

IPv6 Ready Logo Phase 2  
Session Initiation Protocol

Test Profile  
Server

Version 1.1.0

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*IPv6 Forum*  
*Converged Test Specification*  
*IPv6 Logo Committee*  
*IPv6 Promotion Council (Japan)*

*<http://www.ipv6forum.org>*  
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# 1 Overview

This document describes details of the SIP Conformance Test. The format of the description block is as follows:

## Description block

<b>[NAME]</b>	NAME is a name of the test.
<b>[TARGET]</b>	TARGET is a target node of the test.
<b>[PURPOSE]</b>	PURPOSE is a short statement describing what the test attempts to achieve. It is usually phrased as a simple assertion of the feature or capability to be tested.
<b>[REQUIREMENT]</b>	REQUIREMENT section specifies the functions and conditions that will be needed to perform the test.
<b>[PARAMETER]</b>	PARAMETER describes SIP URIs on the topology that relates to the test
<b>[ADDRESS]</b>	ADDRESS describes IP addresses on the topology that relates to the test.
<b>[TOPOLOGY]</b>	TOPOLOGY describes the network used in the test.
<b>[CONFIGURATION for NUT]</b>	CONFIGURATION for NUT describes how to initialize and configure the NUT before starting each test. If a value is not provided, then the protocol's default value is used.
<b>[INITIALIZATION]</b>	INITIALIZATION describes step-by-step instructions for carrying out the setting before the test.
<b>[PROCEDURE]</b>	PROCEDURE describes step-by-step instructions for carrying out the test.
<b>[JUDGMENT]</b>	JUDGEMENT describes expected result. If we can observe as same result as the description of Judgment, the NUT passes the test.
<b>[REFERENCE]</b>	REFERENCE section contains some parts of specification related to the tests. It also shows the document names and section numbers.

NOTE: There are common judgments in the category of JUDGMENT. Refer to Section 3.

## Acronyms

UA	- SIP User Agent
Server	- SIP Sever (Proxy and Registrar server)
IF	- Interface
UNI	- User-Network Interface
NNI	- Network-Network Interface



## Reference standards

- (1) RFC3261: SIP: Session Initiation Protocol (<http://www.ietf.org/rfc/rfc3261.txt>)
- (2) RFC3264: An Offer/Answer Model with Session Description Protocol (<http://www.ietf.org/rfc/rfc3264.txt>)
- (3) RFC4566: SDP: Session Description Protocol (<http://www.ietf.org/rfc/rfc4566.txt>)
- (4) RFC2617: HTTP Authentication: Basic and Digest Access Authentication (<http://www.ietf.org/rfc/rfc2617.txt>)
- (5) RFC3665: SIP Basic Call Flow Examples (<http://www.ietf.org/rfc/rfc3665.txt>)
- (6) IPv6 Ready Logo Phase 2 Policy
- (7) SIP IPv6 Test Scope

## Index

ex. [RFC3261 X.X.X]

Please refer to the table of contents in RFC3261

[RFC3261-X-X]

Please refer to the table number in Test-item-Priority



## 2 Requirement of conformance test

### 2.1 Requirements based on Policy of SIP IPv6 Ready Logo.

[PRq]

1. Supported transport protocol is only UDP.
2. The path MTU is 1500 bytes.
3. Supported URI scheme is only SIP-URI.
4. Supported media type of the message-body is application/sdp.
5. Only unicast session is supported.

### 2.2 Other Requirements

[ORq]

1. INVITE requests includes the bodies and any other requests doesn't include the bodies.
2. In case of a tester for conformance test sending message with Record-Route header field.
3. Use the value of Max-Forwards that are configured.
4. Send Digest authentication challenge for establishing a session.

## 3 Common JUDGMENT

### 3.1 generic\_message

Generic judgement items for SIP message

- The empty line must be present even if the message-body is not. [RFC3261-7-2]
- Request-Line and Status-Line:
  - Must exist as a start-line. [RFC3261.7]
  - Must be terminated by a carriage-return line-feed sequence (CRLF). [RFC3261-7-1]
  - SIP-version: Must be "SIP/2.0". [RFC3261-7-5,6]
- Header fields:
  - Must be terminated by a carriage-return line-feed sequence (CRLF). [RFC3261-7-1]
  - Recommended that Via, Route, Record-Route, Proxy-Require, Max-Forwards, and Proxy-Authorization appear towards the top of the message to facilitate rapid parsing. [RFC3261-7-7]



### 3.2 generic\_forward\_R-URI\_non-responsible-domain

Generic judgement items for Request-URI forwarded to non-responsible domain

- Request-Line:
  - Request-URI: Must equal that of the forwarded request. [RFC3261-16-22,23]

### 3.3 generic\_forward\_R-URI\_responsible-domain

Generic judgement items for Request-URI forwarded to responsible domain

- Request-Line:
  - Request-URI: Must equal one that the location service provides (i.e. Contact address registered by REGISTER request). [RFC3261-16-29,47]

### 3.4 generic\_forward\_from-PX2

Generic judgement items for SIP message forwarded from PX2

The size of whole message must be less than or equal to 1300bytes.

- Request-Line:
  - Method: Must equal as that in the message from PX2. [RFC3261-16-42,43]
- Status-Line:
  - Status-Code: Must equal as that in the message from PX2. [RFC3261-16-42,43]
- Header fields:
  - Must not reorder field values with a common field name. [RFC3261-16-45]
  - \* To
    - Must exist. [RFC3261-16-42,43]
    - addr-spec: Must equal as that in the message from PX2. [RFC3261-16-42,43]
    - tag-param: Must equal as that in the message from PX2(Must not exist unless original message has any value). [RFC3261-16-42,43,124]
  - \* From
    - Must exist. [RFC3261-16-42,43]
    - addr-spec: Must equal as that in the message from PX2. [RFC3261-16-42,43]
    - tag-param: Must equal as that in the message from PX2(Must not exist unless original message has any value). [RFC3261-16-42,43]



\* Call-ID

Must exist. [RFC3261-16-42,43]

Must equal as that in the message from PX2. [RFC3261-16-42,43]

\* CSeq

Must exist. [RFC3261-16-42,43]

seq-no: Must equal as that in the message from PX2. [RFC3261-16-42,43]

Method: Must match that of the request. [RFC3261-16-42,43]

Must equal as that in the message from PX2.

[RFC3261-16-42,43]

\* Content-Length

Must equal as that in the message from PX2. [RFC3261-16-42,43]

- Bodies:

Must equal as that in the message from PX2 (not be added, modified, deleted)

[RFC3261-16-46,131]

### 3.5 generic\_ forward\_from-UA11

Generic judgement items for SIP message forwarded from UA11

The size of whole message must be less than or equal to 1300bytes.

- Request-Line:

Method: Must equal as that in the message from UA11. [RFC3261-16-42,43]

- Status-Line:

Status-Code: Must equal as that in the message from UA11. [RFC3261-16-42,43]

- Header fields:

Must not reorder field values with a common field name. [RFC3261-16-45]

\* To

Must exist. [RFC3261-16-42,43]

addr-spec: Must equal as that in the message from UA11. [RFC3261-16-42,43]

tag-param: Must equal as that in the message from UA11(Mustnot exist unless original message has any value). [RFC3261-16-42,43,124]

\* From

Must exist. [RFC3261-16-42,43]

addr-spec: Must equal as that in the message from UA11. [RFC3261-16-42,43]



tag-param: Must equal as that in the message from UA11(Mustnot exist unless original message has any value). [RFC3261-16-42,43]

\* Call-ID

Must exist. [RFC3261-16-42,43]

Must equal as that in the message from UA11. [RFC3261-16-42,43]

\* CSeq

Must exist. [RFC3261-16-42,43]

seq-no: Must equal as that in the message from UA11. [RFC3261-16-42,43]

Method: Must match that of the request. [RFC3261-16-42,43]

Must equal as that in the message from UA11.

[RFC3261-16-42,43]

\* Content-Length

Must equal as that in the message from UA11. [RFC3261-16-42,43]

- Bodies:

Must equal as that in the message from UA11. [RFC3261-16-46,131]

### 3.6 generic\_forward\_from-UA12

Generic judgement items for SIP message forwarded from UA12.

The size of whole message must be less than or equal to 1300bytes.

- Request-Line:

Method: Must equal as that in the message from UA12. [RFC3261-16-42,43]

- Status-Line:

Status-Code: Must equal as that in the message from UA12. [RFC3261-16-42,43]

- Header fields:

Must not reorder field values with a common field name. [RFC3261-16-45]

\* To

Must exist. [RFC3261-16-42,43]

addr-spec: Must equal as that in the message from UA12. [RFC3261-16-42,43]

tag-param: Must equal as that in the message from UA12(Must not exist unless original message has any value).[RFC3261-16-42,43,124]

\* From



Must exist. [RFC3261-16-42,43]

addr-spec: Must equal as that in the message from UA12. [RFC3261-16-42,43]

tag-param: Must equal as that in the message from UA12 (Must not exist unless original message has any value). [RFC3261-42,43]

\* Call-ID

Must exist. [RFC3261-16-42,43]

Must equal as that in the message from UA12. [RFC3261-16-42,43]

\* CSeq

Must exist. [RFC3261-16-42,43]

seq-no: Must equal as that in the message from UA12. [RFC3261-16-42,43]

Method: Must match that of the request. [RFC3261-16-42,43,]

Must equal as that in the message from UA12. [RFC3261-16-42,43]

\* Content-Length

Must equal as that in the message from UA12. [RFC3261-16-42,43]

- Bodies:

Must equal as that in the message from UA12. [RFC3261-16-46,131]

### 3.7 generic\_forward\_request

Generic judgement items for SIP request that was forwarded

- Header fields:

\* Via

Must exist. [RFC3261-42,43]

Must add a Via header field value. [RFC3261-8-55, RFC3261-16-81]

For the 1st Via header field, Must follow these rules.

via-branch:

token: Must be different from all values sent by NUT in this sequence.  
(Excepting ACK for non-2xx response and CANCEL).

[RFC3261-16-87]

via-branch:

token: Must begin with the characters "z9hG4bK". [RFC3261-8-23,  
RFC3261-20-46]

transport: Must be "UDP". [PRq-1]

sent-by:

host: Recommended to be specified hostname of NUT.

[RFC3261-18-11,12]



For the 2nd Via header field, if the host portion of the "sent-by" parameter contains a domain name,

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

For the Via header field that was in original message,

via-branch: Must equal as that in the message. [RFC3261-8-22]

sent-by: Must equal as that in the message. [RFC3261-16-42,43]

transport: Must equal as that in the message. [RFC3261-42,43]

#### \* Route

Must remove the first value in the Route header field from the request, if the value indicates NUT. [RFC3261-16-72]

#### \* Record-Route

Must insert a Record-Route header field value of NUT into the copy before any existing Record-Route header field values, when it is INVITE. [RFC3261-16-52,53][ORq-2]

The value is SIP URI. [RFC3261-16-54][PRq-3]

Lr-param: Must contain "lr" parameter. [RFC3261-16-55]

#### \* Max-Forwards

Must exist. [RFC3261-16-42,43]

Must be decremented by one from that in the message from UA11. [RFC3261-16-49]

### 3.8 generic\_forward\_response

Generic judgement items for SIP response that was forwarded

- Header fields:

#### \* Via

Must exist. [RFC3261-42,43]

Must not exist the first Via header field line in original message. [RFC3261-16-94]

For the Via header field that was in original message,

via-branch: Must equal as that in the message. [RFC3261-8-22,135]

sent-by: Must equal as that in the message. [RFC3261-16-42,43,135]

transport: Must equal as that in the message. [RFC3261-42,43,135]





\* Record-Route

Must include the Record-Route header field value in original message.[ORq-2]

### 3.9 generic\_make\_ACK\_for-non2XX

Generic judgement items for ACK request for non-2xx response

- Request-Line:

Method: Must be "ACK". [RFC3261 7.1].

Request-URI: Must be the same value of that in the original request.  
[RFC3261-17-32]

Request-URI: Must not contain unescaped spaces or control characters.  
[RFC3261-7-5][RFC3261-19-11]

Request-URI: Must not be enclosed in "<>". [RFC3261-7-4]

- Header fields:

\* From

Must exist. [RFC3261-8-1]

Must be the same value of that in the original request. [RFC3261-17-32]

addr-spec: Must be the specified SIP-URI as NUT(AoR).  
[RFC3261 8.1.1.3],[RFC3261 20.20]

addr-spec: Must be enclosed in "<>" if a comma, semicolon, or question mark is  
contained. [RFC3261-20-13]

tag-param: Must exist. [RFC3261-8-9]

\* Call-ID

Must exist. [RFC3261-8-1]

Must be the same value of that in the original request. [RFC3261-17-32]

\* To

Must exist. [RFC3261-8-1]

Must equal the To header field in the response being acknowledged.  
[RFC3261-17-33]

addr-spec: Must be the specified SIP-URI as UA1(AoR). (Excepting REGISTER  
request.). [RFC3261-12-34]

addr-spec: Must be enclosed in "<>" if a comma, semicolon, or question mark is  
contained. [RFC3261-20-13]

tag-param: Must equal that in corresponding response, if present.  
[RFC3261-16-42,43]

\* Via



MUST be equal to the top Via header field of the original request.[RFC3261-17-35]

\* CSeq

Must exist. [RFC3261-8-1]

Must be less than  $2^{31}$ . [RFC3261-8-15,16, RFC3261-20-32]

Method: Must match that of the request. [RFC3261-8-14, RFC3261-17-37]

sequence number: Must be the same value as was present in the original request.  
[RFC3261-17-36]

\* Max-Forwards

Must exist. [RFC3261-8-1]

Must be the value specified in the tester configuration. [ORq-3]

\* Content-Length

Must be the size of the message-body, in decimal number of octets.  
[RFC3261 25.1]

\* Require

Must not exist. [RFC3261-8-80]

\* Proxy-Require

Must not exist. [RFC3261-8-80]

\* Accept

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Accept-Encoding

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Accept-Language

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Alert-Info

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Allow

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Expires

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* In-Reply-To

Must not exist. [RFC3261 20],[RFC3261-20-8]



\* Organization

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Priority

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Reply-To

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Server

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Subject

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Supported

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Warning

Must not exist. [RFC3261 20],[RFC3261-20-8]

- Bodies:

Must not exist. [RFC3261-17-39]

### 3.10 generic\_make\_CANCEL

Generic judgement items for CANCEL request

The destination address, port, and transport

Must be equal those used to send the original request. [RFC3261-9-11]

- Request-Line:

Method: Must be "CANCEL". [RFC3261 7.1].

Request-URI: Must be equal that in the request being cancelled. [RFC3261-9-2]

- Header fields:

\* Max-Forwards

Must exist. [RFC3261-8-1]

Must be the value specified in the tester configuration. [ORq-3]



\* Via

Must exist. [RFC3261-8-1]

MUST have only a single Via header field value. [RFC3261-9-3]

Must be the value matching the top Via value in the request being cancelled.  
(Tester check the value of sent-by, via-branch, and via-received, respectively.)

[RFC3261-9-3]

via-branch: Must exist in each Via header field. [RFC3261-8-21]

via-branch:

token: Must begin with the characters "z9hG4bK". [RFC3261-8-23,  
RFC3261-20-46]

transport: Must be "UDP". [PRq-1]

sent-by:

host: Recommended to be specified hostname of NUT. [RFC3261-18-11,12]

\* Call-ID

Must equal that in the request being cancelled. [RFC3261-9-2]

\* To

Must equal that in the request being cancelled, including a tag. (Tester check URI  
and tag, respectively.) [RFC3261-9-2]

\* CSeq

sequence number: Must equal that in the request being cancelled. [RFC3261-9-2]

Must equal "CANCEL". [RFC3261-9-4]

\* From

Must equal that in the request being cancelled, including a tag. (Tester check the  
value of URI and tag, respectively.) [RFC3261-9-2]

\* Content-Length

Must be the size of the message-body, in decimal number of octets.  
[RFC3261 25.1]

\* Route

Must exist if the request being cancelled contains a Route header field.  
[RFC3261-9-5]

\* Accept

Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Accept-Encoding

Must not exist. [RFC3261 20],[RFC3261-20-8]



- \* Accept-Language  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Alert-Info  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Allow  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Contact  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Content-Disposition  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Content-Encoding  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Content-Language  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Expires  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* In-Reply-To  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* MIME-Version  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Organization  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Priority  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Proxy-Authorization  
Must not exist. [RFC3261 20],[RFC3261-20-8]
- \* Proxy-Require  
Must not exist. [RFC3261-9-6] [RFC3261 20],[RFC3261-20-8]



\* Reply-To  
Must not exist. [RFC3261 20],[RFC3261-20-8]

\* Require  
Must not exist. [RFC3261-9-6]

\* Subject  
Must not exist. [RFC3261 20],[RFC3261-20-8]

- Bodies:  
Must not exist. [ORq-1]

### 3.11 generic\_make\_response-200\_for-CANCEL

Generic judgement items for 200 response for CANCEL request

The size of whole response message must be less than or equal to 1500bytes.

- Status-Line:  
Status-Code: Must exist. [RFC3261 7.2]  
Status-Code: Must be three digit integer. [RFC3261 7.2]

- Header fields:

\* From  
Must exist. [RFC3261 20]  
Must equal that of the request. (Tester check the value of URI and tag, respectively.). [RFC3261-8-98]

\* Call-ID  
Must exist. [RFC3261 20]  
Must equal that of the request. [RFC3261-8-99]

\* CSeq  
Must exist. [RFC3261 20]  
Must equal that of the request. [RFC3261-8-100]

\* Via  
Must exist. [RFC3261 20]  
via-branch: Must exist in each Via header field. [RFC3261-8-21]  
via-param: Must equal that in the request. [RFC3261-8-101]  
via-param: Must maintain the same ordering as that in the request.(Tester check the value of sent-by, via-branch, and via-received of expect 1st line,



respectively.) [RFC3261-8-102]

\* To

Must exist. [RFC3261 20]

tag-param: Must equal To tag in the response to the original request.  
[RFC3261-8-103]

addr-spec: Must equal that in the request. [RFC3261-8-103]

\* Content-Length

Must be the size of the message-body, in decimal number of octets.  
[RFC3261 25.1]

### 3.12 generic\_make\_response

Generic judgement items for SIP response

The size of whole response message must be less than or equal to 1500bytes.

- Status-Line:

Status-Code: Must exist. [RFC3261 7.2]

Status-Code: Must be three digit integer. [RFC3261 7.2]

- Header fields:

\* From

Must exist. [RFC3261 20]

Must equal that of the request. (Tester check the value of URI and tag, respectively.) [RFC3261-8-98]

\* Call-ID

Must exist. [RFC3261.20]

Must equal that of the request. [RFC3261-8-99]

\* CSeq

Must exist. [RFC3261 20]

Must equal that of the request. [RFC3261-8-100]

\* Via

Must exist. [RFC3261 20]

via-branch: Must exist in each Via header field. [RFC3261-8-21]

via-param: Must equal that in the request. [RFC3261-8-101]

via-param: Must maintain the same ordering as that in the request.(Tester check the value of sent-by, via-branch, and via-received of expect 1st line,



respectively.) [RFC3261-8-102]

\* To

Must exist. [RFC3261 20]

Must equal that of the request if the request contained a tag-param. (Tester check the value of URI and tag, respectively.) [RFC3261-8-103]

addr-spec: Must equal that in the request if the request did not contain a tag-param. [RFC3261-8-104]

tag-param: Must added if the request did not contain a tag-param. (Excepting 100 response.) [RFC3261-8-105]

\* Content-Length

Must be the size of the message-body, in decimal number of octets. [RFC3261 25.1]

### 3.13 generic\_proxy-auth

Generic judgement items for SIP authentication challenge (Proxy-Authenticate)

- Header fields:

\* Proxy-Authenticate

challenge :Must begin with "Digest". [RFC2617-7-3-1]

nonce: Must exist. [RFC2617 3.2.1]

realm: Must exist. [RFC2617 3.2.1]

qop: Must exist. [RFC3261-22-36]

Must include "auth". [RFC3261-22-37]

uri: Must be enclosed in quotation marks. [RFC3261-22-34]

algorithm: Must equal "MD5",if algorithm parameter exist. [RFC2617 3.2.1]

### 3.14 generic\_status

Generic judgement items for SIP response

The size of whole response message must be less than that or equal to 1500bytes.

- Status-Line:

Status-Code: Must exist. [RFC3261 7.2]

Status-Code: Must be three digit integer. [RFC3261 7.2]

- Header fields:

\* From





Must exist. [RFC3261 20]

Must equal that of the request. (Tester check the value of URI and tag, respectively.) [RFC3261-8-98]

\* Call-ID

Must exist. [RFC3261 20]

Must equal that of the request. [RFC3261-8-99]

\* CSeq

Must exist. [RFC3261 20]

Must equal that of the request. [RFC3261-8-100]

\* Via

Must exist. [RFC3261 20]

via-branch: Must exist in each Via header field. [RFC3261-8-21]

via-param: Must equal that in the request. [RFC3261-8-101]

via-param: Must maintain the same ordering as that in the request. (Tester check the value of sent-by, via-branch, and via-received of expect 1st line, respectively.) [RFC3261-8-102]

\* To

Must exist. [RFC3261 20]

Must equal that of the request if the request contained a tag-param. (Tester check the value of URI and tag, respectively.) [RFC3261-8-103]

addr-spec: Must equal that in the request if the request did not contain a tag-param. [RFC3261-8-104]

tag-param: Must added if the request did not contain a tag-param. (Excepting 100 response.) [RFC3261-8-105]

### 3.15 generic\_www-auth

Generic judgement items for SIP authentication challenge (WWW-Authenticate)

- Header fields:

\* WWW-Authenticate

challenge :Must begin with "Digest". [RFC2617-3-1]

nonce: Must exist. [RFC2617 3.2.1]

realm: Must exist. [RFC2617 3.2.1]

qop: Must exist. [RFC3261-22-36]

Must include auth parameter. [RFC3261-22-37]

uri: Must be enclosed in quotation marks. [RFC3261-22-34]



algorithm: Must equal "MD5",if algorithm parameter exist. [RFC2617 3.2.1]



## 4. Test Profile: Server operation

### 4.1 Registration

#### 4.1.1 RG-1-1-1 - SIP Registrar- Successful New Registration

**[NAME]**

RG-1-1-1 - SIP Registrar- Successful New Registration

**[TARGET]**

SIP Registrar (NUT)

**[PURPOSE]**

Verify that a registrar properly processes a REGISTER request for new registration.

**[REQUIREMENT]**

NONE

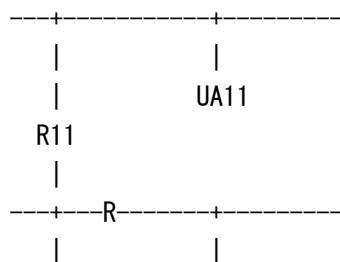
**[PARAMETER]**

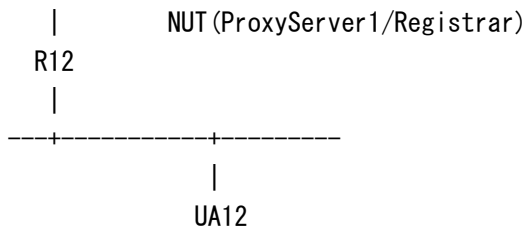
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11	3ffe:501:ffff:1::1/64
UA12	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

**[TOPOLOGY]**

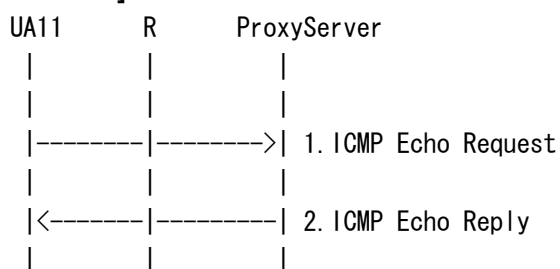




#### [CONFIGURATION for NUT]

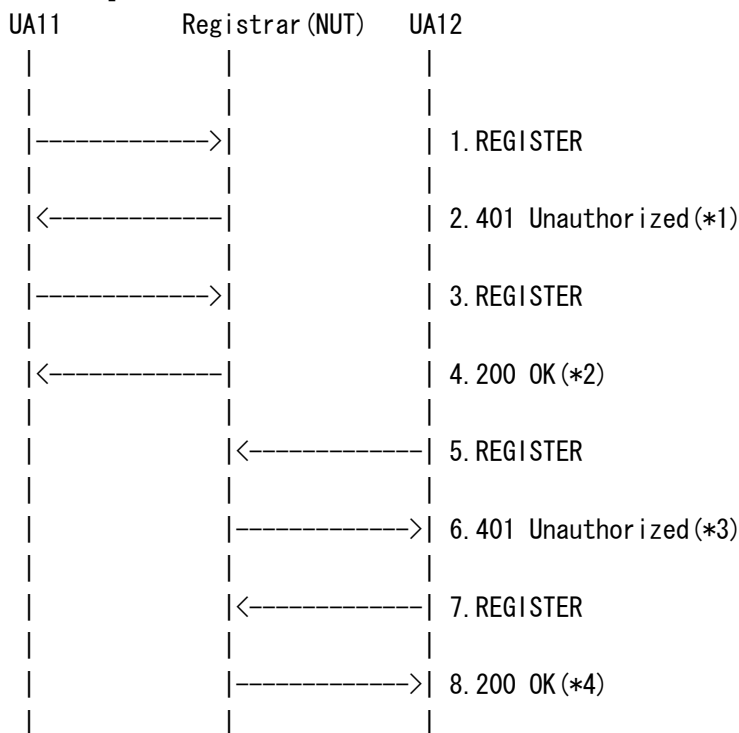
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA12 Send REGISTER.
6. UA12 Receive 401 Unauthorized.
7. UA12 Send REGISTER.
8. UA12 Receive 200 OK.

**=== Message example ===**

1. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70



From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

5. REGISTER UA12 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnasgh7i  
Max-Forwards: 70  
From: UA12 <sip:UA12@under.test.com>;tag=a73kszlf1  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 9k6hJKItGh4kI8d6@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA12@node11.under.test.com>  
Expires: 3600  
Content-Length: 0

6. 401 Unauthorized NUT -> UA12

SIP/2.0 401 Unauthorized



Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnasgh7i  
;received=3ffe:501:ffff:5::X  
From: UA12 <sip:UA12@under.test.com>;tag=a73kszlfl  
To: UA12 <sip:UA12@under.test.com>;tag=1410948204  
Call-ID: 9k6hJKItGh4kI8d6@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="1cec4341ae6cbe5a359ea9c8e88df84f",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

#### 7. REGISTER UA12 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnasgg8k  
Max-Forwards: 70  
From: UA12 <sip:UA12@under.test.com>;tag=ja743ks76zlf1H  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 9k6hJKItGh4kI8d6@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA12@node11.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA12",  
realm="under.test.com",  
nonce="1cec4341ae6cbe5a359ea9c8e88df84f", opaque="",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 8. 200 OK NUT -> UA12

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnasgg8k  
;received=3ffe:501:ffff:5::X  
From: UA12 <sip:UA12@under.test.com>;tag=ja743ks76zlf1H  
To: UA12 <sip:UA12@under.test.com>;tag=37GkEhw16  
Call-ID: 9k6hJKItGh4kI8d6@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA12@node11.under.test.com>;expires=3600  
Date: Sat, 13 Nov 2004 23:29:00 GMT  
Content-Length: 0



## [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "200". [RFC3261 4]

- Header fields:  
See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]  
rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact





Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of NUT. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

\*3:401 response from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*4:200 response from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter



contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

**\* Date**

Should exist. [RFC3261-10-52]  
rfc1123-date: Must finish with "GMT". [RFC3261 20.17, RFC2616 3.3.1]

**\* Contact**

Must exist. [RFC3261-10-50]  
contact-param: Must be the specified parameter. [RFC3261-10-50]  
contact-param: Must be the Contact address of NUT. [RFC3261-10-50]  
contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]  
c-p-expires:  
Must exist. [RFC3261-10-51]  
delta-seconds: Must not be "0". [RFC3261 10.2.2]

**[REFERENCE]**

RFC3665 SIP Basic Call Flow Examples  
See Section 2.1

## 4.1.2 RG-1-1-2 - SIP Registrar- Update of Contact List

**[NAME]**

RG-1-1-2 - SIP Registrar- Update of Contact List

**[TARGET]**

SIP Registrar (NUT)

**[PURPOSE]**

Verify that a registrar properly processes update of a Contact list

**[REQUIREMENT]**

NONE

**[PARAMETER]**

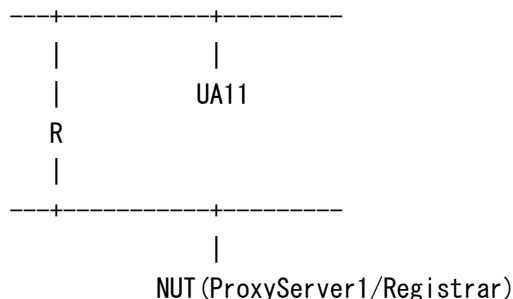
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
------------------------------------	-------------------------

UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

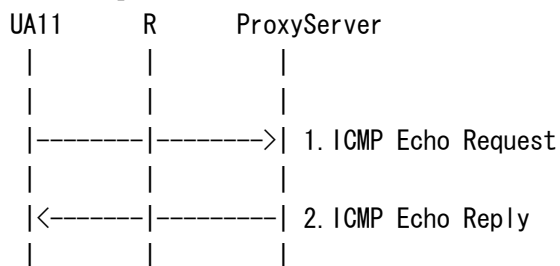
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

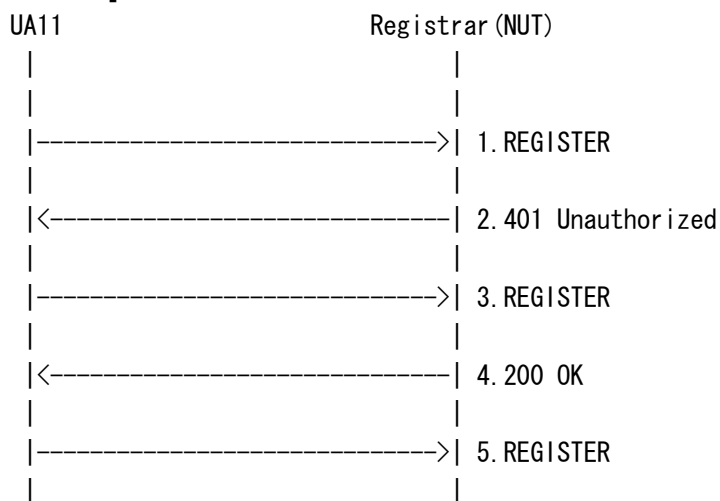
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





|<-----| 6. 200 OK(\*1)  
|

1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.

**=== Message example ===**

1. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70



From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359", opaque="",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=30  
Date: Sat,13 Nov 2004 23:29:00 GMT  
Content-Length: 0

#### 5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=jS8Mwi2mq  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359", opaque="",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",



response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

6. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=jS8Mwi2mq  
To: UA11 <sip:UA11@under.test.com>;tag=34095828jh  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:29:30 GMT  
Content-Length: 0

#### [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "200". [RFC3261 4]

- Header fields:  
See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]  
rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]  
contact-param: Must be the specified parameter. [RFC3261-10-50]  
contact-param: Must be the Contact address of NUT. [RFC3261-10-50]



contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

#### [REFERENCE]

RFC3665 SIP Basic Call Flow Examples

See Section 2.2

### 4.1.3 RG-1-1-3 - SIP Registrar- Request for Current Contact List

#### [NAME]

RG-1-1-3 - SIP Registrar- Request for Current Contact List

#### [TARGET]

SIP Registrar (NUT)

#### [PURPOSE]

Verify that a registrar properly processes a request for a current contact list.

#### [REQUIREMENT]

NONE

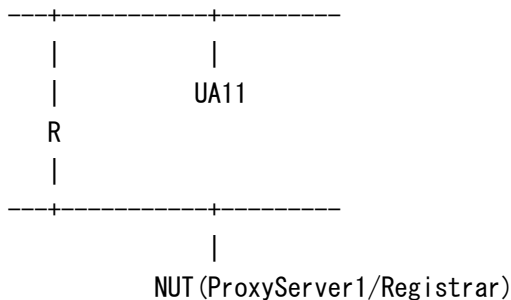
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

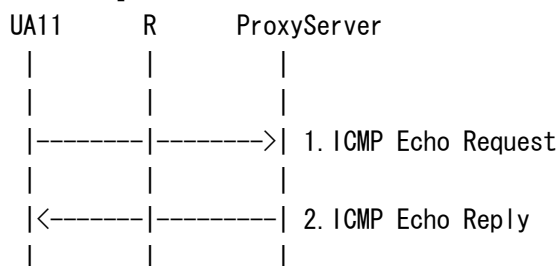
#### [TOPOLOGY]



# [CONFIGURATION for NUT]

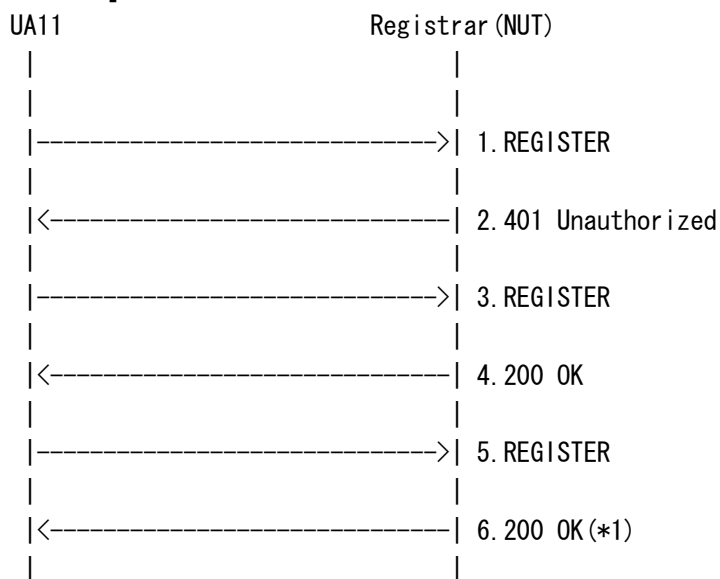
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.

## === Message example ===

1. REGISTER UA11 -> NUT





REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

## 2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359", opaque="",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"



Content-Length: 0

#### 4. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH

To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 2 REGISTER

Contact: <sip:UA11@node.under.test.com>;expires=3600

Date: Sat,13 Nov 2004 23:29:00 GMT

Content-Length: 0

#### 5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=jS8Mwi2mq

To: UA11 <sip:UA11@under.test.com>

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 3 REGISTER

Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359", opaque="",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"

Content-Length: 0

\* Contact is not exist.

#### 6. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=jS8Mwi2mq

To: UA11 <sip:UA11@under.test.com>;tag=jqoiweu75

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com



CSeq: 3 REGISTER

Contact: <sip:UA11@node.under.test.com>;expires=3590

Date: Sat,13 Nov 2004 23:29:10 GMT

Content-Length: 0

## [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [FC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-5-]

contact-param: Must be the Contact address of NUT. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

## [REFERENCE]

RFC3665 SIP Basic Call Flow Examples

See Section 2.3

#### 4.1.4 RG-1-1-4 - SIP Registrar- Cancellation of Registration

##### [NAME]

RG-1-1-4 - SIP Registrar- Cancellation of Registration

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly processes a REGISTER for canceling a registration.

##### [REQUIREMENT]

NONE

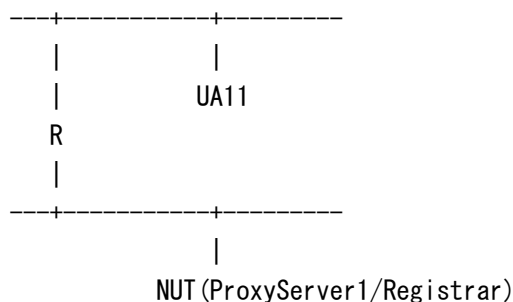
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

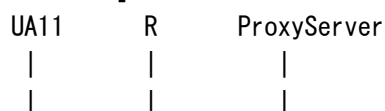
##### [TOPOLOGY]

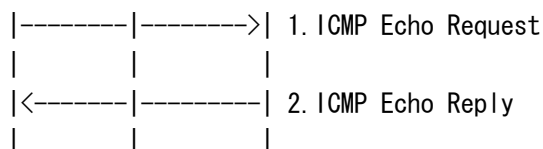


##### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

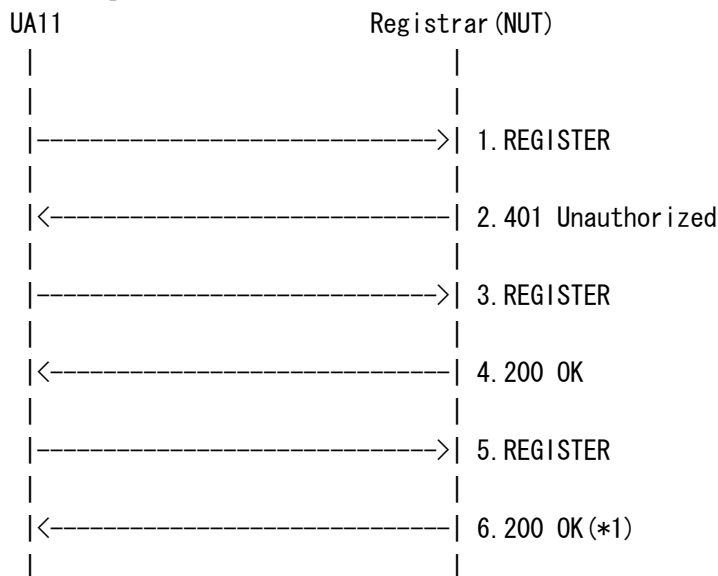
##### [INITIALIZATION]





1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.

#### === Message example ===

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Contact: <sip:UA11@node.under.test.com>
```



Expires: 3600  
Content-Length: 0

## 2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359", opaque="",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

## 4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6



Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Content-Length: 0

#### 5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=jS8Mwi2mq  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Expires: 0  
Contact: \*  
Content-Length: 0

#### 6. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=jS8Mwi2mq  
To: UA11 <sip:UA11@under.test.com>;tag=1418nmdsrf  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Date: Sat,13 Nov 2004 23:29:00 GMT  
Content-Length: 0

### [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "200". [RFC3261 4]

- Header fields:  
See generic\_status



**\* Via**

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

**\* Date**

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

**\* Contact**

contact-param: Must not include the specified parameter.  
[RFC3261-10-50],[RFC3261 10.2.2]

**[REFERENCE]**

RFC3665 SIP Basic Call Flow Examples

See Section 2.4

**4.1.5 RG-1-1-5 - SIP Registrar- REGISTER without Expires header field**

**[NAME]**

RG-1-1-5 - SIP Registrar- REGISTER without Expires header field

**[TARGET]**

SIP Registrar (NUT)

**[PURPOSE]**

Verify that a registrar properly processes a REGISTER request without an Expires header field.

**[REQUIREMENT]**

NONE

**[PARAMETER]**

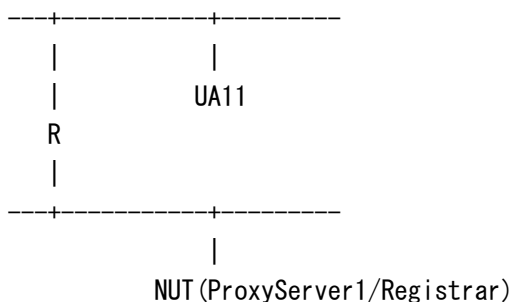
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

**[TOPOLOGY]**

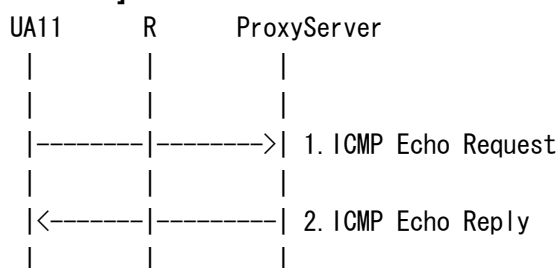




#### [CONFIGURATION for NUT]

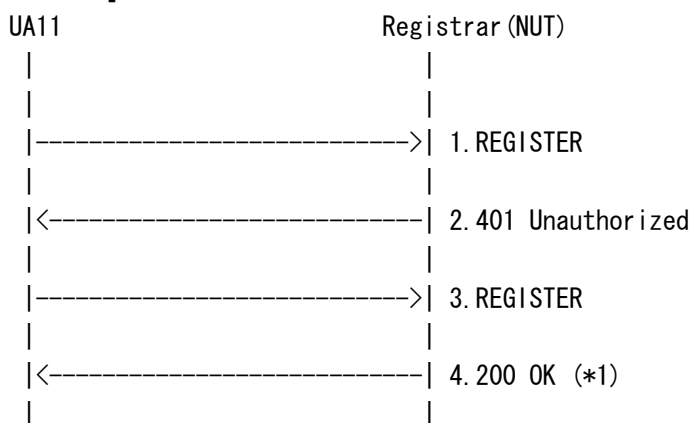
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send REGISTER without Expires header field.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER without Expires header field.
4. UA11 Receive 200 OK.

=== Message example ===



### 1. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Content-Length: 0

\* No Expires header field exists

### 2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

### 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",



response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

\* No Expires header field exists.

4. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8

;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH

To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 2 REGISTER

Contact: <sip:UA11@node.under.test.com>;expires=3600

Date: Sat, 13 Nov 2004 23:28:00 GMT

Content-Length: 0

#### [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist. [RFC3261-10-52]

rfc1123-date: Must finish with "GMT". [rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]



contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

c-p-expires:

Must exist. [RFC3261-10-40,41,51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

delta-seconds: Must contain a locally-configured default value.

[RFC3261-10-42]

## [REFERENCE]

[RFC3261-10-40,41,42]

### 10.3 Processing REGISTER Requests

7. The registrar now processes each contact address in the Contact header field in turn. For each address, it determines the expiration interval as follows:

- If the field value has an "expires" parameter, that value MUST be taken as the requested expiration.
- If there is no such parameter, but the request has an Expires header field, that value MUST be taken as the requested expiration.
- If there is neither, a locally-configured default value MUST be taken as the requested expiration.

## **4.1.6 RG-1-1-6 - SIP Registrar- processing of REGISTER requests in the correct order.**

### [NAME]

RG-1-1-6 - SIP Registrar- The right order processing REGISTER requests

### [TARGET]

SIP Registrar (NUT)

### [PURPOSE]

Verify that a registrar properly processes each REGISTER request in the correct order.

### [REQUIREMENT]

NONE

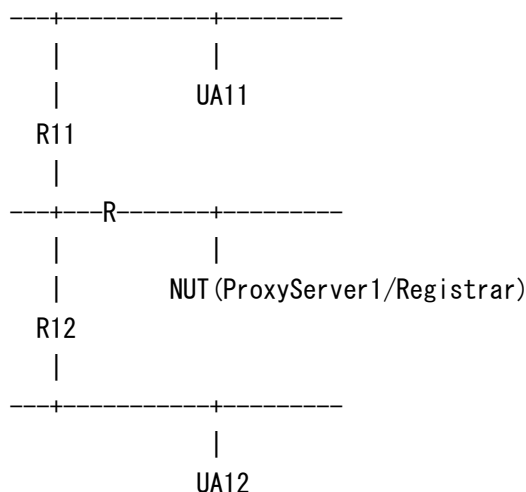
### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11	3ffe:501:ffff:1::1/64
UA12	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

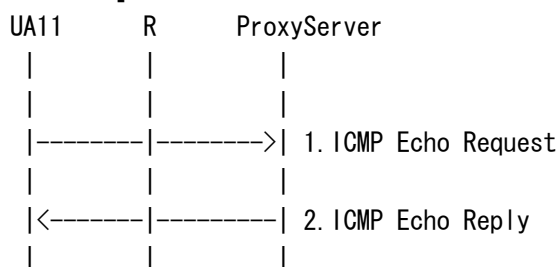
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]

UA11	:	Registrar (NUT)	:	UA12	
	:		:		
	:		:		
	----->		:		1. REGISTER
	:		<-----		2. REGISTER
	<-----		:		3. 401 Unauthorized (*1)
	:		----->		4. 401 Unauthorized (*2)
	:		:		
	----->		:		5. REGISTER
	:		:		
	<-----		:		6. 200 OK (*3)
	:		:		
	:		<-----		7. REGISTER
	:		:		
	:		----->		8. 200 OK (*4)
	:		:		

1. UA11 Send REGISTER.
2. UA12 Send REGISTER.
3. UA11 Receive 401 Unauthorized.
4. UA12 Receive 401 Unauthorized.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.
7. UA12 Send REGISTER.
8. UA12 Receive 200 OK.

### === Message example ===

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
Content-Length: 0
```

2. REGISTER UA12 -> NUT



REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnasgh7i  
Max-Forwards: 70  
From: UA12 <sip:UA12@under.test.com>;tag=a73kszlfl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 9k6hJKItGh4kI8d6@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA12@node11.under.test.com>  
Expires: 3600  
Content-Length: 0

### 3. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

### 4. 401 Unauthorized NUT -> UA12

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnasgh7i  
;received=3ffe:501:ffff:5::X  
From: UA12 <sip:UA12@under.test.com>;tag=a73kszlfl  
To: UA12 <sip:UA12@under.test.com>;tag=1410948204  
Call-ID: 9k6hJKItGh4kI8d6@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="1cec4341ae6cbe5a359ea9c8e88df84f",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

### 5. REGISTER UA11 -> NUT



REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

6. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

7. REGISTER UA12 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnasgg8k  
Max-Forwards: 70  
From: UA12 <sip:UA12@under.test.com>;tag=ja743ks76zlf1H  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 9k6hJKItGh4kI8d6@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA12@node11.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA12",  
realm="under.test.com",





nonce="1cec4341ae6cbe5a359ea9c8e88df84f", opaque="",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

8. 200 OK NUT -> UA12

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnasgg8k  
;received=3ffe:501:ffff:5::X  
From: UA12 <sip:UA12@under.test.com>;tag=ja743ks76zlf1H  
To: UA12 <sip:UA12@under.test.com>;tag=37GkEhw16  
Call-ID: 9k6hJKItGh4kI8d6@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA12@node11.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:29:00 GMT  
Content-Length: 0

#### [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter  
contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was  
received. [RFC3261-18-28]

\*2:401 response from NUT to UA12.

As a SIP Message,  
See generic\_message



As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*3:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]



c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

\*4:200 response from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

## [REFERENCE]

[RFC3261-10-24, 25, 26]

10.3 Processing REGISTER Requests

(snip)



A registrar has to know (for example, through configuration) the set of domain(s) for which it maintains bindings. REGISTER requests MUST be processed by a registrar in the order that they are received. REGISTER requests MUST also be processed atomically, meaning that a particular REGISTER request is either processed completely or not at all. Each REGISTER message MUST be processed independently of any other registration or binding changes.

#### 4.1.7 RG-1-1-7 - SIP Registrar- REGISTER with two Contact header fields with separate expires parameters

##### [NAME]

RG-1-1-7 - SIP Registrar- REGISTER request with two Contact header fields with separate expires parameters

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly processes a REGISTER request with two Contact header fields, one has an expires parameter and the other doesn't.

##### [REQUIREMENT]

NONE

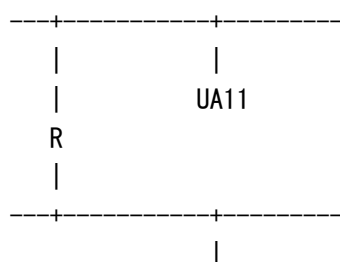
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]



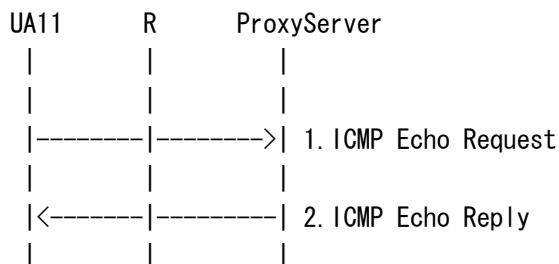


## NUT (ProxyServer1/Registrar)

### [CONFIGURATION for NUT]

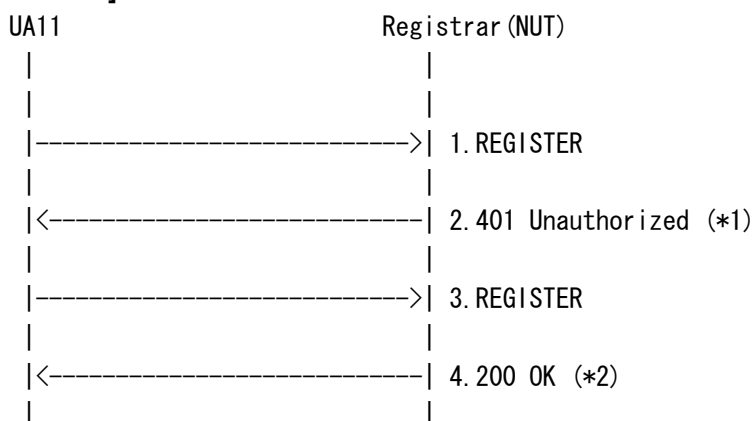
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.

