Consider the Configuration in Appendix 1 (Betrachten Sie die Konfiguration in Appendix 1)

The network Manager needs to find out a series of information: (Der Netzwerk Manager möchte folgende Informationen abfragen:)

1 Indicate the necessary OID to find out the ***"Next Hop Address"*** used by the ***Router R6*** to send messages to Subnet_B. Explain your answer!

(Geben Sie den nötigen OID an, um die ***"Next Hop Address"*** zu erfahren, die ***Router R6*** verwendet, um Meldungen zu Subnet_C zusenden. Begründung?)

OID: 1.3.6.1.2.1.4.21.1.7.192.168.10.96
mib2.IP_Group.IP_Route_Table.IP_Route_Entry.NextHop.index index=Subnet_B Address=192.168.10.96

2 Indicate the necessary OID to find out the ***"Route Mask"*** used by the ***Router R3*** to identify where to sent messages to Subnet_D and explain your answer

(Geben Sie den nötigen OID an, um die ***"Route Mask"*** zu erfahren, die ***Router R3*** benötigt, um Meldungen zu erkennen, die zu Subnet_Dgesendet werden sollen. Begründung?)

OID: 1.3.6.1.2.1.4.21.1.11.192.168.10.16
mib2.IP_Group.IP_Route_Table.IP_Route_Entry.RouteMask.index index=Subnet_D Address=192.168.10.16

3 Indicate the necessary OID to find out the ***time interval in hours*** since Router R6 was in operation since last start.

(Geben Sie den nötigen OID an, um das ***Zeitintervall in Stunden*** heraus zu finden, das angibt, wie lange der Router R6 seit dem letzten Start gelaufen ist.)

OID: 1.3.6.1.2.1.1.3.0
mib2.System_Group.SysUpTime.scalar

1 TimeTick is 0.01s long, so result must be devided throught 360 000 in order to get it in hours.

4. Please consider the ***Router R6*** in the configuration from the Appendix 1
The manager needs to carry out the actions listed below on the Router R6.
(Betrachten Sie ***Router R6*** in der Konfigurationsskizze in Appendix 1
Der Manager möchte folgende Aktionen auf Router R6 durchführen.

4.1. Indicate the necessary OID to find out ***how many interfaces*** are connected to the Router R6.
(Geben Sie den nötigen OID an, um abzufragen, wie viele Interfaces z.Z. von dem Router R6 unterstützt werden?)

OID: 1.3.6.1.2.1.2.1.0
mib2.IF_Group.ifNumber.scalar

4.2. Indicate the necessary OID to find out ***what kind of controller*** is used as interface nr.1?
(Geben Sie die nötigen OID an, um heraus zu finden, welcher Kontroller (Ethernet, Serial, WLAN, etc.) als Interface Nr. 1 des Routers verwendet wird?)

OID: 1.3.6.1.2.1.2.2.1.3.1
mib2.IF_Group.ifTable.ifEntry.if Type.index index=1

5. Please consider the ***Traffic Listings Nr.2***.
Indicate how a manager can establish - using a SNMPUTIL-Tool - which is the state of the connection between the ***Client Station*** with the ***IP-Address 192.168.1.2*** and the ***Station with the IP-Address 192.168.2.2*** from the ***client*** point of view.

(Betrachten Sie das ***Traffic Listings Nr.2***
Geben Sie an, wie der Manager mit einem SNMPUTIL Tool den Zustand der Verbindung zwischen der ***Client Station*** mit ***IP-Adresse 192.168.1.2*** und die ***Station mit der IP-Addresse 192.168.2.2*** aus Sicht des ***Clients,*** herausfinden kann?)

