សាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ

Royal University of Phnom Penh

Data Communication I

Chapter 1.3 : Internet, Protocols and Standards

Lecturer: **CHHORN SYLUN**

Email: chhorn.sylun@rupp.edu.kh

Room: 302, STEM Building, RUPP

Outline

- What is Internet?
- Protocols
- Standards

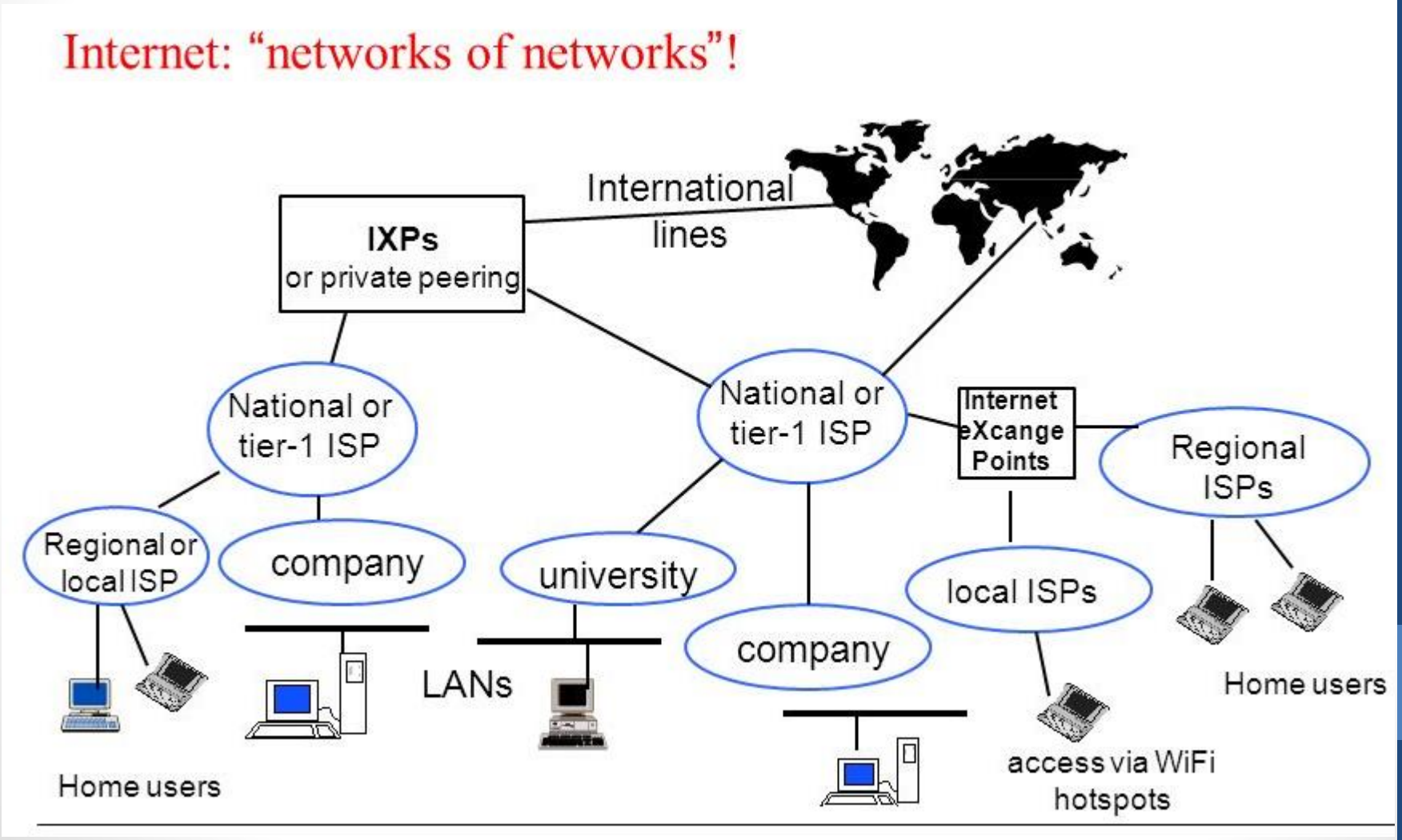
Internet

- The *Internet* has revolutionized many aspects of our daily lives.
- It has affected the way we do business as well as the way we spend our leisure time.

The internet is the global system of interconnected computer network that use the Internet protocol suite (TCP/IP) to link devices worldwide.

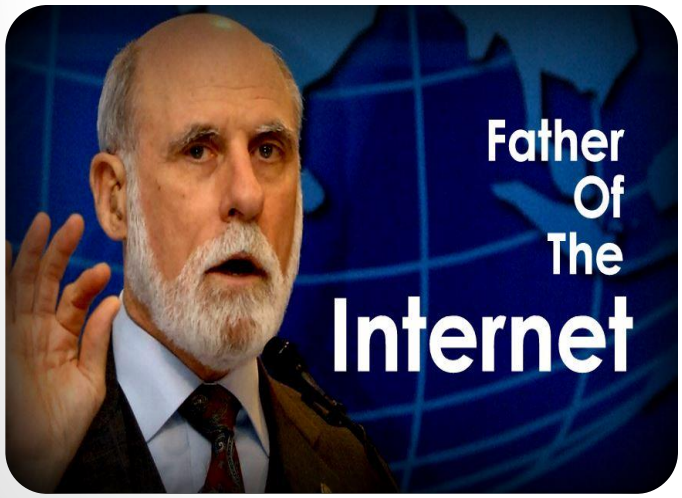
Internet

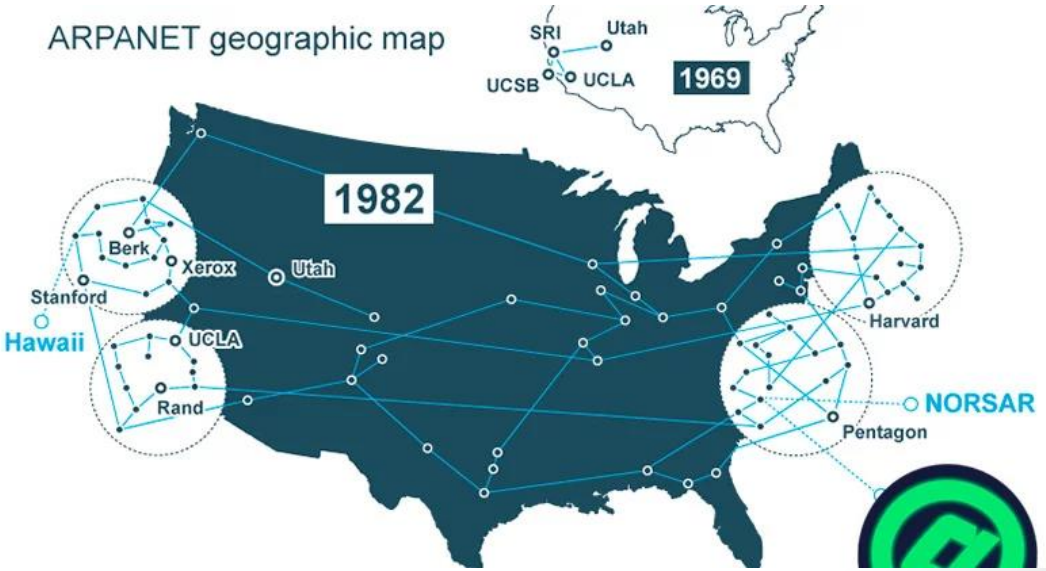
Internet structure



Internet

- Internet was born in late 1960's
- The internet has its root in the ARPANET system of the Advanced Research Project Agency of USA department of Defense which linked together mainframe computers to form a communication networks





