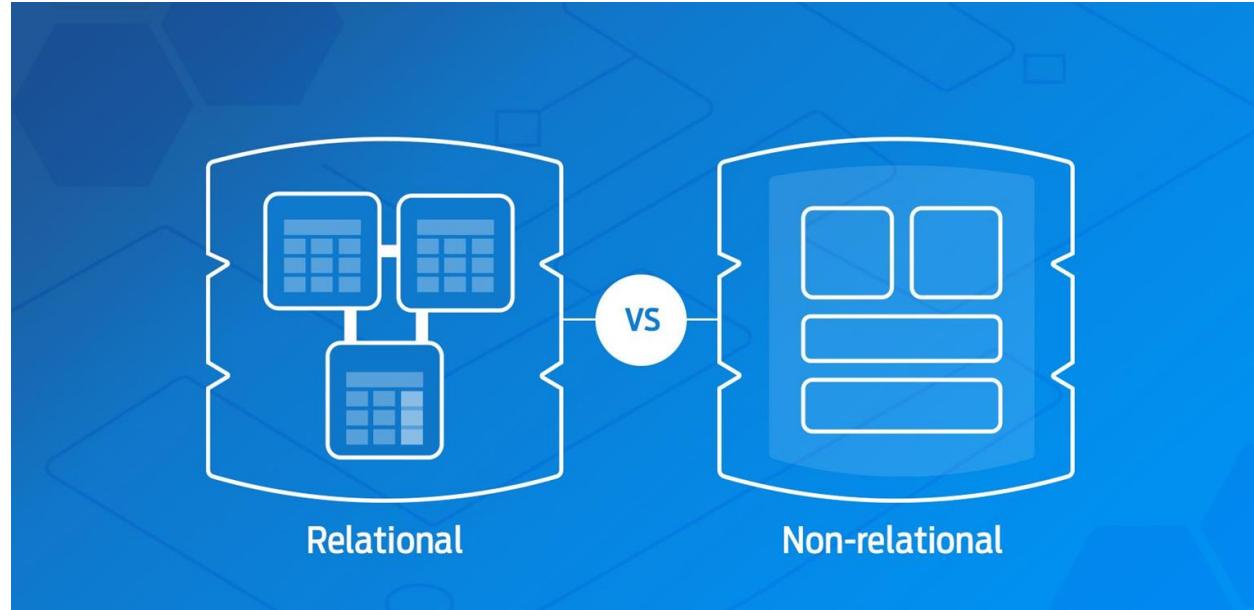
Databases are collections of data, usually organized under a schema, and stored in a format that is efficient for storing and retrieving the data.



Databases



- Types of Databases



Databases



- Relational Database (SQL)

EMPLOYEE			
ID	NAME	AGE	MANAGER_ID
E101	Libinus Xavier	37	M123
E102	Gautham Bhonsle	35	M555
E103	Aravind	45	M404
E104	Shazil	28	M800
E105	Manisha Shah	34	M555



MANAGER		
ID	NAME	DEPT_ID
M123	Ravindranadh	D1011
M404	Shripad Karambelkar	D1011
M555	Meenu Dutta	D2022
M800	James Xavier	D1099
M999	Ibrahim Sheik	D1099



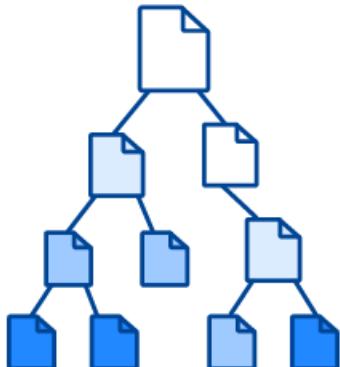
DEPARTMENT			
ID	NAME	DESCRIPTION	LOCATION
D1011	FINANCE	Finance Operations	Mumbai
D1099	HR	Human Resource	Bangalore
D2022	IT	Information Technology	Bangalore
D3033	ADMIN	Administrative Operations	Bangalore

Databases

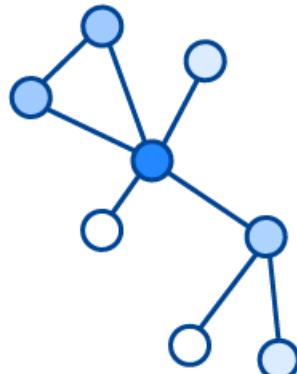


- Non-Relational Database (NoSQL-Not Only SQL)

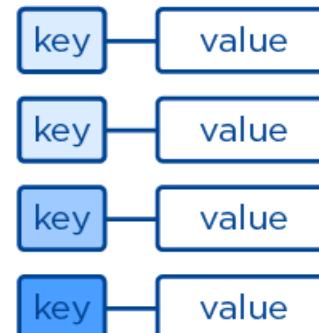
Document



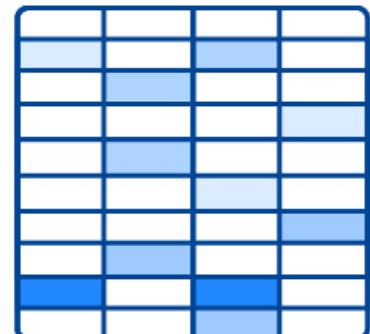
Graph



Key-Value



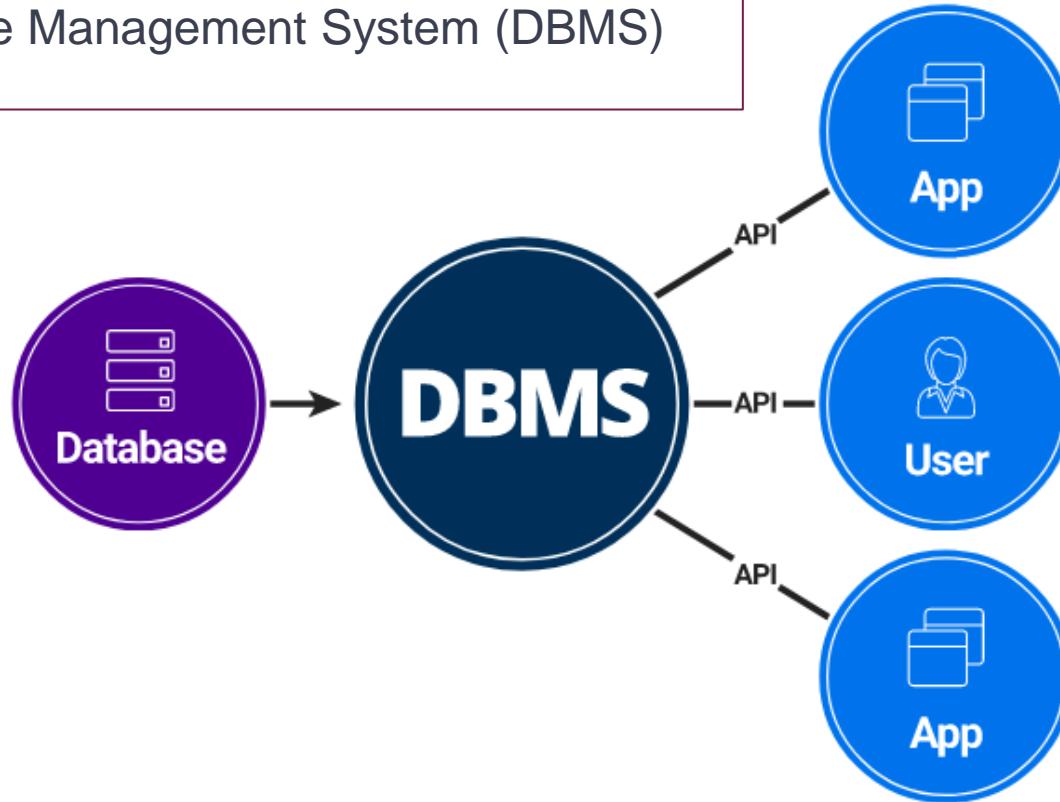
Wide-column



Databases



- Database Management System (DBMS)



Databases

Database Management System (DBMS)

- Creates the complex structures required for data storage.
- Transforms entered data to conform to the data structures.
- Creates a security system and enforces security within that system.
- Allow multiple user access to the data within the computer network environment.
- Performs backup and data recovery procedures to ensure data safety.
- Promotes and enforces integrity rules to maintain data consistency.
- Provides access to the data via utility programs and from programming languages interfaces.

