Praktikum Rechnernetze

Protokoll zu Versuch 10 (VoIP) von Gruppe 1

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Einführung

Mitwirken

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/pojntfx/uni-netpractice-notes):



Abbildung 1: QR-Code zum Quelltext auf GitHub

Lizenz

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



Abbildung 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

Die "Session Traversal Utilities for NAT" ist ein Standard, welcher dabei hilft, die öffentlichen Netzwerkadressen von Netzwerknodes herauszufinden, um eine Peer-to-peer Verbindung zwischen diesen Nodes hinter NAT herzustellen. Es kann außerdem festgestellt werden, welche Art von NAT verwendet wird (Full Cone, Restricted Cone...). Da die Belastung von STUN-Servern in der Realität vergleichsweise niedrig ist, können für viele Projekte öffentliche STUN-Server ausreichend sein.

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

TODO: Add interpretation

Verbindungsaufbau und SDP-Protokoll

Verbindungsaufbau und SDP-Protokoll

Session Initiation Protocol (INVITE)

Welche SIP_Methods unterstützt der Anrufer?

Wie im Screenshot zu sehen unterstützt der Anrufer die SIP-Methoden INVITE, ACK, CANCEL, OPTIONS, BYE, REFER, SUBSCRIBE, NOTIFY, INFO, PUBLISH und MESSAGE.

```
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]
  ▶ ČSeq: 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
```

