

Internet Technologies



Lab4

Project example and Networking

Outline

- Project example
 - Demo
 - Documentation overview
- Networking
 - IP addresses
 - Routing
 - DNS

Project demo

- ❑ Go to <http://lamj.inf.unibz.it:8180/bookmarket/>
- ❑ Its a very good project by Stefan Peer
 - its more than expected!
- ❑ Admin (we will not provide password 😊)
- ❑ Normal user: jakob / password: jakob
- ❑ User with some rights (admin can modify them):
michael / password: michael

IP: Network Classes

Class	Leading bits	Start	End	CIDR prefix	Default subnet mask
Class A	0	0.0.0.0	127.255.255.255	/8	255.0.0.0
Class B	10	128.0.0.0	191.255.255.255	/16	255.255.0.0
Class C	110	192.0.0.0	223.255.255.255	/24	255.255.255.0
Class D (multicast)	1110	224.0.0.0	239.255.255.255	/4	not defined
Class E (reserved)	1111	240.0.0.0	255.255.255.255	/4	not defined

Class A

```
0. 0. 0. 0 = 00000000.00000000.00000000.00000000
127.255.255.255 = 01111111.11111111.11111111.11111111
                0nnnnnnn.HHHHHHHH.HHHHHHHH.HHHHHHHH
```

Class B

```
128. 0. 0. 0 = 10000000.00000000.00000000.00000000
191.255.255.255 = 10111111.11111111.11111111.11111111
                10nnnnnnn.nnnnnnnn.HHHHHHHH.HHHHHHHH
```

Class C

```
192. 0. 0. 0 = 11000000.00000000.00000000.00000000
223.255.255.255 = 11011111.11111111.11111111.11111111
                110nnnnnn.nnnnnnnn.nnnnnnnn.HHHHHHHH
```

IP: Special ranges

Addresses	CIDR Equivalent	Purpose	RFC	Class	Total # of addresses
0.0.0.0 - 0.255.255.255	0.0.0.0/8	Zero Addresses	RFC 1700	A	16,777,216
10.0.0.0 - 10.255.255.255	10.0.0.0/8	Private IP addresses	RFC 1918	A	16,777,216
127.0.0.0 - 127.255.255.255	127.0.0.0/8	Localhost Loopback Address	RFC 1700	A	16,777,216
169.254.0.0 - 169.254.255.255	169.254.0.0/16	Zeroconf / APIPA	RFC 3330	B	65,536
172.16.0.0 - 172.31.255.255	172.16.0.0/12 *	Private IP addresses	RFC 1918	B	1,048,576
192.0.2.0 - 192.0.2.255	192.0.2.0/24	Documentation and Examples	RFC 3330	C	256
192.88.99.0 - 192.88.99.255	192.88.99.0/24	IPv6 to IPv4 relay Anycast	RFC 3068	C	256
192.168.0.0 - 192.168.255.255	192.168.0.0/16 *	Private IP addresses	RFC 1918	C	65,536
198.18.0.0 - 198.19.255.255	198.18.0.0/15 *	Network Device Benchmark	RFC 2544	C	131,072
224.0.0.0 - 239.255.255.255	224.0.0.0/4	Multicast	RFC 3171	D	268,435,456
240.0.0.0 - 255.255.255.255	240.0.0.0/4	Reserved ^{[2],[3],[4]}	RFC 1166	E	268,435,456

IP: Subnet Masks

- What is your subnet mask?
 - Use ipconfig (win) or /sbin/ifconfig (linux)
- What is your host address within your subnet mask?
 - 00001010.00001010.00010100.00000010
 - 11111111.11111111.11111100.00000000
00.00000010
- A subnet is a range of logical addresses within the address space. In a large organization, the amount of broadcasted data would become unmanageable if every computer received broadcasts from every other computer. Subnetting simplifies routing, since each locally connected subnet is typically represented by one row in the routing table in each connected router.

IP: Maximum Number of Hosts

- ❑ Imagine that your IP address is 192.168.0.1 and subnet mask is 255.255.255.0, how many host can we have on it?
- ❑ If the subnet mask is 255.255.252.0?
 - Remember that according to the RFC 950 standard the subnet values consisting of all zeros and all ones are reserved.
- ❑ What is the maximum number of sub networks of class C we can have if in each of sub network there can be 12PCs?

Maintaining your Home Network

- Commands to use:
 - Ipconfig or ifconfig (DHCP assigned?)
 - ip: 10.10.197.17
 - subnet: 255.255.252.0
 - gateway: 10.10.199.254
 - ping gateway and google (74.125.45.100)
 - traceroute 74.125.45.100 (unix)
 - tracert 74.125.45.100 (vista)
 - dig google.com