DIGITAL LITERACY & COMMUNICATION

Week 4 : Introduction to Internet

Created by Digital Literacy Team

President University

The Internet

The Internet

Introduction

The word “internet” was derived from “**interconnected**” (1849)

Internet is the **largest** network in the world that connects hundreds of thousands of individual networks all over the world.

No one owns it.

It has **no** formal management organization.

The Internet

Definition

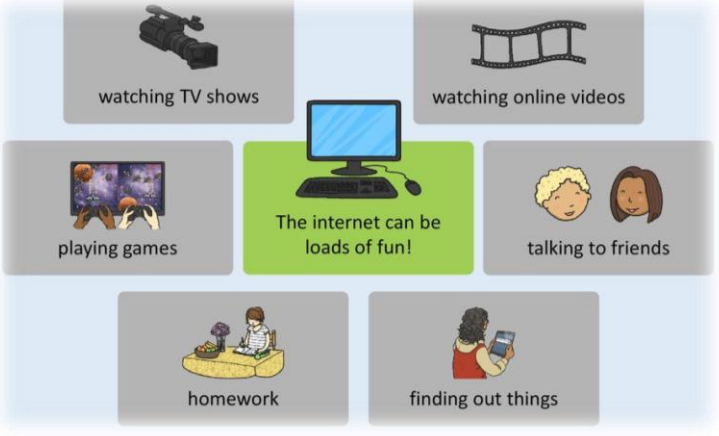
- Typically we refer the “**Internet**” as a global information network that connects millions - or perhaps billions - of computers around the world.
- However, the correct term of *internet* is any computer network that connects several **networks** together. Thus, the “**Internet**” we mention before is the single largest and most popular internet.
- The Internet uses the **TCP/IP** suite of packet switching protocols to connect to/from each others.
- Any computer or devices using software compatible with TCP/IP, regardless of OS, can connect and communicate over the Internet.
- The term of **Internet of Things** has been booming lately, as a result of the emergence of the Internet.

The Internet

The Uses of The Internet

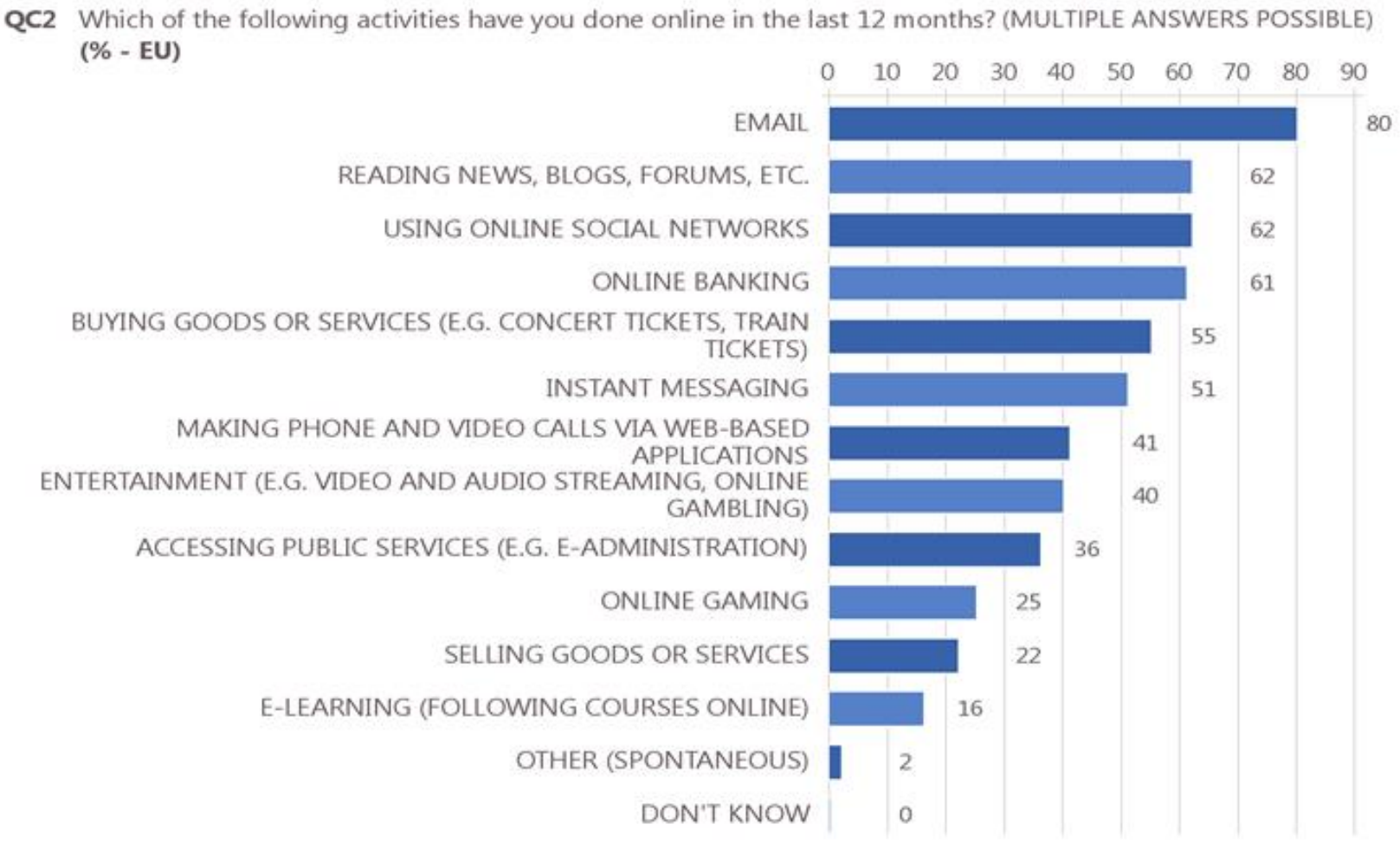
Things we can do with The Internet:

- ❑ Send e-mail messages.
- ❑ Send (**upload**) or receive (**download**) files between computers.
- ❑ Participate in discussion groups, such as mailing lists and newsgroups, or online forums.
- ❑ Chatting and messaging
- ❑ Playing games
- ❑ Shopping
- ❑ Surfing the web
- ❑ And many more.