RTP/RTCP

RTP/RTCP

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

TODO: Add interpretation

271.10.79.0 ### THE TO TERM, SEG-CONTRIBUTE SHOULD THREE SEGMENT ### THE TO TERM, SEG-CONTRIBUTE SHO			
### CHANGE OF THE PRICE OF THE	10.231.172.		212.9.44.249
PROFITE CAT DOM, SERC-CHRISTIC Resp. 1200	49701		21904
### CAPTURE CAT FORM, SERV-ConfeDIC LINEAR, Temp-1880 1200 #### CAPTURE CAT FORM, SERV-ConfeDIC LINEAR, Temp-1880 1200 #### CAPTURE CAT FORM, SERV-CONFEDIC Congression 1200 #### CAPTURE CAT FORM, SERV-CONFEDIC LINEAR, TEMP-1880 1200 #### CAPTURE CAT FORM, SERV-CONFEDIC CONFEDIT LINEAR, TEMP-1880 1200 #### CAPTURE CAT FORM, SERV-CONFEDIT LINEAR, SERV-SERVEN LINEAR, SER		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11381, Time=320	
### ITEM COLD FOR SERVICE STREET STRE		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11382, Time=480	
Part Cal Dec. D		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58396, Time=382584120, Mr	and a
PI-MITE G 111 KMS, SEC-CONTRIGUES, SES-2007, Thes-30234200		PT=ITU-T G.711 PCMA, SSRC=0x81C168A8, Seq=11383, Time=640	
Part Cal Dec. Cal Ca		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58597, Time=582584280	
PI-STEE CALL POOR, SEC-CHARDWISE, SES-SERVED, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE, SES-SERVED, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE, SES-SESSAB, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE, SES-SESSAB, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE, SES-SESSAB, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE, SES-SESSABA, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE, SES-SESSABAD, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE, SES-SESSABA, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE, SES-SESSABAD, Trans-SESSABADE PI-STEE CALL POOR, SEC-CHARDWISE		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11384, Time=800	
######################################		PT=ITU-T G.711 PCMA, SSRC=0x7874FBFC, Seq=58598, Time=582584440	
### CT PRINTE CT		PT=ITU-F G.711 PCMA, SSRC=0x81C1E8A8, Seq=11385, Time=960	
### CAT 17		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58399, Time=582384600	
### CAT PROMISE OF THE CAT		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11386, Time=1120	
### ### ### ### ### ### ### ### ### ##		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58600, Time=582584760	
PI-STEE G. 31 EACH, SEC-CONTRIPETES, SES-SERIOI, Three-SESSARD	49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11387, Time=1280	21804
### CAT 12		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58601, Time=582584920	
PI-STEE G.11 EARS, SEC-ENTERFEES, SES-1800, Three-SESSORDS		PT=ITU-T G.711 PCMA, SSRC=0x81C188A8, Seq=11388, Time=1440	
### CAT 17	49701	PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58602, Time=582585080	
PI-STEP G-312 ROWS, SSC-CATES/SSTEP S-SS-250003. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SSEP S-SS-250003. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SSEP S-SS-250000. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SSEP S-SS-250000. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SSEP S-SS-250000. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SSEP S-SS-20000. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SSEP S-SS-20000. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SSEP S-SS-20000. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SSEP S-SS2000. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SS2000. Three-SS2023000. PI-STEP G-312 ROWS, SSC-CATES/SS2000. Three-SS20000. PI-STEP G-312 ROWS, SSC-CATES/SS2000. Three-SS200000. PI-STEP G-312 ROWS, SSC-CATES/SS2000. Three-SS200000. PI-STEP G-312 ROWS, SSC-CATES/SS2000. Three-SS200000. PI-STEP G-312 ROWS, SSC-CATES/SS2000. Three-SS200		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11389, Time=1600	
### 1701 G.111 CAM, SDEC_HOTH ### C. Sec_5800, Time - \$2258450 7100		PT=ITU-T G.711 PCMA, SSRC=0x7B74FBFC, Seq=58603, Time=582585240	
PI-MITE G.311 EARS, SEC-ENTERFERS. SES-EMBOR, Three-SERVENSON PI-MITE G.311 EARS, SEC-ENTERFERSON PI	49701	PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11390, Time=1760	21804
### 100 C 171 CMS SPEC-CHPE (CMRS SPEC-CHPE (CMRS SPE-1789) T (TWS 1780) PHOTO C 171 CMS SPEC-CHPE (CMRS SPEC-		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58604, Time=582585400	
PF-HTM C 311 KOAN, SSC-CHRIFFER (1982-1980), Three-SESSISS		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11391, Time=1920	
PI-INTO G 711 DOLS, SIGN-CO-BIC (CERM, Sep-1192), Teme-2009 21004	49701	PT=ITU-T G.711 PCMA, SSRC=0x7874FBFC, Seq=58605, Time=582585560	
PI-MITE G.11 EAST, MSC-GOTZ/PERF S. SES-MISSON, Three-SIGNATOTO		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11392, Time=2080	
### FIRST 6.711 PCM, SDE-code CLEMA, Sept-1287, Teme-2280 2100 42001 FF-IRST 6.711 PCM, SDE-code CLEMA, Sept-1287, Teme-2280 2100 42001 FF-IRST 6.711 PCM, SDE-code CLEMA, Sept-1287, Teme-2280 2100 42001 FF-IRST 6.711 PCM, SDE-code CLEMA, Sept-1287, Teme-2280 2100 42001 FF-IRST 6.711 PCM, SDE-code CLEMA, Sept-1287, Teme-2280 2000 2100 42001 FF-IRST 6.711 PCM, SDE-code CLEMA, Sept-1287, Teme-2280 2000 2100 42001 FF-IRST 6.711 PCM, SDE-code CLEMA, Sept-1287, Teme-2280 2000 2100 42001 FF-IRST 6.711 PCM, SDE-code CLEMA, SEPT-1287, Teme-2280 2000 2100 42001 FF-IRST 6.711 PCM, SDE-code CLEMA, SEPT-1287, Teme-2280 2000 2100 4200 4200 4200 4200 4200 420		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58606, Time=582585720	
PI-MIPE G.31 EACH, SEC-ENTRIPERS. SSS-20007. Three-SE255800000 PI-MIPE G.31 EACH, SEC-ENTRIPERS. SSS-20007. Three-SE255800000000000000000000000000000000000		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11393, Time=2240	
### FIFUT G 711 PCMA. SSRC-ode (TLEMA, Soq-1194A, Time-2420 21104 #### FIFUT G 711 PCMA. SSRC-ode (TLEMA, Soq-1194A, Time-54256664) 21200 ##################################		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58607, Time=582585880	
97101		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11394, Time=2400	
69701 PT=ITUT G.711 PCMA_SSRC=0x81C1E8A8, Seq=11995, Time=2560 21804 29701 PT=ITUT G.711 PCMA_SSRC=0x7876fffC_Seq=58690, Time=382386250 21804		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58608, Time=582586040	
49701 PT=ITU-T G.711 PCMA, SSRC=0x7874FBFC, Seq=58609, Time=582586200 21804		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11395, Time=2560	
THE THE STATE OF THE CONTRACT OF THE THE THE THE THE		PT=ITU-T G.711 PCMA, SSRC=0x7874F8FC, Seq=58609, Time=582586200	
		PT=ITU-T G.711 PCMA, SSRC=0x81C1E8A8, Seq=11396, Time=2720	21804

SIP-Byte

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
Г	1 0.088000	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
	3 1.500125	10.237.225.16	10.237.225.1	SIP	370 Request: BYE sip:30080@10.237.225.1:5060
	4 3.501388	10.237.225.16	10.237.225.1	SIP	370 Request: BYE sip:30080@10.237.225.1:5060
	5 7.583520	10.237.225.16	10.237.225.1	SIP	370 Request: BYE sip:30080@10.237.225.1:5060
	6 11.503866	10.237.225.16	10.237.225.1	SIP	370 Request: BYE sip:30080@10.237.225.1:5060
	7 15.504054	10.237.225.16	10.237.225.1	SIP	370 Request: BYE sip:30080@10.237.225.1:5060
	8 19.504955	10.237.225.16	10.237.225.1	SIP	370 Request: BYE sip:30080@10.237.225.1:5060