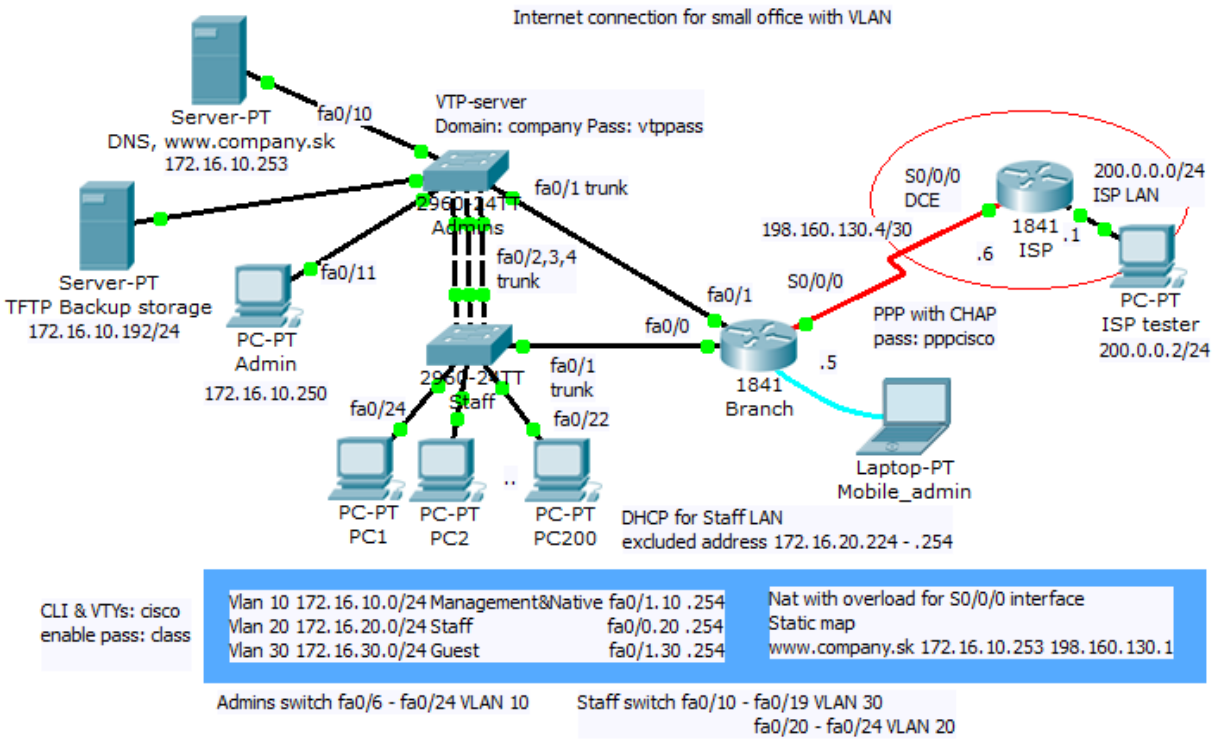
3. Internet connection for small office with VLAN

This scenario is extension of article 1 where we have enabled internet access for our simple home or small office network. Our scenarios focus only proper connectivity without any access lists for adding local office policy.