#### === Message example ===

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
Record-Route: <sip:example.under.test.com;lr>
```



From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=1800  
Contact: <sip:11UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

## 2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=1800  
Contact: <sip:11UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0



4. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8

;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfIH

To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 2 REGISTER

Contact: <sip:UA11@node.under.test.com>;expires=1800

Contact: <sip:11UA11@node.under.test.com>;expires=3600

Date: Sat, 13 Nov 2004 23:28:00 GMT

Content-Length: 0

#### [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]



- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Record-Route

Must not contain this header field. [RFC3261-10-3, 22, 23]

\* Date

Should exist. [RFC3261-10-52]

rfc1123-date: Must finish with "GMT". [rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist. [RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

c-p-expires-param: Must be equal to correct parameter. [RFC3261 10.2.1.1]

## [REFERENCE]

[RFC3261 10.2.1.1]

### 10.2.1.1 Setting the Expiration Interval of Contact Addresses

When a client sends a REGISTER request, it MAY suggest an expiration interval that indicates how long the client would like the registration to be valid. (As described in Section 10.3, the registrar selects the actual time interval based on its local policy.)

There are two ways in which a client can suggest an expiration interval for a binding: through an Expires header field or an "expires" Contact header parameter. The latter allows expiration intervals to be suggested on a per-binding basis when more than one



binding is given in a single REGISTER request, whereas the former suggests an expiration interval for all Contact header field values that do not contain the "expires" parameter.

If neither mechanism for expressing a suggested expiration time is present in a REGISTER, the client is indicating its desire for the server to choose.

#### 4.1.8 RG-1-2-1 - SIP Registrar- Unsuccessful Registration (Wrong user ID / password)

##### [NAME]

RG-1-2-1 - SIP Registrar- Unsuccessful Registration (wrong user ID / password)

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar doesn't register a wrong user ID and a password.

##### [REQUIREMENT]

NONE

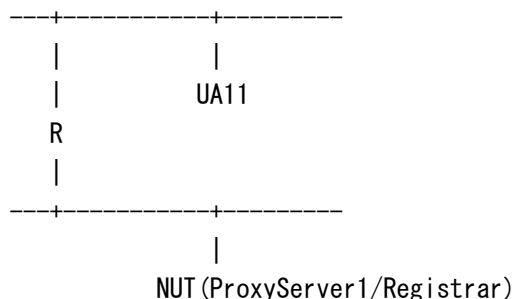
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

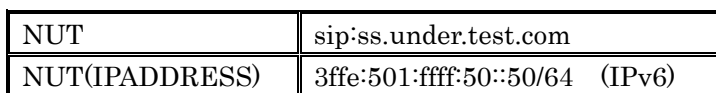
##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]



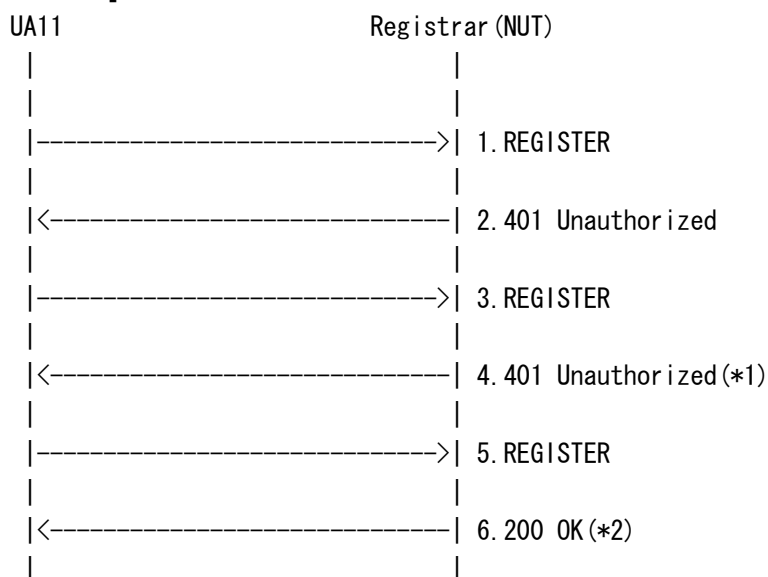
##### [CONFIGURATION for NUT]



```

sequenceDiagram
    participant UA11
    participant R
    participant ProxyServer
    Note over UA11, R: 1. ICMP Echo Request
    UA11-->>R: 
    Note over R, ProxyServer: 
    R-->>ProxyServer: 
    Note over ProxyServer, R: 2. ICMP Echo Reply
    ProxyServer-->>R: 
    Note over R, UA11: 
    R-->>UA11: 
  
```

- [PROCEDURE]**



1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 401 Unauthorized.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.

## 1. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0



Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

## 2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfIH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359", opaque="",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="e6774026cfc04b7fd380421ac892639d"  
Content-Length: 0



- correct user ID("UA11") and wrong password("dummyspassword")

#### 4. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

#### 5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359", opaque="",  
qop=auth, nc=00000003, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

- default correct user ID("UA11") and password("nutsip")

#### 6. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH



To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Content-Length: 0

#### [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "200". [RFC3261 4]

- Header fields:  
See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]



**\* Date**

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

**\* Contact**

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of NUT. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

**[REFERENCE]**

RFC3665 SIP Basic Call Flow Examples

See Section 2.5

**4.1.9 RG-1-2-2 - SIP Registrar- Expiration of REGISTER less than a registrar-configured minimum**

**[NAME]**

RG-1-2-2 - SIP Registrar- Expiration of REGISTER less than a registrar-configured minimum

**[TARGET]**

SIP Registrar (NUT)

**[PURPOSE]**

Verify that a registrar sends a 423 (Interval Too Brief) response when expiration of a REGISTER request is less than a registrar-configured minimum.

**[REQUIREMENT]**

NONE

**[PARAMETER]**

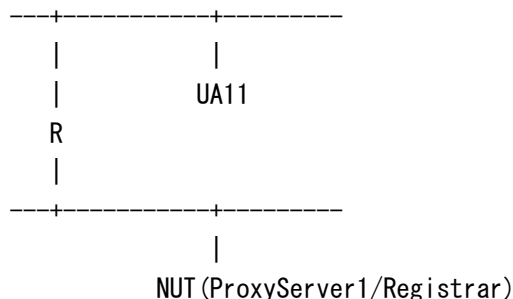
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
------------------------------------	-------------------------

UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

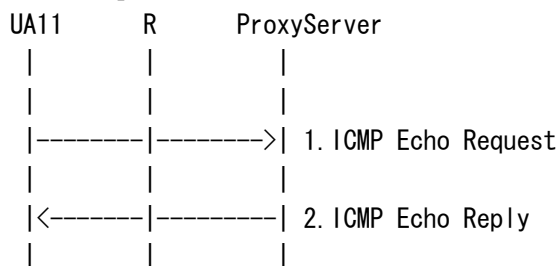
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

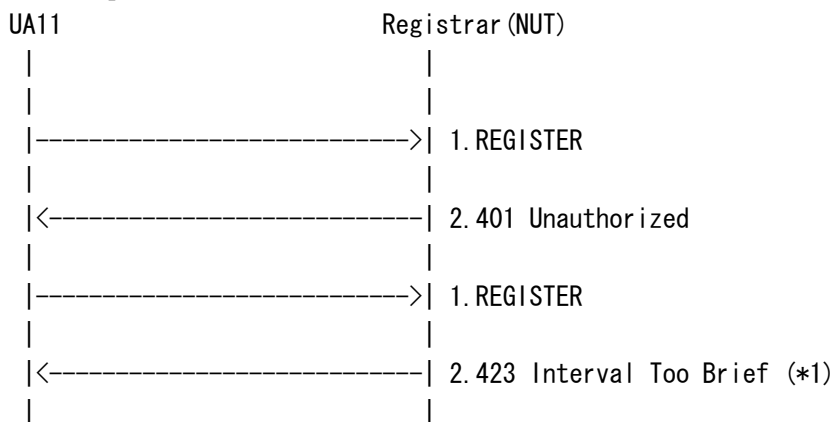
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

\* NUT is able to return 423 response.

#### [PROCEDURE]





1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized .
3. UA11 Send REGISTER.
4. UA11 Receive 423 Interval Too Brief.

**=== Message example ===**

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 30
Content-Length: 0
```

\* Too small Expires header field parameter

2. 401 Unauthorized NUT -> UA11

```
SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
;received=3ffe:501:ffff:5::X
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>;tag=1410948204
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
WWW-Authenticate: Digest realm="under.test.com", qop="auth",
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",
    opaque="", stale=FALSE, algorithm=MD5
Content-Length: 0
```

3. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag= a73kszlflH
To: UA11 <sip:UA11@under.test.com>
```





Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 30  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

## 2. 423 Interval Too Brief NUT -> UA11

SIP/2.0 423 Interval Too Brief  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlflH  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Min-Expires: 3600  
Content-Length: 0

### [JUDGMENT]

\*1:423 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "423". [RFC3261 10.3.7]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Min-Expires  
Must exist. [RFC3261-10-43]

## [REFERENCE]

[RFC3261-10-43]

### 10.3 Processing REGISTER Requests

The registrar MAY choose an expiration less than the requested expiration interval. If and only if the requested expiration interval is greater than zero AND smaller than one hour AND less than a registrar-configured minimum, the registrar MAY reject the registration with a response of 423 (Interval Too Brief). This response MUST contain a Min-Expires header field that states the minimum expiration interval the registrar is willing to honor. It then skips the remaining steps.

## 4.1.10 RG-1-2-3 - SIP Registrar- REGISTER with the equal CSeq value to or lower than the last value of CSeq

### [NAME]

RG-1-2-3 - SIP Registrar- REGISTER with the equal CSeq header field value to or lower than the last value of CSeq

### [TARGET]

SIP Registrar (NUT)

### [PURPOSE]

Verify that a registrar properly rejects the REGISTER request with the equal CSeq header field value to the last value of CSeq or lower than the number..

### [REQUIREMENT]

NONE

### [PARAMETER]

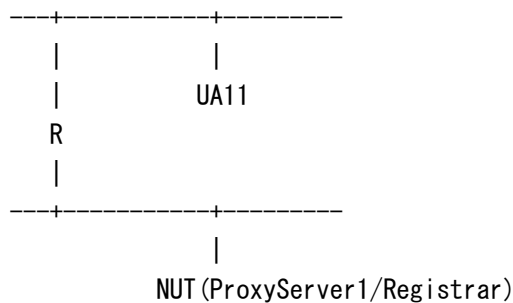
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64

R(IPv6)	3ffe:501:ffff:50::1/64
---------	------------------------

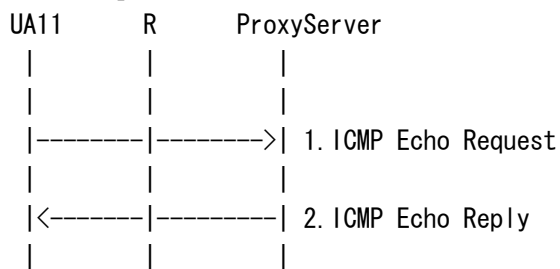
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

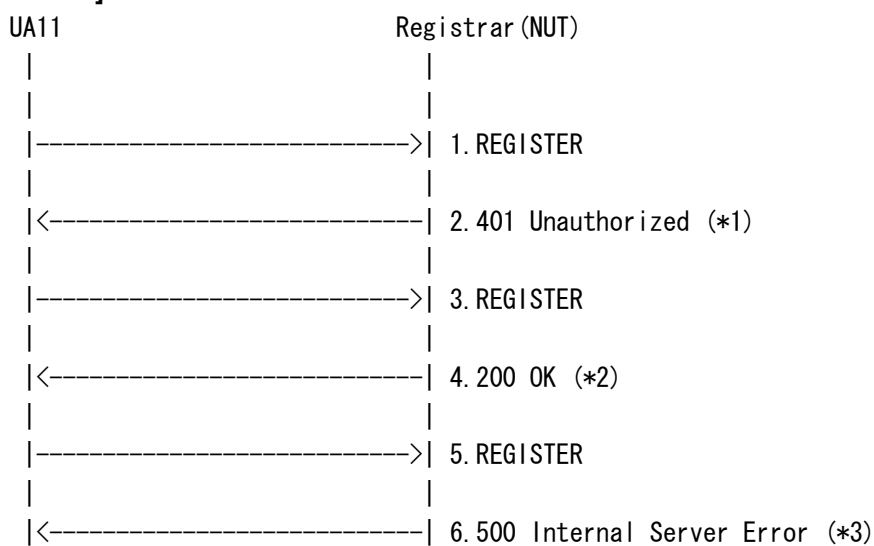
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 500.

**=== Message example ===**

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
Content-Length: 0
```

2. 401 Unauthorized NUT -> UA11

```
SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
;received=3ffe:501:ffff:5::X
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>;tag=1410948204
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
WWW-Authenticate: Digest realm="under.test.com", qop="auth",
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",
opaque="", stale=FALSE, algorithm=MD5
Content-Length: 0
```

3. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zflfH
```



To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat, 13 Nov 2004 23:28:00 GMT  
Content-Length: 0

5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"



Content-Length: 0

6. 500 Internal Server Error NUT -> UA11

SIP/2.0 500 Internal Server Error

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H

To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 2 REGISTER

Contact: <sip:UA11@node.under.test.com>;expires=3600

Date: Sat,13 Nov 2004 23:28:00 GMT

Content-Length: 0

### [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter  
contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was  
received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status



Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

\*3:500 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "500". [RFC3261-10-46,48]

**[REFERENCE]**

[RFC3261-10-45, 46]

10.3 Processing REGISTER Requests

For each address, the registrar then searches the list of current bindings using the URI comparison rules. If the binding does not exist, it is tentatively added. If the binding does exist, the registrar checks the Call-ID value. If the Call-ID value in the existing binding differs from the



Call-ID value in the request, the binding **MUST** be removed if the expiration time is zero and updated otherwise. If they are the same, the registrar compares the CSeq value. If the value is higher than that of the existing binding, it **MUST** update or remove the binding as above. If not, the update **MUST** be aborted and the request fails.

[RFC3261-12-59, 60]

#### 12.2.2 UAS Behavior

If the remote sequence number is empty, it **MUST** be set to the value of the sequence number in the CSeq header field value in the request. If the remote sequence number was not empty, but the sequence number of the request is lower than the remote sequence number, the request is out of order and **MUST** be rejected with a 500 (Server Internal Error) response. If the remote sequence number was not empty, and the sequence number of the request is greater than the remote sequence number, the request is in order.

#### 4.1.11 RG-1-2-4 - SIP Registrar- The case of receiving Contact header field includeing the value ""

##### [NAME]

RG-1-2-4 - SIP Registrar- The case of receiving Contact header field including the value ""

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly sends a 400 (Bad Request) response when receiving the request that Contact value is "" and the wrong headers (or the wrong header value).

##### [REQUIREMENT]

NONE

##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

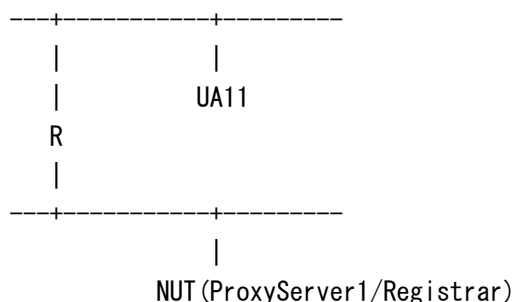
##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64



R(IPv6)	3ffe:501:ffff:50::1/64
---------	------------------------

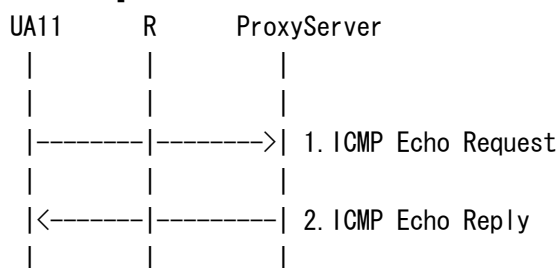
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

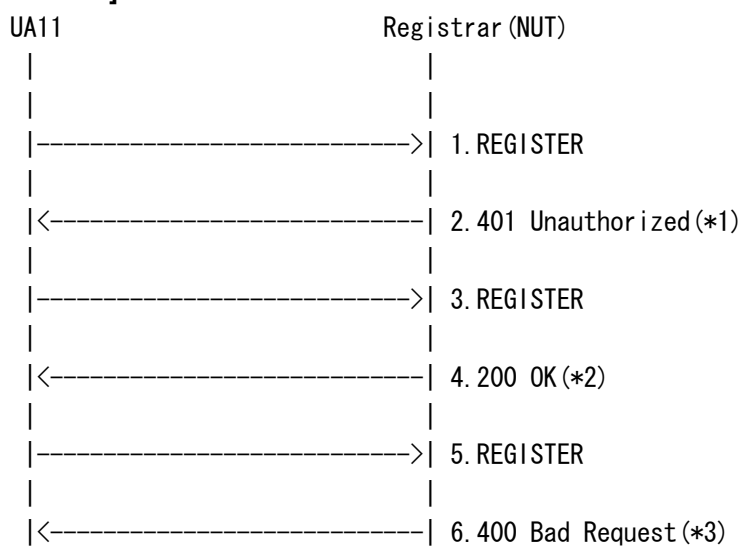
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

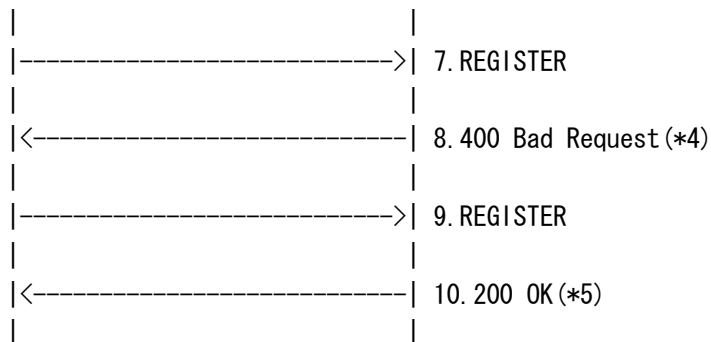
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 400 Bad Request.
7. UA11 Send REGISTER.
8. UA11 Receive 400 Bad Request.
9. UA11 Send REGISTER.
10. UA11 Receive 200 OK.

#### === Message example ===

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
Record-Route: <sip:example.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 11 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
Content-Length: 0
```

2. 401 Unauthorized NUT -> UA11

```
SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
;received=3ffe:501:ffff:5::X
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
```



To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 11 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
    opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

### 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
Record-Route: <sip:example.under.test.com:lr>  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 12 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
    realm="under.test.com",  
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
    qop=auth, nc=00000002, cnonce="d4e4cec0",  
    uri="sip:ss.under.test.com",  
    response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

### 4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
    ;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 12 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

### 5. REGISTER UA11 -> NUT



REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
Max-Forwards: 70  
Record-Route: <sip:example.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 13 REGISTER  
Contact: \*  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 6. 400 Bad Request NUT -> UA11

SIP/2.0 400 Bad Request  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 13 REGISTER  
Content-Length: 0

#### 7. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
Max-Forwards: 70  
Record-Route: <sip:example.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 14 REGISTER  
Contact: \*  
Expires: 0  
Contact: <sip:UA111@node.under.tset.com>  
Authorization: Digest username="UA11",



realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 8. 400 Bad Request NUT -> UA11

SIP/2.0 400 Bad Request  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfIH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 14 REGISTER  
Content-Length: 0

#### 9. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
Record-Route: <sip:example.under.test.com:lr>  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfIH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 15 REGISTER  
Contact: \*  
Expires: 0  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 10. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X



From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 15 REGISTER  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

## [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "200". [RFC3261 4]

- Header fields:  
See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]



via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist. [RFC3261-10-52]

rfc1123-date: Must finish with "GMT". [rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist. [RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

\*3:400 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "400". [RFC3261-10-36,38,39]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*4:400 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:



See generic\_status

Status-Code: Must be "400". [RFC3261-10-36,38,39]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*5:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

contact-param: Must not include the specified parameter.

[RFC3261-10-50],[RFC3261 10.2.2]

## [REFERENCE]

[RFC3261-10-36, 37, 38, 39]

10.3 Processing REGISTER Requests





6. The registrar checks whether the request contains the Contact header field. If not, it skips to the last step. If the Contact header field is present, the registrar checks if there is one Contact field value that contains the special value "\*" and an Expires field. If the request has additional Contact fields or an expiration time other than zero, the request is invalid, and the server **MUST** return a 400 (Invalid Request) and skip the remaining steps. If not, the registrar checks whether the Call-ID agrees with the value stored for each binding. If not, it **MUST** remove the binding. If it does agree, it **MUST** remove the binding only if the CSeq in the request is higher than the value stored for that binding. Otherwise, the update **MUST** be aborted and the request fails.

#### 4.1.12 RG-2-1-1 - SIP Registrar- Record-Route in REGISTER request

**[NAME]**

## RG-2-1-1 - SIP Registrar- Record-Route in REGISTER request

**[TARGET]**

SIP Registrar (NUT)

**[PURPOSE]**

Verify that a registrar properly ignores a Record-Route header field in a REGISTER request.

**[REQUIREMENT]**

NONE

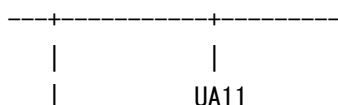
**[PARAMETER]**

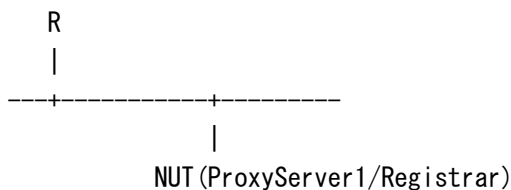
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1:1/64
R(IPv6)	3ffe:501:ffff:50::1/64

## [TOPOLOGY]

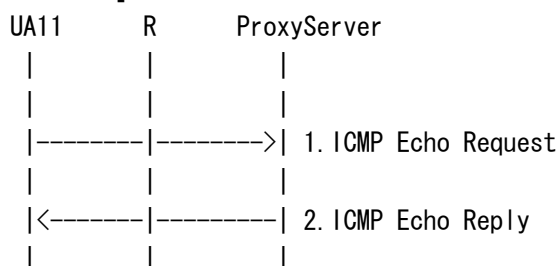




#### [CONFIGURATION for NUT]

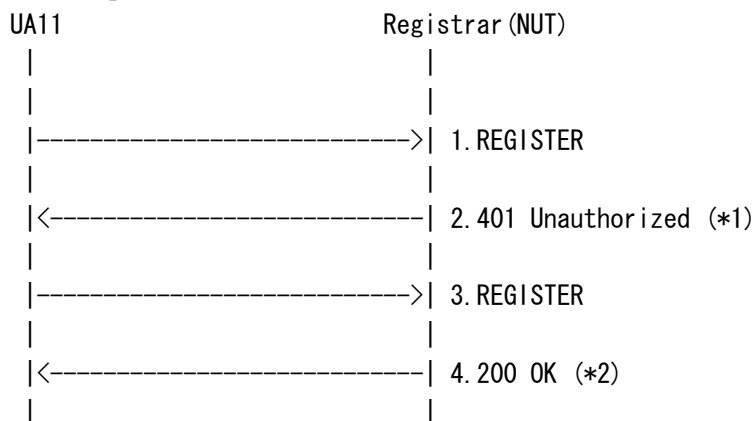
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.

#### === Message example ===

1. REGISTER UA11 -> NUT



REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Record-Route: <sip:example.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

## 2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
Record-Route: <sip:example.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zflfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",



response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat, 13 Nov 2004 23:28:00 GMT  
Content-Length: 0

#### [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Record-Route

Must not contains this header field. [RFC3261-10-3, 22, 23]

\*2:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message



As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Record-Route

Must not contains this header field. [RFC3261-10-3, 22, 23]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

## [REFERENCE]

[RFC3261-10-3]

### 10.2 Constructing the REGISTER Request

The Record-Route header field has no meaning in REGISTER requests or responses, and MUST be ignored if present.

[RFC3261-10-22, 23]

### 10.3 Processing REGISTER Requests

Registrars MUST ignore the Record-Route header field if it is



included in a REGISTER request. Registrars MUST NOT include a Record-Route header field in any response to a REGISTER request.

#### 4.1.13 RG-2-1-2 - SIP Registrar- REGISTER with the different Call-ID value

##### [NAME]

RG-2-1-2 - SIP Registrar- REGISTER with the different Call-ID value

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly removes the binding if the expiration time is zero and updated when the Call-ID value in a REGISTER request is different from the Call-ID value in the existing binding.

##### [REQUIREMENT]

NONE

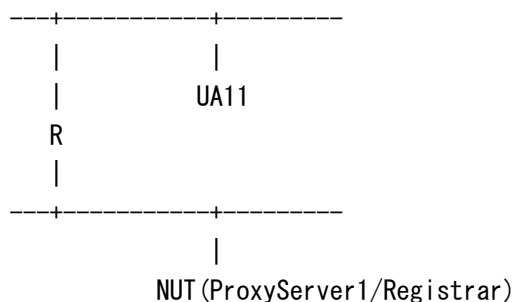
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

##### [ADDRESS]

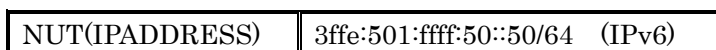
NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]



##### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
-----	--------------------------



```

sequenceDiagram
    participant UA11
    participant R
    participant ProxyServer
    UA11-->>R: 1. ICMP Echo Request
    R-->>ProxyServer: 2. ICMP Echo Reply
  
```

- \* NUT is able to return 423 response.

```

sequenceDiagram
    participant UA11
    participant Registrar as Registrar (NUT)
    Note over Registrar: 1. REGISTER
    UA11->>Registrar: 
    Note over Registrar: 2. 401 Unauthorized (*1)
    Registrar->>UA11: 
    Note over Registrar: 3. REGISTER
    UA11->>Registrar: 
    Note over Registrar: 4. 200 OK (*2)
    Registrar->>UA11: 
    Note over Registrar: 5. REGISTER
    UA11->>Registrar: 
    Note over Registrar: 6. 200 OK (*3)
    Registrar->>UA11: 
    Note over Registrar: 7. REGISTER
    UA11->>Registrar: 
    Note over Registrar: 8. 200 OK (*4)
    Registrar->>UA11: 
  
```

1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.



7. UA11 Send REGISTER.

8. UA11 Receive 200 OK.

**=== Message example ===**

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
Content-Length: 0
```

2. 401 Unauthorized NUT -> UA11

```
SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
;received=3ffe:501:ffff:5::X
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>;tag=1410948204
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
WWW-Authenticate: Digest realm="under.test.com", qop="auth",
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",
    opaque="", stale=FALSE, algorithm=MD5
Content-Length: 0
```

3. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfIH
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 2 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
Authorization: Digest username="UA11",
```





realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

#### 5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: j8m4luaNjkh2nGdy@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 6. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8



;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: j8m4luaNjkh2nGdy@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

\* Call-ID parameter of Message 5 and 6 differ from Message 1-4.

#### 7. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: pe7hS8nkf3kLen7v@under.test.com  
CSeq: 4 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 0  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 8. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: pe7hS8nkf3kLen7v@under.test.com  
CSeq: 4 REGISTER  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

\* Call-ID parameter of Message 7 and 8 differ from Message 1-4 and 5-6.



## [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]



\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of NUT. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC32261 10.2.2]

\*3:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

\*4:200 response from NUT to UA11.



As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:  
See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

#### [REFERENCE]

[RFC3261-10-44]

#### 10.3 Processing REGISTER Requests

If the Call-ID value in the existing binding differs from the Call-ID value in the request, the binding **MUST** be removed if the expiration time is zero and updated otherwise.

#### **4.1.14 RG-2-1-3 - SIP Registrar- Sequence Number is not Incremented.**

##### [NAME]

RG-2-1-3 - SIP Registrar-Sequence Number is not Incremented.

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly sends a 500 (Server Internal Error) response when receiving a REGISTER with the equal CSeq header field value to the last value of CSeq or lower than the number and "\*" in a Contact header field.

# **[REQUIREMENT]**

NONE

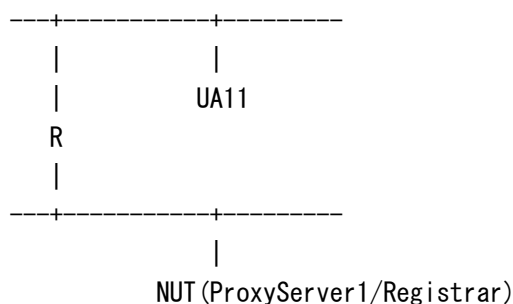
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

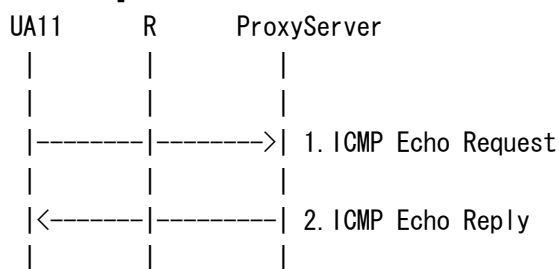
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

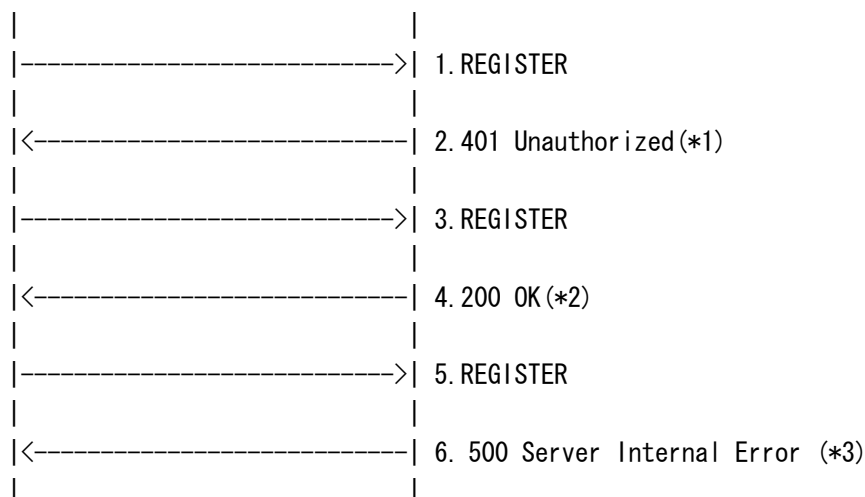
# **[INITIALIZATION]**



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# **[PROCEDURE]**





1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 500 Server Internal Error.

**=== Message example ===**

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
Record-Route: <sip:example.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
Content-Length: 0
```

2. 401 Unauthorized NUT -> UA11

```
SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
;received=3ffe:501:ffff:5::X
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>;tag=1410948204
```



Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
    opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

### 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
Record-Route: <sip:example.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
    realm="under.test.com",  
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
    qop=auth, nc=00000002, cnonce="d4e4cec0",  
    uri="sip:ss.under.test.com",  
    response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

### 4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
    ;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat, 13 Nov 2004 23:28:00 GMT  
Content-Length: 0

### 5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0





Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds9  
Max-Forwards: 70  
Record-Route: <sip:example.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: \*  
Expires: 0  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

\* CSeq number is not incremented.

#### 6. 500 Server Internal Error NUT -> UA11

SIP/2.0 500 Server Internal Error  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Date: Sat, 13 Nov 2004 23:28:00 GMT  
Content-Length: 0

### [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:



See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

\*3:500 response from NUT to UA11.

As a SIP Message,

See generic\_message



As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "500". [RFC3261-10-36,38,39]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

[RFC3261-10-36, 37, 38, 39]

### 10.3 Processing REGISTER Requests

6. The registrar checks whether the request contains the Contact header field. If not, it skips to the last step. If the Contact header field is present, the registrar checks if there is one Contact field value that contains the special value "\*" and an Expires field. If the request has additional Contact fields or an expiration time other than zero, the request is invalid, and the server MUST return a 400 (Invalid Request) and skip the remaining steps. If not, the registrar checks whether the Call-ID agrees with the value stored for each binding. If not, it MUST remove the binding. If it does agree, it MUST remove the binding only if the CSeq in the request is higher than the value stored for that binding. Otherwise, the update MUST be aborted and the request fails.

#### **4.1.15 RG-2-1-4 - SIP Registrar- URI with user-param in To header field in REGISTER**

##### [NAME]

RG-2-1-4 - SIP Registrar- URI with user-param in To header field in REGISTER request

##### [TARGET]

SIP Registrar (NUT)

# **[PURPOSE]**

Verify that a registrar properly processes a URI with a user parameter in a To header field in a REGISTER request.

# **[REQUIREMENT]**

NONE

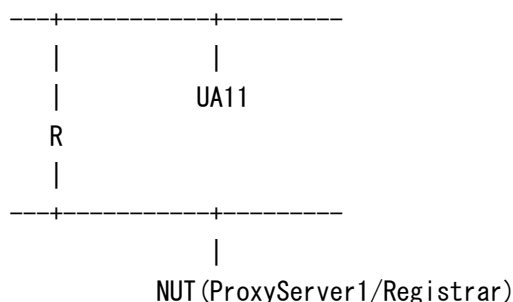
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

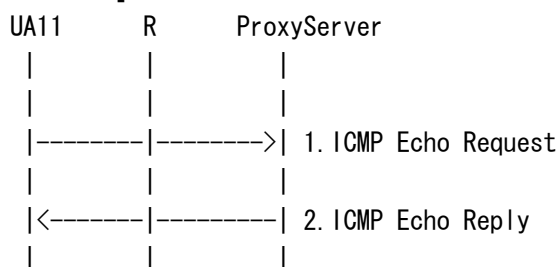
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

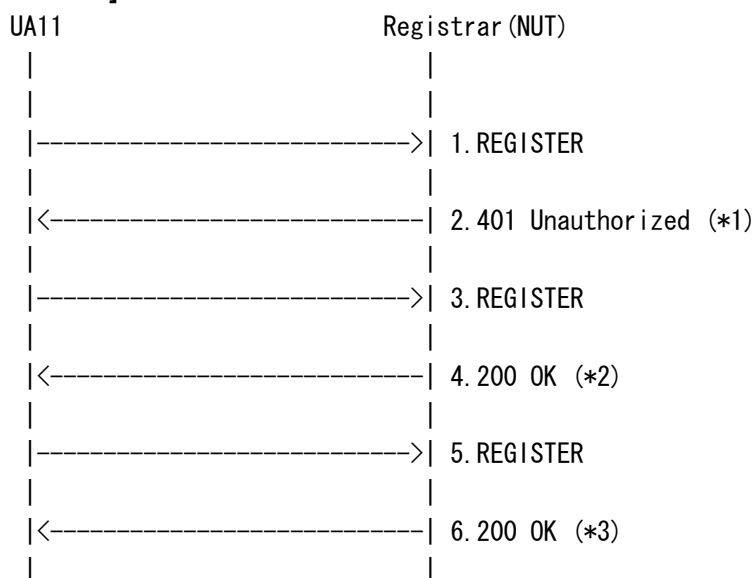
# **[INITIALIZATION]**



1. Send ICMP Echo Request.

2. Receive ICMP Echo Reply.

# [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.

## === Message example ===

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com;user=phone>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
Content-Length: 0
```

\* URI in To header field has uri-param "user=phone".



## 2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl

To: UA11 <sip:UA11@under.test.com;user=phone>;tag=1410948204

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 1 REGISTER

WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5

Content-Length: 0

\* URI in To header field does not change.

## 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH

To: UA11 <sip:UA11@under.test.com;user=phone>

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 2 REGISTER

Contact: <sip:UA11@node.under.test.com>

Expires: 3600

Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"

Content-Length: 0

\* URI in To header field has uri-param "user=phone".

## 4. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH



To: UA11 <sip:UA11@under.test.com;user=phone>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

- \* URI in To header field does not change.
- \* As an internal processing, registrar must convert URI in To header field to a canonical form to compare with the binding list that registrar has.

#### 5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

- \* Not contain user-param in To header field value.

#### 6. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3599  
Date: Sat,13 Nov 2004 23:28:00 GMT



Content-Length: 0

## [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* To

user-param: Must not remove user-param. [RFC3261-10-33, 34]

\*2:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261-10-33, RFC3261-10-34]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]





\* To

user-param: Must not remove user-param. [RFC3261-10-33, 34]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

\*3:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261-10-33,34]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]



contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

#### [REFERENCE]

[RFC3261-10-34]

#### 10.3 Processing REGISTER Requests

5. The registrar extracts the address-of-record from the To header field of the request. If the address-of-record is not valid for the domain in the Request-URI, the registrar MUST send a 404 (Not Found) response and skip the remaining steps. The URI MUST then be converted to a canonical form. To do that, all URI parameters MUST be removed (including the user-param), and any escaped characters MUST be converted to their unescaped form. The result serves as an index into the list of bindings.

#### 4.1.16 RG-2-1-5 - SIP Registrar- URI with escaped characters in To header field in REGISTER

##### [NAME]

RG-2-1-5 - SIP Registrar- URI with escaped characters in To header field in REGISTER request

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly treats the escaped characters as unescaped characters when URI in a To header field in a REGISTER request contains escaped characters.

##### [REQUIREMENT]

NONE

##### [PARAMETER]

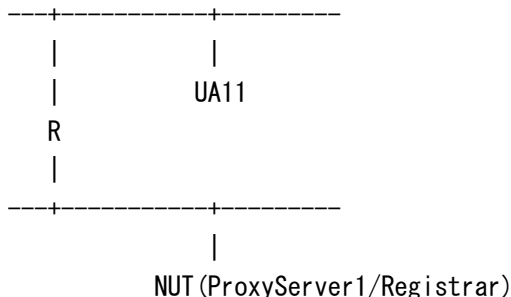
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:U%4111@under.test.com
UA11(Contact)	sip:U%4111@node.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
------------------------------------	-------------------------

UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

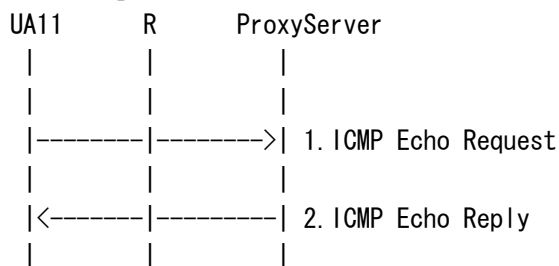
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

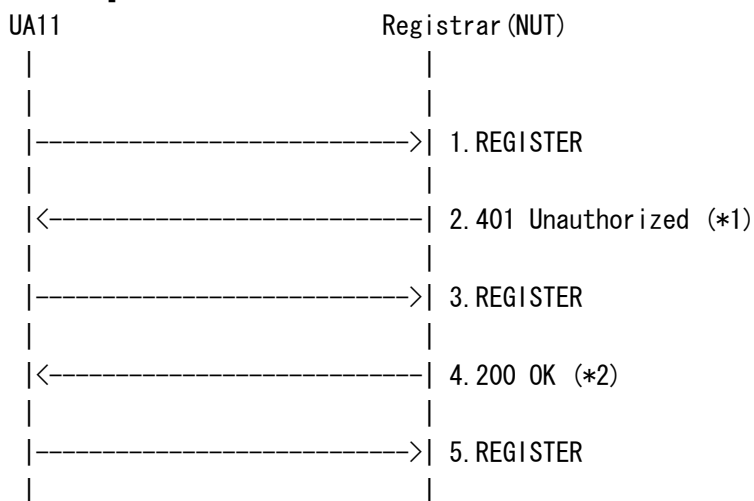
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





|<-----| 6.200 OK (\*2)  
|

1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.

**=== Message example ===**

1. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
From: UA11 <sip:U%4111@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:U%4111@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:U%4111@node.under.test.com>  
Expires: 3600  
Content-Length: 0

\* userinfo of URI in To header field has escaped character (SP(0x20)).

2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:U%4111@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:U%4111@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

\* URI in To header field does not change.



### 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:U%4111@under.test.com>;tag=ja743ks76zlfIH  
To: UA11 <sip:U%4111@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:U%4111@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

\* userinfo of URI in To header field has escaped character (SP(0x20)).

### 4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:U%4111@under.test.com>;tag=ja743ks76zlfIH  
To: UA11 <sip:U%4111@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:U%4111@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

\* URI in To header field does not change.

\* As an internal processing, registrar must convert URI in To header field to a canonical form to compare with the binding list that registrar has.

### 5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8



Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

\* Not contain escaped-character in To header field value.

6. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

#### [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status



See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* To

Must not convert from escaped characters to unescaped characters. [RFC3261-10-33, RFC3261-10-35]

\*2:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261-10-33, RFC3261-10-35]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* To

Must not convert from escaped characters to unescaped characters. [RFC3261-10-33, RFC3261-10-35]

\* Date

Should exist. [RFC3261-10-52]

rfc1123-date: Must finish with "GMT". [rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]



c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

#### [REFERENCE]

[RFC3261-10-33,35]

#### 10.3 Processing REGISTER Requests

5. The registrar extracts the address-of-record from the To header field field of the request. If the address-of-record is not valid for the domain in the Request-URI, the registrar MUST send a 404 (Not Found) response and skip the remaining steps. The URI MUST then be converted to a canonical form. To do that, all URI parameters MUST be removed (including the user-param), and any escaped characters MUST be converted to their unescaped form. The result serves as an index into the list of bindings.

#### 4.1.17 RG-2-2-1 - SIP Registrar- REGISTER with an invalid AoR

##### [NAME]

RG-2-2-1 - SIP Registrar- REGISTER upon an invalid AoR extracted

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly sends 404 (Not Found) response and skip the remaining steps when the AoR is not valid for the domain in the Request-URI.

##### [REQUIREMENT]

NONE

##### [PARAMETER]

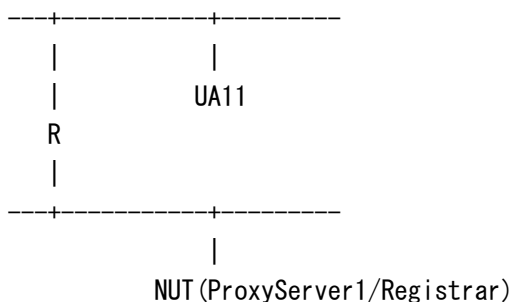
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

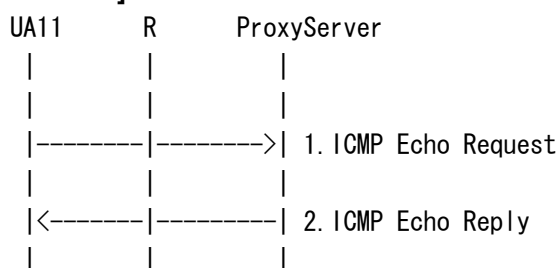




#### [CONFIGURATION for NUT]

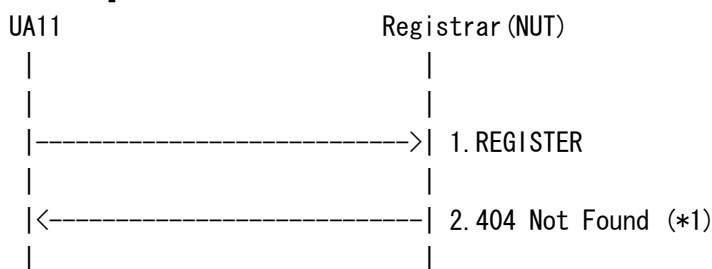
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 404 Not Found.

#### === Message example ===

1. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7

Max-Forwards: 70



From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@biloxi.example.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

2. 404 Not Found NUT -> UA11

SIP/2.0 404 Not Found  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@biloxi.example.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Content-Length: 0

#### [JUDGMENT]

\*1:404 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "404". [RFC3261-10-32]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

[RFC3261-10-32]

10.3 Processing REGISTER Requests

5. The registrar extracts the address-of-record from the To header field field of the request. If the address-of-record is not valid for the domain in the Request-URI, the registrar MUST send a 404 (Not Found) response and skip the remaining steps.

#### 4.1.18 RG-2-2-2 - SIP Registrar- Illegal parameter value in Contact header field

##### [NAME]

RG-2-2-2 - SIP Registrar- Illegal parameter in Contact field

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly sends a 400 (Bad Request) response when receiving the request whose Contact header field value is "\*" and Expires header field value is other than zero.

##### [REQUIREMENT]

NONE

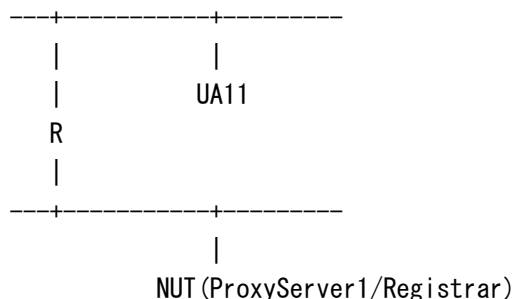
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

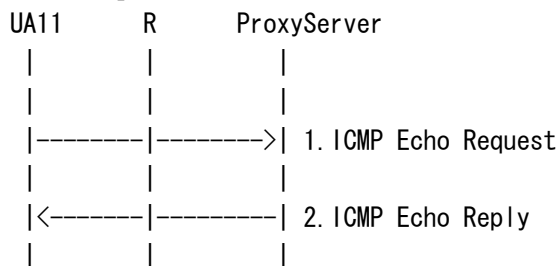
##### [TOPOLOGY]



##### [CONFIGURATION for NUT]

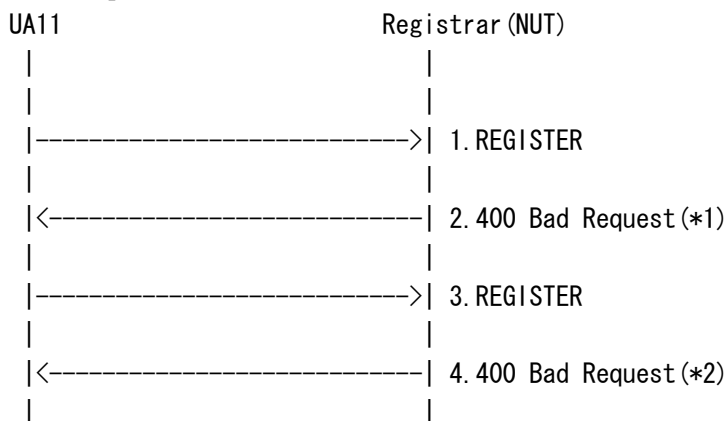
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 400 Bad Request.
3. UA11 Send REGISTER.
4. UA11 Receive 400 Bad Request.

#### === Message example ===

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
```



Contact: \*  
Expires: 3600  
Content-Length: 0

\* Contact header field value is "\*" but Expires parameter is not "0".

## 2. 400 Bad Request NUT -> UA11

SIP/2.0 400 Bad Request  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Content-Length: 0

## 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: hf7Klijndt3Skn3y@under.test.com  
CSeq: 2 REGISTER  
Contact: \*  
Contact: <sip:UA11@node.under.test.com>  
Expires: 0  
Content-Length: 0

\* Contact header field values are "\*" and <sip:UA11@node.under.test.com>.

## 4. 400 Bad Request NUT -> UA11

SIP/2.0 400 Bad Request  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=1643728903  
Call-ID: hf7Klijndt3Skn3y@under.test.com  
CSeq: 2 REGISTER



Content-Length: 0

## [JUDGMENT]

\*1:400 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "400". [RFC3261-10-36]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:400 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "400". [RFC3261-10-36]

- Header fields:

See generic\_status

See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

[RFC3261-10-36]

## 10.3 Processing REGISTER Requests

6. The registrar checks whether the request contains the Contact header field. If not, it skips to the last step. If the Contact header field is present, the registrar checks if there is one Contact field value that contains the special value "\*" and an Expires field. If the request has additional Contact fields or an expiration time other than zero, the request is invalid, and the server MUST return a 400 (Invalid Request) and skip the remaining steps.

### 4.1.19 RG-2-2-3 - SIP Registrar- REGISTER request with two Contact header field values and update failure

#### [NAME]

RG-2-2-3 - SIP Registrar- REGISTER request with two Contact header field value and update failure

#### [TARGET]

SIP Registrar (NUT)

#### [PURPOSE]

Verify that a registrar sends a 500 (Server Error) response when receiving a REGISTER request with two header field values

#### [REQUIREMENT]

NONE

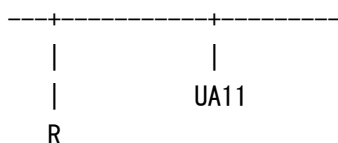
#### [PARAMETER]

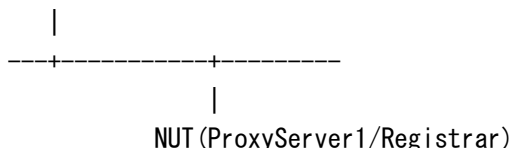
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

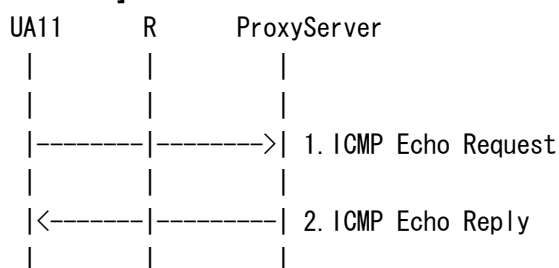




# [CONFIGURATION for NUT]

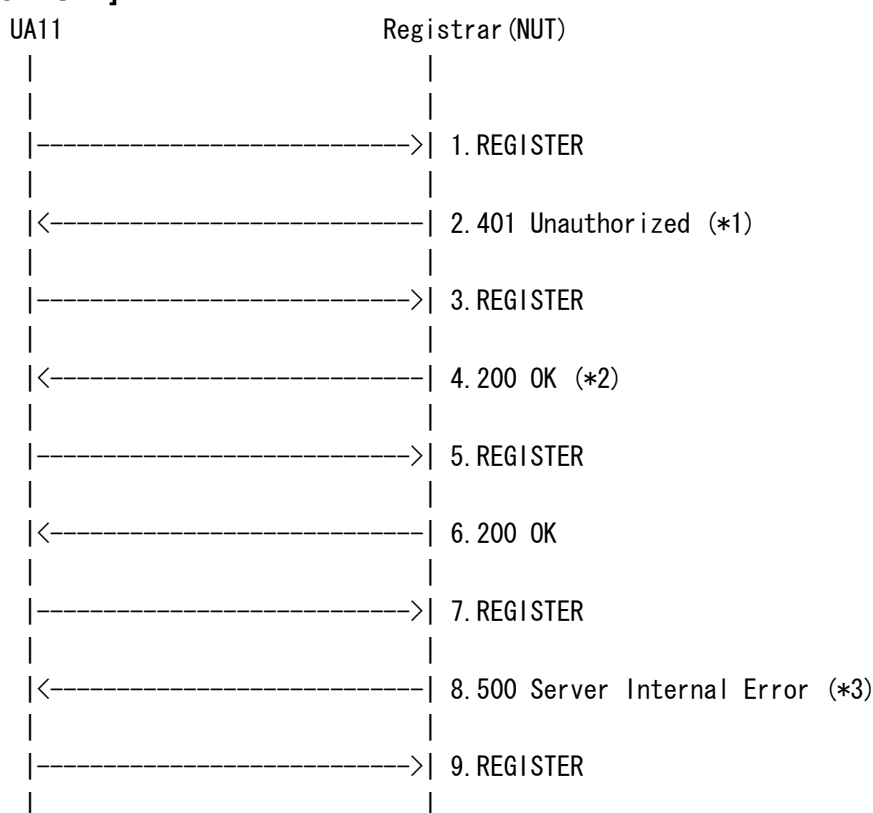
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]







|<-----|10.200 OK (\*4)  
|

1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.
5. UA11 Send REGISTER.
6. UA11 Receive 200 OK.
7. UA11 Send REGISTER.
8. UA11 Receive 500 Server Internal Error.
9. UA11 Send REGISTER.
10. UA11 Receive 200 OK.

**=== Message example ===**

1. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

3. REGISTER UA11 -> NUT



REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat, 13 Nov 2004 23:28:00 GMT  
Content-Length: 0

5. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:11UA11@node.under.test.com>  
Expires: 3600



Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

6. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhw16  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Contact: <sip:11UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

7. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlf1H  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 3 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Contact: <sip:11UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0



/\* CSeq parameter is the same as 5.REGISTER \*/

8. 500 Internal Server Error NUT -> UA11

SIP/2.0 500 Internal Server Error

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH

To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 3 REGISTER

Contact: <sip:UA11@node.under.test.com>;expires=3600

Contact: <sip:11UA11@node.under.test.com>;expires=3600

Date: Sat, 13 Nov 2004 23:28:00 GMT

Content-Length: 0

9. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH

To: UA11 <sip:UA11@under.test.com>

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 4 REGISTER

Authorization: Digest username="UA11",

realm="under.test.com",

nonce="ea9c8e88df84f1cec4341ae6cbe5a359",

qop=auth, nc=00000002, cnonce="d4e4cec0",

uri="sip:ss.under.test.com",

response="b7fd380421adc89263e6774026cfc049"

Content-Length: 0

10. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH

To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 4 REGISTER



Contact: <sip:UA11@node.under.test.com>;expires=3600  
Contact: <sip:11UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

## [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "200". [RFC3261 4]

- Header fields:  
See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]



\* Date

Should exist.[RFC3261-10-52]

rfc1123-date: Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

\*3:500 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "500". [RFC3261-10-46,48]

\*4:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was



received. [RFC3261-18-28]

\* Date

Should exist. [RFC3261-10-52]

rfc1123-date: Must finish with "GMT". [rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist. [RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

**[REFERENCE]**

[RFC3261-10-47, 48, 49]

10.3 Processing REGISTER Requests

7. The binding updates MUST be committed (that is, made visible to the proxy or redirect server) if and only if all binding updates and additions succeed. If any one of them fails (for example, because the back-end database commit failed), the request MUST fail with a 500 (Server Error) response and all tentative binding updates MUST be removed.

**4.1.20 RG-3-1-1 - SIP Registrar- Forwarded REGISTER request**

**[NAME]**

RG-3-1-1 - SIP Registrar- Forwarded REGISTER request

**[TARGET]**

SIP Registrar (NUT)

**[PURPOSE]**

Verify that a registrar properly processes a forwarded REGISTER request.

**[REQUIREMENT]**

Only when the equipment can process forwarded requests.

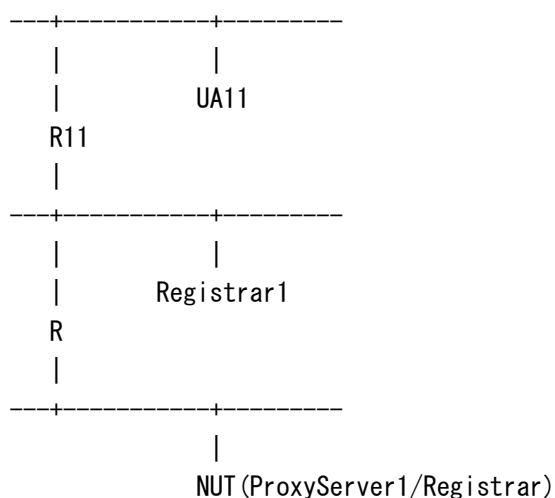
**[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
Registrar1	sip:ss1.biloxi.example.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar)(IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64
Registrar1(IPv6)	3ffe:501:ffff:20::20/64

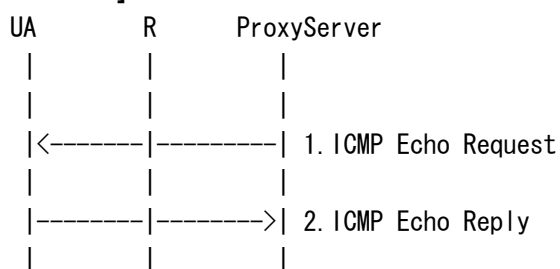
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

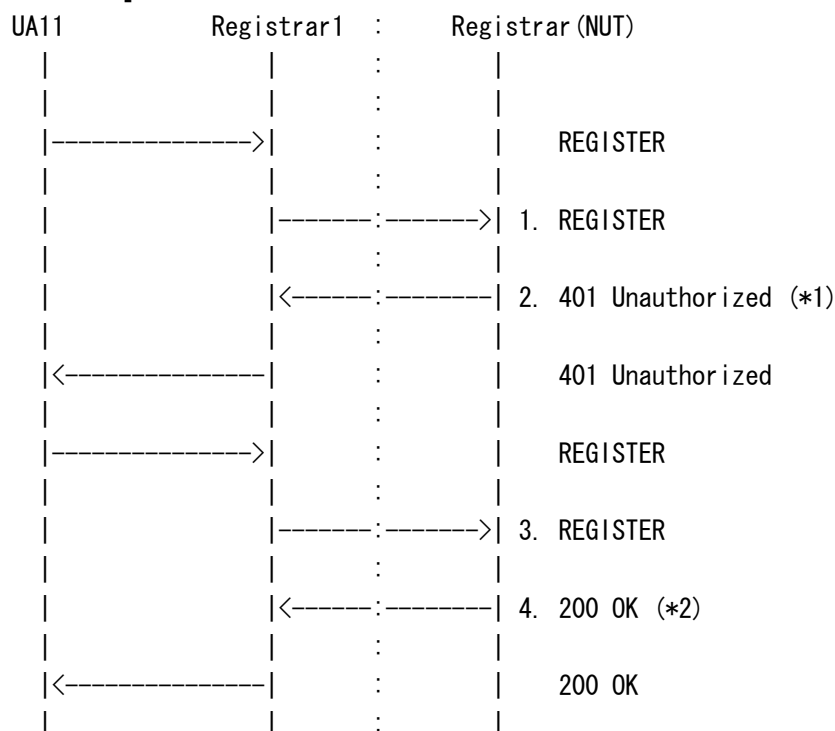
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.



## [PROCEDURE]



1. Registrar1 Send REGISTER.
2. Registrar1 Receive 401 Unauthorized.
3. Registrar1 Send REGISTER.
4. Registrar1 Receive 200 OK.

### === Message example ===

1. REGISTER Registrar1 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss1.biloxi.example.com:5060;branch=z9hG4bKjy8hGfv
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
;received=3ffe:501:ffff:1::1
Max-Forwards: 69
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
Content-Length: 0
```

2. 401 Unauthorized NUT -> Registrar1



SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP ss1.biloxi.example.com:5060;branch=z9hG4bKjy8hGfv  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

### 3. REGISTER Registrar1 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss1.biloxi.example.com:5060;branch=z9hG4bKjy8hGfz  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss.biloxi.example.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

### 4. 200 OK NUT -> Registrar1

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss1.biloxi.example.com:5060;branch=z9hG4bKjy8hGfz  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:1::1



From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

#### [JUDGMENT]

\*1:401 response from NUT to Registrar1.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:200 response from NUT to Registrar1.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "200". [RFC3261 4]

- Header fields:  
See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]



via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist. [RFC3261-10-52]

rfc1123-date: Must finish with "GMT". [rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist. [RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

## [REFERENCE]

Variation of sequence from RFC3665 Section 3.2.

[RFC3261-10-27]

### 10.3 Processing REGISTER Requests

1. The registrar inspects the Request-URI to determine whether it has access to bindings for the domain identified in the Request-URI. If not, and if the server also acts as a proxy server, the server SHOULD forward the request to the addressed domain, following the general behavior for proxying messages described in Section 16.

## 4.1.21 RG-3-1-2 - SIP Registrar- Forwarding REGISTER request

### [NAME]

RG-3-1-2 - SIP Registrar- Forwarding REGISTER request

### [TARGET]

SIP Registrar (NUT)

### [PURPOSE]

Verify that a registrar properly forwards a REGISTER request to an alternate registrar server.

### [REQUIREMENT]



Only when the equipment can forward REGISTER requests.

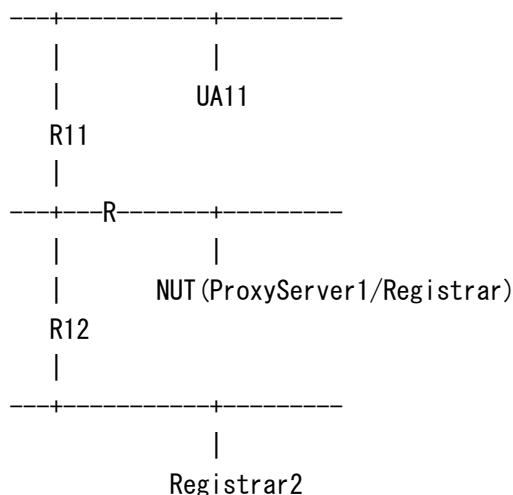
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@biloxi.example.com
UA11(Contact)	sip:UA11@client.biloxi.example.com
Registrar2	sip:ss2.biloxi.example.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar)(IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
R(IPv6)	3ffe:501:ffff:50::1/64
Registrar2(IPv6)	3ffe:501:ffff:20::20/64

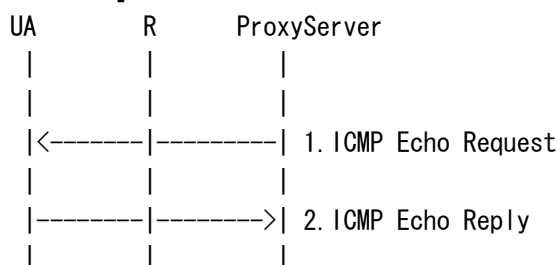
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

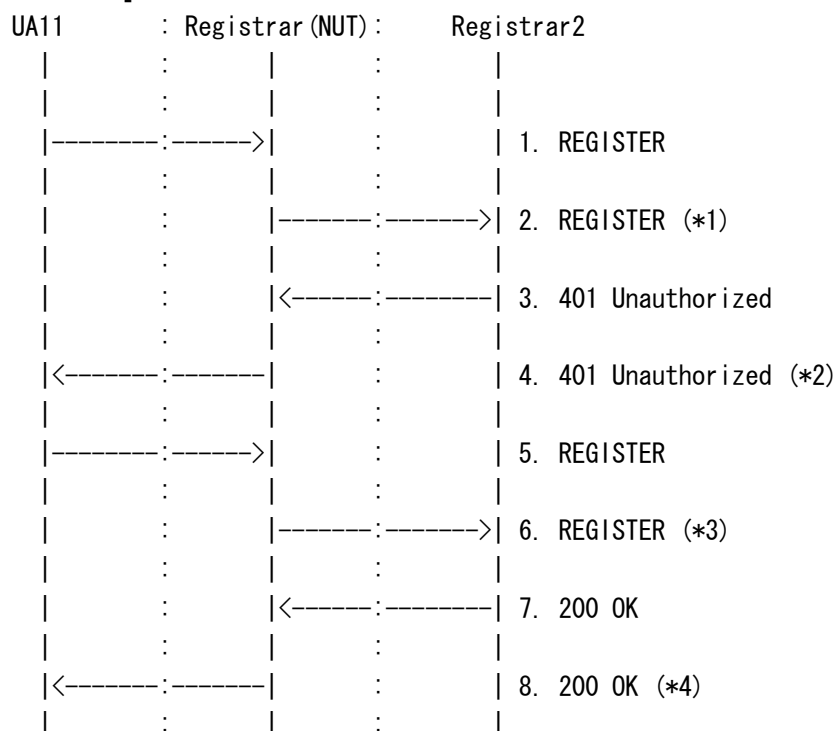
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

\* NUT is able to forward REGISTER request.