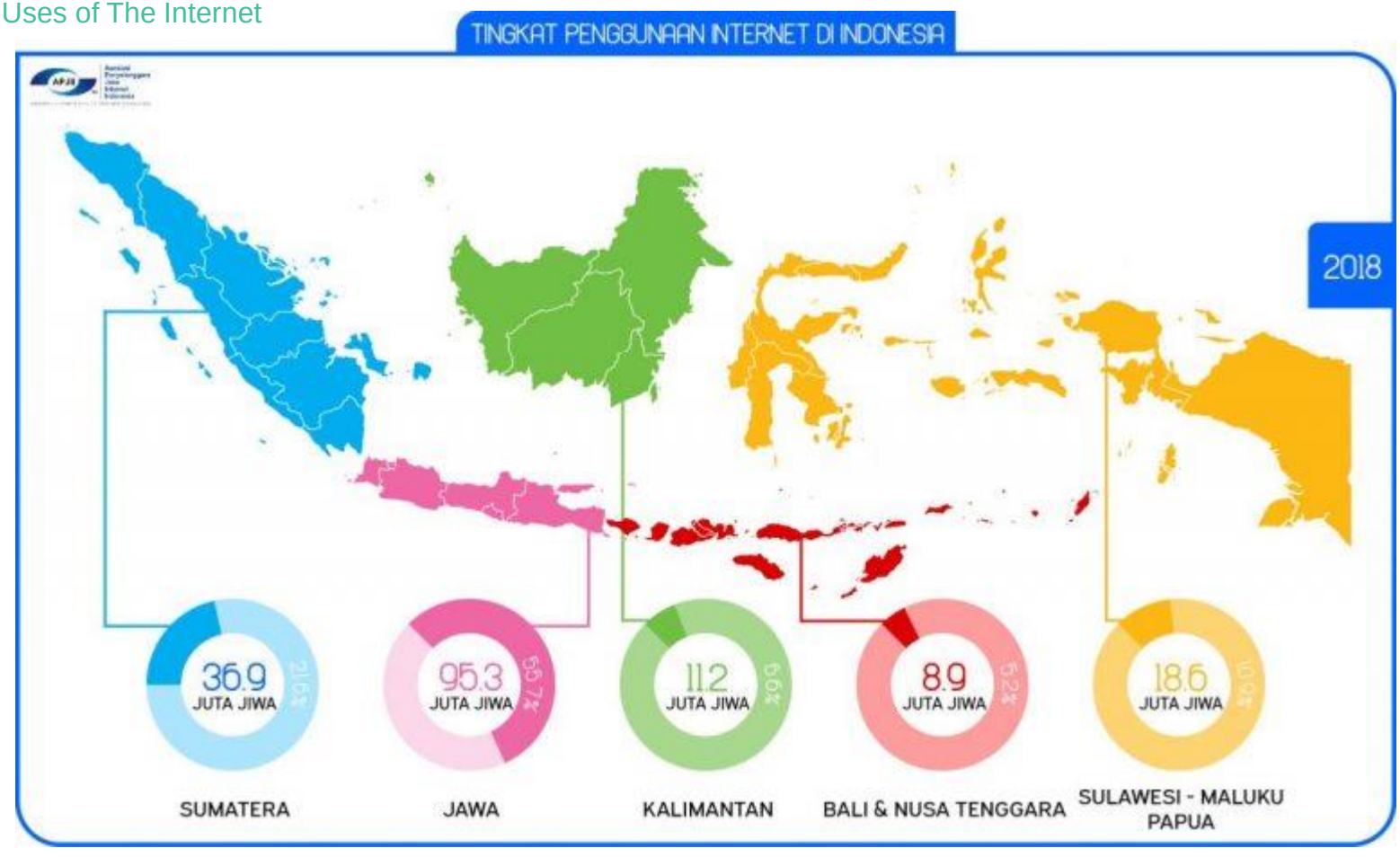
The Internet

The Uses of The Internet



The Internet

The Uses of The Internet



APJII 2018, kominfo.go.id

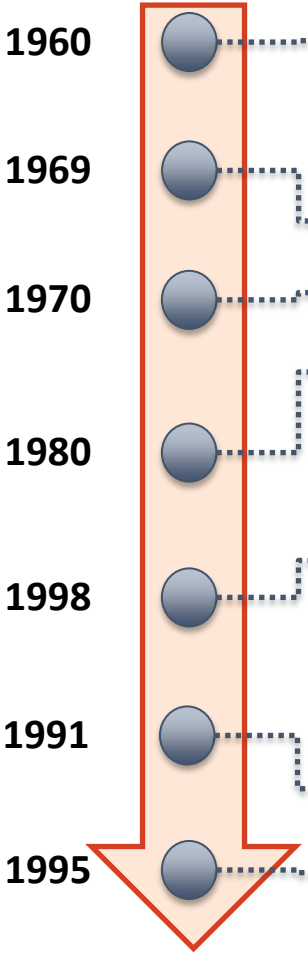
The Internet

History

- ARPANET (The Advanced Research Projects Agency Network) was the network that became the basis for the Internet.
- ARPANET was developed under the direction of the U.S. Advanced Research Projects Agency (ARPA)
- The initial purpose was to communicate with and share computer resources among mainly scientific users at the connected institutions (Military).

The Internet

History



1960 ❑ The American Defense Advanced Projects Research Agency, **ARPA** (later DARPA) started a research project on the subject of computer networks

1969 ❑ An experimental result started with four node network.

1970 ❑ The work with the architecture and **protocols** of the Internet.

1980 ❑ DARPA started to use the **TCP/IP** protocol stack on all installations connected to the DARPA Internet – This is the Internet as we know it today.

1998 ❑ DARPA decided that the experiment of ARPANET was complete. At the same time, the American National Science Foundation established the **NFSNET** which then became the new backbone network.

1991 ❑ The ***World Wide Web*** was introduced.

1995 ❑ Formal acceptance of the term **Internet.**

The Internet

Major Services

- Email – Electronic Mail
- Telnet – Remote session
- Instant Messaging
- Mailing Lists
- Newsgroups
- Internet Telephony (VoIP)
- FTP – File Transfer Protocol
- WWW – World Wide Web
- Video Conferencing

The Internet

How to connect?

- Many schools and businesses have direct access to the Internet using special high-speed communication lines and equipment.
- Students and employees can access through the organization’s local area networks (LAN) or through their own personal computers.
- Another way to access the Internet is through Internet Service Provider (ISP).
- To access the Internet, an existing network need to pay a small registration fee and agree to certain standards based on the TCP/IP (Transmission Control Protocol/Internet Protocol) reference model.
- Each organization pays for its own networks and its own telephone bills, but those costs usually exist independent of the internet.
- The regional Internet companies route and forward all traffic, and the cost is still only that of a local telephone call.

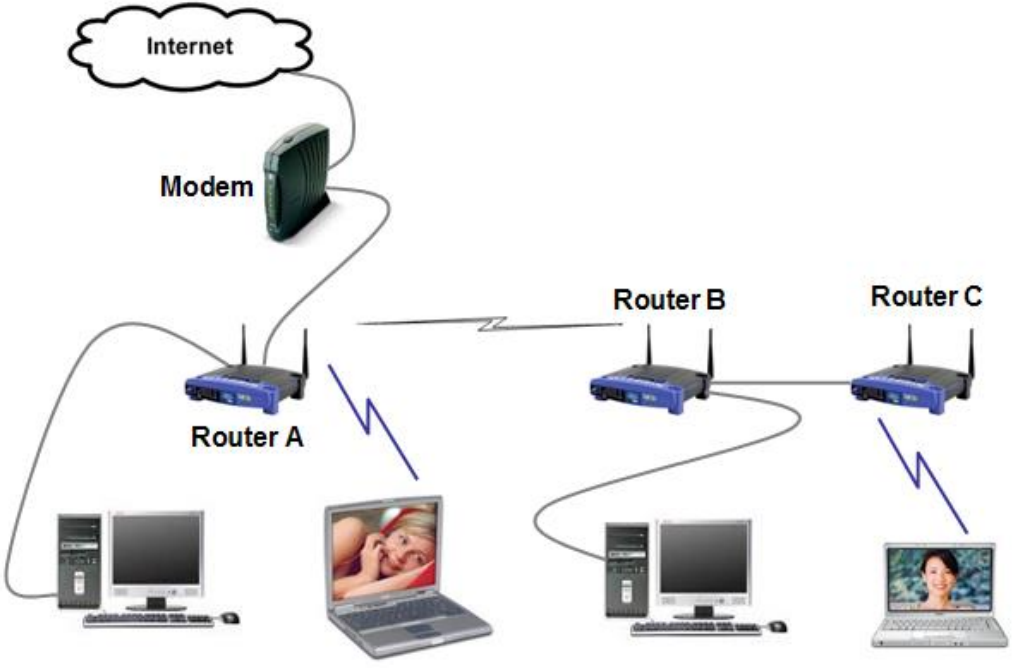
Internet Service Provider

Introduction

- A commercial organization with permanent connection to the Internet that sells temporary connections to subscribers.
- Examples:
  - ✓ Prodigy, America Online, Microsoft network, AT&T Networks, etc.
  - ✓ MNC Play, First Media, IndiHome, CBN, Biznet, etc.

The Internet

How to connect?