Databases



Database Management System (DBMS)

- MySQL
- Microsoft Access
- Oracle
- PostgreSQL
- dBASE
- FoxPro
- SQLite
- IBM DB2
- LibreOffice Base
- MariaDB
- Microsoft SQL Server

DBMS - Some Commonly Used DBMS



Big Data



3 V'S of Big Data and How They Sum Up The Whole Big Data Schematic

Volume

Data Quantity

Velocity

Data Speed

Variety

Data Types



Big Data

2019 *This Is What Happens In An Internet Minute*



2020 *This Is What Happens In An Internet Minute*



Big Data



Pros of Big Data

- Better decision-making
- Increased productivity
- Reduced costs
- Improved customer service
- Fraud detection
- Increased revenue
- Increased agility
- Greater innovation
- Faster time to market



Cons of Big Data

- Data quality
- Need for talent
- Cultural change
- Compliance
- Cybersecurity risks
- Rapid change
- Hardware needs
- Costs
- Difficulty integrating legacy systems

Big Data



My wife asked me why I was speaking so softly at home.

I told her I was afraid Mark Zuckerberg was listening!

She laughed. I laughed.

Alexa laughed. Siri laughed. Cortana laughed.



Please write your ideas about Big Data



Pear Deck



Students, write your response!

Pear Deck Interactive Slide
Do not remove this bar

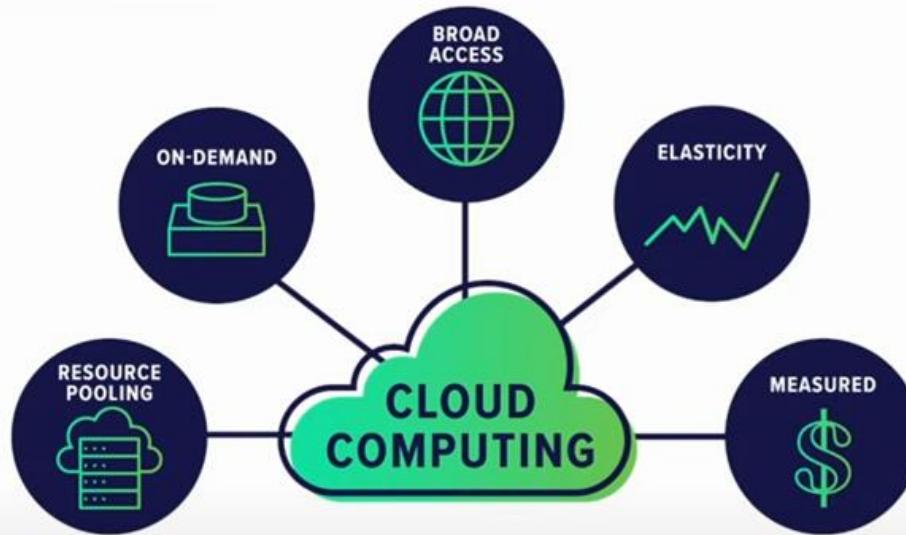
Clouds



Clouds



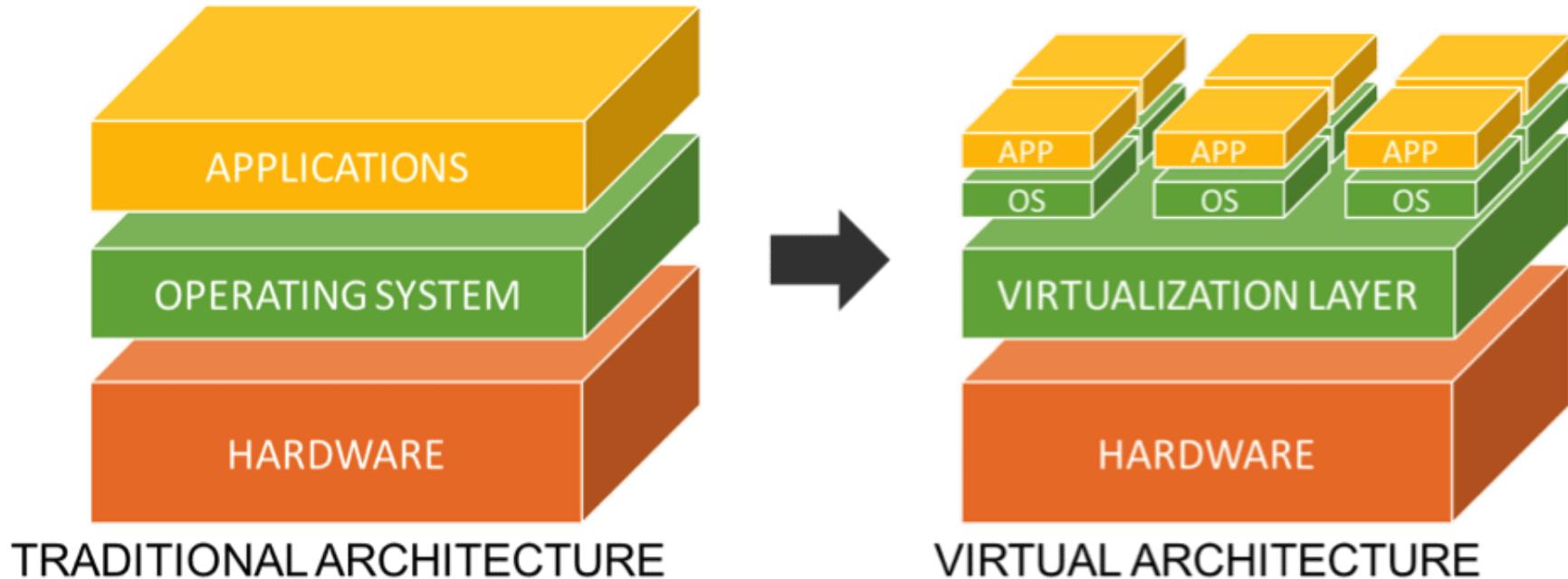
The Cloud Infrastructure



Clouds



Virtualization



Clouds



Clouds



Public Cloud

Typically have massive amounts of available space, which translates into easy scalability. Recommended for software development and collaborative projects.

Hybrid Cloud

Combine public clouds with private clouds to allow the two platforms to interact seamlessly. Recommended for businesses balancing big data analytics with strict data privacy regulations.



Types of Cloud Deployment

Private Cloud

Usually reside behind a firewall and are utilized by a single organization. Recommended for businesses with very tight regulatory requirements

Community Cloud

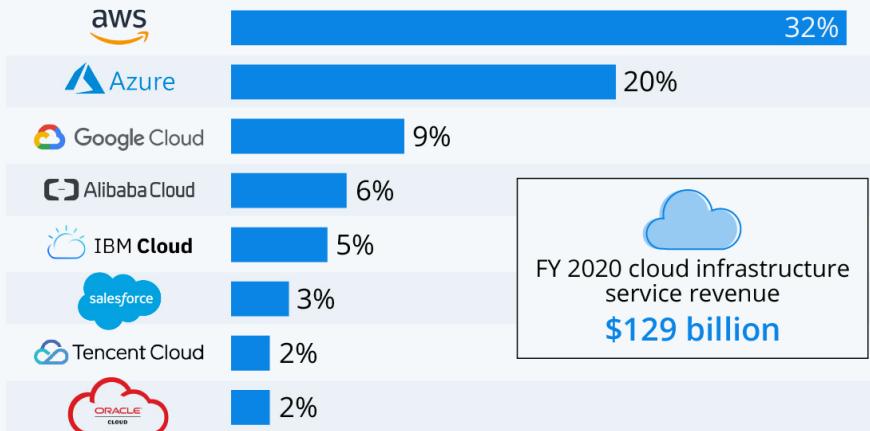
A collaborative, multi-tenant platform used by several distinct organizations to share the same applications. Users are typically operating within the same industry or field.