OID: 1.3.6.1.2.1.6.13.1.1.192.168.1.2.20.192.168.2.2.80

mib2.TCP_Group.TCPConnTable.TCPConnEntry.TCPConnState.index

index=localAddress.localPort.remoteAddress.remotePort

localAddress=192.168.1.2 localPort=20

remoteAddress=192.168.2.2 remotePort=80

Listing 2: SYN/SYN, ACK/RST

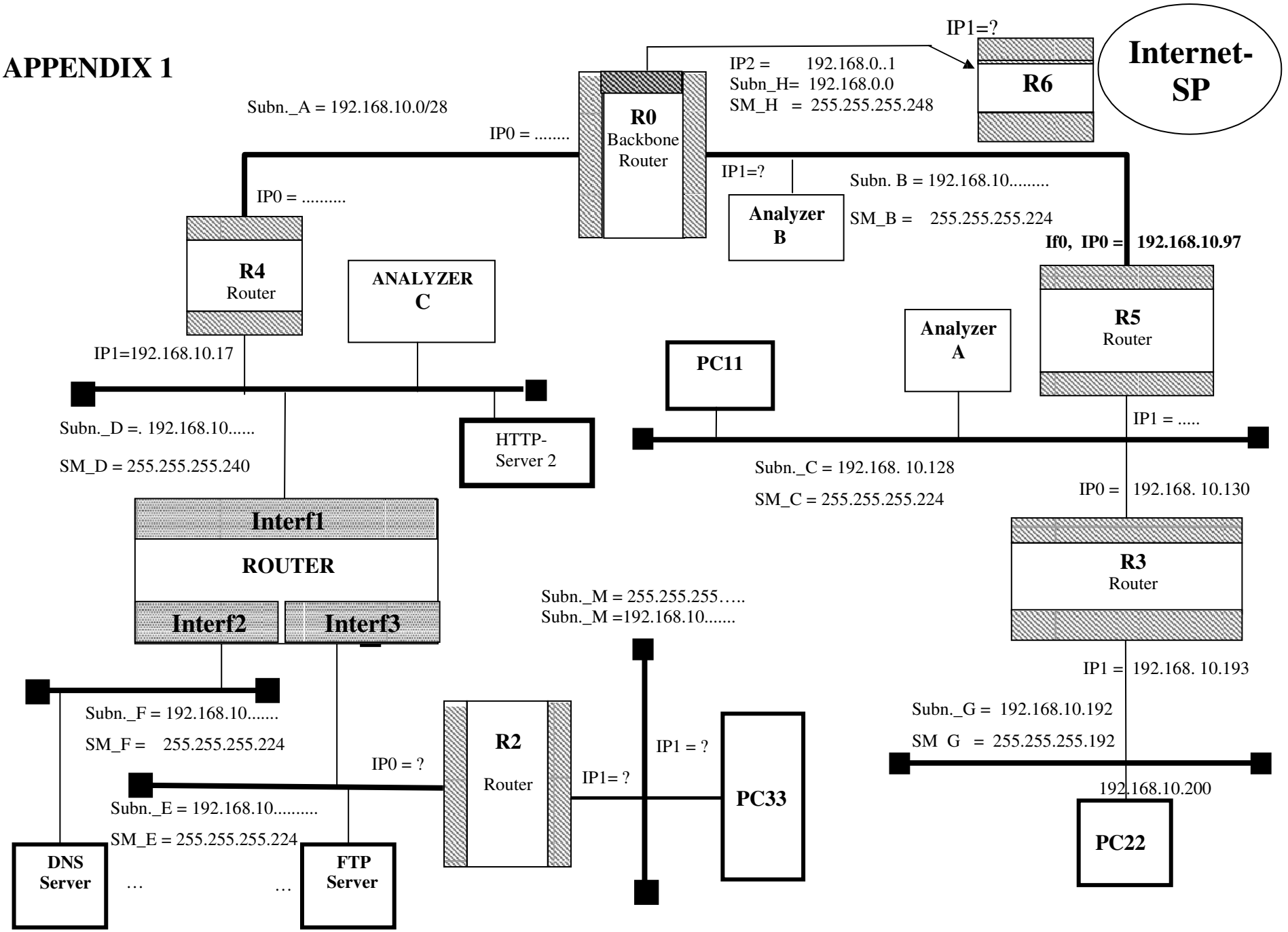
```
No.   Time        Source          Destination     Protocol Info
1     0.000000    192.168.1.2     192.168.2.2     TCP  ftp-data > http
                                                  [SYN] Seq=4294967295
                                                  Win=8192 Len=0

Frame 1 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: CadmusCo_82:92:27 (08:00:27:82:92:27), Dst:
CadmusCo_9b:f3:9d (08:00:27:9b:f3:9d)
Internet Protocol, Src: 192.168.1.2 (192.168.1.2), Dst: 192.168.2.2
(192.168.2.2)
Transmission Control Protocol, Src Port: ftp-data (20), Dst Port: http
(80), Seq: 4294967295, Len: 0
    Source port: ftp-data (20)
    Destination port: http (80)
    Sequence number: 4294967295    (relative sequence number)
    Header length: 20 bytes
    Flags: 0x02 (SYN)
        0... .... = Congestion Window Reduced (CWR): Not set
        .0.. .... = ECN-Echo: Not set
        ..0. .... = Urgent: Not set
        ...0 .... = Acknowledgment: Not set
        .... 0... = Push: Not set
        .... .0.. = Reset: Not set
        .... ..1. = Syn: Set
        .... ...0 = Fin: Not set
    Window size: 8192
    Checksum: 0x0b2a [correct]
    [SEQ/ACK analysis]

No.   Time        Source          Destination     Protocol Info
2     0.000713    192.168.2.2     192.168.1.2     TCP  http > ftp-data [SYN,
                                                  ACK] Seq=0 Ack=0 Win=5840
                                                  Len=0 MSS=1460

Frame 2 (60 bytes on wire, 60 bytes captured)
Ethernet II, Src: CadmusCo_9b:f3:9d (08:00:27:9b:f3:9d), Dst:
CadmusCo_82:92:27 (08:00:27:82:92:27)
Internet Protocol, Src: 192.168.2.2 (192.168.2.2), Dst: 192.168.1.2
(192.168.1.2)
Transmission Control Protocol, Src Port: http (80), Dst Port: ftp-data
(20), Seq: 0, Ack: 0, Len: 0
    Source port: http (80)
    Destination port: ftp-data (20)
    Sequence number: 0    (relative sequence number)
    Acknowledgement number: 0    (relative ack number)
    Header length: 24 bytes
    Flags: 0x12 (SYN, ACK)
```

```
        0... .... = Congestion Window Reduced (CWR): Not set
        .0.. .... = ECN-Echo: Not set
        ..0. .... = Urgent: Not set
        ...1 .... = Acknowledgment: Set
        .... 0... = Push: Not set
        .... .0.. = Reset: Not set
        .... ..1. = Syn: Set
        .... ...0 = Fin: Not set
    Window size: 5840
    Checksum: 0x95a7 [correct]
    Options: (4 bytes)
    [SEQ/ACK analysis]
```

