

RAM0780 Arvutivõrkude administreerimine 1.

Devices, CPT basics, ARP, STP

Cisco switchi ja routeri
algadministreerimine

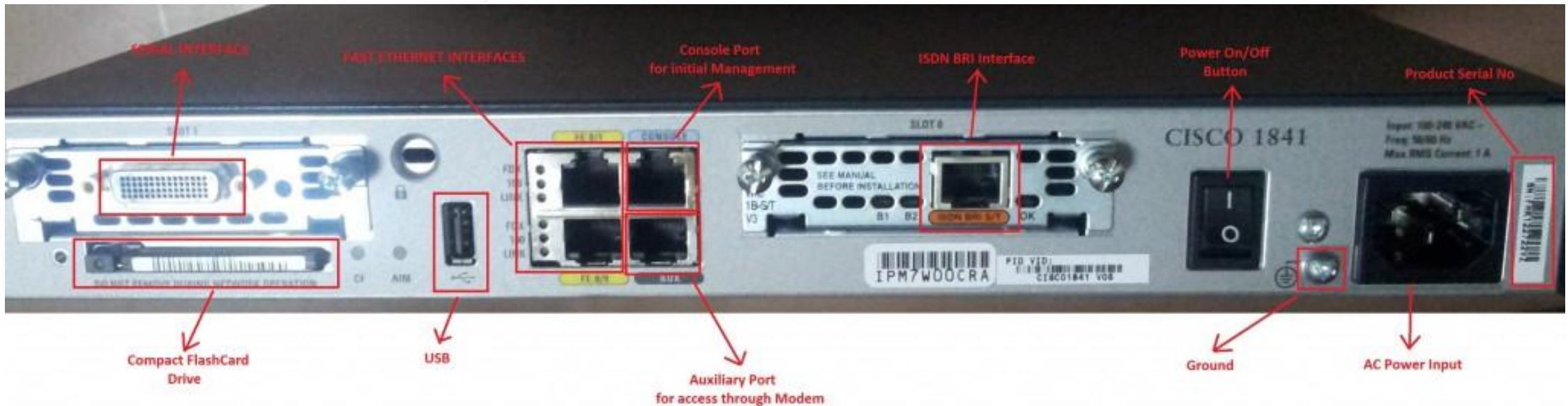
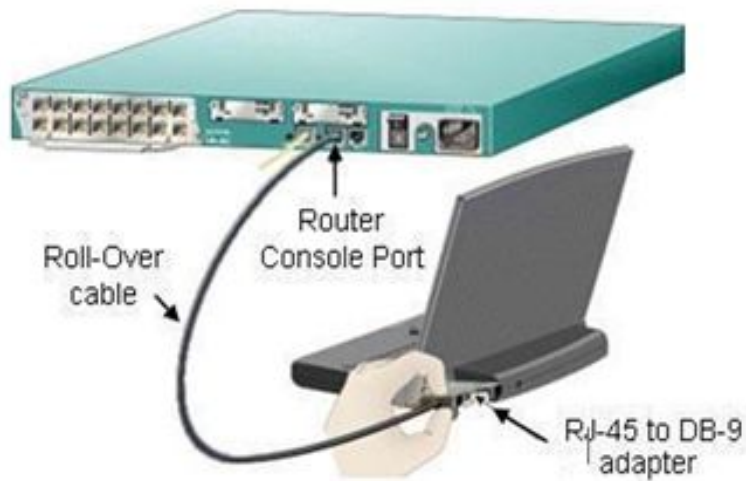
Eesmärgid

1. Turvalisus
2. Kättesaadavus

Võrgu administraatori ülesanded

1. Võrgu planeerimine (seadmed, lisaprotokollid, lisateenused, seadmete paigaldamine, võrgu segmenteerimine)
2. Võrgu sõlmede paigaldamine ja seadistamine (arvutid, kommutatsiooniseadmed)
3. Võrguprotokollide seadistamine
4. Võrgu teenistuste seadistamine (DHCP, DNS, WINS (Windows Internet Name Service), marsruutimine, VPN, failid ja printerid; Microsoft Active Directory; e-põst; andmebaasid)
5. Tõrkeotsing
6. Võrgu tõhususe parandamine
7. Võrgusõlmede jälgimine
8. Võrguliikluse jälgimine
9. Andmekaitse (backup, kasutajad ja kasutajapolitika, IPSec, VPN, PKI jne)

