Comunicatii de Date si Sisteme Distribuite

http://www.cdsd.ro

Motto:

"There are three kinds of death in this world. There's heart death, there's brain death, and there's being off the network. "
Dr. Guy Almes http://www.educause.edu/members/guy-t-almes-0

The following are the important benefits of a computer network.

- **File sharing:** Networking of computers helps the users to share data files.
- **Hardware sharing:** Users can share devices such as printers, scanners, CD-ROM drives, hard drives etc.
- **Application sharing:** Applications can be shared over the network, and this allows to implement client/server applications
- **User communication:** Networks allow users to communicate using e-mail, newsgroups, and video conferencing etc.
- **Network gaming:** Lot of games are available, which are supports multi-users.
- **Social Networks**

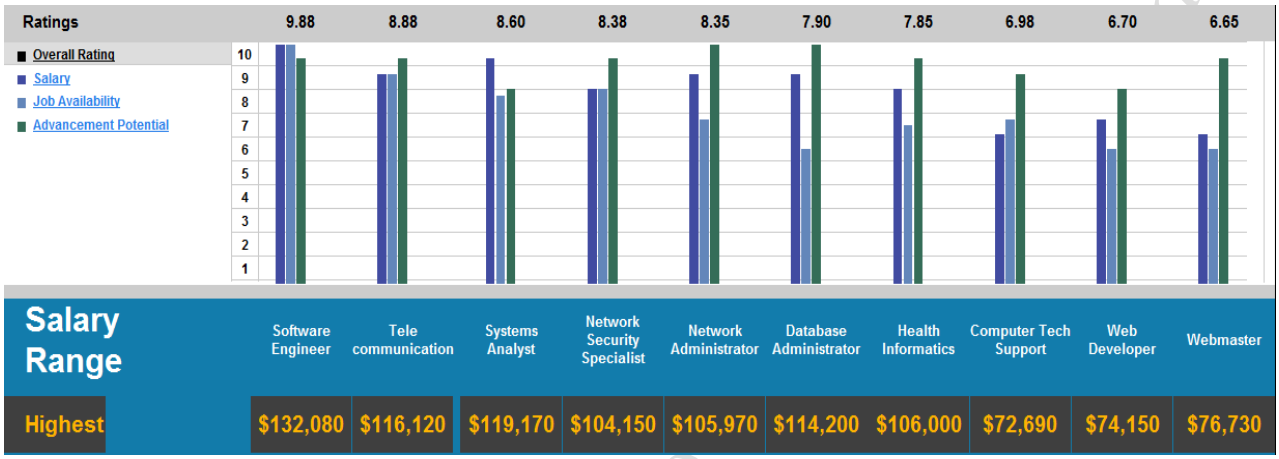
.....etc !
http://www.omnisecu.com/basic-networking/why-we-need-computer-network.htm

Google's Oregon data center (https://www.datacenterdynamics.com/news/google-opens-600m-netherlands-data-center/)

The basic job titles one sees for computer networking and networking-related positions include

- Network Administrator
- Network (Systems) Engineer
- Network (Service) Technician
- Network Programmer/Analyst
- Network/Information Systems Manager
- .....

http://compnetworking.about.com/od/itinformationtechnology/l/aa032601a.htm



Sursa: http://computer-careers-review.toptenreviews.com/

http://www.nsa.gov/careers/career_fields/compsci.shtml

Career Paths in Computer Science
Our computer scientists work in two major categories: development and support. Within these two categories, a multitude of jobs are available with NSA:

Computer Network Operations
Information Systems Security
Vulnerability Discovery
Information Assurance
Project Management
Database Management
Telecommunications
Real-time Interfaces
Information Resource Management
Object-oriented Programming
Executive Support
Graphics
Web Design

Computer Networking and Security: Career Diploma Description

http://tricksnetwork.com/networking-career/computer-networking-as-career-option/

Why Earn a Computer Networking and Security Diploma?

With information technology advancing as quickly as it is, there is a continual need for computer professionals to maintain the variety of computer and network systems that are used in corporate environments. A Computer Networking and Security Diploma is the ticket that will help grant admission to all the networking job opportunities, since employers prefer to hire applicants who have a formal education.

Career Possibilities

Occupational Outlook and Demand for Computer Networking and Security

The outlook for computer networking and security professionals is especially good, since information technology keeps expanding and an increasing number of workplaces relies heavily upon computers for daily business transactions.

Salary Information for Computer Networking and Security

According to *PayScale.com*, the starting salary for network support technicians is about $34,042 per year, and a systems administrator may start out at approximately $40,848 per year.

Degree Specifics

Computer Networking and Security Coursework Requirements

Students enrolled in a computer networking and security diploma program acquire the technical skills and knowledge to assume positions in network installation, network security or network support on graduation. Some of the courses that may be required are as follows:

- Computer Software Applications
- Novell NetWare Administration

- Linux Operating Systems
- TCP/IP
- Introduction to LAN/WAN Networks
- Techniques of Computer Forensics

Computer Networking and Security Skills to Learn

To become an IT professional, the student must have an analytical, detail-oriented, hands-on attitude. Once the Computer Networking and Security Diploma program has been completed, the student should possess the skills to:

- Protect network information systems from outside intrusion
- Ensure compatibility and proper configuration of all computer and network components
- Determine future needs for networks and provide recommendations for network improvements

Computer Networking As Career Option | Computer Networking Jobs

by Tricks Network 04 July 2012 Networking Career No Comment
Networking seems just a concept of connecting world together, but if we go exploring it there are hundreds of job profiles in networking. As we go from user end to core system we can classify them in different ways.

Computer Networking As Career Option

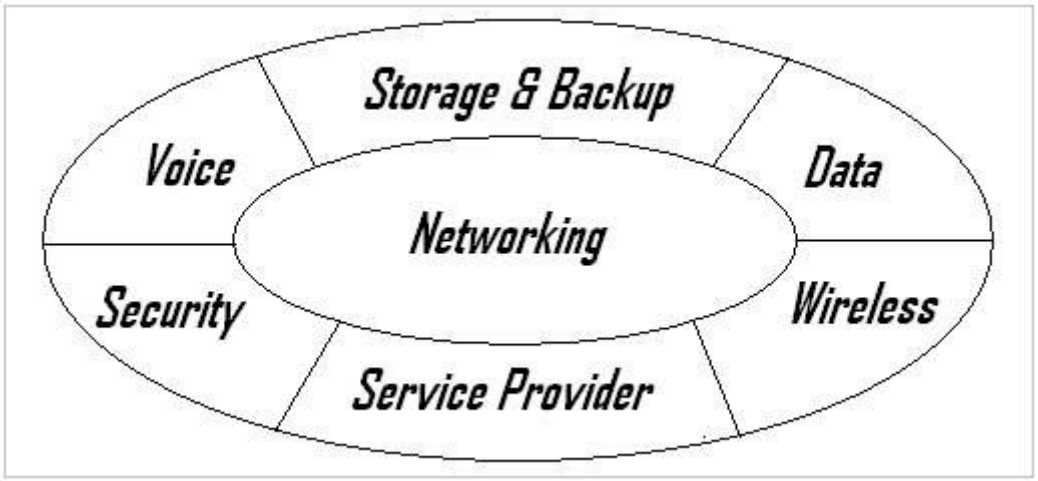
http://tricksnetwork.com/networking-career/computer-networking-as-career-option/

Job Profiles With Computer Networking!!

When we think of computers, we think of its usage for various applications. There are many applications in computer which need communications with peers like Outlook-Email Access, Internet access, Server-Data Manipulation.
To make sure all these thing are functional there is one profile which comes under desktop Support even we can call it as system engineer. He is responsible for User database (AD-Active directory) management, Authentication, Email configurations, Server Management and many more. Certification like MCSE can be done to excel in this field.

When we think one step ahead of computers in networking perspective then we reach to connectivity. How these computers are connected & located in the network, (IP)Addressing - Transport system. Here comes the networking devices like Hub, Switches, Routers, and other devices.
So these devices needs to be configured, maintained, monitored for uninterrupted connectivity. This things create other stream of job profiles, we collectively call it as Network Engineer. Well before this there is one more factor of computer assembly, software & OS installation, troubleshooting, which also has a different job category, comes under Hardware Networking; Where you can open a cyber cafe with all computer related services and do a business.

