



Information Technology Module

IT Networks

Materials from:

Kenneth, C., LAUDON, L., & JANE, P. (2018). *Management information systems: Managing the Digital firm* (15th ed.). Harlow: Pearson Education Limited, UK.



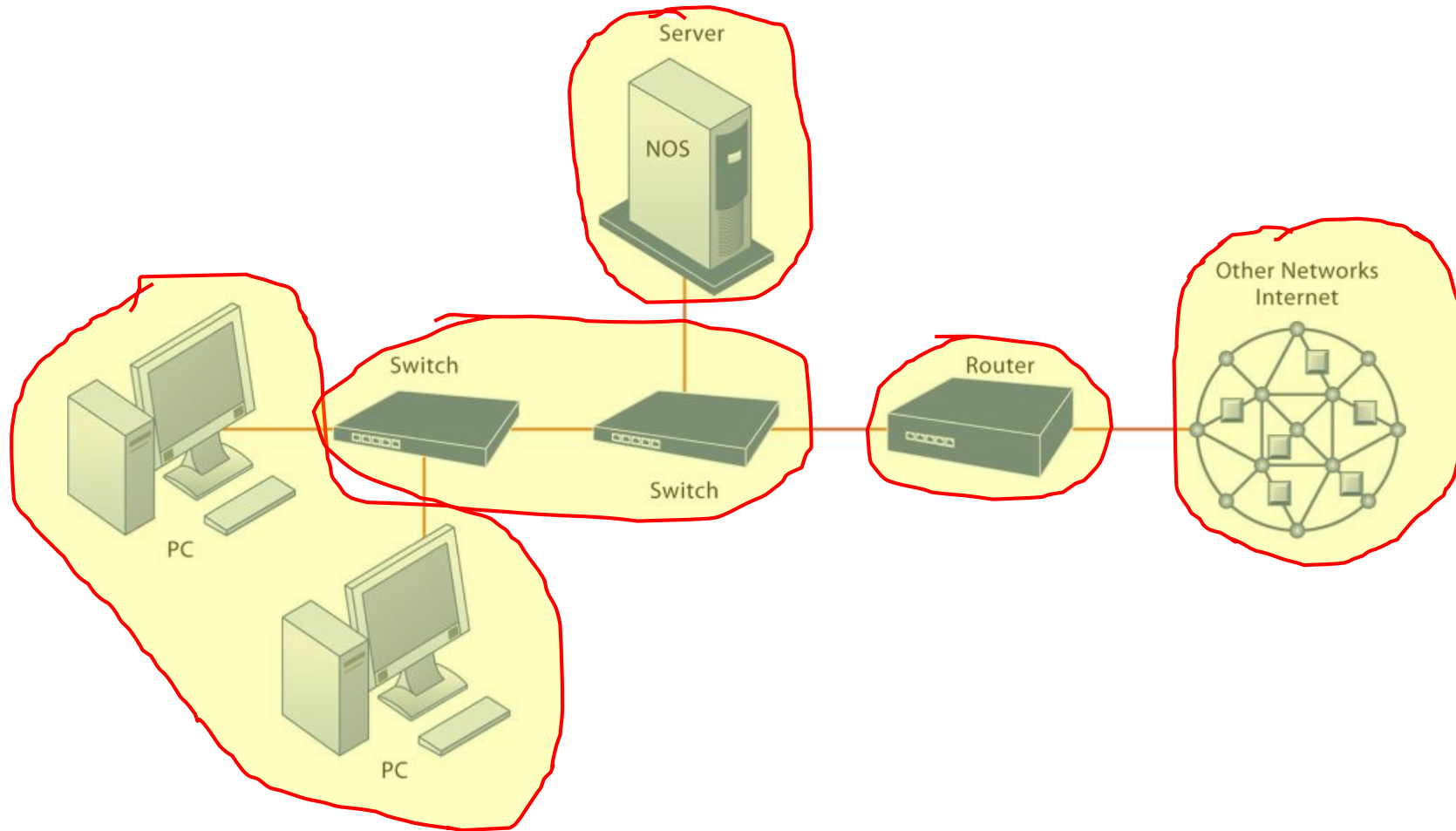
What Is a Computer Network?