CLI (Command Line Interface)



CLI (2)

Command Mode	Access Method	Prompt	Exit or Access Next Mode
User EXEC	This is the first level of access. (For the switch) Change terminal settings, perform basic tasks, and list system information.	Switch>	Enter the logout command. To enter privileged EXEC mode, enter the enable command.
Privileged EXEC	From user EXEC mode, enter the enable command.	Switch#	To exit to user EXEC mode, enter the disable command. To enter global configuration mode, enter the configure command.
Global configuration	From privileged EXEC mode, enter the configure command.	Switch(config)#	To exit to privileged EXEC mode, enter the exit or end command, or press Ctrl-Z . To enter interface configuration mode, enter the interface configuration command.
Interface configuration	From global configuration mode, specify an interface by entering the interface command followed by an interface identification.	Switch(config-if)#	To exit to privileged EXEC mode, enter the end command, or press Ctrl-Z . To exit to global configuration mode, enter the exit command.

CLI (3)

Interface configuration	From global configuration mode, specify an interface by entering the interface command followed by an interface identification.	Switch(config-if)#	To exit to privileged EXEC mode, enter the end command, or press Ctrl-Z . To exit to global configuration mode, enter the exit command.
Config-vlan	In global configuration mode, enter the vlan <i>vlan-id</i> command.	Switch(config-vlan)#	To exit to global configuration mode, enter the exit command. To return to privileged EXEC mode, enter the end command, or press Ctrl-Z .
VLAN configuration	From privileged EXEC mode, enter the vlan database command.	Switch(vlan)#	To exit to privileged EXEC mode, enter the exit command.
Line configuration	From global configuration mode, specify a line by entering the line command.	Switch(config-line)#	To exit to global configuration mode, enter the exit command. To return to privileged EXEC mode, enter the end command, or press Ctrl-Z .

Enable password

```
Router1
Physical | Config | CLI |
IOS Command Line Interface

Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#enable password parol
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#disable
Router>en
Password:
```


Terminal

- PuTTY(putty.org)
- TeraTerm
- HyperTerm
- Secure SRT

```
User EXEC Command-Router>
```

```
ping  
show (limited)  
enable  
etc...
```

```
Privileged EXEC Commands-Router#
```

```
all User EXEC Commands  
debug commands  
reload  
configure  
etc..
```

```
Global Configuration Commands-Router(config)#
```

```
hostname  
enable secret  
ip route
```

```
interface ethernet  
serial  
bri  
etc.
```

```
Interface Commands-Router(config-if)#
```

```
ip address  
ipx network  
encapsulation  
shutdown/ no shutdown  
etc..
```

```
router rip  
ospf  
eigrp  
etc..
```

```
Routing Engine Commands-Router(config-router)#
```

```
network  
version  
auto summary  
etc...
```

```
line vty  
console  
etc.
```

```
Line Commands-Router(config-line)#
```

```
password  
login  
modem commands  
etc..
```

Basic commands

Hostname

Logon Banner

Console Password

Telnet Password

Enable Password

Management IP

Default Gateway

Shutdown

Negating Command

Saving Configuration

Basic commands (2)

- `hostname Sw1234`
- `banner motd &***`

Console password

- router#conf t
- !--- Enter configuration commands, one per line. End with CNTL/Z.
- router(config)#line con 0
- router(config-line)#
- router(config-line)#password <password>
- router(config-line)#login -----*enable password checking at login---*