Computer Networking Jobs' Profiles Categorization

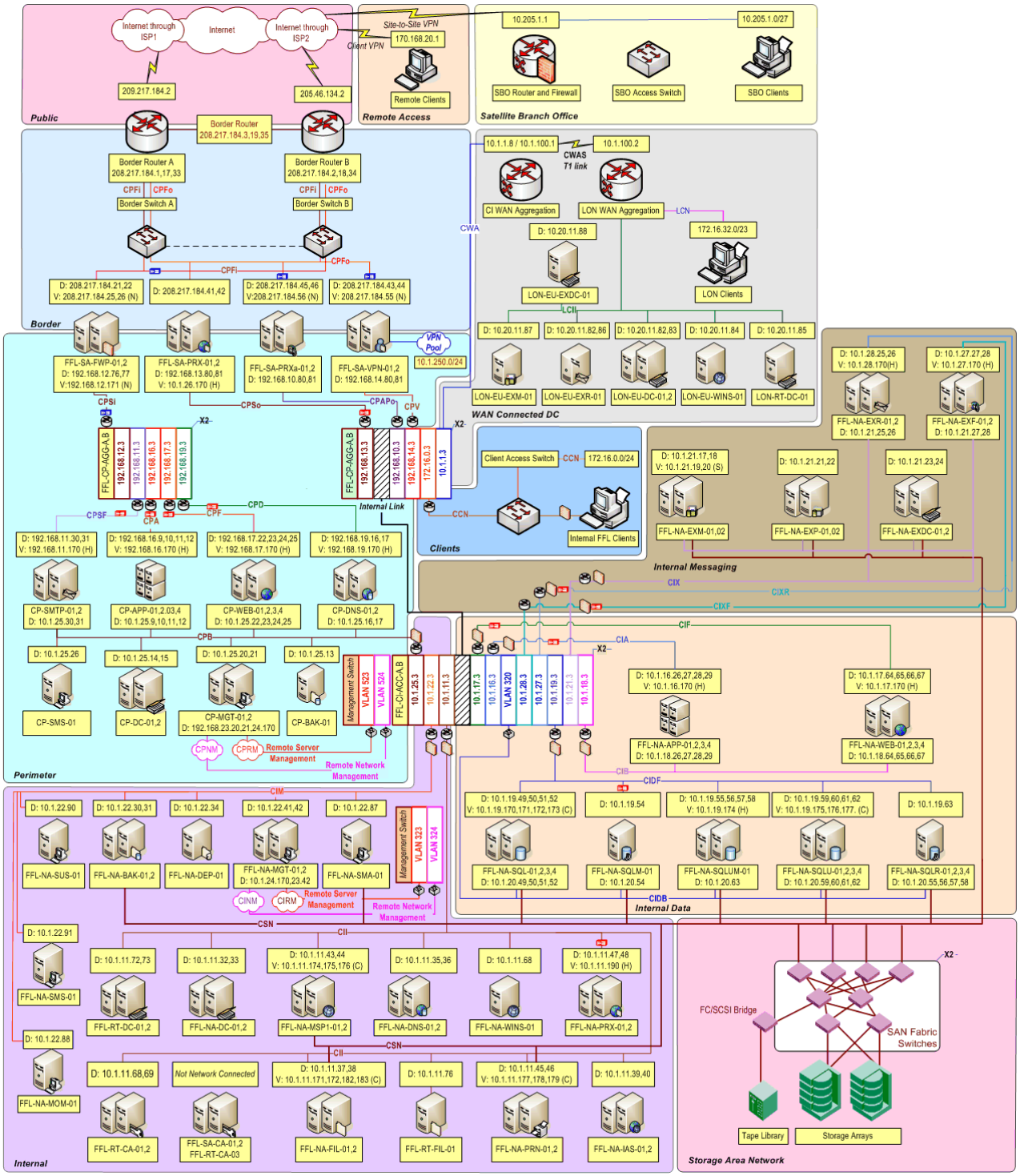


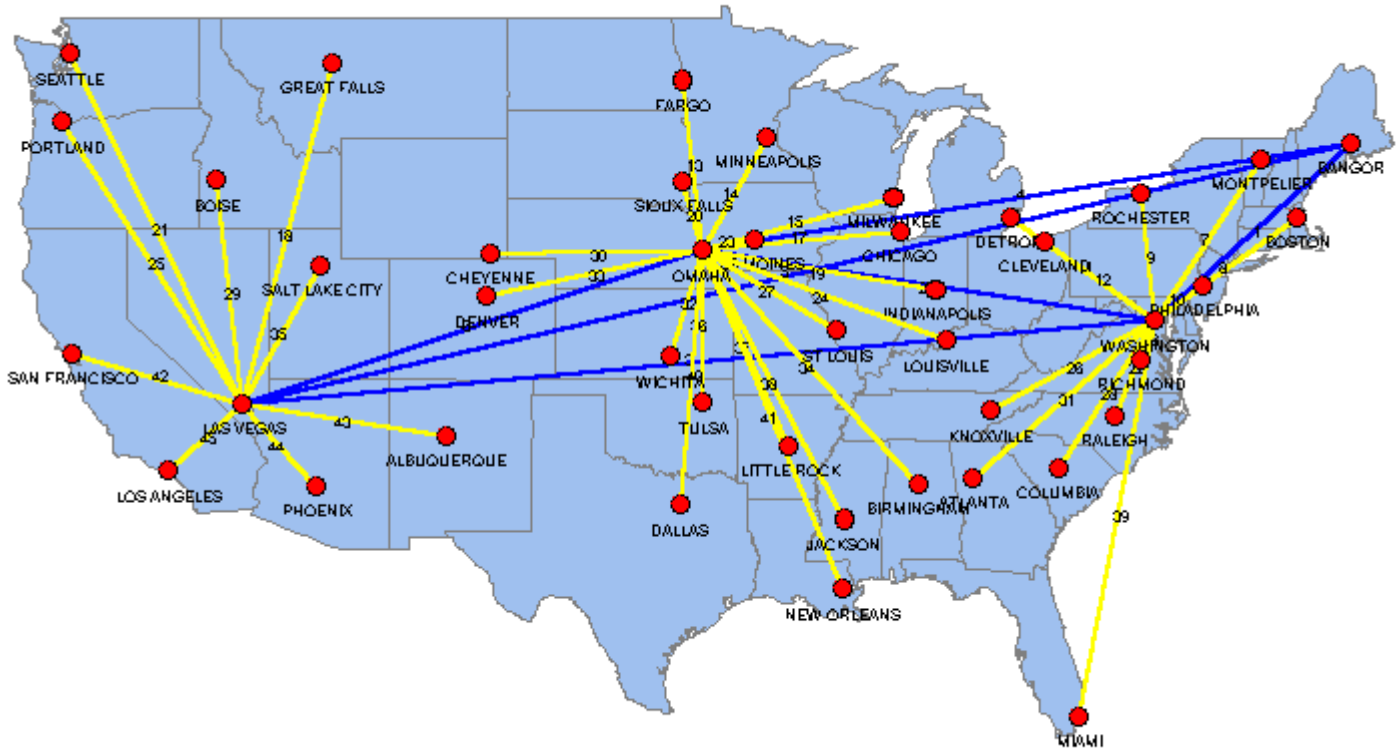
According to technologies we divide networking in categories Like

- **Data**
- **Voice**
- **Security**
- **Wireless**

- **Storage & Backup**
- Service Provider

Ex:





Etc.....

Technology Wise Work phases Of Networking Divided In Following Parts

For Above technologies for any particular project, according to work phases networking is divided in following parts

Presales

This is like Pre (before work) Sales, which includes primarily designing of a project to arrive at a rough estimate which can be used for bidding to win a project among competitors. This designing can range from high level to micro levels too, It includes gathering client requirements and mapping to technical terms which is explained further.

Design & Planing

Once project won or to be owned then we need to do designing & planing accordingly. We need a plan about how to do implement & execute things one by one, manpower & efforts needed for it so as to keep money factor in control. This one can be a totally different profile which comes under presales category.
It takes lot of efforts like going through RFIs (Request for information) & RFPs (Request for proposals), Data analysis & extraction, requirement mapping & creating a bill of material & man hours to implement the project.