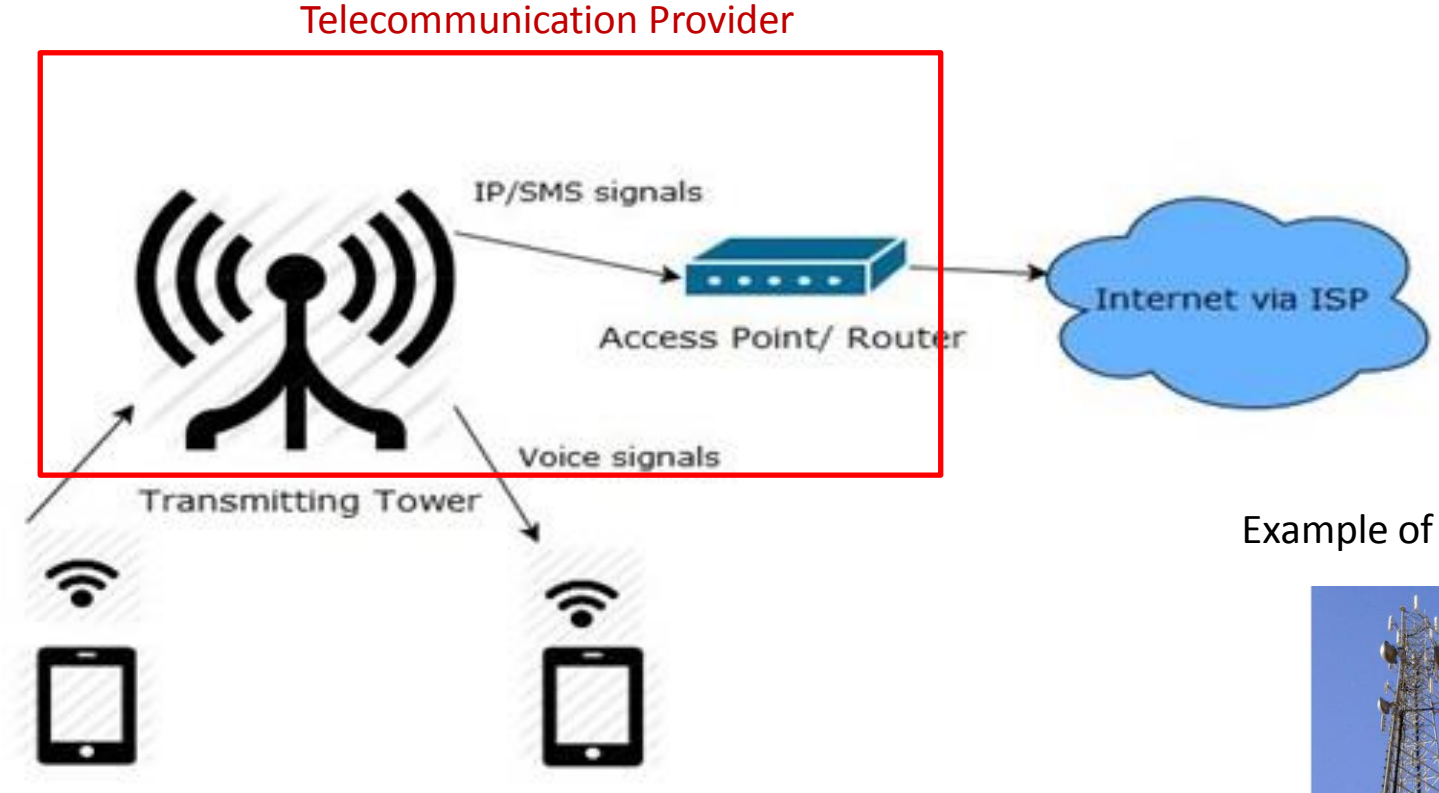


To connect to
The internet we need to pay the internet service fee from **ISP**, and

Generally, we need hardware called "**modem**"

The Internet

How to connect?

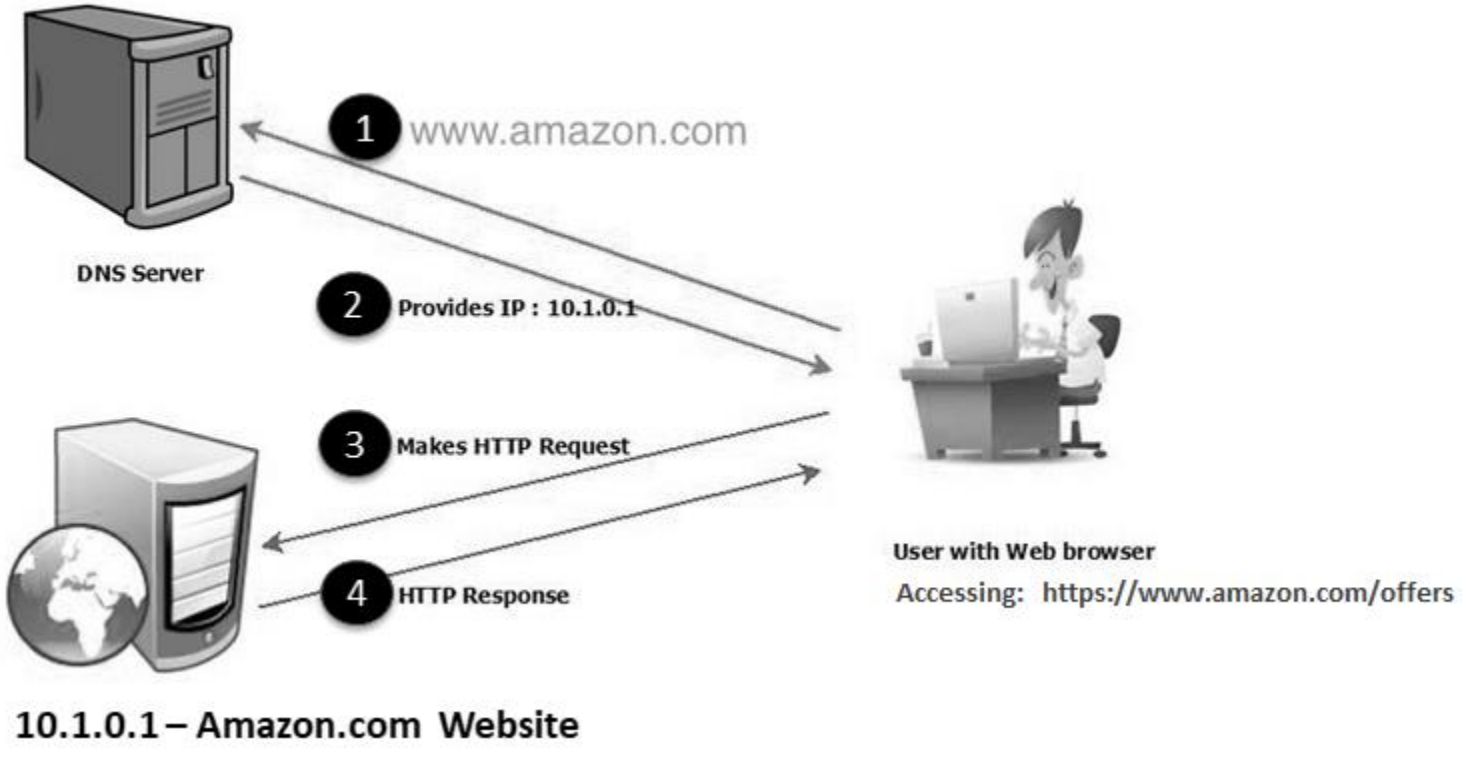


Example of the Tower

Mobile phone has a “built-in modem”, specifically to communicate with Internet Tower from the Provider through 2G, 3G, 4G or 5G connection.