- *(show running-config)*

- router#write memory

Telnet password

```
router#conf t
```

!--- Enter configuration commands, one per line. End with CNTL/Z.

```
router(config)#line vty 0 4
```

```
router(config-line)#
```

```
router(config-line)#password <password>
```

```
router(config-line)#login
```

```
router(config-line)#end
```

```
router#
```

(sh run, sh int)

```
router#write memory
```

Enable password

- Router#configure terminal
 - Enter configuration commands, one per line. End with CNTL/Z.
 - Router(config)#enable secret SecretPassword
 - Router(config)#exit
 - Router#
-
- Router#configure terminal
 - Enter configuration commands, one per line. End with CNTL/Z.
 - Router(config)#service password-encryption
 - Router(config)#exit

More commands

- no IP-domain lookup
- show ip interface brief

- shutdown – no shutdown

IP-address for switch

```
int vlan 1  
ip add 10.1.1.1 255.255.255.0  
no shutdown
```

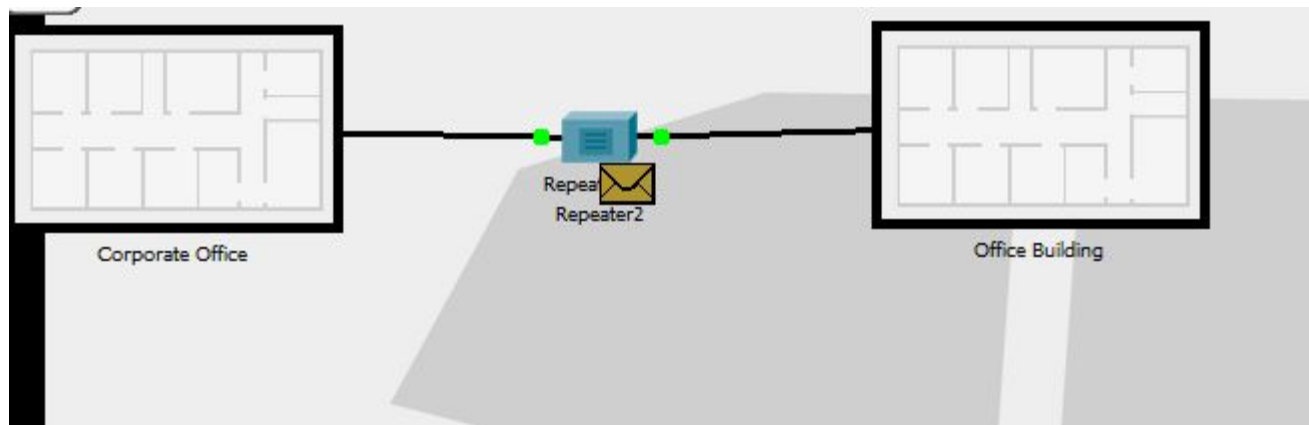
Try to connect using telnet from the PC

```
telnet 10.1.1.1
```