For expecting work of this network you must:

- configure VTP and VLAN
- set STP 802.1D priority (STP about)
- inter VLAN communication in router on a stick scenario
- default route to ISP and static route pointing to Branch
- PPP encapsulation on local loop to ISP central office
- basic access passwords for network devices in topology
- select proper cabling
- configure end devices with static or DHCP added IP and DNS
- enable and adjust www, DNS, TFTP services
- assign address from suggested networks

Training topology (configured PKT 5.2 lab)



VTP and VLAN on Staff switch is

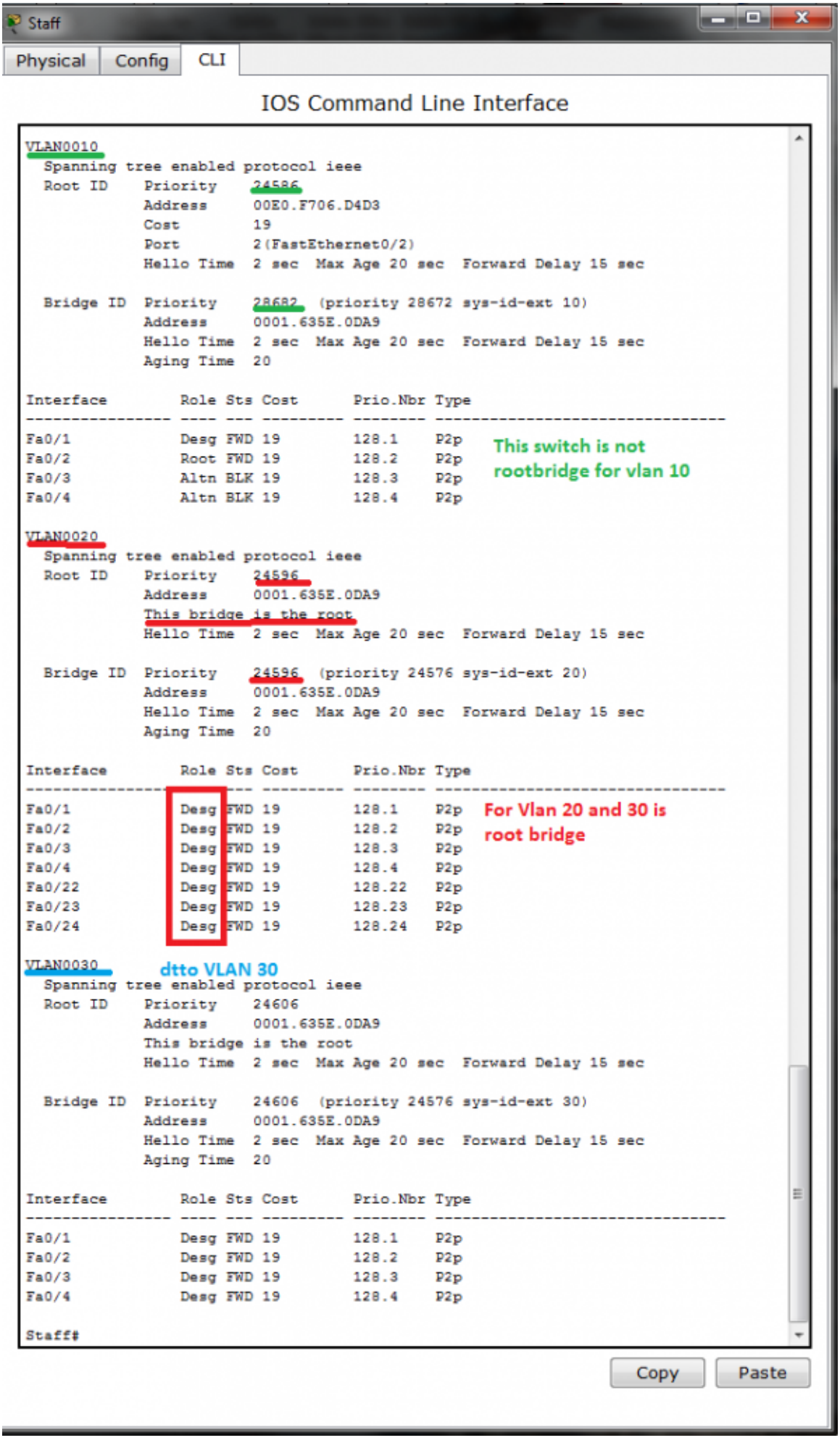
```
Staff#show vtp status
VTP Version                     : 2
Configuration Revision          : 5
Maximum VLANs supported locally : 255
Number of existing VLANs        : 8
VTP Operating Mode              : Client
VTP Domain Name                 : company
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xA7 0xB9 0xDE 0x19 0xBB 0x82 0x1E 0x01
Configuration last modified by 172.16.10.250 at 3-1-93 01:14:59
Staff#show vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Gig1/1, Gig1/2

10   Management&Native                 active
20   Staff                             active    Fa0/20, Fa0/21, Fa0/22, Fa0/23
                                                 Fa0/24
30   Guest                             active    Fa0/10, Fa0/11, Fa0/12, Fa0/13
                                                 Fa0/14, Fa0/15, Fa0/16, Fa0/17
