

Praktikum Rechnernetze

Protokoll zu Versuch 10 (VoIP) von Gruppe 1

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Einführung

Diese Materialien basieren auf Professor Kiefers “Praktikum Rechnernetze”-Vorlesung der HdM Stuttgart.

Sie haben einen Fehler gefunden oder haben einen Verbesserungsvorschlag? Bitte eröffnen Sie ein Issue auf GitHub (github.com/poijntfx/uni-netpractice-notes):



Figure 1: QR-Code zum Quelltext auf GitHub

Dieses Dokument und der enthaltene Quelltext ist freie Kultur bzw. freie Software.



Figure 2: Badge der AGPL-3.0-Lizenz

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STUN und Registrierung

STUN und Registrierung

Bei der Konfiguration des sipgate-Accounts sind auch Angaben zum sogenannten STUN-Server erforderlich. Beschreiben Sie mit eigenen Worten Aufgaben und die Funktion eines STUN-Servers

TODO: Add answer

Welche IP-Adresse hat das REGISTER-Paket nach dem NAT-Vorgang (NAT ist wegen der privaten Adresse erforderlich)?

TODO: Add interpretation

1 0.000000	10.231.172.221	217.10.79.9	SIP	710 Request: REGISTER sip:sipgate.de (1 binding)
2 0.010972	217.10.79.9	10.231.172.221	SIP	521 Status: 401 Unauthorized
3 0.011573	10.231.172.221	217.10.79.9	SIP	904 Request: REGISTER sip:sipgate.de (1 binding)
4 0.021907	217.10.79.9	10.231.172.221	SIP	585 Status: 200 OK (REGISTER) (1 binding)
5 31.298931	217.10.79.9	10.231.172.221	SIP/SDP	1359 Request: INVITE sip:2555428e0@10.231.172.221:49699
6 31.298931	10.231.172.221	217.10.79.9	SDP	2220 217.10.79.9:49699

Request-Line: REGISTER sip:sipgate.de SIP/2.0

Message Header

Via: SIP/2.0/UDP 194.49.221.7:22556;branch=z9hG4bK8041d10841bbe8118a33a1d115dda7c5;rport

Verbindungsaufbau und SDP-Protokoll

Welche SIP_Methods unterstützt der Anrufer?

TODO: Add interpretation

```
▼ Session Initiation Protocol (INVITE)
  ▶ Request-Line: INVITE sip:2555428e0@10.231.172.221:49699 SIP/2.0
  ▼ Message Header
    ▶ Record-Route: <sip:217.10.79.9;lr;ftag=as1da87d54>
    ▶ Record-Route: <sip:172.20.40.6;lr>
    ▶ Record-Route: <sip:217.10.68.137;lr;ftag=as1da87d54>
    ▶ Via: SIP/2.0/UDP 217.10.79.9;branch=z9hG4bK620d.70720930871bcf1d63f6077496ee77cd.0
    ▶ Via: SIP/2.0/UDP 172.20.40.6;branch=z9hG4bK620d.458c80f8dc48e38afdc31b1c423a13c0.0
    ▶ Via: SIP/2.0/UDP 217.10.68.137;branch=z9hG4bK620d.e61e620768ab8026e3b97ca6f225b04f.0
    ▶ Via: SIP/2.0/UDP 217.10.77.115:5060;branch=z9hG4bK1f25f9bd
    Max-Forwards: 67
    ▶ From: "anonymous" <sip:anonymous@sipgate.de>;tag=as1da87d54
    ▶ To: <sip:2555428e0@sipgate.de>
    ▶ Contact: <sip:anonymous@217.10.77.115:5060>
    Call-ID: 5d0eca60468d2182243ab84b059ee901@sipgate.de
    [Generated Call-ID: 5d0eca60468d2182243ab84b059ee901@sipgate.de]
    ▶ CSeq: 103 INVITE
    Allow: INVITE, ACK, CANCEL, OPTIONS, BYE, REFER, SUBSCRIBE, NOTIFY, INFO, PUBLISH, MESSAGE
    Supported: replaces
    Content-Type: application/sdp
    Content-Length: 415
  ▶ Message Body
```

Figure 11: Erlaubte SIP-Methoden

RTP/RTCP

Dokumentieren Sie den RTP-Kommunikationsfluss anhand der IP-Adressen. Wer kommuniziert mit wem?

TODO: Add interpretation

10.231.172.221 217.10.79.9 212.9.44.249

49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11380, Time=160, Mark	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11381, Time=320	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11382, Time=480	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58596, Time=582584120, Mark	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11383, Time=640	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58597, Time=582584280	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11384, Time=800	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58598, Time=582584440	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11385, Time=960	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58599, Time=582584600	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11386, Time=1120	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58600, Time=582584760	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11387, Time=1280	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58601, Time=582584920	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11388, Time=1440	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58602, Time=582585080	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11389, Time=1600	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58603, Time=582585240	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11390, Time=1760	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58604, Time=582585400	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11391, Time=1920	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58605, Time=582585560	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11392, Time=2080	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58606, Time=582585720	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11393, Time=2240	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58607, Time=582585880	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11394, Time=2400	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58608, Time=582586040	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11395, Time=2560	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x7874BFBC, Seq=58609, Time=582586200	21804
49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11396, Time=2720	21804

SIP-Byte

Beschreiben Sie, wie der BYE-Method-Timer arbeitet?

TODO: Translate answer

This document provides an extension to SIP that defines a session expiration mechanism. Periodic refreshes, through re-INVITEs or UPDATEs, are used to keep the session active. The extension is sufficiently backward compatible with SIP that it works as long as either one of the two participants in a dialog understands the extension. Two new header fields (Session-Expires and Min-SE) and a new response code (422) are defined. Session-Expires conveys the duration of the session, and Min-SE conveys the minimum allowed value for the session expiration. The 422 response code indicates that the session timer duration was too small.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.237.225.16	10.237.225.1	SIP	370	Request: BYE sip:30080@10.237.225.1:5060
2	0.499997	10.237.225.16	10.237.225.1	SIP	370	Request: BYE sip:30080@10.237.225.1:5060