Implementation

Once we are done with presales stuff of planning & designing, its time to implement the things as planned.Whiles infrastructure is under construction, which first comes is structured cabling, which includes cable laying & organizing with a proper manpower in place.
Then its time for implementation of racks/cabinets which withholds the patch panels, active equipments like switches, routers, security devices & others. Then these devices needs to be configured in order to get the connectivity. This things are covered under a job profile called implementation.

Monitoring

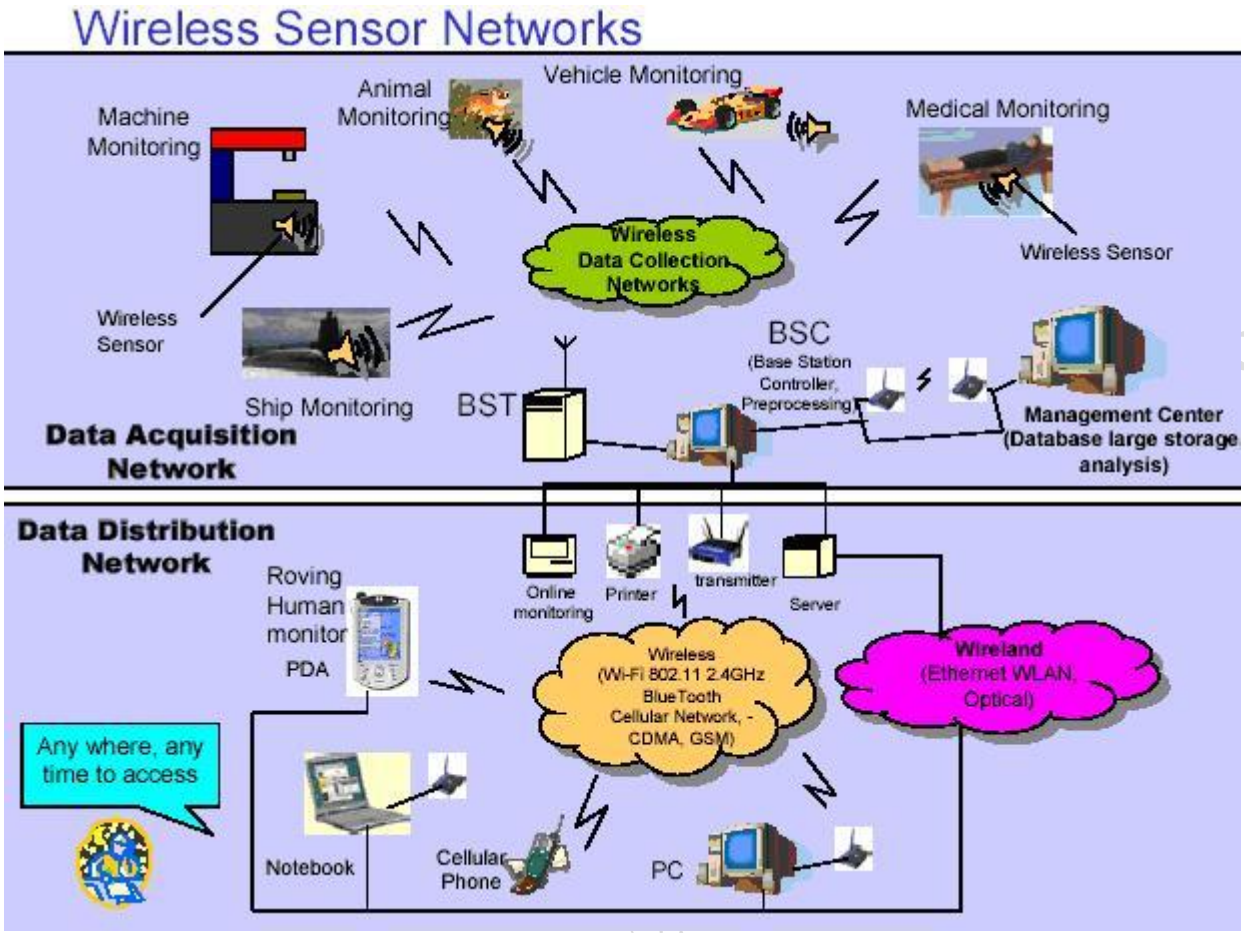
Things implemented needs monitoring so as to know if its functioning smoothly with desired performance about speed, quality etc. It monitors the crtical nodes which in case fails brings whole network down or cause a critical damage to enterprise.
It also monitors the memory utilization to keep up with maximum performance. There are network monitoring tools like whats-up-gold, Solar-winds etc. This is one of the job profiles which includes watching over network performance & in case some mishap occurs reporting to concerned facility so as getting recovered.

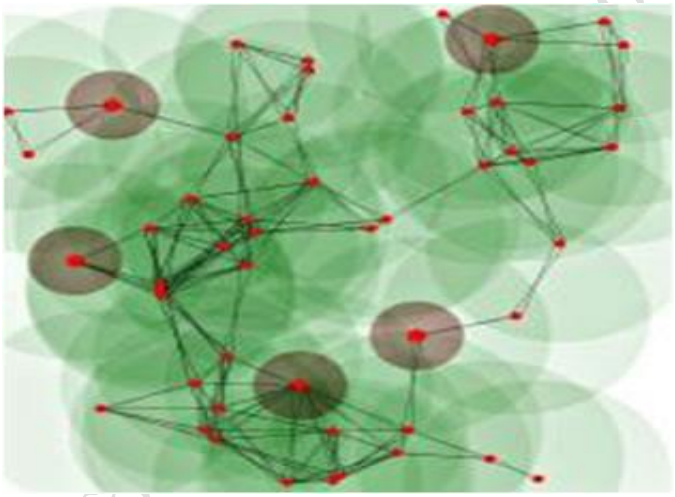
Maintenance & Troubleshooting

Once things are implemented properly with all precautions, it needs a maintenance factor as well, which covers the things those are not considered while implementing, like things which are bound to change for example bandwidth calculations, link failures,security threats, slow speed, redundancy& all.
In summary anything that happens in the network which is not supposed to, troubleshoot it & get it recovered to previous state of desired performance.

Consulting

This is completely distinguished profile in networking. It can just do its part in presales like gathering customer requirement and providing them with a most efficient solution for their network. It also can be used to do audit of a particular network to get a security vulnerability & its performance.
http://tricksnetwork.com/networking-career/computer-networking-as-career-option/



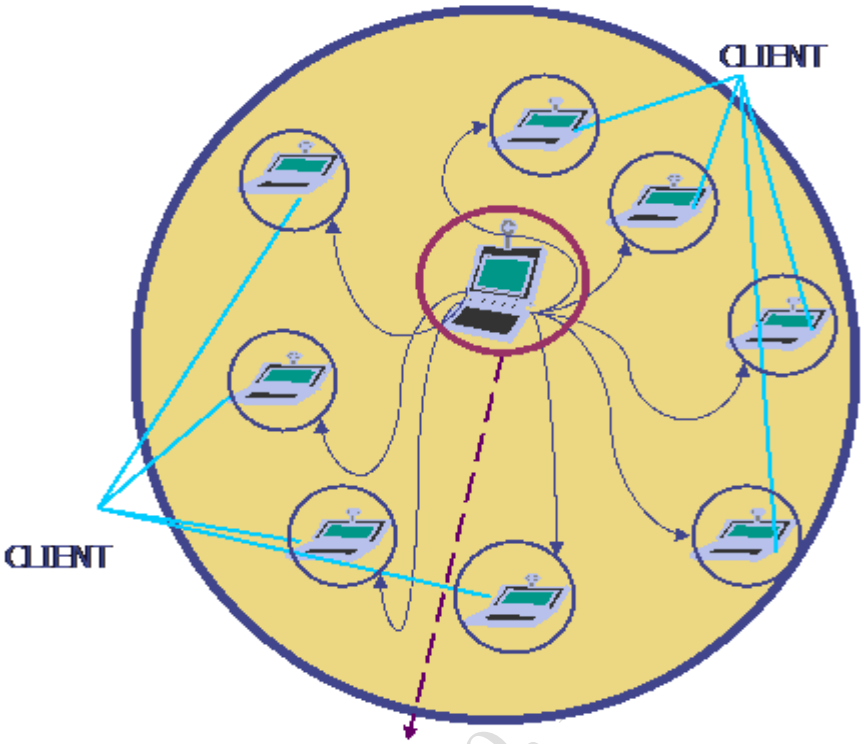


In recent years, sensor networks have emerged as an important class of networks for many military and commercial applications. A sensor network is a collection of wireless communication nodes. Each node is capable of sensing the environment and communicating the measured data to the neighboring nodes, and eventually to the external users. The majority of sensor networks are designed to collect data or to perform anomaly detection. In this research, we study the algorithms and coding techniques for energy efficiency, robustness, accurate localization and collection in sensor networks.