No.	Time	Source	Destination	Protocol	Info
3	0.001024	192.168.1.2	192.168.2.2	TCP	ftp-data > http [RST] Seq=0 Win=0 Len=0

```
Frame 3 (54 bytes on wire, 54 bytes captured)
Ethernet II, Src: CadmusCo_82:92:27 (08:00:27:82:92:27), Dst:
CadmusCo_9b:f3:9d (08:00:27:9b:f3:9d)
Internet Protocol, Src: 192.168.1.2 (192.168.1.2), Dst: 192.168.2.2
(192.168.2.2)
Transmission Control Protocol, Src Port: ftp-data (20), Dst Port: http
(80), Seq: 0, Len: 0
    Source port: ftp-data (20)
    Destination port: http (80)
    Sequence number: 0    (relative sequence number)
    Header length: 20 bytes
    Flags: 0x04 (RST)
        0... .... = Congestion Window Reduced (CWR): Not set
        .0.. .... = ECN-Echo: Not set
        ..0. .... = Urgent: Not set
        ...0 .... = Acknowledgment: Not set
        .... 0... = Push: Not set
        .... .1.. = Reset: Set
        .... ..0. = Syn: Not set
        .... ...0 = Fin: Not set
    Window size: 0
    Checksum: 0x2b27 [correct]
```

APPENDIX 1


IP1=?
Internet-SP
IP2 = 192.168.0..1
Subn_H= 192.168.0.0
SM_H = 255.255.255.248
R6
Subn._A = 192.168.10.0/28
IP0 = ...
R0
Backbone
Router
IP1=?
Subn. B = 192.168.10.....
SM_B = 255.255.255.224
Analyzer
B
If0, IP0 = 192.168.10.97
IP0 = ...
R4
Router
ANALYZER
C
R5
Router
Analyzer
A
PC11
IP1=192.168.10.17
Subn._D =. 192.168.10.....
SM_D = 255.255.255.240
HTTP-
Server 2
IP1 = ...
Subn._C = 192.168. 10.128
SM_C = 255.255.255.224
IP0 = 192.168. 10.130
Interf1
ROUTER
Interf2
Interf3
R3
Router
Subn._M = 255.255.255…..
Subn._M =192.168.10.....
IP1 = 192.168. 10.193
Subn._G = 192.168.10.192
SM G = 255.255.255.192
Subn._F = 192.168.10.....
SM_F = 255.255.255.224
IP0 = ?
R2
Router
IP1= ?
IP1 = ?
PC33
192.168.10.200
PC22
Subn._E = 192.168.10.....
SM_E = 255.255.255.224
DNS
Server
…
…
FTP
Server