#### [PROCEDURE]



1. UA11 Send REGISTER.
2. Registrar2 Receive REGISTER.
3. Registrar2 Send 401 Unauthorized.
4. UA11 Receive 401 Unauthorized.
5. UA11 Send REGISTER.
6. Registrar2 Receive REGISTER.
7. Registrar2 Send 200 OK.
8. UA11 Receive 200 OK.

#### === Message example ===

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss2.biloxi.example.com SIP/2.0
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl
To: UA11 <sip:UA11@biloxi.example.com>
```



Call-ID: 1j9FpLxk3uxtm8tn@biloxi.example.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@client.biloxi.example.com>  
Expires: 3600  
Content-Length: 0

## 2. REGISTER NUT -> Registrar2

REGISTER sip:ss2.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjy8hGfv  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@biloxi.example.com>  
Call-ID: 1j9FpLxk3uxtm8tn@biloxi.example.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@client.biloxi.example.com>  
Expires: 3600  
Content-Length: 0

## 3. 401 Unauthorized Registrar2 -> NUT

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjy8hGfv  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@biloxi.example.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@biloxi.example.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="biloxi.example.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 4. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl



To: UA11 <sip:UA11@biloxi.example.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@biloxi.example.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="biloxi.example.com", qop="auth",  
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
    opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

#### 5. REGISTER UA11 -> NUT

REGISTER sip:ss2.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@biloxi.example.com>  
Call-ID: 1j9FpLxk3uxtm8tn@biloxi.example.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@client.biloxi.example.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
    realm="biloxi.example.com",  
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
    qop=auth, nc=00000002, cnonce="d4e4cec0",  
    uri="sip:ss2.biloxi.example.com",  
    response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

#### 6. REGISTER NUT -> Registrar2

REGISTER sip:ss2.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjy8hGfz  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds8  
    ;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@biloxi.example.com>  
Call-ID: 1j9FpLxk3uxtm8tn@biloxi.example.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@client.biloxi.example.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
    realm="biloxi.example.com",  
    nonce="ea9c8e88df84f1cec4341ae6cbe5a359",





qop=auth, nc=00000002, cnonce="d4e4cec0",  
uri="sip:ss2.biloxi.example.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

7. 200 OK Registrar2 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjy8hGfz  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@biloxi.example.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@biloxi.example.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@client.biloxi.example.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

8. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@biloxi.example.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@biloxi.example.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@biloxi.example.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@client.biloxi.example.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

## [JUDGMENT]

\*1:REGISTER request from NUT to Registrar2.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11



See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

\*2:401 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "401". [RFC3261 22.2]

- Header fields:

See generic\_status

See generic\_www-auth

- \* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*3:REGISTER request from NUT to Registrar2.

As a SIP Message,

See generic\_message

Should Forward this request to Registrar2. [RFC3261-10-27]

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog



See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

\*4:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_status

Status-Code: Must be "200". [RFC3261 4]

- Header fields:

See generic\_status

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Date

Should exist.[RFC3261-10-52]

rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]

\* Contact

Must exist. [RFC3261-10-50]

contact-param: Must be the specified parameter. [RFC3261-10-50]

contact-param: Must be the Contact address of UA11. [RFC3261-10-50]

contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]

c-p-expires:

Must exist.[RFC3261-10-51]

delta-seconds: Must not be "0". [RFC3261 10.2.2]

## [REFERENCE]

[RFC3261-10-27]

### 10.3 Processing REGISTER Requests

1. The registrar inspects the Request-URI to determine whether it



has access to bindings for the domain identified in the Request-URI. If not, and if the server also acts as a proxy server, the server SHOULD forward the request to the addressed domain, following the general behavior for proxying messages described in Section 16.

#### 4.1.22 RG-4-1-1 - SIP Registrar- Future extension about new header field

##### [NAME]

RG-4-1-1 - SIP Registrar- Future extension about new header field

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly processes a new header field as normal processing in order to extend that for future.

##### [REQUIREMENT]

NONE

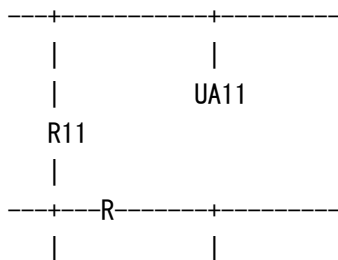
##### [PARAMETER]

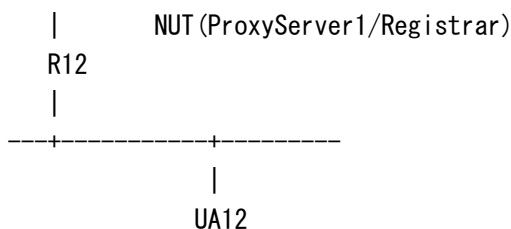
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

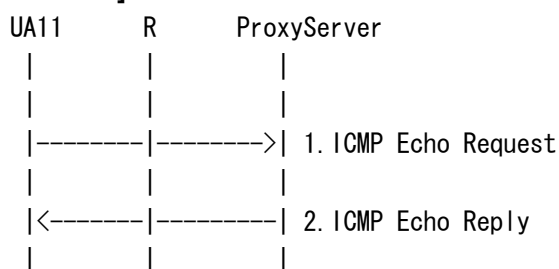




#### [CONFIGURATION for NUT]

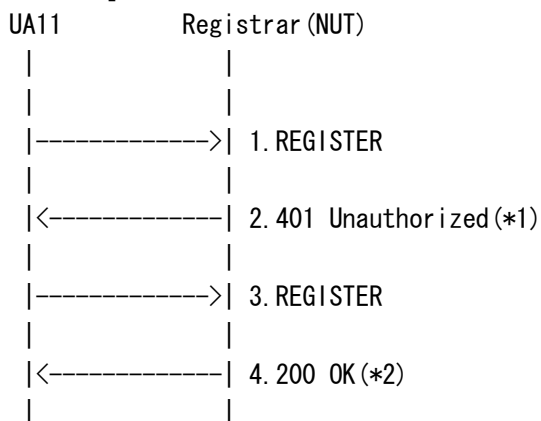
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 401 Unauthorized.
3. UA11 Send REGISTER.
4. UA11 Receive 200 OK.

#### === Message example ===

1. REGISTER UA11 -> NUT



REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
NewHeader field: new  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Content-Length: 0

## 2. 401 Unauthorized NUT -> UA11

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl  
To: UA11 <sip:UA11@under.test.com>;tag=1410948204  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. REGISTER UA11 -> NUT

REGISTER sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
Max-Forwards: 70  
NewHeader field: new  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>  
Expires: 3600  
Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="ea9c8e88df84f1cec4341ae6cbe5a359",  
qop=auth, nc=00000002, cnonce="d4e4cec0",



uri="sip:ss.under.test.com",  
response="b7fd380421adc89263e6774026cfc049"  
Content-Length: 0

4. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds8  
;received=3ffe:501:ffff:5::X  
From: UA11 <sip:UA11@under.test.com>;tag=ja743ks76zlfH  
To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6  
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com  
CSeq: 2 REGISTER  
Contact: <sip:UA11@node.under.test.com>;expires=3600  
Date: Sat,13 Nov 2004 23:28:00 GMT  
Content-Length: 0

#### [JUDGMENT]

\*1:401 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_status  
Status-Code: Must be "401". [RFC3261-8-70,71]

- Header fields:  
See generic\_status  
See generic\_www-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter  
contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was  
received. [RFC3261-18-28]

\*2:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,



- Status-Line:  
See generic\_status  
Status-Code: Must be "200". [RFC3261-8-70,71]
- Header fields:  
See generic\_status
  - \* Via
    - via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]
    - via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]
  - \* Date
    - Should exist.[RFC3261-10-52]
    - rfc1123-date:Must finish with "GMT".[rfc3261 20.17, rfc2616 3.3.1]
  - \* Contact
    - Must exist. [RFC3261-10-50]
    - contact-param: Must be the specified parameter. [RFC3261-10-50]
    - contact-param: Must be the Contact address of NUT. [RFC3261-10-50]
    - contact-param: "\*" MUST NOT be used unless the Expires header field is present with a value of "0". [RFC3261-10-15]
    - c-p-expires:
      - Must exist.[RFC3261-10-51]
      - delta-seconds: Must not be "0". [RFC3261 10.2.2]

## [REFERENCE]

[RFC3261-8-70, 71]

## 8 General User Agent Behavior

### 8.2 UAS Behavior

#### 8.2.2 Header field Inspection

If a UAS does not understand a header field in a request (that is, the header field is not defined in this specification or in any supported extension), the server **MUST** ignore that header field and continue processing the message. A UAS **SHOULD** ignore any malformed header fields that are not necessary for processing requests.



#### 4.1.23 RG-4-1-2 - SIP Registrar- Non-supported option-tag in Require header field

##### [NAME]

RG-4-1-2 - SIP Registrar- Non-supported option-tag in Require filed

##### [TARGET]

SIP Registrar (NUT)

##### [PURPOSE]

Verify that a registrar properly sends a 420 (Bad Extension) response when receiving an option-tag parameter in a Require header field that isn't supported.

##### [REQUIREMENT]

NONE

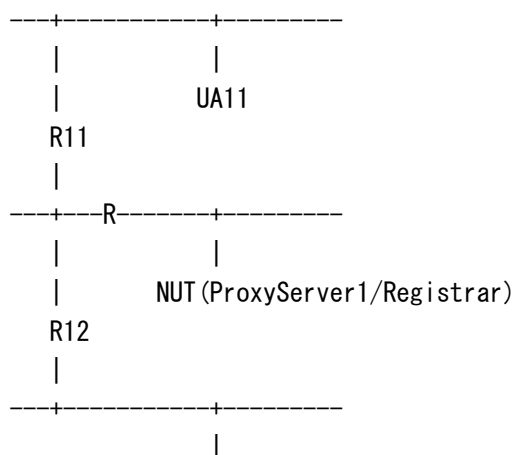
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

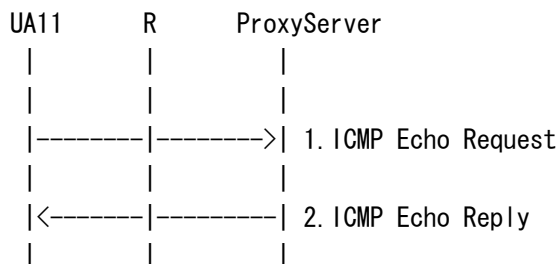


## UA12

### [CONFIGURATION for NUT]

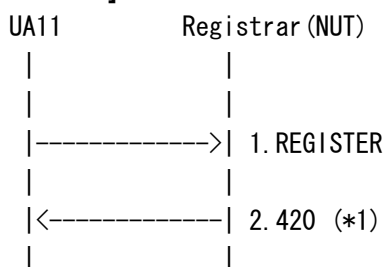
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]



1. UA11 Send REGISTER.
2. UA11 Receive 420 Bad Extension.

#### === Message example ===

1. REGISTER UA11 -> NUT

```
REGISTER sip:ss.under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=a73kszlfl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 1j9FpLxk3uxtm8tn@under.test.com
CSeq: 1 REGISTER
Require: 999rel
Contact: <sip:UA11@node.under.test.com>
Expires: 3600
```



Content-Length: 0

8. 420 Bad Extension NUT -> UA11

SIP/2.0 420 Bad Extension

Via: SIP/2.0/UDP node.under.test.com:5060;branch= z9hG4bKnashds7

;received=3ffe:501:ffff:5::X

From: UA11 <sip:UA11@under.test.com>;tag= a73kszlfl

To: UA11 <sip:UA11@under.test.com>;tag=37GkEhwl6

Call-ID: 1j9FpLxk3uxtm8tn@under.test.com

CSeq: 1 REGISTER

Unsupported:999rel

Contact: <sip:UA11@node.under.test.com>;expires=3600

Date: Sat,13 Nov 2004 23:28:00 GMT

Content-Length: 0

#### [JUDGMENT]

\*1:420 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "420". [RFC3261-8-78,79]

- Header fields:

See generic\_make\_response

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Unsupported

Must exist. [RFC3261-8-79]

option-tag: Must include "999rel". [RFC3261-8-78,79]

#### [REFERENCE]

[RFC3261-8-78, 79]

8.2.2.3 Require

Assuming the UAS decides that it is the proper element to process the request, it examines the Require header field, if present.

The Require header field is used by a UAC to tell a UAS about SIP extensions that the UAC expects the UAS to support in order to process the request properly. Its format is described in Section 20.32. If a UAS does not understand an option-tag listed in a Require header field, it **MUST** respond by generating a response with status code 420 (Bad Extension). The UAS **MUST** add an Unsupported header field, and list in it those options it does not understand amongst those in the Require header field of the request.

## 4.2 Session Establishment on One Proxy

### 4.2.1 PX-1-1-1 - SIP Proxy- Session Establishment Through One Proxy in the same domain

#### [NAME]

PX-1-1-1 - SIP Proxy- Session Establishment Through One Proxy in the same domain

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes when a session is established through one proxy in the same domain.

#### [REQUIREMENT]

NONE

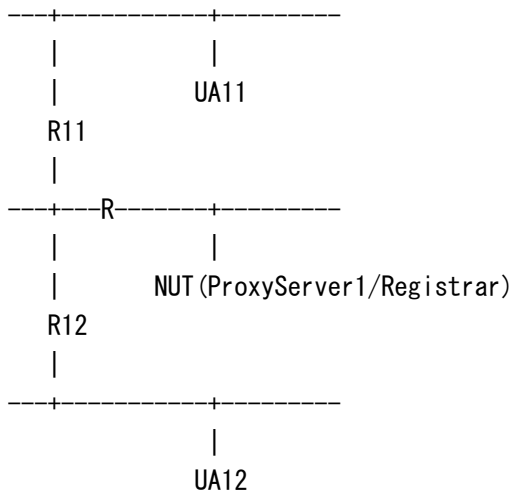
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

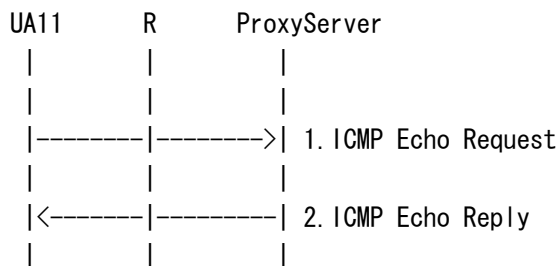
## [TOPOLOGY]



## [CONFIGURATION for NUT]

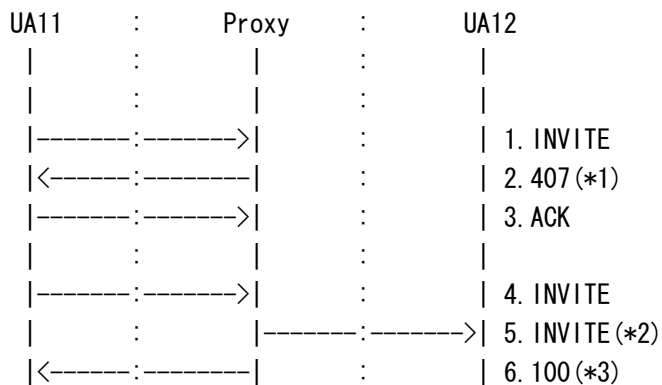
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

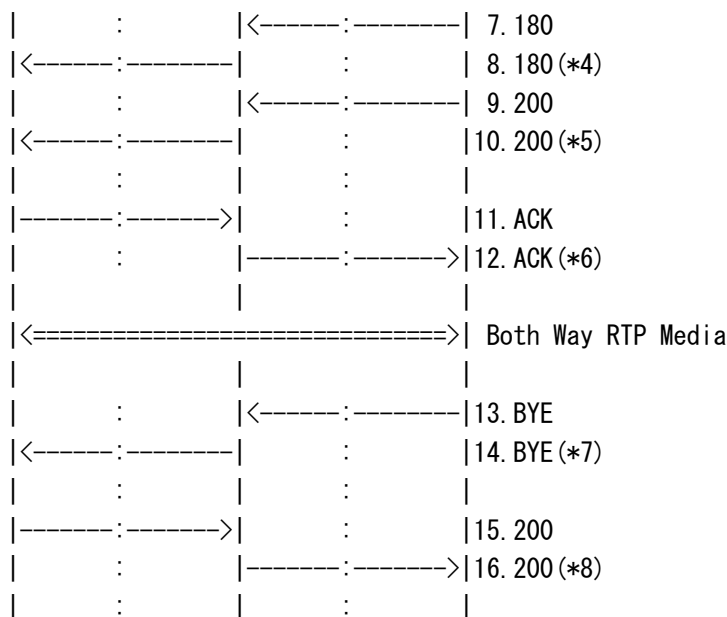
## [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200.
16. UA12 Receive 200.

### === Message example ===

1. INVITE UA11 -> NUT

```
INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
```



Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

/\* Proxy(NUT) challenges UA11for authentication \*/

## 2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="f84f1cec41e6cbe5aea9c8e88d359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 ACK  
Content-Length: 0



/\* UA11 responds by re-sending the INVITE with authentication credentials in it. \*/

#### 4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

/\* Proxy(NUT) accepts the credentials and forwards the INVITE to UA12

2. Client for UA11 prepares to receive data on port 49172 from the network. \*/

#### 5. INVITE NUT -> UA12

INVITE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69





Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 7. 180 Ringing UA11 -> NUT

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE



Content-Length: 0

#### 8. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA12@node11.under.test.com>

CSeq: 2 INVITE

Content-Length: 0

#### 9. 200 OK UA12 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA12@node11.under.test.com>

Supported: none

Allow: INVITE, ACK, CANCEL, OPTIONS, BYE

Content-Type: application/sdp

Content-Length: 147

v=0

o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

#### 10. 200 OK NUT -> UA11



SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

11. ACK UA11 -> NUT

ACK sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

12. ACK NUT -> UA12

ACK sip:UA12@node11.under.test.com SIP/2.0



Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

13. BYE UA12 -> NUT

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA12@under.test.com>;tag=314159  
To: NUT <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

14. BYE NUT -> UA11

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74b43  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA12@under.test.com>;tag=314159  
To: NUT <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

15. 200 OK UA11 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2



From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

16. 200 OK NUT -> UA12

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

#### [JUDGMENT]

\*1:407 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:  
See generic\_make\_response  
See generic\_proxy-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:INVITE request from NUT to UA12.

As a SIP Message,  
See generic\_message



As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

\*3:100 response from NUT to UA11.(Optional)

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "100". [RFC3261 4]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*4:180 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180". [RFC3261-16-104]



- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

\*5:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "200". [RFC3261-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

\*6:ACK request from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11



See generic\_forward\_R-URI\_responsible-domain

- Header fields:
  - outside of a dialog
    - See generic\_forward\_from-UA11
    - See generic\_forward\_request
- Bodies:
  - See generic\_forward\_from-UA11

\*7:BYE request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:
  - See generic\_forward\_from-UA12
- Header fields:
  - inside of a dialog
    - See generic\_forward\_from-UA12
    - See generic\_forward\_request
- Bodies:
  - See generic\_forward\_from-UA12

\*8:200 response from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:
  - See generic\_forward\_from-UA11
  - Status-Code: Must be "200". [RFC3261-16-104]
- Header fields:
  - See generic\_forward\_from-UA11
  - See generic\_forward\_response





- Bodies:  
See generic\_forward\_from-UA12

#### [REFERENCE]

Sequence from RFC3665 Section 3.2.

### 4.2.2 PX-1-1-2 - SIP Proxy- Unsuccessful No Answer [CANCEL]

#### [NAME]

PX-1-1-2 - SIP Proxy- Unsuccessful No Answer [CANCEL]

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes when a UA doesn't send any response and receives a CANCEL request from the other UA..

#### [REQUIREMENT]

NONE

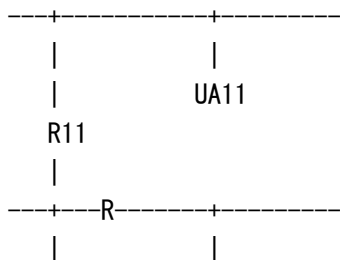
#### [PARAMETER]

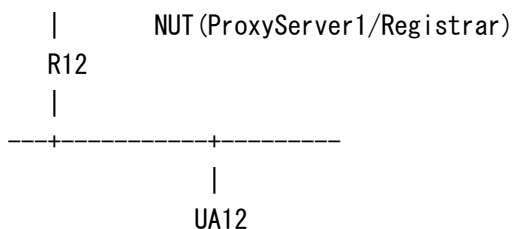
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

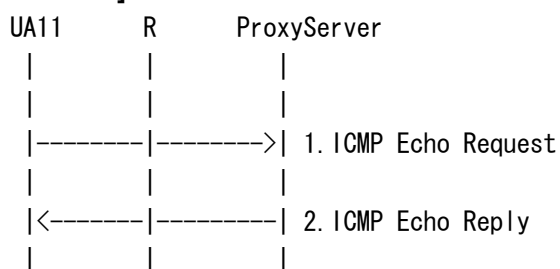




#### [CONFIGURATION for NUT]

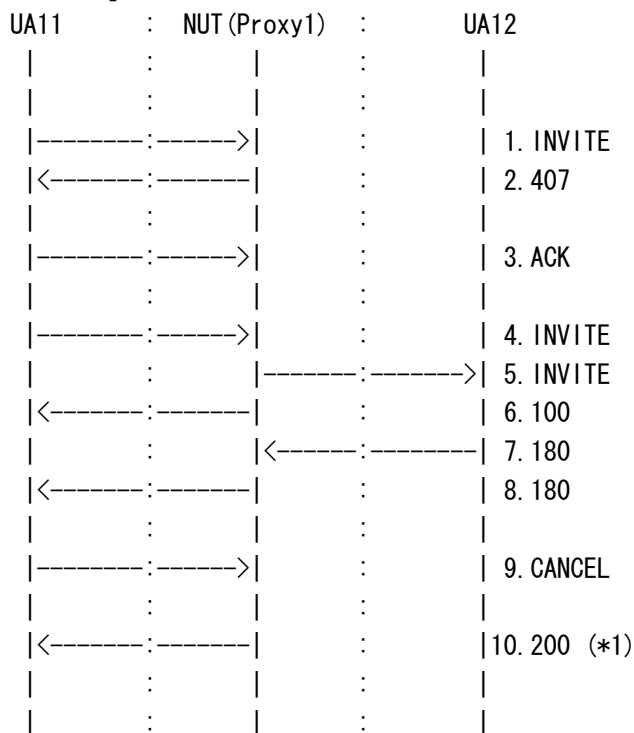
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





	:	----->	11. CANCEL (*2)
	:		
	:	<-----	12. 200
	:		
	:	<-----	13. 487
	:		
	:	----->	14. ACK (*3)
<-----	:		15. 487 (*4)
	:		
----->	:		16. ACK
	:		

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA11 Send CANCEL.
10. UA11 Receive 200 OK.
11. UA12 Receive CANCEL.
12. UA12 Send 200 OK.
13. UA12 Send 487 Request Terminated.
14. UA12 Receive ACK.
15. UA11 Receive 487 Request Terminated.
16. UA11 Send ACK.

**=== Message example ===**

1. INVITE UA11 -> NUT

```

INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 2xTb9vxSit55XU7p8@under.test.com
CSeq: 1 INVITE
Contact: <sip:UA11@node.under.test.com>
Supported: none
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE
Content-Type: application/sdp

```



Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="f84f1cec41e6cbe5aea9c8e88d359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

3. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com



CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151  
  
v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

##### 5. INVITE NUT -> UA12

INVITE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151  
  
v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1



t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 7. 180 Ringing UA12 -> NUT

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Length: 0

#### 8. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Length: 0



#### 9. CANCEL UA11 -> NUT

CANCEL sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Route: <sip:ss.under.test.com;lr>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL  
Content-Length: 0

#### 10. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL  
Content-Length: 0

#### 11. CANCEL NUT -> UA12

CANCEL sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL  
Content-Length: 0

#### 12. 200 OK UA12 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:50::50  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL



Content-Length: 0

### 13. 487 Request Terminated UA12 -> NUT

SIP/2.0 487 Request Terminated

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

### 14. ACK NUT -> UA12

ACK sip:UA12@under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 ACK

Content-Length: 0

### 15. 487 Request Terminated NUT -> UA11

SIP/2.0 487 Request Terminated

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

### 16. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl





To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response-200\_for-CANCEL  
Status-Code: Must be "200". [RFC3261 16.10]

- Header fields:  
See generic\_make\_response-200\_for-CANCEL

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:CANCEL request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_CANCEL

- Header fields:  
- outside of a dialog  
See generic\_make\_CANCEL

- Bodies:  
See generic\_make\_CANCEL



\*3:ACK request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX
- Header fields:
  - outside of a dialog  
See generic\_make\_ACK\_for-non2XX
- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*4:487 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "487". [RFC3261-9-15]
- Header fields:  
See generic\_make\_response
- \* To  
tag-param: Should be the same value of "10. 200 response". [RFC3261-9-16]
- \* Via  
via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

Sequence from RFC3665 Section 3.8.

### 4.2.3 PX-1-1-3 - SIP Proxy- Session establishment and holding with re-INVITE

#### [NAME]

PX-1-1-3 - SIP Proxy- Session establishment and holding with re-INVITE

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes when a session is established and on holding with re-INVITE.

#### [REQUIREMENT]

NONE

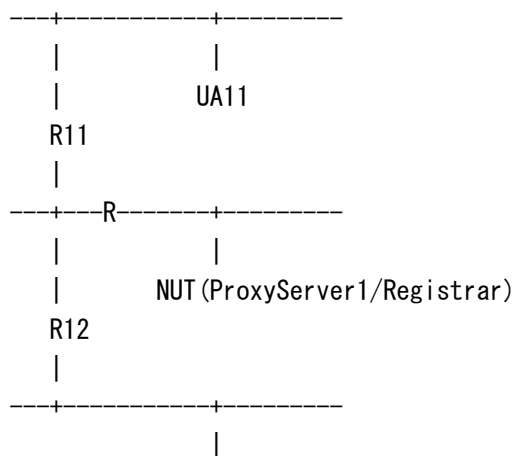
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

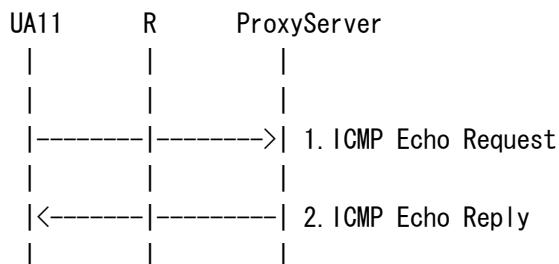


UA12

**[CONFIGURATION for NUT]**

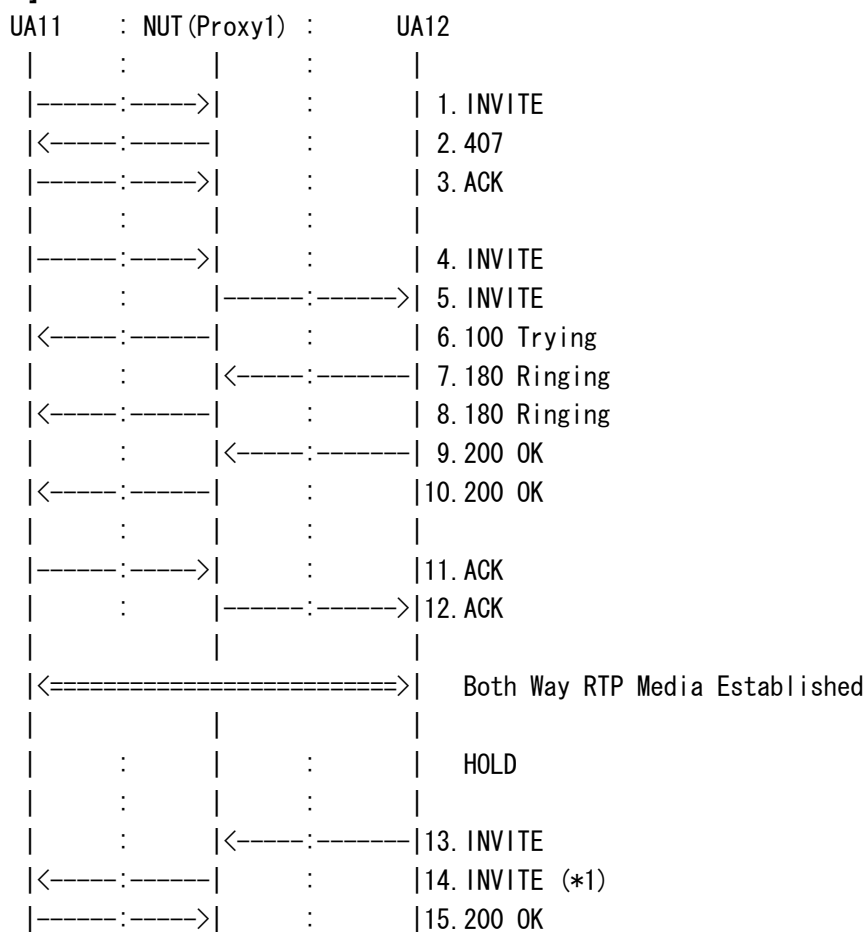
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

**[INITIALIZATION]**



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

**[PROCEDURE]**



```

|      :      |-----:----->|16. 200 OK (*2)
|      :      |<-----:-----|17. ACK
|<-----:-----|      :      |18. ACK (*3)
|      :      |      :      |
|      :      |      :      |    HOLD Release
|      :      |      :      |
|      :      |<-----:-----|19. INVITE
|<-----:-----|      :      |20. INVITE (*4)
|-----:----->|      :      |21. 200 OK
|      :      |-----:----->|22. 200 OK (*5)
|      :      |<-----:-----|23. ACK
|<-----:-----|      :      |24. ACK (*6)
|      :      |      :      |
|<=====|      :      |    New RTP Media Stream
|      :      |      :      |
|-----:----->|      :      |25. BYE
|      :      |-----:----->|26. BYE
|      :      |<-----:-----|27. 200 OK
|<-----:-----|      :      |28. 200 OK
|      :      |      :      |

```

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send INVITE.
14. UA11 Receive INVITE.
15. UA11 Send 200 OK.
16. UA12 Receive 200 OK.
17. UA12 Send ACK.
18. UA11 Receive ACK.
19. UA12 Send INVITE.
20. UA11 Receive INVITE.
21. UA11 Send 200 OK.
22. UA12 Receive 200 OK.



23. UA12 Send ACK.
24. UA11 Receive ACK.
25. UA11 Send BYE.
26. UA12 Receive BYE.
27. UA12 Send 200 OK.
28. UA11 Receive 200 OK.

**=== Message example ===**

1. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="f84f1cec41e6cbe5aea9c8e88d359",  
opaque="", stale=FALSE, algorithm=MD5



Content-Length: 0

### 3. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

### 4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

### 5. INVITE NUT -> UA12



INVITE sip:UA11@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

7. 180 Ringing UA12 -> NUT

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1





Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Length: 0

8. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Length: 0

9. 200 OK UA12 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2



t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

10. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

11. ACK UA11 -> NUT

ACK sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b7b  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Route: <sip:ss.under.test.com;lr>,  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com



CSeq: 2 ACK  
Content-Length: 0

## 12. ACK NUT -> UA12

ACK sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKgs24u  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b7b  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

## 13. INVITE UA12 -> NUT

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=UA12 2890844527 2890844528 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendonly

## 14. INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0



Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjgkI5  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=UA12 2890844527 2890844528 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendonly

15. 200 OK UA11 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjgkI5  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 150

v=0



o=UA11 2890844526 2890844527 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=recvonly

16. 200 OK NUT -> UA12

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 150

v=0  
o=UA11 2890844526 2890844527 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=recvonly

17. ACK UA12 -> NUT

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKhyu5r  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com



CSeq: 15 ACK  
Content-Length: 0

18. ACK NUT -> UA11

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjugh6  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKhyu5r  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 ACK  
Content-Length: 0

19. INVITE UA12 -> NUT

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKhgt56  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=UA12 2890844527 2890844529 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

20. INVITE NUT -> UA11



INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKsdp9i  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKhgt56  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=UA12 2890844527 2890844529 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

21. 200 OK UA11 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKsdp9i  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKhgt56  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 150



v=0  
o=UA11 2890844526 2890844528 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

22. 200 OK NUT -> UA12

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKhgt56  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 150

v=0  
o=UA11 2890844526 2890844528 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

23. ACK UA12 -> NUT

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKdft27  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 ACK





Content-Length: 0

24. ACK NUT -> UA11

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKkjyt4  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKdft27  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 ACK  
Content-Length: 0

25. BYE UA11 -> NUT

BYE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK78jk6  
Route: <sip:ss.under.test.com;lr>  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 3 BYE  
Content-Length: 0

26. BYE NUT -> UA12

BYE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKju6y8  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK78jk6  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 3 BYE  
Content-Length: 0

27. 200 OK UA12 -> NUT



SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKju6y8

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK78jk6

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 3 BYE

Content-Length: 0

28. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKju6y8

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 3 BYE

Content-Length: 0

## [JUDGMENT]

\*1:INVITE request from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA12

See generic\_forward\_R-URI\_responsible-domain

- Header fields:

- inside of a dialog

See generic\_forward\_from-UA12

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA12



\*2:200 response from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA11  
Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-UA11  
See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:  
See generic\_forward\_from-UA11

\*3:ACK request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA12  
See generic\_forward\_R-URI\_responsible-domain

- Header fields:  
- inside of a dialog  
See generic\_forward\_from-UA12  
See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-UA12



\*4:INVITE request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA12  
See generic\_forward\_R-URI\_responsible-domain

- Header fields:
  - inside of a dialog  
See generic\_forward\_from-UA12  
See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-UA12

\*5:200 response from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA11  
Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-UA11  
See generic\_forward\_response

- \* Via

- via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

- via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:  
See generic\_forward\_from-UA11

\*6:ACK request from NUT to UA11.



As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA12  
See generic\_forward\_R-URI\_responsible-domain
- Header fields:
  - inside of a dialog  
See generic\_forward\_from-UA12  
See generic\_forward\_request
- Bodies:  
See generic\_forward\_from-UA12

#### [REFERENCE]

Sequence from RFC3665 Section 3.7.

### 4.2.4 PX-1-2-1 - SIP Proxy- Unsuccessful Busy

#### [NAME]

PX-1-2-1 - SIP Proxy- Unsuccessful Busy

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes when the callee is busy.

#### [REQUIREMENT]

NONE

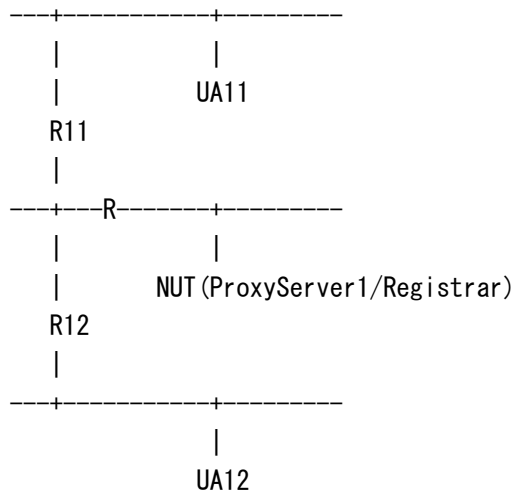
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

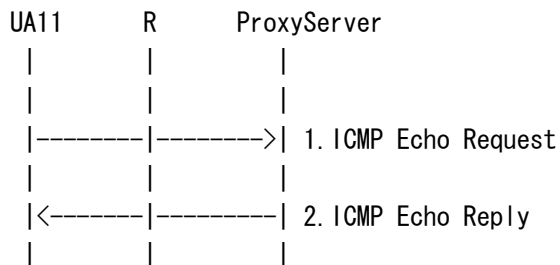
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

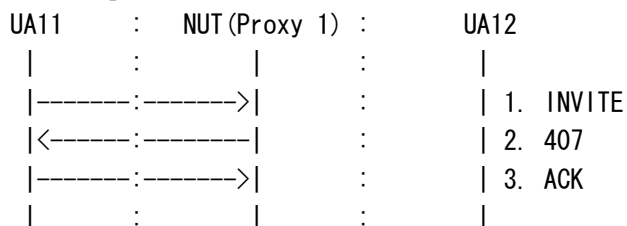
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

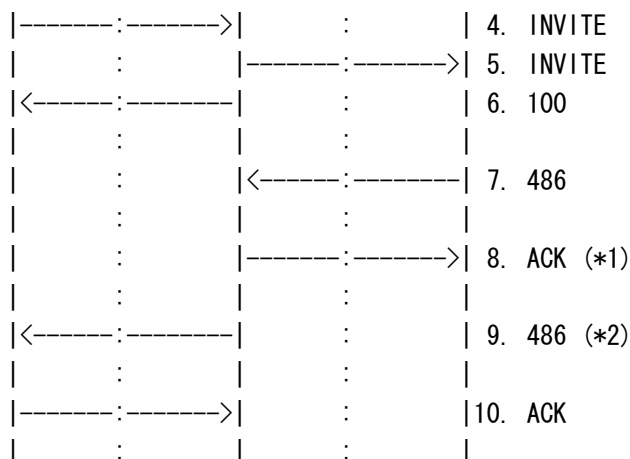
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 486 Busy Here.
8. UA12 Receive ACK.
9. UA11 Receive 486 Busy Here.
10. UA11 Send ACK.

**=== Message example ===**

1. INVITE UA11 -> NUT

```
INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 2xTb9vxSit55XU7p8@under.test.com
CSeq: 1 INVITE
Contact: <sip:UA11@node.under.test.com>
Supported: none
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
```



c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="dc3a5ab2530aa93112cf5904ba7d88fa",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

## 4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="dc3a5ab2530aa93112cf5904ba7d88fa", opaque="",





qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

##### 5. INVITE NUT -> UA12

INVITE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com:lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

/\*Client for NUT prepares to receive data on port 49172 from the



network.\*/

#### 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 7. 486 Busy Here UA12 -> NUT

SIP/2.0 486 Busy Here

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 8. ACK NUT -> UA12

ACK sip:UA12@under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### 9. 486 Busy Here NUT -> UA11

SIP/2.0 486 Busy Here

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl



To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

10. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### [JUDGMENT]

\*1:ACK request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX
- Header fields:
  - outside of a dialog  
See generic\_make\_ACK\_for-non2XX
- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*2:486 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response



Status-Code: Must be "486". [RFC3261 16.7.6]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.9.

### 4.2.5 PX-1-2-2 - SIP Proxy- Unsuccessful No Response from User Agent

#### [NAME]

PX-1-2-2 - SIP Proxy- Unsuccessful processing by No Response from User Agent

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes when receiving no response.

#### [REQUIREMENT]

NONE

#### [PARAMETER]

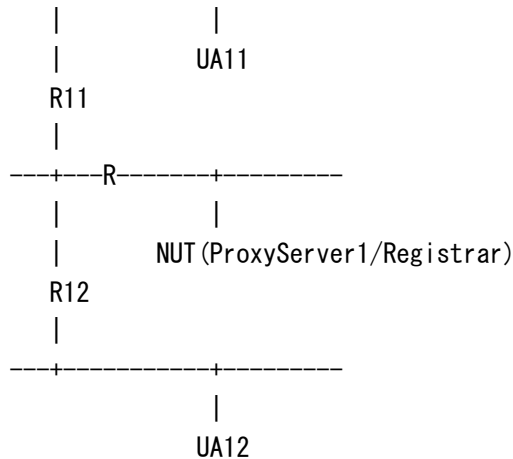
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

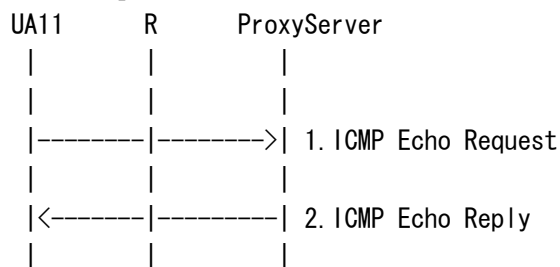
-----+-----+-----



#### [CONFIGURATION for NUT]

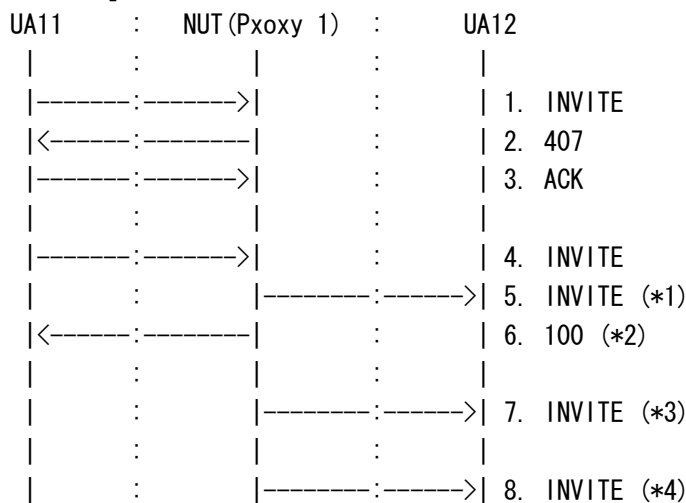
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

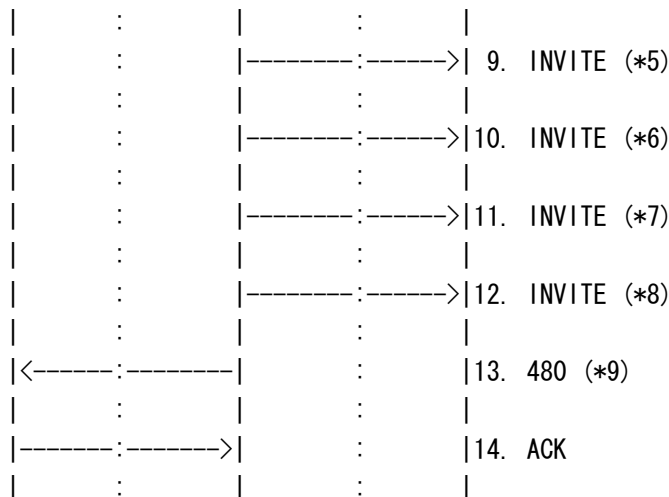
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Receive INVITE.
8. UA12 Receive INVITE.
9. UA12 Receive INVITE.
10. UA12 Receive INVITE.
11. UA12 Receive INVITE.
12. UA12 Receive INVITE.
13. UA11 Receive 480 No Response.
14. UA11 Send ACK.

**=== Message example ===**

1. INVITE UA11 -> NUT

```

INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 2xTb9vxSit55XU7p8@under.test.com
CSeq: 1 INVITE
Contact: <sip:UA11@node.under.test.com>
Supported: none
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE
Content-Type: application/sdp

```



Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="cf5904ba7d8dc3a5ab2530aa931128fa",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

3. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com



CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="cf5904ba7d8dc3a5ab2530aa931128fa", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

5. INVITE NUT -> UA12

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1





t=0 0

m=audio 49172 RTP/AVP 0

a=rtpmap:0 PCMU/8000

6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

7. INVITE NUT -> UA12

Resend of message 5.

8. INVITE NUT -> UA12

Resend of message 5.

9. INVITE NUT -> UA12

Resend of message 5.

10. INVITE NUT -> UA12

Resend of message 5.

11. INVITE NUT -> UA12

Resend of message 5.

12. INVITE NUT -> UA12

Resend of message 5.

13. 480 No Response NUT -> UA11

SIP/2.0 480 No Response

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9



;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

14. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### [JUDGMENT]

\*9:480 response from NUT to UA12

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "480". [RFC3261 16.7.6], [RFC3261 21.4.18]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.10.

### 4.2.6 PX-1-2-3 - SIP Proxy- Unsuccessful Temporarily Unavailable

#### [NAME]

## PX-1-2-3 - SIP Proxy- Unsuccessful Temporarily Unavailable

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly forwards a 480 (Temporarily Unavailable) response.

### [REQUIREMENT]

NONE

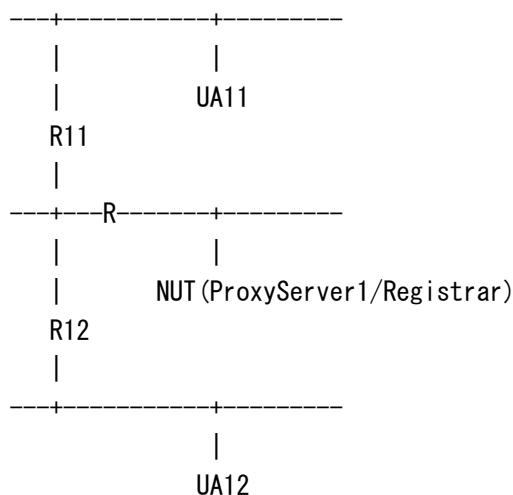
### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

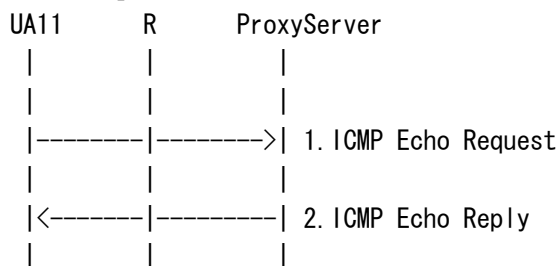
### [TOPOLOGY]



### [CONFIGURATION for NUT]

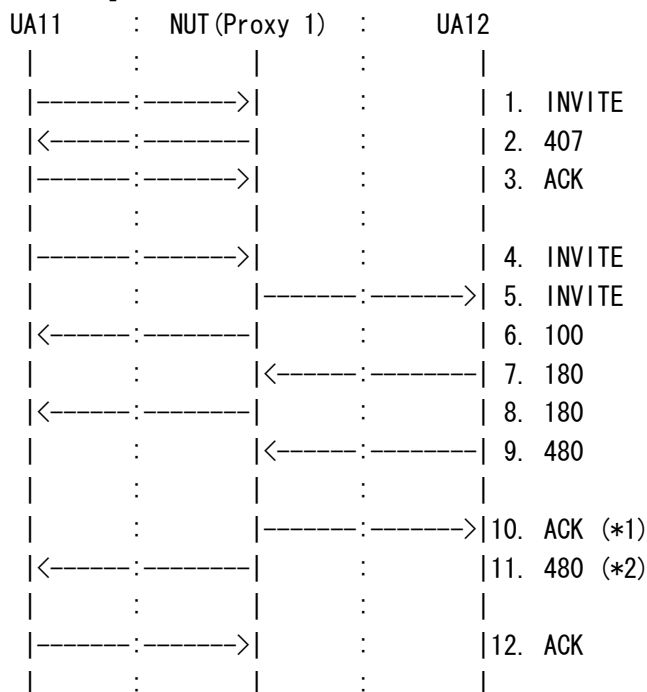
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

## [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authorization.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.



9. UA12 Send 480 Temporarily Unavailable.
10. UA12 Receive ACK.
11. UA11 Receive 480 Temporarily Unavailable.
12. UA11 Send ACK.

**=== Message example ===**

1. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="cf5904ba7d8dc3a5ab2530aa931128fa",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0



### 3. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

### 4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="cf5904ba7d8dc3a5ab2530aa931128fa", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

### 5. INVITE NUT -> UA12



INVITE sip:UA12@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>,  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported: none  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Length: 0

7. 180 Ringing UA12 -> NUT

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1



Record-Route: <sip:ss.under.test.com:lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Length: 0

#### 8. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com:lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Length: 0

#### 9. 480 Temporarily Unavailable UA12 -> NUT

SIP/2.0 480 Temporarily Unavailable  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 10. ACK NUT -> UA12

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK





Content-Length: 0

11. 480 Temporarily Unavailable NUT -> UA11

SIP/2.0 480 Temporarily Unavailable

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

12. ACK UA11 -> NUT

ACK sip:UA12@node.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74bf9

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 ACK

Content-Length: 0

#### [JUDGMENT]

\*1:ACK request from NUT to UA12

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_make\_ACK\_for-non2XX

- Header fields:

- outside of a dialog

See generic\_make\_ACK\_for-non2XX

- Bodies:

See generic\_make\_ACK\_for-non2XX



\*2:480 response from NUT to UA11

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "480". [RFC3261 16.7.6], [RFC3261 21.4.18]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.11.

## 4.3 Session Establishment on Two Proxies

### 4.3.1 PX-2-1-1 - SIP Proxy- Session Establishment Through Two Proxies - Callee hanging up [another domain] (Caller)

#### [NAME]

PX-2-1-1 - SIP Proxy- Session Establishment Through Two Proxies - Callee hanging up [another domain] (Caller)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that the Proxy1 properly forwards to another domain when a session is established through two proxies.

#### [REQUIREMENT]

Only when a proxy can forward requests/responses on NNI connection.

#### [PARAMETER]

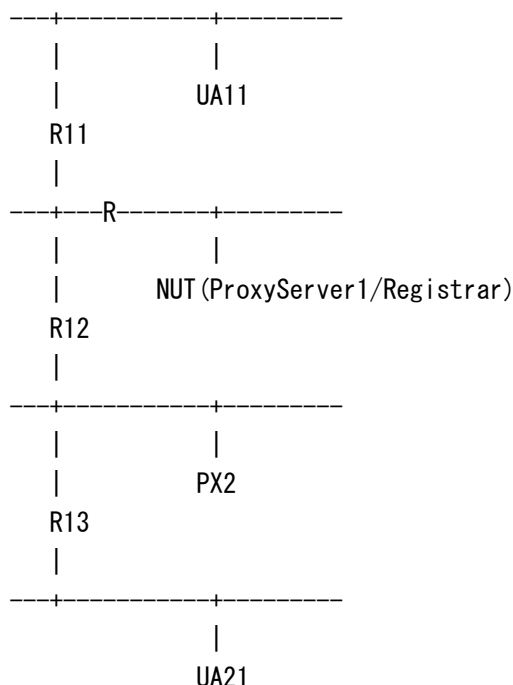
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com

UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

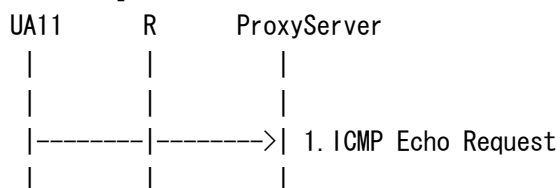
#### [TOPOLOGY]

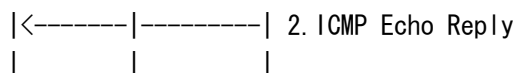


#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

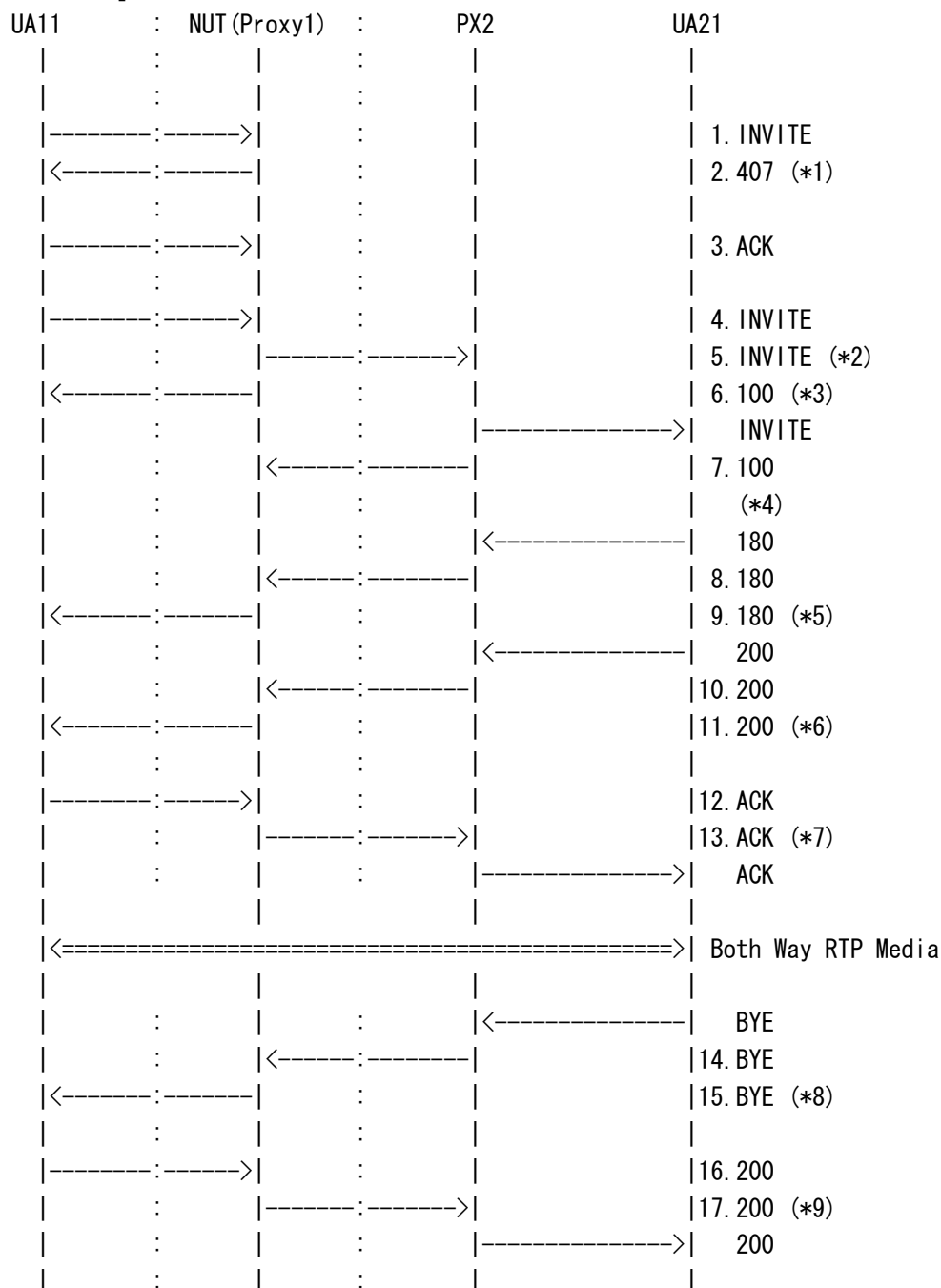
#### [INITIALIZATION]





1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. PX2 Receive INVITE.
6. UA11 Receive 100 Trying.
7. PX2 Send 100 Trying.
8. PX2 Send 180 Ringing.
9. UA11 Receive 180 Ringing.
10. PX2 Send 200 OK.
11. UA11 Receive 200 OK.
12. UA11 Send ACK.
13. PX2 Receive ACK.
14. PX2 Send BYE.
15. UA11 Receive BYE.
16. UA11 Send 200 OK.
17. PX2 Receive 200 OK.

**=== Message example ===**

1. INVITE UA11 -> NUT

```
INVITE sip:UA21@biloxi.example.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA21 <sip:UA21@biloxi.example.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 1 INVITE
Contact: <sip:UA11@node.under.test.com>
Supported:
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

```
/* Proxy(NUT) challenges UA11 for authentication */
```



## 2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf

Call-ID: 3848276298220188511@under.test.com

CSeq: 1 INVITE

Proxy-Authenticate: Digest realm="under.test.com", qop="auth",

nonce="f84f1cec41e6cbe5aea9c8e88d359",

opaque="", stale=FALSE, algorithm=MD5

Content-Length: 0

## 3. ACK UA11 -> NUT

ACK sip:UA21@biloxi.example.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf

Call-ID: 3848276298220188511@under.test.com

CSeq: 1 ACK

Content-Length: 0

/\* UA11 responds by re-sending the INVITE with authentication  
credentials in it. \*/

## 4. INVITE UA11 -> NUT

INVITE sip:UA21@biloxi.example.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

Max-Forwards: 70

Proxy-Authorization: Digest username="UA11",

realm="under.test.com",

nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",

qop=auth, nc=00000004, cnonce="6f54a149",

uri="sip:UA21@biloxi.example.com",

response="b51e504e73af54829e4f2bd7f8dc4654"

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>

Call-ID: 3848276298220188511@under.test.com



CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported:  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

/\* Proxy(NUT) accepts the credentials and forwards the INVITE to Proxy  
2. Client for UA11 prepares to receive data on port 49172 from the  
network. \*/

5. INVITE NUT -> Proxy 2

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Supported:  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0



a=rtpmap:0 PCMU/8000

#### 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Content-Length: 0

#### 7. 100 Trying Proxy 2 -> NUT

SIP/2.0 100 Trying

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Content-Length: 0

#### 8. 180 Ringing Proxy 2 -> NUT

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA21@client.biloxi.example.com>

CSeq: 2 INVITE

Content-Length: 0

#### 9. 180 Ringing NUT -> UA11





SIP/2.0 180 Ringing

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA21@client.biloxi.example.com>

CSeq: 2 INVITE

Content-Length: 0

10. 200 OK Proxy 2 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA21@client.biloxi.example.com>

Supported:

Allow: INVITE, ACK, CANCEL, OPTIONS, BYE

Content-Type: application/sdp

Content-Length: 147

v=0

o=UA21 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

11. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss2.biloxi.example.com;lr>,



<sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Supported:  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA21 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

12. ACK UA11 -> NUT

ACK sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA21@biloxi.example.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

13. ACK NUT -> Proxy 2

ACK sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76



;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Route: <sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### 14. BYE Proxy 2 -> NUT

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Route: <sip:ss.under.test.com;lr>  
Record-Route: <sip:ss2.biloxi.example.com;lr>,  
From: UA11 <sip:UA21@biloxi.example.com>;tag=314159  
To: NUT <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

#### 15. BYE NUT -> UA11

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA21@biloxi.example.com>;tag=314159  
To: NUT <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

#### 16. 200 OK UA11 -> NUT

SIP/2.0 200 OK



Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxcde76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

17. 200 OK NUT -> Proxy 2

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxcde76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

#### [JUDGMENT]

\*1:407 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]



via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:INVITE request from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:  
- outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-UA11

\*3:After 100 response from PX2 to NUT  
Must not forward this message. [RFC3261-16-109]

\*3:100 response from NUT to UA11.(Optional)

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "100". [RFC3261 4]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]



\*4:180 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-PX2

Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-PX2

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-PX2

\*5:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-PX2

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-PX2

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]



- Bodies:  
See generic\_forward\_from-PX2

\*6:ACK request from NUT to PX2.