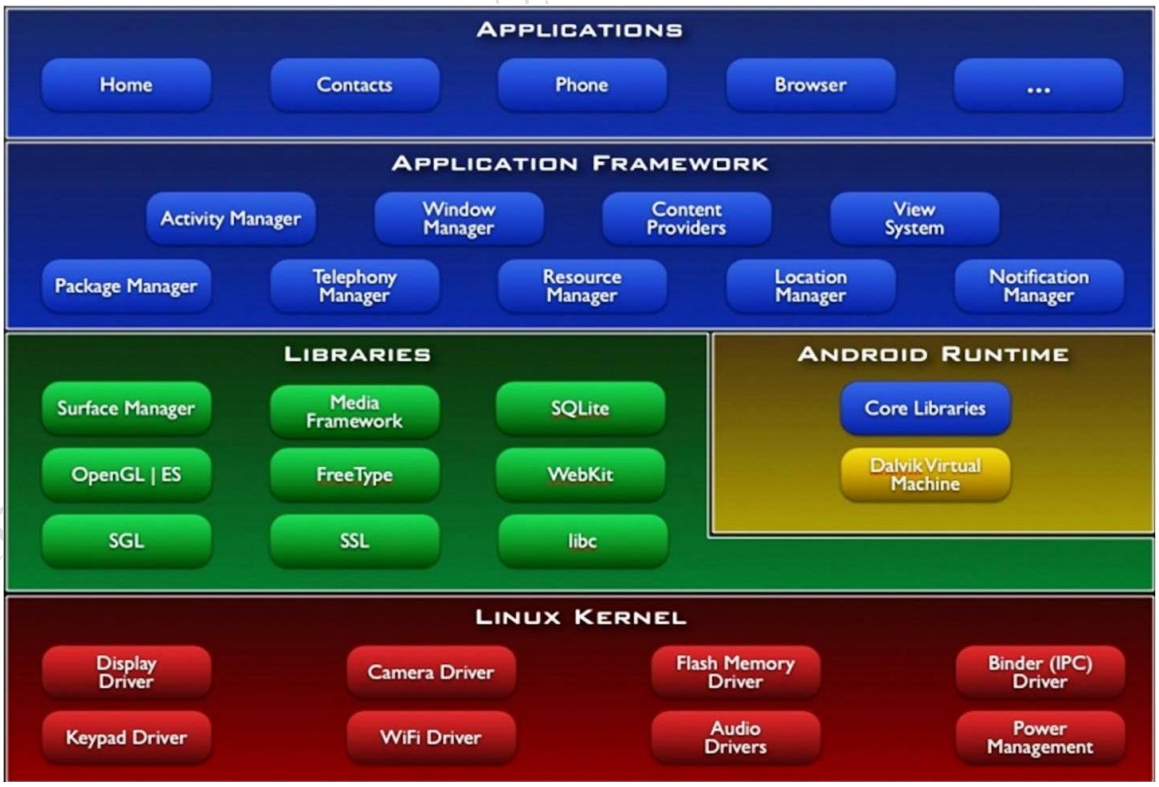
http://www.monash.edu.au/eresearch/showcase/wireless-security.html

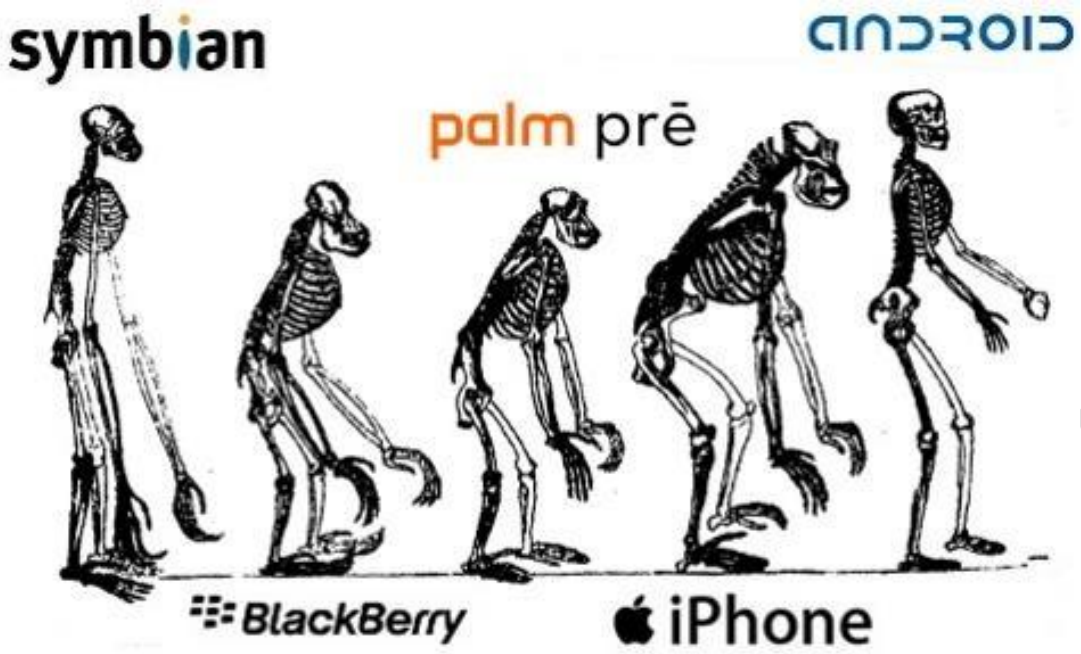
Ex:

- **AdHoc Network**

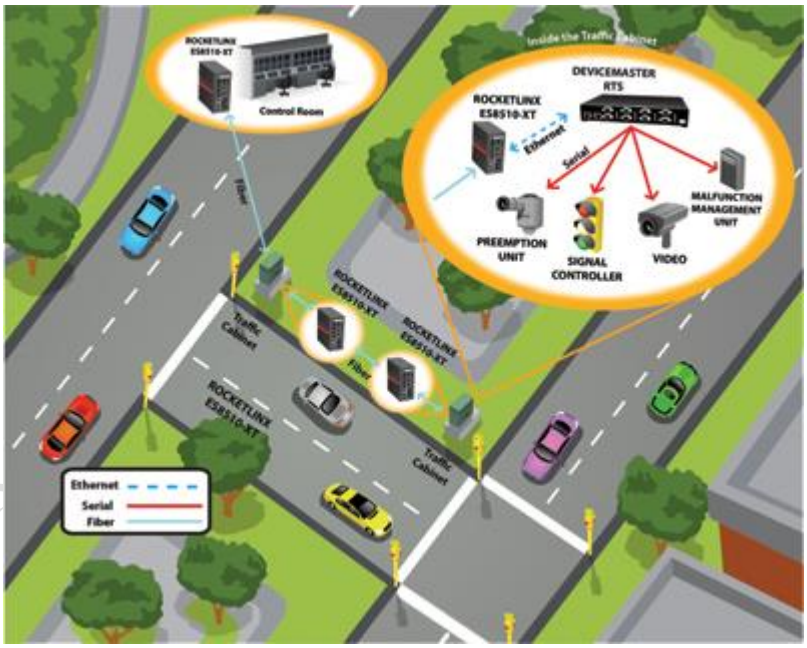


http://careermania55.koolcentre.in/2012/09/faadooengineerscom-mobile-ad-hoc.html





Traffic Intersection Networking Solution



Sursa: http://www.comtrol.com/pub/en/RocketLinx-ES8510-XT-Provides-a-Reliable-Networking-Solution-for-Traffic-Intersections