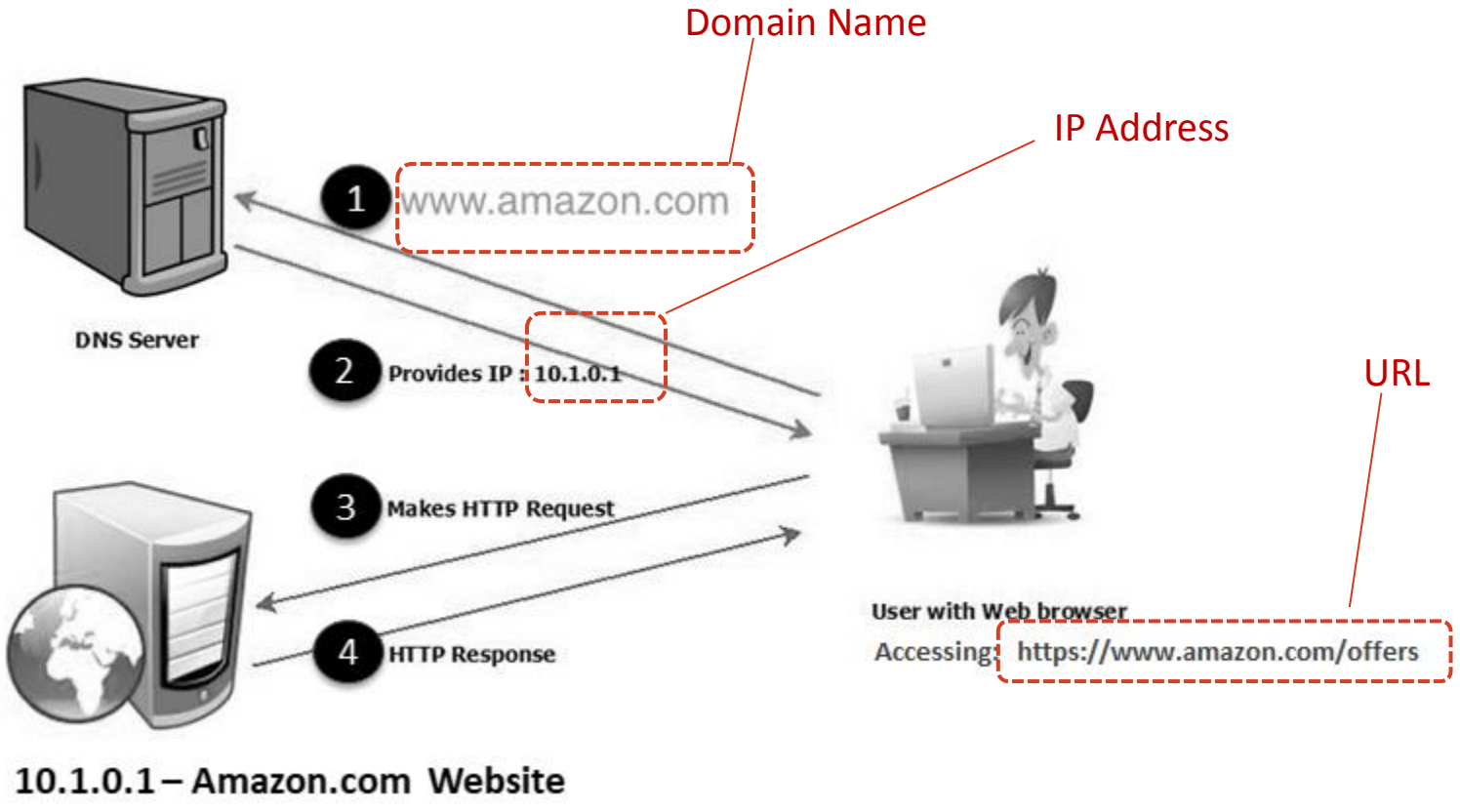
The Internet

How it work?



The Internet

How it work?



About IP Address, Domain and URL

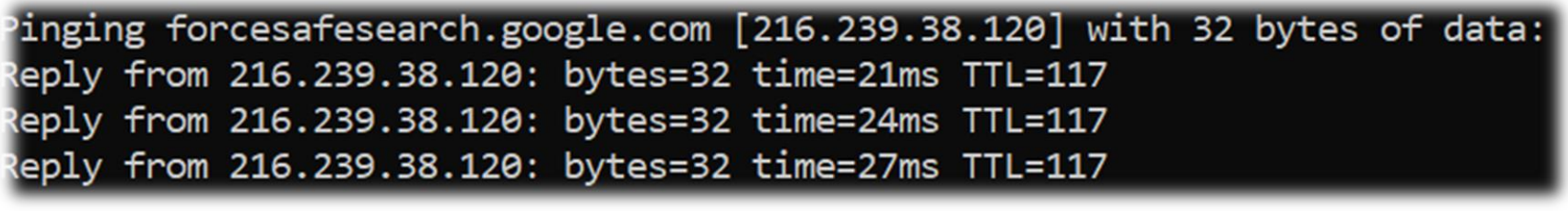
Overview

- **IP (*Internet Protocol*) address** is a *numerical* label assigned to each device (e.g., computer, printer) participating in a computer network that uses the Internet Protocol for communication.
- The **IP address** and the **domain name** each identify a particular computer on the Internet. However, they do not indicate where a Web page's document resides on that computer.
- To identify a Web pages exact location, Web browsers rely on **Uniform Resource Locator (URL)**. URL is a four-part addressing scheme that tells the Web browser:
  - What transfer protocol to use for transporting the file
  - The domain name of the computer on which the file resides
  - The pathname of the folder or directory on the computer on which the file resides
  - The name of the file

IP Address

Introduction

- 216.239.38.120 is example of IP Address: one of **Google,com** IP Address.
- IP address is same as mobile number which is unique. It is provided to all the devices which are connected to internet or network.
- IP addresses are managed by service providers and a central allocation system.
- Some IP addresses are assigned newly each time, this is called as **dynamic IP address**, and some other are permanently set by fixed configuration (either using hardware or software) is known as using a **static IP address**.



IP Address

Introduction

- As the Internet and technology evolve, there has been an increasing demand for IP addresses. To help meet the demand for IP addresses, **IPv6** was introduced. The IP address we know before is referred to **IPv4**.
- Example of an IPv4 address: **45.79.151.23**
- Example of an IPv6 address: **2601:681:4200:c5c0:516:f0bb:ac3b:46bd**

IP Address

Introduction

CLASSES	ADDRESS RENGE	SUPPORTS
A	1.0.0.1 to 126.255.255.254	Supports 16 million hosts on each of 127 networks.
B	128.1.0.1 to 191.255.255.254	Supports 65,000 hosts on each of 16,000 networks.
C	192.0.1.1 to 223.255.254.254	**Supports 254 hosts on each of 2 million networks.**
D	224.0.0.0 to 239.255.255.255	Reserved for multicast groups.
E	240.0.0.0 to 254.255.255.254	Reserved for future use, or Research and Purposes.

- There are five classes of available IP ranges on **IPv4** type: Class A, Class B, Class C, Class D and Class E.
- Only A, B, and C are commonly used.
- Each class allows for a range of valid IP addresses, shown in the following table.

Domain Name

Introduction

- To identify an entity, TCP/IP protocols use the IP address, which uniquely identifies the connection of a host to the Internet.
- However, people **prefer to use names instead of numeric addresses**. Therefore, we need a system that can map a name to an address or an address to a name. The domain name was introduced to solve this issue.
- The name always has two or more parts separated by a dot.