- As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:
  - outside of a dialog  
See generic\_forward\_from-UA11
  - See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-UA11

\*7:BYE request from NUT to UA11.

- As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-PX2

- Header fields:
  - outside of a dialog  
See generic\_forward\_from-PX2
  - See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-PX2

\*8:200 response from NUT to PX2.

- As a SIP Message,



See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA11

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA11

See generic\_forward\_response

- Bodies:

See generic\_forward\_from-PX2

#### **[REFERENCE]**

Sequence from RFC3665 Section 3.2.

[RFC3261-16-108, 109]

### 16.7 Response Processing

#### 5. Check response for forwarding

A stateful proxy MUST NOT immediately forward any other responses. In particular, a stateful proxy MUST NOT forward any 100 (Trying) response. Those responses that are candidates for forwarding later as the "best" response have been gathered as described in step "Add Response to Context".

### **4.3.2 PX-2-1-2 - SIP Proxy- Session Establishment Through Two Proxies - Callee hanging up [another domain] (Callee)**

#### **[NAME]**

PX-2-1-2 - SIP Proxy- Session Establishment Through Two Proxies - Callee hanging up [another domain] (Callee)

#### **[TARGET]**

SIP Proxy (NUT)

#### **[PURPOSE]**

Verify that the Proxy1 properly processes that upstream that is forwarded from another domain when a session is established through two proxies.



# [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

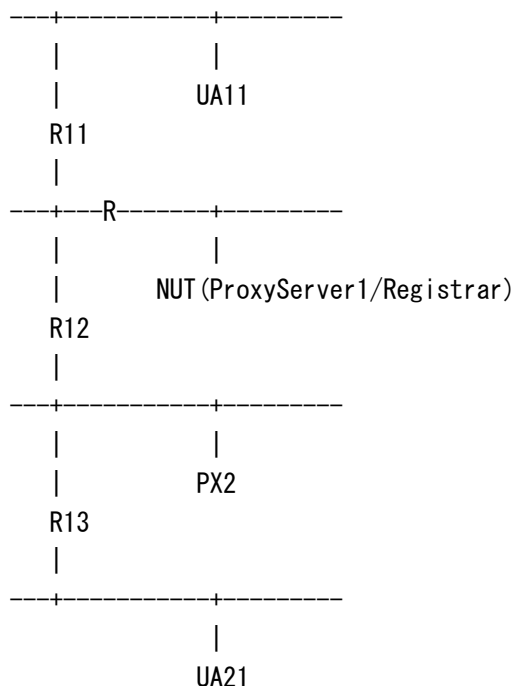
# [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

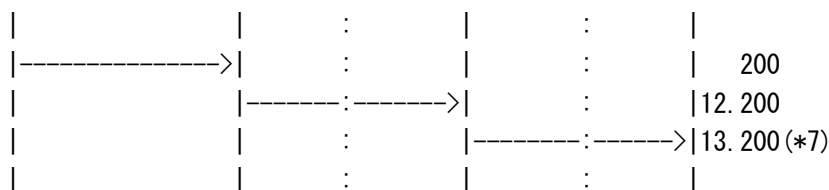
# [TOPOLOGY]



# [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)





1. PX2 Send INVITE.
2. UA11 Receive INVITE.
3. PX2 Receive 100 Trying.
4. UA11 Send 180 Ringing.
5. PX2 Receive 180 Ringing.
6. UA11 Send 200 OK.
7. PX2 Receive 200 OK.
8. PX2 Send ACK.
9. UA11 Receive ACK.
10. UA11 Send BYE.
11. PX2 Receive BYE.
12. PX2 Send 200 OK.
13. UA11 Receive 200 OK.

#### === Message example ===

1. INVITE Proxy 2 -> NUT

```

INVITE sip:UA11@under.test.com SIP/2.0
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9
;received=3ffe:501:ffff:2::2
Max-Forwards: 69
Record-Route: <sip:ss2.biloxi.example.com;lr>
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 3848276298220188511@biloxi.example.com
CSeq: 2 INVITE
Contact: <sip:UA21@client.biloxi.example.com>
Content-Type: application/sdp
Content-Length: 151
  
```

```

v=0
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2
s=-
c=IN IP6 3ffe:501:ffff:2::2
t=0 0
m=audio 49172 RTP/AVP 0
  
```



a=rtpmap:0 PCMU/8000

2.INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

3.100 Trying NUT -> Proxy 2

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 INVITE  
Content-Length: 0



#### 4.180 Ringing UA11 -> NUT

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>,

<sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 3848276298220188511@biloxi.example.com

Contact: <sip:UA11@node.under.test.com>

CSeq: 2 INVITE

Content-Length: 0

#### 5.180 Ringing NUT -> Proxy 2

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>,

<sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 3848276298220188511@biloxi.example.com

Contact: <sip:UA11@node.under.test.com>

CSeq: 2 INVITE

Content-Length: 0

#### 6.200 OK UA11 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:2::2



Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA11 2890844527 2890844527 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

7.200 OK NUT -> Proxy 2

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA11 2890844527 2890844527 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000



## 8.ACK Proxy 2 -> NUT

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74b76  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Route: <sip:ss.under.test.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 ACK  
Content-Length: 0

## 9.ACK NUT -> UA11

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74b76  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 ACK  
Content-Length: 0

/\* RTP streams are established between UA11 and UA21 \*/

/\* UA21 Hangs Up with UA11. \*/

/\* Again, note that the CSeq is NOT 3. UA11 and UA21 maintain  
their own separate CSeq counts \*/

## 10.BYE UA11 -> NUT

BYE sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>



From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 1 BYE  
Content-Length: 0

11. BYE NUT -> Proxy 2

BYE sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Route: <sip:ss2.biloxi.example.com;lr>  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 1 BYE  
Content-Length: 0

12.200 OK Proxy 2 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 1 BYE  
Content-Length: 0

13.200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl





Call-ID: 3848276298220188511@biloxi.example.com

CSeq: 1 BYE

Content-Length: 0

## [JUDGMENT]

\*1:INVITE request from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-PX2

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-PX2

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-PX2

\*2:100 response from NUT to PX2.(Optional)

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "100". [RFC3261 4]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]



\*3:180 response from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA11  
Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-UA11  
See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*4:200 response from NUT to PX1.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA11  
Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-UA11  
See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:  
See generic\_forward\_from-UA11

\*5:ACK request from NUT to UA11.



As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-PX2  
See generic\_forward\_R-URI\_non-responsible-domain
- Header fields:
  - outside of a dialog  
See generic\_forward\_from-PX2
  - See generic\_forward\_request
- Bodies:  
See generic\_forward\_from-PX2

\*6:BYE request from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11
- Header fields:
  - outside of a dialog  
See generic\_forward\_from-UA11
  - See generic\_forward\_request
- Bodies:  
See generic\_forward\_from-UA11

\*7:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,



- Status-Line:  
See generic\_forward\_from-PX2  
Status-Code: Must be "200". [RFC3261-16-104]
- Header fields:  
See generic\_forward\_from-PX2  
See generic\_forward\_response
  - \* Via
    - via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]
    - via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.2.

### 4.3.3 PX-2-1-3 - SIP Proxy- Unsuccessful No Answer [CANCEL] (Caller)

#### [NAME]

PX-2-1-3 - SIP Proxy- Unsuccessful No Answer [CANCEL] (Caller)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that the Proxy1 properly processes when the UA1 receives no response and sends a CANCEL request.

#### [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

#### [PARAMETER]

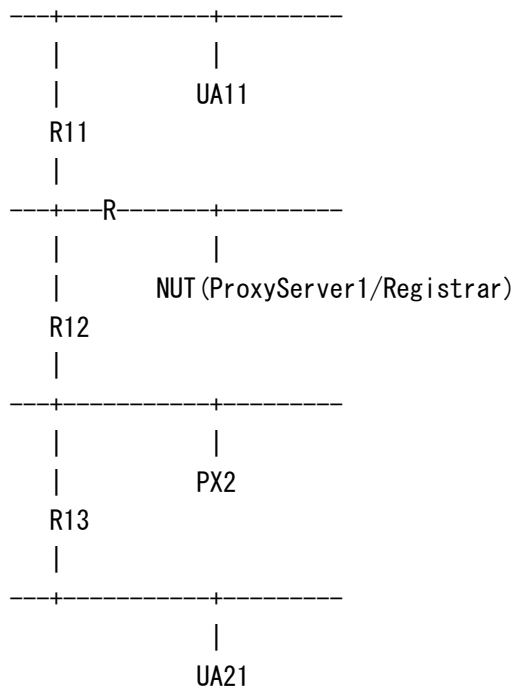
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64

UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

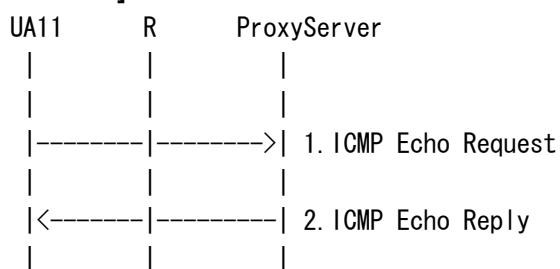
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

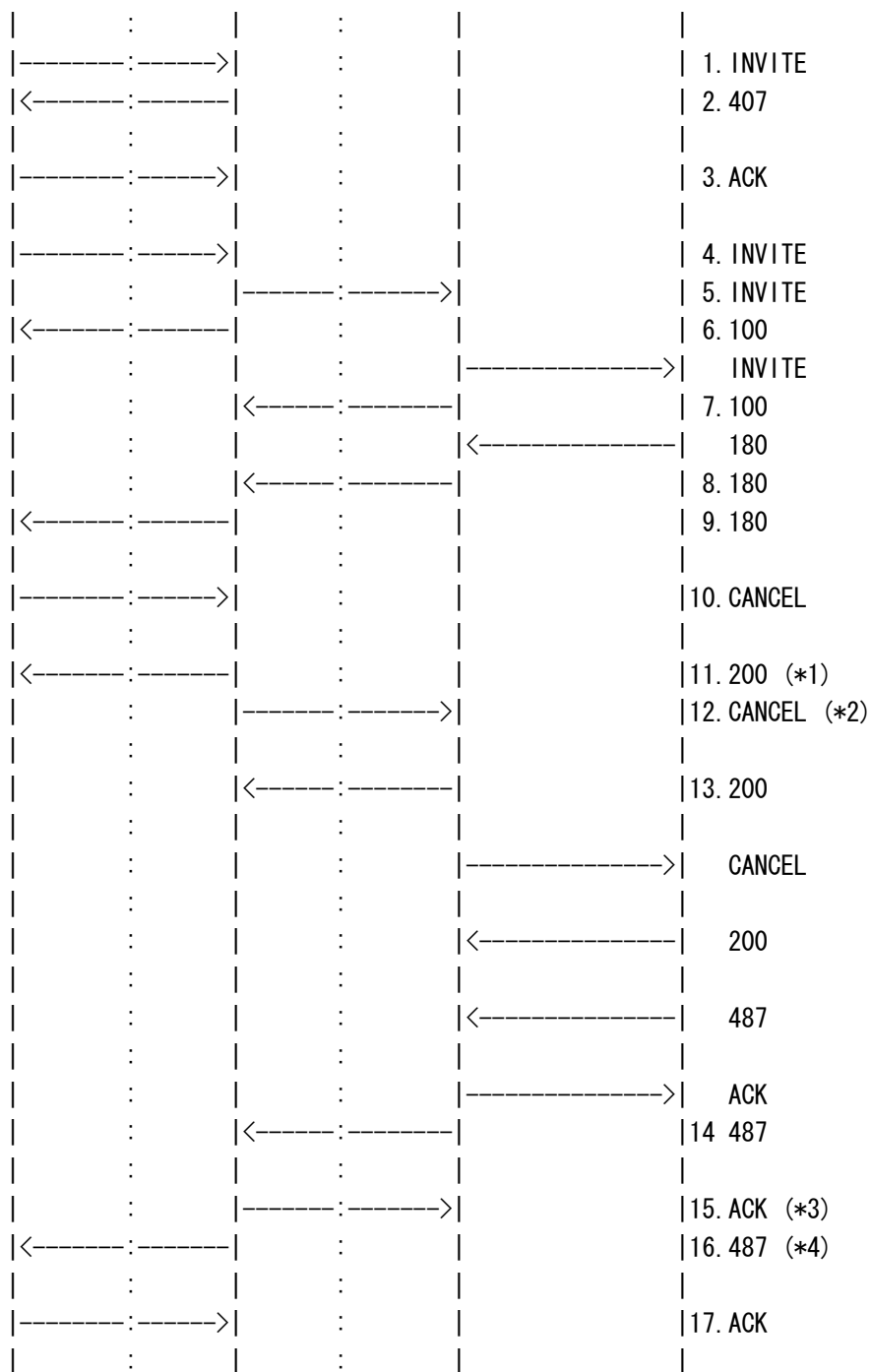
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

UA11	:	NUT (Proxy1)	:	PX2	UA21
	:		:		



- IPv6 FORUM TECHNICAL DOCUMENT*



7. PX2 Send 100 Trying.
8. PX2 Send 180 Ringing.
9. UA11 Receive 180 Ringing.
10. UA11 Send CANCEL.
11. UA11 Receive 200 OK.
12. PX2 Receive CANCEL.
13. PX2 Send 200 OK.
14. PX2 Send 487 Request Terminated.
15. PX2 Receive ACK.
16. UA11 Receive 487 Request Terminated.
17. UA11 Send ACK.

**=== Message example ===**

1. INVITE UA11 -> NUT

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE



Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="f84f1cec41e6cbe5aea9c8e88d359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

### 3. ACK UA11 -> NUT

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

### 4. INVITE UA11 -> NUT

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA21@biloxi.example.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000





## 5. INVITE NUT -> PX2

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com:lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

## 7. 100 Trying PX2 -> NUT

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com



CSeq: 2 INVITE  
Content-Length: 0

#### 8. 180 Ringing PX2 -> NUT

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>,  
<sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Length: 0

#### 9. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>,  
<sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Length: 0

#### 10. CANCEL UA11 -> NUT

CANCEL sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Route: <sip:ss.under.test.com;lr>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL



Content-Length: 0

11. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 CANCEL

Content-Length: 0

12. CANCEL NUT -> PX2

CANCEL sip:UA21@biloxi.example.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 CANCEL

Content-Length: 0

13. 200 OK PX2 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 CANCEL

Content-Length: 0

14. 487 Request Terminated PX2 -> NUT

SIP/2.0 487 Request Terminated

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl



To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

15. ACK NUT -> PX2

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

16. 487 Request Terminated NUT -> UA11

SIP/2.0 487 Request Terminated  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

17. ACK UA11 -> NUT

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### [JUDGMENT]

- \*1:200 response from NUT to UA11.
  - As a SIP Message,
  - See generic\_message



As a SIP response,

- Status-Line:

See generic\_make\_response-200\_for-CANCEL

Status-Code: Must be "200". [RFC3261 16.10]

- Header fields:

See generic\_make\_response-200\_for-CANCEL

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:CANCEL request from NUT to PX2.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_make\_CANCEL

- Header fields:

- outside of a dialog

See generic\_make\_CANCEL

- Bodies:

See generic\_make\_CANCEL

\*3:ACK request from NUT to PX2.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_make\_ACK\_for-non2XX



- Header fields:
  - outside of a dialog
  - See generic\_make\_ACK\_for-non2XX

- Bodies:
  - See generic\_make\_ACK\_for-non2XX

\*4:487 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:
  - See generic\_make\_response
  - Status-Code: Must be "487". [RFC3261-9-15]

- Header fields:
  - See generic\_make\_response

\* To  
tag-param: Should be the same value of "11. 200 response". [RFC3261-9-16]

\* Via  
via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### **[REFERENCE]**

Sequence from RFC3665 Section 3.8.

### **4.3.4 PX-2-1-4 - SIP Proxy- Unsuccessful No Answer [CANCEL] (Callee)**

#### **[NAME]**

PX-2-1-4 - SIP Proxy- Unsuccessful No Answer [CANCEL] (Callee)

#### **[TARGET]**

SIP Proxy (NUT)

#### **[PURPOSE]**

Verify that the Proxy1 properly processes when the UA1 receives no response and sends a

CANCEL request.

# **[REQUIREMENT]**

Only when a proxy supports the architecture with two proxies

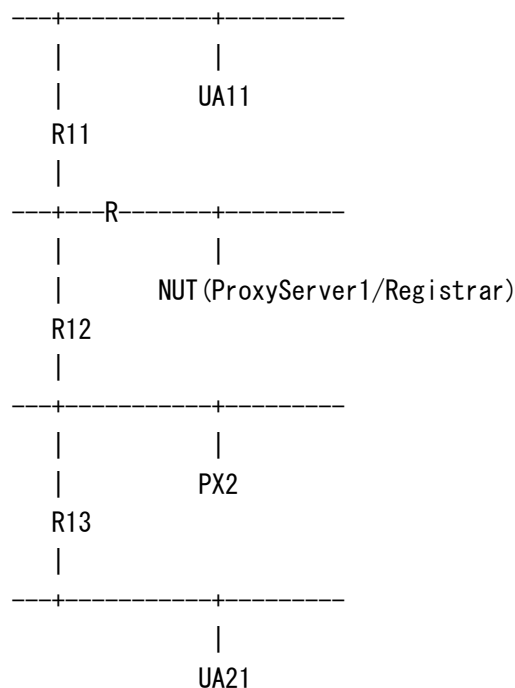
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

# **[ADDRESS]**

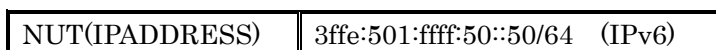
NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com
-----	-----------------------

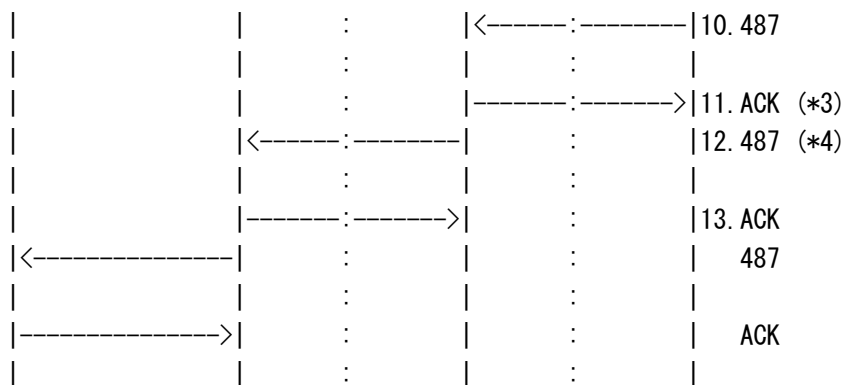


```

sequenceDiagram
    participant UA11
    participant R
    participant ProxyServer
    UA11-->>R: 1. ICMP Echo Request
    R-->>ProxyServer: 2. ICMP Echo Reply
  
```

- | UA21   | PX2    | : | NUT (Proxy 1) | : | UA11           |
|--------|--------|---|---------------|---|----------------|
|        |        | : |               | : |                |
|        |        | : |               | : |                |
| -----> |        | : |               | : | INVITE         |
| <----- |        | : |               | : | 407            |
|        |        | : |               | : |                |
| -----> |        | : |               | : | ACK            |
|        |        | : |               | : |                |
| -----> |        | : |               | : | INVITE         |
|        | -----> | : |               | : | 1. INVITE      |
| <----- |        | : |               | : | 100            |
|        |        | : | ----->        | : | 2. INVITE      |
|        | <----- | : |               | : | 3. 100         |
|        |        | : | <-----        | : | 4. 180         |
|        | <----- | : |               | : | 5. 180         |
| <----- |        | : |               | : | 180            |
|        |        | : |               | : |                |
| -----> |        | : |               | : | CANCEL         |
|        |        | : |               | : |                |
| <----- |        | : |               | : | 200            |
|        | -----> | : |               | : | 6. CANCEL      |
|        |        | : |               | : |                |
|        | <----- | : |               | : | 7. 200 (*1)    |
|        |        | : |               | : |                |
|        | -----> | : |               | : | 8. CANCEL (*2) |
|        |        | : |               | : |                |
|        |        | : | <-----        | : | 9. 200         |
|        |        | : |               | : |                |





1. PX2 Send INVITE.
2. UA11 Receive INVITE.
3. PX2 Receive 100 Trying.
4. UA11 Send 180 Ringing.
5. PX2 Receive 180 Ringing.
6. PX2 Send CANCEL.
7. PX2 Receive 200 OK.
8. UA11 Receive CANCEL.
9. UA11 Send 200 OK.
10. UA11 Send 487 Request Terminated.
11. UA11 Receive ACK.
12. PX2 Receive 487 Request Terminated.
13. PX2 Send ACK.

#### === Message example ===

1. INVITE PX2 -> NUT

```

INVITE sip:UA11@node.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9
;received=3ffe:501:ffff:2::2
Record-Route: <sip:ss2.biloxi.example.com;lr>
Max-Forwards: 69
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com
CSeq: 1 INVITE
Contact: <sip:UA21@client.biloxi.example.com>
Content-Type: application/sdp
Content-Length: 151
  
```

v=0



o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 2. INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
Max-Forwards: 68  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 3. 100 Trying NUT -> PX 2

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>



Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Content-Length: 0

#### 4. 180 Ringing UA11 -> NUT

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss2.node.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com:lr>,  
<sip:ss2.biloxi.example.com:lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Length: 0

#### 5. 180 Ringing NUT -> PX2

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com:lr>,  
<sip:ss2.biloxi.example.com:lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Length: 0

#### 6. CANCEL PX2 -> NUT

CANCEL sip:UA11@node.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

Max-Forwards: 70



From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 CANCEL  
Content-Length: 0

7. 200 OK NUT -> PX2

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 CANCEL  
Content-Length: 0

8. CANCEL NUT -> UA11

CANCEL sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Max-Forwards: 70  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 CANCEL  
Content-Length: 0

9. 200 OK UA11 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 CANCEL  
Content-Length: 0

10. 487 Request Terminated UA11 -> NUT

SIP/2.0 487 Request Terminated  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1



;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Content-Length: 0

#### 11. ACK NUT -> UA11

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Max-Forwards: 70  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 ACK  
Content-Length: 0

#### 12. 487 Request Terminated NUT -> PX2

SIP/2.0 487 Request Terminated  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Content-Length: 0

#### 13. ACK PX2 -> NUT

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
Max-Forwards: 70  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com



CSeq: 1 ACK  
Content-Length: 0

#### [JUDGMENT]

\*1:200 response from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response-200\_for-CANCEL  
Status-Code: Must be "200". [RFC3261 16.10]

- Header fields:  
See generic\_make\_response-200\_for-CANCEL

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:CANCEL request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_CANCEL

- Header fields:  
- outside of a dialog  
See generic\_make\_CANCEL

- Bodies:  
See generic\_make\_CANCEL

\*3:ACK request from NUT to UA11.



As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX

- Header fields:
  - outside of a dialog  
See generic\_make\_ACK\_for-non2XX

- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*4:487 response from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "487". [RFC3261-9-15]

- Header fields:  
See generic\_make\_response

- \* To  
tag-param: Should be the same value of "7. 200 response". [RFC3261-9-16]

- \* Via  
via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

Sequence from RFC3665 Section 3.8.

### 4.3.5 PX-2-1-5 - SIP Proxy- Session establishment and call hold by re-INVITE (Caller)

#### [NAME]

PX-2-1-5 - SIP Proxy- Session establishment and call hold by re-INVITE (Caller)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that the Proxy1 properly processes when the UA2 sends a re-INVITE for holding.

#### [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

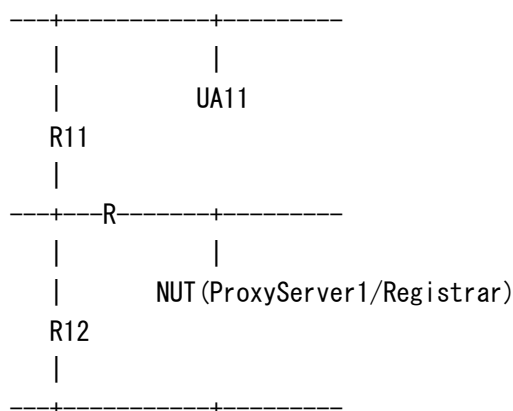
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

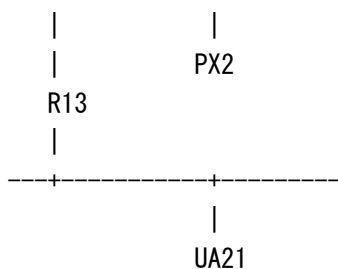
#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]



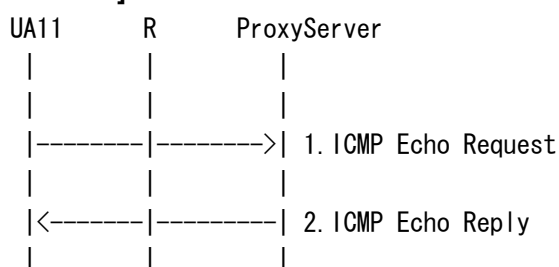




#### [CONFIGURATION for NUT]

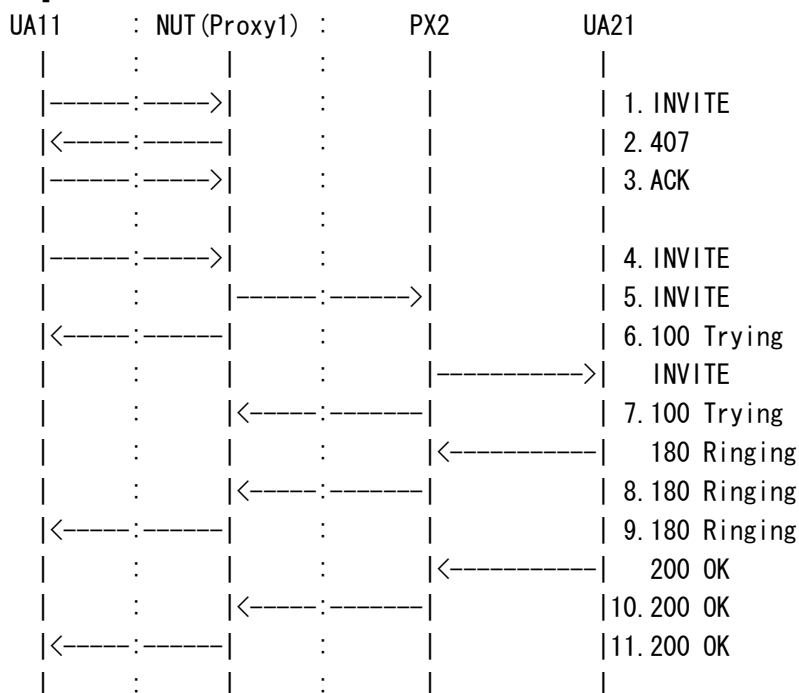
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

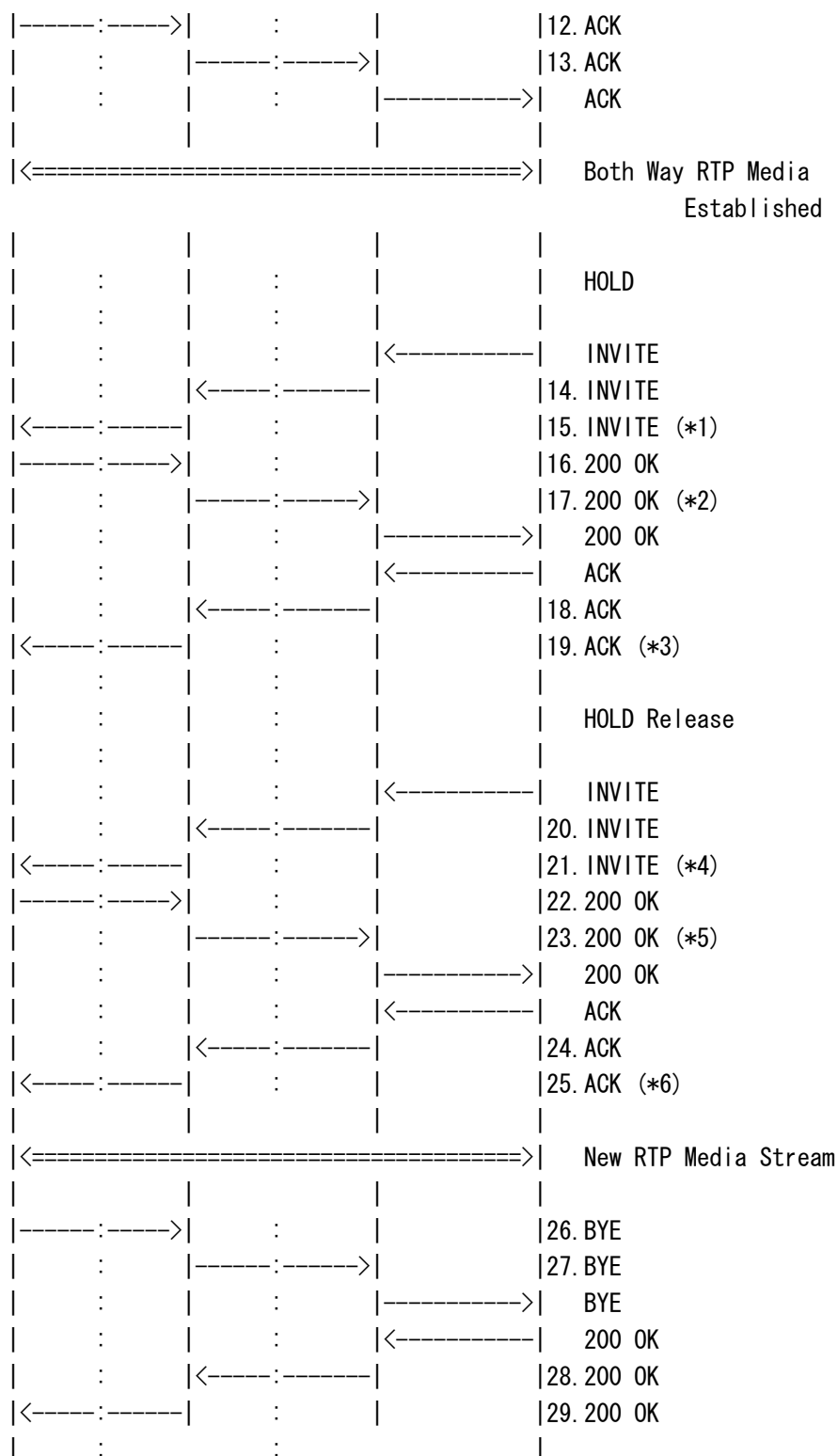
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.

3. UA11 Send ACK.
4. UA11 Send INVITE.
5. PX2 Receive INVITE.
6. UA11 Receive 100 Trying.
7. PX2 Send 100 Trying.
8. PX2 Send 180 Ringing.
9. UA11 Receive 180 Ringing.
10. PX2 Send 200 OK.
11. UA11 Receive 200 OK.
12. UA11 Send ACK.
13. PX2 Receive ACK.
14. PX2 Send INVITE.
15. UA11 Receive INVITE.
16. UA11 Send 200 OK.
17. PX2 Receive 200 OK.
18. PX2 Send ACK.
19. UA11 Receive ACK.
20. PX2 Send INVITE.
21. UA11 Receive INVITE.
22. UA11 Send 200 OK.
23. PX2 Receive 200 OK.
24. PX2 Send ACK.
25. UA11 Receive ACK.
26. UA11 Send BYE.
27. PX2 Receive BYE.
28. PX2 Send 200 OK.
29. UA11 Receive 200 OK.

**=== Message example ===**

1. INVITE UA11 -> NUT

```
INVITE sip:UA21@biloxi.example.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA21 <sip:UA21@biloxi.example.com>
Call-ID: 2xTb9vxSit55XU7p8@under.test.com
CSeq: 1 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
```

v=0



o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="f84f1cec41e6cbe5aea9c8e88d359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. ACK UA11 -> NUT

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

## 4. INVITE UA11 -> NUT

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA21@biloxi.example.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"



From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 5. INVITE NUT -> PX2

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying



Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 7. 100 Trying PX2 -> NUT

SIP/2.0 100 Trying

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 8. 180 Ringing PX2 -> NUT

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>,  
<sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Length: 0

#### 9. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>,



<sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Length: 0

10. 200 OK PX2 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>,  
<sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA21 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

11. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>,  
<sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com



CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA21 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

12. ACK UA11 -> NUT

ACK sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b7b  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA21@biloxi.example.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

13. ACK NUT -> PX2

ACK sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b7b  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 70  
Route: <sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com





CSeq: 2 ACK  
Content-Length: 0

#### 14. INVITE PX2 -> NUT

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Route: <sip:ss.under.test.com;lr>  
Record-Route: <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=UA21 2890844527 2890844528 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendonly

#### 15. INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Record-route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 INVITE



Contact: <sip:UA21@client.biloxi.example.com>

Content-Type: application/sdp

Content-Length: 149

v=0

o=UA21 2890844527 2890844528 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=sendonly

16. 200 OK UA11 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7

;received=3ffe:501:ffff:2::2

Record-route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 15 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Type: application/sdp

Content-Length: 150

v=0

o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1

s=-

c=IN IP6 3ffe:501:ffff:1::1

t=0 0

m=audio 49172 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=recvonly

17. 200 OK NUT -> PX2

SIP/2.0 200 OK



Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Record-route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 150

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=recvonly

#### 18. ACK PX2-> NUT

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Route: <sip:ss.under.test.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 ACK  
Content-Length: 0

#### 19. ACK NUT -> UA11

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7



;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 15 ACK  
Content-Length: 0

## 20. INVITE PX2 -> NUT

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Route: <sip:ss.under.test.com;lr>  
Record-route: <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=UA21 2890844527 2890844529 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 21. INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68



Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=UA21 2890844527 2890844529 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

22. 200 OK UA11 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 150

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000



### 23. 200 OK NUT -> PX2

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 16 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Type: application/sdp

Content-Length: 150

v=0

o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1

s=-

c=IN IP6 3ffe:501:ffff:1::1

t=0 0

m=audio 49172 RTP/AVP 0

a=rtpmap:0 PCMU/8000

### 24. ACK PX2 -> NUT

ACK sip:UA11@node.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2

Max-Forwards: 69

Route: <sip:ss.under.test.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 16 ACK

Content-Length: 0

### 25. ACK NUT -> UA11

ACK sip:UA11@node.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1



;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 16 ACK  
Content-Length: 0

26. BYE UA11 -> NUT

BYE sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bo4  
Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 3 BYE  
Content-Length: 0

27. BYE NUT -> PX2

BYE sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bo4  
;received=3ffe:501:ffff:1::1  
Route: <sip:ss2.biloxi.example.com;lr>  
Record-Route: <sip:ss.under.test.com;lr>  
Max-Forwards: 69  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 3 BYE  
Content-Length: 0

28. 200 OK PX2 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50



Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bo4  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 3 BYE  
Content-Length: 0

29. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bo4  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 3 BYE  
Content-Length: 0

#### [JUDGMENT]

\*1:INVITE request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-PX2  
See generic\_forward\_R-URI\_responsible-domain

- Header fields:  
- outside of a dialog  
See generic\_forward\_from-PX2  
See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-PX2

\*2:200 response from NUT to PX2.  
As a SIP Message,





See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA11

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA11

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA11

\*3:ACK request from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-PX2

See generic\_forward\_R-URI\_responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-PX2

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-PX2

\*4:INVITE request from NUT to UA11.

As a SIP Message,



See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-PX2

See generic\_forward\_R-URI\_responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-PX2

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-PX2

\*5:200 response from NUT to PX2.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA11

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA11

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA11

\*6:ACK request from NUT to UA11.

As a SIP Message,

See generic\_message



As a SIP request,

- Request-Line:

See generic\_forward\_from-PX2

See generic\_forward\_R-URI\_responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-PX2

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-PX2

#### [REFERENCE]

Sequence from RFC3665 Section 3.7.

### 4.3.6 PX-2-1-6 - SIP Proxy- Session establishment and call hold by re-INVITE (Callee)

#### [NAME]

PX-2-1-6 - SIP Proxy- Session establishment and call hold by re-INVITE (Callee)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that the Proxy1 properly processes when the UA2 sends a re-INVITE for holding.

#### [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

#### [PARAMETER]

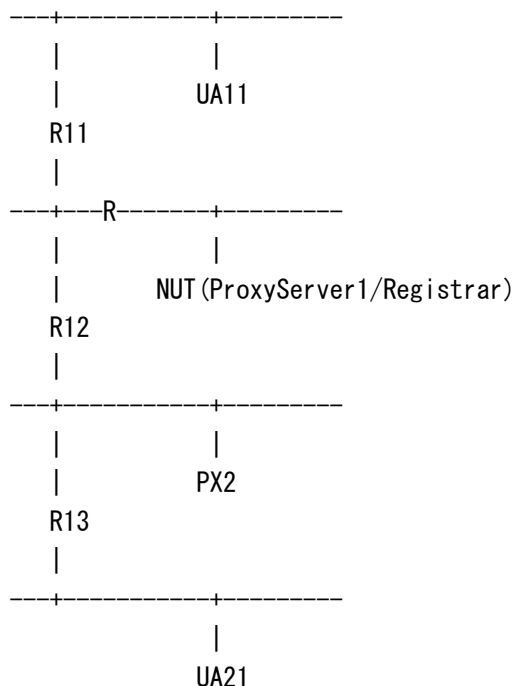
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
------------------------------------	-------------------------

UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

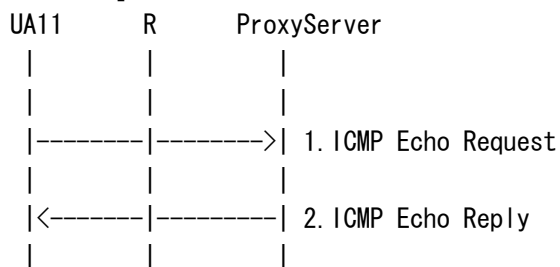
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

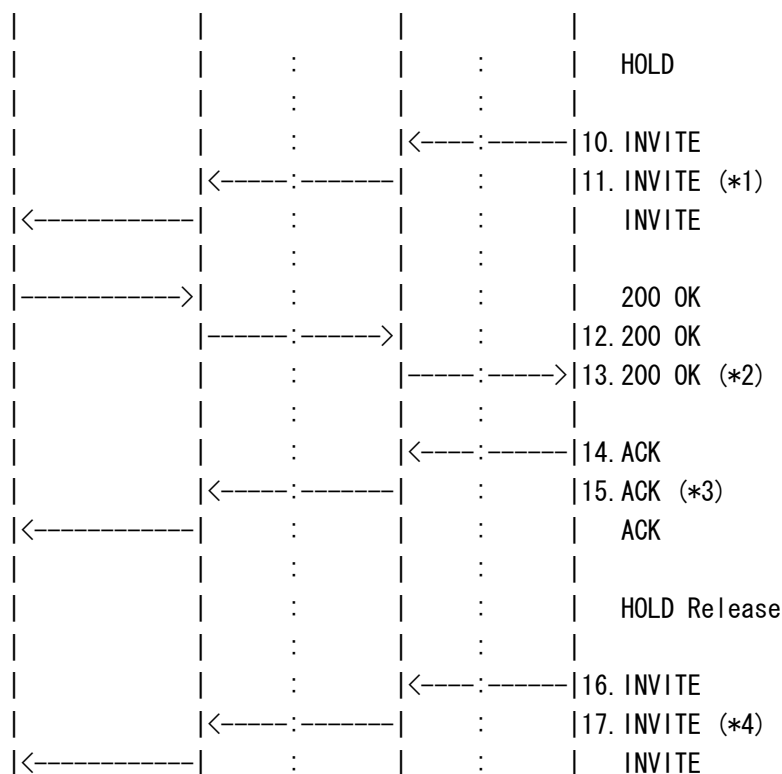
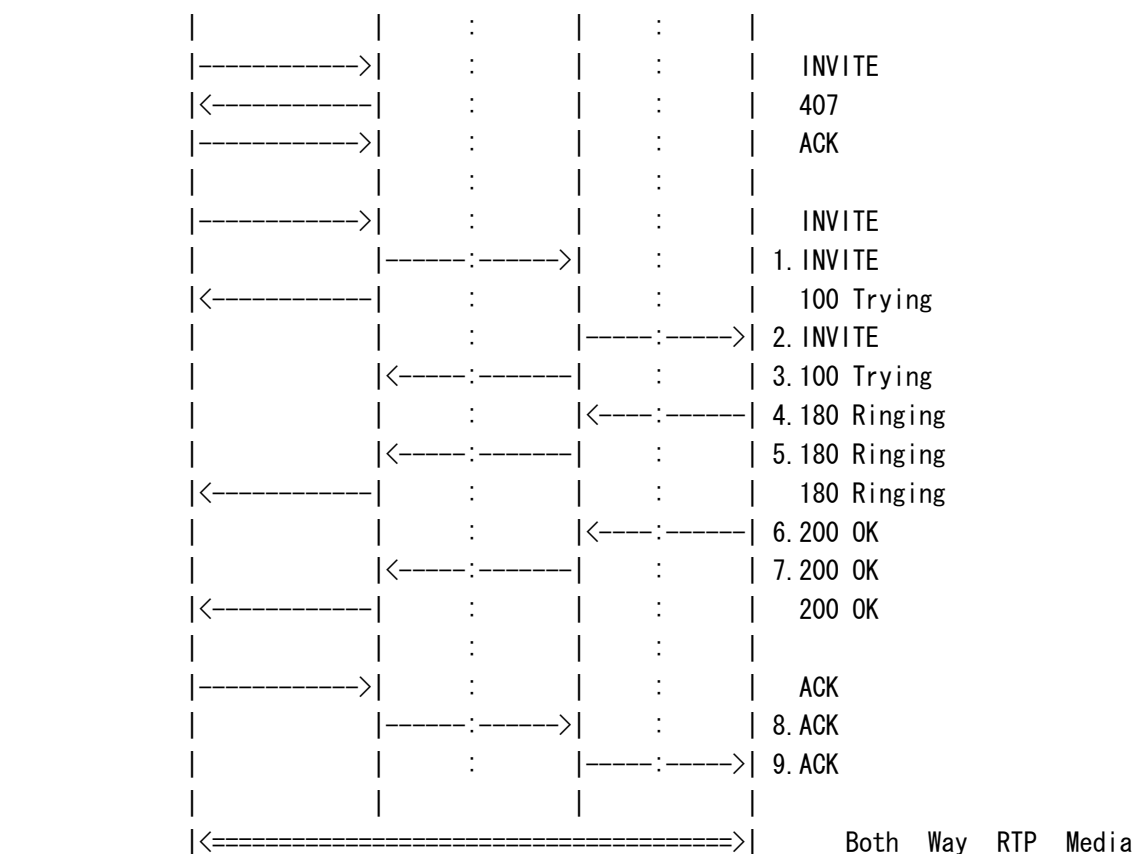
#### [INITIALIZATION]

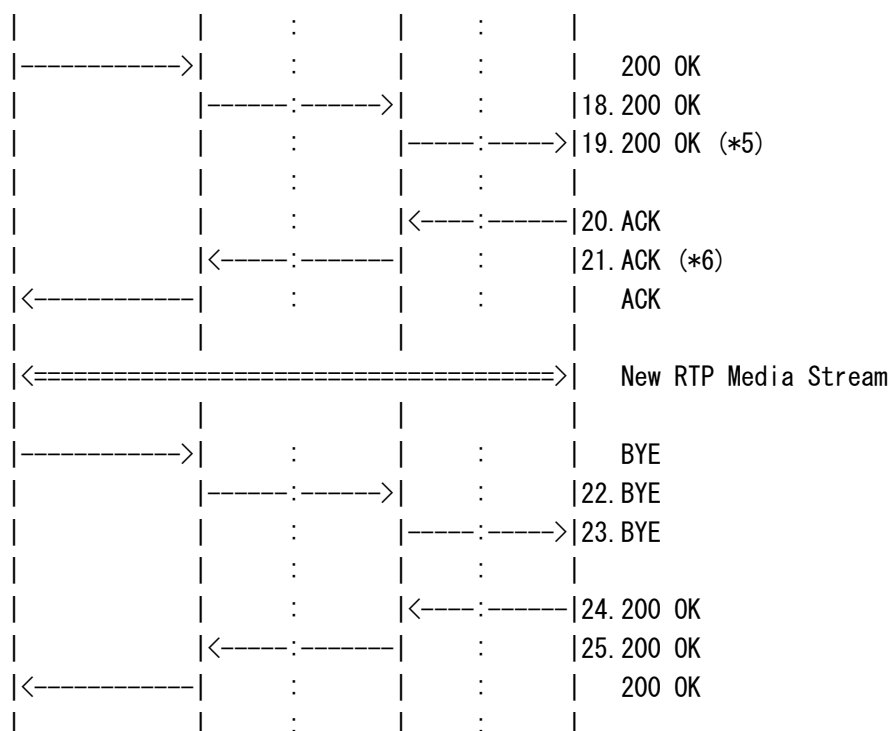


1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

UA21 PX2 : NUT (Proxy 1) : UA11





1. PX2 Send INVITE.
2. UA11 Receive INVITE.
3. PX2 Receive 100 Trying.
4. UA11 Send 180 Ringing.
5. PX2 Receive 180 Ringing.
6. UA11 Send 200 OK.
7. PX2 Receive 200 OK.
8. PX2 Send ACK.
9. UA11 Receive ACK.
10. UA11 Send INVITE.
11. PX2 Receive INVITE.
12. PX2 Send 200 OK.
13. UA11 Receive 200 OK.
14. UA11 Send ACK.
15. PX2 Receive ACK.
16. UA11 Send INVITE.
17. PX2 Receive INVITE.
18. PX2 Send 200 OK.
19. UA11 Receive 200 OK.
20. UA11 Send ACK.
21. PX2 Receive ACK.
22. PX2 Send BYE.
23. UA11 Receive BYE.



- 24. UA11 Send 200 OK.
- 25. PX2 Receive 200 OK.

**=== Message example ===**

1. INVITE PX2 -> NUT

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Record-Route: <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

2. INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE



Contact: <sip:UA21@client.biloxi.example.com>

Content-Type: application/sdp

Content-Length: 151

v=0

o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 49172 RTP/AVP 0

a=rtpmap:0 PCMU/8000

3. 100 Trying NUT -> PX2

SIP/2.0 100 Trying

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:2::2

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Content-Length: 0

4. 180 Ringing UA11 -> NUT

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com:lr>,

<sip:ss2.biloxi.example.com:lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Length: 0





## 5. 180 Ringing NUT -> PX2

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Length: 0

## 6. 200 OK UA11 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Type: application/sdp

Content-Length: 147

v=0

o=NUT 2890844527 2890844527 IN IP6 3ffe:501:ffff:1::1

s=-

c=IN IP6 3ffe:501:ffff:1::1

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000



## 7. 200 OK NUT -> PX2

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>,

<sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Type: application/sdp

Content-Length: 147

v=0

o=NUT 2890844527 2890844527 IN IP6 3ffe:501:ffff:1::1

s=-

c=IN IP6 3ffe:501:ffff:1::1

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

## 8. ACK PX2 -> NUT

ACK sip:UA11@node.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74b76

;received=3ffe:501:ffff:2::2

Max-Forwards: 69

Route: <sip:ss.under.test.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 ACK

Content-Length: 0

## 9. ACK NUT -> UA11

ACK sip:UA11@node.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1



Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74b76  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 ACK  
Content-Length: 0

#### 10. INVITE UA11 -> NUT

INVITE sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlkld5l  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 14 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=NUT 2890844527 2890844528 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendonly

#### 11. INVITE NUT -> PX2

INVITE sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlkld5l  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Route: <sip:ss2.biloxi.example.com;lr>



Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 14 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=NUT 2890844527 2890844528 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendonly

12. 200 OK PX2 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlkld5l  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 14 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 150

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=recvonly



13. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlkld5l  
;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=314159

To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 14 INVITE

Contact: <sip:UA21@client.biloxi.example.com>

Content-Type: application/sdp

Content-Length: 150

v=0

o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 49172 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=recvonly

14. ACK UA11 -> NUT

ACK sip:UA21@client.biloxi.example.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlkldcc

Max-Forwards: 70

Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=314159

To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 14 ACK

Content-Length: 0

15. ACK NUT -> PX2

ACK sip:UA21@client.biloxi.example.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlkldcc

;received=3ffe:501:ffff:1::1



Max-Forwards: 69  
Route: <sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 14 ACK  
Content-Length: 0

#### 16. INVITE UA11 -> NUT

INVITE sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlkbqc  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 15 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=NUT 2890844527 2890844529 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 17. INVITE NUT -> PX2

INVITE sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlkbqc  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Route: <sip:ss2.biloxi.example.com;lr>  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com



CSeq: 15 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 149

v=0  
o=NUT 2890844527 2890844529 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

18. 200 OK PX2 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlklbqc  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 15 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 150

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

19. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlklbqc  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>



From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 15 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 150

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

20. ACK UA11 -> NUT

ACK sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlklbqc  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 15 ACK  
Content-Length: 0

21. ACK NUT -> PX2

ACK sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKlklbqc  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 70  
Route: <sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 15 ACK  
Content-Length: 0





## 22. BYE PX2 -> NUT

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Route: <sip:ss.under.test.com;lr>  
Record-Route: <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 2 BYE  
Content-Length: 0

## 23. BYE NUT -> UA11

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
Max-Forwards: 68  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 2 BYE  
Content-Length: 0

## 24. 200 OK UA11 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159



Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 2 BYE

Content-Length: 0

25. 200 OK NUT -> PX2

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 2 BYE

Content-Length: 0

#### [JUDGMENT]

\*1: INVITE request from NUT to PX2.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

\*2: 200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,



- Status-Line:

See generic\_forward\_from-PX2

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-PX2

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-PX2

\*3:ACK request from NUT to PX2.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

\*4:INVITE request from NUT to PX2.

As a SIP Message,

See generic\_message

As a SIP request,



- Request-Line:
  - See generic\_forward\_from-UA11
  - See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:
  - outside of a dialog
    - See generic\_forward\_from-UA11
    - See generic\_forward\_request

- Bodies:
  - See generic\_forward\_from-UA11

\*5:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:
  - See generic\_forward\_from-PX2
  - Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:
  - See generic\_forward\_from-PX2
  - See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:
  - See generic\_forward\_from-PX2

\*6:ACK request from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:
  - See generic\_forward\_from-UA11



See generic\_forward\_R-URI\_responsible-domain

- Header fields:
  - outside of a dialog
    - See generic\_forward\_from-UA11
    - See generic\_forward\_request
- Bodies:
  - See generic\_forward\_from-UA11

#### [REFERENCE]

Sequence from RFC3665 Section 3.7.

### 4.3.7 PX-2-2-1 - SIP Proxy- Unsuccessful Busy (Caller)

#### [NAME]

PX-2-2-1 - SIP Proxy- Unsuccessful Busy (Caller)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that the Proxy1 properly processes when the UA2 is busy.