KEY FEATURES AND BENEFITS ::

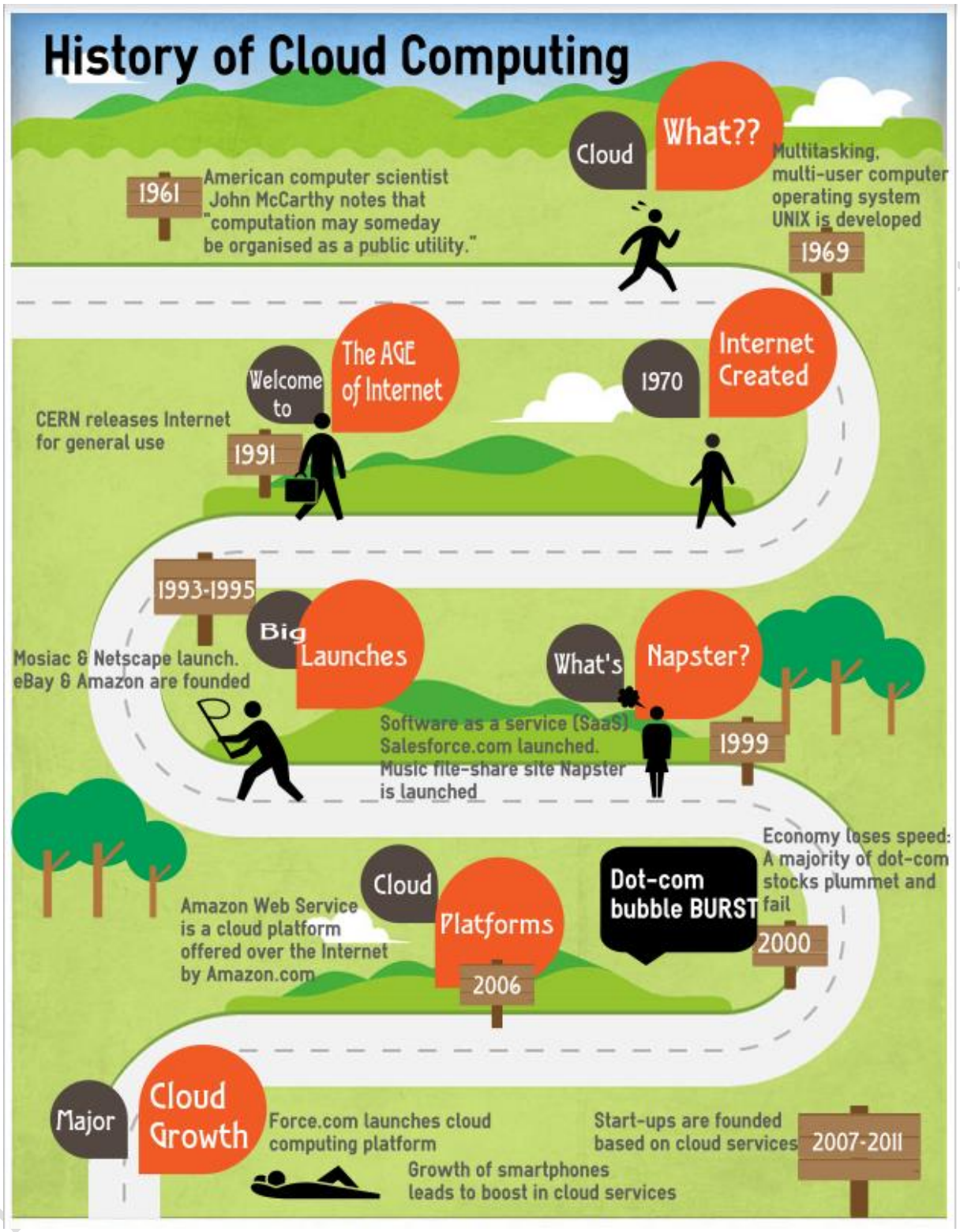
- Multiple redundant ring (recovery time <5ms)
- 7 10/100BASE-TX ports and 3 Gigabit RJ45/SFP combo ports (10/100/1000BASE-TX, 100BASE-FX,1000BASE-X)
- 32Gbps non-blocking, 8K MAC address table
- VLAN, GVRP, QoS, IGMP snooping V1/V2/V3, rate control, port trunking, LACP, online multi-port mirroring
- Management via console CLI , Web, SNMP V1/V2c/V3, RMON, HTTPS, SSH and NetVision
- Advanced security feature supports IP security, port security, DHCP server, IP and MAC binding, 802.1x network access control
- Event notification by email, SNMP trap, syslog, digital input and relay output
- -40° to +74°C operating temperature for extreme environments
- Rigid aluminum IP31 housing, excellent heat dispersion, redundant power, DIN rail/wall mount installation
- NEMA TS2 Compliant