                                                 Fa0/18, Fa0/19

1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

STP configuration Admins and Staff sw is

```
spanning-tree vlan 1,10 priority 24576
```

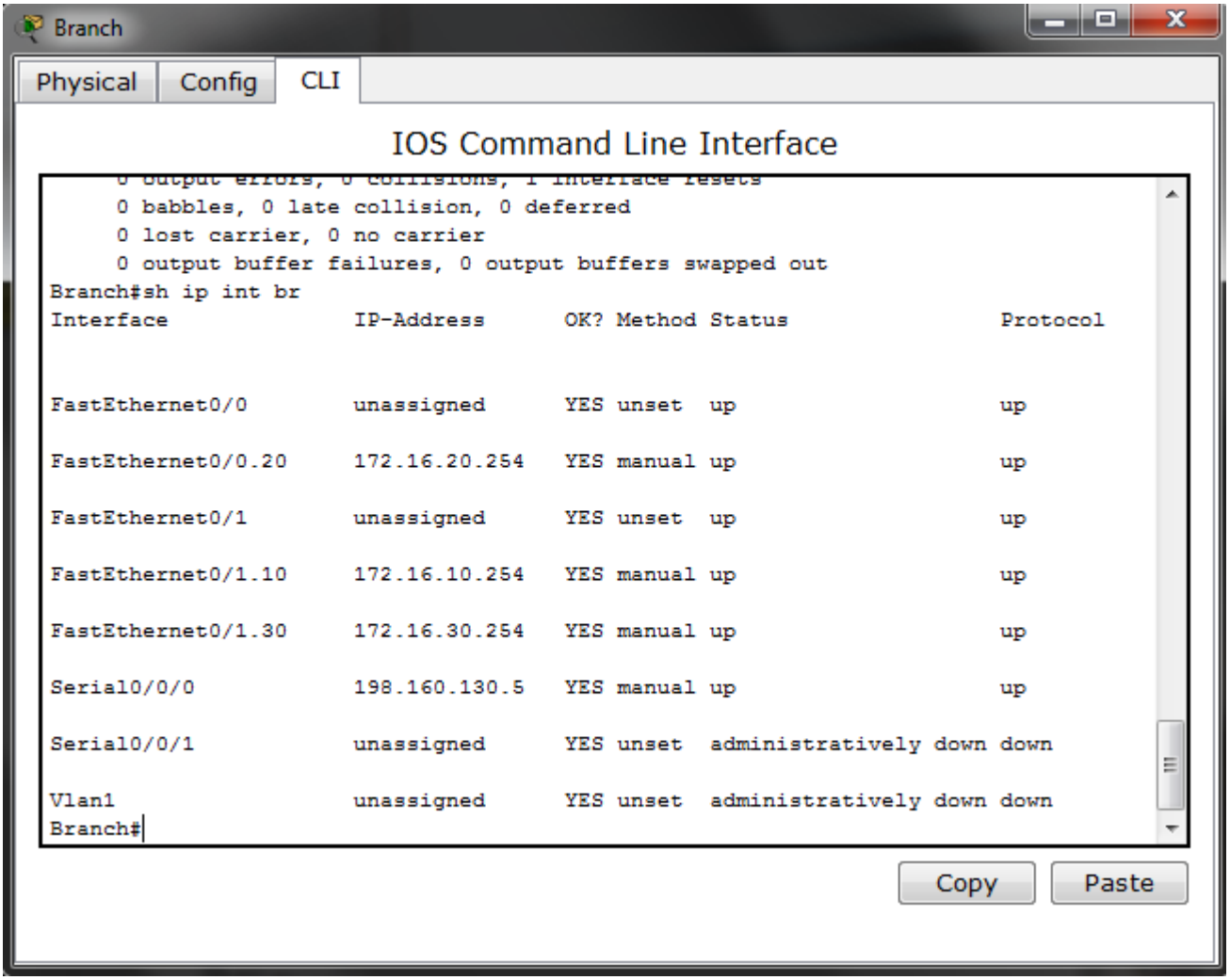
```
spanning-tree vlan 20,30 priority 28672
```

Appropriate show command issued on Staff switch lead to expected root bridge election and port roles and states


Staff
Physical
Config
CLI
IOS Command Line Interface
VLAN0010
Spanning tree enabled protocol ieee
Root ID Priority 24586
Address 00E0.F706.D4D3
Cost 19
Port 2(FastEthernet0/2)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 28682 (priority 28672 sys-id-ext 10)
Address 0001.635E.0DA9
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
Interface Role Sts Cost Prio.Nbr Type
Fa0/1 Desg FWD 19 128.1 P2p
Fa0/2 Root FWD 19 128.2 P2p
Fa0/3 Altn BLK 19 128.3 P2p
Fa0/4 Altn BLK 19 128.4 P2p
This switch is not rootbridge for vlan 10
VLAN0020
Spanning tree enabled protocol ieee
Root ID Priority 24596
Address 0001.635E.0DA9
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 24596 (priority 24576 sys-id-ext 20)
Address 0001.635E.0DA9
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
Interface Role Sts Cost Prio.Nbr Type
Fa0/1 Desg FWD 19 128.1 P2p
Fa0/2 Desg FWD 19 128.2 P2p
Fa0/3 Desg FWD 19 128.3 P2p
Fa0/4 Desg FWD 19 128.4 P2p
Fa0/22 Desg FWD 19 128.22 P2p
Fa0/23 Desg FWD 19 128.23 P2p
Fa0/24 Desg FWD 19 128.24 P2p
For Vlan 20 and 30 is root bridge
VLAN0030
dtto VLAN 30