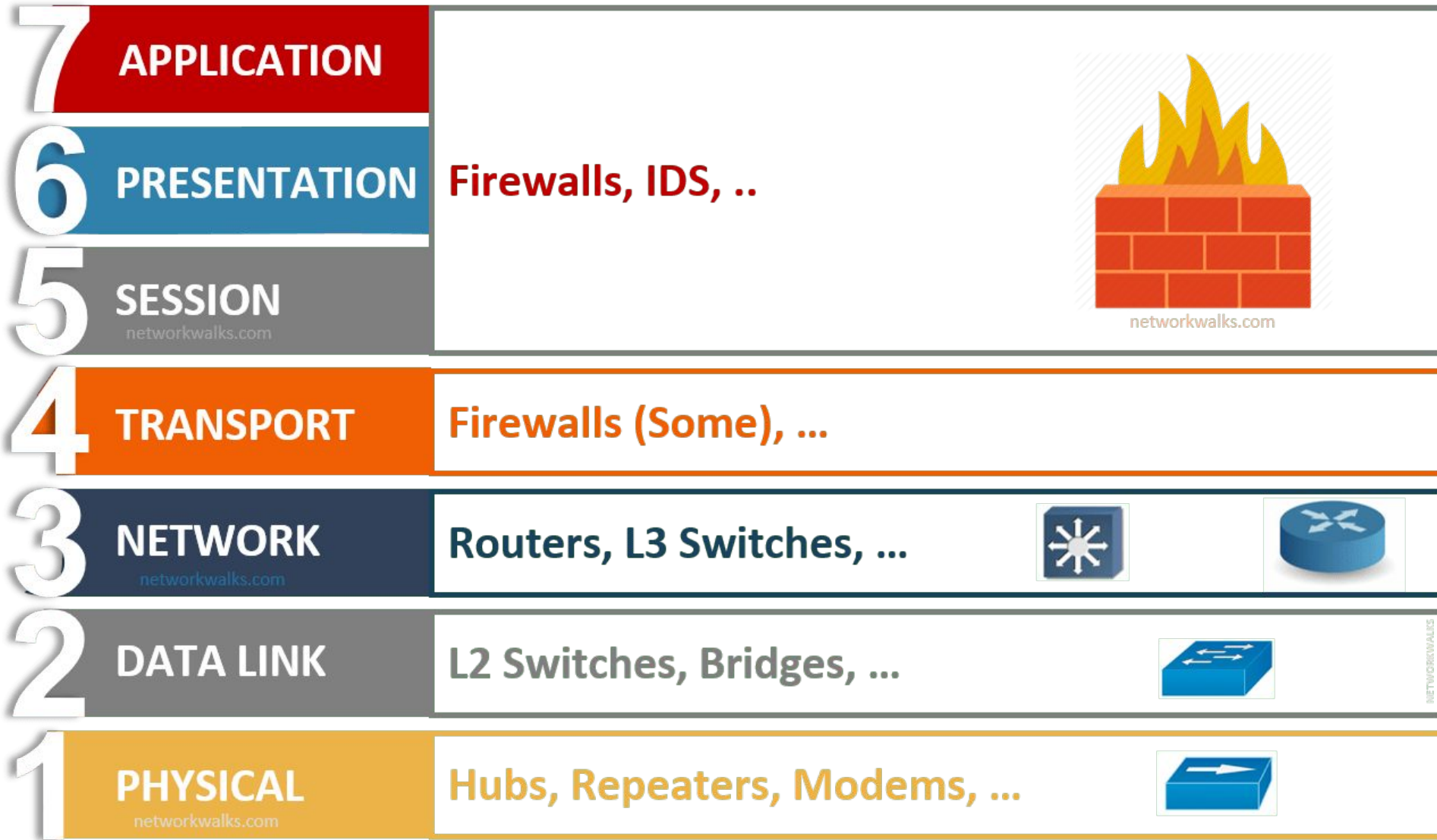
- *Milliseid parooli on vaja switchiga ühenduse loomiseks?*
- *Which of the passwords you need to connect to the switch?*
- *Какие из паролей необходимы, чтобы подключиться к коммутатору?*