#### [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

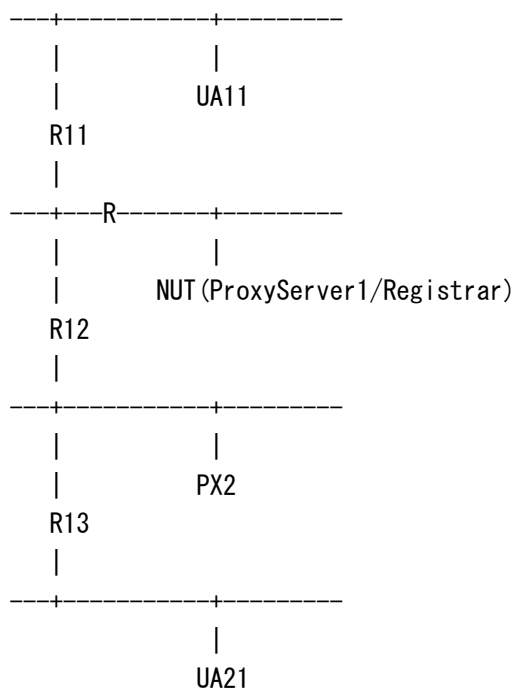
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

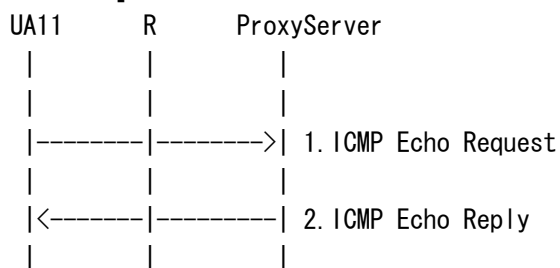
## [TOPOLOGY]



## [CONFIGURATION for NUT]

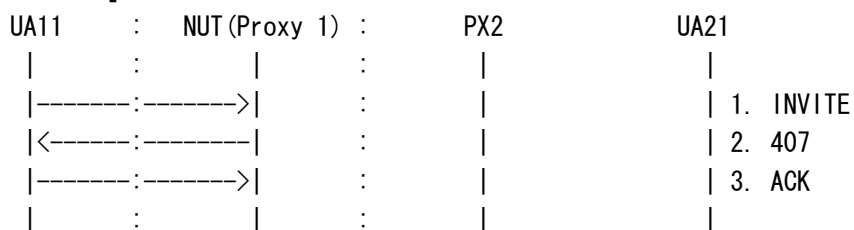
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

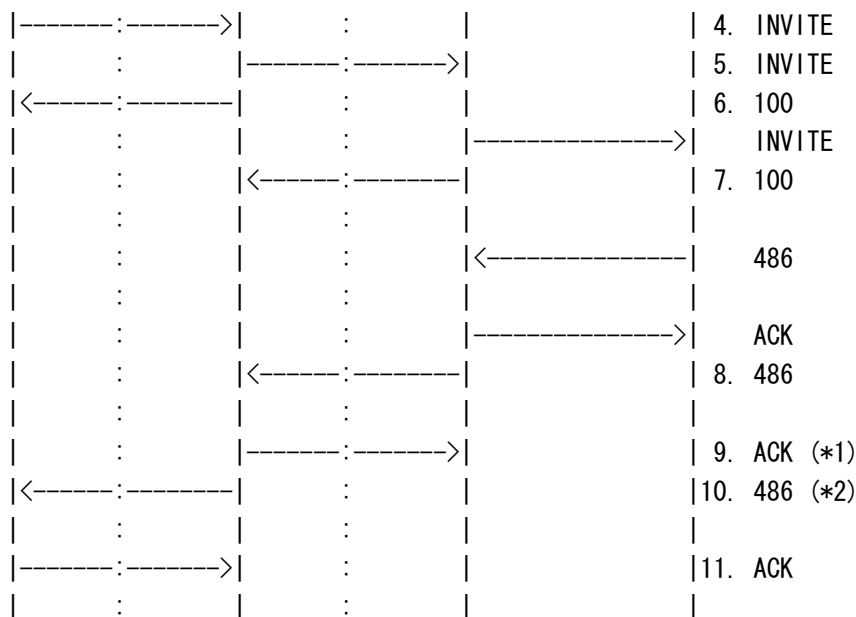
## [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. PX2 Receive INVITE.
6. UA11 Receive 100 Trying.
7. PX2 Send 100 Trying.
8. PX2 Send 486 Busy Here.
9. PX2 Receive ACK.
10. UA11 Receive 486 Busy Here.
11. UA11 Send ACK.

#### === Message example ===

1. INVITE UA11 -> NUT

```

INVITE sip:UA21@biloxi.example.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA21 <sip:UA21@biloxi.example.com>
Call-ID: 2xTb9vxSit55XU7p8@under.test.com
CSeq: 1 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
  
```



v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="dc3a5ab2530aa93112cf5904ba7d88fa",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

## 3. ACK UA11 -> NUT

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

## 4. INVITE UA11 -> NUT

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>





Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="dc3a5ab2530aa93112cf5904ba7d88fa", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA21@biloxi.example.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

##### 5. INVITE NUT -> PX2

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

/\*Client for NUT prepares to receive data on port 49172 from the  
network.\*/



## 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

## 7. 100 Trying PX2 -> NUT

SIP/2.0 100 Trying

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

## 8. 486 Busy Here PX2 -> NUT

SIP/2.0 486 Busy Here

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

## 9. ACK NUT -> PX2

ACK sip:UA21@biloxi.example.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

Max-Forwards: 70



From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

10. 486 Busy Here NUT -> UA11

SIP/2.0 486 Busy Here  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

11. ACK UA11 -> NUT

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### **[JUDGMENT]**

\*1:ACK request from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX

- Header fields:  
- outside of a dialog  
See generic\_make\_ACK\_for-non2XX



- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*2:486 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "486". [RFC3261 16.7.6]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.9.

### 4.3.8 PX-2-2-2 - SIP Proxy- Unsuccessful Busy (Callee)

#### [NAME]

PX-2-2-2 - SIP Proxy- Unsuccessful Busy (Callee)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that the Proxy1 properly processes when the UA2 is busy.

#### [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

#### [PARAMETER]

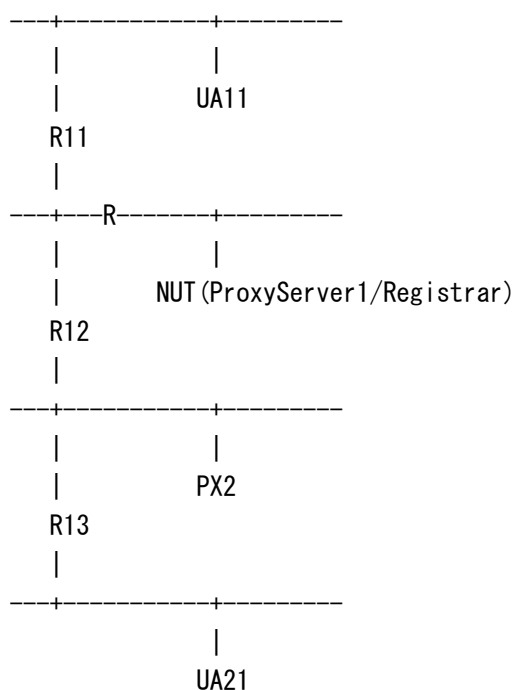
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

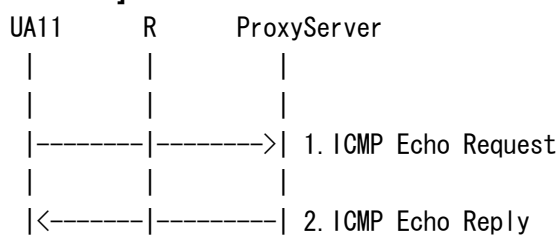
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

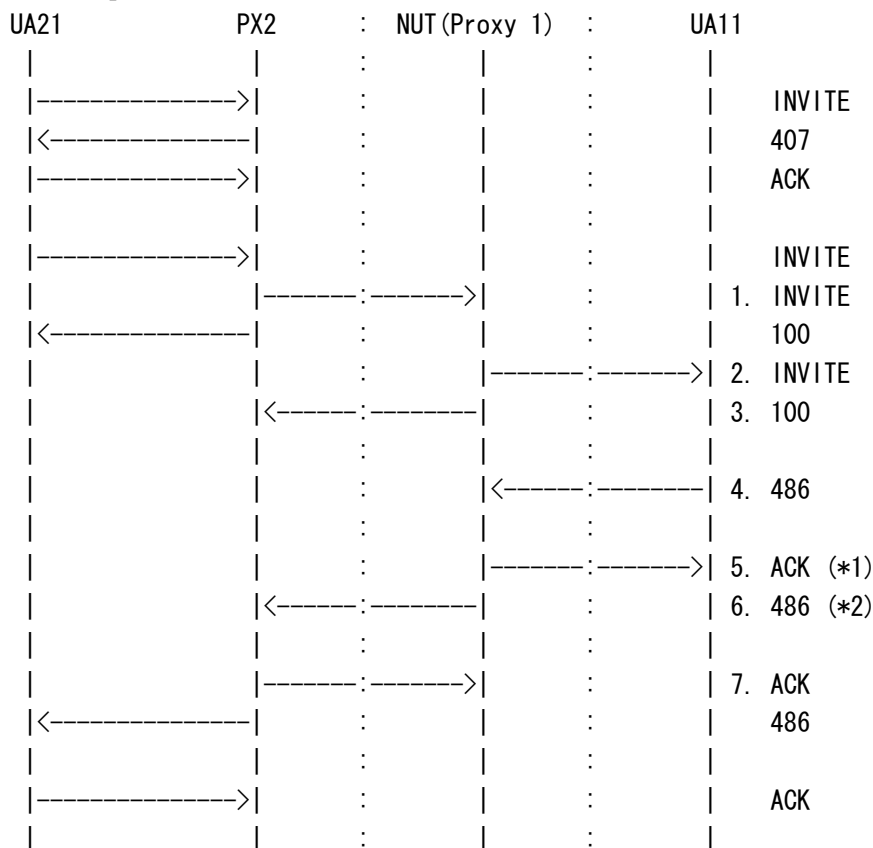
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. PX2 Send INVITE.
2. UA11 Receive INVITE.
3. PX2 Receive 100 Trying.
4. UA11 Send 486 Busy Here.
5. UA11 Receive ACK.
6. PX2 Receive 486 Busy Here.
7. PX2 Send ACK.

#### === Message example ===

1. INVITE PX2 -> NUT

INVITE sip:UA11@under.test.com SIP/2.0

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9



;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Record-Route: <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

2. INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0



m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

### 3. 100 Trying NUT -> PX2

SIP/2.0 100 Trying

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Content-Length: 0

### 4. 486 Busy Here UA11 -> NUT

SIP/2.0 486 Busy Here

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Content-Length: 0

### 5. ACK NUT-> UA11

ACK sip:UA11@node.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Max-Forwards: 70  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 ACK  
Content-Length: 0

### 6. 486 Busy Here NUT -> PX2





SIP/2.0 486 Busy Here  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Content-Length: 0

#### 7. ACK PX2 -> NUT

ACK sip:UA11@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
Max-Forwards: 70  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 ACK  
Content-Length: 0

### [JUDGMENT]

\*1:ACK request from NUT to UA11

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX
- Header fields:
  - outside of a dialog  
See generic\_make\_ACK\_for-non2XX
- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*2:486 response from NUT to PX2



As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "486". [RFC3261 16.7.6]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.9.

### 4.3.9 PX-2-2-3 - SIP Proxy- Unsuccessful No Response from the UA through the other proxy

#### [NAME]

PX-2-2-3 - SIP Proxy- Unsuccessful No Response from the UA through the other proxy

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly executes an unsuccessful processing when the UA through the other proxy has no response.

#### [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

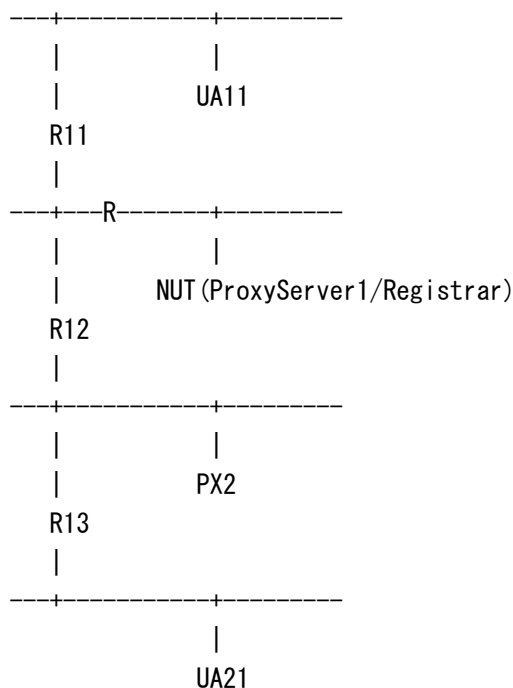
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

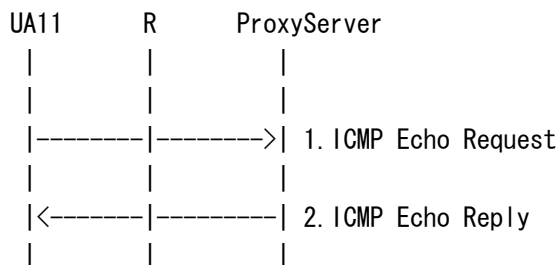
# [TOPOLOGY]



# [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

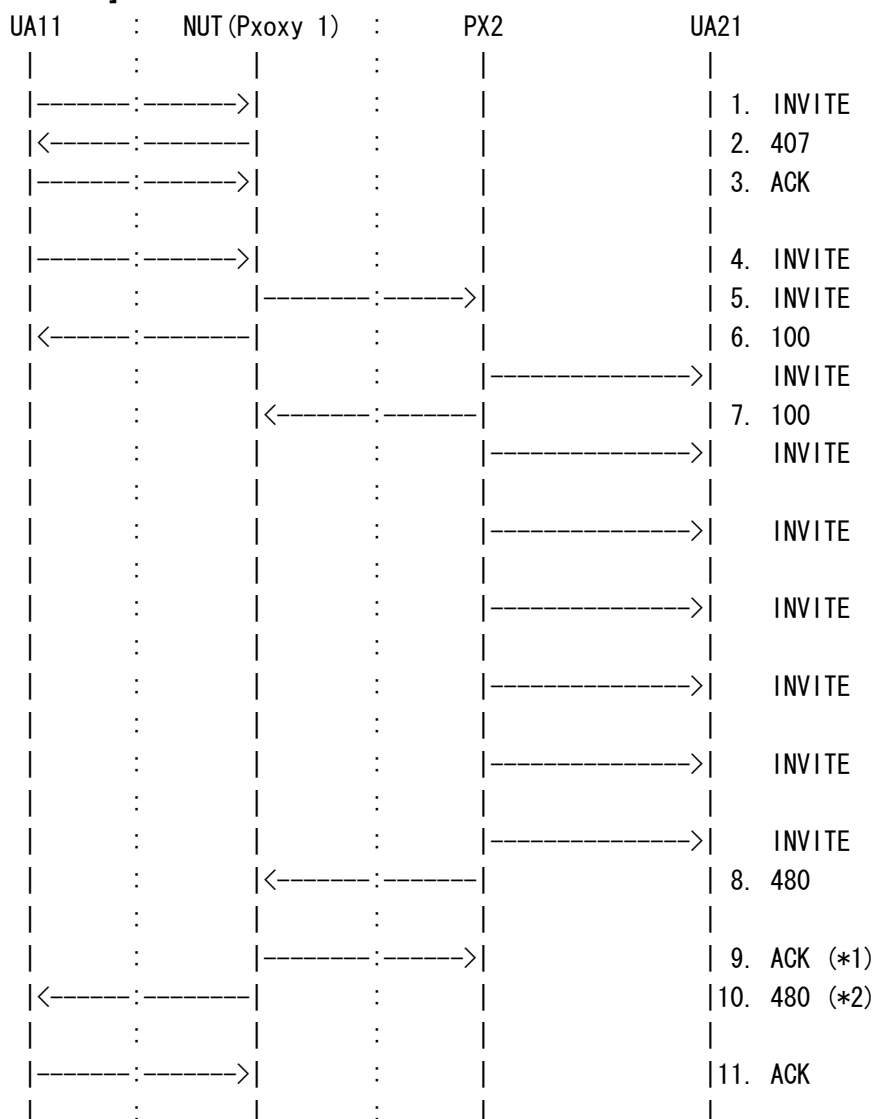
# [INITIALIZATION]



1. Send ICMP Echo Request.

## 2. Receive ICMP Echo Reply.

### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. PX2 Receive INVITE.
6. UA11 Receive 100 Trying.
7. PX2 Send 100 Trying.
8. PX2 Send 480 No Response.
9. PX2 Receive ACK.
10. UA11 Receive 480 No Response.



## 11. UA11 Send ACK.

### === Message example ===

#### 1. INVITE UA11 -> NUT

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="cf5904ba7d8dc3a5ab2530aa931128fa",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

#### 3. ACK UA11 -> NUT

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70



From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=3flal12sf  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

#### 4. INVITE UA11 -> NUT

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="cf5904ba7d8dc3a5ab2530aa931128fa", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA21@biloxi.example.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 5. INVITE NUT -> PX2

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>



Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

7. 100 Trying PX2 -> NUT

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

8. 480 No Response PX2 -> NUT

SIP/2.0 480 No Response  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50



Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 9. ACK NUT -> PX2

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### 10. 480 No Response NUT -> UA11

SIP/2.0 480 No Response  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 11. ACK UA11 -> NUT

ACK sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

### [JUDGMENT]

\*1:ACK request from NUT to UA11





As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX

- Header fields:  
- outside of a dialog  
See generic\_make\_ACK\_for-non2XX

- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*2:480 response from NUT to PX2

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "480".[RFC3261 16.7.6], [RFC3261 21.4.18]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.10.

#### **4.3.10 PX-2-2-4 - SIP Proxy- Unsuccessful No Response from UA (Callee)**

[NAME]

## PX-2-2-4 - SIP Proxy- Unsuccessful No Response from UA (Callee)

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that the Proxy1 properly sends a 480 (No Response) response to the other proxy when the UA2 has no response.

### [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

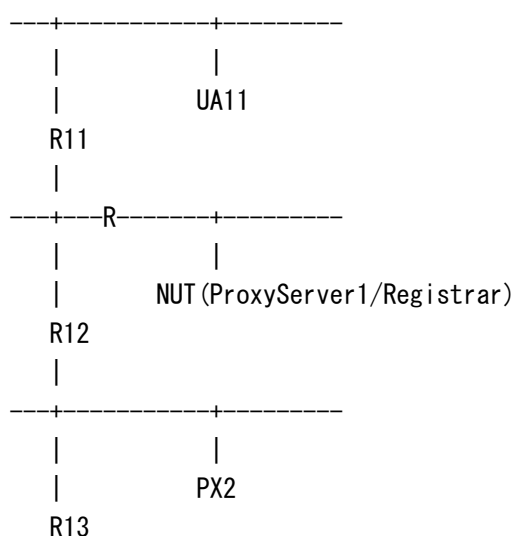
### [PARAMETER]

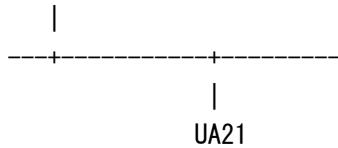
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

### [TOPOLOGY]

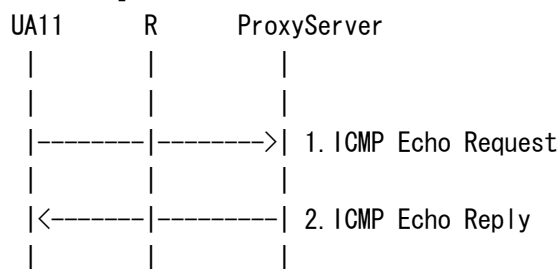




### [CONFIGURATION for NUT]

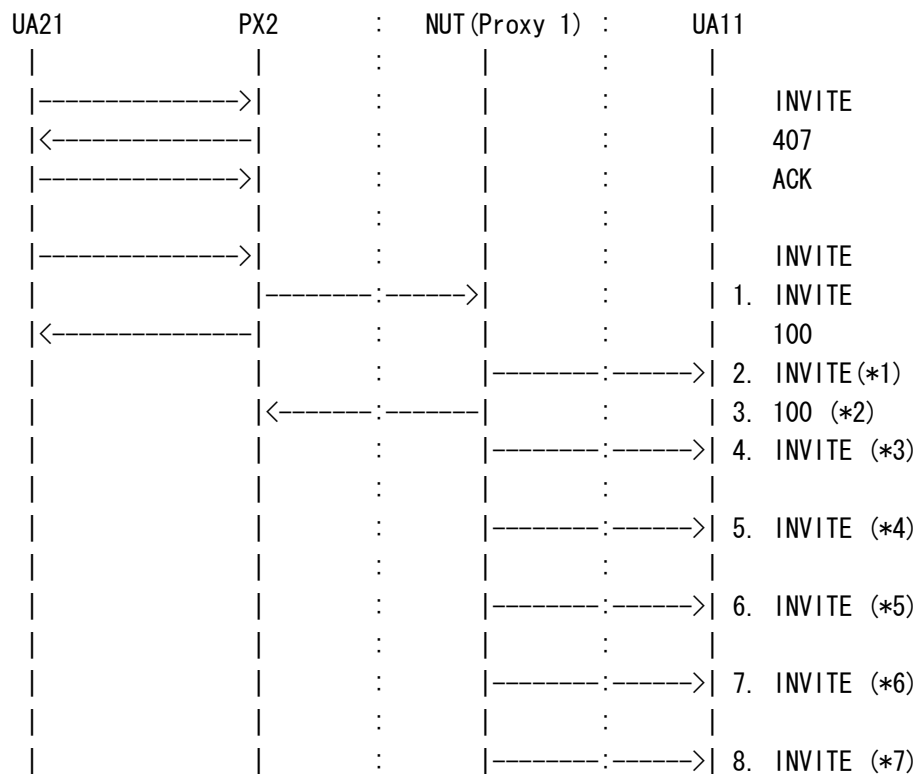
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

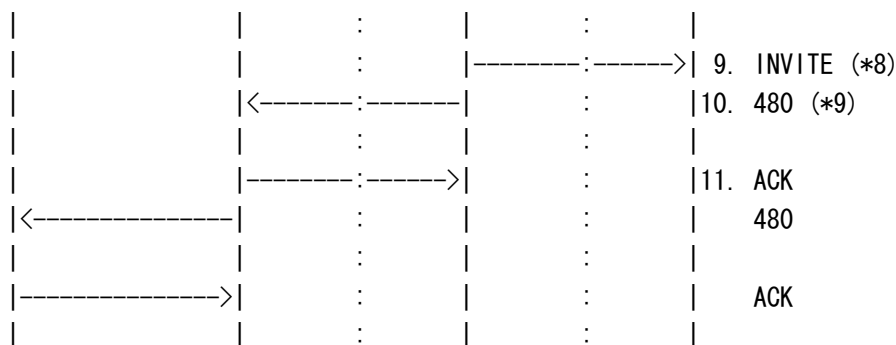
### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]





1. PX2 Send INVITE.
2. UA11 Receive INVITE.
3. PX2 Receive 100 Trying.
4. UA11 Receive INVITE.
5. UA11 Receive INVITE.
6. UA11 Receive INVITE.
7. UA11 Receive INVITE.
8. UA11 Receive INVITE.
9. UA11 Receive INVITE.
10. PX2 Receive 480 No Response.
11. PX2 Send ACK.

### === Message example ===

1. INVITE PX2 -> NUT

```

INVITE sip:UA11@under.test.com SIP/2.0
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9
;received=3ffe:501:ffff:2::2
Max-Forwards: 69
Record-Route: <sip:ss2.biloxi.example.com;lr>
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com
CSeq: 1 INVITE
Contact: <sip:UA21@client.biloxi.example.com>
Content-Type: application/sdp
Content-Length: 151

v=0
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2
s=-
c=IN IP6 3ffe:501:ffff:2::2
  
```



t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 2. INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 3. 100 Trying NUT -> PX2

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Content-Length: 0



4. INVITE NUT -> UA11

Resend of Message 2.

5. INVITE NUT -> UA11

Resend of Message 2.

6. INVITE NUT -> UA11

Resend of Message 2.

7. INVITE NUT -> UA11

Resend of Message 2.

8. INVITE NUT -> UA11

Resend of Message 2.

9. INVITE NUT -> UA11

Resend of Message 2.

/\* NUT gives up \*/

10. 480 No Response NUT -> PX2

SIP/2.0 480 No Response

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com

CSeq: 1 INVITE

Content-Length: 0

11. ACK PX2 -> NUT

ACK sip:UA11@under.test.com SIP/2.0



Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
Max-Forwards: 70  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 ACK  
Content-Length: 0

#### [JUDGMENT]

\*\* The response code for INVITE would be different from your implementation.  
Tester supports any of 4xx response here.

\*9:480 response from NUT to PX2

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "480". [RFC3261-16-40,41], [RFC3261 16.7.6], [RFC3261 21.4.18]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.10.

### 4.3.11 PX-2-2-5 - SIP Proxy- Unsuccessful Temporarily Unavailable (Callee)

#### [NAME]

PX-2-2-5 - SIP Proxy- Unsuccessful Temporarily Unavailable (Callee)

#### [TARGET]

SIP Proxy (NUT)



#### [PURPOSE]

Verify that the Proxy1 properly processes when receiving a 480 (Temporarily Unavailable.) from the UA2.

#### [REQUIREMENT]

Only when a proxy supports the architecture with two proxies

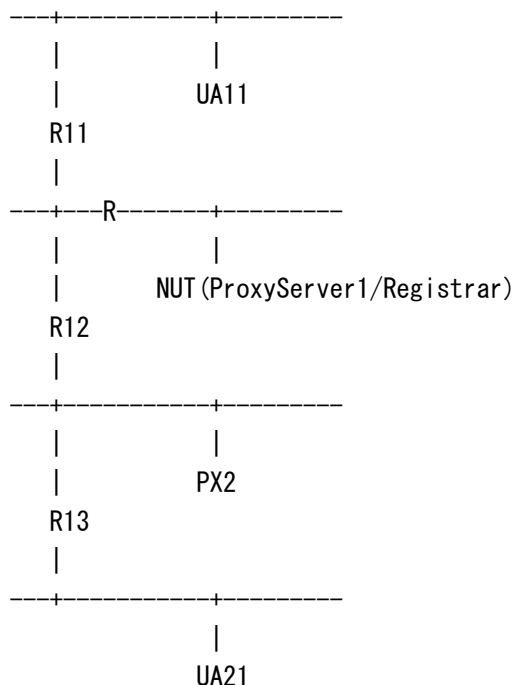
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

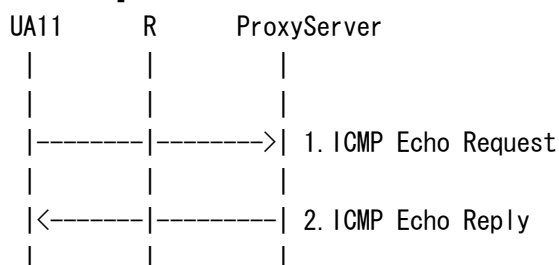




# [CONFIGURATION for NUT]

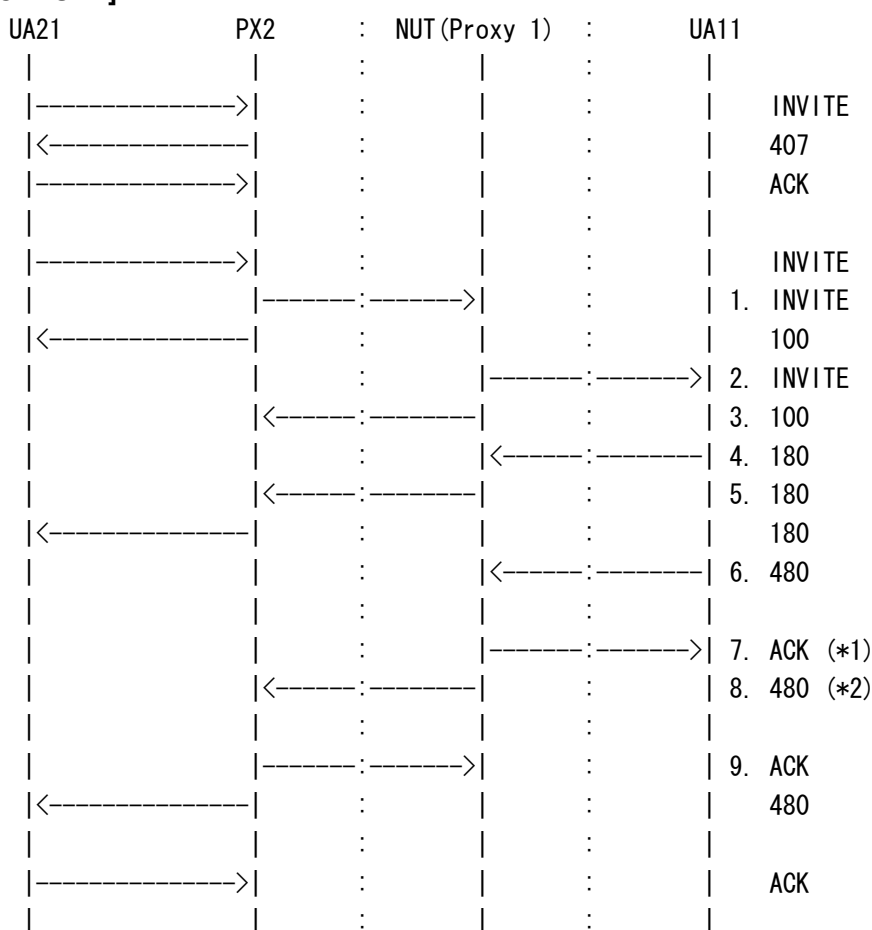
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]



1. PX2 Send INVITE.



2. UA11 Receive INVITE.
3. PX2 Receive 100 Trying.
4. UA11 Send 180 Ringing.
5. PX2 Receive 180 Ringing.
6. UA11 Send 480 Temporarily Unavailable.
7. UA11 Receive ACK.
8. PX2 Receive 480 Temporarily Unavailable.
9. PX2 Send ACK.

**=== Message example ===**

1. INVITE PX2 -> NUT

INVITE sip:UA11@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Record-Route: <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

2. INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68



Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

### 3. 100 Trying NUT -> PX2

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Length: 0

### 4. 180 Ringing UA11 -> NUT

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>



From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Length: 0

#### 5. 180 Ringing NUT -> PX2

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Length: 0

#### 6. 480 Temporarily Unavailable UA11 -> NUT

SIP/2.0 480 Temporarily Unavailable  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Content-Length: 0

#### 7. ACK NUT -> UA11

ACK sip:UA11@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Max-Forwards: 70



From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 ACK  
Content-Length: 0

#### 8. 480 Temporarily Unavailable NUT -> PX2

SIP/2.0 480 Temporarily Unavailable  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 INVITE  
Content-Length: 0

#### 9. ACK PX2 -> NUT

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
Max-Forwards: 70  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@biloxi.example.com  
CSeq: 1 ACK  
Content-Length: 0

### [JUDGMENT]

\*1:ACK request from NUT to UA11

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX
- Header fields:
  - outside of a dialog



See generic\_make\_ACK\_for-non2XX

- Bodies:

See generic\_make\_ACK\_for-non2XX

\*2:480 response from NUT to PX2

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "480". [RFC3261 16.7.6], [RFC3261 21.4.18]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

Sequence from RFC3665 Section 3.11.

## 4.4 Routing

### 4.4.1 FW-1-1-1 - SIP Proxy- Request-URI with escaped characters

#### [NAME]

FW-1-1-1 - SIP Proxy- Request-URI with escaped characters

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy doesn't change escaped characters in a Request-URI into unescaped characters and sends the request the other UA when receiving a request with escaped characters.

#### [REQUIREMENT]

NONE

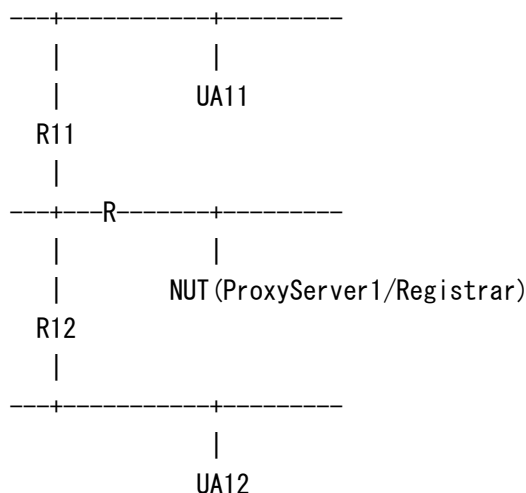
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

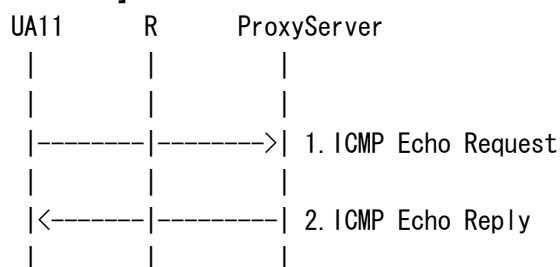
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

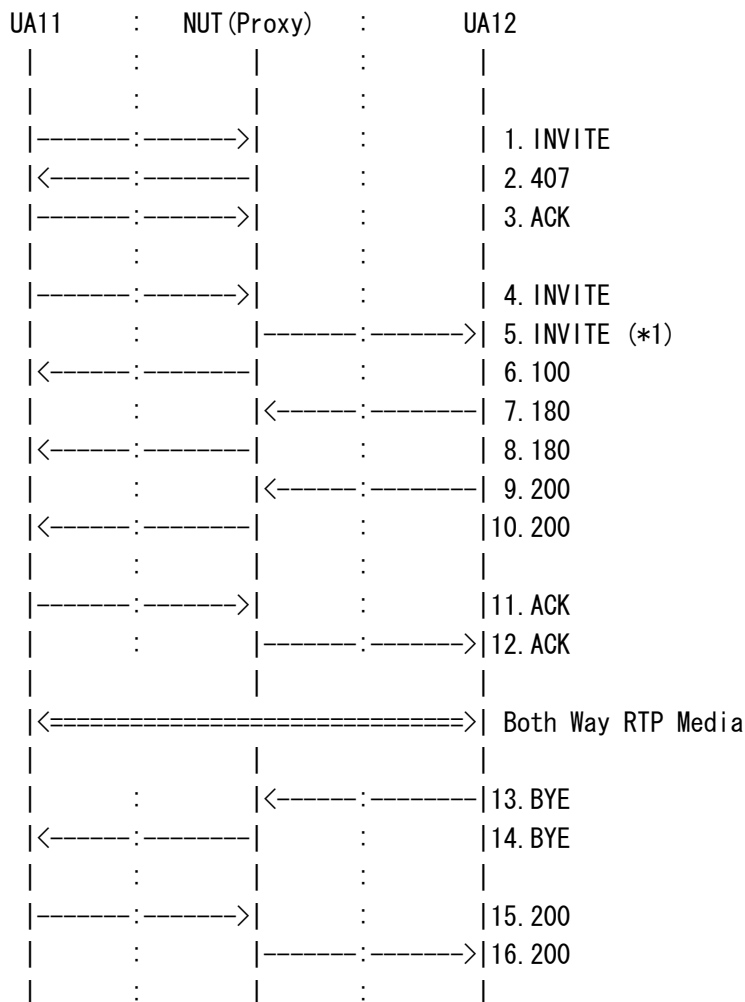
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

**[PROCEDURE]**



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.





12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200.
16. UA12 Receive 200.

**=== Message example ===**

1. INVITE UA11 -> NUT

```
INVITE sip:U%6512@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:U%6512@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 1 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

\* userinfo of Request-URI has escaped character (SP(0x20)).

/\* Proxy(NUT) challenges UA11for authentication \*/

2. 407 Proxy Authentication Required NUT -> UA11

```
SIP/2.0 407 Proxy Authentication Required
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
;received=3ffe:501:ffff:1::1
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:U%6512@under.test.com>;tag=3flal12sf
Call-ID: 3848276298220188511@under.test.com
CSeq: 1 INVITE
```



Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="f84f1cec41e6cbe5aea9c8e88d359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

### 3. ACK UA11 -> NUT

ACK sip:U%6512@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>;tag=3flal12sf  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 ACK  
Content-Length: 0

\* Request-URI does not change.

### 4. INVITE UA11 -> NUT

INVITE sip:U%6512@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:U%6512@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-



c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

\* userinfo of Request-URI has escaped character (SP(0x20)).

#### 5. INVITE NUT -> UA12

INVITE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

\* Request-URI: userinfo part does not change.

#### 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl



To: UA12 <sip:U%6512@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

#### 7. 180 Ringing UA12 -> NUT

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com:lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

#### 8. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com:lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

#### 9. 200 OK UA12 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1



Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

10. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

11. ACK UA11 -> NUT



ACK sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:U%6512@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### 12. ACK NUT -> UA12

ACK sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:U%6512@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### 13. BYE UA12 -> NUT

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:U%6512@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0



\* userinfo of From header field has escaped character (SP(0x20)).

#### 14. BYE NUT -> UA11

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74b43  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:U%6512@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

#### 15. 200 OK UA11 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
From: UA12 <sip:U%6512@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

#### 16. 200 OK NUT -> UA12

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
From: UA12 <sip:U%6512@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0



## [JUDGMENT]

\*2:INVITE request from NUT to UA12.

As a SIP Message,

Must be transmitted. [RFC3261-16-31]

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

Request-URI

userinfo: Must convert from escaped characters to unescaped characters.  
[RFC3261-16-31][RFC3261-19-12]

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

\* To

Must not convert escaped characters into unescaped characters.  
[RFC3261-16-31]

- Bodies:

See generic\_forward\_from-UA11

## [REFERENCE]

[RFC3261-16-31]

### 16.5 Determining Request Targets

When accessing the location service constructed by a registrar, the Request-URI MUST first be canonicalized as described in Section 10.3 before being used as an index. The output of these mechanisms is used to construct the target set.

## 4.4.2 FW-1-1-2 - SIP Proxy- Non-allowed parameters in Request-URI

### [NAME]

FW-1-1-2 - SIP Proxy- Non-allowed parameters in Request-URI



# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy properly removes the parameters in a Request-URI which are not allowed.

# **[REQUIREMENT]**

NONE

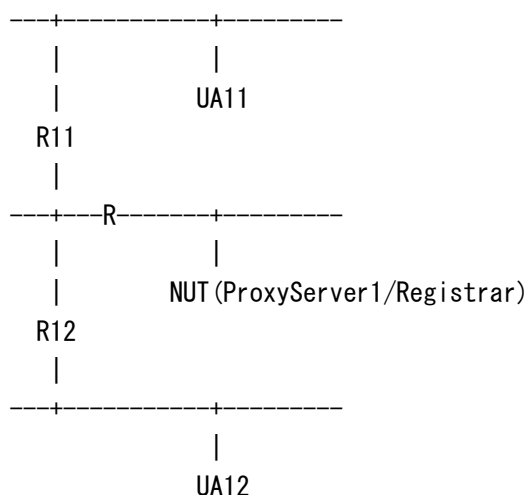
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

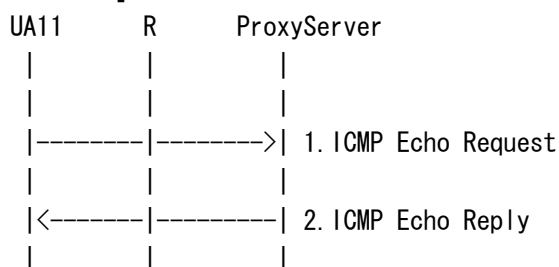
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

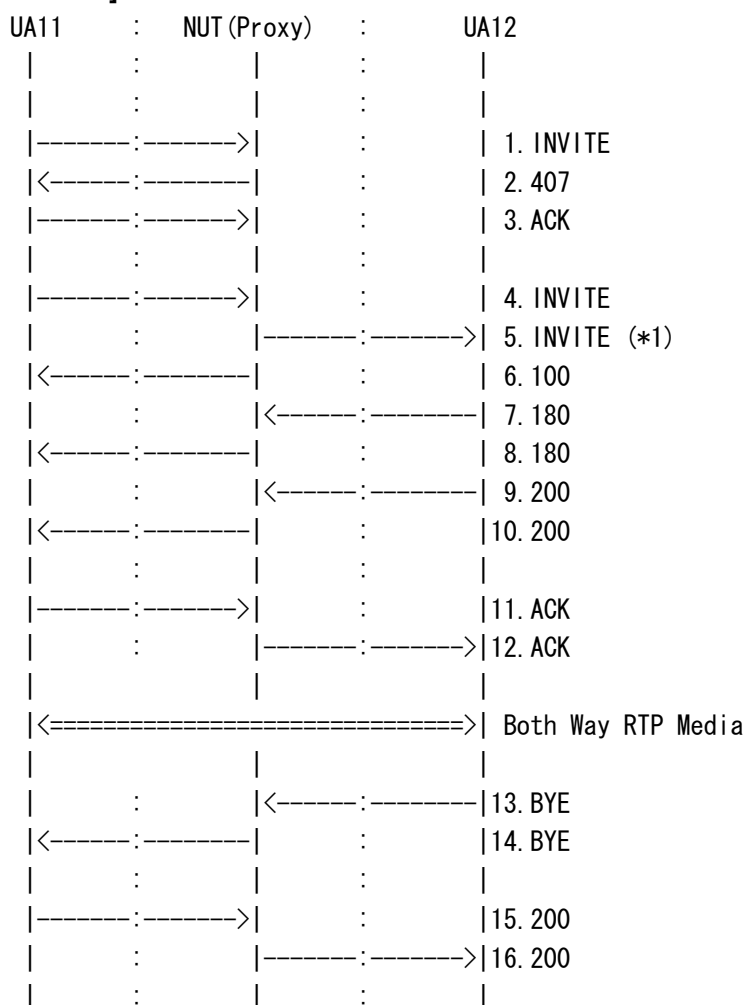
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

## [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.



4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200.
16. UA12 Receive 200.

**=== Message example ===**

4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com;method=INVITE?Subject=test SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

Max-Forwards: 70

Proxy-Authorization: Digest username="UA11",

realm="under.test.com",

nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",

qop=auth, nc=00000004, cnonce="6f54a149",

uri="sip:UA12@under.test.com",

response="b51e504e73af54829e4f2bd7f8dc4654"

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA11@node.under.test.com>

Content-Type: application/sdp

Content-Length: 151

v=0

o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1

s=-

c=IN IP6 3ffe:501:ffff:1::1

t=0 0

m=audio 49172 RTP/AVP 0

a=rtpmap:0 PCMU/8000

/\* There are two components that are not allowed to exist in Request-URI,



one is method component, another is header field component (Subject). \*/

#### 5. INVITE NUT -> UA12

```
INVITE sip:UA12@node11.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
;received=3ffe:501:ffff:1::1
Max-Forwards: 69
Record-Route: <sip:ss.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151

v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

#### [JUDGMENT]

\*1:INVITE request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain

\* Request-URI  
Must remove any parameters not allowed in a Request-URI.  
[RFC3261-16-48][RFC3261-19-9]

- Header fields:



- outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request
- Bodies:  
See generic\_forward\_from-UA11

#### [REFERENCE]

[RFC3261-16-47, 48]  
16.6 Request Forwarding

#### 2. Request-URI

The Request-URI in the copy's start line MUST be replaced with the URI for this target. If the URI contains any parameters not allowed in a Request-URI, they MUST be removed.

### 4.4.3 FW-1-1-3 - SIP Proxy- Update of a Request-URI scheme

#### [NAME]

FW-1-1-3 - SIP Proxy- Update of a Request-URI scheme

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly changes the scheme into the SIP scheme and sends that request when receiving a 416 (Unsupported URI Scheme) response because the Request-URI scheme is tel URL, not the SIP scheme.

#### [REQUIREMENT]

Only when the proxy can forward tel-URL.

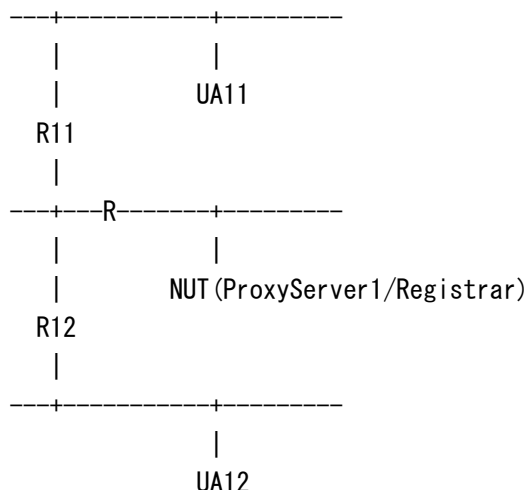
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:00011112222
UA12(Contact)	sip:00011112222
UA12(Contact)	tel:00011112222;user=phone

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

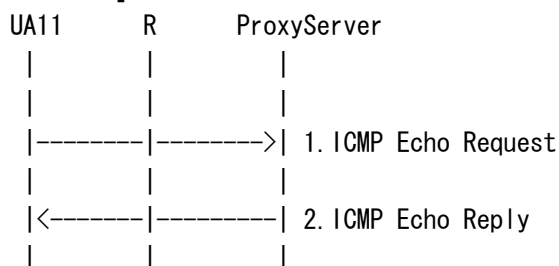
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

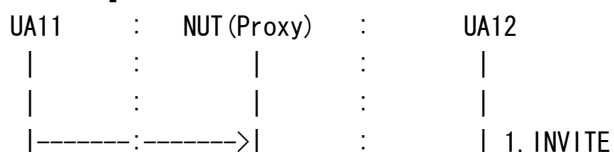
#### [INITIALIZATION]

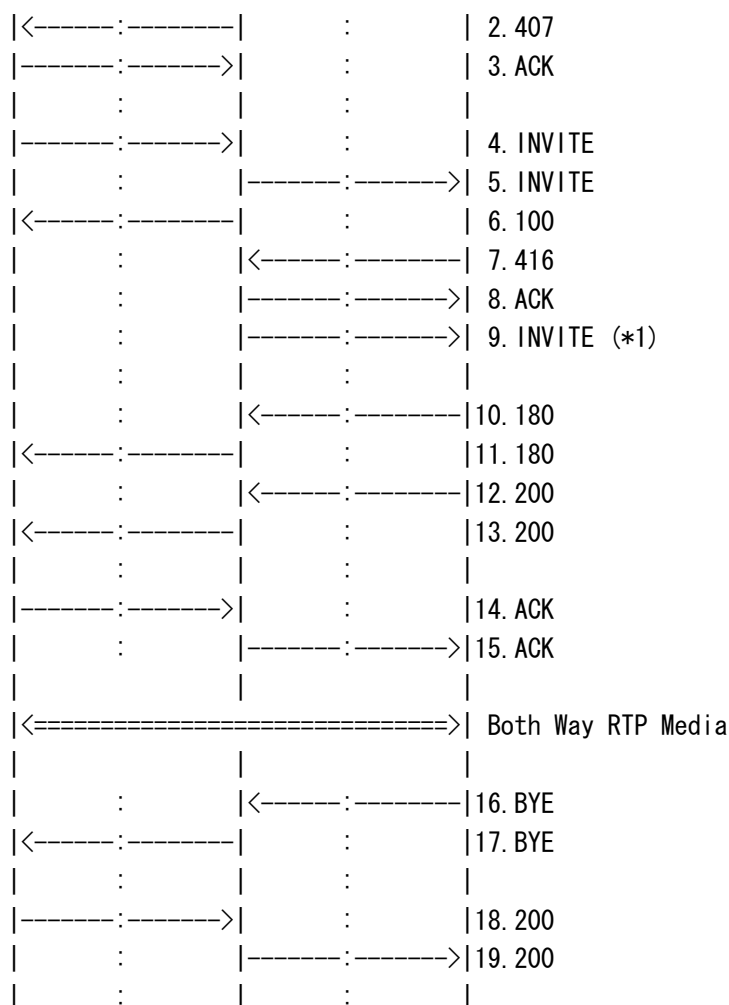


1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

\* NUT changes SIP-URI scheme to tel-URL scheme.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 416 Unsupported URI Scheme.
8. UA12 Receive ACK.
9. UA12 Receive INVITE
10. UA12 Send 180 Ringing.
11. UA11 Receive 180 Ringing.
12. UA12 Send 200 OK.
13. UA11 Receive 200 OK.
14. UA11 Send ACK.
15. UA12 Receive ACK.
16. UA12 Send BYE.



17. UA11 Receive BYE.
18. UA11 Send 200.
19. UA12 Receive 200.

**=== Message example ===**

4. INVITE UA11 -> NUT

```
INVITE sip:00011112222 SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
Max-Forwards: 70
Proxy-Authorization: Digest username="UA11",
  realm="under.test.com",
  nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",
  qop=auth, nc=00000004, cnonce="6f54a149",
  uri="sip:00011112222",
  response="b51e504e73af54829e4f2bd7f8dc4654"
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:00011112222>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151

v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

/\* Proxy(NUT) accepts the credentials and forwards the INVITE to UA12  
2. Client for UA11 prepares to receive data on port 49172 from the  
network. \*/

5. INVITE NUT -> UA12

```
INVITE tel:00011112222;user=phone SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
  ;received=3ffe:501:ffff:1::1
```





Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <tel:00011112222;user=phone>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 7. 416 Unsupported URI Scheme UA12 -> NUT

SIP/2.0 416 Unsupported Scheme  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:00011112222>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:00011112222>  
CSeq: 2 INVITE  
Content-Length: 0

#### 9. INVITE NUT -> UA12

INVITE sip:00011112222 SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>



From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:00011112222>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### [JUDGMENT]

\*1:INVITE request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain  
Request-URI: Must be the original SIP URI. [RFC3261-16-101, RFC3261-16-102]
- Header fields:
  - outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request
- Bodies:  
See generic\_forward\_from-UA11

#### [REFERENCE]

[RFC3261-16-101, 102]  
16.7 Response Processing

If a proxy receives a 416 (Unsupported URI Scheme) response to  
a request whose Request-URI scheme was not SIP, but the scheme



in the original received request was SIP or SIPS (that is, the proxy changed the scheme from SIP or SIPS to something else when it proxied a request), the proxy SHOULD add a new URI to the target set. This URI SHOULD be a SIP URI version of the non-SIP URI that was just tried. In the case of the tel URL, this is accomplished by placing the telephone-subscriber part of the tel URL into the user part of the SIP URI, and setting the hostpart to the domain where the prior request was sent. See Section 19.1.6 for more detail on forming SIP URIs from tel URLs.

#### 4.4.4 FW-1-2-1 - SIP Proxy- Request-URI with an unknown scheme

##### [NAME]

FW-1-2-1 - SIP Proxy- Request-URI with an unknown scheme

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy rejects the request with a 416 (Unsupported URI Scheme) response when a request contains the Request-URI whose scheme is not understood.

##### [REQUIREMENT]

NONE

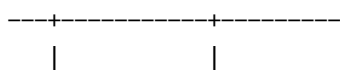
##### [PARAMETER]

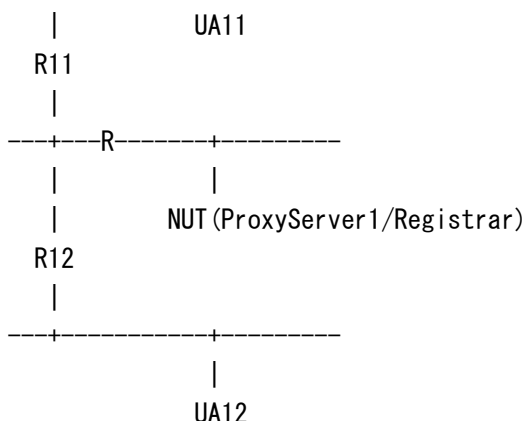
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

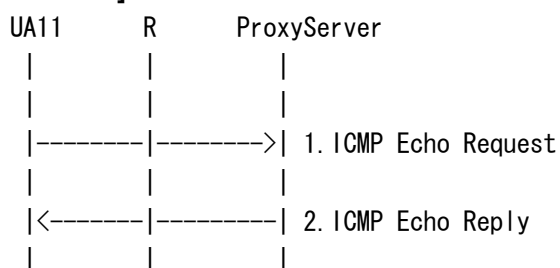




#### [CONFIGURATION for NUT]

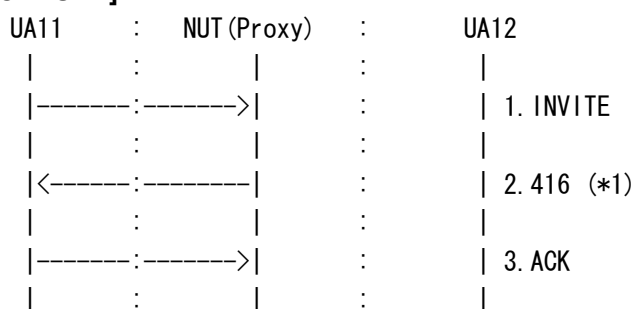
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 416 Unsupported URI Scheme.
3. UA11 Send ACK.

=== Message example ===



## 1. INVITE UA11 -> NUT

INVITE nobodyKnowsThisScheme:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

### [JUDGMENT]

\*1:416 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Should be "416". [RFC3261-16-15]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

### [REFERENCE]

[rfc3261]



## 16.3 Request Validation

### 2. URI scheme check

If the Request-URI has a URI whose scheme is not understood by the proxy, the proxy **SHOULD** reject the request with a 416 (Unsupported URI Scheme) response.

## 4.4.5 FW-1-2-2 - SIP Proxy- Request with an inexistent entity at the proxy

### [NAME]

FW-1-2-2 - SIP Proxy- Request with an inexistent entity at the proxy

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly returns a 404 (Not Found) response when receiving a Request-URI with the entity that doesn't exist at the proxy.

### [REQUIREMENT]

NONE

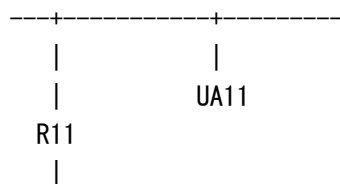
### [PARAMETER]

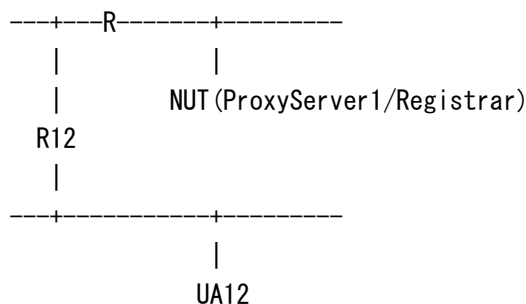
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

### [TOPOLOGY]

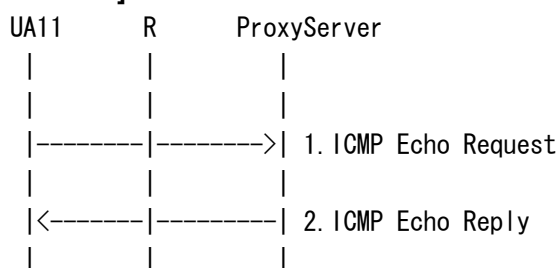




#### [CONFIGURATION for NUT]

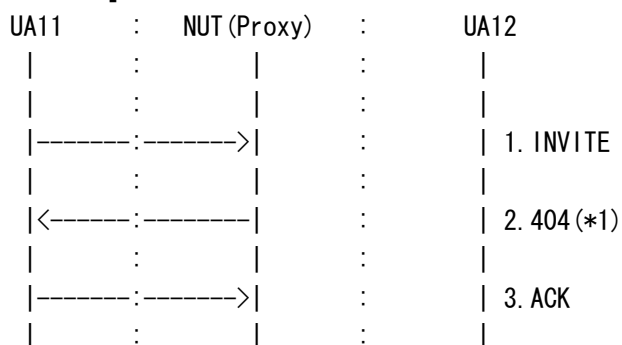
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 404 Not Found.
3. UA11 Send ACK.

#### === Message example ===

1. INVITE UA11 -> NUT



INVITE sip:NotExist@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: NotExist <sip:NotExist@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

\* UA11 send INVITE to no existing entity "NotExist".

## 2. 404 Not Found NUT -> UA11

SIP/2.0 404 Not Found  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: NotExist <sip:NotExist@under.test.com>;tag=3flal12sf  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 INVITE  
Content-Length: 0

### [JUDGMENT]

\*1:404 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response





Status-Code: Must be "404". [RFC3261-16-39]

- Header fields:

See generic\_make\_response

See generic\_proxy-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

[RFC3261-16-39]

16.5 Determining Request Targets

If the Request-URI indicates a resource at this proxy that does not exist, the proxy MUST return a 404 (Not Found) response.

### 4.4.6 FW-1-2-3 - SIP Proxy- An unsupported option-tag in a Proxy-Require

#### [NAME]

FW-1-2-3 - SIP Proxy- An unsupported option-tag in a Proxy-Require

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly rejects an unsupported option-tag in a Proxy-Require header field with 420 (Bad Extension) response.

#### [REQUIREMENT]

NONE

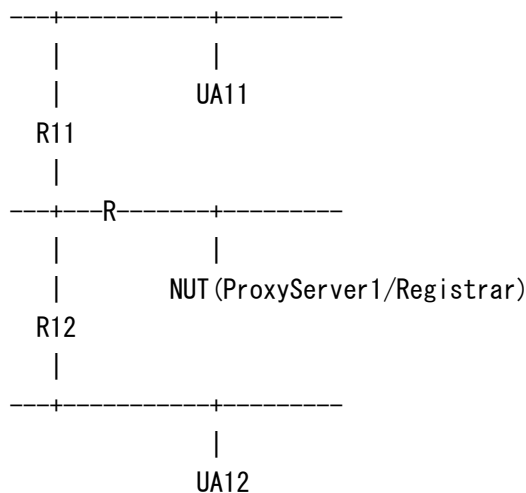
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

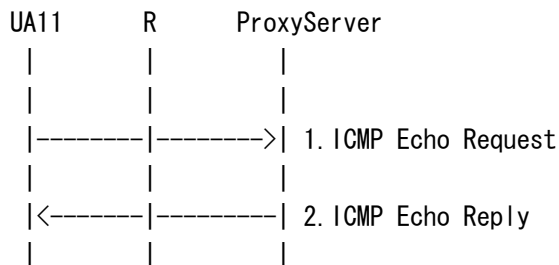
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

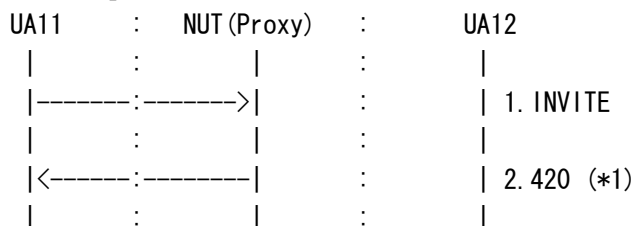
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





```
|-----:----->|      :      | 3. ACK
|      :      |      :      |
```

1. UA11 Send INVITE.
2. UA11 Receive 420 Bad Extension.
3. UA11 Send ACK.

#### === Message example ===

1. INVITE UA11 -> NUT

```
INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 1 INVITE
Proxy-Require: 999rel
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

#### [JUDGMENT]

\*1:420 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "420". [RFC3261-16-18]

- Header fields:  
See generic\_make\_response



via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Unsupported

Must exist.

option-tag: Must include "999rel". [RFC3261-16-19]

## [REFERENCE]

[RFC3261-16-18, 19]

16.3 Request Validation

### 5. Proxy-Require check

If the request contains a Proxy-Require header field (Section 20.29) with one or more option-tags this element does not understand, the element MUST return a 420 (Bad Extension) response. The response MUST include an Unsupported (Section 20.40) header field listing those option-tags the element did not understand.