- Two or more connected computers
- Major components in simple network
 - Client and server computers
 - Network interfaces (NICs)
 - Connection medium
 - Network operating system (NOS)
 - Hubs, switches, routers





Components of a Simple Computer Network





What Is the Internet?

- The Internet
 - World's most extensive network
 - Internet service providers (ISPs)
 - Provide connections
 - Types of Internet connections
 - Dial-up
 - Digital subscriber line (DSL/aDSL)
 - Cable Internet connections
 - Fiber Optics (FTTH)
 - Satellite

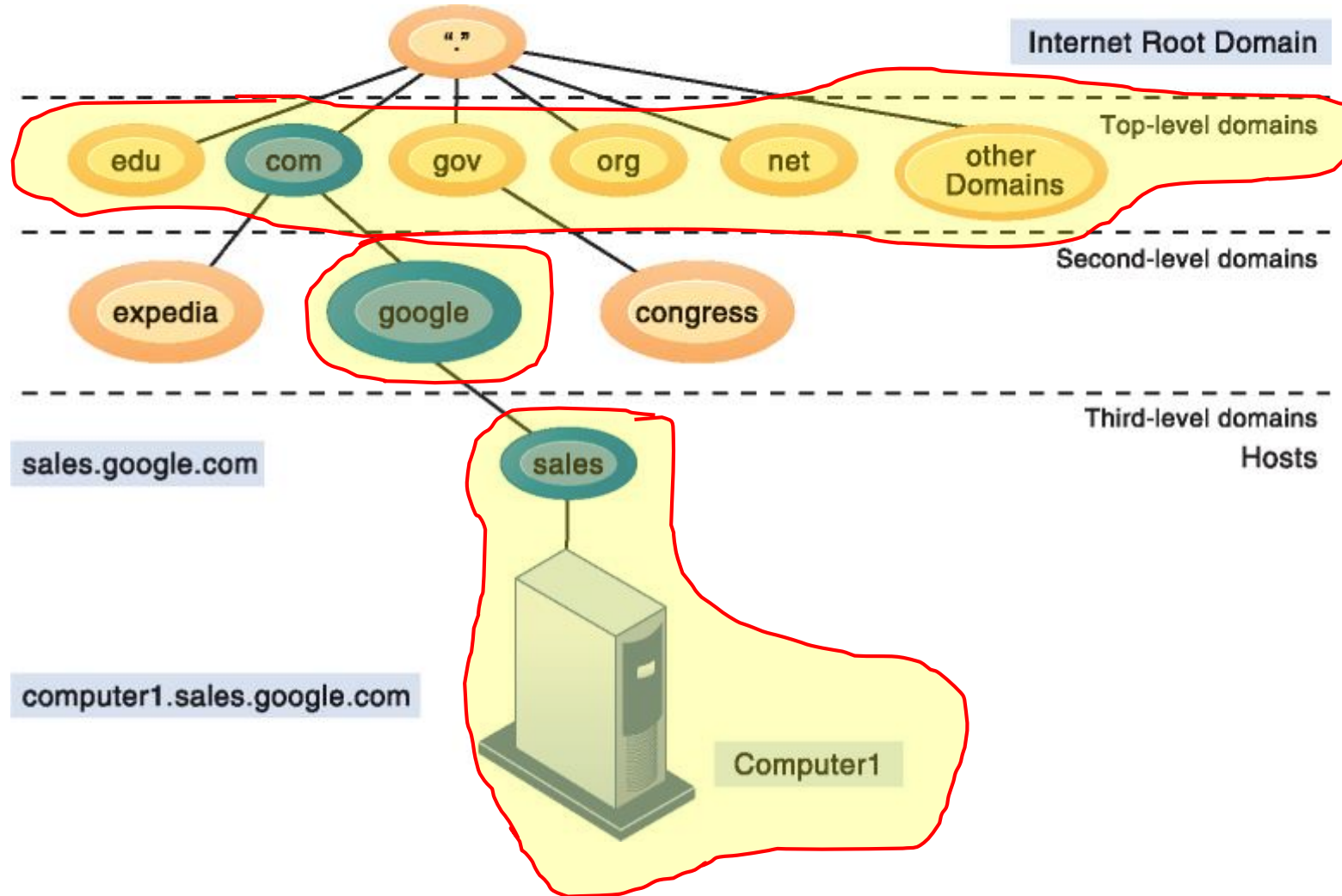


Internet Addressing and Architecture

- Each device has an assigned Internet Protocol (IP) address
- 32-bit number, e.g. 207.46.250.119
- The Domain Name System (DNS)
 - Converts IP addresses to domain names
 - Hierarchical structure
 - Top-level domains