CPT

- Loogiline skeem
- Füüsiline skeem

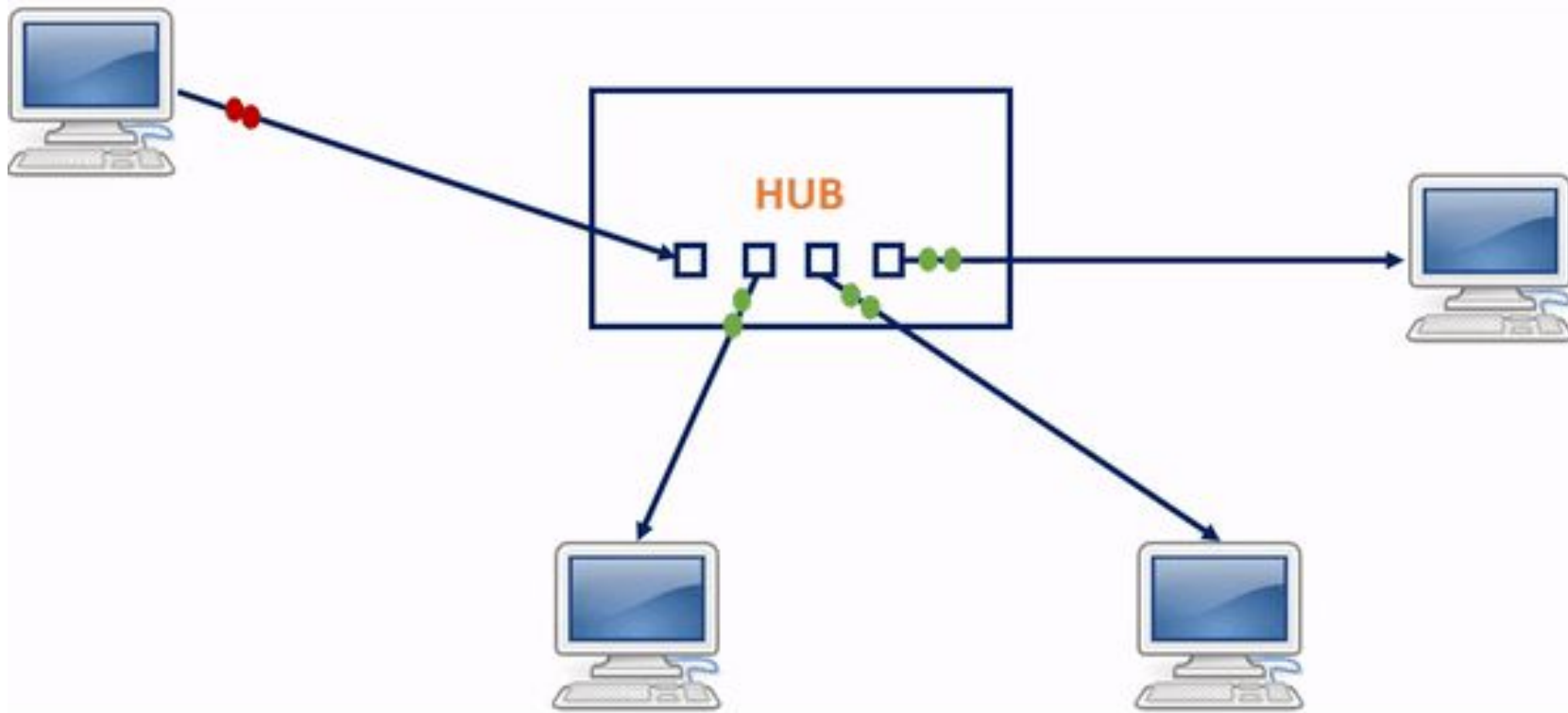


Seadmete hierarhia



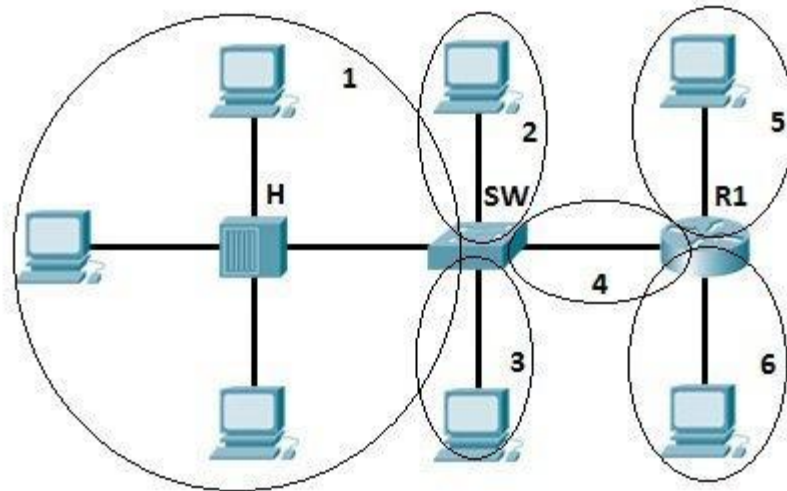
Hubs and bridges

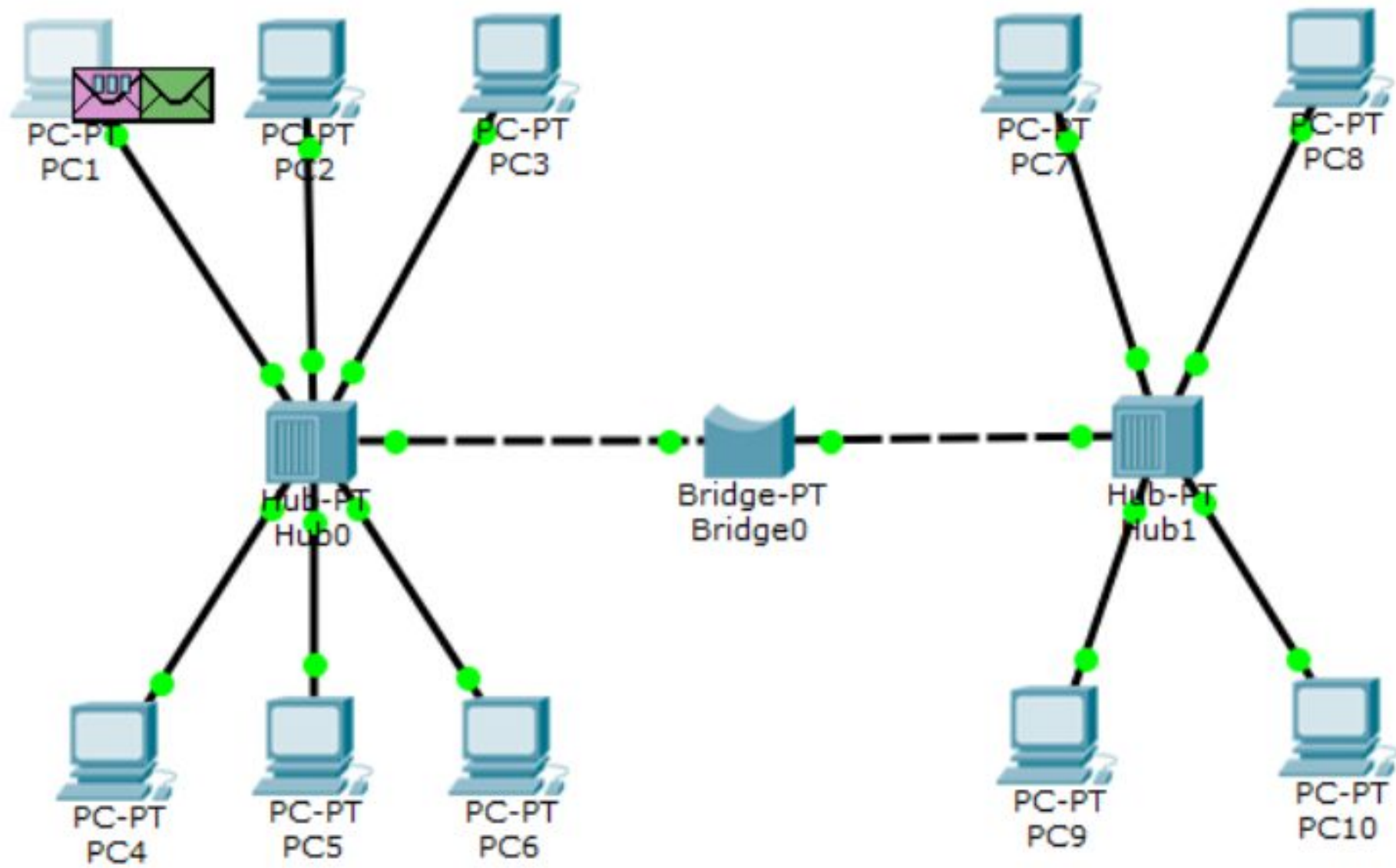




Collision domains

- Võrgu kokkupõrge tekib siis, kui mitu seadet üritab võrgusegmendis paketti saata korraga.
- A network collision occurs when more than one device attempts to send a packet on a network segment at the same time.