Clouds



Amazon Leads \$130-Billion Cloud Market

Worldwide market share of leading cloud infrastructure service providers in Q4 2020*

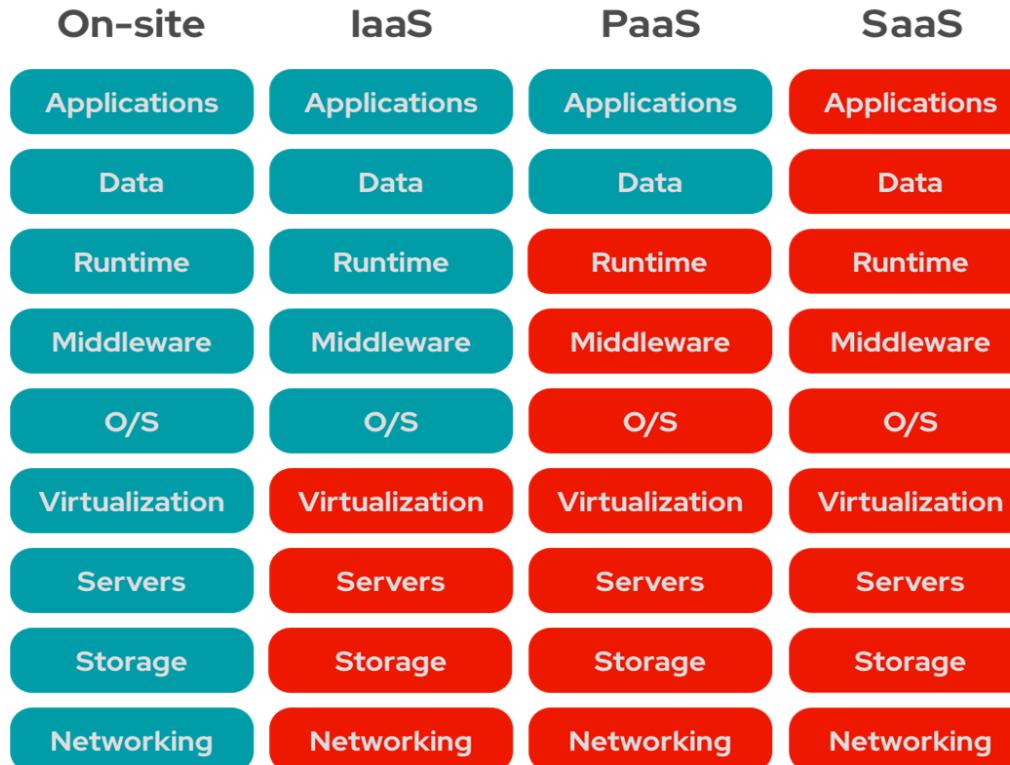


* includes platform as a service (PaaS) and infrastructure as a service (IaaS)
as well as hosted private cloud services

Source: Synergy Research Group



Clouds



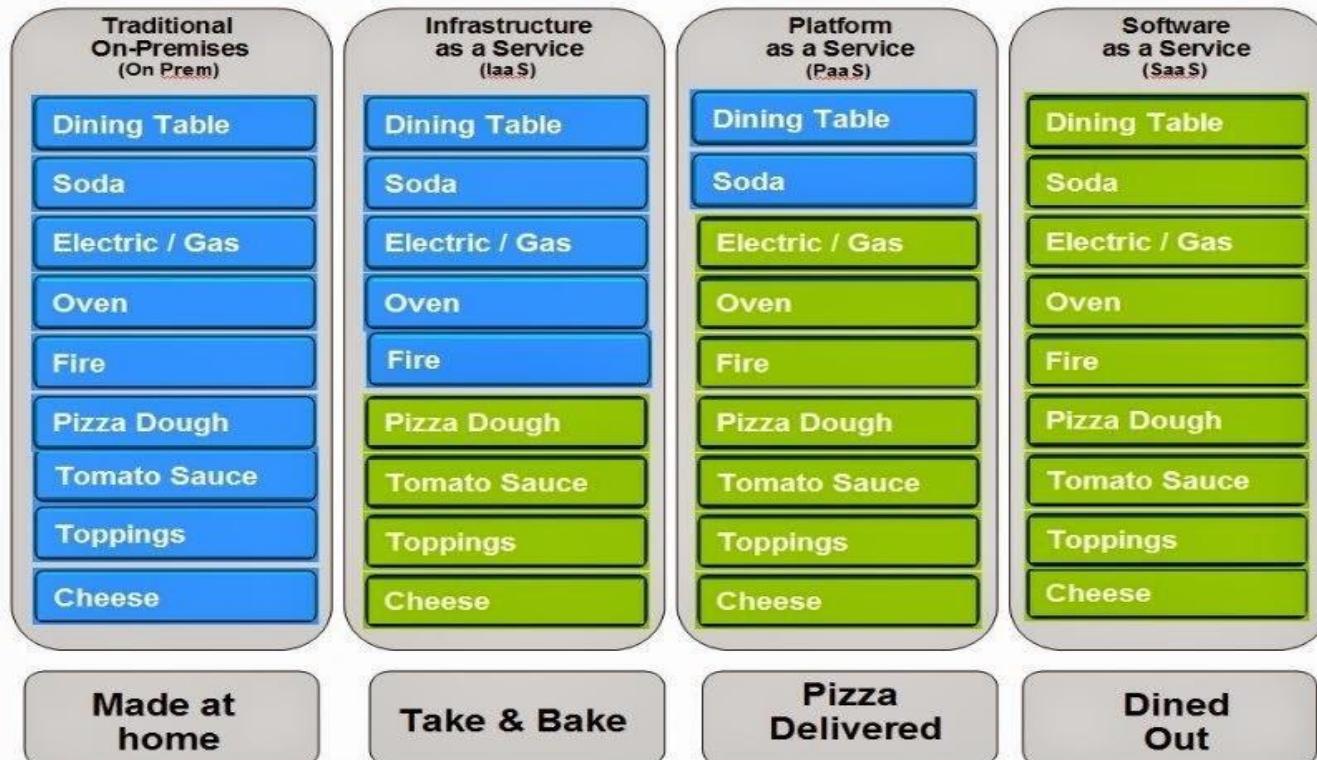
You manage

Service provider manages

Clouds



Pizza as a Service



Circle how you are feeling:



Students, draw anywhere on this slide!



- Web Browsers
- Security





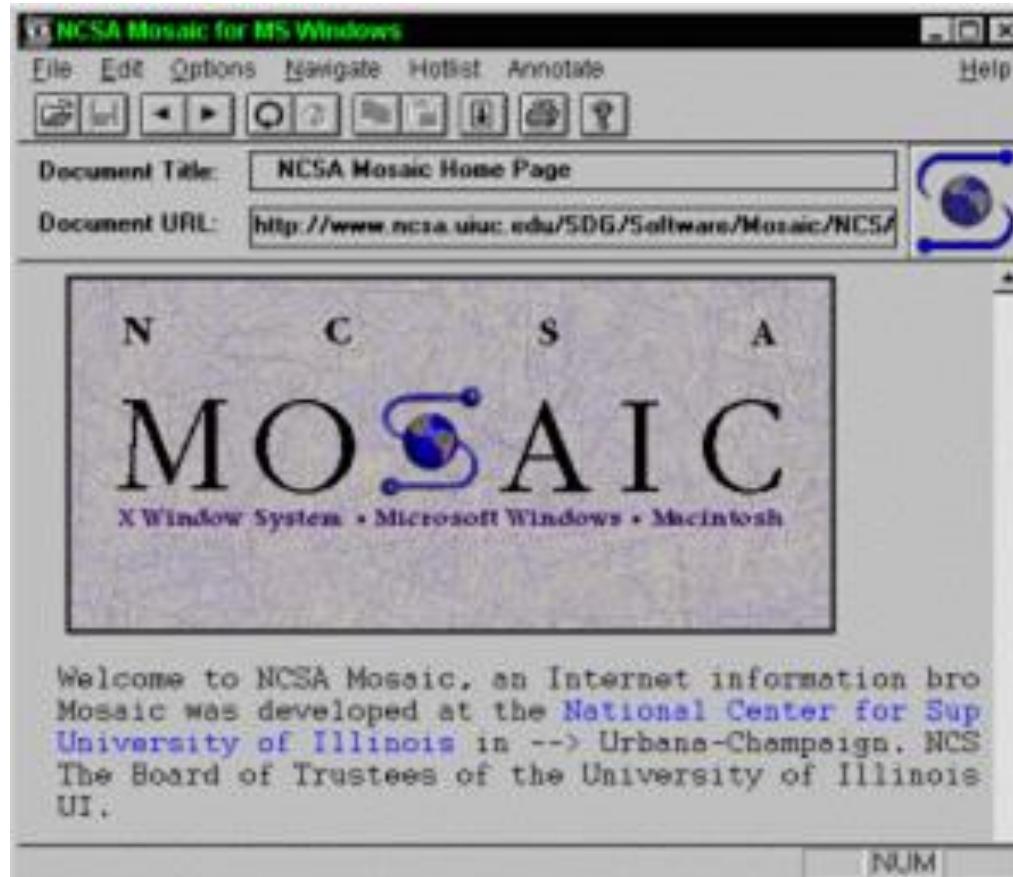
Agenda

- ▶ Web Browsers
- ▶ HTTP
- ▶ Cyber Attacks
- ▶ Encryption/Decryption
- ▶ HTTPS
- ▶ VPN
- ▶ API



Kahoot!