Internet

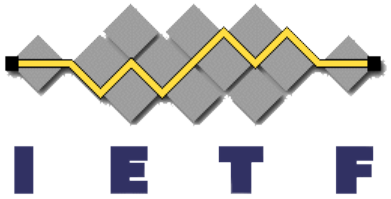
Internet services

- Webpage
- Web browser
- Search Engine
- Protocol
- DNS
- Chat, Message
- HTTP/HTTPS
- FTP
- Email
- Telnet
- Forum
- Video conference
- ……

Internet

Internet organization

- **ISOC** (Internet Society)
- **IETF**(Internet Engineering Task Force)
- **ICANN**(Internet Corporation for Assigned Names and Numbers)
- **W3C**(World Wide Web Consortium)



Internet

ISOC (Internet Society)

ISOC is concerned with the long-term coordination of the Internet development.
ISOC is a kind of a legal umbrella organization for the various organizations.

IETF (Internet Engineering Task Force)

IETF is a an open international community of network professionals and experts.
The mission of IETF is to produce high quality technical documents (standards as RFCs) for improving the Internet's quality and performance.
One of the main duties of IETF is the editorial management of internet drafts before they become RFCs (each draft is assigned to and managed by an RFC editor). .

ICANN (Internet Corporation for Assigned Names and Number)

ICANN (formerly InterNIC) is an internationally organized non-profit organization under Californian right.
The responsibilities of ICANN are IP address space allocation, root server system management and protocol identifier assignment

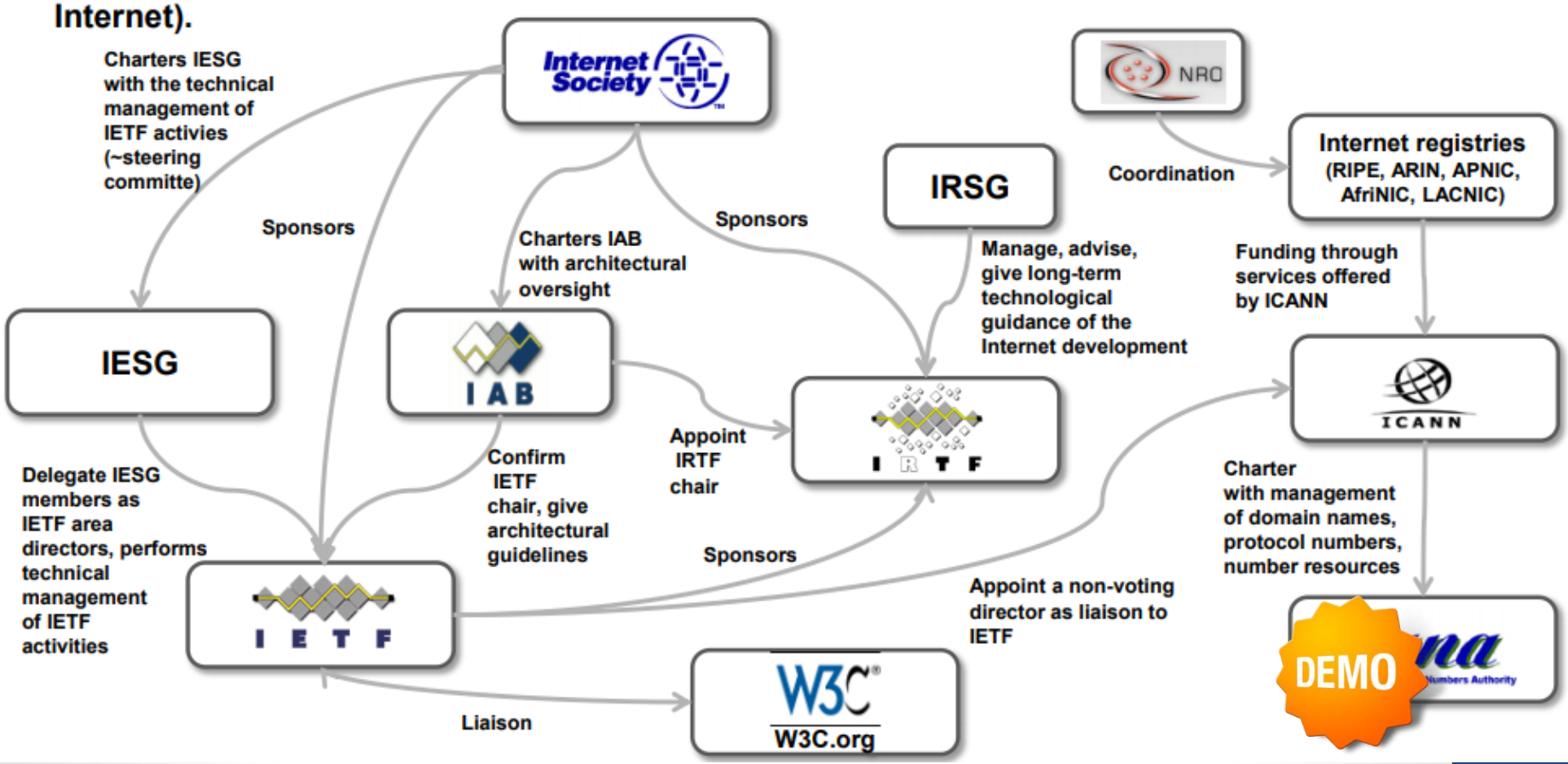
W3C (World Wide Web Consortium)

W3C develops web technology standards, HTML, HTML5, CSS, support multiple platform like chrome, firefox, internet explorer,….