### 4.4.7 FW-1-2-4 - SIP Proxy- Max-Forwards header field with a value of zero(0)

#### [NAME]

FW-1-2-4 - SIP Proxy- Max-Forwards header field with a value of zero(0)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy sends a 483 (Too many hops) response and doesn't forward the request when receiving a request containing a Max-Forwards header field with a field value of zero(0).

#### [REQUIREMENT]

NONE

#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

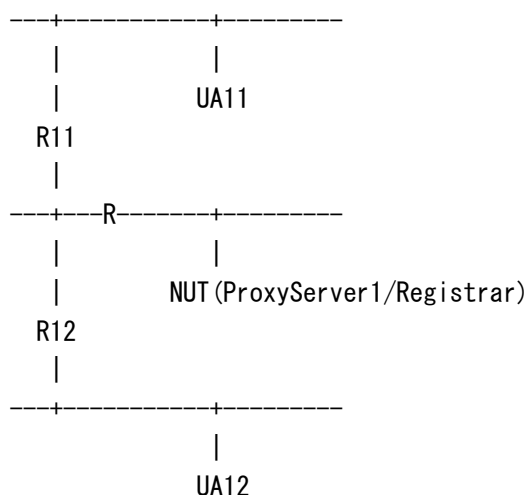
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

:

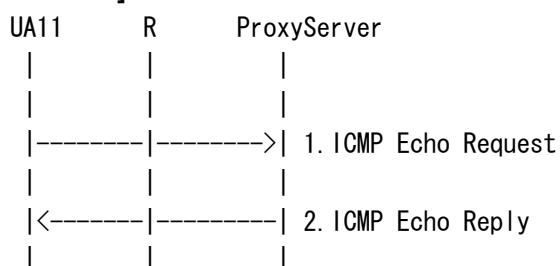
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

UA11 : NUT (Proxy) : UA12



	:		:	
-----:	----->		:	1. INVITE
	:		:	(*1)
<-----:	-----		:	2. 483 (*2)
	:		:	
-----:	----->		:	3. ACK
	:		:	

1. UA11 Send INVITE.
2. UA11 Receive 483 Too many hops.
3. UA11 Send ACK.

### === Message example ===

1. INVITE UA11 -> NUT

```
INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43
Max-Forwards: 0
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 1 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

### [JUDGMENT]

\*1:after NUT received INVITE request.

Must not forward this request to UA12. [RFC3261-16-16]

\*2:483 response from NUT to UA11.  
As a SIP Message,



See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "483". [RFC3261-16-17]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

[RFC3261-16-16, 17]

## 16.3 Request Validation

### 3. Max-Forwards check

If the request contains a Max-Forwards header field with a field value of zero (0), the element MUST NOT forward the request. If the request was for OPTIONS, the element MAY act as the final recipient and respond per Section 11. Otherwise, the element MUST return a 483 (Too many hops) response.

## 4.4.8 FW-1-2-5 - SIP Proxy- Request without Max-Forwards header field

### [NAME]

FW-1-2-5 - SIP Proxy- Request without Max-Forwards header field

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy adds a Max-Forwards header field with a field value, which should be 70, when a request doesn't have a Max-Forwards header field.

### [REQUIREMENT]

NONE

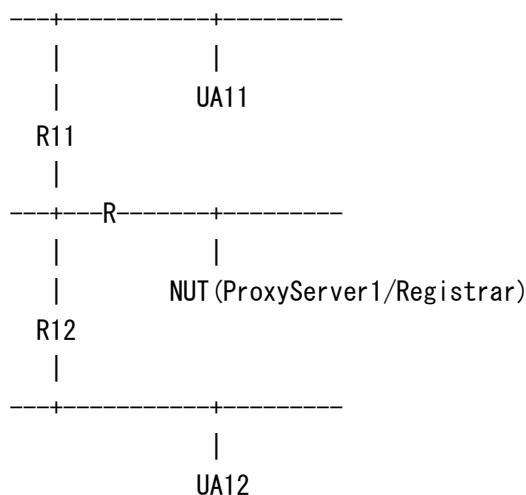
# [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

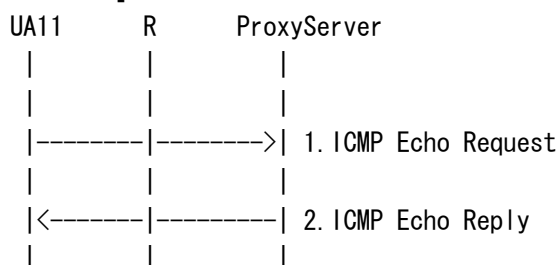
# [TOPOLOGY]



# [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

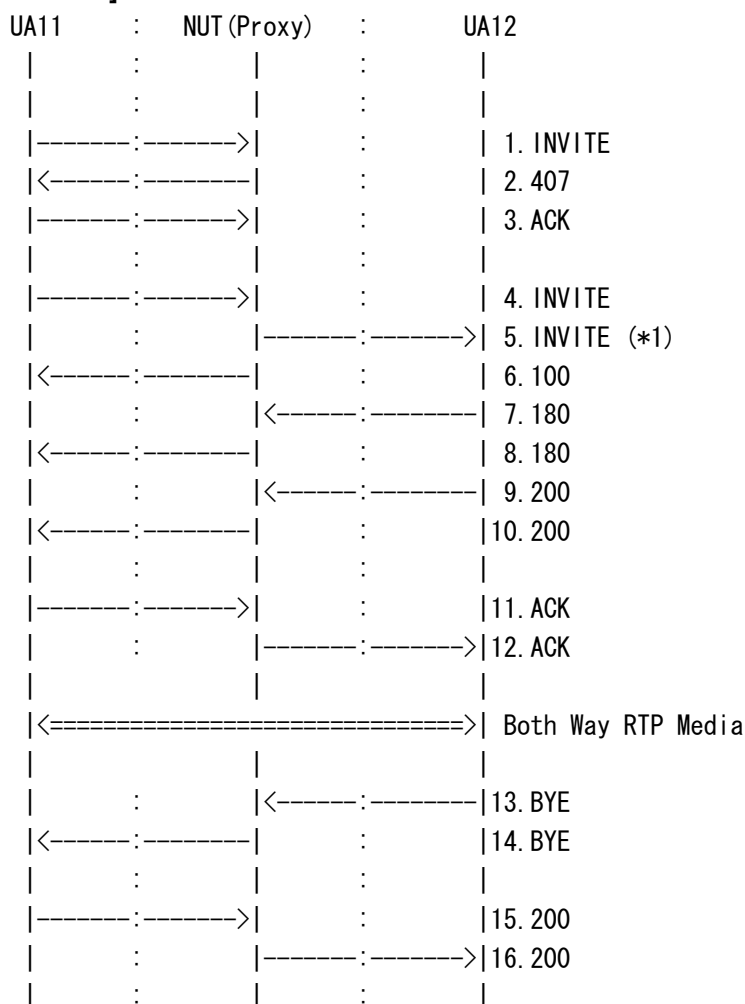
# [INITIALIZATION]





1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.



13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200.
16. UA12 Receive 200.

**=== Message example ===**

4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

/\* There are no Max-Forwards header field. \*/

5. INVITE NUT -> UA12

INVITE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 70  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl



To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### [JUDGMENT]

\*1:INVITE request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:  
- outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request

\* Max-Forwards  
Must exist. [RFC3261-16-50]  
1\*DIGIT: the value Should be "70". [RFC3261-16-51]

- Bodies:  
See generic\_forward\_from-UA11

#### [REFERENCE]

[RFC3261-16-50, 51]

#### 16.6 Request Forwarding



### 3. Max-Forwards

If the copy does not contain a Max-Forwards header field, the proxy MUST add one with a field value, which SHOULD be 70.

Some existing UAs will not provide a Max-Forwards header field in a request.

#### 4.4.9 FW-1-2-6 - SIP Proxy- Timestamp header field in a 100 response

##### [NAME]

FW-1-2-6 - SIP Proxy- Timestamp header field in a 100 response

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy properly copies any Timestamp header field into the 100 response when 100 (trying) response is generated.

##### [REQUIREMENT]

Only when a proxy can process a Timestamp header field.

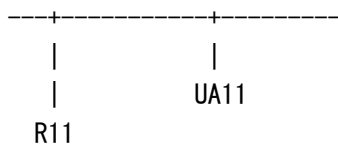
##### [PARAMETER]

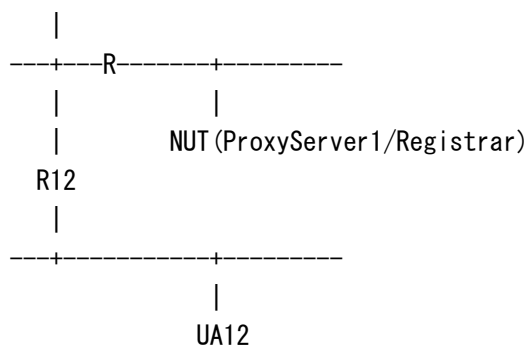
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

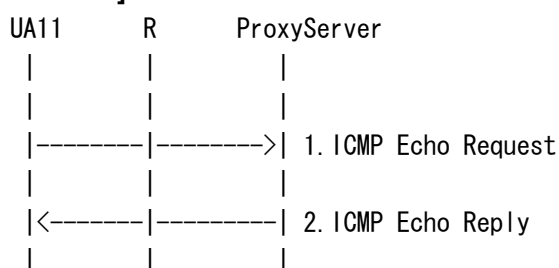




### [CONFIGURATION for NUT]

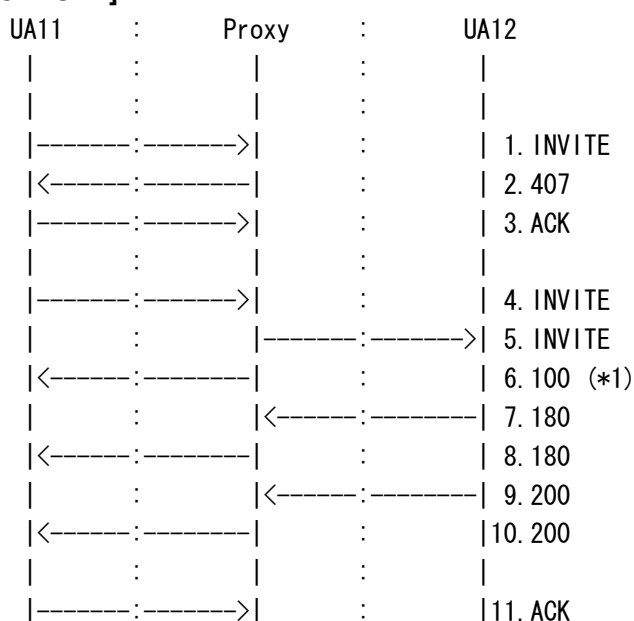
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

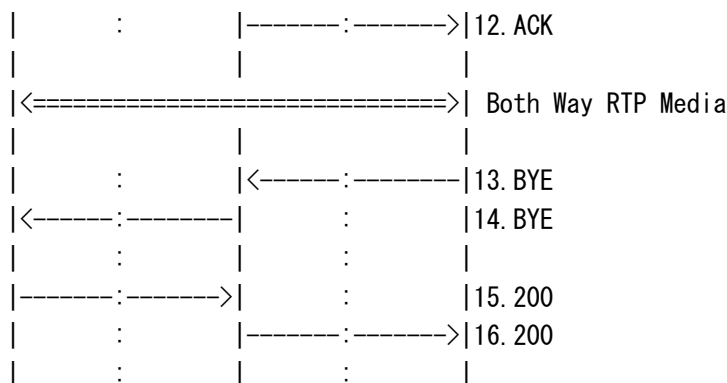
### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200.
16. UA12 Receive 200.

**=== Message example ===**

4. INVITE UA11 -> NUT

```
INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
Max-Forwards: 70
Proxy-Authorization: Digest username="UA11",
  realm="under.test.com",
  nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",
  qop=auth, nc=00000004, cnonce="6f54a149",
  uri="sip:UA12@under.test.com",
  response="b51e504e73af54829e4f2bd7f8dc4654"
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
```



CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151  
Timestamp: 54

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 6. 100 Trying NUT -> UA11

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0  
Timestamp: 54 1.5

\* "1.5" in Timestamp header field is the delay value, if there is a delay in generating the response

### [JUDGMENT]

\*1:100 response from NUT to UA11.(Optional)

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "100". [RFC3261 4]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Timestamp

Must exist.

Must be the same as "4.INVITE"(except delay). [RFC3261-8-95]

## [REFERENCE]

[RFC3261-8-95, 96, 97]

### 8.2.6.1 Sending a Provisional Response

When a 100 (Trying) response is generated, any Timestamp header field present in the request **MUST** be copied into this 100 (Trying) response. If there is a delay in generating the response, the UAS **SHOULD** add a delay value into the Timestamp value in the response. This value **MUST** contain the difference between the time of sending of the response and receipt of the request, measured in seconds.

## 4.4.10 FW-2-1-1 - SIP Proxy- "sent-by" in Via with a domain name and a port

### [NAME]

FW-2-1-1 - SIP Proxy- SIP Proxy- "sent-by" in Via with a domain name and a port

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly forwards to the port of the element when a "sent-by" parameter in a Via header field contains a domain name and a port.

### [REQUIREMENT]

NONE

### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com



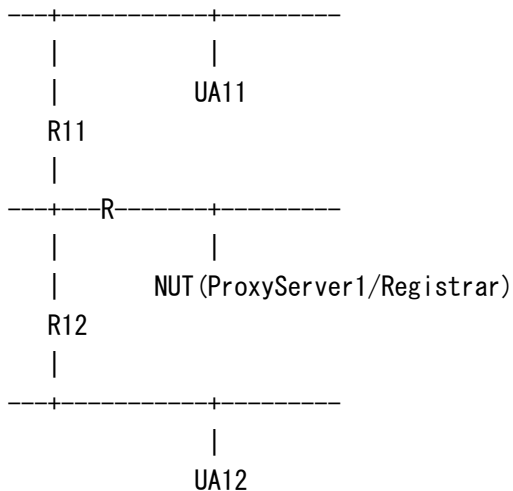


UA12(Contact)	sip:UA12@node11.under.test.com
---------------	--------------------------------

**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

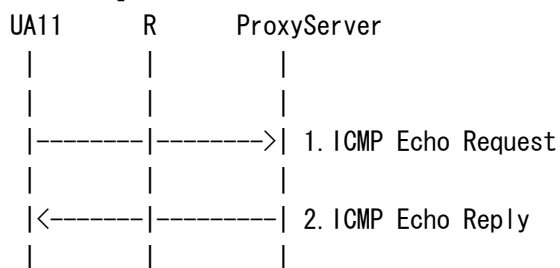
# [TOPOLOGY]



# [CONFIGURATION for NUT]

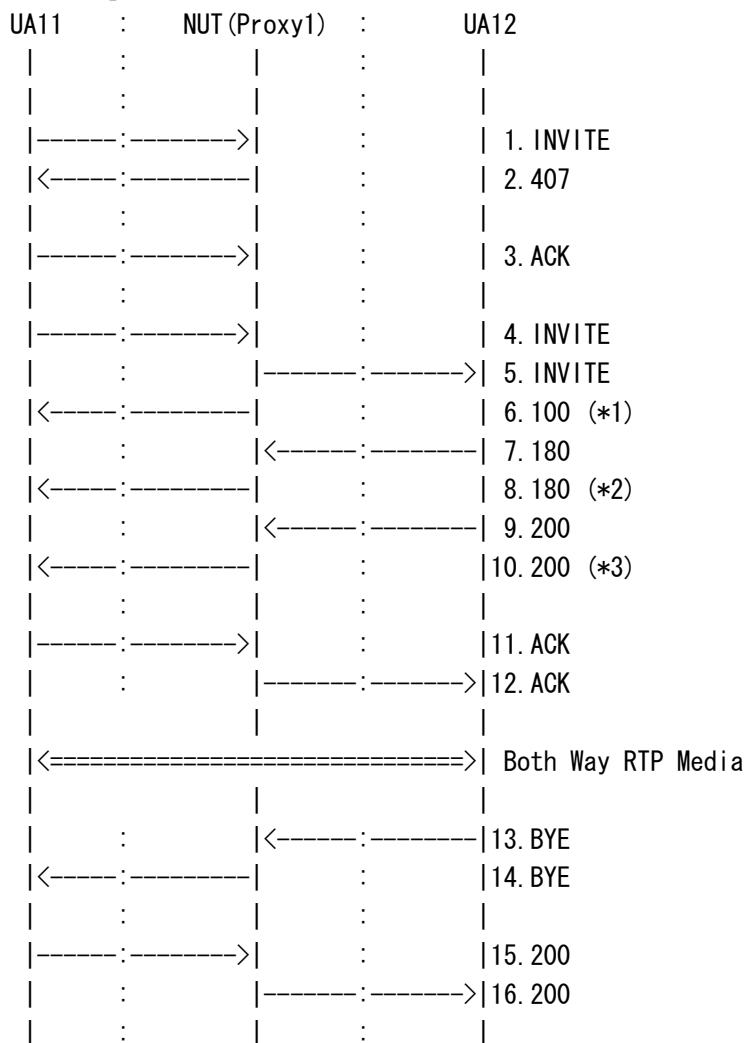
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.



14. UA11 Receive BYE.
15. UA11 Send 200 OK.
16. UA12 Receive 200 OK.

**=== Message example ===**

4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5070;branch=z9hG4bK74b43  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip: UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip: UA12@under.test.com >  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

\* Source port number = 5070

8. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP node.under.test.com:5070;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159



Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA12@under.test.com>

CSeq: 2 INVITE

Content-Length: 0

10. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5070;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA12@under.test.com>

Content-Type: application/sdp

Content-Length: 147

v=0

o=UA21 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:1::1

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

#### [JUDGMENT]

\*1:100 response from NUT to UA11.(Optional)

The destination address of this message Must be equal to 3ffe:501:ffff:50::50.  
[RFC3261-18-35]

The destination port of this message Must be equal to 5070. [RFC3261-18-35]

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "100". [RFC3261 4]

- Header fields:



See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:180 response from NUT to UA11.

The destination address of this message Must be equal to 3ffe:501:ffff:50::50.

[RFC3261-18-35]

The destination port of this message Must be equal to 5070. [RFC3261-18-35]

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180".[RFC3261-16-104]

- Header fields:

See generic\_forward\_from- UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from- UA12

\*3:200 response from NUT to UA11.

The destination address of this message Must be equal to 3ffe:501:ffff:50::50.

[RFC3261-18-35]

The destination port of this message Must be equal to 5070. [RFC3261-18-35]

As a SIP Message,

See generic\_message

As a SIP response,



- Status-Line:

See generic\_forward\_from- UA12

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from- UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from- UA12

## [REFERENCE]

[RFC3261-18-26, 27, 28]

### 18.2.1 Receiving Requests

When the server transport receives a request over any transport, it MUST examine the value of the "sent-by" parameter in the top Via header field value. If the host portion of the "sent-by" parameter contains a domain name, or if it contains an IP address that differs from the packet source address, the server MUST add a "received" parameter to that Via header field value. This parameter MUST contain the source address from which the packet was received. This is to assist the server transport layer in sending the response, since it must be sent to the source IP address from which the request came.

[RFC3261-18-35]

### 18.2.2 Sending Responses

- o Otherwise (for unreliable unicast transports), if the top Via has a "received" parameter, the response MUST be sent to the address in the "received" parameter, using the port indicated in the "sent-by" value, or using port 5060 if none is specified explicitly.

## 4.4.11 FW-2-1-2 - SIP Proxy- "sent-by" in Via with a domain name and without a port

# **[NAME]**

FW-2-1-2 - SIP Proxy- "sent-by" in Via with a domain name and without a port

# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy properly forwards to the element that has the port number of 5060 when a "sent-by" parameter in a Via header field contains a domain name and no port.

# **[REQUIREMENT]**

NONE

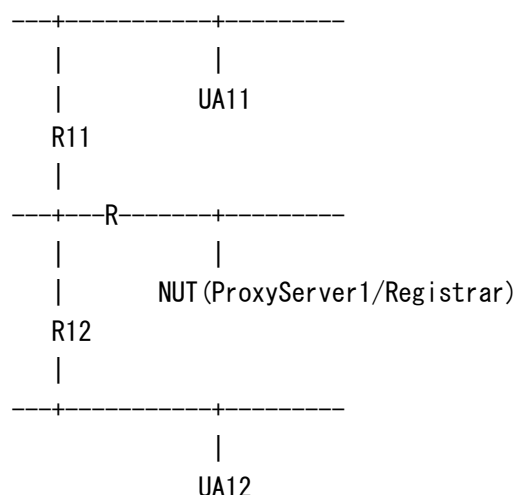
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

# **[TOPOLOGY]**

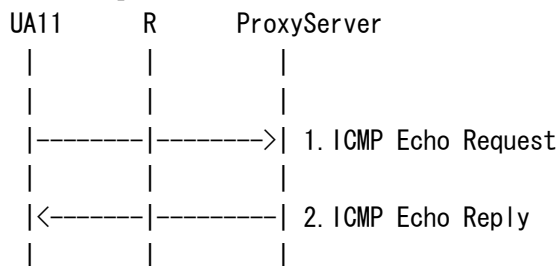


# **[CONFIGURATION for NUT]**



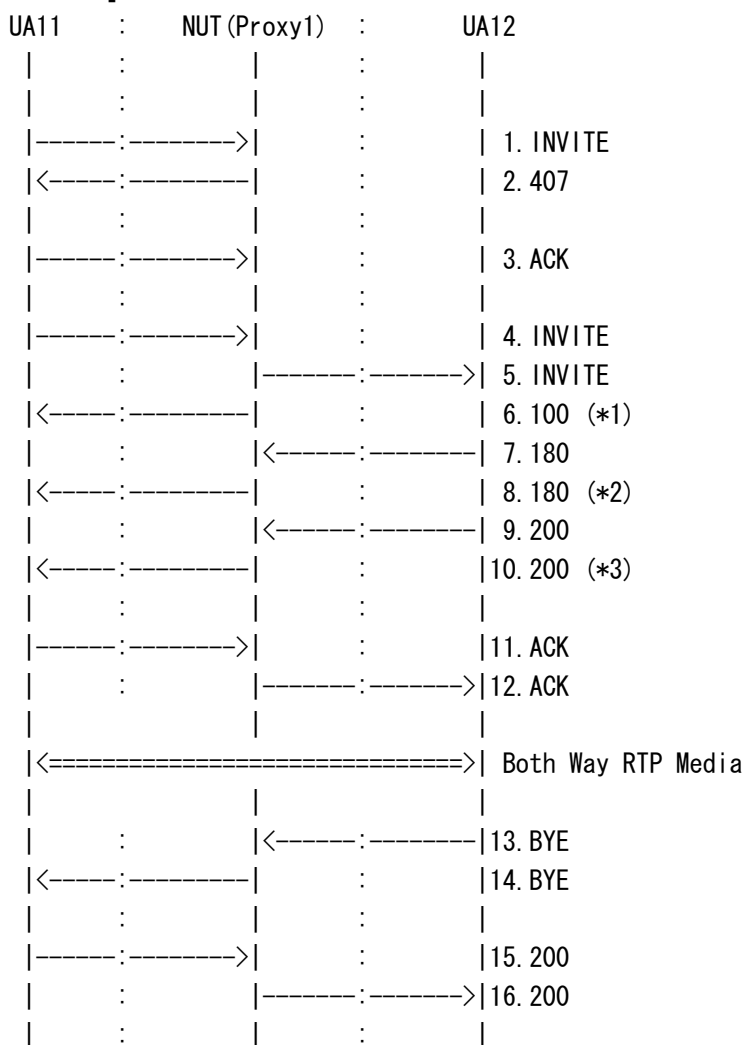
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200 OK.
16. UA12 Receive 200 OK.

**=== Message example ===**

1. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

8. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing



Via: SIP/2.0/UDP node.under.test.com;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

10. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@under.test.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA21 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### [JUDGMENT]

The destination address of this message Must be equal to 3ffe:501:ffff:50::50.  
[RFC3261-18-35]

The destination port of this message Must be equal to 5060. [RFC3261-18-35]

\*1:100 response from NUT to UA11.(Optional)

As a SIP Message,  
See generic\_message

As a SIP response,



- Status-Line:

See generic\_make\_response

Status-Code: Must be "100". [RFC3261 4]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:180 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

\*3:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

## [REFERENCE]

[RFC3261-18-35]

### 18.2.2 Sending Responses

- o Otherwise (for unreliable unicast transports), if the top Via has a "received" parameter, the response MUST be sent to the address in the "received" parameter, using the port indicated in the "sent-by" value, or using port 5060 if none is specified explicitly.

## 4.4.12 FW-2-1-3 - SIP Proxy- Multiple 2xx responses

### [NAME]

FW-2-1-3 - SIP Proxy- Multiple 2xx responses

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly processes when each session is established and the proxy receives multiple 2xx responses.

### [REQUIREMENT]

Only when a proxy supports two-proxy architecture.

### [PARAMETER]

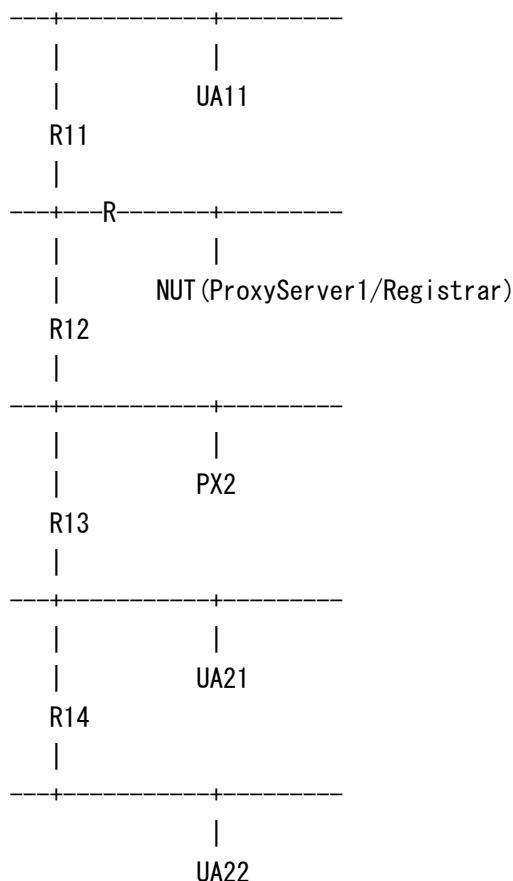
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
UA22(Contact)	sip:UA22@client2.biloxi.example.com
PX2	sip:ss2.biloxi.example.com;lr

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
UA22(IPv6)	3ffe:501:ffff:22::22/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

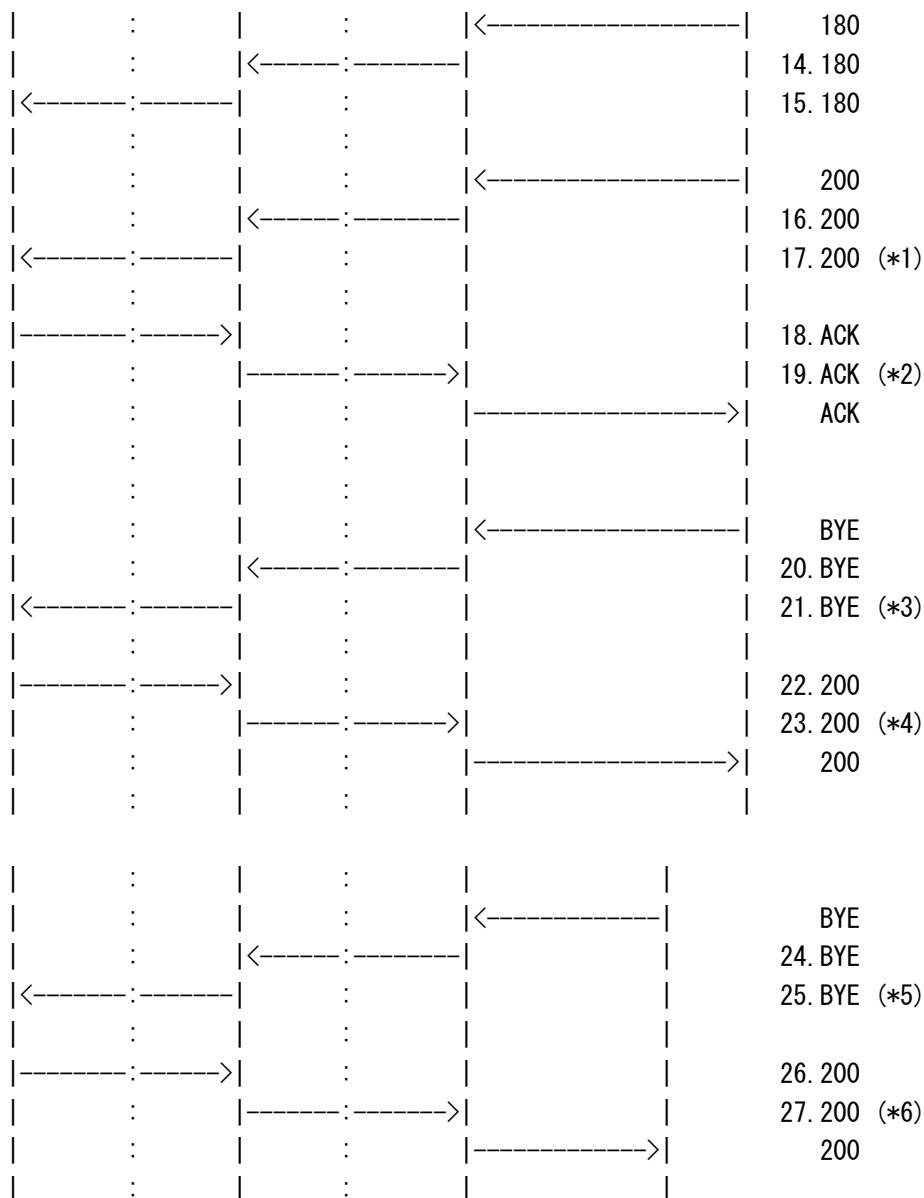
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. PX2 Receive INVITE.
6. UA11 Receive 100 Trying.
7. PX2 Send 100 Trying.
8. PX2 Send 180 Ringing.
9. UA11 Receive 180 Ringing.
10. PX2 Send 200 OK.
11. UA11 Receive 200 OK.





12. UA11 Send ACK.
13. PX2 Receive ACK.
14. PX2 Send 180 Ringing.
15. UA11 Receive 180 Ringing.
16. PX2 Send 200 OK.
17. UA11 Receive 200 OK.
18. UA11 Send ACK.
19. PX2 Receive ACK.
20. PX2 Send BYE.
21. UA11 Receive BYE.
22. UA11 Send 200 OK.
23. PX2 Receive 200 OK.
24. PX2 Send BYE.
25. UA11 Receive BYE.
26. UA11 Send 200 OK.
27. PX2 Receive 200 OK.

**=== Message example ===**

4. INVITE UA11 -> NUT

```
INVITE sip:UA21@biloxi.example.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
Max-Forwards: 70
Proxy-Authorization: Digest username="UA11",
  realm="under.test.com",
  nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",
  qop=auth, nc=00000004, cnonce="6f54a149",
  uri="sip:UA21@biloxi.example.com",
  response="b51e504e73af54829e4f2bd7f8dc4654"
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA21 <sip:UA21@biloxi.example.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151

v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
```



a=rtpmap:0 PCMU/8000

#### 5. INVITE NUT -> Proxy 2

INVITE sip:UA21@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 10. 200 OK Proxy 2 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0



o=UA21 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

11. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA21 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

12. ACK UA11 -> NUT

ACK sip:UA21@client.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA21@biloxi.example.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=314159



Call-ID: 3848276298220188511@under.test.com

CSeq: 2 ACK

Content-Length: 0

13. ACK NUT -> Proxy 2

ACK sip:UA21@client.biloxi.example.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76

;received=3ffe:501:ffff:1::1

Max-Forwards: 69

Route: <sip:ss2.biloxi.example.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 ACK

Content-Length: 0

16. 200 OK Proxy 2 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=r98765

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA22@client2.biloxi.example.com>

Content-Type: application/sdp

Content-Length: 147

v=0

o=UA22 2890844527 2890844527 IN IP6 3ffe:501:ffff:22::22

s=-

c=IN IP6 3ffe:501:ffff:22::22

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

\* To tag and Contact URI are different from these in 10.200 OK.



17. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss2.biloxi.example.com;lr>, <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=r98765

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA22@client2.biloxi.example.com>

Content-Type: application/sdp

Content-Length: 147

v=0

o=UA22 2890844527 2890844527 IN IP6 3ffe:501:ffff:22::22

s=-

c=IN IP6 3ffe:501:ffff:22::22

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

18. ACK UA11 -> NUT

ACK sip:UA22@client2.biloxi.example.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKiLv329

Max-Forwards: 70

Proxy-Authorization: Digest username="UA11",

realm="under.test.com",

nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",

qop=auth, nc=00000004, cnonce="6f54a149",

uri="sip:UA21@biloxi.example.com",

response="b51e504e73af54829e4f2bd7f8dc4654"

Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=r98765

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 ACK

Content-Length: 0

19. ACK NUT -> Proxy 2



ACK sip:UA22@client2.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK5yE0nza  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKiLv329  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Route: <sip:ss2.biloxi.example.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA21 <sip:UA21@biloxi.example.com>;tag=r98765  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

20. BYE Proxy 2 -> NUT

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bKai8mVsO  
Via: SIP/2.0/UDP client2.biloxi.example.com:5060;branch=z9hG4bKcei8Ww3  
;received=3ffe:501:ffff:22::22  
Max-Forwards: 69  
Route: <sip:ss.under.test.com;lr>  
Record-Route: <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=r98765  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

21. BYE NUT -> UA11

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKbsO93jH  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bKai8mVsO  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client2.biloxi.example.com:5060;branch=z9hG4bKcei8Ww3  
;received=3ffe:501:ffff:22::22  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=r98765  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0



## 22. 200 OK UA11 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKbsO93jH  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bKai8mVsO  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client2.biloxi.example.com:5060;branch=z9hG4bKcei8Ww3  
;received=3ffe:501:ffff:22::22

Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=r98765

To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

Call-ID: 3848276298220188511@under.test.com

CSeq: 1 BYE

Content-Length: 0

## 23. 200 OK NUT -> Proxy 2

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bKai8mVsO  
;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP client2.biloxi.example.com:5060;branch=z9hG4bKcei8Ww3  
;received=3ffe:501:ffff:22::22

Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=r98765

To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

Call-ID: 3848276298220188511@under.test.com

CSeq: 1 BYE

Content-Length: 0

## 24. BYE Proxy 2 -> NUT

BYE sip:UA11@node.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1

Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2

Max-Forwards: 69

Route: <sip:ss.under.test.com;lr>

Record-Route: <sip:ss2.biloxi.example.com;lr>

From: UA21 <sip:UA21@biloxi.example.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

Call-ID: 3848276298220188511@under.test.com

CSeq: 1 BYE



Content-Length: 0

25. BYE NUT -> UA11

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

26. 200 OK UA11 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

27. 200 OK NUT -> Proxy 2

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=314159





To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 BYE  
Content-Length: 0

#### [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-PX2  
Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-PX2  
See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:  
See generic\_forward\_from-PX2

\*2:ACK request from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:  
- outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request



- Bodies:  
See generic\_forward\_from-UA11

\*3:BYE request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-PX2

- Header fields:
  - outside of a dialog  
See generic\_forward\_from-PX2
  - See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-PX2

\*4:200 response from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA11  
Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-UA11  
See generic\_forward\_response

- Bodies:  
See generic\_forward\_from-PX2

\*5:BYE request from NUT to UA11.

As a SIP Message,



See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-PX2

- Header fields:

- outside of a dialog

See generic\_forward\_from-PX2

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-PX2

\*6:200 response from NUT to PX2.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA11

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA11

See generic\_forward\_response

- Bodies:

See generic\_forward\_from-PX2

## [REFERENCE]

[RFC3261-16-92]

### 16.7 Response Processing

When a response is received by an element, it first tries to locate a client transaction (Section 17.1.3) matching the response. If none is found, the element **MUST** process the response (even if it is an informational response) as a stateless proxy (described below). If a match is found, the response is handed to the client transaction.



Forwarding responses for which a client transaction (or more generally any knowledge of having sent an associated with request) is not found improves robustness. In particular, it ensures that "late" 2xx responses to INVITE requests are forwarded properly.

#### 4.4.13 FW-2-2-1 - SIP Proxy- Receipt of 503 (Service Unavailable) response

##### [NAME]

FW-2-2-1 - SIP Proxy- Receipt of 503 (Service Unavailable) response

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy generates a 500 (Server Internal Error) response and forwards that upstream when receiving a 503 (Service Unavailable) response.

##### [REQUIREMENT]

NONE

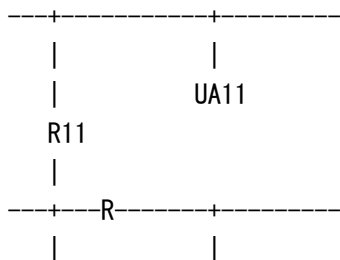
##### [PARAMETER]

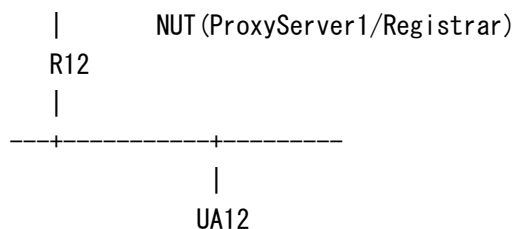
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

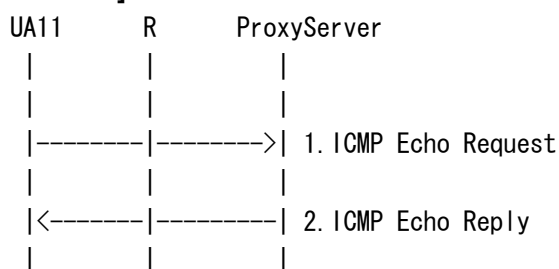




#### [CONFIGURATION for NUT]

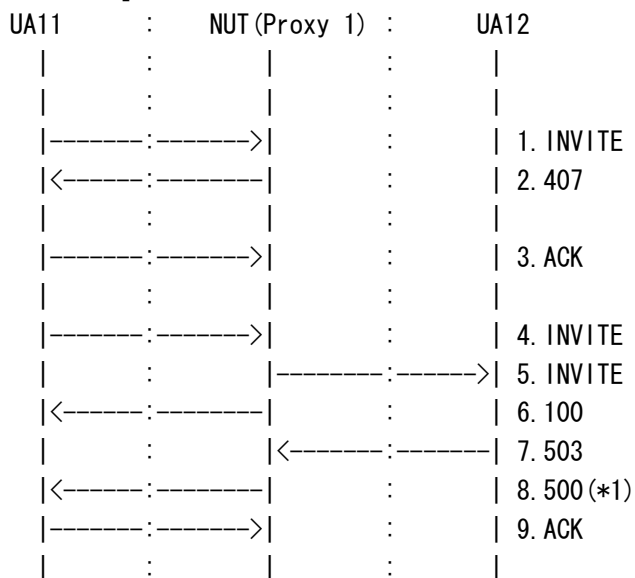
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407.
3. UA11 Send ACK.

4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 503 Service Unavailable.
8. UA11 Receive 500 Server Internal Error.
9. UA11 Send ACK.

**=== Message example ===**

7.503 Service Unavailable UA12 -> NUT

SIP/2.0 503 Service Unavailable

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>

From: UA12 <sip:UA12@under.test.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA11@node.under.test.com>

Retry-After: 3600

CSeq: 2 INVITE

Content-Length: 0

8.500 Server Internal Error NUT -> UA11

SIP/2.0 500 Server Internal Error

Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>

From: UA12 <sip:UA12@under.test.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA11@node.under.test.com>

Retry-After: 3600

CSeq: 2 INVITE

Content-Length: 0

**[JUDGMENT]**

\*1:500 response from NUT to UA11.

As a SIP Message,

See generic\_message



As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "500". [RFC3261-16-119]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

[RFC3261-16-118, 119]

#### 16.7 Response Processing

A proxy which receives a 503 (Service Unavailable) response SHOULD NOT forward it upstream unless it can determine that any subsequent requests it might proxy will also generate a 503. In other words, forwarding a 503 means that the proxy knows it cannot service any requests, not just the one for the Request-URI in the request which generated the 503. If the only response that was received is a 503, the proxy SHOULD generate a 500 response and forward that upstream.

#### **4.4.14 FW-2-2-2 - SIP Proxy- Receipt of 503 (Service Unavailable) response without Retry-After**

##### [NAME]

FW-2-2-2 - SIP Proxy- Receipt of 503 (Service Unavailable) response without Retry-After

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy generates a 500 (Server Internal Error) response and sends that to that upstream when receiving a 503 (Service Unavailable) response without a Retry-After header field.

# **[REQUIREMENT]**

NONE

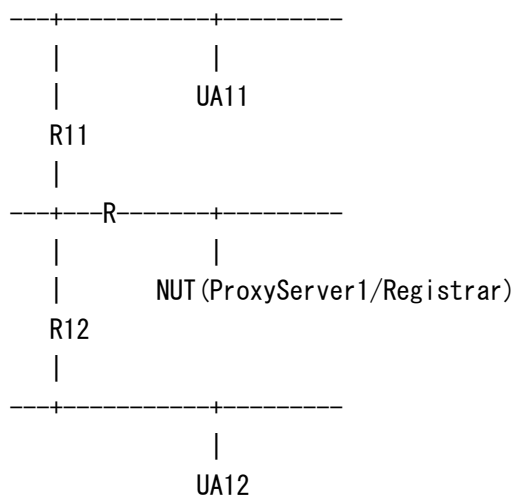
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

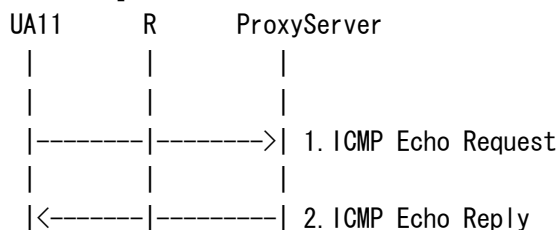
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# **[INITIALIZATION]**





1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

UA11	:	NUT (Proxy 1)	:	UA12
	:		:	
	:		:	
-----:	----->		:	1. INVITE
<-----:	-----		:	2. 407
	:		:	
-----:	----->		:	3. ACK
	:		:	
-----:	----->		:	4. INVITE
	:	-----:	----->	5. INVITE
<-----:	-----		:	6. 100
	:	<-----:	-----	7. 503
<-----:	-----		:	8. 500 (*1)
-----:	----->		:	9. ACK
	:		:	

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 503 Service Unavailable.
8. UA11 Receive 500 Server Internal Error.
9. UA11 Send ACK.

#### === Message example ===

7.503 Service Unavailable UA12 -> NUT

SIP/2.0 503 Service Unavailable

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=314159

To: UA12 <sip:UA12@under.test.com>;tag=9fxced76sl



Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA11@node.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

8.500 Server Internal Error NUT -> UA11

SIP/2.0 500 Server Internal Error  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=314159  
To: UA12 <sip:UA12@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

#### [JUDGMENT]

\*1:500 response from NUT to UA11.

destination IP address Must be different from that in 1.INVITE.

As a SIP Message,

See generic\_message

The destination address should be equal to 3ffe:501:ffff:50::51.

[RFC3261-21-27]

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "500". [RFC3261-16-119]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was



received. [RFC3261-18-28]

#### [REFERENCE]

[RFC3261-16-118, 119]

#### 16.7 Response Processing

A proxy which receives a 503 (Service Unavailable) response SHOULD NOT forward it upstream unless it can determine that any subsequent requests it might proxy will also generate a 503. In other words, forwarding a 503 means that the proxy knows it cannot service any requests, not just the one for the Request-URI in the request which generated the 503. If the only response that was received is a 503, the proxy SHOULD generate a 500 response and forward that upstream.

#### 4.4.15 FW-2-2-3 - SIP Proxy- Forwarding of INVITE to an alternate server upon receipt of 503 response

##### [NAME]

FW-2-2-3 - SIP Proxy- Forwarding of INVITE to an alternate server upon receipt of 503 response

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy properly forwards an INVITE request to an alternate server when receiving a 503 (Service Unavailable) response.

##### [REQUIREMENT]

Only when a proxy supports DNS.

##### [PARAMETER]

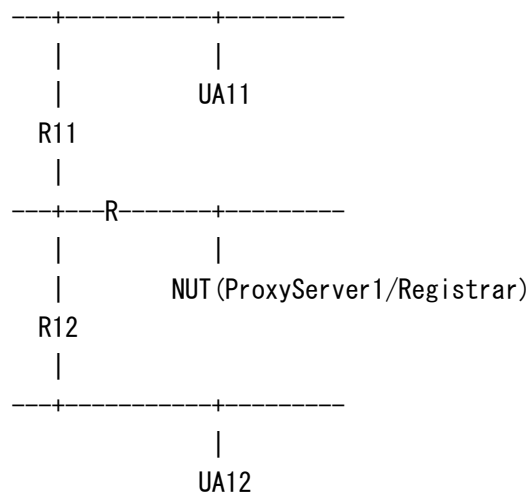
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
------------------------------------	-------------------------

UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
UA12'(IPv6)	3ffe:501:ffff:2::3/64
R(IPv6)	3ffe:501:ffff:50::1/64

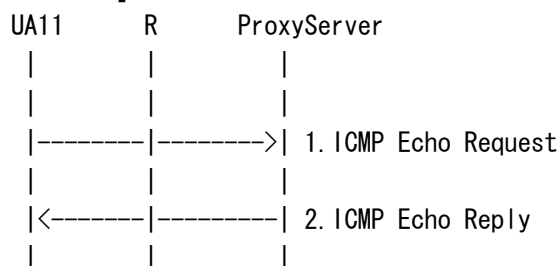
#### [TOPOLOGY]



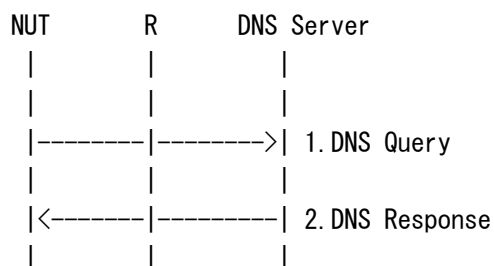
#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



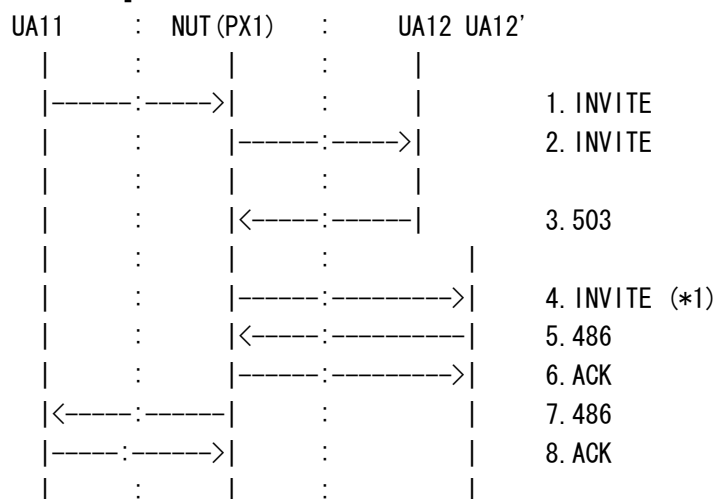
1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.



ss2.biloxi.example.com resolves to two IP addresses.

(node11.under.test.com 3ffe:501:ffff:2::2)  
 (node11.under.test.com 3ffe:501:ffff:2::3)

# [PROCEDURE]



1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA12 Send 503 Service Unavailable.
4. UA12' Receive INVITE.
5. UA12' Send 486 Busy Here.
6. UA12' Receive ACK.
7. UA11 Receive 486 Busy Here.
8. UA11 Send ACK.

## === Message example ===

3. 503 Service Unavailable UA12 -> NUT

SIP/2.0 503 Service Unavailable

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKbf9f45

;received=3ffe:501:ffff:50::50

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@biloxi.example.com>;tag=53fHlqlQ3

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

Retry-After: 3600

CSeq: 1 INVITE

Content-Length: 0

# [JUDGMENT]



- \*\* precondition for testing this scenario:
  - NUT must resolve PX2 to two IP addresses.

\*1:INVITE request from NUT to UA12'.

destination IP address Must be different from that in 1.INVITE.

As a SIP Message,

See generic\_message

The destination address should be equal to 3ffe:501:ffff:50::51.

[RFC3261-21-27]

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

#### [REFERENCE]

[RFC3261-21-27, 28]

#### 21.5.4 503 Service Unavailable

A client (proxy or UAC) receiving a 503 (Service Unavailable) SHOULD attempt to forward the request to an alternate server. It SHOULD NOT forward any other requests to that server for the duration specified in the Retry-After header field, if present.

#### 4.4.16 FW-2-2-4 - SIP Proxy- Forwarding of INVITE to an alternate server upon receipt of 503 response

# **[NAME]**

FW-2-2-4 - SIP Proxy- Forwarding of INVITE to an alternate server upon receipt of 503 response

# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy properly forwards a 500 (Server Internal Error) response to that upstream when receiving two 503 (Server Internal Error) responses .

# **[REQUIREMENT]**

Only when a proxy supports two-proxy architecture and DNS.

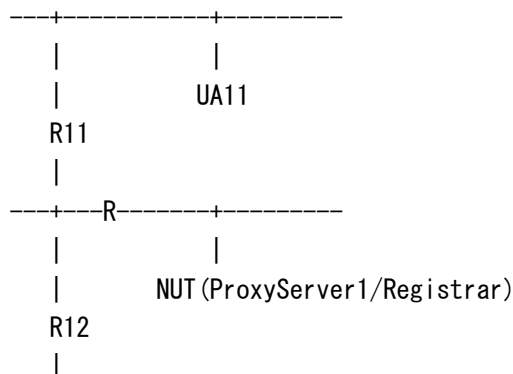
# **[PARAMETER]**

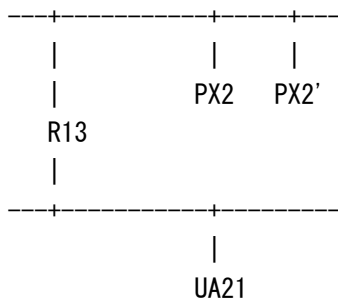
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com;lr
PX2'	sip:ss2.biloxi.example.com;lr

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
PX2'(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

# **[TOPOLOGY]**

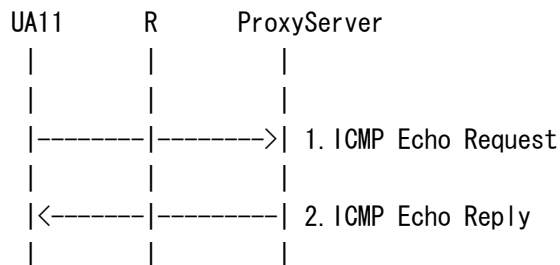




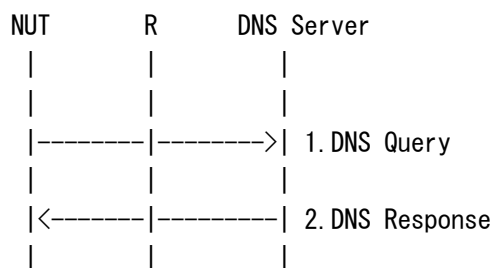
#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

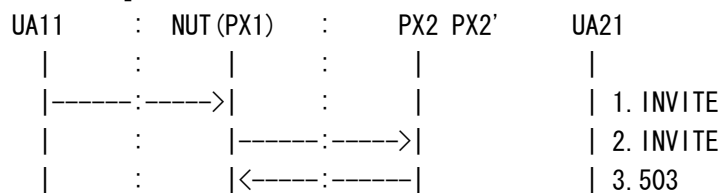


ss2.biloxi.example.com resolves to two IP addresses.

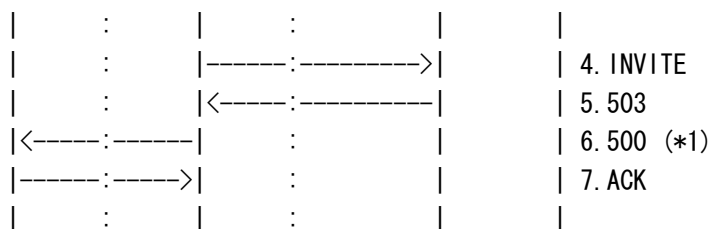
(ss2.biloxi.example.com 3ffe:501:ffff:20::20)

(ss2.biloxi.example.com 3ffe:501:ffff:20::21)

#### [PROCEDURE]







1. UA11 Send INVITE.
2. PX2 Receive INVITE.
3. PX2 Send 503 Service Unavailable.
4. PX2' Receive INVITE.
5. PX2' Send 503 Service Unavailable.
6. UA11 Receive 500 Server Internal Error.
7. UA11 Send ACK.

**=== Message example ===**

3. 503 Service Unavailable PX2 -> NUT

SIP/2.0 503 Service Unavailable

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKbf9f45

;received=3ffe:501:ffff:50::50

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA21 <sip:UA21@biloxi.example.com>;tag=53fHlqlQ3

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

Retry-After: 3600

CSeq: 1 INVITE

Content-Length: 0

**[JUDGMENT]**

- \*\* precondition for testing this scenario:
- NUT must resolve PX2 to two IP addresses.

\*1:500 response from NUT to PX2.

destination IP address Must be different from that in 1.INVITE.

As a SIP Message,

See generic\_message

The destination address should be equal to 3ffe:501:ffff:50::51.

[RFC3261-21-27]

As a SIP Message,

See generic\_message



As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "500". [RFC3261-16-118,119]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

[RFC3261-21-27, 28]

#### 21.5.4 503 Service Unavailable

A client (proxy or UAC) receiving a 503 (Service Unavailable) SHOULD attempt to forward the request to an alternate server. It SHOULD NOT forward any other requests to that server for the duration specified in the Retry-After header field, if present.

### 4.4.17 FW-3-1-1 - SIP Proxy- Session Establishment Through Two Proxies with a strict router in separate domains (Callee)

#### [NAME]

FW-3-1-1 - SIP Proxy- Session Establishment Through Two Proxies with a strict router in separate domains (Callee)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that the Proxy1 properly processes when a session through two proxies with a strict router in separate domains is established and a BYE request is forwarded from the strict router.

#### [REQUIREMENT]

Only when a proxy supports 2-proxy architecture and strict routing.

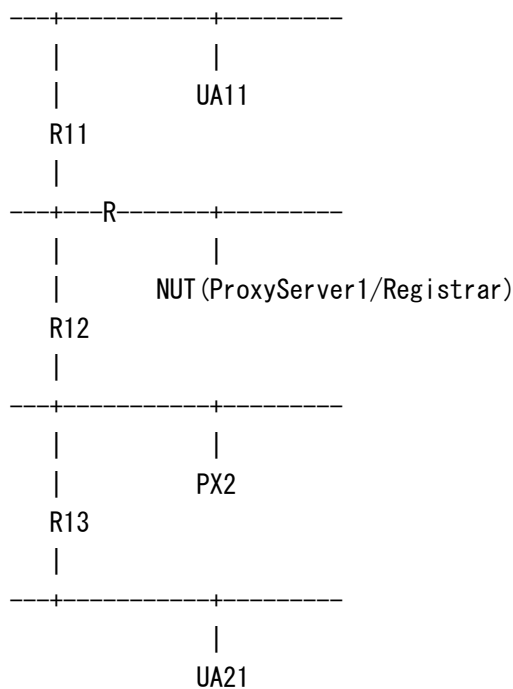
# [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

# [TOPOLOGY]

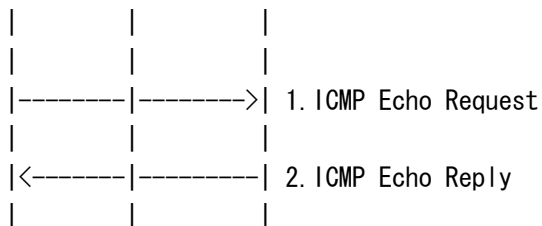


# [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]

UA11      R      ProxyServer



- [PROCEDURE]**





<-----	:		:		200
	:		:		

1. PX2 Send INVITE.
2. UA11 Receive INVITE.
3. PX2 Receive 100 Trying.
4. UA11 Send 180 Ringing.
5. PX2 Receive 180 Ringing.
6. UA11 Send 200 OK.
7. PX2 Receive 200 OK.
8. PX2 Send ACK.
9. UA11 Receive ACK.
10. PX2 Send BYE.
11. UA11 Receive BYE.
12. UA11 Send 200 OK.
13. PX2 Receive 200 OK.

**=== Message example ===**

1. INVITE Proxy 2 -> NUT

```
INVITE sip:UA11@under.test.com SIP/2.0
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9
    ;received=3ffe:501:ffff:2::2
Max-Forwards: 69
Record-Route: <sip:ss2.biloxi.example.com>
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl
To: UA11 <sip:UA11@under.test.com>
Call-ID: 3848276298220188511@biloxi.example.com
CSeq: 2 INVITE
Contact: <sip:UA21@client.biloxi.example.com>
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2
s=-
c=IN IP6 3ffe:501:ffff:2::2
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```



## 2.INVITE NUT -> UA11

INVITE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com:lr>,  
<sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 INVITE  
Contact: <sip:UA21@client.biloxi.example.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA21 2890844526 2890844526 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 3.100 Trying NUT -> Proxy 2

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 INVITE  
Content-Length: 0

## 4.180 Ringing UA11 -> NUT



SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com:lr>,  
<sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
Contact: <sip:UA11@node.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

5.180 Ringing NUT -> Proxy 2

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com:lr>,  
<sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
Contact: <sip:UA11@node.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

6.200 OK UA11 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9



;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA11 2890844527 2890844527 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

7.200 OK NUT -> Proxy 2

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:2::2  
Record-Route: <sip:ss.under.test.com;lr>,  
<sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA11 2890844527 2890844527 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 3456 RTP/AVP 0





a=rtpmap:0 PCMU/8000

#### 8.ACK Proxy 2 -> NUT

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bKh7ygtr5s  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKJh9ygrCt  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 69  
Route: <sip:ss.under.test.com;lr>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 ACK  
Content-Length: 0

#### 9.ACK NUT -> UA11

ACK sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKJtHu8RfskE  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bKh7ygtr5s  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKJh9ygrCt  
;received=3ffe:501:ffff:2::2  
Max-Forwards: 68  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 2 ACK  
Content-Length: 0

/\* RTP streams are established between UA11 and UA21 \*/

/\* UA21 Hangs Up with UA11. \*/

#### 10.BYE Proxy2 -> NUT

BYE sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7



;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Route: <UA11@node.under.test.com>  
Record-Route: <sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 3 BYE  
Content-Length: 0

11.BYE NUT -> UA11

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKhgtuBft3  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 68  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 3 BYE  
Content-Length: 0

12.200 OK UA11 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKhgtuBft3  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP ss2.biloxi.example.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:20::20  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 3 BYE  
Content-Length: 0



13.200 OK NUT -> Proxy2

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss2.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:20::20

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>, <sip:ss2.under.test.com>

From: UA21 <sip:UA21@biloxi.example.com>;tag=9fxced76sl

To: UA11 <sip:UA11@under.test.com>;tag=314159

Call-ID: 3848276298220188511@biloxi.example.com

CSeq: 3 BYE

Content-Length: 0

#### [JUDGMENT]

\*1:BYE request from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

Request-URI: Must be the URI of first URI from the route set,  
because that does not contain the lr parameter. [RFC3261-8-33]

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

\* Route: Must not exist. [RFC3261-16-22]

- Bodies:

See generic\_forward\_from-UA11

#### [REFERENCE]

[RFC3261-16-22, 23]

#### 16.4 Route Information Preprocessing

If the Request-URI of the request contains a value this proxy previously placed into a Record-Route header field (see Section 16.6 item 4), the proxy MUST replace the Request-URI in the request with the last value from the Route header field, and remove that value from the Route header field. The proxy MUST then proceed as if it received this modified request.