Domain Name System

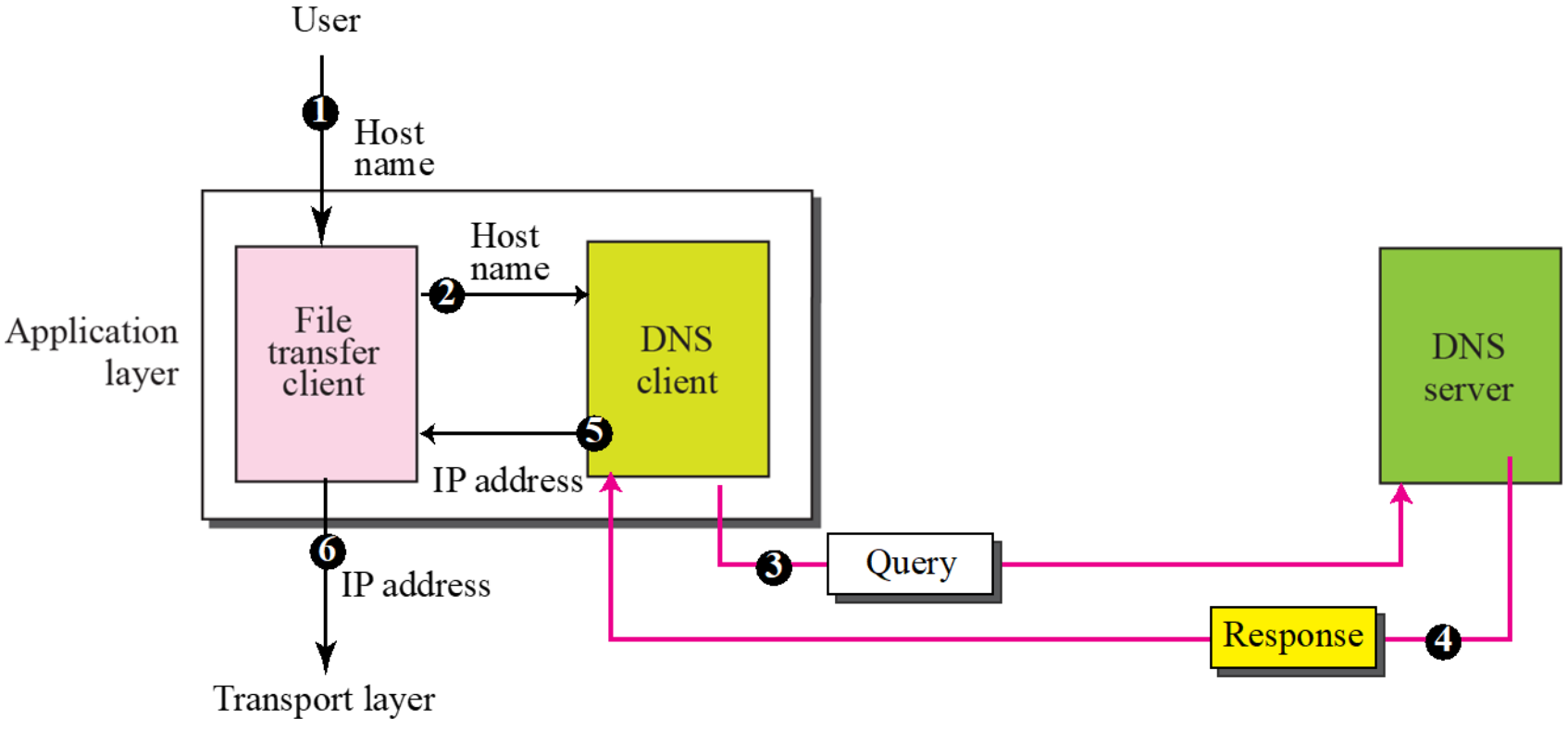
Introduction

- Most web browsers do not use the IP address as well to locate Web sites and individual pages.
- They use **domain name addressing**.
- Again, a domain name is a unique name associated with a specific IP address – **organized by a program** that runs on an Internet host computer.
- This program, which coordinates the IP addresses and domain names for all computers attached to it, is called **DNS (Domain Name System)** software.
- The host computer that runs this software is called a **Domain Name Server**.