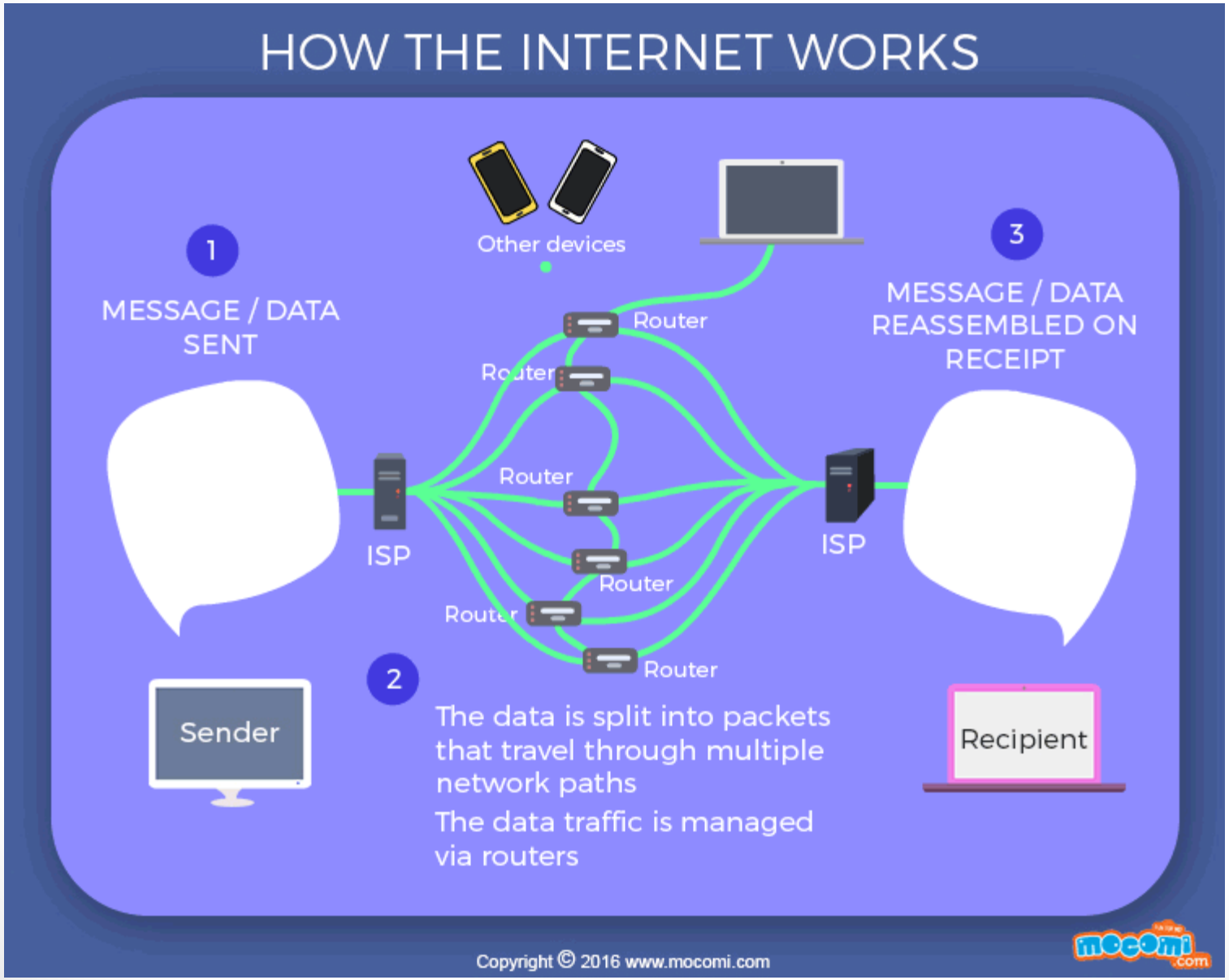
Internet

Internet organization

A number of loosely coupled organizations are concerned with governing the development of the Internet.
There is no strict hierarchy in these organizations (non-hierarchy is a core principle of the Internet).

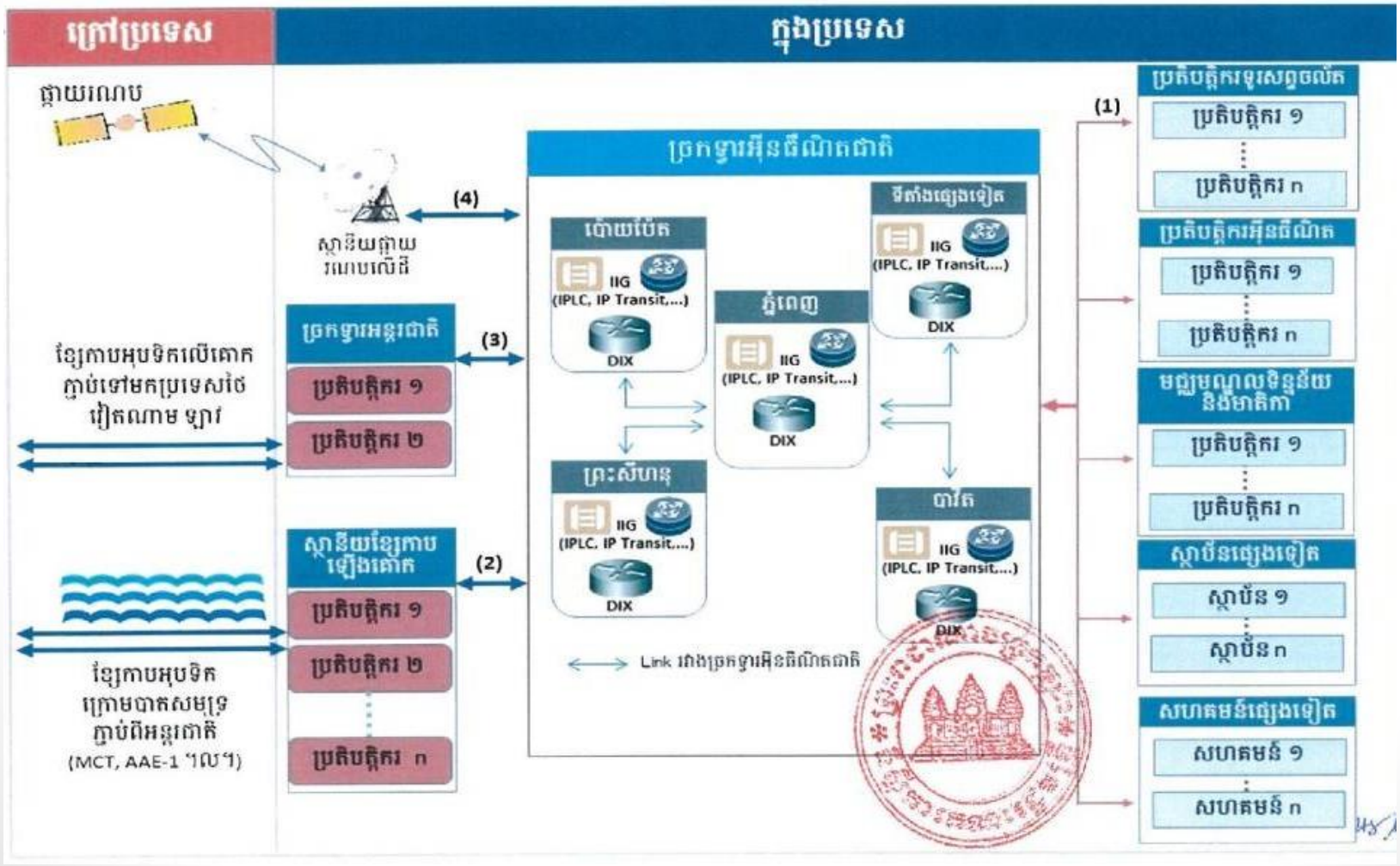


Internet


HOW THE INTERNET WORKS
Other devices
1
MESSAGE / DATA SENT
3
MESSAGE / DATA REASSEMBLED ON RECEIPT
Router
Router
Router
Router
Router
Router
ISP
ISP
Sender
Recipient
2
The data is split into packets that travel through multiple network paths
The data traffic is managed via routers
Copyright © 2016 www.mocomi.com

Internet

Cambodia Internet Gateway



Internet

1. Who Owns the Internet?
2. How many Worldwide users use internet?
3. Is Web and Internet the same?

Internet

World Wide Web(WWW) or Web

- WWW is an information space where documents and other web resources are identified by Uniform Resource Locators (URLs), interlinked by hypertext links, and accessible via the Internet.

- The World Wide Web is what most people think of as the Internet. It is all the Web pages, pictures, videos and other online content that can be accessed via a Web browser. The Internet, in contrast, is the underlying network connection that allows us to send email and access the World Wide Web.

