

SIP measurement

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Introduction

The measurement tasks cover various aspects of

- Voice over IP (RTP protocol)
- SIP signalling protocol.

Measurements can be carried out with the following equipment (Figure 1):

- one Cisco 3640 router,
- one Cisco 3640 router,
- Catalyst FastEthernet switch with 24 ports of 100 Mbits/s
- routers are connected through a serial line of capacity 2Mbits/s.
- 4 IP telefons which use SIP protocol to establish and release calls
- 2 PCs (called B) running Linux for the generation of background traffic
- [Proxy software from Columbia University](#)
- PCs running Linux for monitoring traffic and SIP signalling messages with the use of Sniffer

Note that the equipments only represent a piece of SIP telefon arsenal, equipments from other vendors may be used for the measurements as well.

Quiz

1. What is a SIP? What is SIP used for?
2. What is a proxy? What is a proxy used for?
3. What is a redirect server?
4. What is an INVITE, ACK, BYE,... message?
5. How can FastEthernet switch be configured to monitor traffic on a given port with commands?

For answering quiz 20 points can be collected.

Tasks

Before configuring equipments:

1. tasks should be understood and manuals should be carefully read,
2. the plan of configuration and steps should be prepared,
3. the plan of configuration and steps should be approved by the supervisor of the measurement.
4. carry out the approved plan of configuration and steps

The following tasks should be carried out.

1. Task 1 (10 points, 6 points without help): The IP network is realized with two routers. Each

router is connected to the FastEthernet switch on separate Fast Ethernet port. The switch is configured to provide two VLANs (Virtual LAN). Two VLANs are connected by an IP network connected by 2 routers. The two routers are connected by serial lines of 2Mbits/s. In each VLAN there are two PCs and two IP telefons available for measurements. Assume that on each VLAN we want to run program Sniffer (runned in a separate PC in each VLAN) to monitor traffic between two VLAN. Determine which port should be configured to be monitored on the FastEthernet switch. How should the switch be configured in order to monitor the chosen port (and traffic between two VLANs) from PCs with Sniffer?

2. Task 2: (Configuration is illustrated in Figure B-4 of a document "[SIP call flows](#)")
 - o Subtask 1 (10 points without help, 6 points with help): Realize the call process illustrated in Figure B-4 with a proxy running in a separate PC. This is a default configuration when the IP telefons are started. Monitor and save the SIP signalling messages collected by Sniffer to a file!
 - o Subtask 2 (10 points without help, 6 points with help): Realize the call process in Figure B-4 without proxy software (in each IP phone)! In order to do that SIP configuration of IP telefons should be modified. Namely, the IP address of the proxy should be modified (The proxy address of telefon A should be modified to be the IP address of telefon B, and so on). Monitor and save the SIP signalling messages collected by Sniffer to a file! Compare with the previous case (the case without proxy)! Analyze and compare with the description written in a document "SIP call flows"!
3. Task 3
 - o Subtask 1 (10 points without help, 6 points with help): Realize the call process illustrated in Figure B-5 (the proxy address of IP telefons should be modified to be the IP address of the host running proxy). Monitor and save the SIP signalling messages collected by Sniffer to a file! Analyze and compare with the description written in a document "SIP call flows"!
 - o Subtask 2 (10 points without help, 6 points with help): Realize the call process illustrated in Figure B-6. Monitor and save the SIP signalling messages collected by Sniffer to a file! Analyze and compare with the description written in a document "SIP call flows"!
 - o Subtask 3 (15 points without help, 6 points with help): Realize the call process illustrated in Figure B-7. Monitor and save the SIP signalling messages collected by Sniffer to a file! Analyze and compare with the description written in a document "SIP call flows"!
 - o Subtask 4 (15 points without help, 6 points with help): Realize the call process illustrated in Figure B-8. Monitor and save the SIP signalling messages collected by Sniffer to a file! Analyze and compare with the description written in a document "SIP call flows"!
4. Task 3 (not compulsory, but for one who wants to submit a paper on measurements): Use MGEN to generate background traffic. Judge the voice quality under various load value.

Literature for Preparation (for answering quiz and carrying out tasks)

- [About SIP](#)
- [Down load MGEN and exercise the usage at home.](#)
- [SIP call flows \(from Cisco\)](#)
- [Monitoring traffic on switch \(Section Enabling Switch port analyzer\)](#)