Google

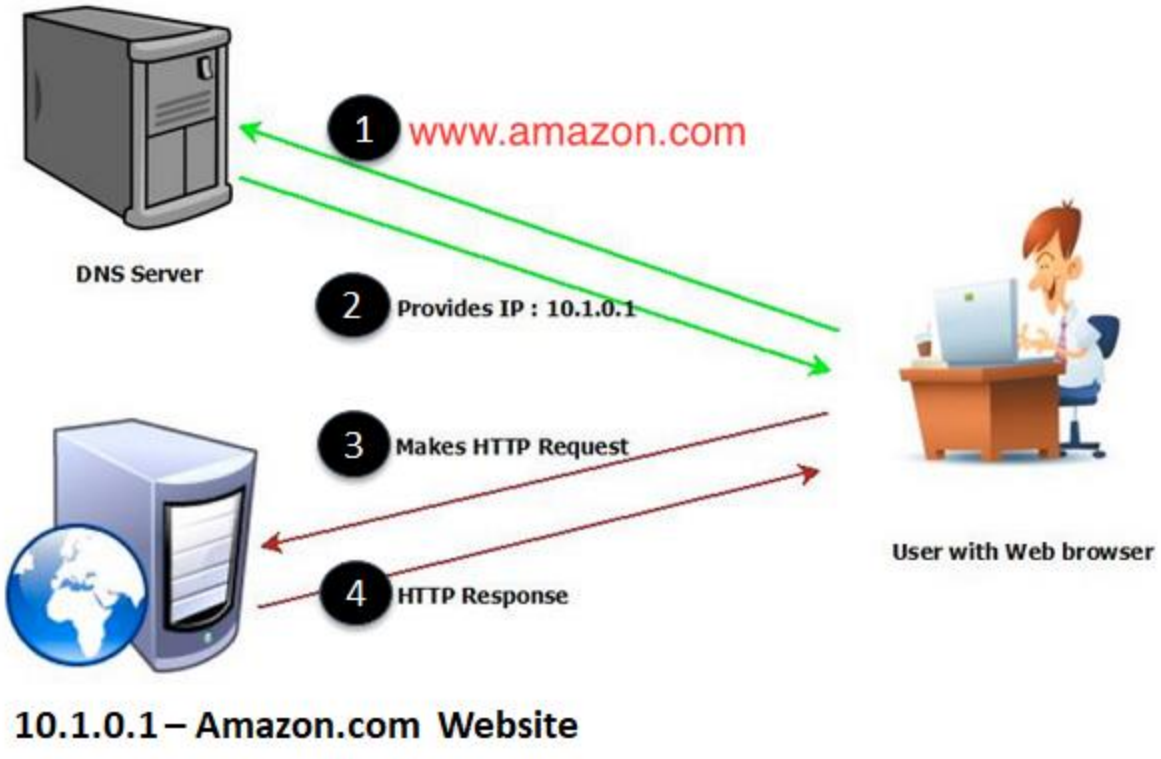
Domain Name System

Introduction



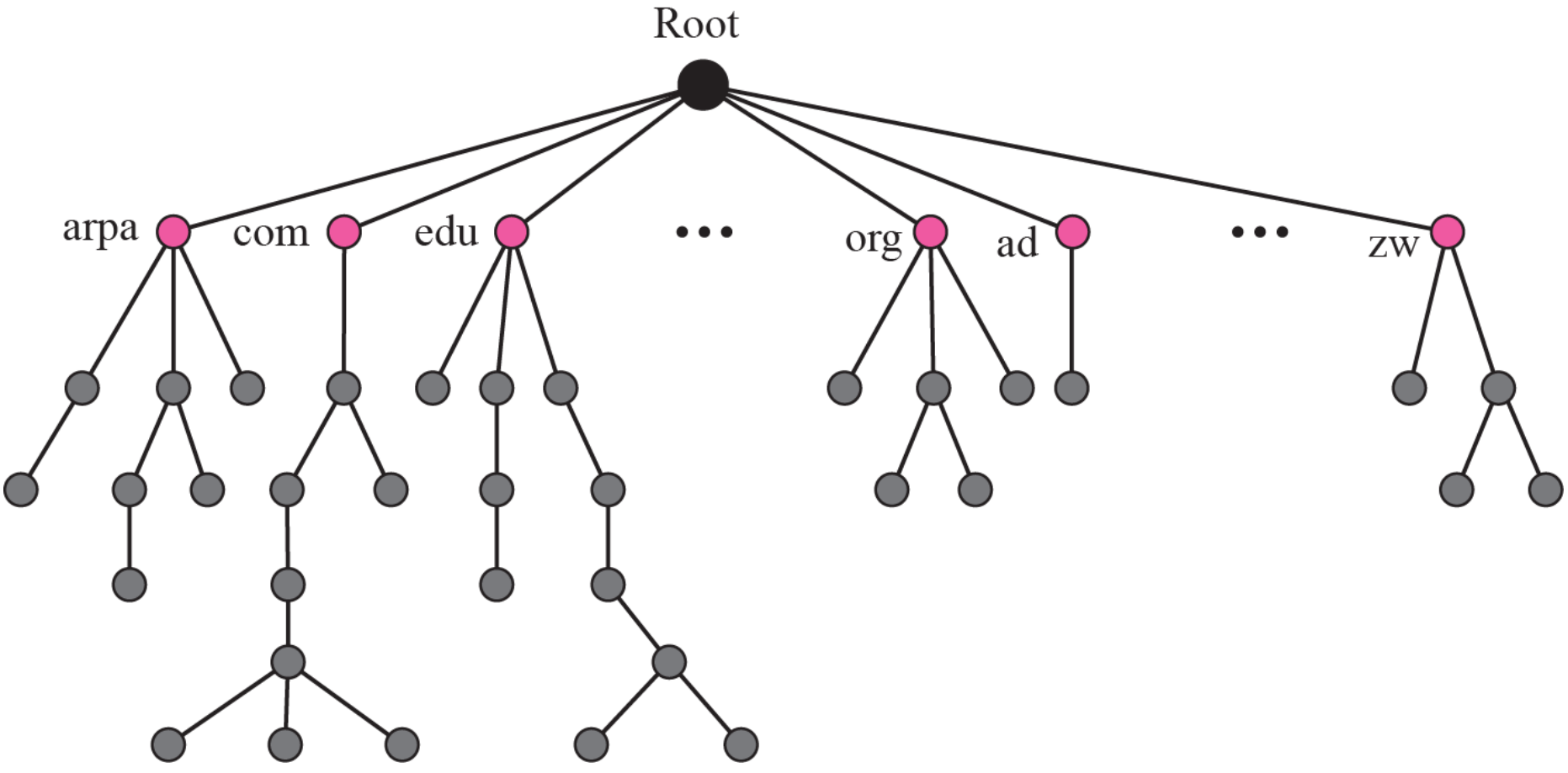
Domain Name System

Introduction



Domain Name System

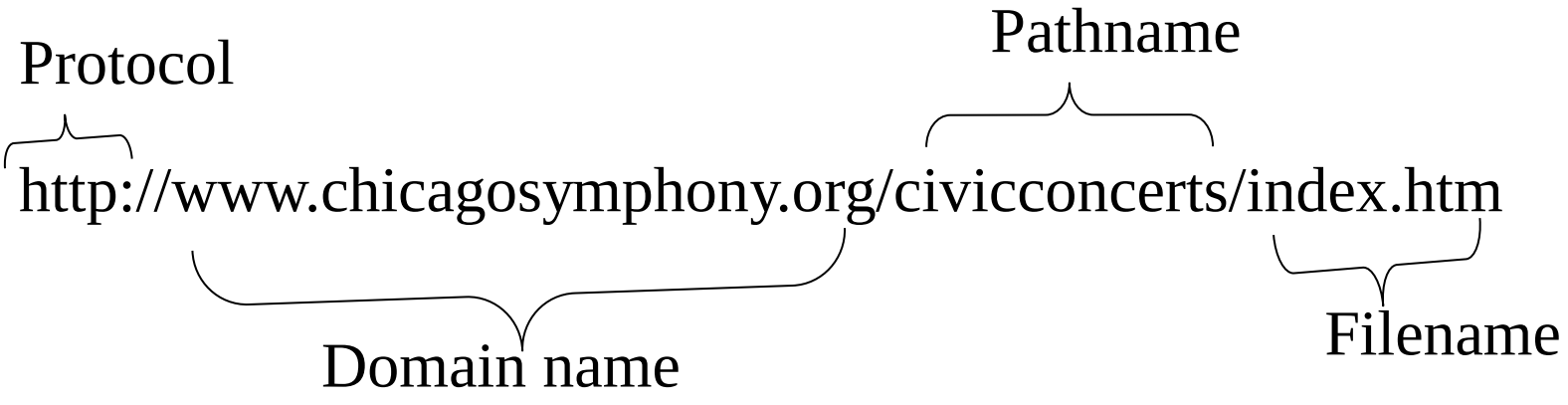
Introduction



Uniform Resource Locators (URL)

Introduction

- URL identify a Web pages **exact** location in the server.
- URL is also unique.



HTTP

Introduction

- The transfer protocol is the set of rules that the computers use to move files from one computer to another on the Internet. It tells your computer what type of page you are looking at.
- The most common transfer protocol used on the Internet is the Hypertext Transfer Protocol (HTTP).
- Another variant of HTTP is HTTPS. It is indicated a more secure (HTTP) Webpage.
- Two other protocols that you can use on the Internet are the File Transfer Protocol (FTP) and the Telnet Protocol, used for File Transfer Protocol and Remote Session respectively.

Internet Security

- Internet security is a tree branch of **computer security** specifically related to the Internet, often involving browser security but also network security on a more general level as it applies to other applications or operating systems on a whole.
- Types of security
  - Network layer security
  - Internet Protocol Security
  - Security token
  - Electronic mail security
- Enable Firewalls
  - A computer firewall controls access between networks. It generally consists of gateways and filters which vary from one firewall to another
- Create Strong, Secure Passwords
- Keep Your Other Information Protected

Internet Ethics

- You shall not use internet to harm other people.
- You shall not snoop around in other people's internet files.
- You shall not use a internet to steal or hack.
- You shall not use other people's internet resources without authorization or proper compensation.
- You shall always use internet in ways that show consideration and respect for your fellow humans.
- You should not upload articles that may scratch others psychological manners.

Internet: Advantages and Disadvantages

The Advantages of Internet:

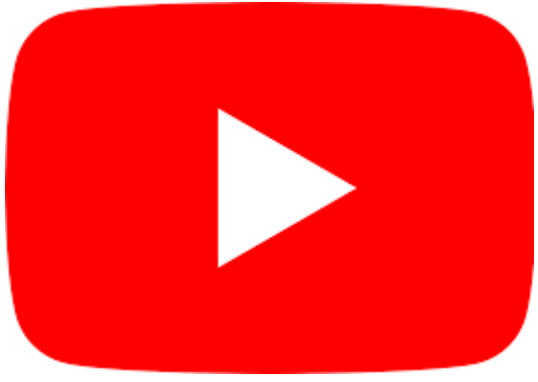
- ❑ Communication
- ❑ Research
- ❑ Education
- ❑ Financial transactions
- ❑ And many more..

The Disadvantages of Internet:

- ❑ Theft of Personal Information
- ❑ Spamming
- ❑ Malware Threats
- ❑ Social Isolation, Obesity and Depression
- ❑ And many more..

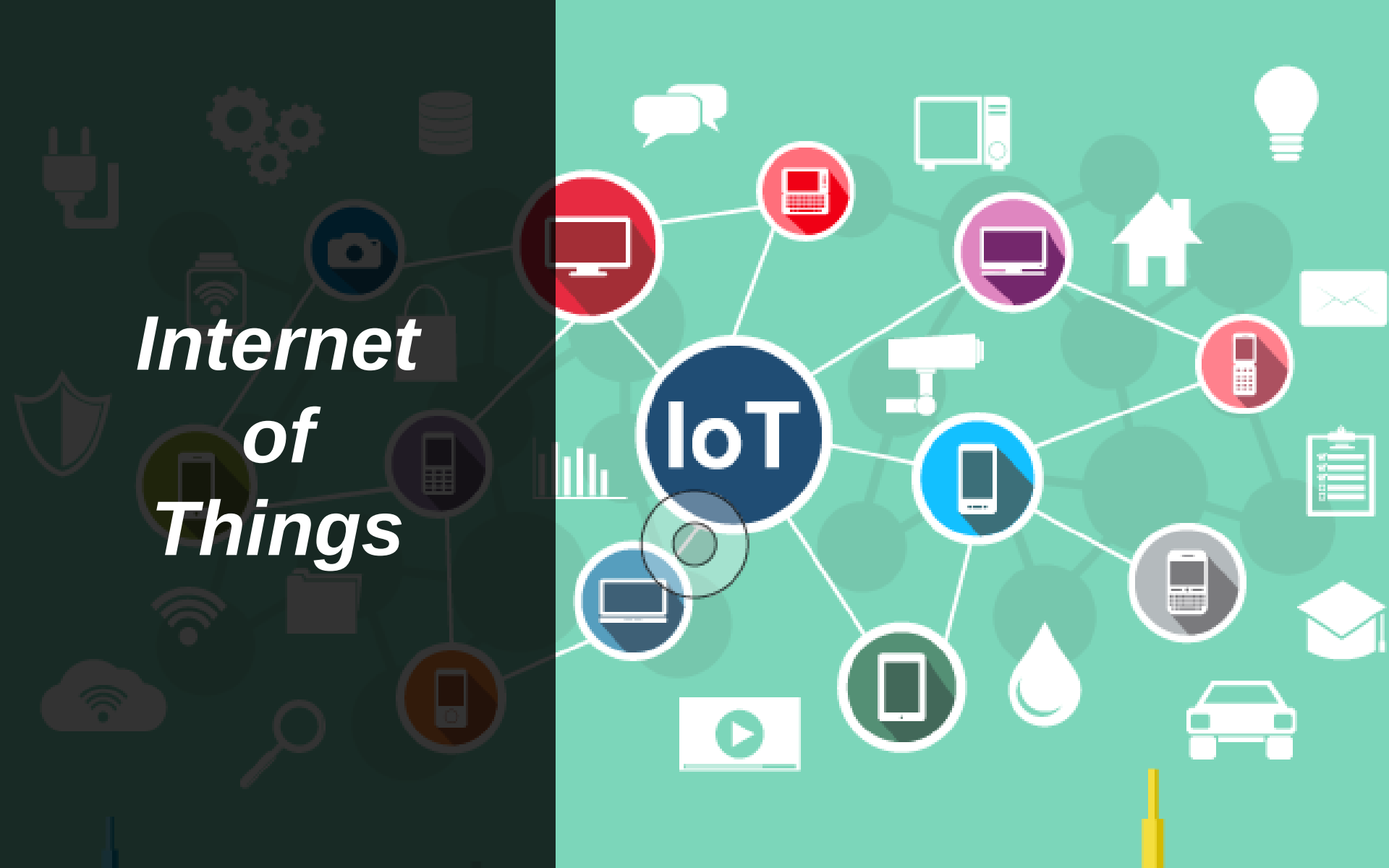
The Internet

Watch how the Internet works?