Hubs and bridges

- 1) PC1: IP-192.168.1.1, Mask-255.255.255.0
- 2) PC2: IP-192.168.1.2, Mask-255.255.255.0
- 3) PC3: IP-192.168.1.3, Mask-255.255.255.0
- 4) PC4: IP-192.168.1.4, Mask-255.255.255.0
- 5) PC5: IP-192.168.1.5, Mask-255.255.255.0
- 6) PC6: IP-192.168.1.6, Mask-255.255.255.0
- 7) PC7: IP-192.168.1.7, Mask-255.255.255.0.
- 8) PC8: IP-192.168.1.8, Mask-255.255.255.0.
- 9) PC9: IP-192.168.1.9, Mask-255.255.255.0.
- 10) PC10: IP-192.168.1.10, Mask-255.255.255.0.

Hubs and bridges (2)

1. Kirjeldage, milliseid protokolle kasutatakse ja kuidas sild töötab?

Describe what protocols are using and how the bridge works.

Опишите, какие протоколы используются и каков принцип работы моста.

2. Mitu kokkupõrke domeeni see võrk omab?

How many collision domains have this network? Сколько доменов коллизий в этой сети?

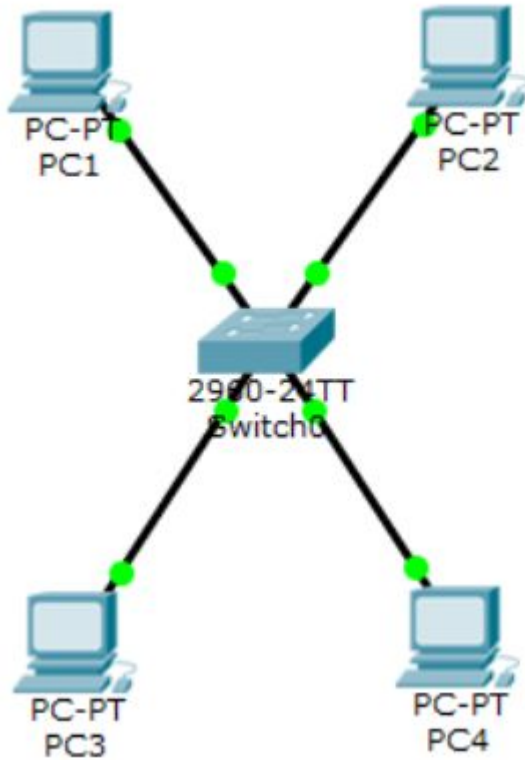
Switches



Switches

- Bridge – program commutation, switch – hardware commutation (ASIC)
- Level 2
- Level 2+ (3?)

Switches (2)



- 1) PC1: IP-192.168.1.1, Mask-255.255.255.0.
- 2) PC2: IP-192.168.1.2, Mask-255.255.255.0.
- 3) PC3: IP-192.168.1.3, Mask-255.255.255.0.
- 4) PC4: IP-192.168.1.4, Mask-255.255.255.0.

Switches (3)

- show mac-address-table

```
Switch#show mac-address-table  
      Mac Address Table
```

```
-----  
Vlan   Mac Address      Type      Ports  
----   -
```

Switches (3)

- Kirjeldage, kuidas lüliti täidab MAC-aadressitabelit.
 - Describe how the switch fills the MAC-address table.
 - Опишите, как коммутатор заполняет таблицу MAC-адресов.

Sources

- <https://www.intuit.ru/studies/courses/3549/791/info>
- https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3560/software/release/12-2_46_se/command/reference/cr1/intro.pdf
- <https://community.cisco.com/t5/networking-documents/configuring-telnet-console-and-aux-port-passwords/ta-p/3126628>
- <https://habr.com/ru/company/ua-hosting/blog/440612/>