Internet

World Wide Web

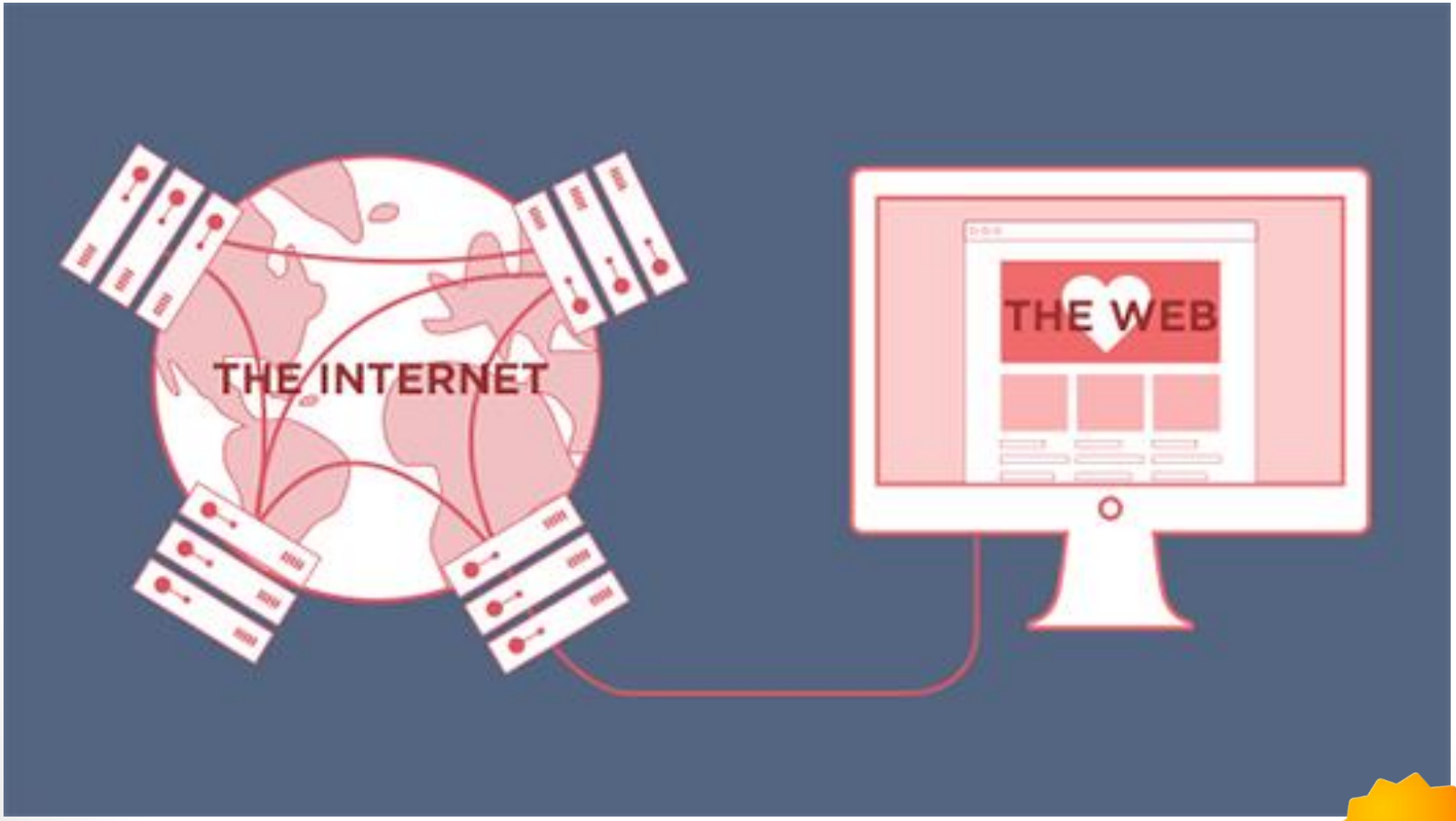
- An application layer built using the Internet
- Refers mostly to protocols and content
  - http
  - ftp
  - Email: pop, imail, etc.
- **Anything accessible via a URL.**

Internet

- Existed before the WWW
- Refers mostly to physical network, i.e., hardware, computers, etc.
- Network of Network concept
- Unique features
  - TCP/IP protocol
  - Packet Switching

Internet

WWW vs Internet



DEMO

Internet

INTERNET	INTRANET
I**NTER**national **NET**work	**INT**ernal **R**estricted **A**ccess **NET**work
Information about everything	Information concerning a particular organization
Can be used by anyone	Use by employee, stake holders of the organization
Difficult to restrict the access	Certain websites outside the internal network can be blocked or restricted
Less secured	Secure from hackers as they usually behind the firewall
No authentication necessary	Authentication required from access
Cab be accessed from anywhere	Can be accessed from agreed points

Internet

Domain Name

A domain name is your company's address on the internet or your website name.

