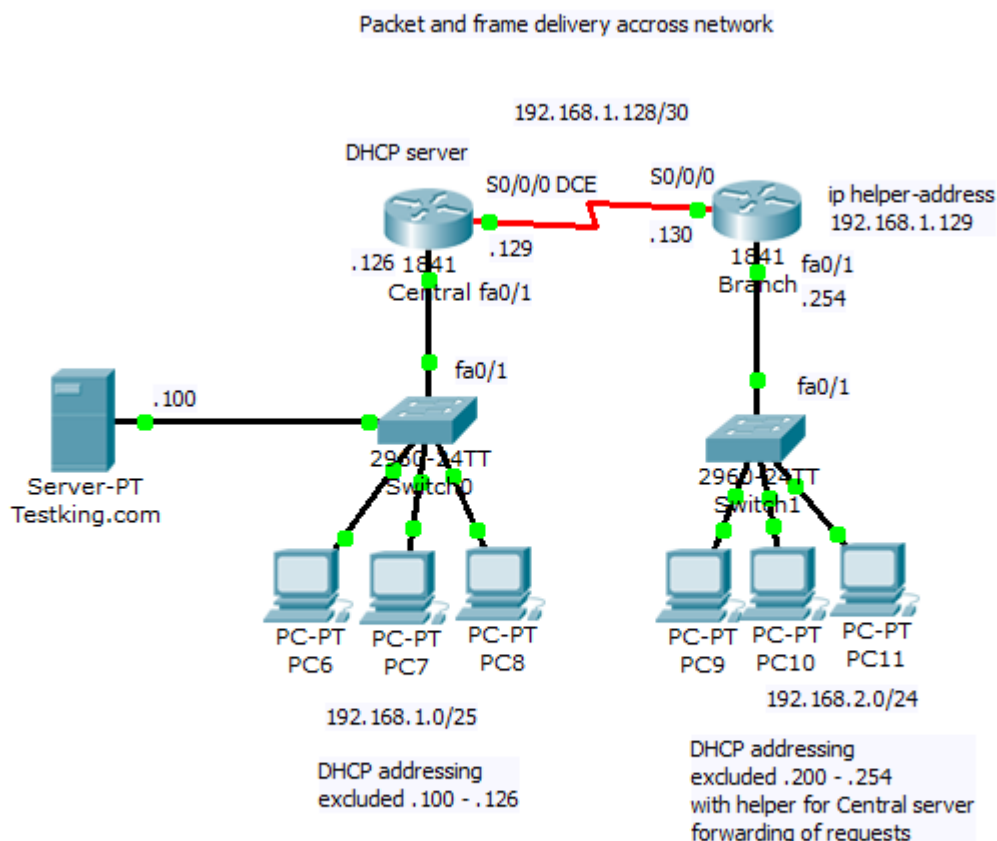# 2. Packet and frame delivery

When data segment is encapsulated into packet appropriate PC must examine destination address when preparing frame creation. If destination IP is on same network as sending PC data are send to to appropriate host. Else data are sent to network interface that act as a default gateway.
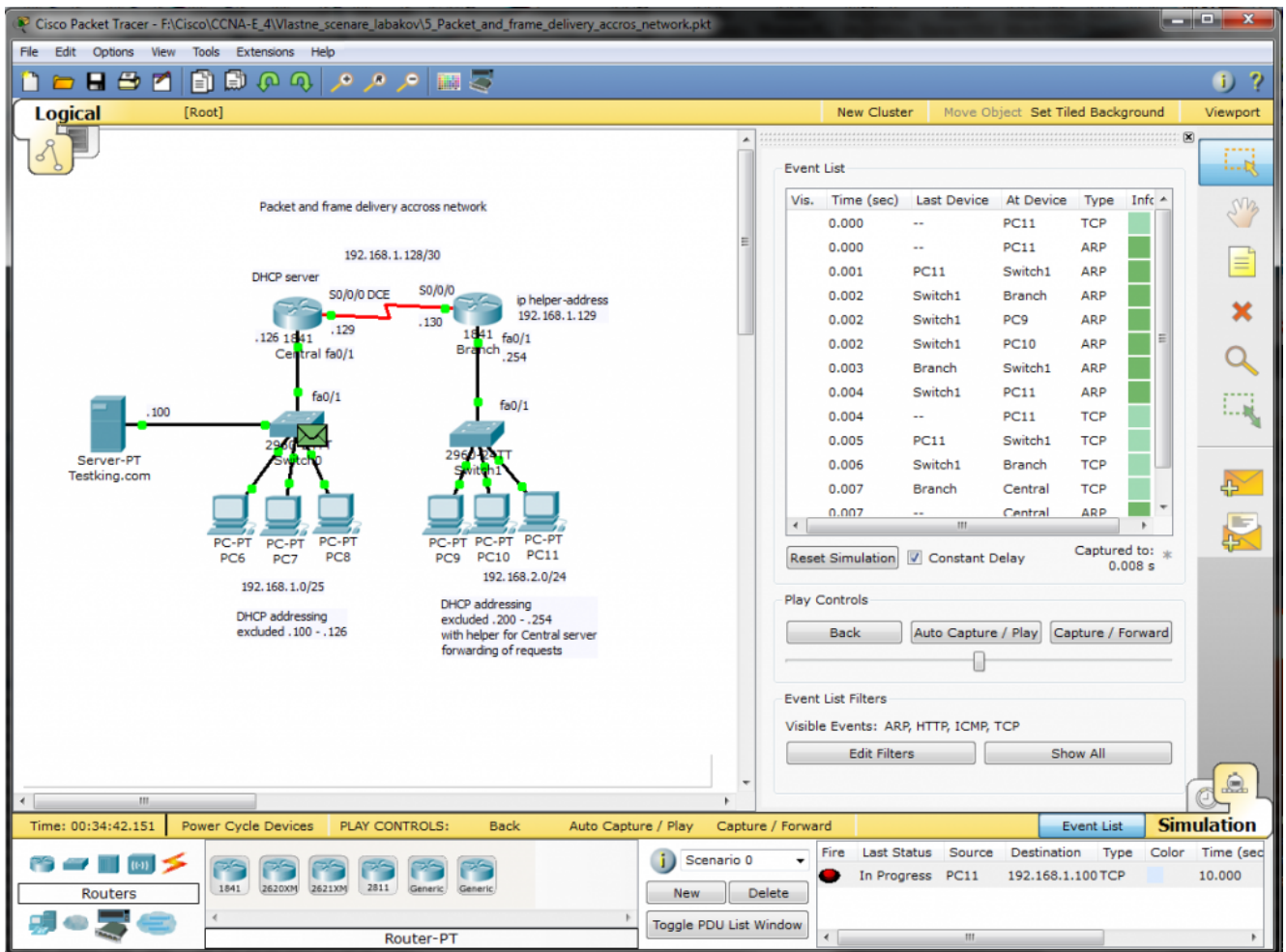
This process use and-ing destination IP in binary format with binary format of network mask and next make comparation with configured network address. If they are unequal data are send to default gateway (MAC address of default gateway is set as destination address of frame). In this scenario you are encouraged to create PDU in simulation mode and examine packet delivery. Interesting are also PDU at appropriate protocol stack (Transport, network and data link layer).