https://youtu.be/5o8CwafCxnU

Internet of Things



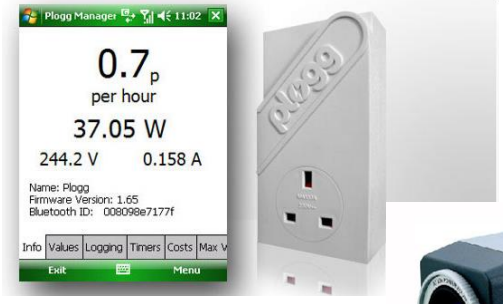
INTERNET


1 NEW DEFINITION IS ADDED ON urban
1,600+ READS ON Scribd.
13,000+ HOURS MUSIC STREAMING ON PANDORA
12,000+ NEW ADS POSTED ON craigslist
370,000+ MINUTES VOICE CALLS ON skype
98,000+ TWEETS
20,000+ NEW POSTS ON tumblr.
13,000+ iPhone APPLICATIONS DOWNLOADED
320+ NEW twitter ACCOUNTS
100+ NEW LinkedIn ACCOUNTS
1 associatedcontent NEW ARTICLE IS PUBLISHED
IN 60 SECONDS...
QUESTIONS ASKED ON THE INTERNET...
100+ Answers.com
40+ YAHOO! ANSWERS
600+ NEW VIDEOS
25+ HOURS TOTAL DURATION
70+ DOMAINS REGISTERED
60+ NEW BLOGS
1,500+ BLOG POSTS
168 MILLION EMAILS ARE SENT
694,445 SEARCH QUERIES
Google
Google Search
1,700+ Firefox DOWNLOADS
6,600+ NEW PICTURES ARE UPLOADED ON flickr
50+ WordPress DOWNLOADS
695,000+ facebook STATUS UPDATES
125+ PLUGIN DOWNLOADS
79,364 WALL POSTS
510,040 COMMENTS
GO-Globe.com

Sensor devices are becoming widely available

Overview

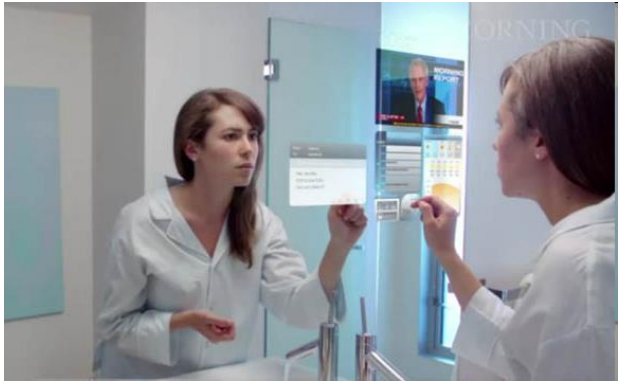
- Programmable devices
- Off-the-shelf gadgets/tools



More “Things” are being connected

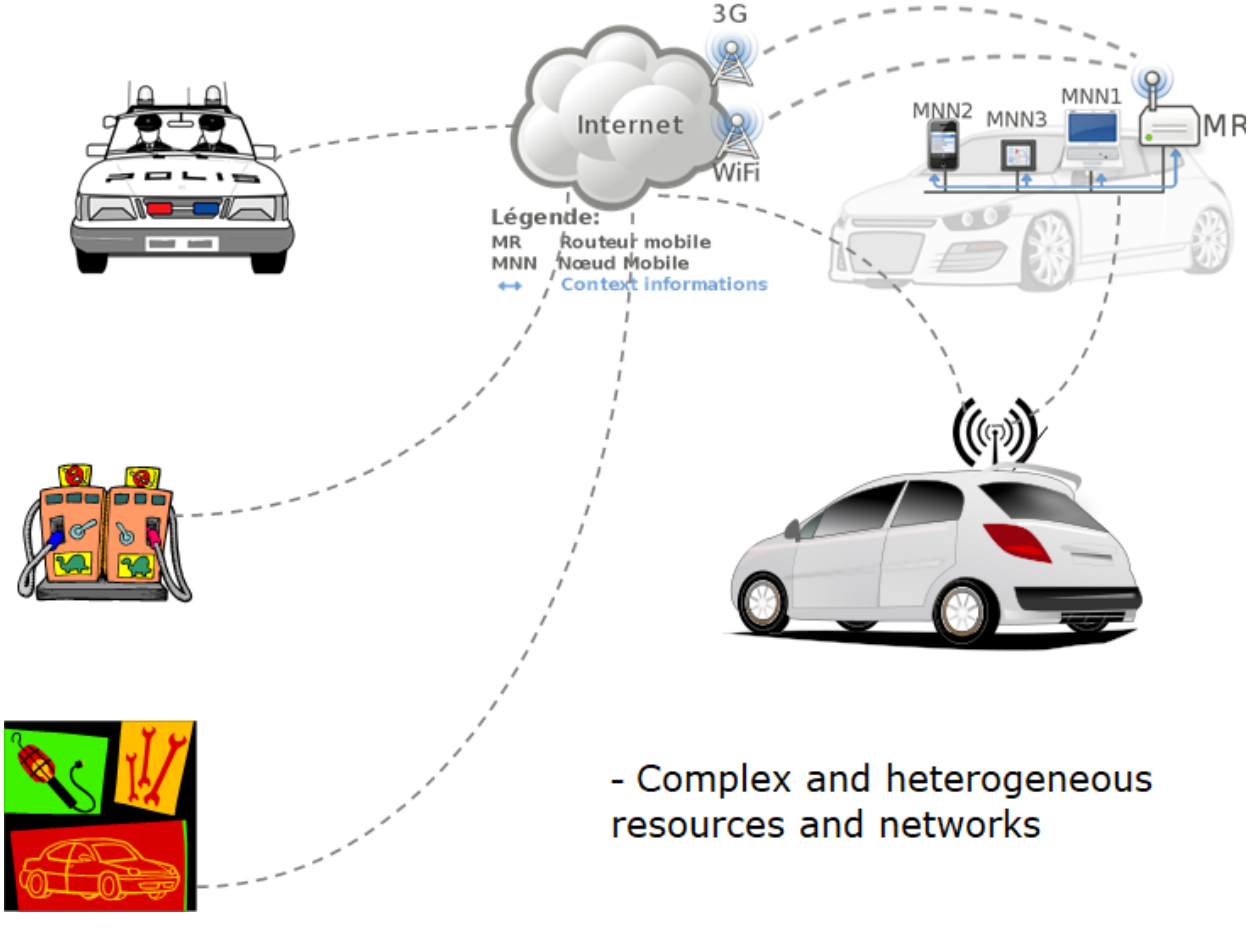
Overview

- ✓ Home/daily-life devices
- ✓ Business and
- ✓ Public infrastructure
- ✓ Health-care
- ✓ And so on