http://www.rupp.edu.kh/fe/

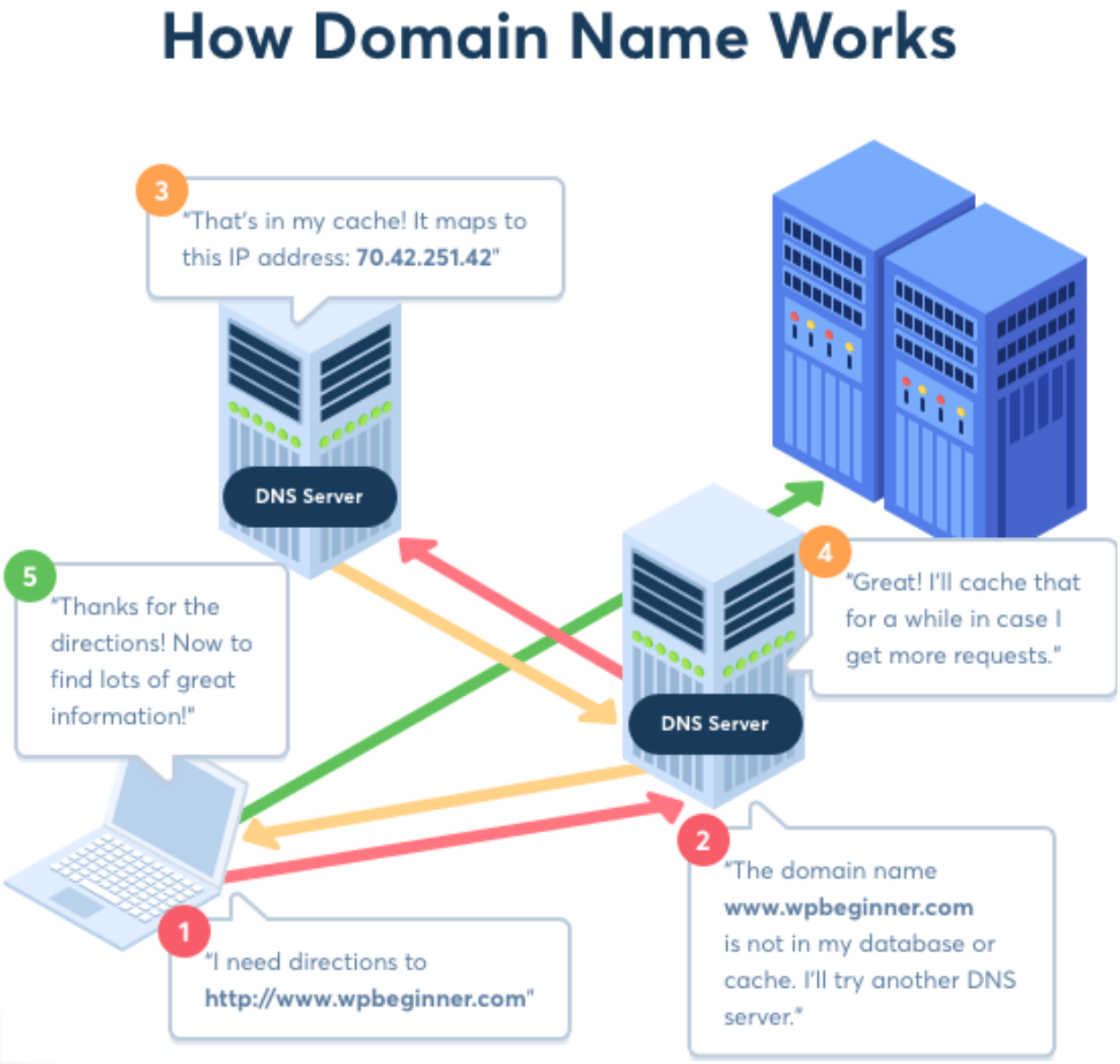
http:// : Hypertext Transfer Protocol

www : Sub-Domain / Host Name

rupp.edu.kh: Domain Name

fe/ : Directory Name

Internet


How Domain Name Works
3
"That's in my cache! It maps to this IP address: 70.42.251.42"
DNS Server
4
"Great! I'll cache that for a while in case I get more requests."
DNS Server
5
"Thanks for the directions! Now to find lots of great information!"
1
"I need directions to http://www.wpbeginner.com"
2
"The domain name www.wpbeginner.com is not in my database or cache. I'll try another DNS server."

Internet

Web Hosting

Web hosting is a service that allows your website to be accessible to the world wide web(www).

When you set up an online business, you have a series of files, images, and HTML code that make up your website. These files take up space and need a place to live. Without an online home, your files would just sit on your computer, and no one would ever see them.