Cloud Computing

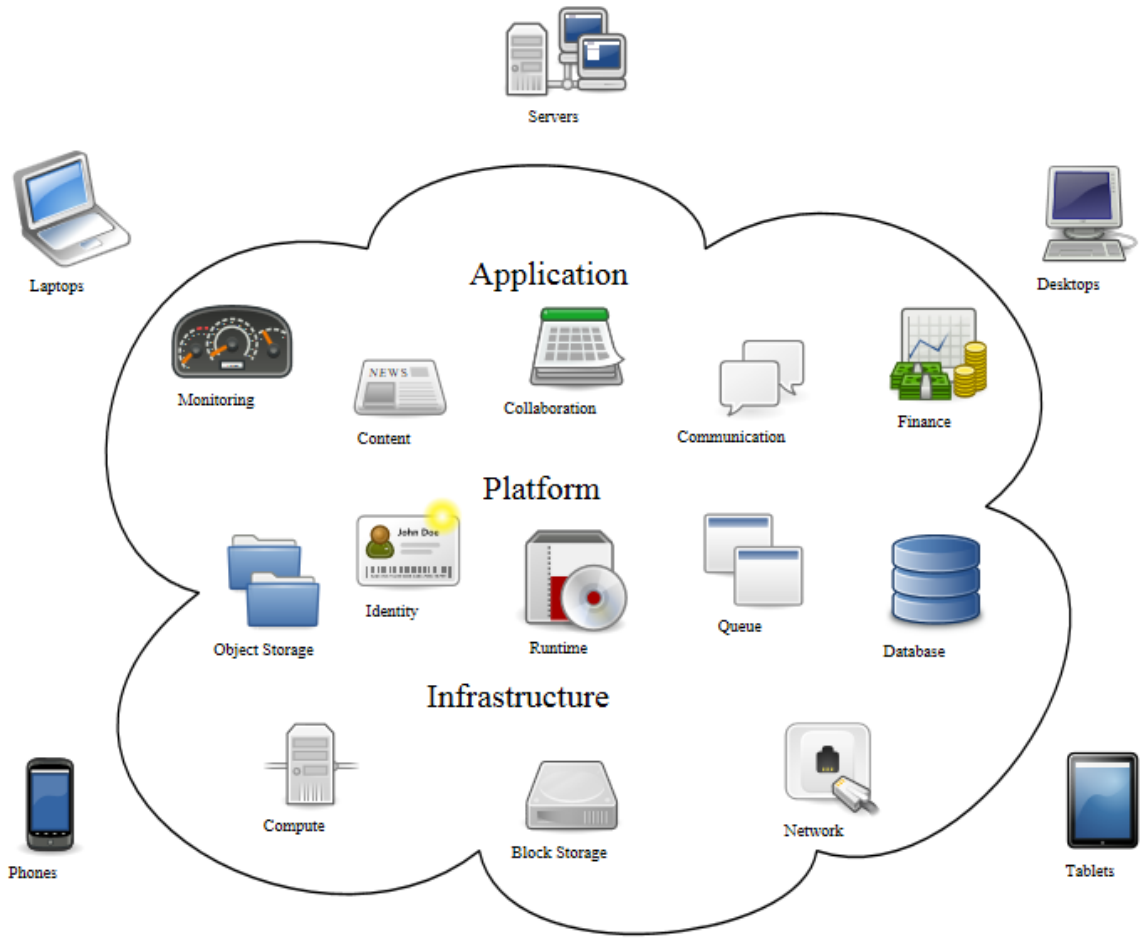
Cloud Computing

Having secure access to all your applications and data from any network device

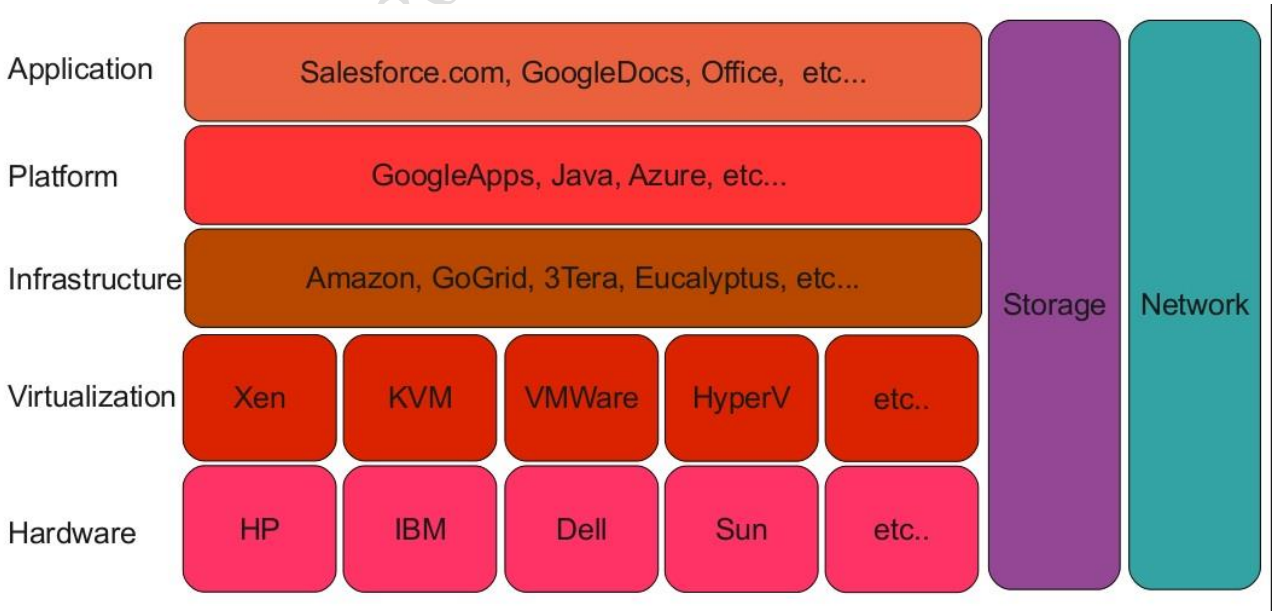
Sursa: http://thehealthcareblog.com/blog/tag/cloud-computing/



Sursa: http://inbound.nowitworks.com/Portals/174836/images/Screen%20shot%202012-12-27%20at%204.18.29%20PM.png



Cloud Computing



Sursa: http://thevarguy.com/site-files/thevarguy.com/files/archive/thevarguy.com/wp-content/uploads/2009/10/cloud-components.jpg

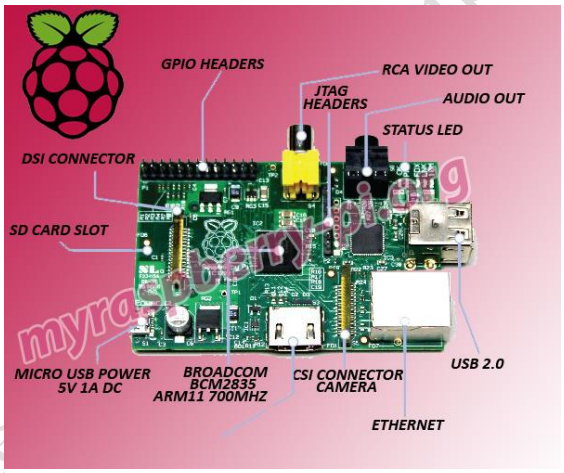
System-on-a-Chip (SoC)

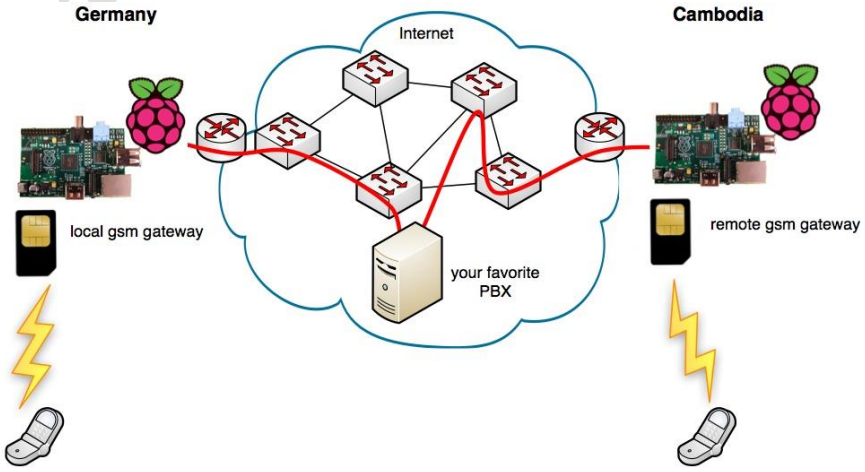
Sursa: http://whatis.techtarget.com/definition/system-on-a-chip-SoC
System-on-a-chip (SoC) technology is the packaging of all the necessary electronic circuits and parts for a "system" (such as a cell phone or digital camera) on a single integrated circuit (IC), generally known as a microchip . For example, a system-on-a-chip for a sound-detecting device might include an audio receiver, an analog-to-digital converter (ADC), a microprocessor , necessary memory , and the input/output logic control for a user - all on a single microchip.

System-on-a-chip technology is used in small, increasingly complex consumer electronic devices. Some such devices have more processing power and memory than a typical 10-year-old desktop computer. In the future, SoC-equipped nanorobot s (robots of microscopic dimensions) might act as programmable antibodies to fend off previously incurable diseases. SoC video devices might be embedded in the brains of blind people, allowing them to see; SoC audio devices might allow deaf people to hear. Handheld computers with small whip antennas might someday be capable of browsing the Internet at megabit-per-second speeds from any point on the surface of the earth.

SoC is evolving along with other technologies such as silicon-on-insulator (SOI), which can provide increased clock speed s while reducing the power consumed by a microchip.

Exemple:
http://www.raspberrypi.org/





Intel Galileo

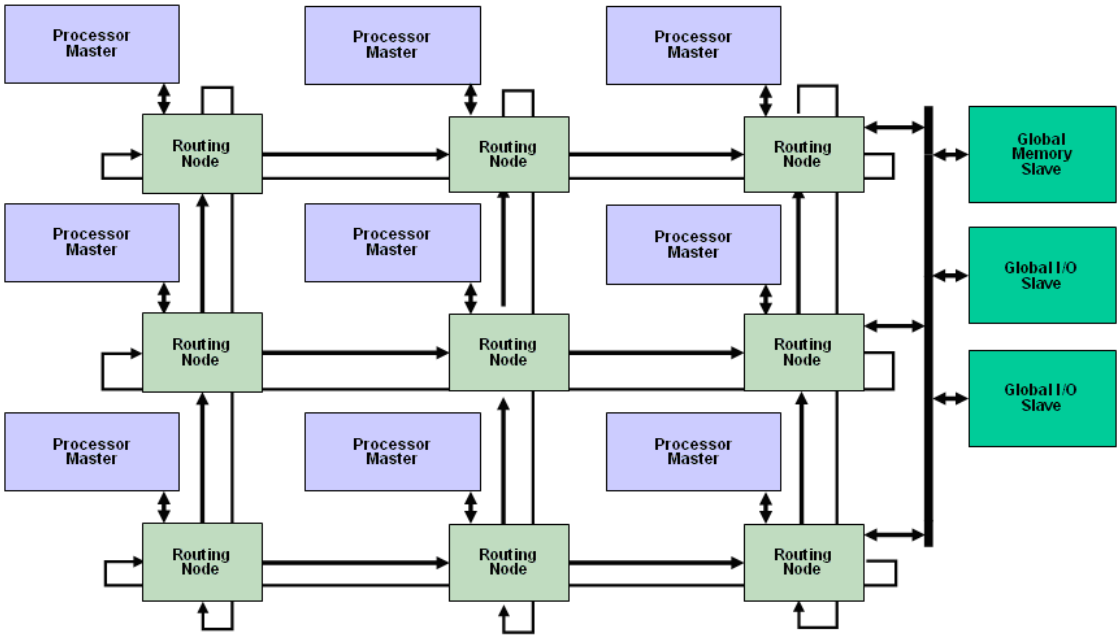
http://www.intel.com/content/www/us/en/do-it-yourself/galileo-maker-quark-board.html

Network on Chip (SoC)

- According to Wikipedia:
  - *"Network-on-a-chip (NoC) is a new paradigm for System-on-Chip (SoC) design. NoC based-systems accommodate multiple asynchronous clocking that many of today's complex SoC designs use. The NoC solution brings a networking method to on-chip communications and claims roughly a threefold performance increase over conventional bus systems."*

Sursa:http://www.site.uottawa.ca/~mbolic/ceg4131/CEG4136%20Network%20on%20chip.ppt#261,13,What are NoC's?