The Domain Name System





The Hierarchical DNS System

- “*.pt”
 - Portuguese top-level domain
 - Owner: DNS.PT
- “*.ulisboa.pt”
 - Owner: Universidade de Lisboa
- “*.iseg.ulisboa.pt”
 - Owner: ISEG
 - www.iseg.ulisboa.pt
 - jira.iseg.ulisboa.pt
 - printserver.iseg.ulisboa.pt



The Future Internet: IPv6 and Internet 2

- IPv4: www.google.com → 172.217.16.228
 - 2^{32} possible addresses
 - Internal addresses and NAT (Network Address Translation)
- IPv6
 - New addressing scheme for IP numbers
 - Will provide more than a quadrillion new addresses
 - 2^{128} possible addresses
- Internet2
 - Advanced networking consortium
 - Universities, businesses, government agencies, other institutions
 - Developed high-capacity 100 Gbps testing network
 - Testing leading-edge new technologies for Internet



Internet Services and Tools

- Internet services
 - E-mail
 - Chatting and instant messaging
 - Newsgroups
 - Telnet
 - File Transfer Protocol (FTP)
 - World Wide Web
 - Voice over IP (VoIP)
 - Digital voice communication using IP, packet switching



Internet Services and Tools

Unified communications

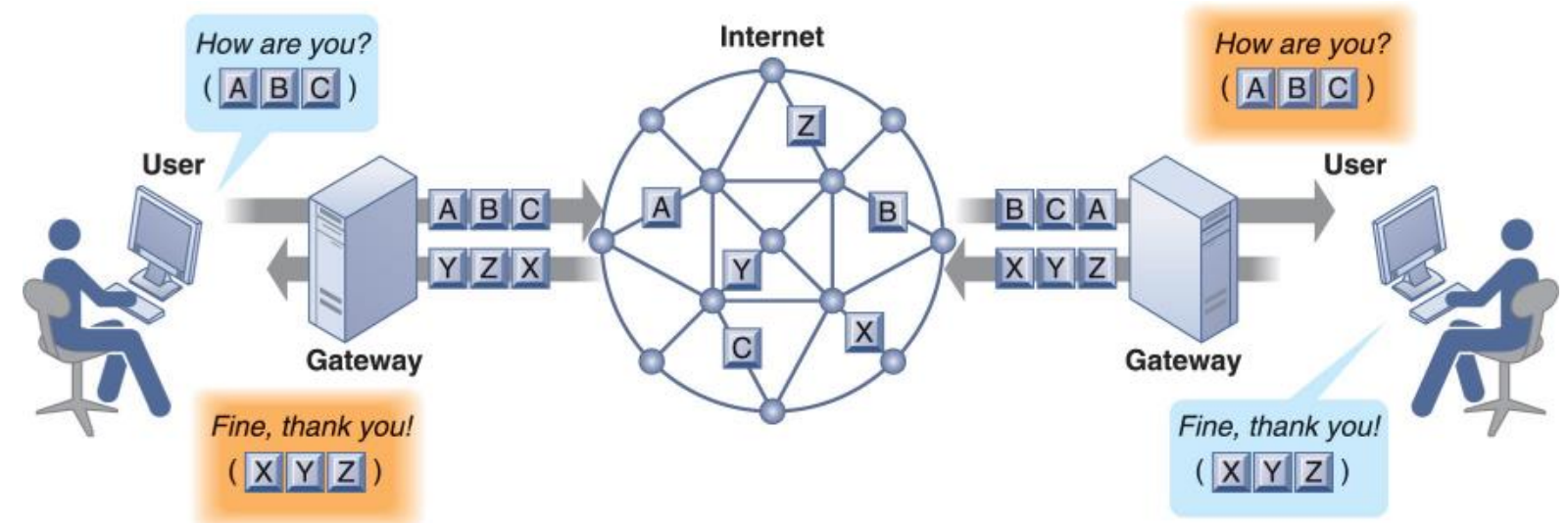
- Communications systems that integrate voice, data, e-mail, conferencing