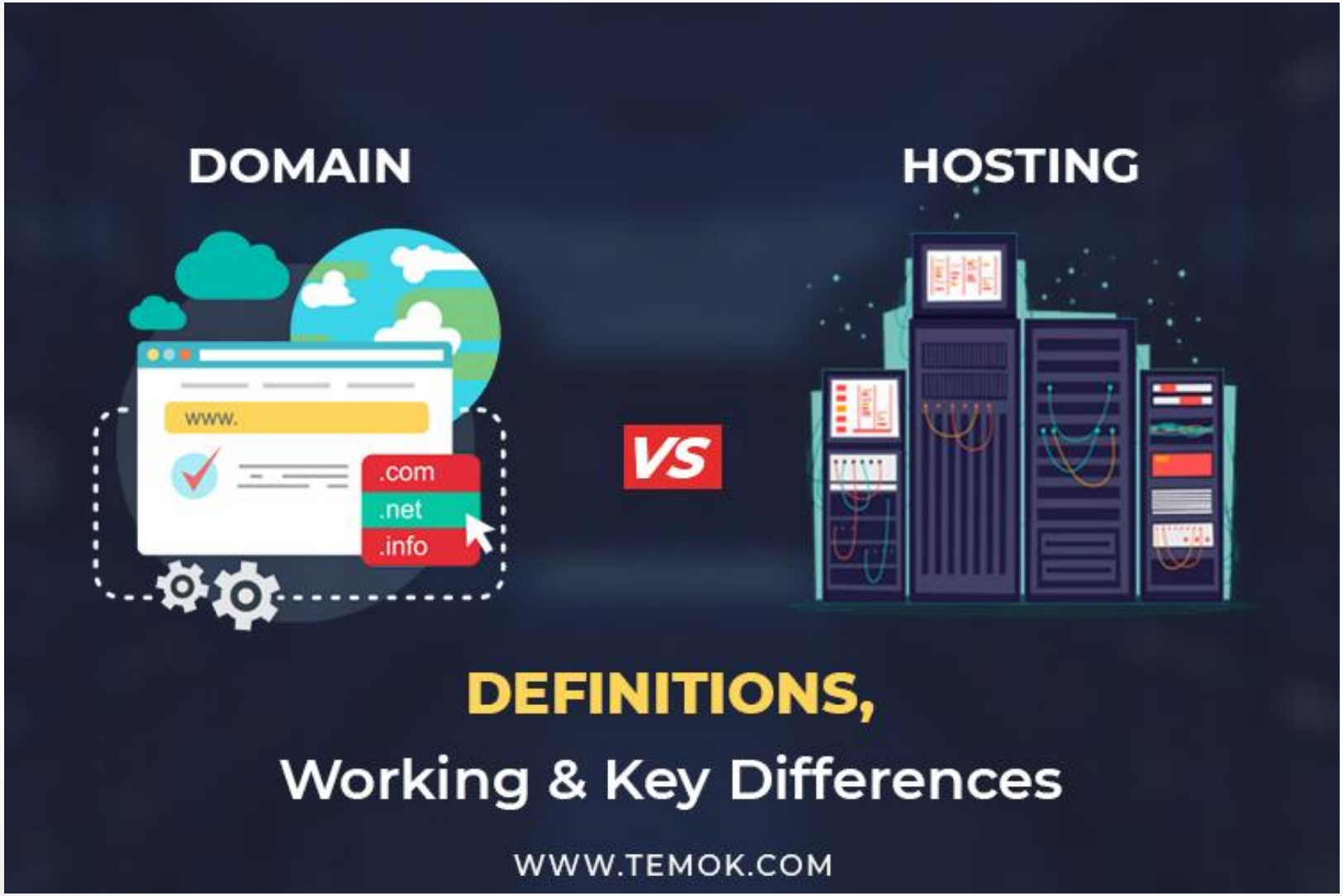
Top Web hosting companies

bluehost HostGator inmotion hosting

GoDaddy TSOHOST HOSTINGER

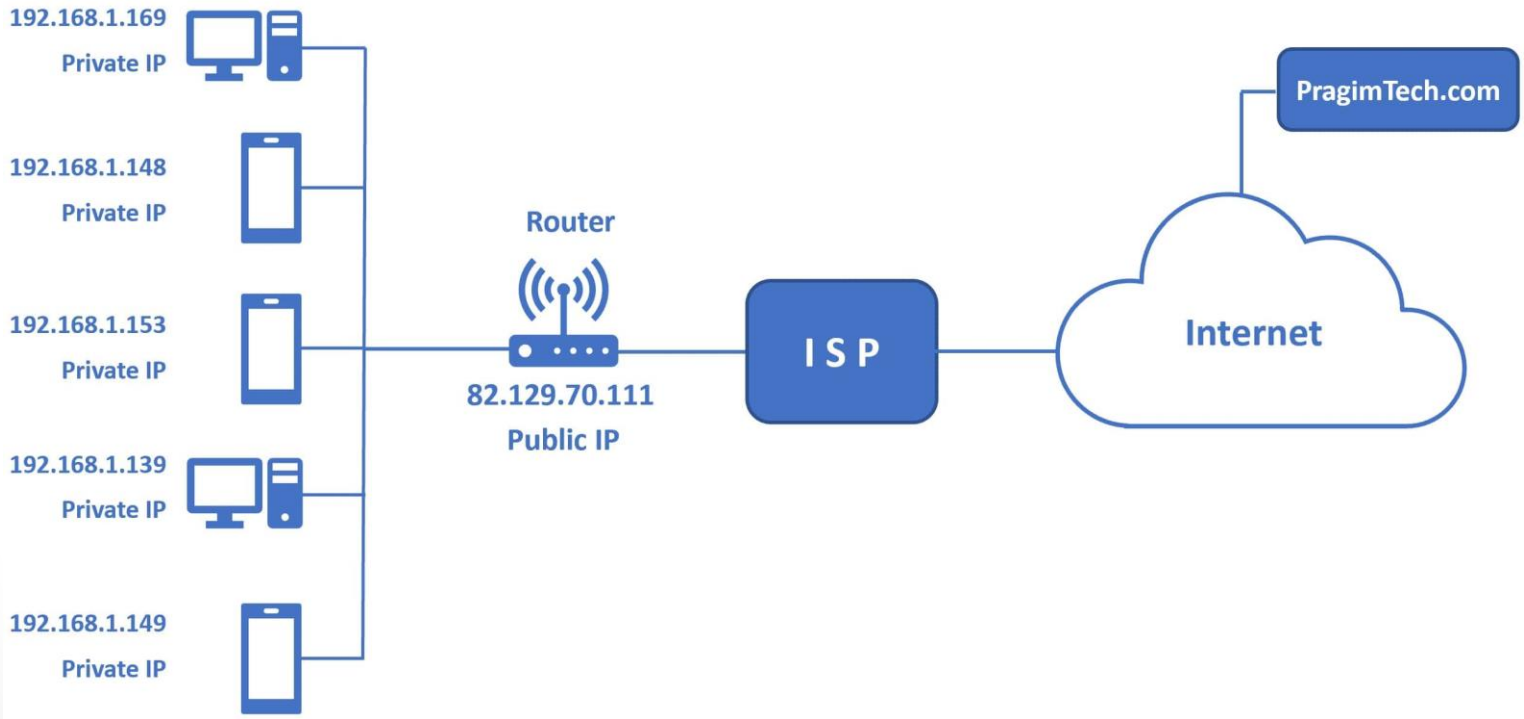
SiteGround Hostwinds WiX

Internet


DOMAIN
HOSTING
www.
.com
.net
.info
VS
DEFINITIONS,
Working & Key Differences
WWW.TEMOK.COM

Internet

Private IP vs Public IP Address



Now→ Go to Google search and type: "**What is my IP address?**"

Internet

Public IP	Private IP
Designed for communication outside the local network (internet)	Designed for communication within the local network
Assigned by your ISP	Assigned by your network administrator or device
Recognized on the internet	Not recognized on the internet
Globally unique	Unique only within your local network

Protocols and Standards

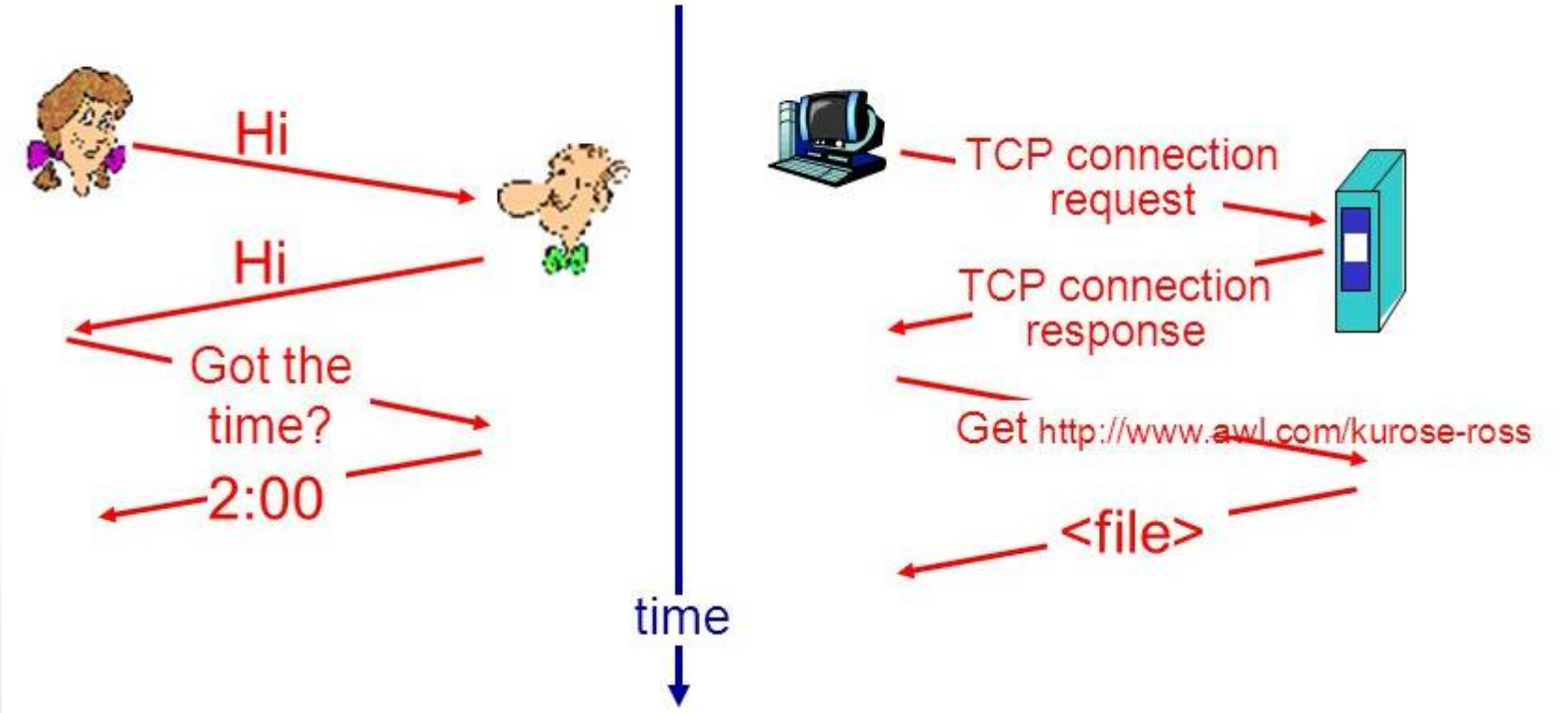
Protocols

- In computer networks, communication occurs between entities in different systems. An entity is anything capable of sending or receiving information.
- However, two entities cannot simply send bit streams to each other and expect to be understood.
- For communication to occur, the entities must agree on a protocol.
- A protocol is a set of rules that govern data communications.
- A protocol defines what is communicated, how it is communicated, and when it is communicated.