Topology of our scenario is

Packet and frame delivery accross network

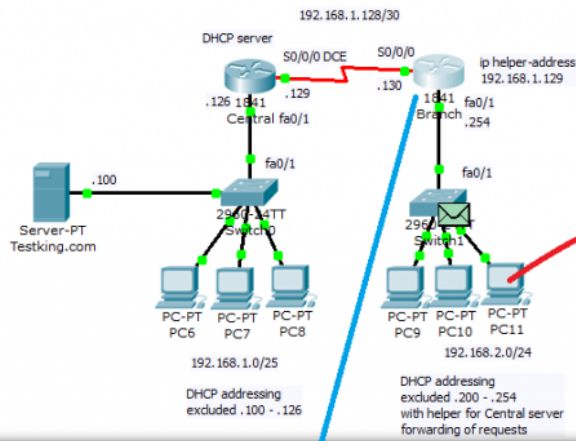Preconfigured scenario (PKT 5.2 or above).

When you toggle betw. realtime and simulation mode, interface will change to next picture

After appropriate time used for PDU propagation across network (and ARP caching for L2 encapsulation), PC11 can send frame to Branch fa0/1 interface that act as a default gateway. You can scroll event list and look at PDU emitted by PC11 after ARP process as it show next picture.

Packet and frame delivery accross network

192.168.1.128/30

DHCP server

S0/0/0 DCE   S0/0/0   ip helper-address
.129   .130   192.168.1.129

.126 1841   1841 fa0/1
Central fa0/1 Branch .254

fa0/1   fa0/1

.100

Server-PT   2960-24TT   2960-24TT
Testking.com   Switch0   Switch1

PC-PT PC-PT PC-PT   PC-PT PC-PT PC-PT
PC6   PC7   PC8   PC9   PC10   PC11

192.168.1.0/25   192.168.2.0/24

DHCP addressing   DHCP addressing
excluded .100 - .126   excluded .200 - .254
                          with helper for Central server
                          forwarding of requests

Branch

Physical | Config | CLI

IOS Command Line Interface

```
Branch#show interface fa0/1
FastEthernet0/1 is up, line protocol up (connected)
  Hardware is Lance, address is 000a.f329.7902 (bia 000a.f329.7902)
  Internet address is 192.168.2.254/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 1 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     7 packets input, 416 bytes, 0 no buffer
     Received 6 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     5 packets output, 310 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
--More--
```

Copy | Paste

mac of defaults gateway

PDU Information at Device: Switch1

OSI Model | Inbound PDU Details | Outbound PDU Details

PDU Formats

Ethernet II

PC11 send frame to default gateway

0   4   8   14   19 Byte

PREAMBLE: DEST MAC: SRC MAC:
101010...1011 000A.F329.7902 0030.F2EC.AA48

TYPE: DATA (VARIABLE LENGTH)   FCS:
0x800   0x0

IP

0   4   8   16   19   31 Bits

4   IHL   DSCP: 0x0   TL: 44
    ID: 0x4   0x2   0x0
TTL: 128   PRO: 0x6   CHKSUM
        SRC IP: 192.168.2.1
        DST IP: 192.168.1.100
        OPT: 0x0   0x0
        DATA (VARIABLE LENGTH)

**because source and dest are
not on same network**

16   31 Bits

C PORT: 6542   DEST PORT: 80

pture / Forward   Event List   **Simulation**

o 0

Fire | Last Status | Source | Destination | Type | Color | Time (sec)
● | In Progress | PC11 | 192.168.1.100 | TCP | | 10.000

Delete

ist Window

is set as destination address of frame). In this scenario y
encouraged to create PDU in simulation mode and examine
delivery. Interesting are also PDU at appropriate protocol
(Transport, network and data link layer).

3 reads   Send to friend

Alt+F4 Exit