Virtual private network (VPN)

- Secure, encrypted, private network run over Internet
- PPTP
- Tunneling

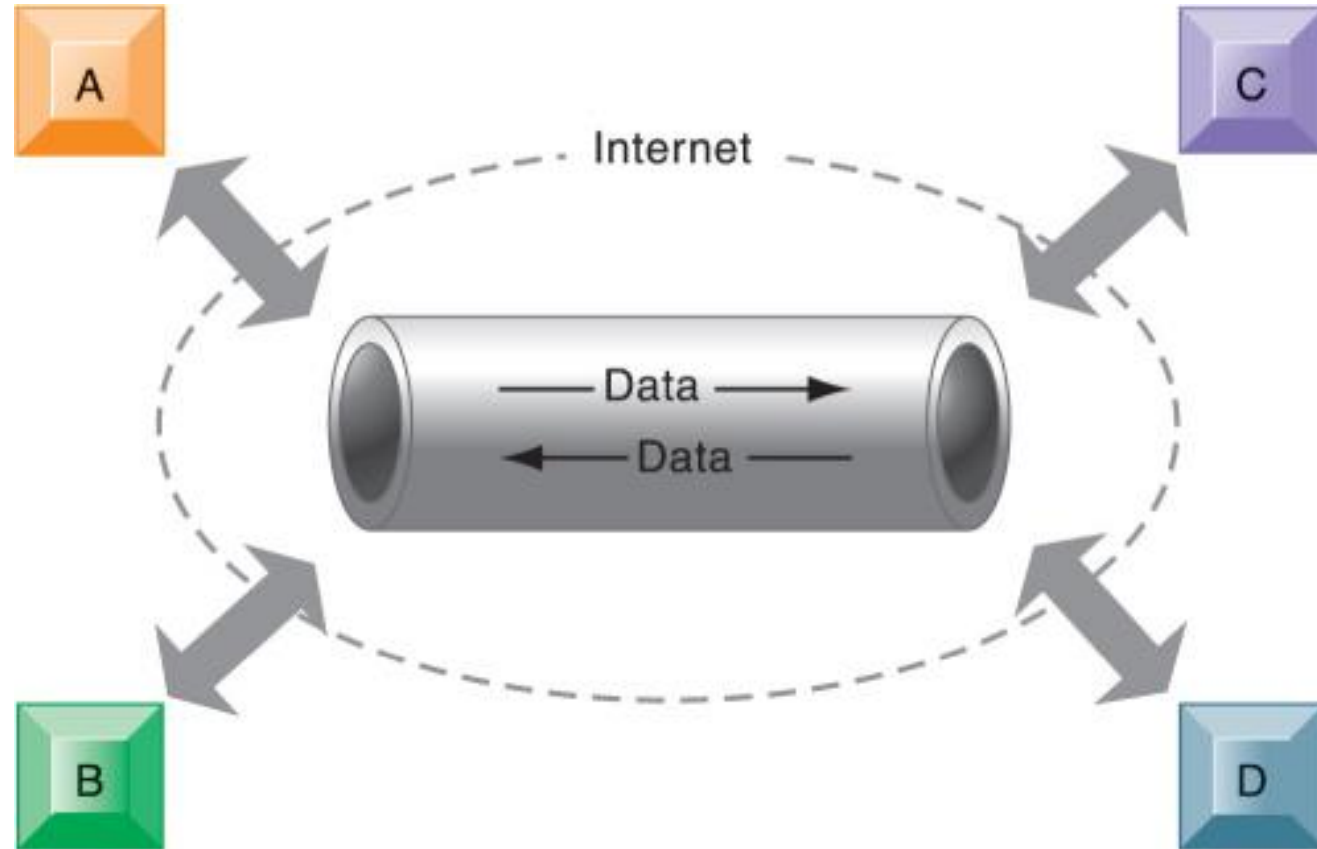


How Voice over IP Works





Virtual Private Network Using the Internet





The Web

- Hypertext
 - Hypertext Markup Language (HTML)
 - Hypertext Transfer Protocol (HTTP):
 - Uniform resource locator (URL):
 - <http://www.megacorp.com/content/features/082602.html>
- Web servers
 - Software for locating and managing web pages