Exemplu:



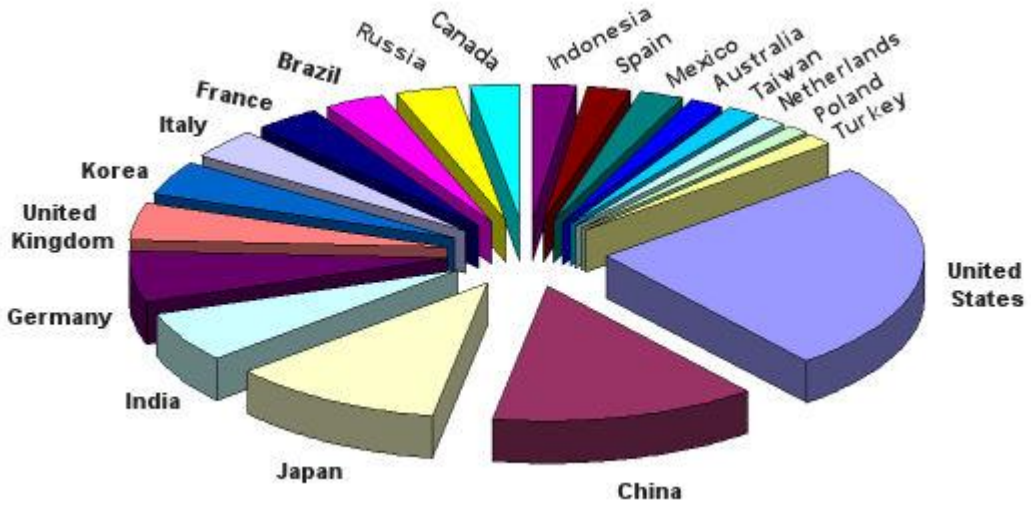
Servicii Internet

a. Despre Internet

Definition: The term **Internet** today refers to the global network of public computers running Internet Protocol. The Internet supports the public WWW and many special-purpose client/server software systems. Internet technology also supports many private corporate intranets and private home LANs.

The term "Internet" was originally coined in the 1970s. At that time, only the very meager beginnings of a public global network were in place. Throughout the 1970s, 1980s, and 1990s, a number of smaller national networks like ARPANET, BITNET, CSNET, and NSFNET evolved, merged, or dissolved, then finally joined with non-US networks to form the global Internet.

Sursa: http://compnetworking.about.com/od/internetaccessbestuses/l/bldef_internet.htm



b. Intrebuintarea internetului a fost pusa sub microscop, cel putin pentru anul 2011, si se pare ca mai mult de o treime din populatia globului este online. In medie, 2,1 Miliarde de utilizatori diferiti au folosit internetul in 2011 si aproximativ 555 milioane de site-uri au fost “numarate” de catre Pingdom anul trecut. Exista o serie de cifre interesante oferite de compania de statistica pe care le vom enumera mai jos.

E-mail

- **3,146 Miliarde** de conturi de e-mail
- **27,6%** reprezinta popularitatea celui mai folosit client de e-mail **Microsoft Outlook**
- **19%** este procentul de e-mail-uri de tip **SPAM** livrate catre conturile de mail ale companiilor in ciuda filtrelor de SPAM
- **112** de e-mail-uri trimise si/sau primite in medie de catre un utilizator business
- **71%** este procentul de e-mailuri de tip **SPAM** trimise in toata lumea
- **360 milioane** de utilizatori detine **Hotmail** (cel mai mare serviciu de e-mail din lume)
- **44,25** dolari este profitul returnat pentru 1 dolar investit in campanii online de e-mail
- **40** de ani au trecut de la trimiterea primului e-mail in 1971

Website-uri

- **555** milioane de website-uri numarate in 2011
- **300** milioane de website-uri create doar in 2011