Things Connecting to Things

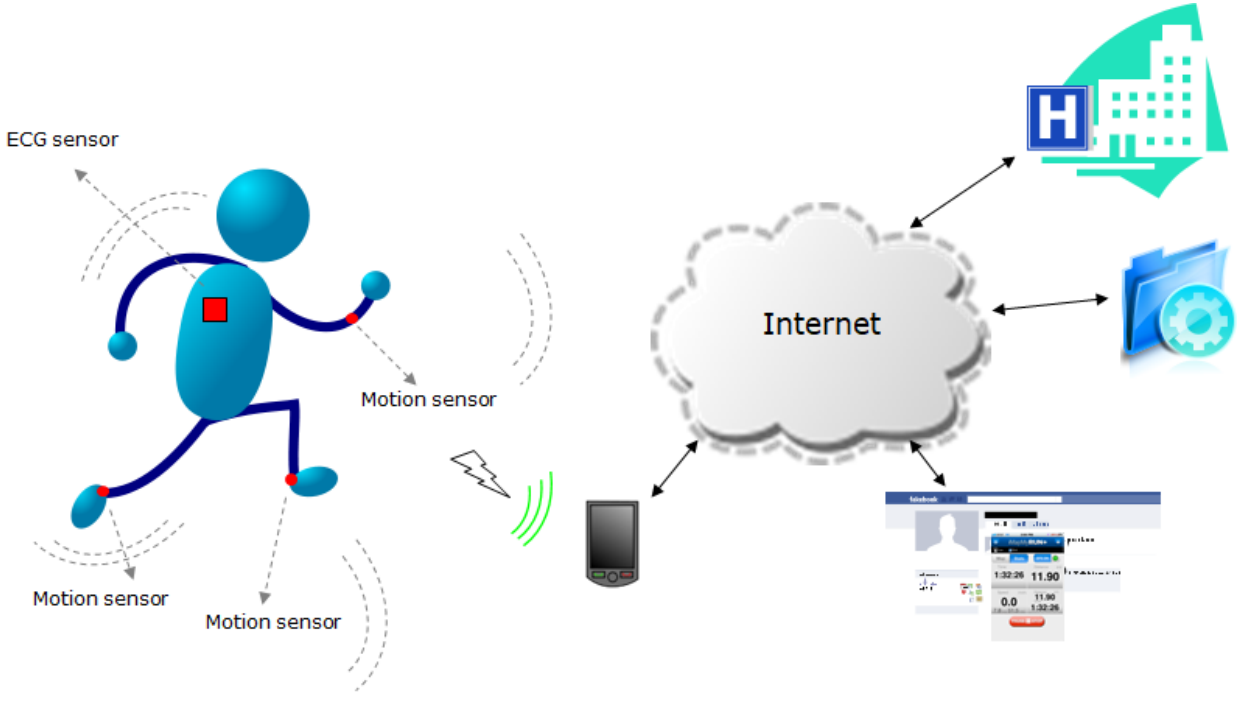
Overview



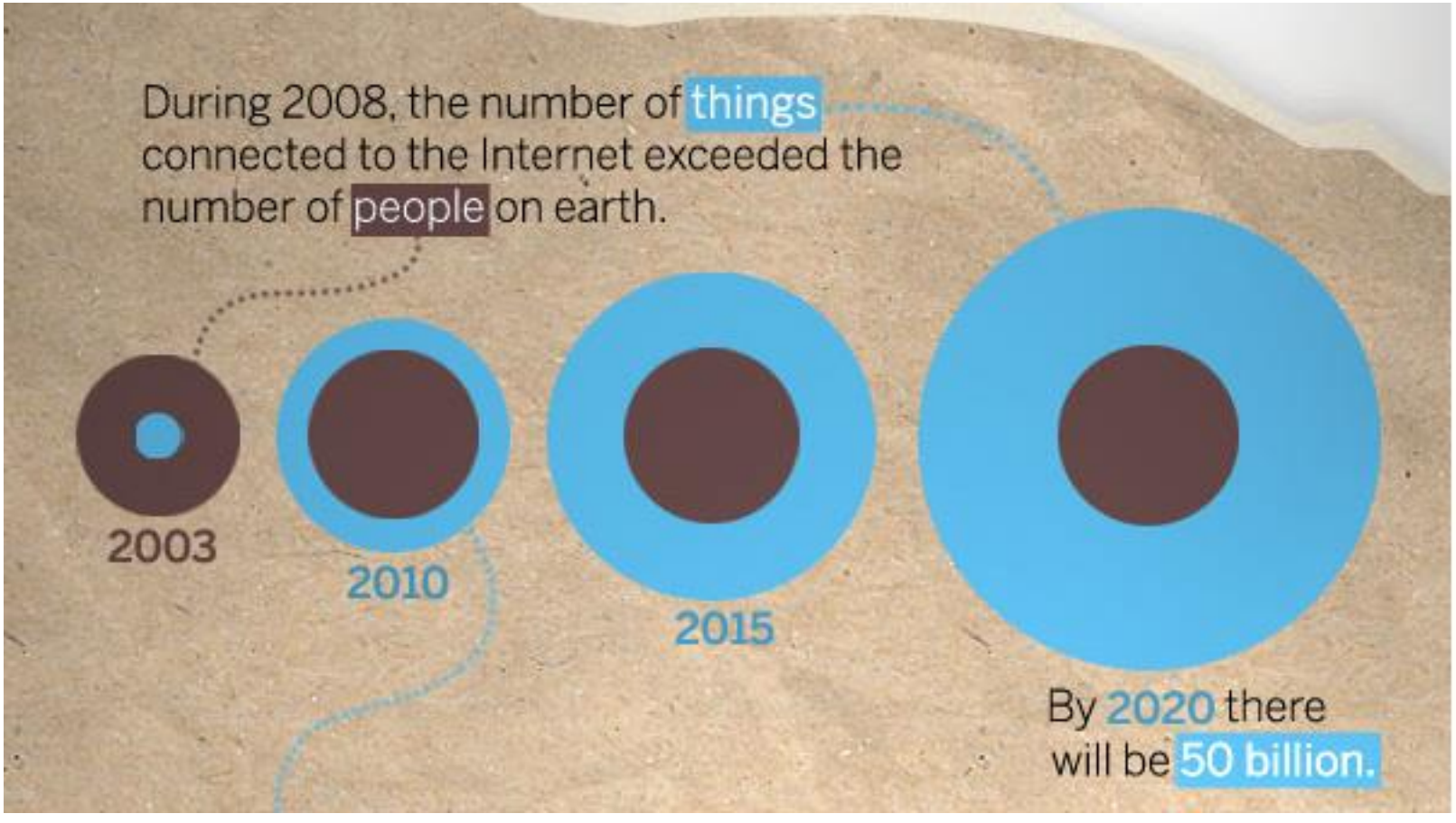
- Complex and heterogeneous resources and networks

Even People Connecting to Things

Overview



Number of Connected Things



Sources: Cisco IBSG, Jim Cicconi, AT&T , Steve Leibson, Computer History Museum, CNN, University of Michigan, Fraunhofer

Internet of Things - IoT

Definition

- Extending the current Internet and providing connection, communication, and inter-networking between devices and physical objects, or "Things," is a growing trend that is often referred to as the Internet of Things.

- “The technologies and solutions that enable integration of real world data and services into the current information networking technologies are often described under the umbrella term of the Internet of Things (IoT)”

Internet of Things - IoT

Why Should I Care?

- Emerging technologies
- Growing IoT Services and Applications in various areas including smart cities, healthcare, transport, logistics, retail, safety and security, etc.
- Business trends and new opportunities

Intelligent Systems for a More Connected World

WHAT ARE INTELLIGENT SYSTEMS?

Intelligent Systems are devices that transform how we travel, shop, make things and more.

Connected
Shares data through Internet and the cloud

Managed
Can be remotely monitored, updated and power controlled

Secured
Protects data against malware, theft and tampering

7 Connected Devices per Person
By 2020 each person will own an average of 7 connected devices[1].

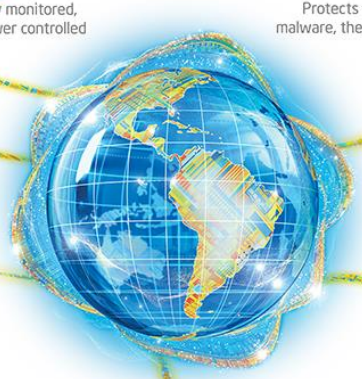
COMMUNICATIONS

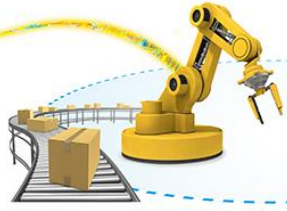
#2 Data Breach
Medical data disclosure is the second most breached source of data[2].

MEDICAL

71% of Shoppers are Multi-Channel...
based on respondents planning their 2011 holiday shopping[3].

RETAIL





30% Annual Growth Rate
Projected increase in connected machine-to-machine devices over the next 5 years[4].

INDUSTRIAL

23.6M Connected Cars

23.6 million cars will have Internet access by 2016, rising from 8.7 million in 2010[5].

VEHICLES

1) Cisco, "The Internet of Things: How the Next Evolution of the Internet Is Changing Everything", April 2011
2) Bloor Research, "Security challenges in the US healthcare sector" White Paper, December 2010, http://www.mcafee.com/us/resources/white-papers/wp-bloor-healthcare-security.pdf
3) Deloitte U.S., 2011 Annual Holiday Survey, http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/Consumer%20Business/us_retail_AnnualHolidaySurvey_2011_pr_102611.pdf
4) McKinsey Global Institute analysis, "Big data: The next frontier for innovation, competition, and productivity", June 2011)
5) Wall Street Journal, http://online.wsj.com/article/SB10001424052702304066504576349763614933844.html, estimate from research firm, Frost & Sullivan

intel
Intelligent Systems

Discussion

“Evolution of Internet Technology”

Duration: 25 Min

✓ Prepare your presentation about the topic.

✓ Present the result with Google meet.

THANK YOU

Digital Literacy