Searching for Information on the Web

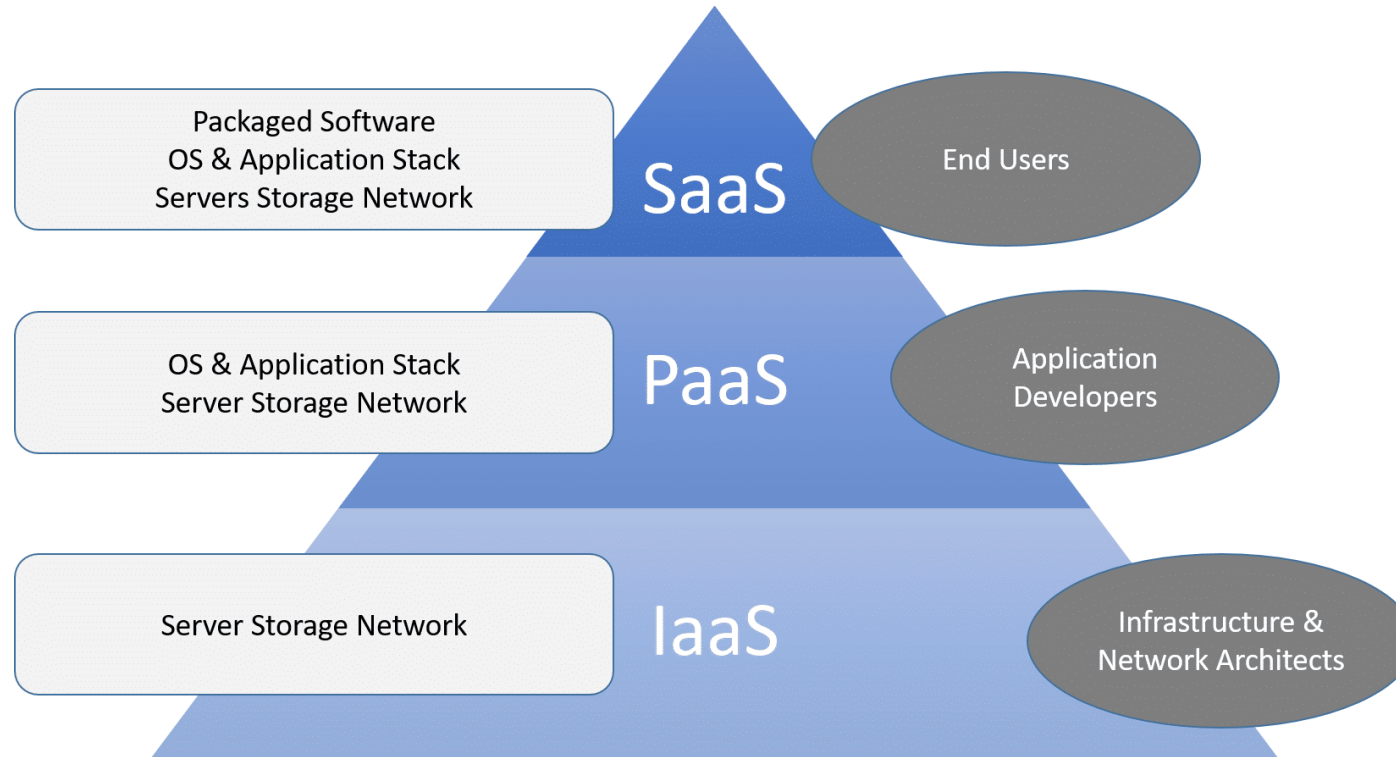
- Search engines
 - Google's PageRank System
- Mobile search
- Semantic search
- Social search
- Visual search and the visual web
 - Tagging
 - Pinterest