Web Browsers





Web Browsers



Web Browsers



S App | Certifier x | EU-CF - Google Dr x | EU_CF_S-3_s2recap x | CF-Browser-Securi x | Motivational Music x | Course: ITF-08/21 x | CF: What is a Web x + - □ X

lms.clarusway.com/mod/lesson/view.php?id=70

Uygulamalar Bitfinex - Bitcoin, Lit... Start Here With Ma... Gmail YouTube Appen Your Current... clarusway AWS_Instances | EC... Quizlet Online Kurslar - Her... »

CLARUSWAY Way to Reinvent Yourself

CF Participants Badges Competencies Grades General Computer Hardware Operating Systems

Computer Fundamentals

Dashboard / Courses / Miscellaneous / CF / How Does a Web Browser Work? / What is a Web Browser? / Preview Edit page contents

What is a Web Browser?

Preview Edit Reports Grade essays

Introduction

A browser is a software designed to find and display content on the World Wide Web. This content might be a web page, a pdf

Lesson menu

- Introduction
- Let's Practice



Which web browser do you use?



Web Browsers

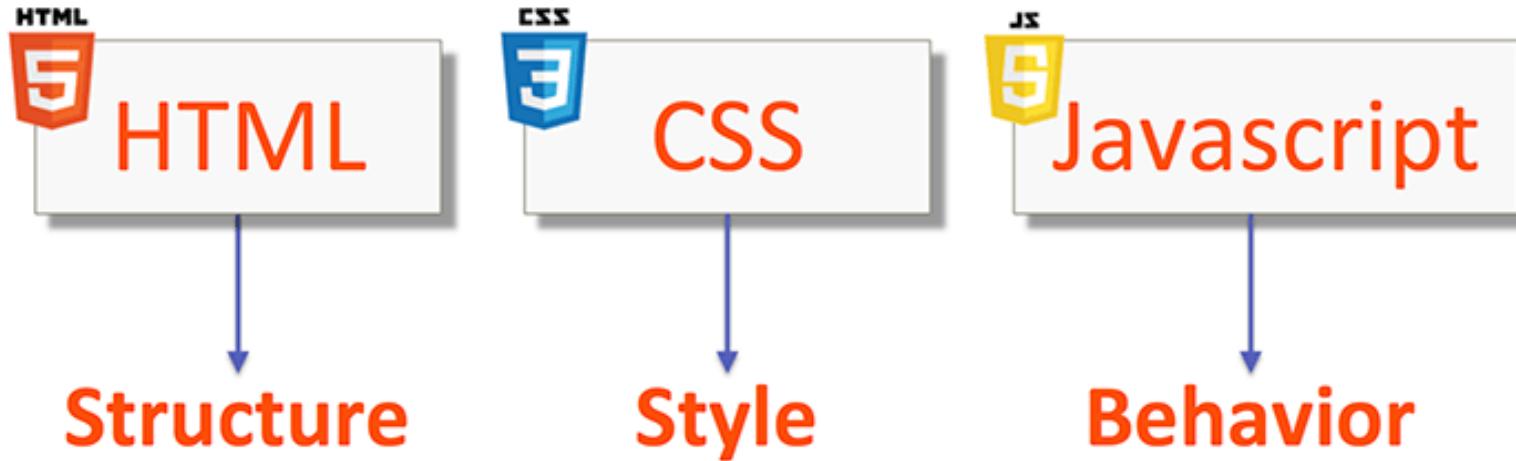
- HTML: Hypertext Markup Language



Web Browsers



- CSS: Cascading Style Sheets



Web Browsers



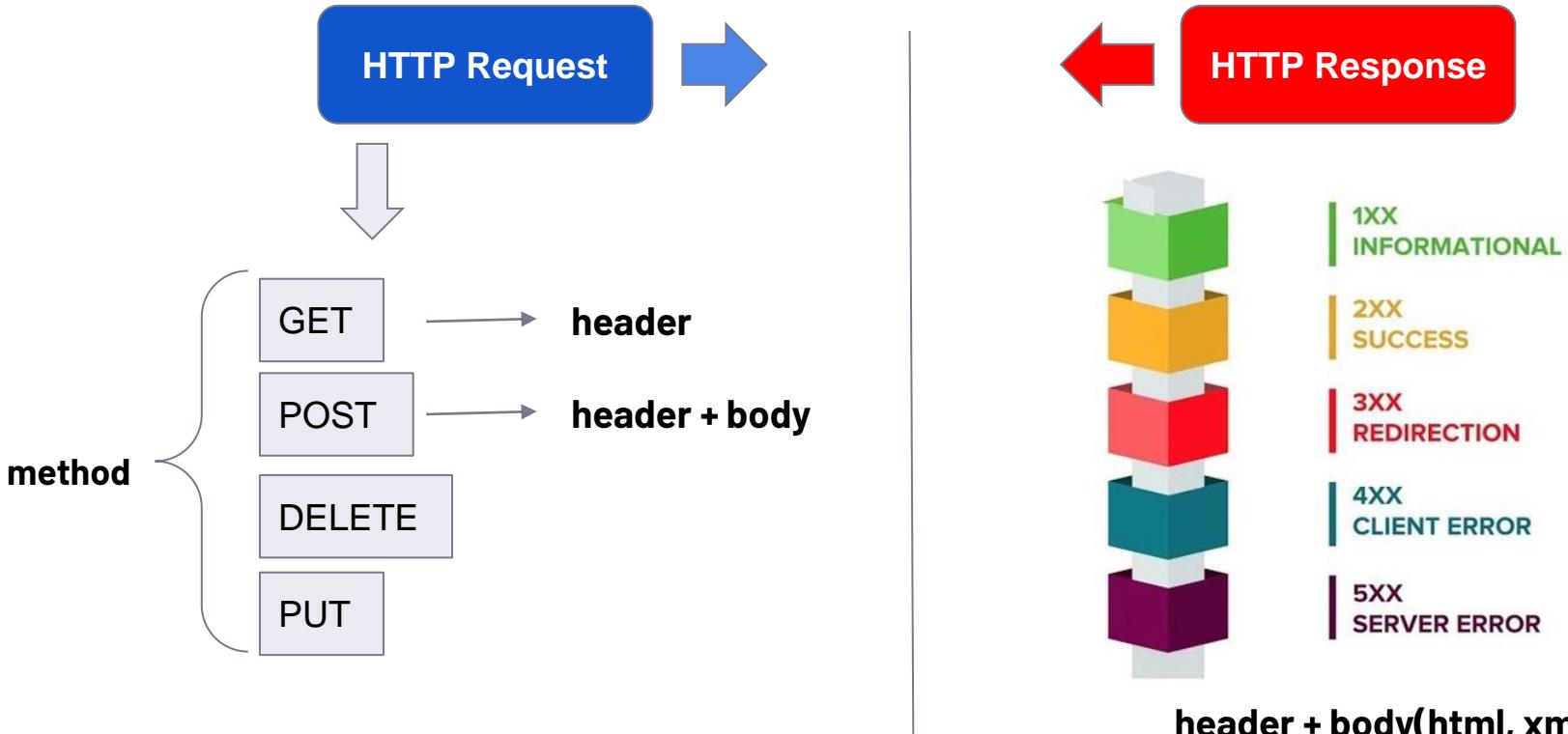
HTTP



- HTTP: Hypertext Transfer Protocol



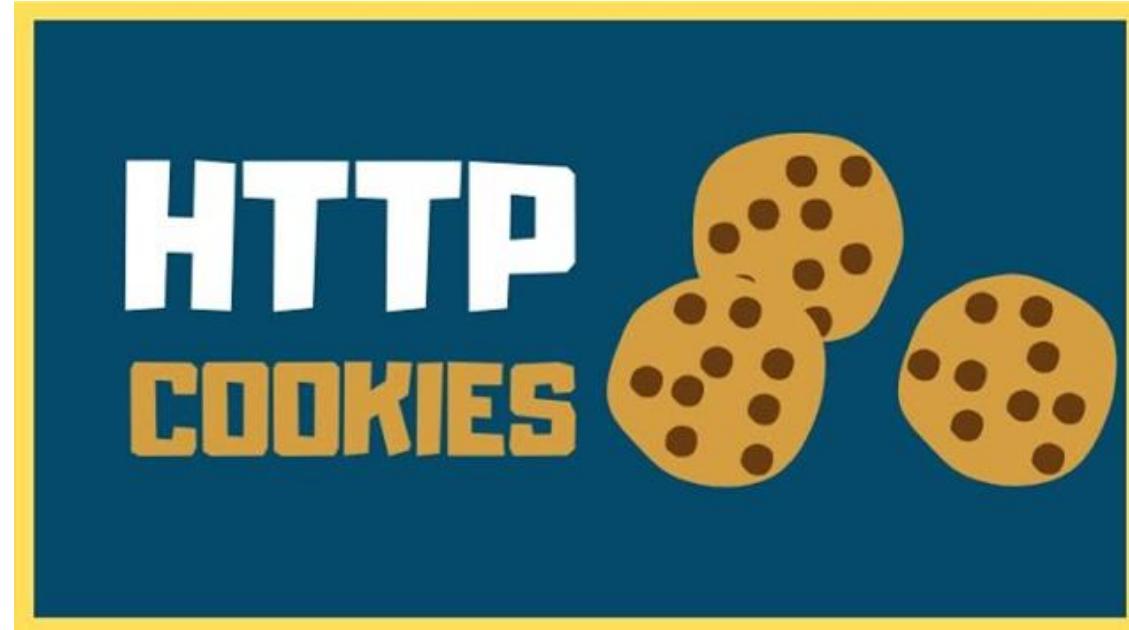
HTTP



HTTP



- Cookies



Cyber Attacks

- Physical Security: Using physical barriers to prevent unauthorized access to data (like locking the door of the server room).
- Software Security: Fixing flaws in your application that could grant attackers unwanted levels of access to your systems.
- Network Security: Security of networked services (websites, [databases](#), etc).



Cyber Attacks



THE GAINING ACCESS PROCESS

Identification

Authentication

Authorization



Cyber Attacks



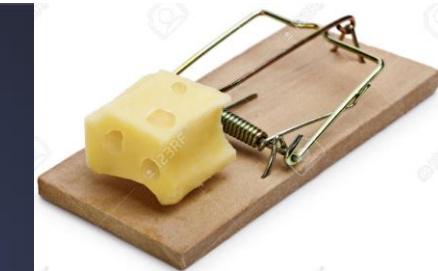
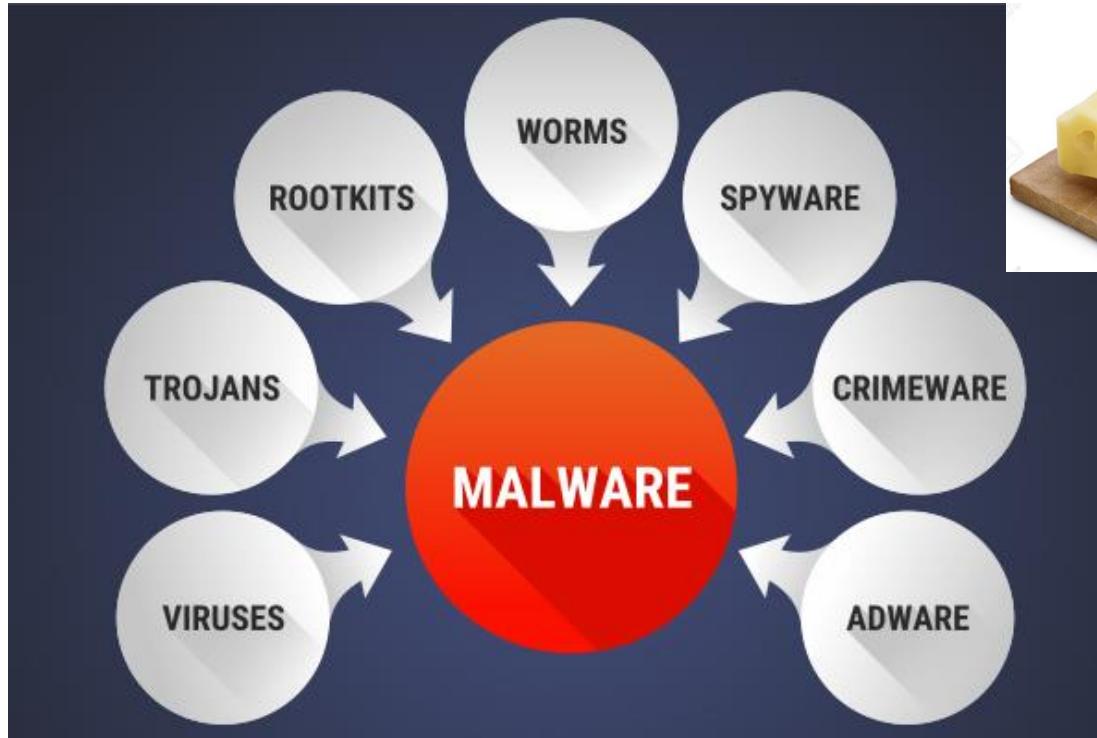
- Phishing