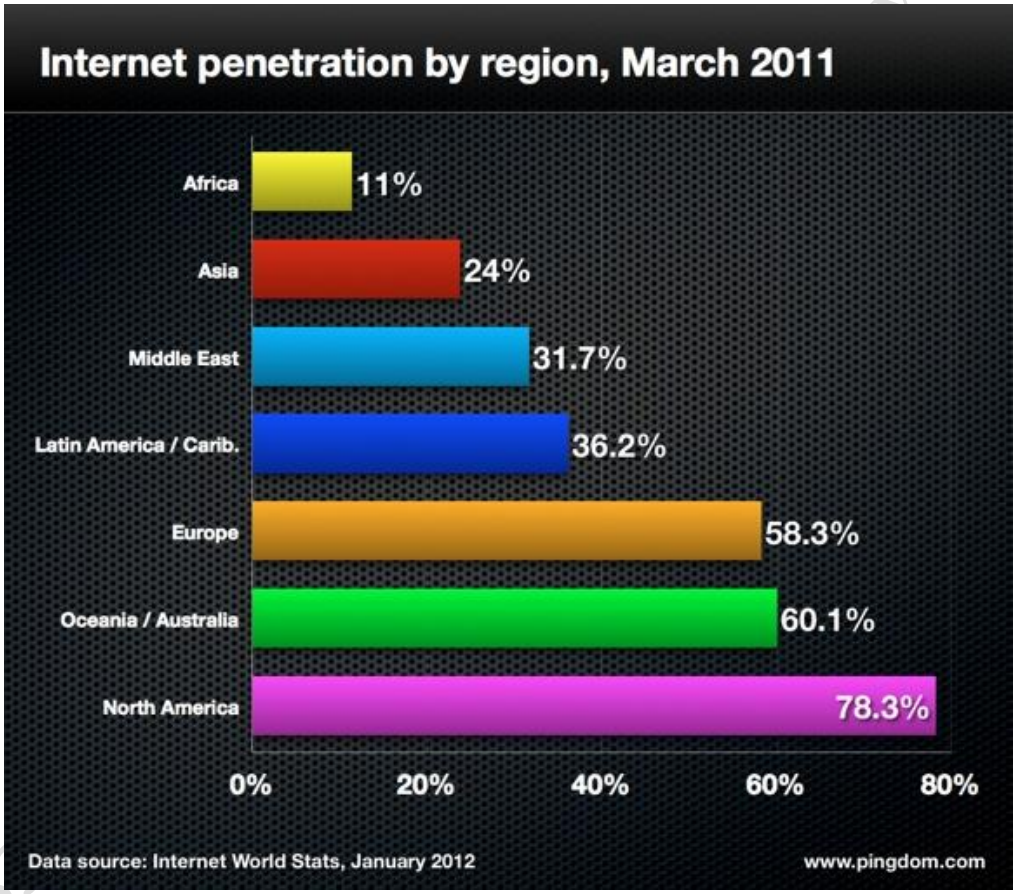
Nume de domenii

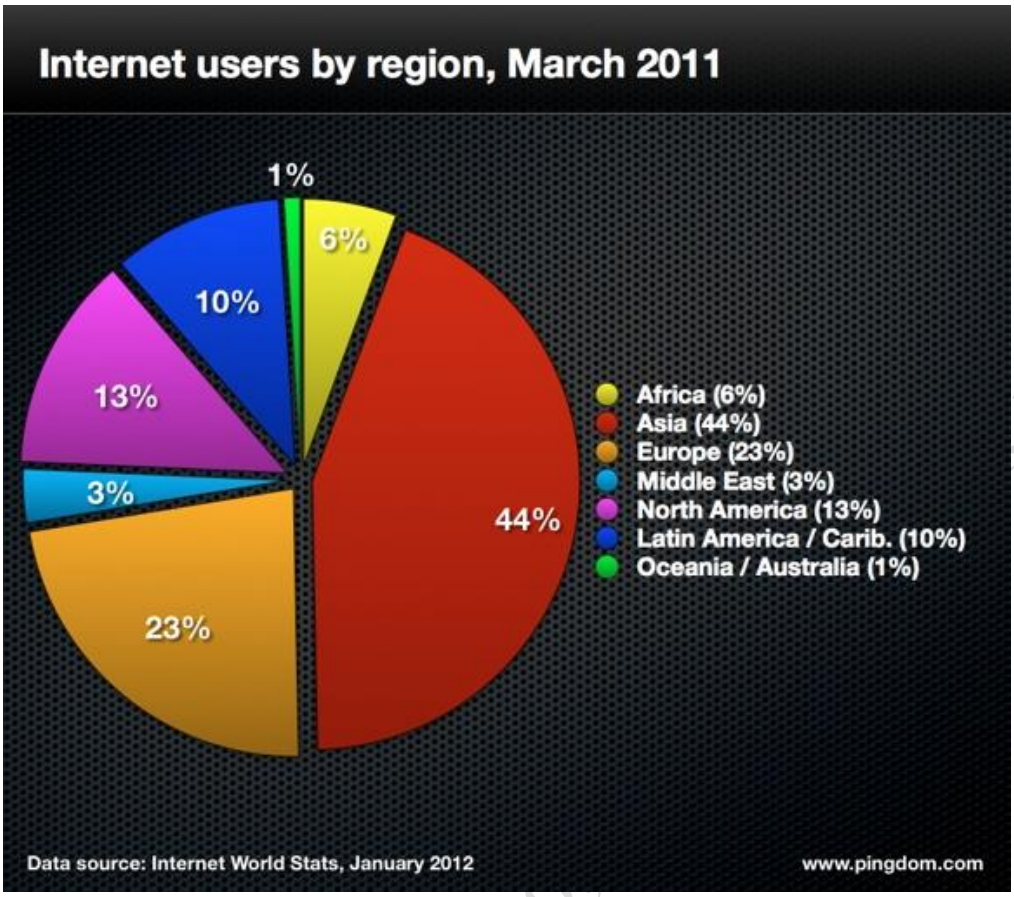
- **95,5** milioane de domenii **.com** la sfarsitul lui 2011
- **13,8** milioane de domenii **.net** la sfarsitul lui 2011
- **9,3** milioane de domenii **.org** la sfarsitul lui 2011
- **7,6** milioane de domenii **.info** la sfarsitul lui 2011

- **220** milioane de domenii inregistrate in 2011
- **2,6** milioane de dolari a fost pretul domeniului **social.com** achizitionat in 2011

Utilizatori Internet

- **2,1** miliarde de utilizatori de internet in toata lumea
- **922,2** milioane de utilizatori de internet in **Asia**
- **476,2** milioane de utilizatori de internet in **Europa**
- **271, 1** milioane de utilizatori internet in **America de Nord**
- **215,9** milioane de utilizatori internet in **America Latina/Caraibe**
- **118,6** milioane de utilizatori internet in **Africa**
- **68,6** milioane de utilizatori internet in **orientul Mijlociu**
- **21, 3** milioane de utilizatori internet in **Oceania/Australia**
- **45%** este procentul de utilizatori internet sub 25 ani
- **485** milioane de utilizatori internet in **China**
- **36,3%** este penetrarea utilizatorilor de internet in **China**
- **591** milioane de abonamente internet fixe/broadband in toata lumea

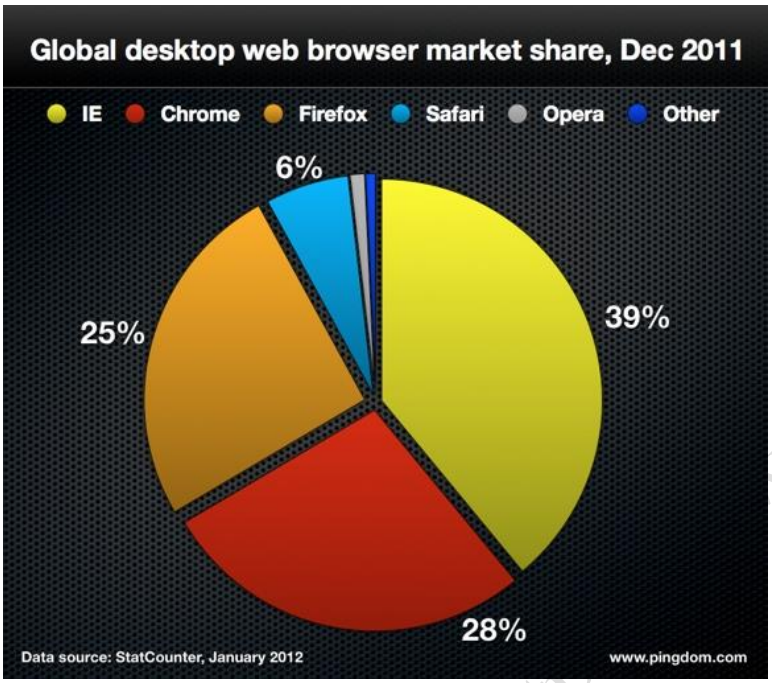




Social Media

- **800+** milioane de utilizatori **Facebook** pana la sfarsitul lui 2011
- **200** de milioane de conturi **Facebook** create doar in 2011
- **350** milioane de utilizatori **Facebook** ce se logheaza de pe dispozitive mobile
- **225** milioane de conturi **Twitter**
- **100** de milioane de utilizatori activi **Twitter** in 2011
- **18,1** milioane de persoane urmaresc contul de **Twitter** al lui **Lady Gaga**
- **250** milioane de Tweet-uri pe zi
- cel mai folosit hashtag in 2011 a fost **#egypt**
- **8,868** de Tweet-uri pe secunda in medie
- **70** de milioane de blog-uri **WordPress** la sfarsitul anului 2011
- **2,6** miliarde de conturi de IM (mesagerie instant)
- **2,4** miliarde de conturi social media in toata lumea

Browsere Web



Telefonie Mobila

- **1,2** miliarde de subscriptii mobile broadband in 2011
- **5,9** miliarde de subscriptii mobile estimate in 2011
- **85%** din terminalele mobile livrate in 2011 includ un browser web
- **88%** reprezinta procentul de trafic pe segmentul pe tablete facut de iPad

Video

- **1 Trilion** (un milion de milioane) numarul de accesari de clipuri pe **YouTube**
- **140** numarul de clipuri vazute pe **YouTube** per persoana la nivel global
- **48 ore** de continut video uploadat pe **YouTube** in fiecare minut
- cel mai vizionat clip pe **YouTube** in 2011 a fost **Rebecca Black – Friday**
- **76,4%** este procentul detinut de **YouTube** ppe video la nivel global
- **201,4** miliarde de clipuri vizionate pe luna la nivel global
- **88,3** miliarde de clipuri vizionate pe luna doar pe **YouTube**

Imagini

- **14** milioane de conturi **Instagram** create doar in 2011 la nivel global
- **60** de imagini pe secunda uploadate pe **Instagram**
- **100** miliarde de imagini pe **Facebook** pana la jumatatea lui 2011 (acum sunt peste 300 miliarde)
- **51** milioane de utilizatori **Flickr**
- **4,5** milioane de imagini uploadate pe Flickr zilnic
- **Apple iPhone 4** cea mai populara camera pe Flickr

„Aventura” continua .....

Sursa: http://www.rocu.de/content/images/uploads/2013-05/thinking_together.jpg

Sursa: http://www.jaztechnologies.com/myftp/jaz/assets/img/3.jpg

Motto:

"The collapse of education is the collapse of the Nation"