Protocols and Standards

Protocols

a human protocol and a computer network protocol:



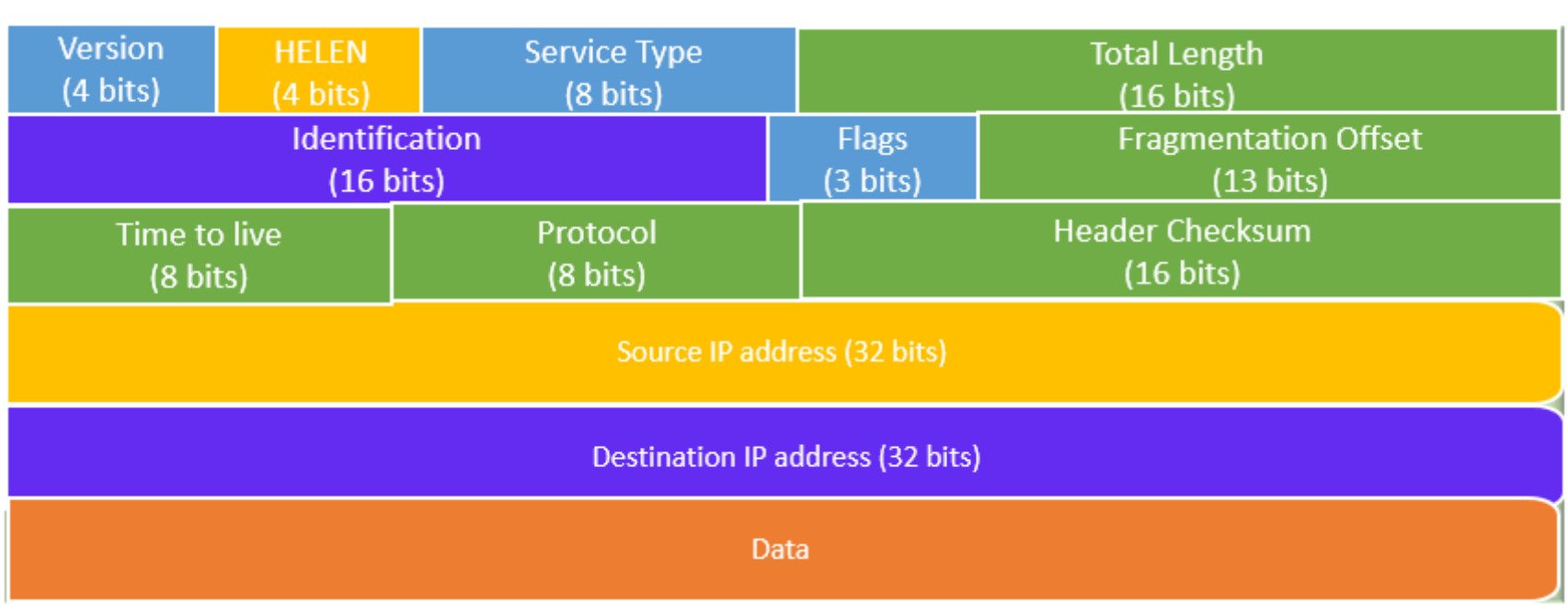
Protocols and Standards

Protocols: *key elements*

1. Syntax
   - Structure or format of data
   - Indicates how to read the bits
2. Semantics
   - Interprets the meaning of the bits
   - Knows which fields define what action
3. Timing
   - When data should be sent and what *(sequencing)*
   - Speed at which data should be sent or speed at which it is being received *(Speed matching)*

Protocols and Standards

IP Packet Header: Format



Protocols and Standards

Common Protocol used

Protocol	Acronym	Description
Point to Point	**PPP**	Used to manage network communication over a modem
Transfer/Transmission Control Protocol	**TCP/IP**	The most widely used protocol. Basic for internet
File Transfer Protocol	**FTP**	Used to send and received file from a remote host
Simple Mail Transfer Protocol	**SMTP**	Used to send Email over a network
Hyper Text Transfer Protocol	**HTTP**	Used for Internet to send document that encoded in HTML
OSI Model	**OSI Layer**	A way to illustrating how information function travel through network of its 7 layer.
Domain Name System	**DNS**	Uses PC's logic name rather then numerical address.

Protocols and Standards

Standards

- Standards provide guidelines to manufacturers, vendors, government agencies, and other service providers to ensure the kind of interconnectivity necessary in today's marketplace and in international communications.
- For more details of Internet standard, visit the link:

https://www.rfc-editor.org/standards#IS

Protocols and Standards

Standards

Standards Organizations

- **IEEE** (Institute of Electrical and Electronics Engineers)
- **ANSI** (American National Standards Institute)
- **ITU** (International Telecommunications Union – formerly CCITT)
- **ISO** (International Organization for Standards)
- **ETSI** (European Telecommunications Standards Institute)
- **W3C**(World Wide Web Consortium)

Protocols and Standards

IEEE Standards

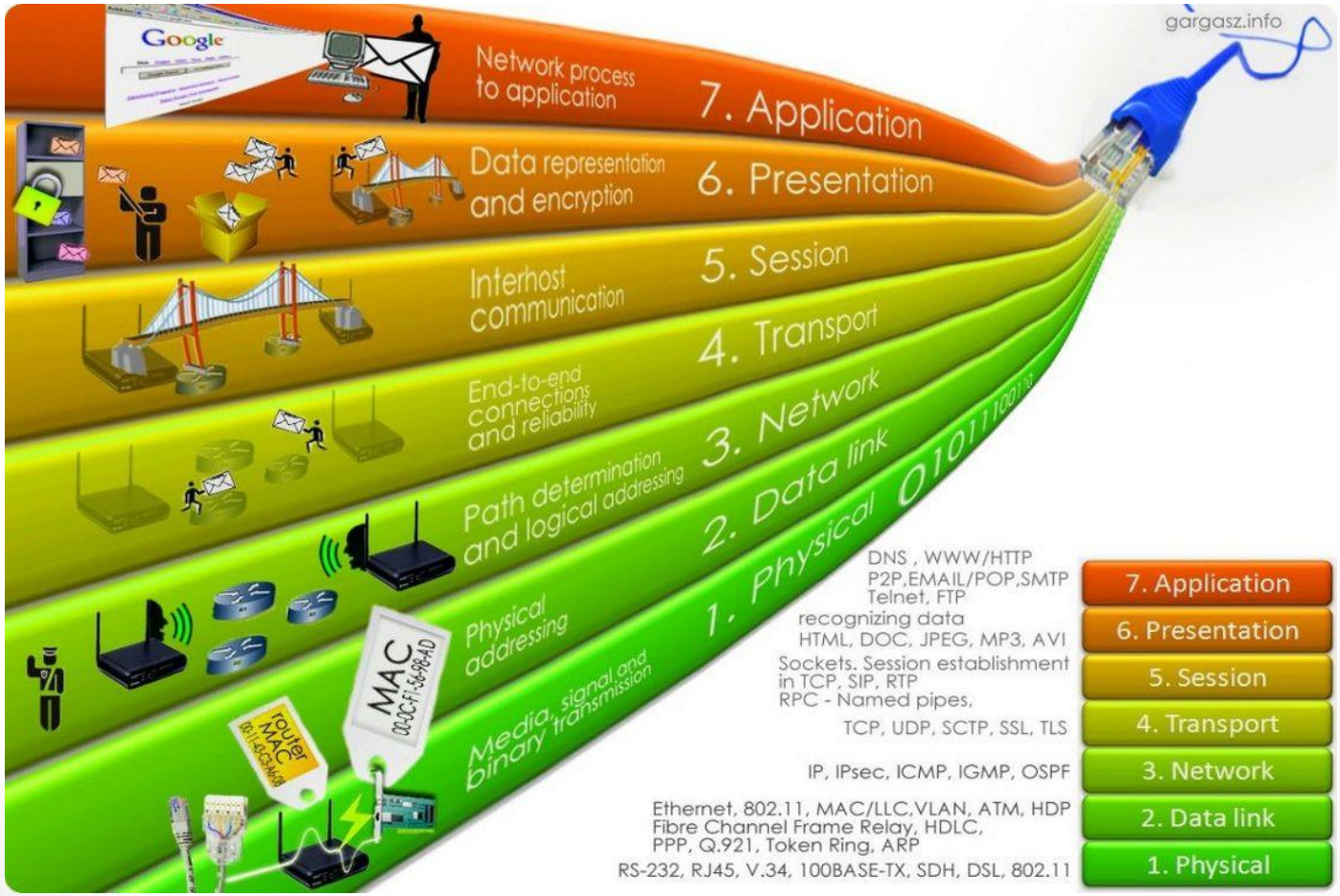
Some of the best-known IEEE standards are:

1. IEEE 802.1 (LAN/MAN)
2. IEEE 802.3 (Ethernet)
3. IEEE 802.5 (Token Ring)
4. IEEE 802.11 (Wireless LAN)

Protocols and Standards

ISO standards

International Organization for Standards, who developed OSI model



Protocols and Standards

W3C standards

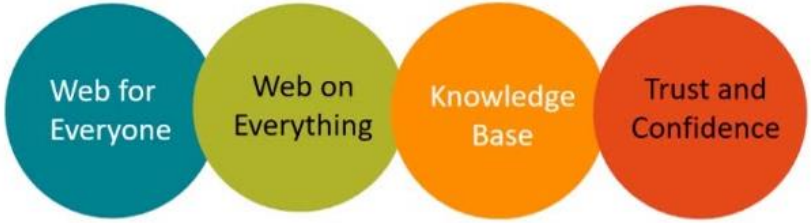
WEB STANDARDS > WORLD WIDE WEB CONSORTIUM (W3C)

Mission: *"to lead the Web to its full potential"*

In order to achieve the mission and goals W3C sets and monitors **WEB STANDARDS.**

And W3C also creates a **TECHNOLOGY STACK** that meets the **STANDARDS.**

General Goals of W3C



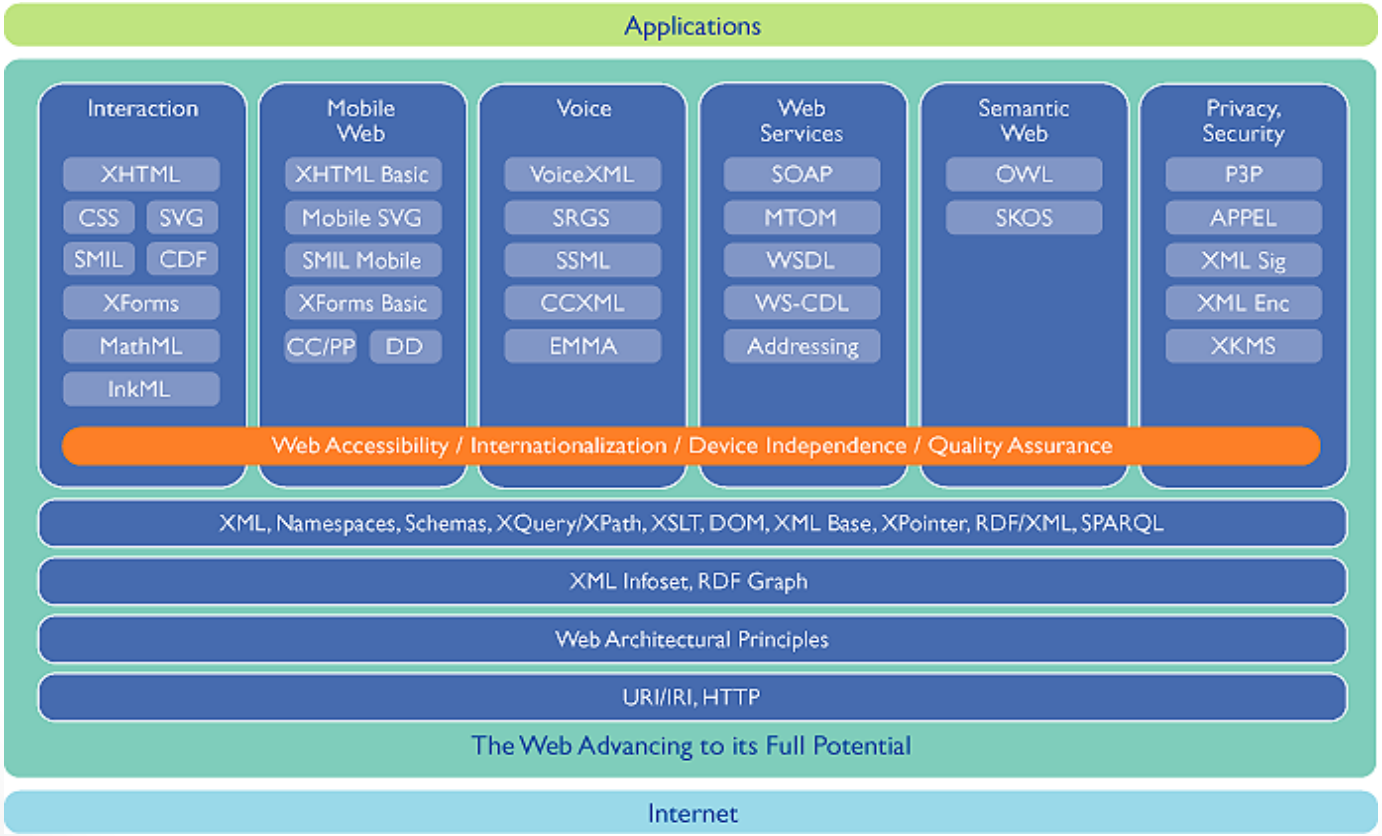
Goals of W3C (under the hood)

- Prevent the Web from breaking apart
- Grant interoperability
- Make sure that the web is a creative space
- Maintain extensibility
- Lead the web to its full potential

Protocols and Standards

W3C standards

The **world wide web consortium** develops international Web standard HTML, CSS, and many more.



Q&A

New Developer

https://www.youtube.com/watch?v=dDVA2ZyGeRw&list=PLWrsrLN26mWaUR5YbETVkxLTdo5KEd9t9&ab_channel=%E1%9E%9A%E1%9F%80%E1%9E%93IT

https://www.youtube.com/watch?v=684N38GW8Go&ab_channel=QCMedia

https://www.youtube.com/watch?v=6jvrQIQ3cN8&ab_channel=%E1%9E%9A%E1%9F%80%E1%9E%93IT

https://www.youtube.com/watch?v=sG71q1n7q4M&ab_channel=KhodeAcademy

https://www.youtube.com/watch?v=G21J6ek89KM&list=PLBngdQ_FhSMkvslASEmAXtoVr_VmUVC-p&ab_channel=ProgrammingwithNIT

https://www.youtube.com/watch?v=fY75OdgjthY&ab_channel=SokchabPho