Cyber Attacks



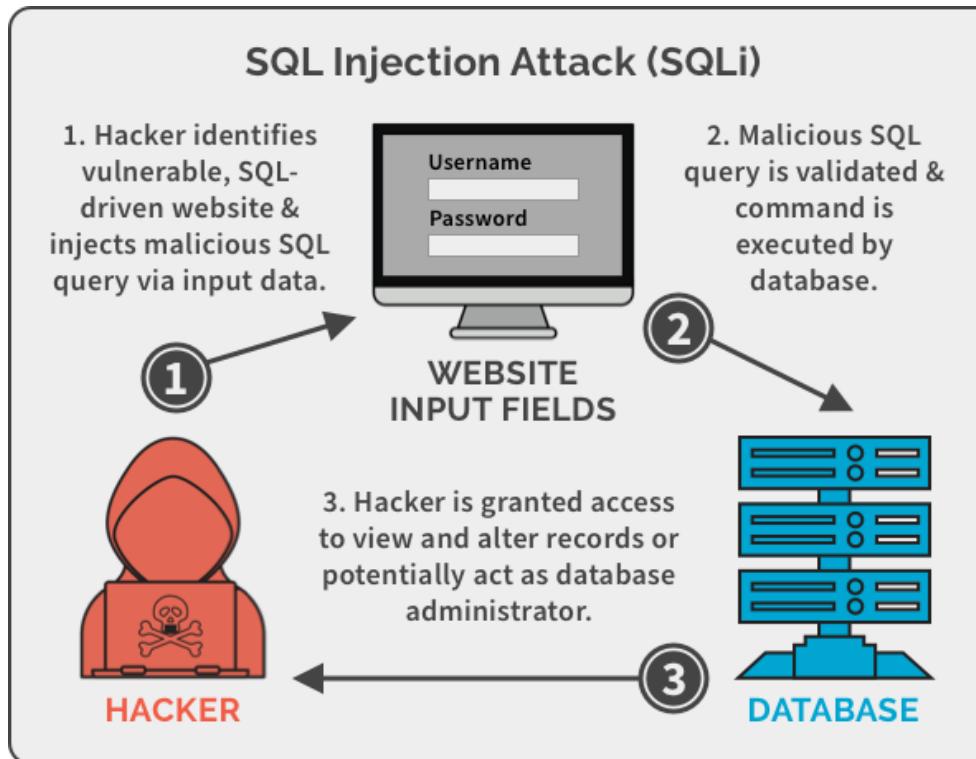
- Malware: Malicious Software



Cyber Attacks



- SQL Injection



Cyber Attacks



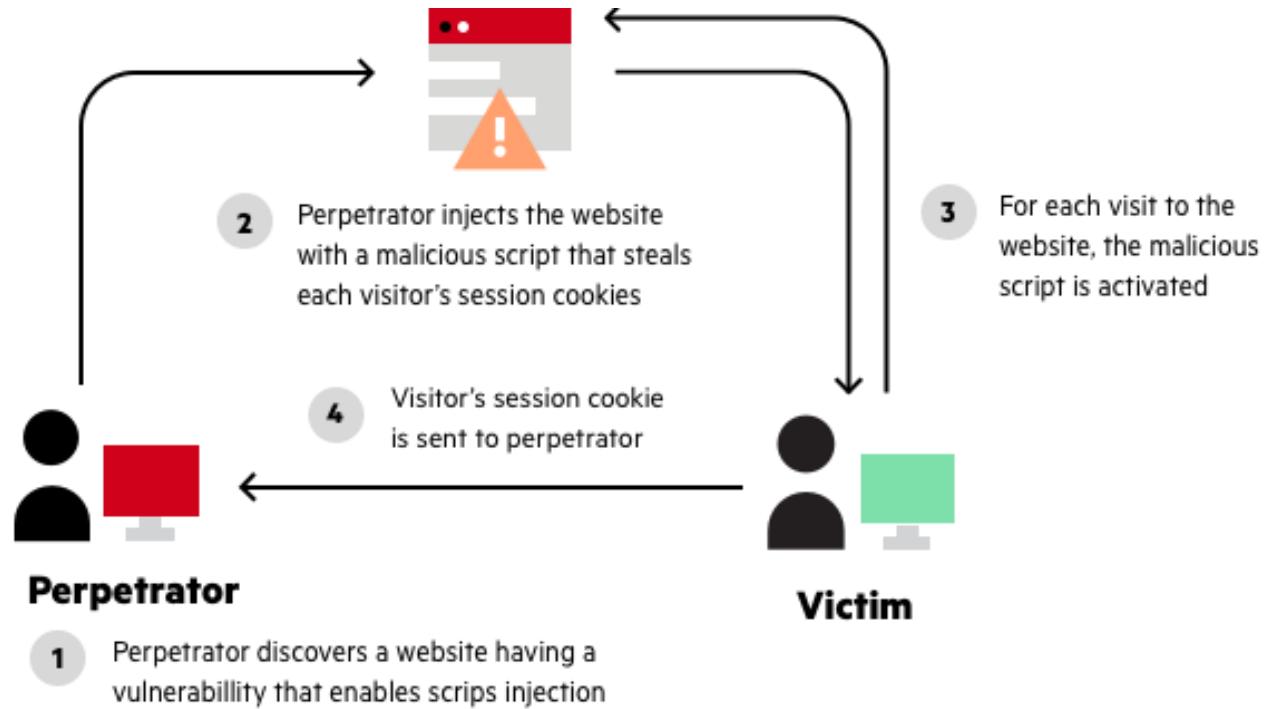
- SQL Injection



Cyber Attacks



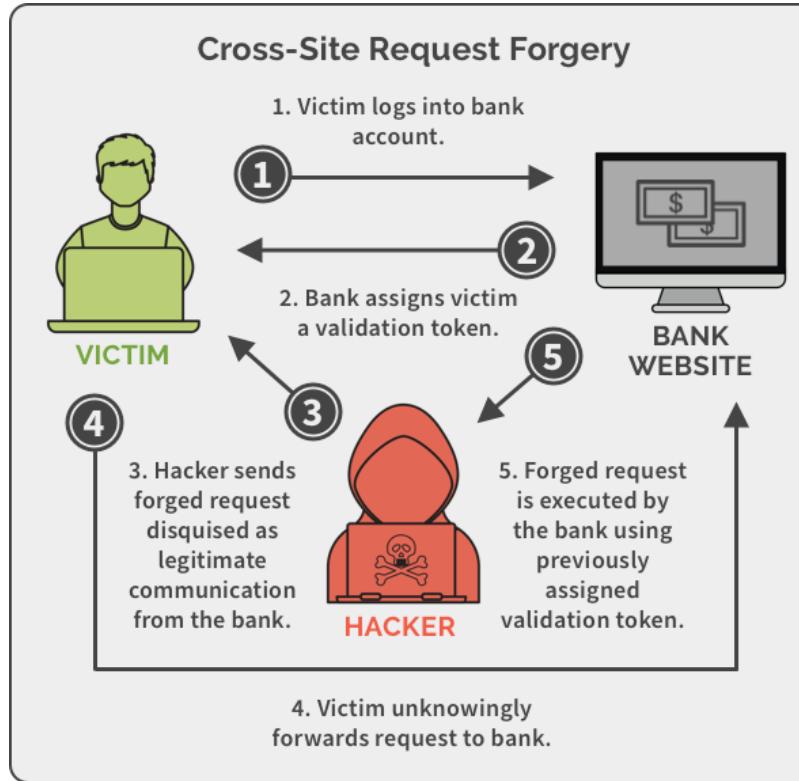
- XSS: Cross-Site Scripting



Cyber Attacks



- CSRF: Cross-site Request Forgery



Encryption/Decryption

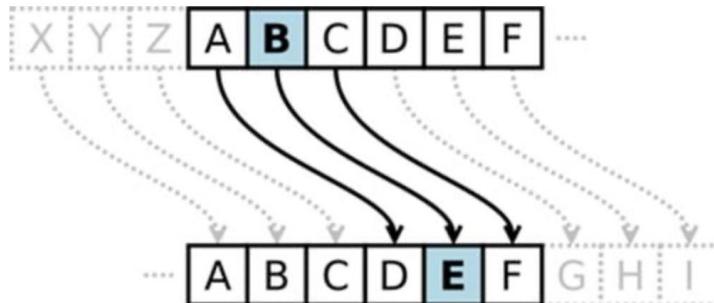


Figure 14-1: Shifting over letters by three spaces. Here, B becomes E.

"Hello"

plaintext

encryption

"SNifgNi+uk0="

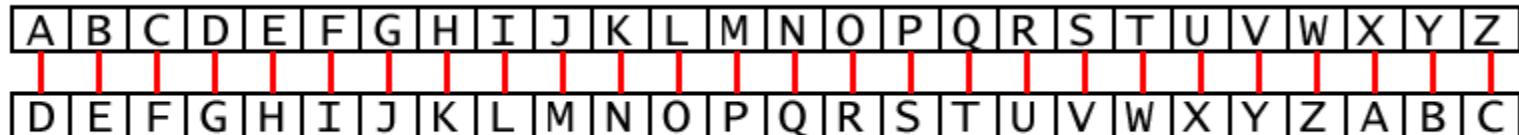
ciphertext

Encryption/Decryption



John → Caesar Cypher +3

Mrkq



Alphabet shifted by 3 spaces.

Encryption/Decryption

Mike → Caesar Cypher -3



Students, write your response!

REINVENT YOURSELF

Pear Deck Interactive Slide
Do not remove this bar

Encryption/Decryption

Key Size	Possible combinations
1-bit	2
2-bit	4
4-bit	16
8-bit	256
16-bit	65536
32-bit	4.2×10^9
56-bit (DES)	7.2×10^{16}
64-bit	1.8×10^{19}
128-bit (AES)	3.4×10^{38}
192-bit (AES)	6.2×10^{57}
256-bit (AES)	1.1×10^{77}

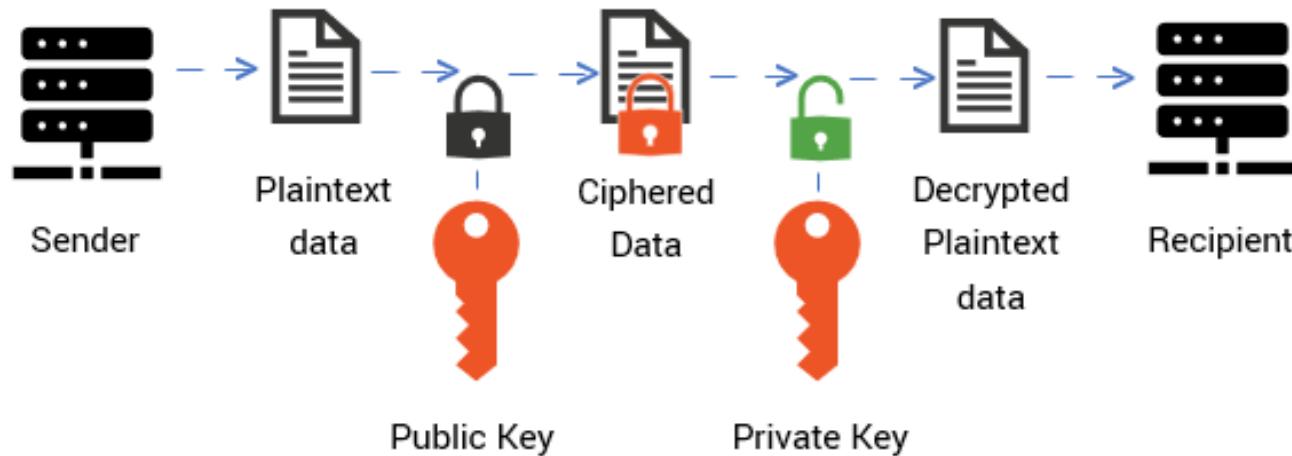
Key size	Time to Crack
56-bit	399 seconds
128-bit	1.02×10^{18} years
192-bit	1.872×10^{37} years
256-bit	3.31×10^{56} years