#### 4.4.18 FW-3-1-2 - SIP Proxy- Session Establishment Through Two Proxies with a strict router in separate domains (Caller)

##### [NAME]

FW-3-1-2 - SIP Proxy- Session Establishment Through Two Proxies with a strict router in separate domains (Caller)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that the Proxy1 properly processes when a session through two proxies with a strict router in separate domains is established and a BYE request is forwarded to the strict router.

##### [REQUIREMENT]

Only when a proxy supports 2-proxy architecture and strict routing.

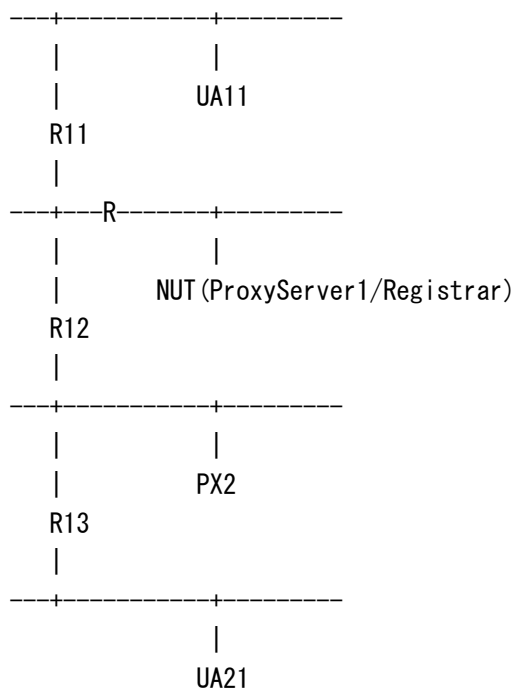
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

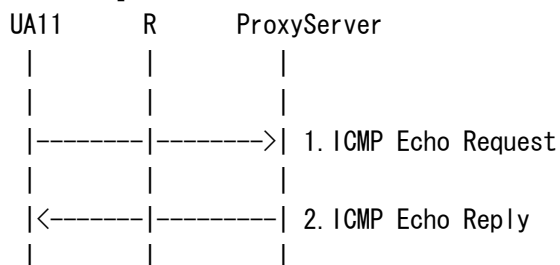
##### [TOPOLOGY]



#### [CONFIGURATION for NUT]

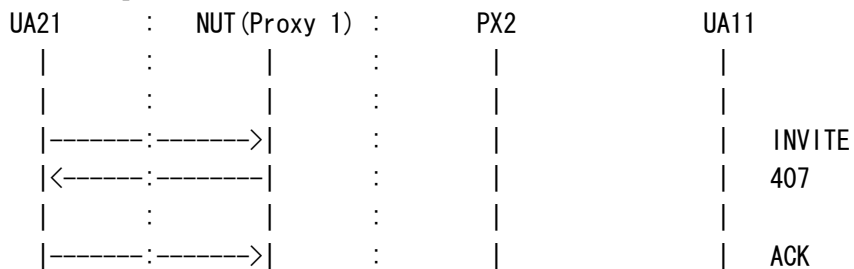
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

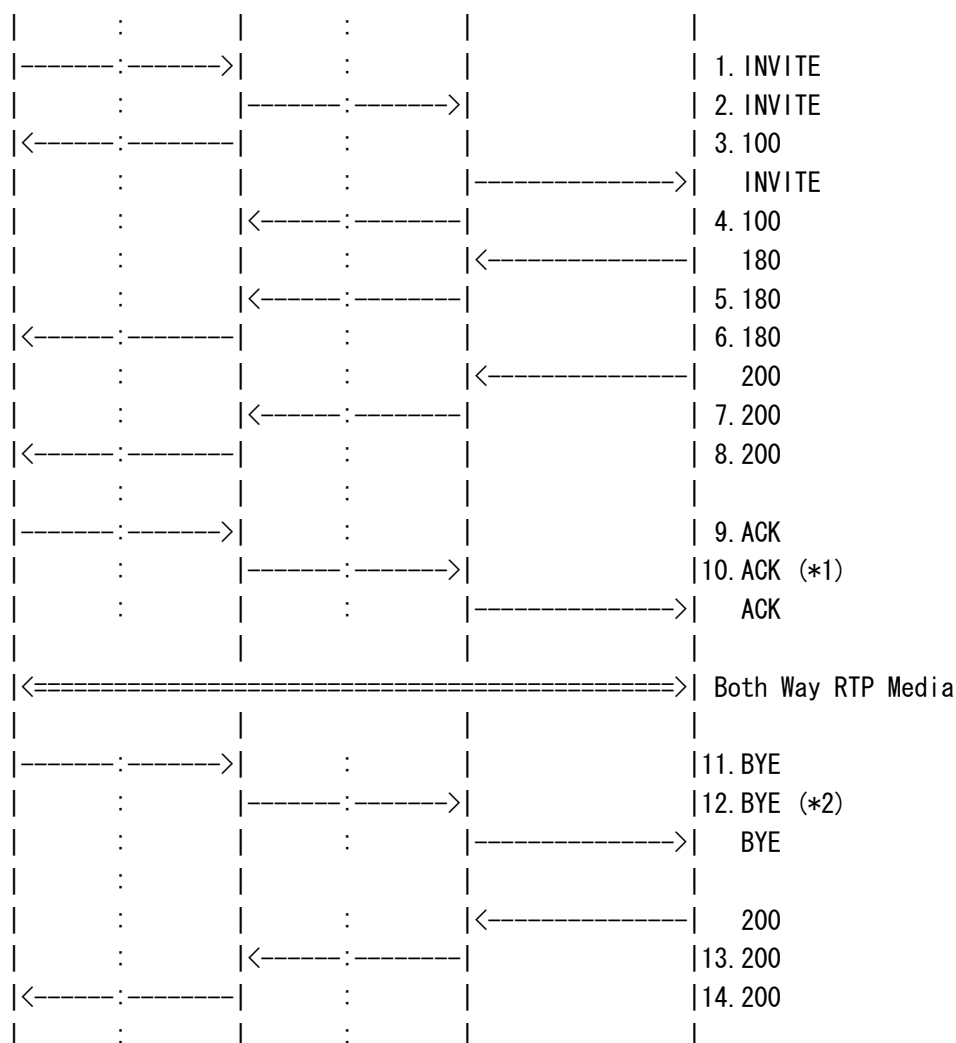
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA21 Send INVITE.
2. PX2 Receive INVITE.
3. UA21 Receive 100 Trying.
4. PX2 Send 100 Trying.
5. PX2 Send 180 Ringing.
6. UA21 Receive 180 Ringing.
7. PX2 Send 200 OK.
8. UA21 Receive 200 OK.
9. UA21 Send ACK.
10. PX2 Receive ACK.
11. UA21 Send BYE.
12. PX2 Receive BYE.
13. PX2 Send 200 OK.
14. UA21 Receive 200 OK.

=== Message example ===



#### 11. BYE UA21 -> NUT

BYE sip:UA11@biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>, <sip:ss2.biloxi.example.com>  
From: UA21 <sip:UA21@under.test.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@biloxi.example.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 3 BYE  
Content-Length: 0

#### 12. BYE NUT -> Proxy 2

BYE sip:ss2.biloxi.example.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKhgtuBft3  
Via: SIP/2.0/UDP client.biloxi.example.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Route: <UA11@biloxi.example.com>  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA21 <sip:UA21@under.test.com>;tag=9fxced76sl  
To: UA11 <sip:UA11@biloxi.example.com>;tag=314159  
Call-ID: 3848276298220188511@biloxi.example.com  
CSeq: 3 BYE  
Content-Length: 0

### [JUDGMENT]

\*1: ACK request from NUT to PX2.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain  
Request-URI: Must equal the last value of Route header field.  
[RFC3261-16-70, RFC3261-16-71]

- Header fields:



- outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request

\* Route: Must equal the Request-URI in "10.ACK".  
[RFC3261-16-70,72]

- Bodies:  
See generic\_forward\_from-UA11

\*2:BYE request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
Request-URI: Must equal the last value of Route header field.  
[RFC3261-16-70, 71]  
Must be the URI of first URI from the route set,  
because that does not contain the lr parameter. [RFC3261-8-33]

- Header fields:
  - outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request

\* Route: Must equal the Request-URI in "10.ACK".  
[RFC3261-16-70, RFC3261-16-72]

- Bodies:  
See generic\_forward\_from-UA11

#### **[REFERENCE]**

[RFC3261-16-69, 70, 71, 72]

16.6 Request Forwarding

If the copy contains a Route header field, the proxy **MUST**  
inspect the URI in its first value. If that URI does not





contain an lr parameter, the proxy MUST modify the copy as follows:

- The proxy MUST place the Request-URI into the Route header field as the last value.
- The proxy MUST then place the first Route header field value into the Request-URI and remove that value from the Route header field.

#### 4.4.19 FW-4-1-1 - SIP Proxy- Unsuccessful No Answer with Proxy-Require [CANCEL]

##### [NAME]

FW-4-1-1 - Unsuccessful No Answer with Proxy-Require [CANCEL]

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy ignores a Proxy-Require header field in the CANCEL request when a UA receives no response and sends a CANCEL request.

##### [REQUIREMENT]

NONE

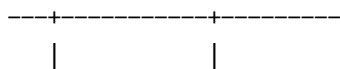
##### [PARAMETER]

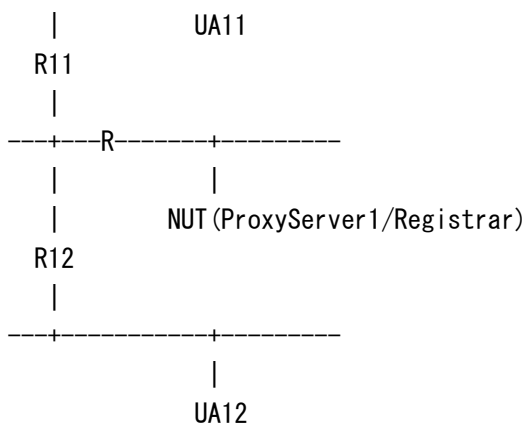
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

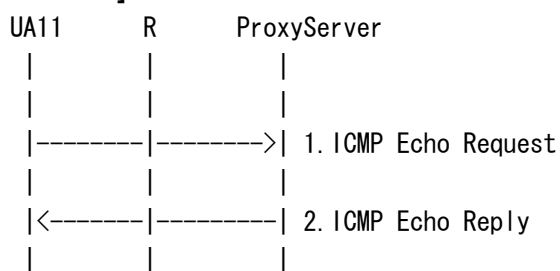




#### [CONFIGURATION for NUT]

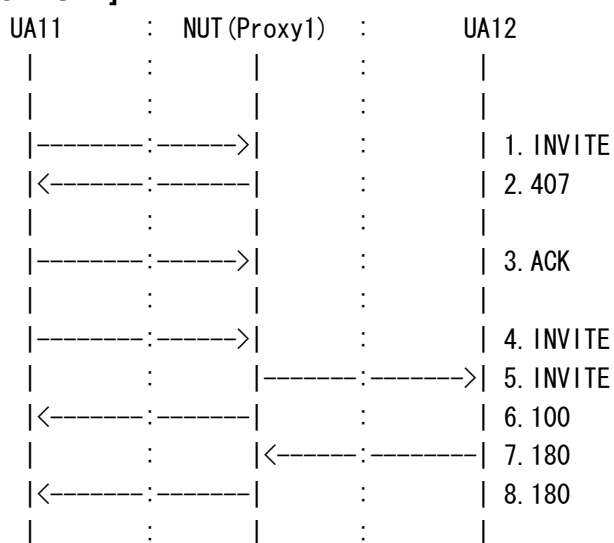
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

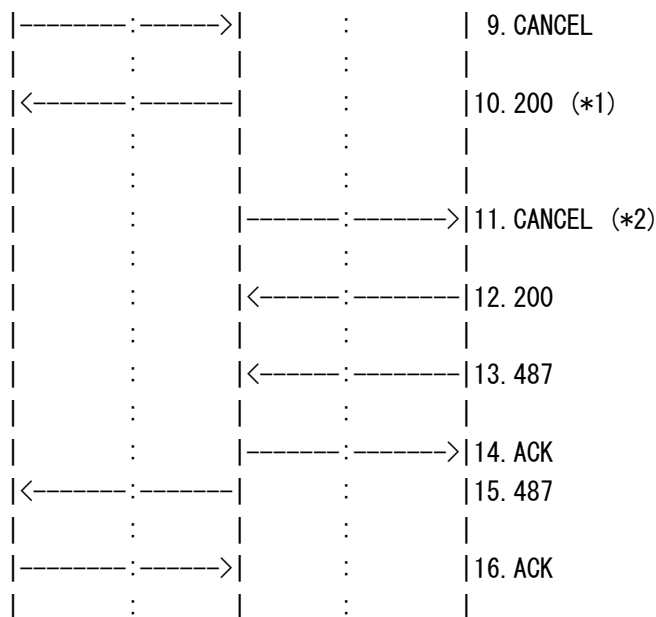
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA11 Send CANCEL.
10. UA11 Receive 200 OK.
11. UA12 Receive CANCEL.
12. UA12 Send 200 OK.
13. UA12 Send 487 Request Terminated.
14. UA12 Receive ACK.
15. UA11 Receive 487 Request Terminated.
16. UA11 Send ACK.

**=== Message example ===**

9. CANCEL UA11 -> NUT

```
CANCEL sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
Max-Forwards: 70
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Route: <sip:ss.under.test.com;lr>
```



Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL  
Proxy-Require: 100rel  
Content-Length: 0

\* Contained Proxy-Require header field.

10. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL  
Content-Length: 0

\* Not contained Proxy-Require header field

11. CANCEL NUT -> UA12

CANCEL sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL  
Content-Length: 0

\* Not contained Proxy-Require header field.

## [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response-200\_for-CANCEL  
Status-Code: Must be "200". [RFC3261 16.10]



- Header fields:

- See generic\_make\_response-200\_for-CANCEL

- Must not contain Proxy-Require header field. [RFC3261-8-81]

- \* Via

- via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

- via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:CANCEL request from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

- See generic\_make\_CANCEL

- Header fields:

- outside of a dialog

- See generic\_make\_CANCEL

- Must not contain Proxy-Require header field. [RFC3261-8-81]

- Bodies:

- See generic\_make\_CANCEL

## [REFERENCE]

[RFC3261-8-80, 81]

8 General User Agent Behavior

8.2 UAS Behavior

8.2.2 Header field Inspection

8.2.2.3 Require

Note that Require and Proxy-Require MUST NOT be used in a SIP CANCEL request, or in an ACK request sent for a non-2xx response. These



header fields MUST be ignored if they are present in these requests.

#### 4.4.20 FW-4-1-2 - SIP Proxy- processing of CANCEL upon no provisional response

##### [NAME]

FW-4-1-2 - SIP Proxy- processing of CANCEL upon no provisional response

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy doesn't send a CANCEL request when no provisional response has been received.

##### [REQUIREMENT]

NONE

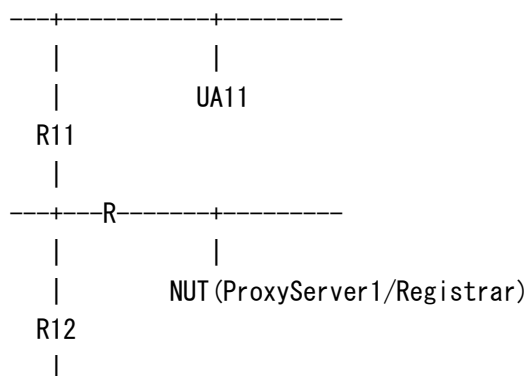
##### [PARAMETER]

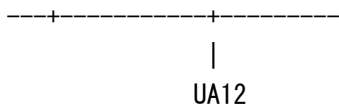
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

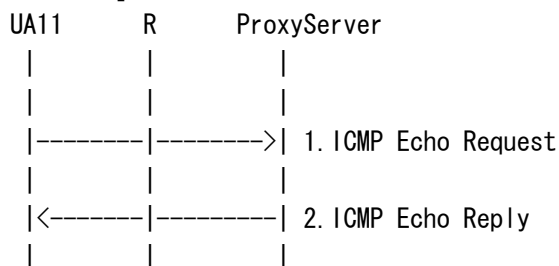




#### [CONFIGURATION for NUT]

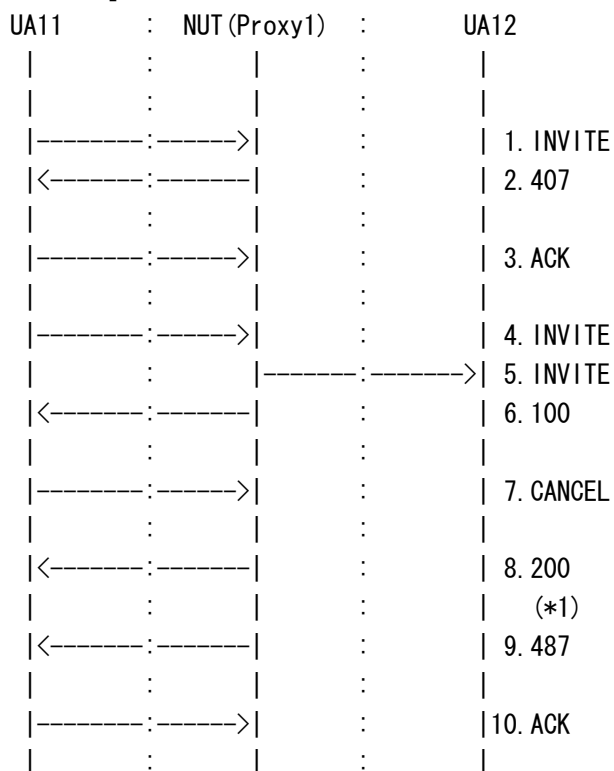
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.



2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA11 Send CANCEL.
8. UA11 Receive 200 OK.
9. UA11 Receive 487 Request Terminated.
10. UA11 Send ACK.

**=== Message example ===**

7. CANCEL UA11 -> NUT

CANCEL sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Route: <sip:ss.under.test.com;lr>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL  
Content-Length: 0

8. 200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 CANCEL  
Content-Length: 0

**[JUDGMENT]**

\*1: Must not send CANCEL request. [RFC3261-9-7,8,9]

**[REFERENCE]**

[RFC3261-9-7, 8, 9, 10, 11]

9 Canceling a Request

9.1 Client Behavior



Once the CANCEL is constructed, the client SHOULD check whether it has received any response (provisional or final) for the request being cancelled (herein referred to as the "original request").

If no provisional response has been received, the CANCEL request MUST NOT be sent; rather, the client MUST wait for the arrival of a provisional response before sending the request. If the original request has generated a final response, the CANCEL SHOULD NOT be sent, as it is an effective no-op, since CANCEL has no effect on requests that have already generated a final response. When the client decides to send the CANCEL, it creates a client transaction for the CANCEL and passes it the CANCEL request along with the destination address, port, and transport. The destination address, port, and transport for the CANCEL MUST be identical to those used to send the original request.

## 4.5 Forwarding Request

### 4.5.1 RQ-1-1-1 - SIP Proxy- Receipt of OPTIONS from UAC

#### [NAME]

RQ-1-1-1 - SIP Proxy- Receipt of OPTIONS from UAC

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy returns a 200 response when receiving an OPTIONS request from a UAC.

#### [REQUIREMENT]

Only when a proxy understands a OPTIONS request.

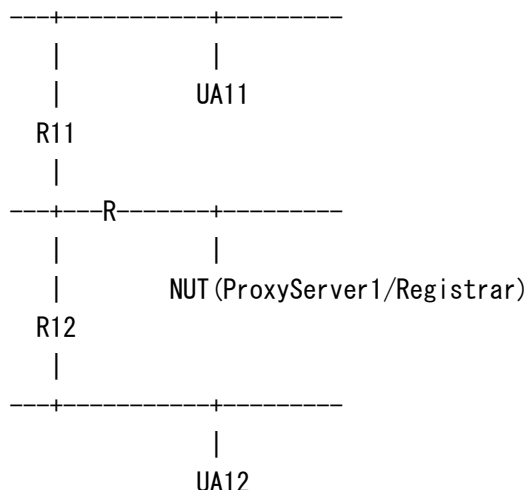
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
U A12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

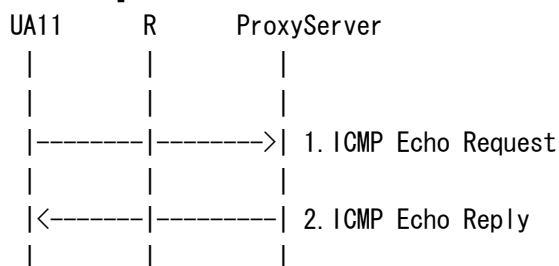
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

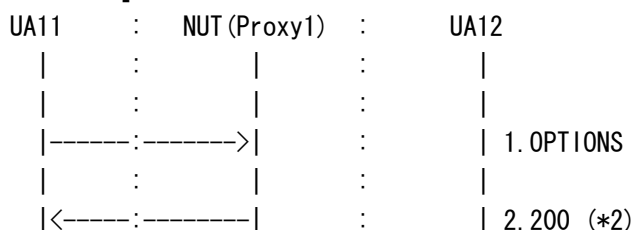
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





| : | : |

1. UA11 Send OPTIONS.
2. UA11 Receive 200 OK.

**=== Message example ===**

1.OPTIONS UA11 -> NUT

OPTIONS sip:ss.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@node.under.test.com>  
Call-ID: 3848276298220188511@atlanta.example.com  
CSeq: 1 OPTIONS  
Contact: <sip:UA11@node.under.test.com>  
Accept: application/sdp  
Content-Length: 0

2.200 OK NUT -> UA11

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@node.under.test.com>;tag=314159  
Call-ID: 3848276298220188511@atlanta.example.com  
CSeq: 1 OPTIONS  
Accept: application/sdp  
Accept-Encoding: gzip  
Accept-Language: en  
Supported: timer

**[JUDGMENT]**

\*1:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response



Status-Code: Must be "200". [RFC3261 11.2]

- Header fields:

See generic\_make\_response

See generic\_proxy-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Record-Route

Must copy all Record-Route header field values from the request into the response. [RFC3261-12-2]

rec-route: Must maintain the order of Record-Route header field values. [RFC3261-12-3]

\* Allow

Should not exist. [RFC3261-11-5]

\* Accept

Should exist. [RFC3261-11-4]

\* Accept-Encoding

Should exist. [RFC3261-11-4]

\* Accept-Language

Should exist. [RFC3261-11-4]

\* Supported

Should exist. [RFC3261-11-4]

## [REFERENCE]

[RFC3261-11-4, 5]

### 11.2 Processing of OPTIONS Request

If the response to an OPTIONS is generated by a proxy server, the proxy returns a 200 (OK), listing the capabilities of the server.

The response does not contain a message body.

Allow, Accept, Accept-Encoding, Accept-Language, and Supported header field fields SHOULD be present in a 200 (OK) response to an OPTIONS



request. If the response is generated by a proxy, the Allow header field field SHOULD be omitted as it is ambiguous since a proxy is method agnostic. Contact header fields MAY be present in a 200 (OK) response and have the same semantics as in a 3xx response. That is, they may list a set of alternative names and methods of reaching the user. A Warning header field MAY be present.

#### 4.5.2 RQ-1-1-2 - SIP Proxy- Receipt of OPTIONS when a UAS is ready to accept a call

##### [NAME]

RQ-1-1-2 - SIP Proxy- Receipt of OPTIONS when a UAS is ready to accept a call

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy copies the header fields in an OPTIONS request from UAC and doesn't reorder the ordering of them.

##### [REQUIREMENT]

Only when a proxy understands a OPTIONS request.

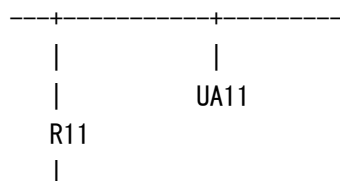
##### [PARAMETER]

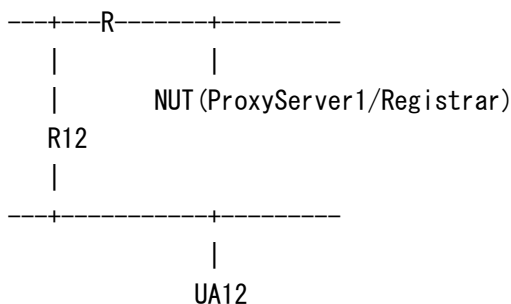
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

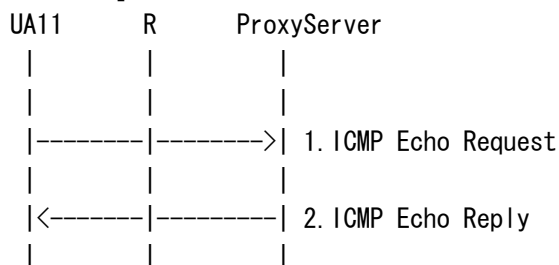




#### [CONFIGURATION for NUT]

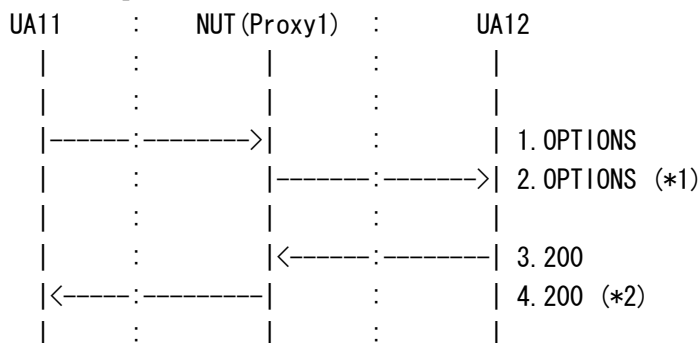
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send OPTIONS.
2. UA12 Receive OPTIONS.
3. UA12 Send 200 OK.
4. UA11 Receive 200 OK.

=== Message example ===

1.OPTIONS UA11 -> NUT



OPTIONS sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@atlanta.example.com  
CSeq: 1 OPTIONS  
Contact: <sip:UA12@node11.under.test.com>  
Accept: application/sdp  
Content-Length: 0

### 3.200 OK UA12 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@atlanta.example.com  
Contact: <sip:UA12@node11.under.test.com>  
Allow: INVITE, ACK, CANCEL, OPTIONS, BYE  
Accept: application/sdp  
Accept-Encoding: gzip  
Accept-Language: en  
Supported: timer  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

### [JUDGMENT]

\*1:OPTIONS request from NUT to UA12

As a SIP Message,  
See generic\_message



As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

\*2:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Accept

Must equal as that in the message from UA12. [RFC3261-16-43]

\* Allow

Must equal as that in the message from UA12. [RFC3261-16-43]

\* Accept-Encoding





Must equal as that in the message from UA12. [RFC3261-16-43]

\* Accept-Language

Must equal as that in the message from UA12. [RFC3261-16-43]

\* Supported

Must equal as that in the message from UA12. [RFC3261-16-43]

\* Contact

Must equal as that in the message from UA12. [RFC3261-16-43]

- Bodies:

See generic\_forward\_from-UA11

## [REFERENCE]

[RFC3261-16-42, 43, 44, 45, 46]

### 16.6 Request Forwarding

#### 1. Copy request

The proxy starts with a copy of the received request. The copy MUST initially contain all of the header fields from the received request. Fields not detailed in the processing described below MUST NOT be removed. The copy SHOULD maintain the ordering of the header fields as in the received request. The proxy MUST NOT reorder field values with a common field name (See Section 7.3.1). The proxy MUST NOT add to, modify, or remove the message body.

An actual implementation need not perform a copy; the primary requirement is that the processing for each next hop begin with the same request.

## 4.5.3 RQ-2-1-1 - SIP Proxy- Future extension about new header fields

### [NAME]

RQ-2-1-1 - SIP Proxy- Future extension about new header fields

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy doesn't refuse to forward a new header field in a request..

# **[REQUIREMENT]**

NONE

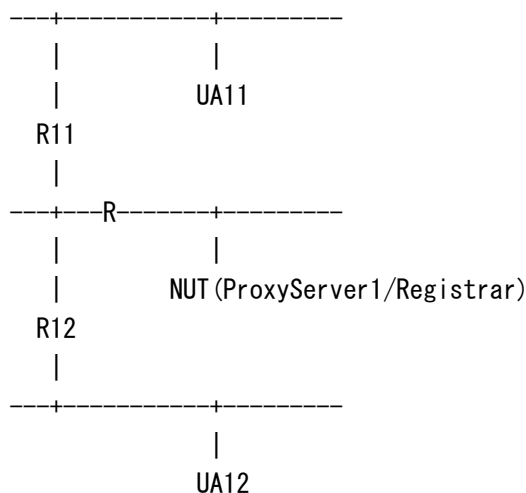
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
U A12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

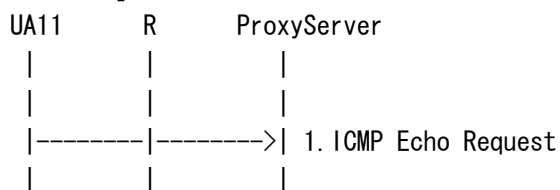
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# **[INITIALIZATION]**



```

|<-----|-----| 2. ICMP Echo Reply
|         |         |

```

1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

UA11	:	NUT (Proxy)	:	UA12
	:		:	
-----:		----->	:	1. INVITE
<-----:		-----:	:	2. 407
-----:		----->	:	3. ACK
	:		:	
-----:		----->	:	4. INVITE
	:	-----:		5. INVITE (*1)
<-----:		-----:	:	6. 100
	:	<-----:		7. 180
<-----:		-----:	:	8. 180
	:	<-----:		9. 200
<-----:		-----:	:	10. 200
	:		:	
-----:		----->	:	11. ACK
	:	-----:		12. ACK
	:		:	
<=====		=====>		Both Way RTP Media
	:		:	
	:	<-----:		13. BYE
<-----:		-----:	:	14. BYE
	:		:	
-----:		----->	:	15. 200
	:	-----:		16. 200
	:		:	

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.



11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200.
16. UA12 Receive 200.

**=== Message example ===**

2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="under.test.com", qop="auth",  
nonce="f84f1cec41e6cbe5aea9c8e88d359",  
opaque="", stale=FALSE, algorithm=MD5  
Content-Length: 0

5. INVITE NUT -> UA12

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
NewHeader field: new  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1



t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### [JUDGMENT]

\*1:INVITE request from NUT to UA12.

As a SIP Message,  
See generic\_message  
Must not refuse to forward this message. [RFC3261-16-14]

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain
- Header fields:
  - outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request
  - \* NewHeader field  
Should equal that of original message. [RFC3261-16-13]
- Bodies:  
See generic\_forward\_from-UA11

#### [REFERENCE]

[RFC3261-16-12, 13, 14]

#### 16.3 Request Validation

##### 1. Reasonable syntax check

The request **MUST** be well-formed enough to be handled with a server transaction. Any components involved in the remainder of these Request Validation steps or the Request Forwarding section **MUST** be well-formed. Any other components, well-formed or not, **SHOULD** be ignored and remain unchanged when the message is forwarded.

(snip)



This protocol is designed to be extended. Future extensions may define new methods and header fields at any time. An element **MUST NOT** refuse to proxy a request because it contains a method or header field it does not know about.

#### 4.5.4 RQ-2-1-2 - SIP Proxy- Request without a tag in From field

**[NAME]**

RQ-2-1-2 - SIP Proxy- Request without a tag in From field

**[TARGET]**

SIP Proxy (NUT)

**[PURPOSE]**

Verify that a proxy properly processes a request without a tag in a From header field.

**[REQUIREMENT]**

NONE

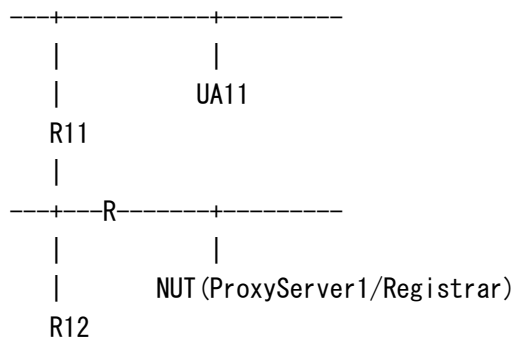
**[PARAMETER]**

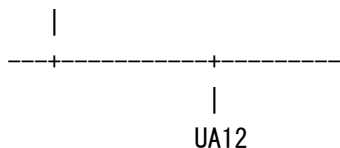
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

**[TOPOLOGY]**

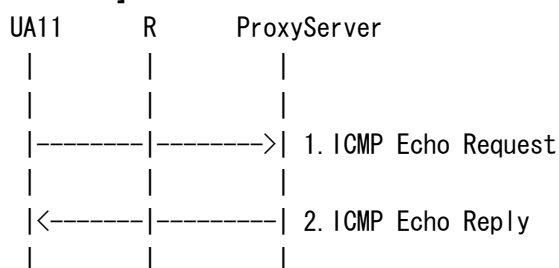




# [CONFIGURATION for NUT]

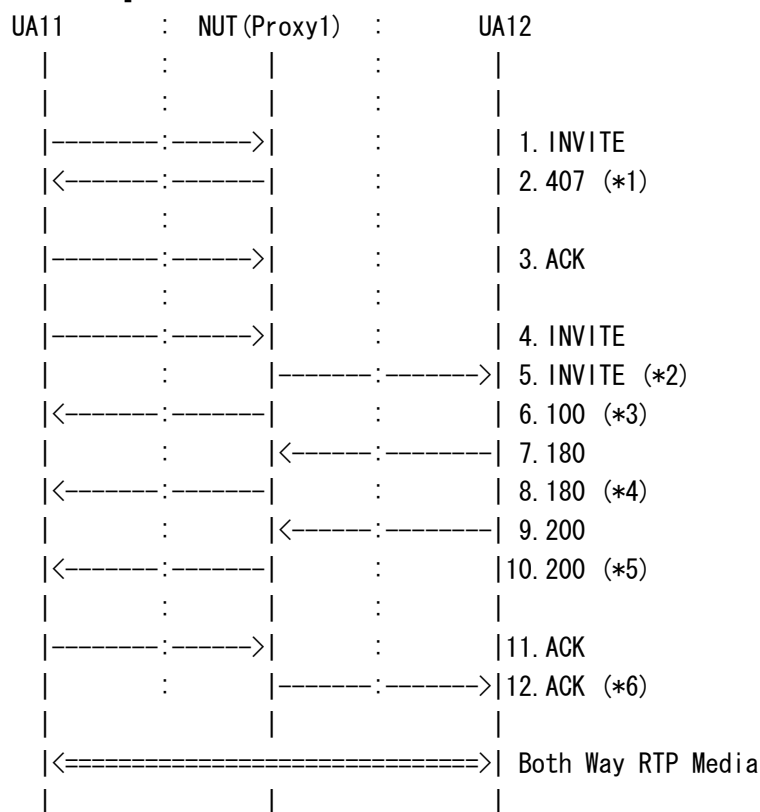
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]



	:	<-----:-----	13. BYE
<-----:-----	:		14. BYE (*7)
	:		:
-----:----->	:		15. 200
	:	-----:----->	16. 200 (*8)
	:		:

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200 OK.
16. UA12 Receive 200 OK.

**=== Message example ===**

1. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No From tag.

2. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>;tag=314159

(snip)





\* No From tag.

4.INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No From tag.

5.INVITE NUT -> UA12

INVITE sip:UA12@under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <UA12@under.test.com>

(snip)

\* No From tag.

6.100 Trying NUT -> UA11

SIP/2.0 100 Trying

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>;tag=314159

(snip)

\* No From tag.

7.180 Ringing UA12 -> NUT

SIP/2.0 180 Ringing

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com >;tag=314159

(snip)

\* No From tag.

8.180 Ringing NUT -> UA11



SIP/2.0 180 Ringing

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>;tag=314159

(snip)

\* No From tag.

9.200 OK UA12 -> NUT

SIP/2.0 200 OK

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>;tag=314159

(snip)

\* No From tag.

10.200 OK NUT -> UA11

SIP/2.0 200 OK

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>;tag=314159

(snip)

\* No From tag.

11.ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>;tag=314159

(snip)

12.ACK NUT -> UA12

ACK sip:UA12@node11.under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>

To: UA12 <sip:UA12@under.test.com>;tag=314159



(snip)

\* No From tag.

13.BYE UA12 -> NUT

BYE sip:UA11@node.under.test.com SIP/2.0

(snip)

From: UA12 <sip:UA12@under.test.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>

(snip)

\* No To tag.

14.BYE NUT -> UA11

BYE sip:UA11@node.under.test.com SIP/2.0

(snip)

From: UA12 <sip:UA12@under.test.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>

(snip)

\* No To tag.

15.200 OK UA11 -> NUT

SIP/2.0 200 OK

(snip)

From: UA12 <sip:UA12@under.test.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>

(snip)

\* No To tag.

16.200 OK Proxy -> UA12

SIP/2.0 200 OK

(snip)

From: UA12 <sip:UA12@under.test.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>

(snip)

\* No To tag.

## [JUDGMENT]

\*1:407 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* From

tag-param: Must be omitted from the From header field. [RFC3261-12-17]

\*2:INVITE request from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

\* From

tag-param: Must be omitted from the From header field. [RFC3261-12-17]

- Bodies:



See generic\_forward\_from-UA11

\*3:100 response from NUT to UA11.(Optional)

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "100" [RFC3261 4].

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* From

tag-param: Must be omitted from the From header field. [RFC3261-12-17]

\*4:180 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]



\* From

tag-param: Must be omitted from the From header field. [RFC3261-12-17]

- Bodies:

See generic\_forward\_from-UA12

\*5:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* From

tag-param: Must be omitted from the From header field. [RFC3261-12-17]

- Bodies:

See generic\_forward\_from-UA12

\*6:ACK request from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:



- outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request

\* From

tag-param: Must be omitted from the From header field. [RFC3261-12-17]

- Bodies:  
See generic\_forward\_from-UA11

\*7:BYE request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA12

- Header fields:
  - outside of a dialog  
See generic\_forward\_from-UA12  
See generic\_forward\_request

\* To

tag-param: Must be omitted from the To header field.

- Bodies:  
See generic\_forward\_from-UA12

\*8:200 response from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA11  
Status-Code: Must be "200". [RFC3261-16-104]



- Header fields:

See generic\_forward\_from-UA11

See generic\_forward\_response

\* To

tag-param: Must be omitted from the To header field. [RFC3261-16-121, RFC3261-16-122]

- Bodies:

See generic\_forward\_from-UA12

## [REFERENCE]

[RFC3261-12-12, 13, 14, 15, 16, 17]

### 12.1.1 UAS behavior

The remote sequence number **MUST** be set to the value of the sequence number in the CSeq header field of the request. The local sequence number **MUST** be empty. The call identifier component of the dialog ID **MUST** be set to the value of the Call-ID in the request. The local tag component of the dialog ID **MUST** be set to the tag in the To field in the response to the request (which always includes a tag), and the remote tag component of the dialog ID **MUST** be set to the tag from the From field in the request. A UAS **MUST** be prepared to receive a request without a tag in the From field, in which case the tag is considered to have a value of null.

[RFC3261-16-12, 13]

### 16.3 Request Validation

#### 1. Reasonable syntax check

The request **MUST** be well-formed enough to be handled with a server transaction. Any components involved in the remainder of these Request Validation steps or the Request Forwarding section **MUST** be well-formed. Any other components, well-formed or not, **SHOULD** be ignored and remain unchanged when the message is forwarded. For instance, an element would not reject a request because of a malformed Date header field. Likewise, a proxy would not remove a malformed Date header field before forwarding a request.

[RFC3261-16-121, 122]

### 16.7 Response Processing





## 6. Choosing the best response

1xx and 2xx responses may be involved in the establishment of dialogs. When a request does not contain a To tag, the To tag in the response is used by the UAC to distinguish multiple responses to a dialog creating request. A proxy **MUST NOT** insert a tag into the To header field of a 1xx or 2xx response if the request did not contain one. A proxy **MUST NOT** modify the tag in the To header field of a 1xx or 2xx response.

### 4.5.5 RQ-2-1-3 - SIP Proxy- Response without a tag in To field

#### [NAME]

RQ-2-1-3 - SIP Proxy- Response without a tag in the To field

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes a response without a tag in a To header field.

#### [REQUIREMENT]

NONE

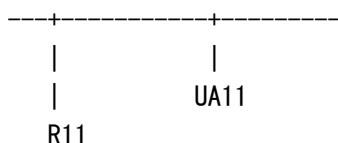
#### [PARAMETER]

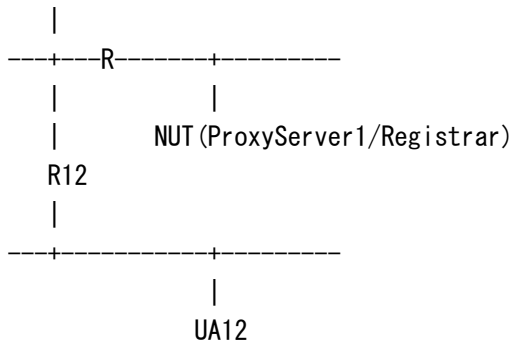
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

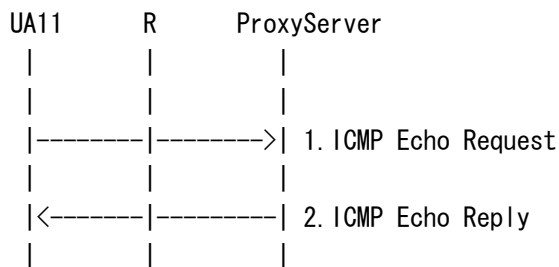




#### [CONFIGURATION for NUT]

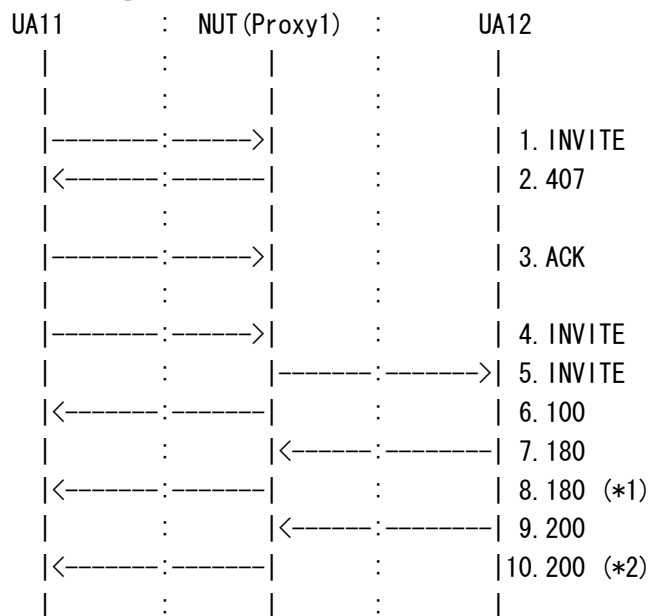
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

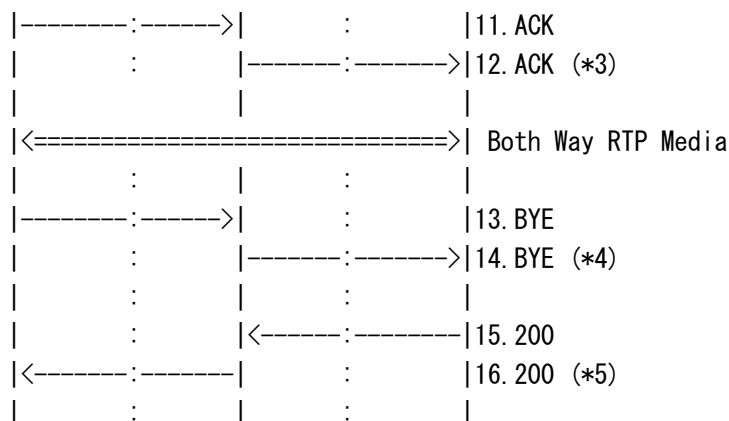
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA11 Send BYE.
14. UA12 Receive BYE.
15. UA12 Send 200 OK.
16. UA11 Receive 200 OK.

### === Message example ===

7. 180 Ringing UA12 -> NUT

SIP/2.0 180 Ringing

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

8. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing



(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

9. 200 OK UA12 -> NUT

SIP/2.0 200 OK

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

10. 200 OK NUT -> UA11

SIP/2.0 200 OK

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

11. ACK UA11 -> NUT

ACK sip:UA12@node11.under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

12. ACK NUT -> UA12

ACK sip:UA12@node11.under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>



(snip)

\* No To tag.

13.BYE UA11 -> NUT

BYE sip:UA12@node11.under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

14.BYE NUT -> UA12

BYE sip:UA12@node11.under.test.com SIP/2.0

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

15.200 OK UA12 -> NUT

SIP/2.0 200 OK

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

16.200 OK NUT -> UA11

SIP/2.0 200 OK

(snip)

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

(snip)

\* No To tag.

## [JUDGMENT]

\*1:180 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* To

tag-param: Must be omitted from the To header field. [RFC3261-16-121, RFC3261-16-122]

- Bodies:

See generic\_forward\_from-UA12

\*2:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter



contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* To

tag-param: Must be omitted from the To header field. [RFC3261-16-121, RFC3261-16-122]

- Bodies:

See generic\_forward\_from-UA12

\*3:ACK request from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

\* From

tag-param: Must equal that contained in the From header field of "1.INVITE" request. [RFC3261-12-37]

\* To

tag-param: Must be omitted from the To header field. [RFC3261-16-121, RFC3261-16-122]

- Bodies:

See generic\_forward\_from-UA11

\*4:BYE request from NUT to UA12.

As a SIP Message,

See generic\_message



As a SIP request,

- Request-Line:

See generic\_forward\_from-UA12

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA12

See generic\_forward\_request

- \* To

tag-param: Must be omitted from the To header field. [RFC3261-16-121, RFC3261-16-122]

- Bodies:

See generic\_forward\_from-UA12

\*5:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA11

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA11

See generic\_forward\_response

- \* To

tag-param: Must be omitted from the To header field.  
[RFC3261-16-121, RFC3261-16-122]

- Bodies:

See generic\_forward\_from-UA12

## **[REFERENCE]**

[RFC3261-16-121, 122]

## 16.7 Response Processing



## 6. Choosing the best response

1xx and 2xx responses may be involved in the establishment of dialogs. When a request does not contain a To tag, the To tag in the response is used by the UAC to distinguish multiple responses to a dialog creating request. A proxy **MUST NOT** insert a tag into the To header field of a 1xx or 2xx response if the request did not contain one. A proxy **MUST NOT** modify the tag in the To header field of a 1xx or 2xx response.

### 4.5.6 RQ-2-1-4 - SIP Proxy- Unrecognized type of body

#### [NAME]

RQ-2-1-4 - SIP Proxy- Unrecognized type of body

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly copies the received request and forwards the request when receiving an unrecognized media type of body.

#### [REQUIREMENT]

NONE

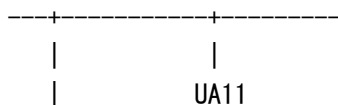
#### [PARAMETER]

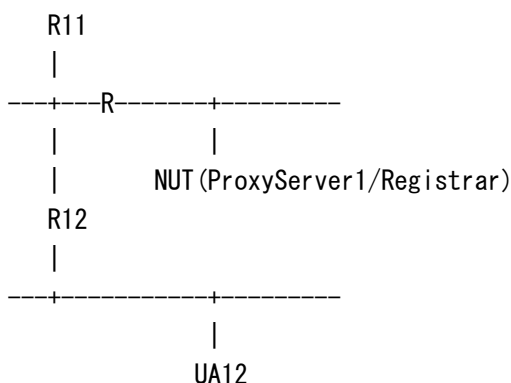
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

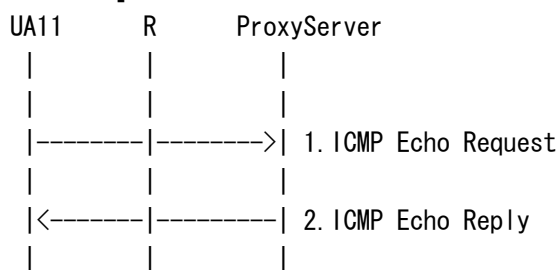




#### [CONFIGURATION for NUT]

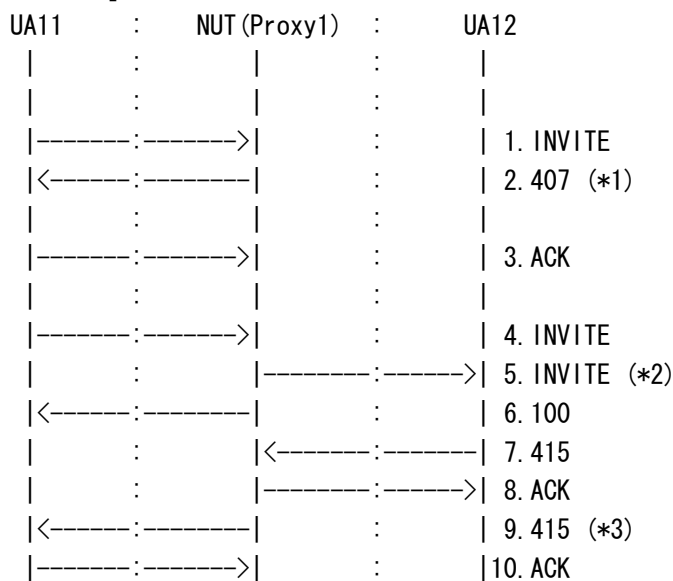
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



| : | : |

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 415 Unsupported Media Type.
8. UA12 Receive ACK.
9. UA11 Receive 415 Unsupported Media Type.
10. UA11 Send ACK.