Spanning tree enabled protocol ieee
Root ID Priority 24606
Address 0001.635E.0DA9
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Bridge ID Priority 24606 (priority 24576 sys-id-ext 30)
Address 0001.635E.0DA9
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20
Interface Role Sts Cost Prio.Nbr Type
Fa0/1 Desg FWD 19 128.1 P2p
Fa0/2 Desg FWD 19 128.2 P2p
Fa0/3 Desg FWD 19 128.3 P2p
Fa0/4 Desg FWD 19 128.4 P2p
Staff#
Copy
Paste

Router interfaces was configured as it is listed in output

Branch#show IP interface brief



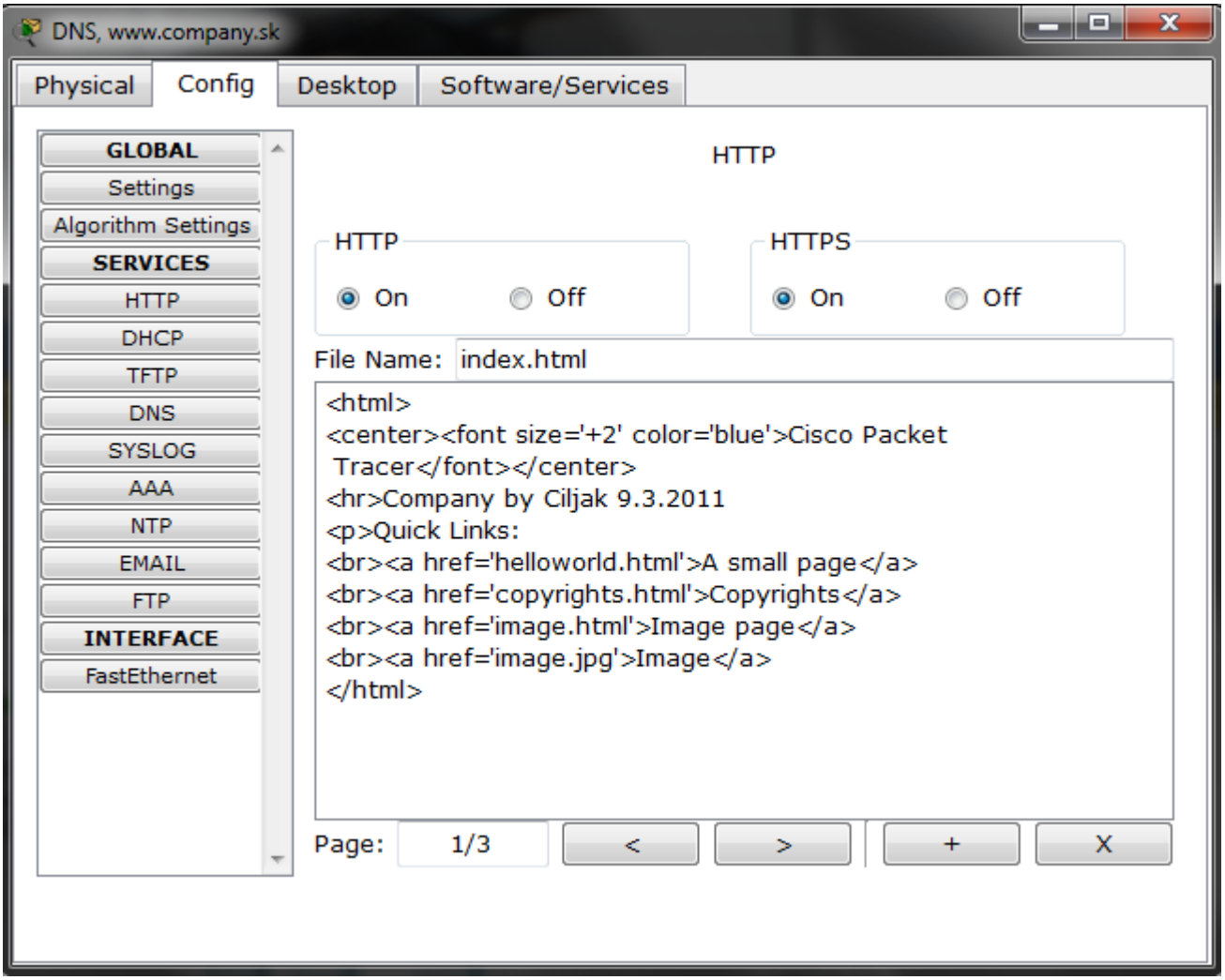
Routers running configuration is:

```
hostname Branch
!
enable secret 5 $1$mERr$9cTjUIEqNGurQiFU.ZeCi1
!
ip dhcp excluded-address 172.16.20.224 172.16.20.254 address
excluded from DHCP pool
!
ip dhcp pool StaffLAN                                    DHCP
pool configuration
 network 172.16.20.0 255.255.255.0
 default-router 172.16.20.254
 dns-server 172.16.10.253
!
username ISP password 0 pppcisco       access password for
```

```
oposite end of ppp link used during chap 3 way handshake
!
no ip domain-lookup   router will not interpret incorrectly
typed commands as domain names
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/0.20
 encapsulation dot1Q 20
 ip address 172.16.20.254 255.255.255.0
 ip nat inside  marking interface inside „local“ for NAT
!
interface  FastEthernet0/1   address  was  removed  or  not
configured on interface divided on subinterfaces in router on
a stick