Encryption/Decryption



Public Key Encryption (Asymmetric)



HTTPS



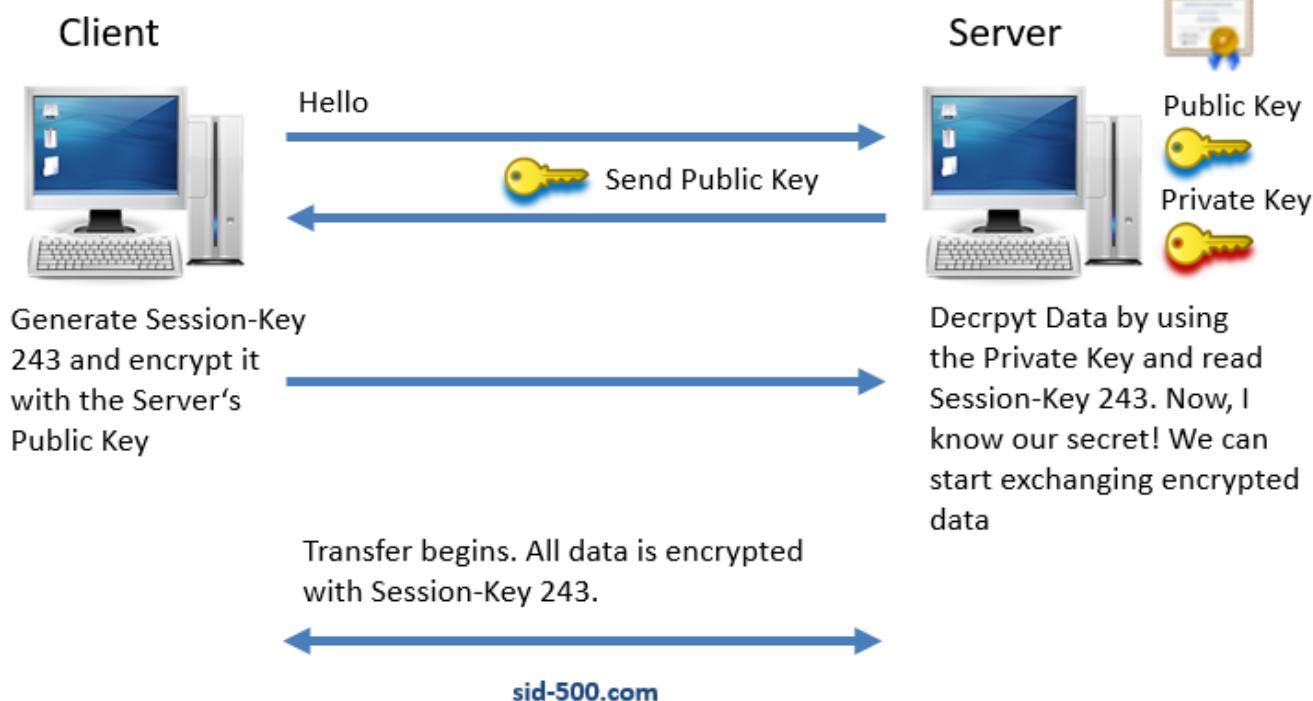
- Popular Certificates and HTTPS:
 - SSL : Secure Sockets Layer
 - TLS : Transport Layer Security



HTTPS



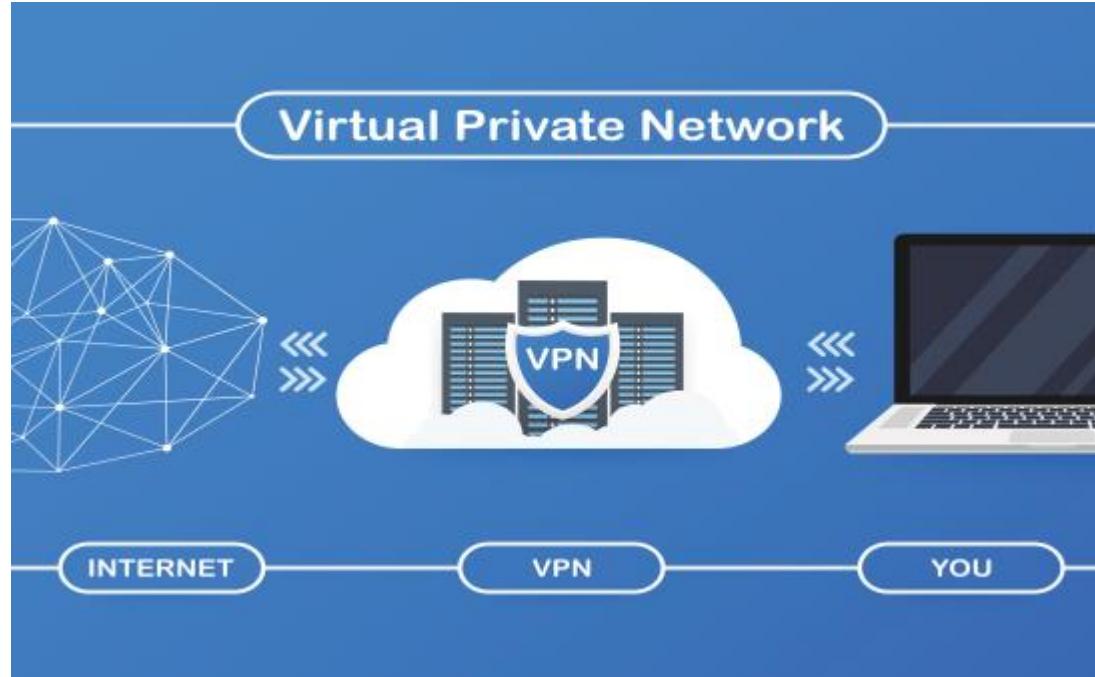
SSL Encryption (HTTPS)