Cloud - Computing



Cloud Service Models

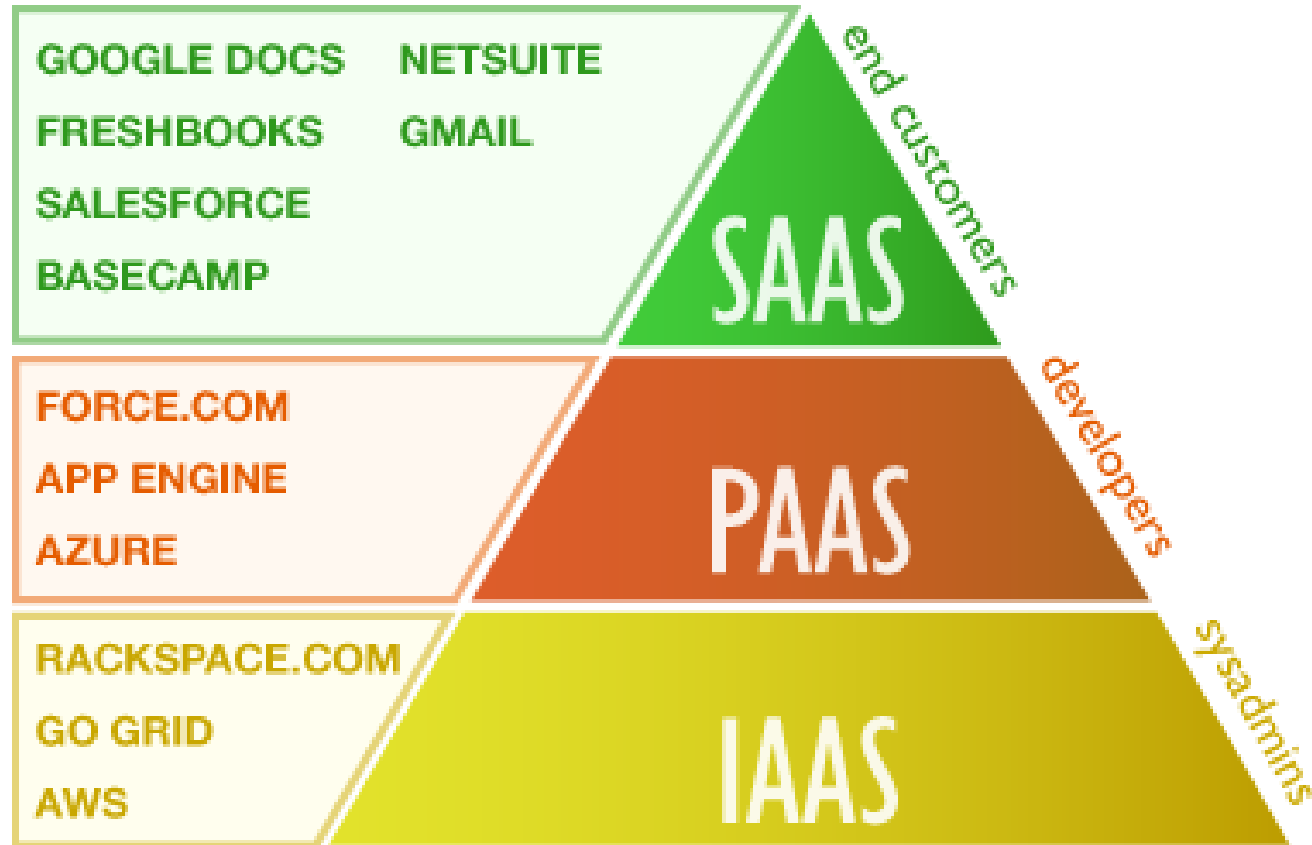


Cloud computing is Web-based processing, whereby shared resources, software, and information are provided to computers and other devices on demand, like the smart phones.

Source: Uniprint - <https://www.uniprint.net/en/7-types-cloud-computing-structures/>



Cloud Computing Examples



Source: Globaldots - <https://www.globaldots.com/blog/cloud-computing-types-of-cloud>

END

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