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/1.10
 encapsulation dot1Q 10 native   native keyword mark VLAN used
for untagged traffic – from default 1 moved to 10
 ip address 172.16.10.254 255.255.255.0
 ip nat inside   marking interface inside „local“ for NAT
!
interface FastEthernet0/1.30
 encapsulation dot1Q 30
 ip address 172.16.30.254 255.255.255.0
 ip nat inside     marking interface inside „local“ for NAT
!
interface Serial0/0/0
 ip address 198.160.130.5 255.255.255.252
 encapsulation ppp     encpasulation and authentification on
ppp link
 ppp authentication chap
 ip nat outside   marking interface as outside „local“ for NAT
!
interface Serial0/0/1
```

```
 no ip address
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
ip nat inside source list Allowed interface Serial0/0/0
overload  PAT with interface s0/0/0 overload command
ip nat inside source static 172.16.10.253 198.160.130.1
  static NAT translation for connectivity to inside company
web server from outside network
ip classless
ip route 0.0.0.0 0.0.0.0 Serial0/0/0   default route used for
routing outgoing traffic
!
!
ip access-list standard Allowed          access list marking
clients allowed for NAT translation
 permit 172.16.10.0 0.0.0.255
 permit 172.16.20.0 0.0.0.255
 permit 172.16.30.0 0.0.0.255
access-list 1 permit 172.16.10.0 0.0.0.255
!
line con 0
 exec-timeout 30 0
 password cisco
 logging synchronous
 login
line vty 0 4
 access-class 1 in
 exec-timeout 30 0
 password cisco
 logging synchronous
 login
!