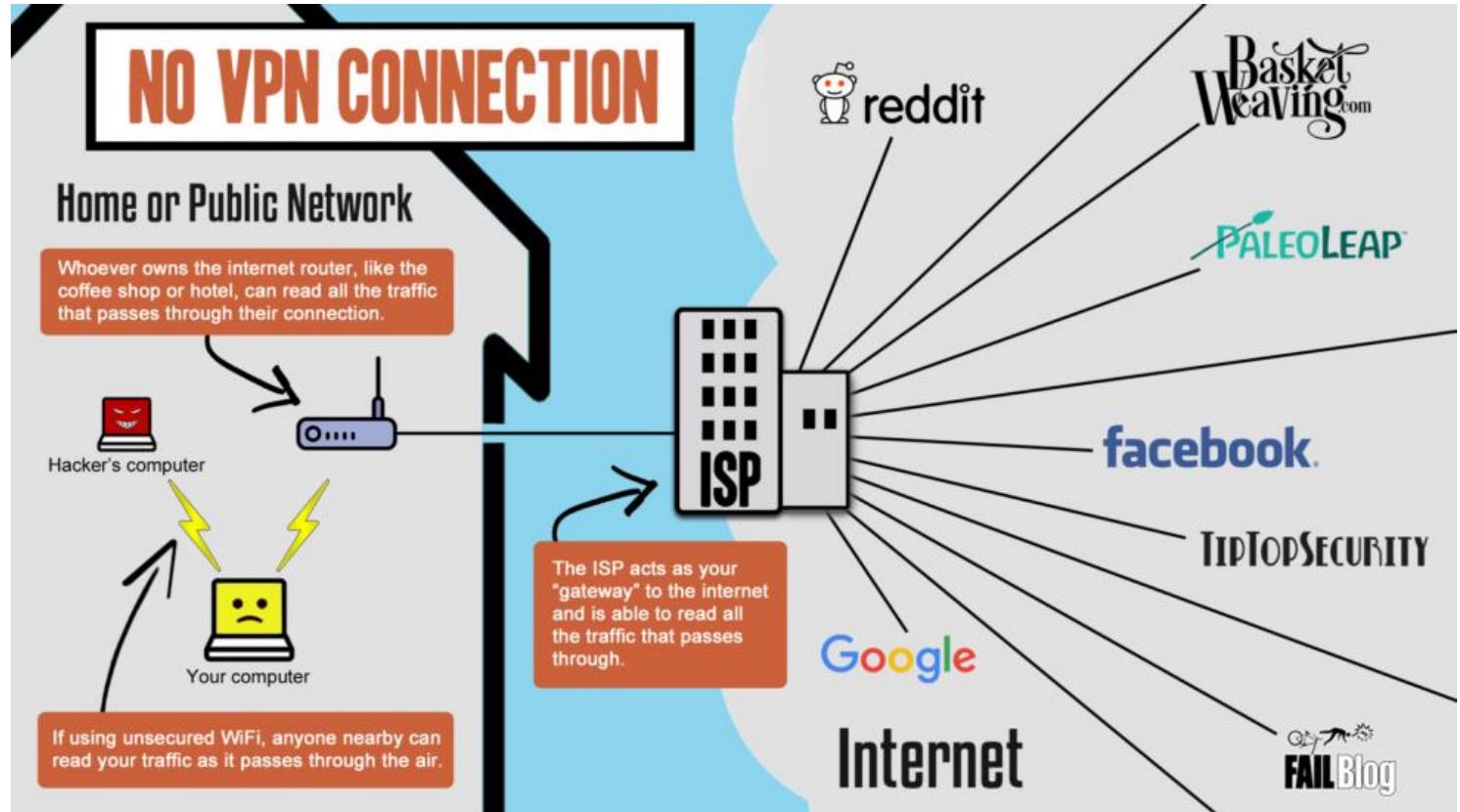
VPN



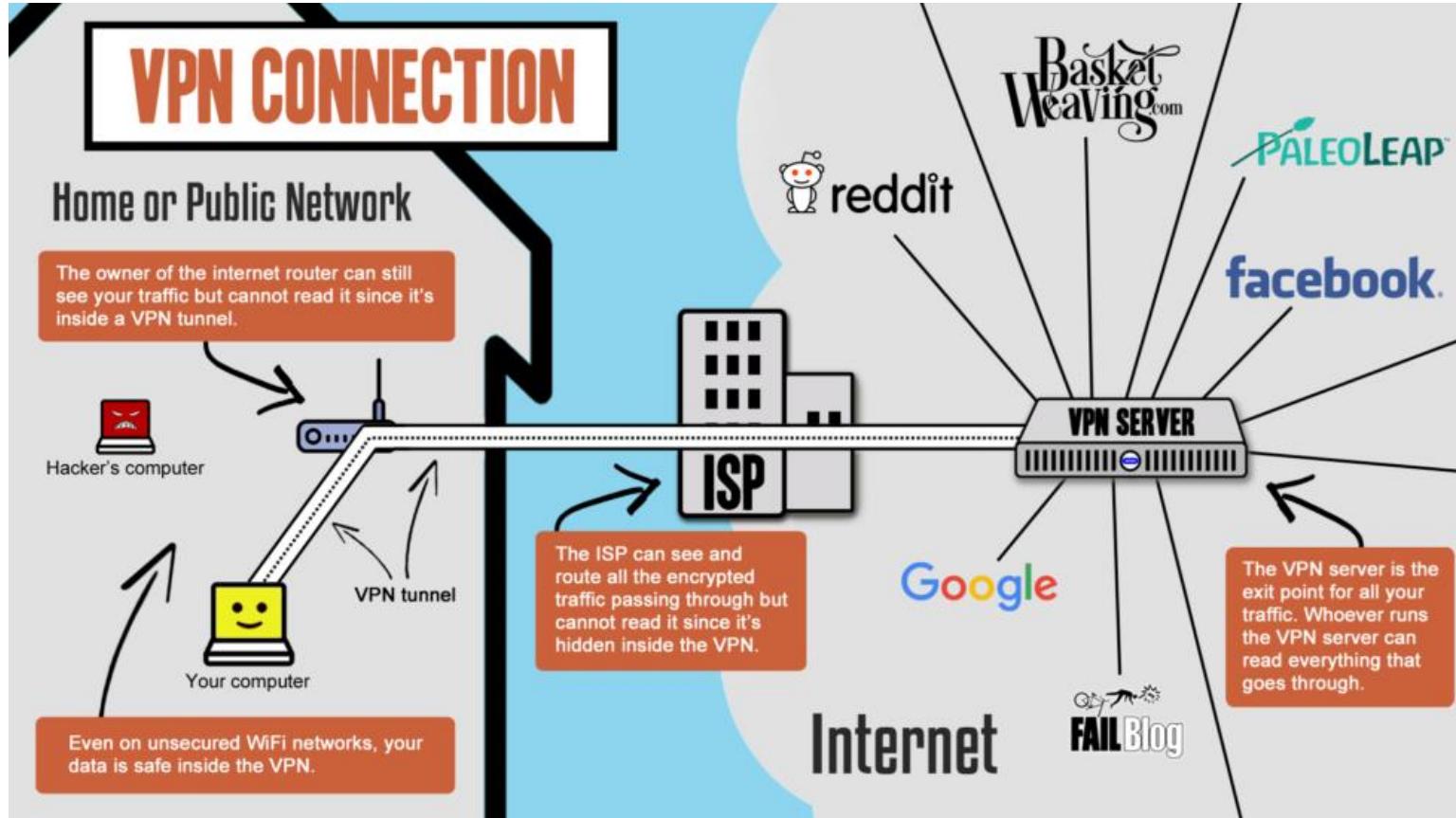
- VPN: Virtual Private Network



VPN

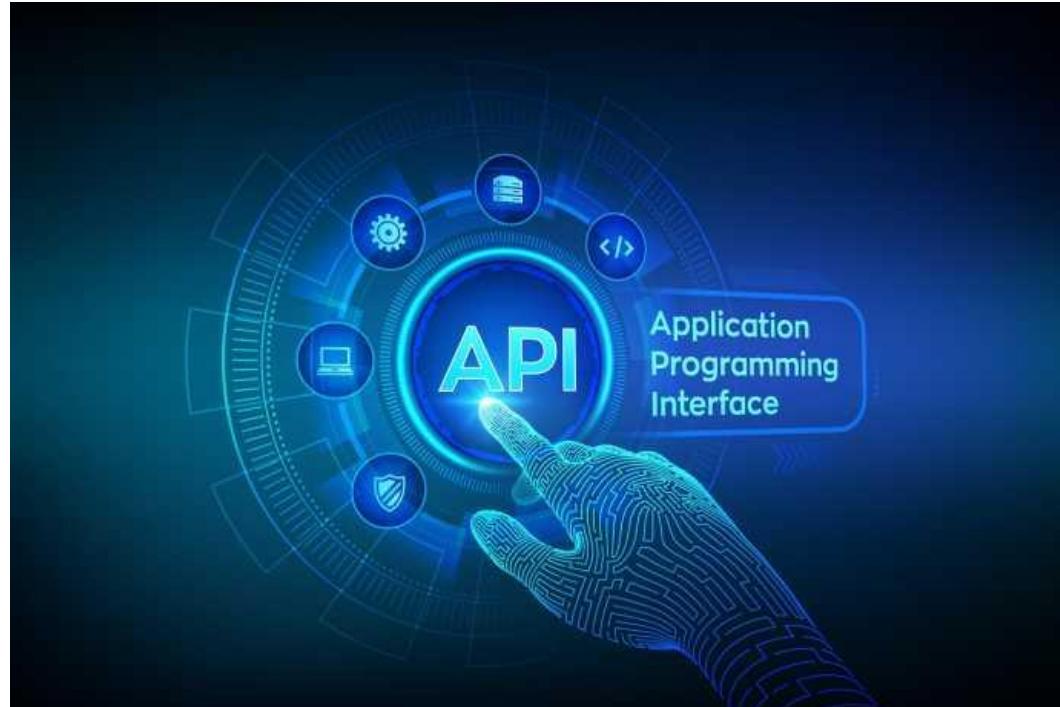


VPN



API

- API: Application Programming Interface



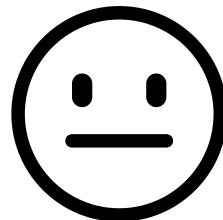
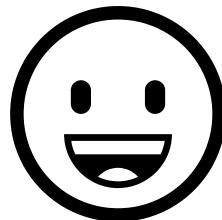
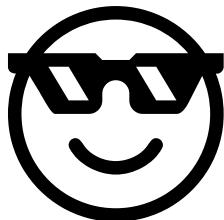
API





Kahoot!
KEEP
CALM
IT'S
KAHOOT
TIME!

Select how you are feeling on the right:



In one or two minutes,
write the most important thing from today's lesson.



Students, write your response!

Pear Deck Interactive Slide
Do not remove this bar



THANKS!

Any questions?

You can find me at:

- ▶ @Jamil
- ▶ jamil@clarusway.com
- ▶ @Tomy
- ▶ tomy@clarusway.com