end
```

On DNS, www.company.sk server are made these settings


DNS, www.company.sk
Physical
Config
Desktop
Software/Services
GLOBAL
Settings
Algorithm Settings
SERVICES
HTTP
DHCP
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
INTERFACE
FastEthernet
HTTP
HTTP
On
Off
HTTPS
On
Off
File Name: index.html
<html>
Cisco Packet
Tracer
<hr>Company by Ciljak 9.3.2011
<p>Quick Links:

A small page

Copyrights

Image page

Image
</html>
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1/3
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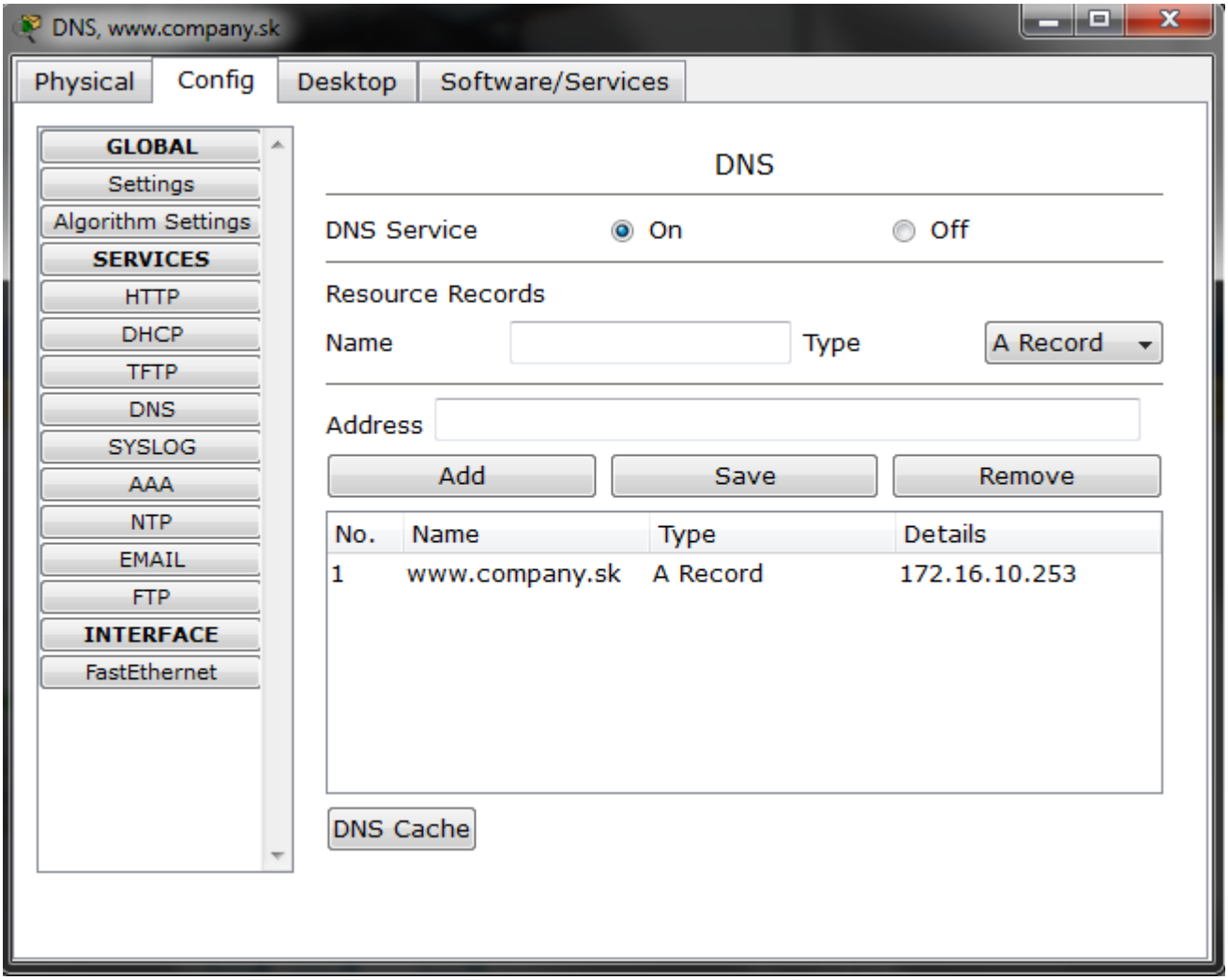
DNS records


DNS, www.company.sk
Physical
Config
Desktop
Software/Services
GLOBAL
Settings
Algorithm Settings
SERVICES
HTTP
DHCP
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
INTERFACE
FastEthernet
DNS
DNS Service
On
Off
Resource Records
Name
Type
A Record
Address
Add
Save
Remove
No.
Name
Type
Details
1
www.company.sk
A Record
172.16.10.253
DNS Cache