**=== Message example ===**

4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
 Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
 Max-Forwards: 70  
 From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
 To: UA12 <sip:UA12@under.test.com>  
 Call-ID: 3848276298220188511@under.test.com  
 CSeq: 2 INVITE  
 Contact: <sip:UA11@node.under.test.com>  
 Content-Disposition: session;handling=required  
 Content-Type: unknown  
 Content-Length: XXX

unknownunknownunknownunknownunknownunknown  
 unknownunknownunknownunknownunknownunknown  
 unknownunknownunknownunknownunknownunknown  
 unknownunknownunknownunknownunknownunknown  
 unknownunknownunknownunknownunknownunknown

5. INVITE NUT -> UA12

INVITE sip:UA12@node11.under.test.com SIP/2.0  
 Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKghnF9tJ9  
 Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
 received=3ffe:501:ffff:1::1  
 Max-Forwards: 69  
 Record-Route: <sip:ss.under.test.com:lr>



From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Disposition: session;handling=required  
Content-Type: unknown  
Content-Length: XXX

unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown

#### 7. 415 Unsupported Media Type UA12 -> NUT

SIP/2.0 415 Unsupported Media Type  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKghnF9tJ9  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Accept: application/sdp  
Content-Length: 0

#### 9. 415 Unsupported Media Type NUT -> UA11

SIP/2.0 415 Unsupported Media Type  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Accept: application/sdp



Content-Length: 0

#### [JUDGMENT]

\*1:407 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:INVITE request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:  
- outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-UA11

\*3:415 response from NUT to UA11.



As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "415".

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Record-Route

Must exist.

MUST copy all Record-Route header field values from the request into the response. [RFC3261-12-2]

rec-route: MUST maintain the order of Record-Route header field values. [RFC3261-12-3]

\* Accept

Must equal as that in the message from UA12. [RFC3261-16-43]

## [REFERENCE]

[RFC3261-16-42, 43, 44, 45, 46]

### 16.6 Request Forwarding

#### 1. Copy request

The proxy starts with a copy of the received request. The copy MUST initially contain all of the header fields from the received request. Fields not detailed in the processing described below MUST NOT be removed. The copy SHOULD maintain the ordering of the header fields as in the received request. The proxy MUST NOT reorder field values with a common field name (See Section 7.3.1). The proxy MUST NOT add to, modify, or remove the message body.

An actual implementation need not perform a copy; the primary



requirement is that the processing for each next hop begin with the same request.

#### 4.5.7 RQ-2-1-5 - SIP Proxy- Unrecognized encoding of body

##### [NAME]

RQ-2-1-5 - SIP Proxy- Unrecognized encoding of body

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy properly processes an unrecognized encoding of body.

##### [REQUIREMENT]

NONE

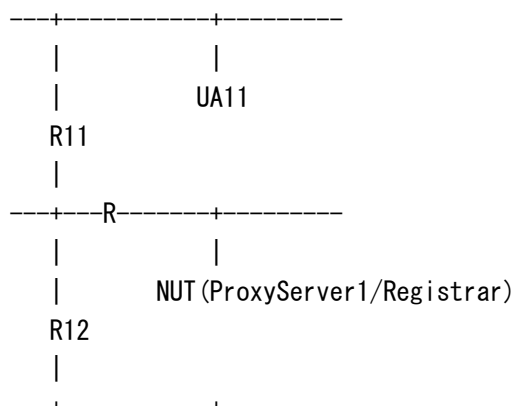
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

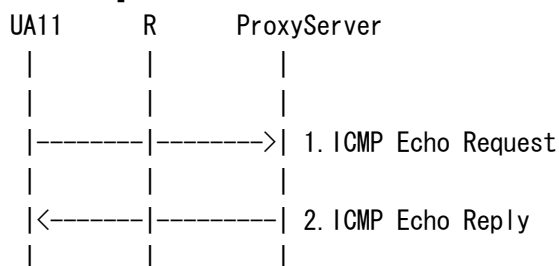


UA12

### [CONFIGURATION for NUT]

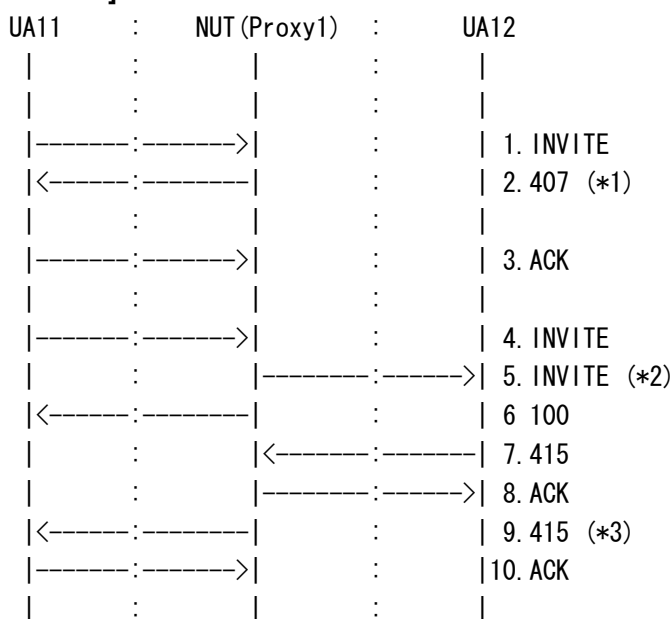
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.





7. UA12 Send 415 Unsupported Media Type.
8. UA12 Receive ACK.
9. UA11 Receive 415 Unsupported Media Type.
10. UA11 Send ACK.

**=== Message example ===**

4.INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Disposition: session;handling=required  
Content-Encoding: unknownEncoding  
Content-Length: XXX

unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown

5.INVITE NUT -> UA12

INVITE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKghnF9tJ9  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Disposition: session;handling=required  
Content-Encoding: unknownEncoding  
Content-Length: XXX



unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown

#### 7. 415 Unsupported Media Type UA12 -> NUT

SIP/2.0 415 Unsupported Media Type

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKghnF9tJ9  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Accept-Encoding: gzip

Content-Length: 0

#### 9. 415 Unsupported Media Type NUT -> UA11

SIP/2.0 415 Unsupported Media Type

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Accept-Encoding: gzip

Content-Length: 0

### [JUDGMENT]

\*1:407 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,



- Status-Line:

See generic\_make\_response

Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:INVITE request from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

\*3:415 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_response

Status-Code: Must be "415".



- Header fields:

See generic\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Record-Route

Must exist.

MUST copy all Record-Route header field values from the request into the response. [RFC3261-12-2]

rec-route: MUST maintain the order of Record-Route header field values. [RFC3261-12-3]

\* Accept-Encoding

Must equal as that in the message from UA12. [RFC3261-16-43]

## [REFERENCE]

[RFC3261-16-42, 43, 44, 45, 46]

### 16.6 Request Forwarding

#### 1. Copy request

The proxy starts with a copy of the received request. The copy MUST initially contain all of the header fields from the received request. Fields not detailed in the processing described below MUST NOT be removed. The copy SHOULD maintain the ordering of the header fields as in the received request. The proxy MUST NOT reorder field values with a common field name (See Section 7.3.1). The proxy MUST NOT add to, modify, or remove the message body.

An actual implementation need not perform a copy; the primary requirement is that the processing for each next hop begin with the same request.

## 4.5.8 RQ-2-1-6 - SIP Proxy- Unrecognized language of body

### [NAME]

RQ-2-1-6 - SIP Proxy- Unrecognized language of body

### [TARGET]

## SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly processes a message body in unrecognized language

### [REQUIREMENT]

NONE

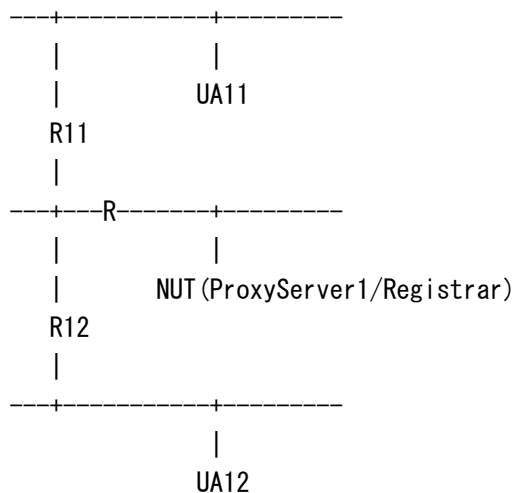
### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

### [TOPOLOGY]

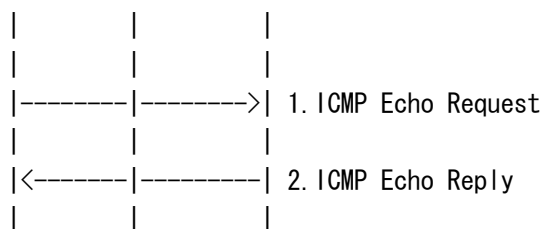


### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

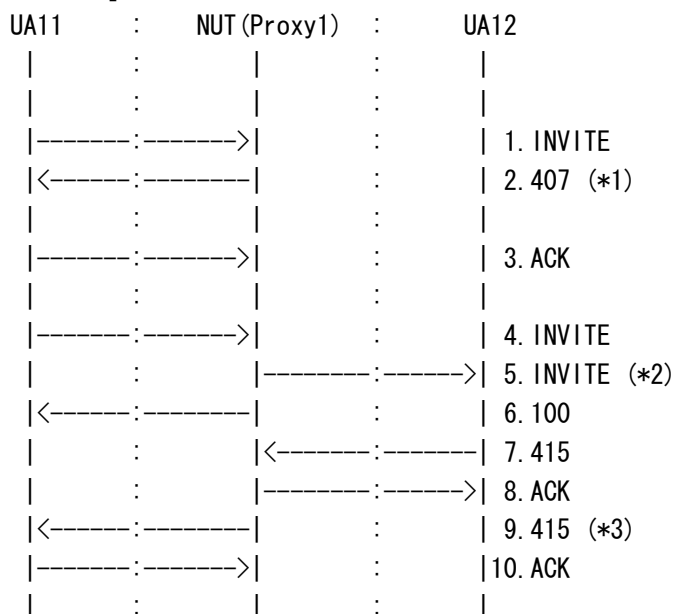
### [INITIALIZATION]

UA11      R      ProxyServer



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 415 Unsupported Media Type.
8. UA12 Receive ACK.
9. UA11 Receive 415 Unsupported Media Type.
10. UA11 Send ACK.

#### === Message example ===

4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0



Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
Max-Forwards: 69  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Disposition: session;handling=required  
Content-Language: unknownLanguage  
Content-Length: XXX

unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown

#### 5. INVITE NUT -> UA12

INVITE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKghnF9tJ9  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Disposition: session;handling=required  
Content-Language: unknownLanguage  
Content-Length: XXX

unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown  
unknownunknownunknownunknownunknownunknown

#### 7. 415 Unsupported Media Type UA12 -> NUT



SIP/2.0 415 Unsupported Media Type  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKghnF9tJ9  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Accept-Language: en  
Content-Length: 0

#### 9. 415 Unsupported Media Type NUT -> UA11

SIP/2.0 415 Unsupported Media Type  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Accept-Language: en  
Content-Length: 0

### [JUDGMENT]

\*1:407 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:  
See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]





via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:INVITE request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:  
- outside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-UA11

\*3:415 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_response  
Status-Code: Must be "415".

- Header fields:  
See generic\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Record-Route



Must exist.

MUST copy all Record-Route header field values from the request into the response. [RFC3261-12-2]

rec-route: MUST maintain the order of Record-Route header field values.  
[RFC3261-12-3]

\* Accept-Language

Must equal as that in the message from UA12. [RFC3261-16-43]

## [REFERENCE]

[RFC3261-16-42, 43, 44, 45, 46]

### 16.6 Request Forwarding

#### 1. Copy request

The proxy starts with a copy of the received request. The copy MUST initially contain all of the header fields from the received request. Fields not detailed in the processing described below MUST NOT be removed. The copy SHOULD maintain the ordering of the header fields as in the received request. The proxy MUST NOT reorder field values with a common field name (See Section 7.3.1). The proxy MUST NOT add to, modify, or remove the message body.

An actual implementation need not perform a copy; the primary requirement is that the processing for each next hop begin with the same request.

### 4.5.9 RQ-3-1-1 - SIP Proxy- Receipt of BYE with an unacceptable header field

#### [NAME]

RQ-3-1-1 - SIP Proxy- Receipt of BYE with an unacceptable header field

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy ignores and forwards the BYE request, remaining unchanging that header field when receiving a BYE request with an unacceptable header field..

#### [REQUIREMENT]

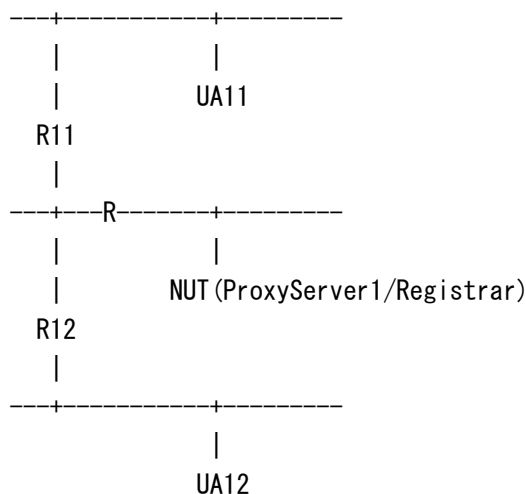
NONE

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

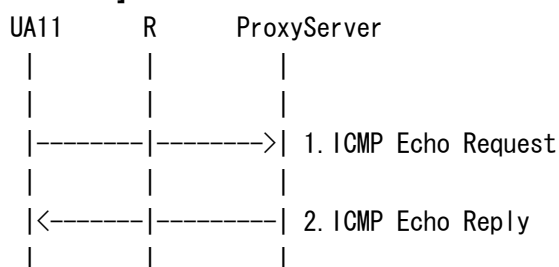
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

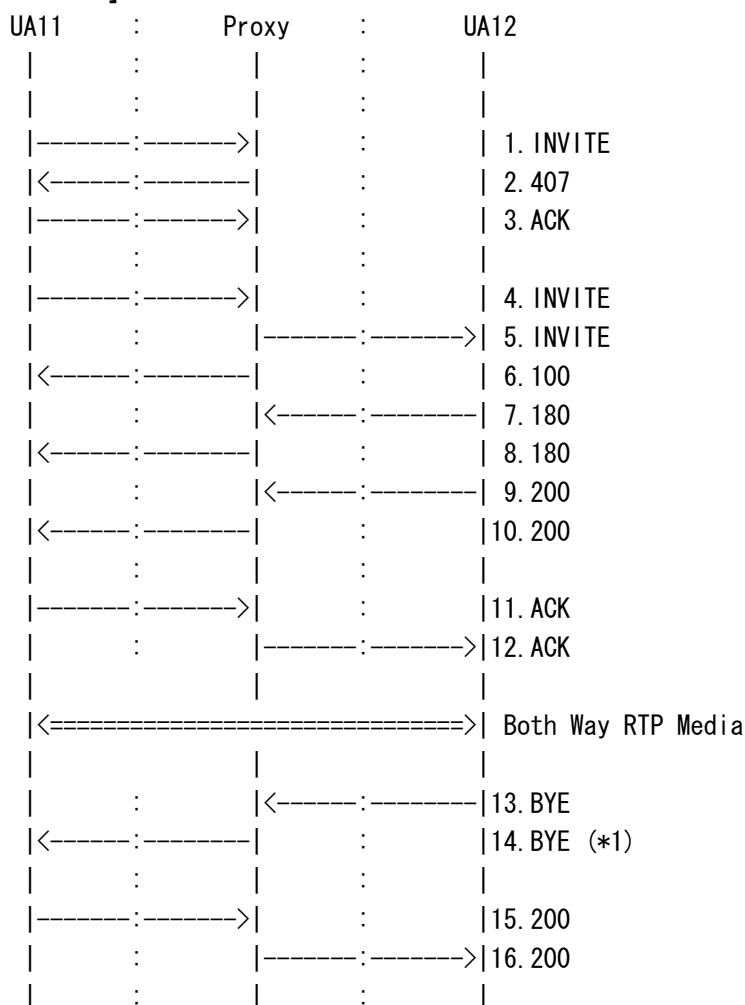
#### [INITIALIZATION]



1. Send ICMP Echo Request.

## 2. Receive ICMP Echo Reply.

### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.



14. UA11 Receive BYE.
15. UA11 Send 200.
16. UA12 Receive 200.

**=== Message example ===**

13. BYE UA12 -> NUT

BYE sip:UA11@node.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA12 <sip:UA12@under.test.com>;tag=314159  
To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 1 BYE  
Content-Length: 0

\* Contact header field is "Not applicable" in BYE

**[JUDGMENT]**

\*1:BYE request from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA12

- Header fields:  
- outside of a dialog  
See generic\_forward\_from-UA12  
See generic\_forward\_request  
\* Contact  
Should be the same as "13.BYE".[RFC3261-7-12, RFC3261-16-13]

- Bodies:  
See generic\_forward\_from-UA12

**[REFERENCE]**

[RFC3261-16-12, 13]



## 16.3 Request Validation

### 1. Reasonable syntax check

The request **MUST** be well-formed enough to be handled with a server transaction. Any components involved in the remainder of these Request Validation steps or the Request Forwarding section **MUST** be well-formed. Any other components, well-formed or not, **SHOULD** be ignored and remain unchanged when the message is forwarded. For instance, an element would not reject a request because of a malformed Date header field. Likewise, a proxy would not remove a malformed Date header field before forwarding a request.

[RFC3261-20-4, 5, 6, 7, 8, 9, 10, 11]

### 20 Header field Fields

"Optional" means that an element **MAY** include the header field in a request or response, and a UA **MAY** ignore the header field if present in the request or response (The exception to this rule is the Require header field discussed in 20.32). A "mandatory" header field **MUST** be present in a request, and **MUST** be understood by the UAS receiving the request. A mandatory response header field **MUST** be present in the response, and the header field **MUST** be understood by the UAC processing the response. "Not applicable" means that the header field **MUST NOT** be present in a request. If one is placed in a request by mistake, it **MUST** be ignored by the UAS receiving the request. Similarly, a header field labeled "not applicable" for a response means that the UAS **MUST NOT** place the header field in the response, and the UAC **MUST** ignore the header field in the response.

## 4.5.10 RQ-3-1-2 - SIP Proxy- BYE not matching an existing dialog

### [NAME]

RQ-3-1-2 - SIP Proxy- BYE not matching an existing dialog

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly processes when a BYE request doesn't match an existing dialog.

### [REQUIREMENT]

NONE

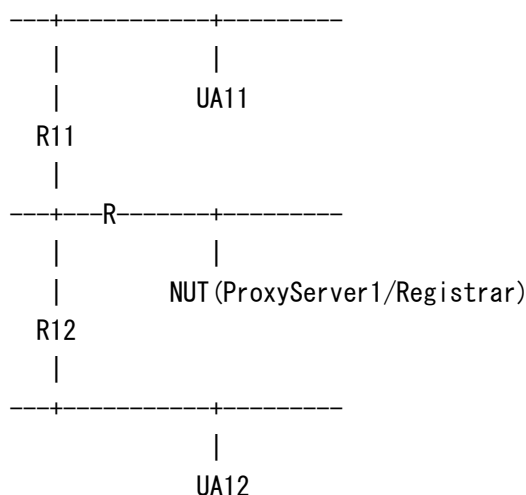
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
U A12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

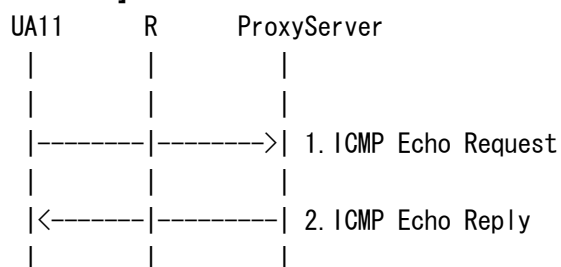
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]

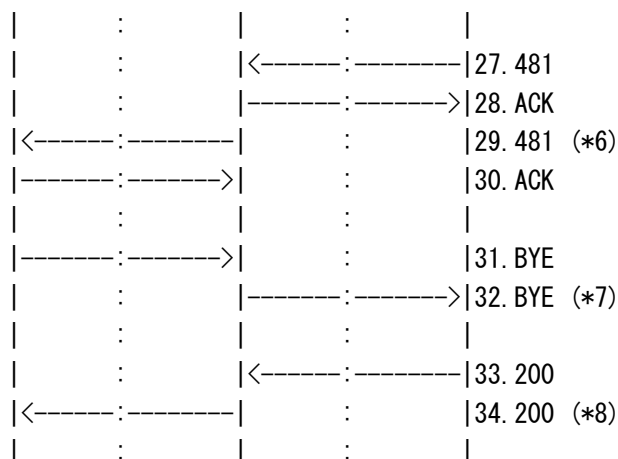


1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

UA11	:	Proxy	:	UA12
	:		:	
	:		:	
----->	:		:	1. INVITE
<-----	:		:	2. 407
----->	:		:	3. ACK
	:		:	
----->	:		:	4. INVITE
	:	----->	:	5. INVITE
<-----	:		:	6. 100
	:	<-----	:	7. 180
<-----	:		:	8. 180
	:	<-----	:	9. 200
<-----	:		:	10. 200
	:		:	
----->	:		:	11. ACK
	:	----->	:	12. ACK
	:		:	
<=====	:		:	Both Way RTP Media
	:		:	
----->	:		:	13. BYE with another Call-ID
	:	----->	:	14. BYE with another Call-ID (*1)
	:		:	
	:	<-----	:	15. 481
	:	----->	:	16. ACK
<-----	:		:	17. 481 (*2)
----->	:		:	18. ACK
	:		:	
----->	:		:	19. BYE without From tag
	:	----->	:	20. BYE without From tag (*3)
	:		:	
	:	<-----	:	21. 481
	:	----->	:	22. ACK
<-----	:		:	23. 481 (*4)
----->	:		:	24. ACK
	:		:	
----->	:		:	25. BYE without To tag
	:	----->	:	26. BYE without To tag (*5)





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA11 Send BYE with another Call-ID.
14. UA12 Receive BYE with another Call-ID.
15. UA12 Send 481 Call/Transaction Does Not Exist.
16. UA12 Receive ACK.
17. UA11 Receive 481 Call/Transaction Does Not Exist.
18. UA11 Send ACK.
19. UA11 Send BYE without From tag.
20. UA12 Receive BYE without From tag.
21. UA12 Send 481 Call/Transaction Does Not Exist.
22. UA12 Receive ACK.
23. UA11 Receive 481 Call/Transaction Does Not Exist.
24. UA11 Send ACK.
25. UA11 Send BYE without To tag.
26. UA12 Receive BYE without To tag.
27. UA12 Send 481 Call/Transaction Does Not Exist.
28. UA12 Receive ACK.
29. UA11 Receive 481 Call/Transaction Does Not Exist.
30. UA11 Send ACK.



31. UA11 Send BYE.
32. UA12 Receive BYE.
33. UA12 Send 200.
34. UA11 Receive 200.

**=== Message example ===**

4. INVITE UA11 -> NUT

INVITE sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
Proxy-Authorization: Digest username="UA11",  
realm="under.test.com",  
nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",  
qop=auth, nc=00000004, cnonce="6f54a149",  
uri="sip:UA12@under.test.com",  
response="b51e504e73af54829e4f2bd7f8dc4654"  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

9. 200 OK UA12 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159



Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Type: application/sdp  
Content-Length: 147

v=0  
o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

13. BYE UA11 -> NUT

BYE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: LMjiweinxonYxwbqp@under.test.com  
CSeq: 2 BYE  
Content-Length: 0

\* Call-ID header field value is different from that in Initial-INVITE.

19. BYE UA11 -> NUT

BYE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 3 BYE  
Content-Length: 0

\* No tag in the From header field.

25. BYE UA11 -> NUT



BYE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 4 BYE  
Content-Length: 0

\* No tag in the To header field.

31. BYE UA12 -> NUT

BYE sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bKnashds7  
Max-Forwards: 70  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 5 BYE  
Content-Length: 0

\* This is the genuine BYE request with correct dialog parameters  
(Call-ID, From tag, To tag).

## [JUDGMENT]

\*1,\*3,\*5,\*7:BYE request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11

- Header fields:  
- inside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request



- Bodies:

- See generic\_forward\_from-UA11

\*2,\*4,\*6:481 response from NUT to UA11.

- As a SIP Message,

- See generic\_message

- As a SIP response,

- Status-Line:

- See generic\_forward\_from-UA12

- Status-Code: Must be "481". [RFC3261 16.7.6], [RFC3261 21.4.19]

- Header fields:

- See generic\_forward\_from-UA12

- See generic\_forward\_response

- Bodies:

- See generic\_forward\_from-UA12

\*8:200 response from NUT to UA11.

- As a SIP Message,

- See generic\_message

- As a SIP response,

- Status-Line:

- See generic\_forward\_from-UA12

- Status-Code: Must be "200" [RFC3261-16-104].

- Header fields:

- See generic\_forward\_from-UA12

- See generic\_forward\_response

- Bodies:

- See generic\_forward\_from-UA12

## [REFERENCE]

[RFC3261-16-42, 43, 44, 45, 46]



## 16.6 Request Forwarding

### 1. Copy request

The proxy starts with a copy of the received request. The copy **MUST** initially contain all of the header fields from the received request. Fields not detailed in the processing described below **MUST NOT** be removed. The copy **SHOULD** maintain the ordering of the header fields as in the received request. The proxy **MUST NOT** reorder field values with a common field name (See Section 7.3.1). The proxy **MUST NOT** add to, modify, or remove the message body.

An actual implementation need not perform a copy; the primary requirement is that the processing for each next hop begin with the same request.

### 4.5.11 RQ-3-1-3 - SIP Proxy- BYE with a lower CSeq

#### [NAME]

RQ-3-1-3 - SIP Proxy- BYE with a lower CSeq

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes a BYE request with lower value in a CSeq header field.

#### [REQUIREMENT]

NONE

#### [PARAMETER]

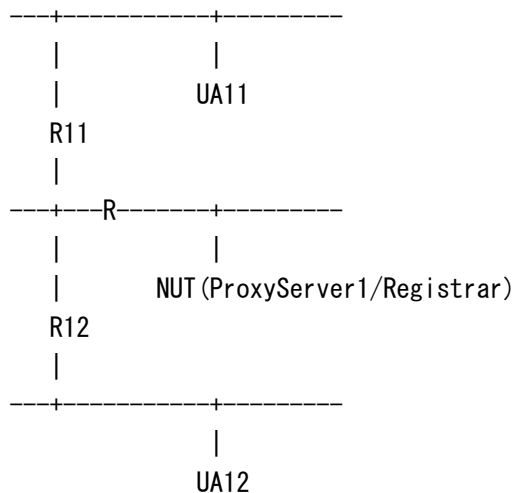
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64

UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

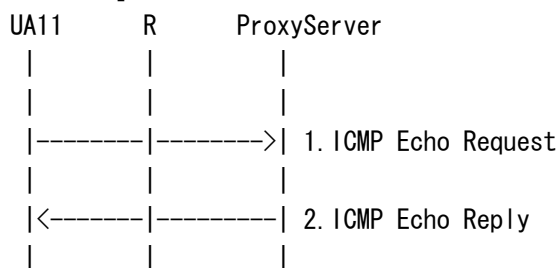
### [TOPOLOGY]



### [CONFIGURATION for NUT]

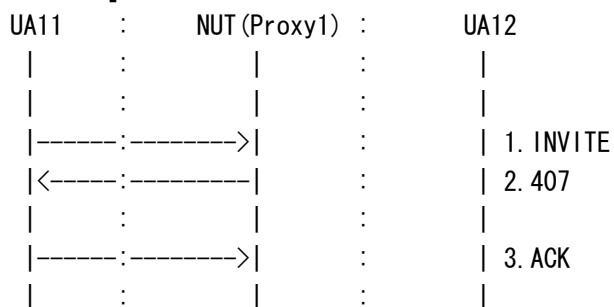
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

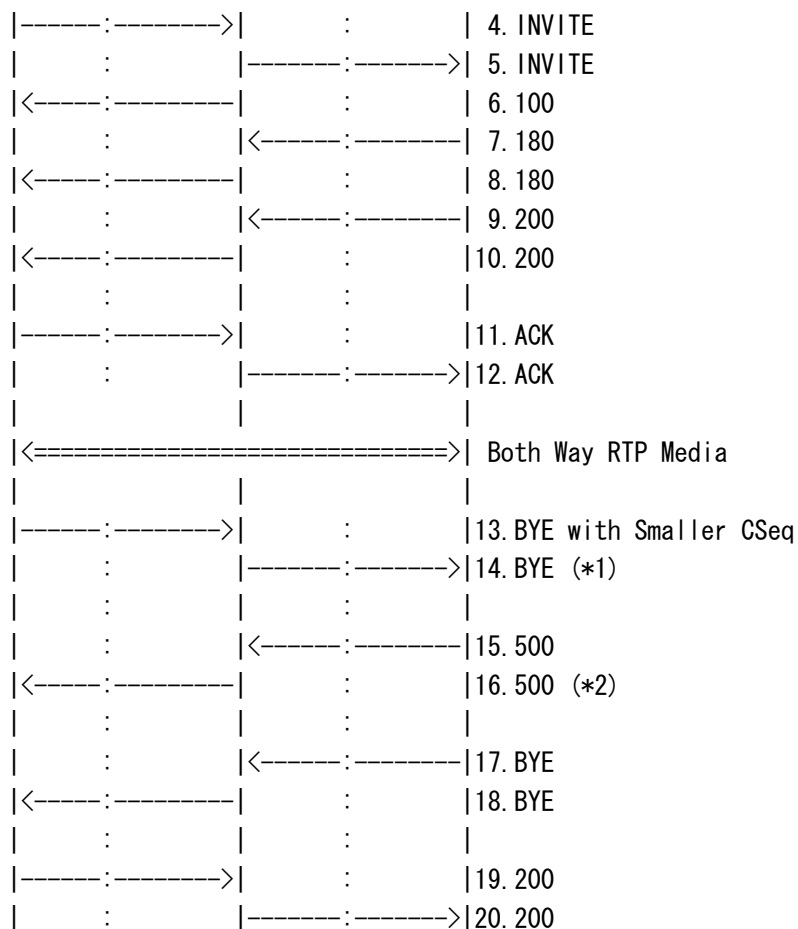
### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA11 Send BYE.
14. UA12 Receive BYE.
15. UA12 Send 500 Server Internal Error.
16. UA11 Receive 500 Server Internal Error.
17. UA12 Send BYE.
18. UA11 Receive BYE.





- 19. UA11 Send 200 OK.
- 20. UA12 Receive 200 OK.

#### [JUDGMENT]

\*1:BYE request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11

- Header fields:  
- inside of a dialog  
See generic\_forward\_from-UA11  
See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-UA11

\*2:500 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_response  
Status-Code: Must be "500". [RFC3261-12-61]

- Header fields:  
See generic\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\* Record-Route  
Must exist.



MUST copy all Record-Route header field values from the request into the response. [RFC3261-12-2]

rec-route: MUST maintain the order of Record-Route header field values. [RFC3261-12-3]

#### [REFERENCE]

[RFC3261-16-12, 13]

16.3 Request Validation

##### 1. Reasonable syntax check

The request MUST be well-formed enough to be handled with a server transaction. Any components involved in the remainder of these Request Validation steps or the Request Forwarding section MUST be well-formed. Any other components, well-formed or not, SHOULD be ignored and remain unchanged when the message is forwarded. For instance, an element would not reject a request because of a malformed Date header field. Likewise, a proxy would not remove a malformed Date header field before forwarding a request.

#### 4.5.12 RQ-4-1-1 - SIP Proxy- receipt of CANCEL with an unacceptable header field

##### [NAME]

RQ-4-1-1 - SIP Proxy- receipt of CANCEL with an unacceptable header field

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy ignores and forwards the CANCEL request, remaining unchanging that header field when receiving a CANCEL request with an unacceptable header field..

##### [REQUIREMENT]

NONE

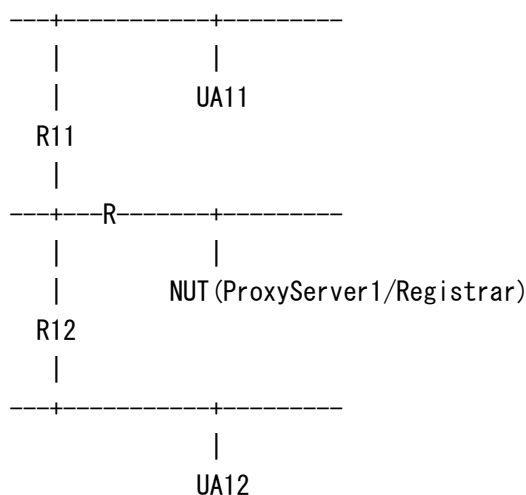
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
U A12(Contact)	sip:UA12@node11.under.test.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

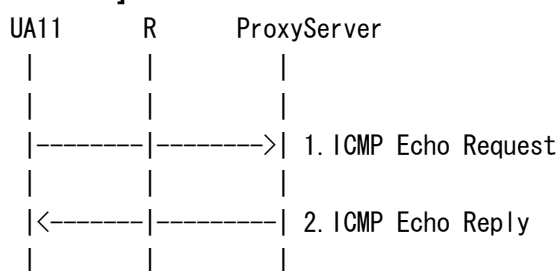
# [TOPOLOGY]



# [CONFIGURATION for NUT]

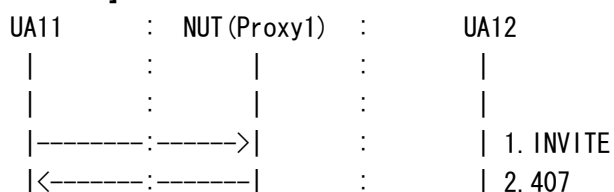
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

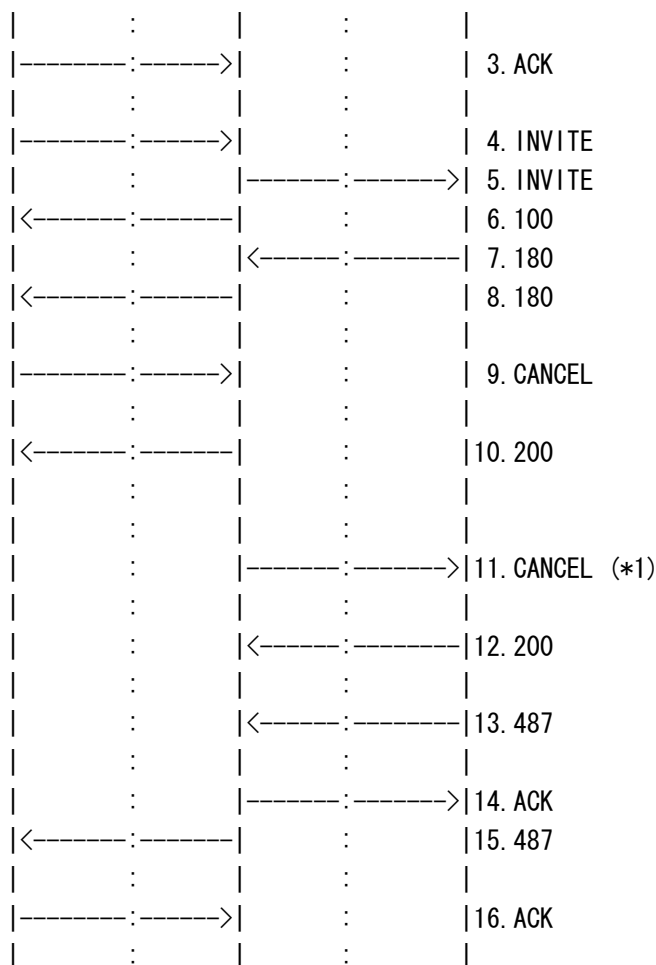
# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA11 Send CANCEL.
10. UA11 Receive 200 OK.
11. UA12 Receive CANCEL.
12. UA12 Send 200 OK.
13. UA12 Send 487 Request Terminated.
14. UA12 Receive ACK.
15. UA11 Receive 487 Request Terminated.
16. UA11 Send ACK.

**=== Message example ===**



## 9. CANCEL UA11 -> NUT

CANCEL sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Route: <sip:ss.under.test.com;lr>  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
Contact: <UA11@node.under.test.com>  
CSeq: 2 CANCEL  
Content-Length: 0

\* Contact header field is "Not applicable" in CANCEL

### [JUDGMENT]

\*1: CANCEL request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_CANCEL

- Header fields:  
- outside of a dialog  
See generic\_make\_CANCEL

\* Contact  
Should be the same as "9.CANCEL".[RFC3261-7-12, RFC3261-16-13]

- Bodies:  
See generic\_make\_CANCEL

### [REFERENCE]

[RFC3261-16-12, 13]

## 16.3 Request Validation

### 1. Reasonable syntax check

The request **MUST** be well-formed enough to be handled with a server



transaction. Any components involved in the remainder of these Request Validation steps or the Request Forwarding section **MUST** be well-formed. Any other components, well-formed or not, **SHOULD** be ignored and remain unchanged when the message is forwarded. For instance, an element would not reject a request because of a malformed Date header field. Likewise, a proxy would not remove a malformed Date header field before forwarding a request.

[RFC3261-20-4, 5, 6, 7, 8, 9, 10, 11]

#### 20 Header field Fields

"Optional" means that an element **MAY** include the header field in a request or response, and a UA **MAY** ignore the header field if present in the request or response (The exception to this rule is the Require header field discussed in 20.32). A "mandatory" header field **MUST** be present in a request, and **MUST** be understood by the UAS receiving the request. A mandatory response header field **MUST** be present in the response, and the header field **MUST** be understood by the UAC processing the response. "Not applicable" means that the header field **MUST NOT** be present in a request. If one is placed in a request by mistake, it **MUST** be ignored by the UAS receiving the request. Similarly, a header field labeled "not applicable" for a response means that the UAS **MUST NOT** place the header field in the response, and the UAC **MUST** ignore the header field in the response.

## 4.6 Forwarding Response

### 4.6.1 RS-1-1-1 - SIP Proxy- Unrecognized response code (2xx)

#### [NAME]

RS-1-1-1 - SIP Proxy- Unrecognized response code (2xx)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly forwards an unrecognized response code (2xx) immediately.

#### [REQUIREMENT]

NONE

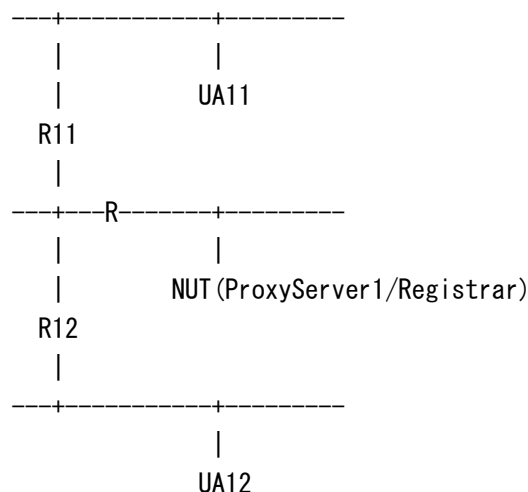
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

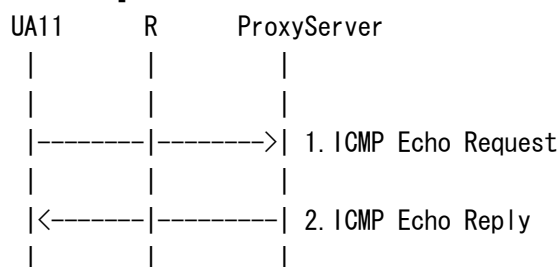
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

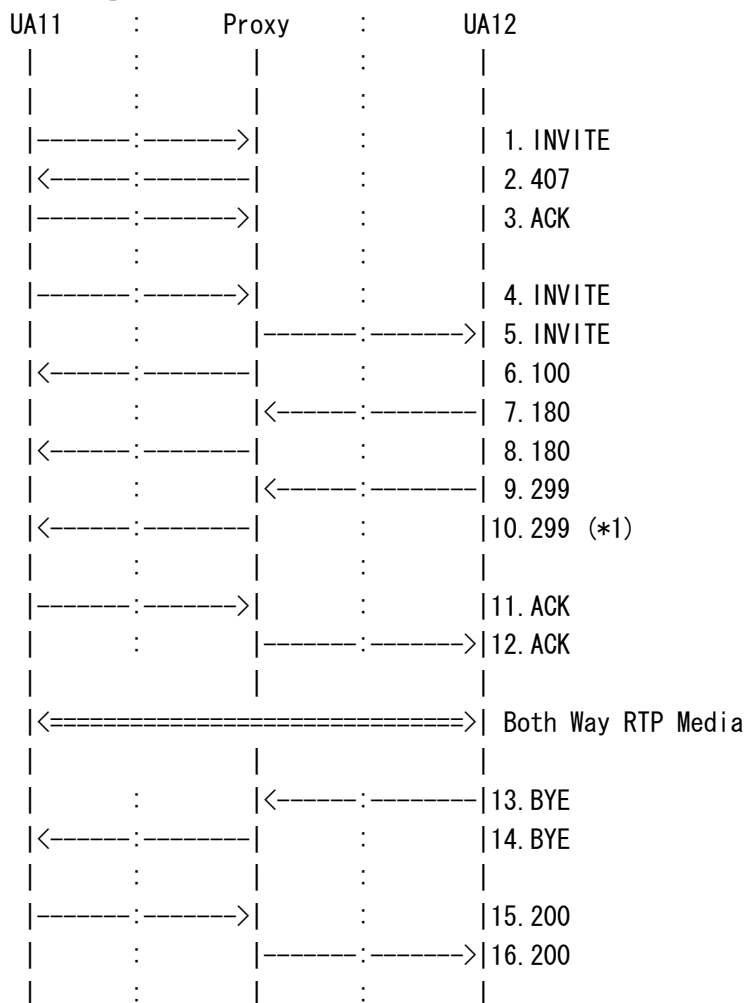
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 299 OK.
10. UA11 Receive 299 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.





15. UA11 Send 200.
16. UA12 Receive 200.

**=== Message example ===**

9. 299 OK UA12 -> NUT

SIP/2.0 299 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA12@node11.under.test.com>

Content-Type: application/sdp

Content-Length: 147

v=0

o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

10. 299 OK NUT -> UA11

SIP/2.0 299 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA12@node11.under.test.com>

Content-Type: application/sdp

Content-Length: 147

v=0



o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## [JUDGMENT]

\*1:299 response from NUT to UA11.

As a SIP Message,

Must be sent. [RFC3261-16-107]

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "299". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

## [REFERENCE]

Sequence from RFC3665 Section 3.2.

[RFC3261-16-104]

### 16.7 Response Processing

#### 5. Check response for forwarding

Until a final response has been sent on the server transaction,  
the following responses MUST be forwarded immediately:

- Any provisional response other than 100 (Trying)

- Any 2xx response

#### 4.6.2 RS-1-1-2 - SIP Proxy- Unrecognized response code (4xx)

##### [NAME]

RS-1-1-2 - SIP Proxy- Unrecognized response code (4xx)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy properly processes an unrecognized response code (4xx) as 400 response.

##### [REQUIREMENT]

NONE

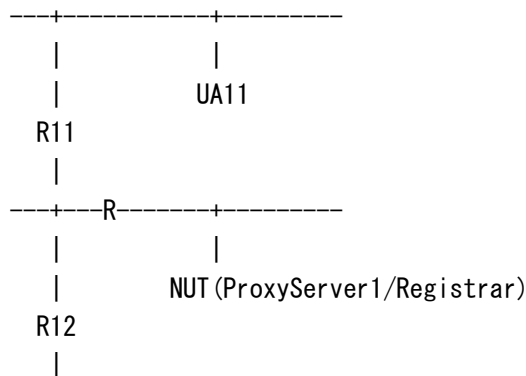
##### [PARAMETER]

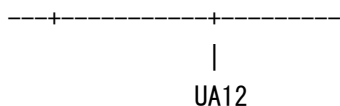
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

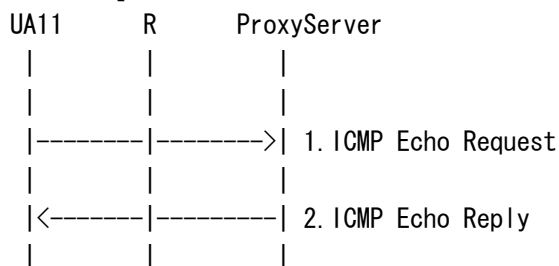




# **[CONFIGURATION for NUT]**

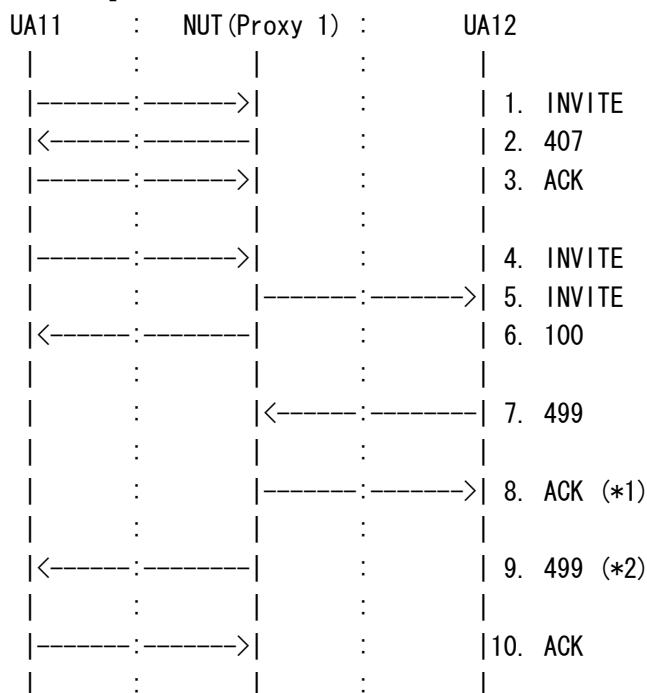
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# **[INITIALIZATION]**



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# **[PROCEDURE]**



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.



4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 499 response.
8. UA12 Receive ACK.
9. UA11 Receive 499 response.
10. UA11 Send ACK.

**=== Message example ===**

7. 499 response UA12 -> NUT

SIP/2.0 499 Error

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

8. ACK NUT -> UA12

ACK sip:UA12@under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 ACK

Content-Length: 0

9. 499 response NUT -> UA11

SIP/2.0 499 Error

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0



#### 10. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### [JUDGMENT]

\*1:ACK request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX

- Header fields:  
- outside of a dialog  
See generic\_make\_ACK\_for-non2XX

\* To  
tag-param: Should equal as that in the original message. [RFC3261-16-123]

- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*2:499 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "499". [RFC3261 16.7.6]



- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

Sequence from RFC3665 Section 3.9.

[RFC3261-16-123]

[rfc3261]

### 16.7 Response Processing

#### 6. Choosing the best response

3-6xx responses are delivered hop-by-hop. When issuing a 3-6xx response, the element is effectively acting as a UAS, issuing its own response, usually based on the responses received from downstream elements. An element **SHOULD** preserve the To tag when simply forwarding a 3-6xx response to a request that did not contain a To tag.

[RFC3261-13-15]

#### 13.2.2.3 4xx, 5xx and 6xx Responses

A single non-2xx final response may be received for the INVITE. 4xx, 5xx and 6xx responses may contain a Contact header field value indicating the location where additional information about the error can be found. Subsequent final responses (which would only arrive under error conditions) **MUST** be ignored.

All early dialogs are considered terminated upon reception of the non-2xx final response.

After having received the non-2xx final response the UAC core considers the INVITE transaction completed. The INVITE client transaction handles the generation of ACKs for the response (see Section 17).

### 4.6.3 RS-1-1-3 - SIP Proxy- Unrecognized response code (5xx)

#### [NAME]

RS-1-1-3 - SIP Proxy- Unrecognized response code (5xx)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes an unrecognized response code (5xx) as 500 response.

#### [REQUIREMENT]

NONE

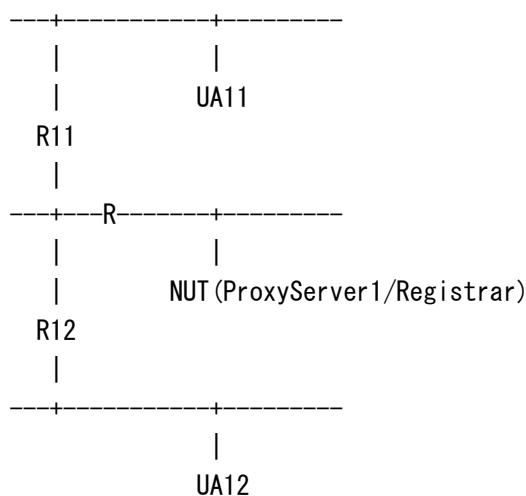
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

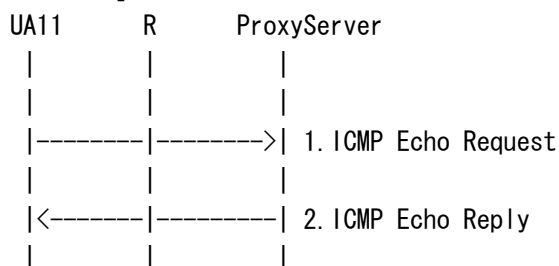




# [CONFIGURATION for NUT]

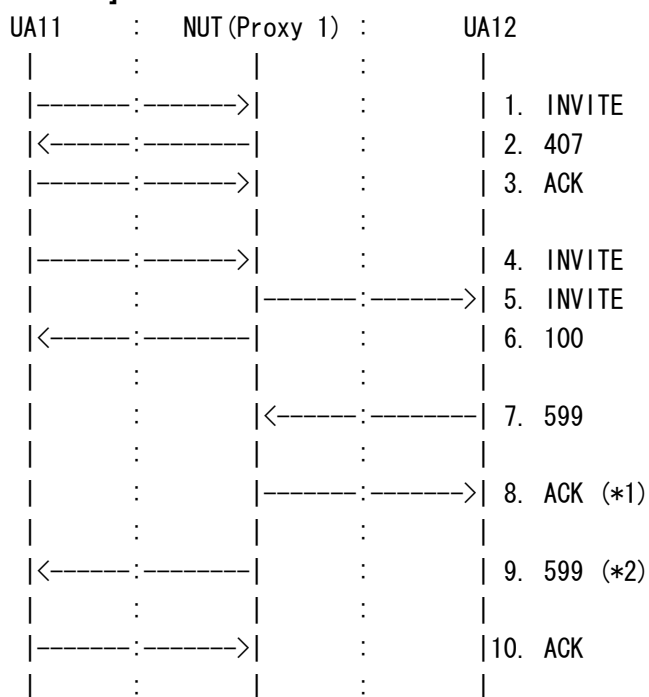
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.



7. UA12 Send 599 response.
8. UA12 Receive ACK.
9. UA11 Receive 599 response.
10. UA11 Send ACK.

**=== Message example ===**

7. 599 response UA12 -> NUT

SIP/2.0 599 Error

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

8. ACK NUT -> UA12

ACK sip:UA12@under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 ACK

Content-Length: 0

9. 599 response NUT -> UA11

SIP/2.0 599 Error

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

10. ACK UA11 -> NUT



ACK sip:UA12@under.test.com SIP/2.0  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 2xTb9vxSit55XU7p8@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### [JUDGMENT]

\*1:ACK request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX

- Header fields:  
- outside of a dialog  
See generic\_make\_ACK\_for-non2XX

\* To  
tag-param: Should equal as that in the original message. [RFC3261-16-123]

- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*2:599 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "599". [RFC3261 16.7.6]

- Header fields:  
See generic\_make\_response



\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

Sequence from RFC3665 Section 3.9.

[RFC3261-16-123]

### 16.7 Response Processing

#### 6. Choosing the best response

3-6xx responses are delivered hop-by-hop. When issuing a 3-6xx response, the element is effectively acting as a UAS, issuing its own response, usually based on the responses received from downstream elements. An element **SHOULD** preserve the To tag when simply forwarding a 3-6xx response to a request that did not contain a To tag.

[RFC3261-13-15]

#### 13.2.2.3 4xx, 5xx and 6xx Responses

A single non-2xx final response may be received for the INVITE. 4xx, 5xx and 6xx responses may contain a Contact header field value indicating the location where additional information about the error can be found. Subsequent final responses (which would only arrive under error conditions) **MUST** be ignored.

All early dialogs are considered terminated upon reception of the non-2xx final response.

After having received the non-2xx final response the UAC core considers the INVITE transaction completed. The INVITE client transaction handles the generation of ACKs for the response (see Section 17).

## 4.6.4 RS-1-1-4 - SIP Proxy- Unrecognized response code (6xx)

### [NAME]

RS-1-1-4 - SIP Proxy- Unrecognized response code (6xx)

# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy properly processes an unrecognized response code (6xx) as 600 response.

# **[REQUIREMENT]**

NONE

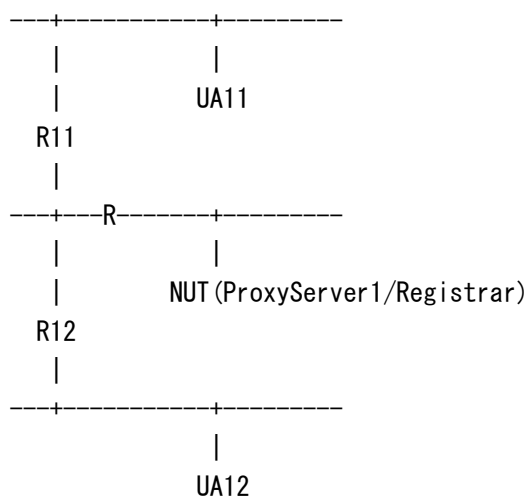
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

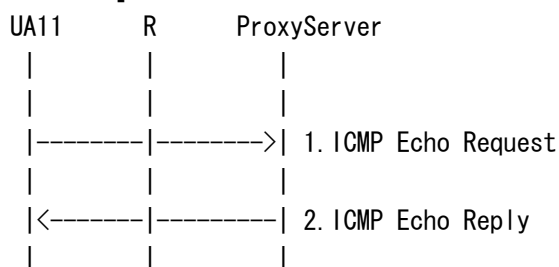
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

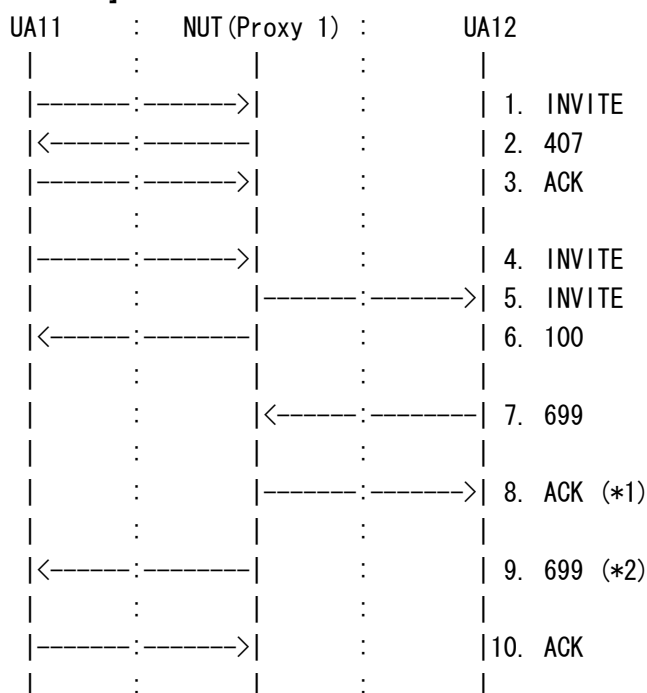
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

## [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 699 response.
8. UA12 Receive ACK.
9. UA11 Receive 699 response.
10. UA11 Send ACK.

=== Message example ===



7. 699 response UA12 -> NUT

SIP/2.0 699 Error

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

8. ACK NUT -> UA12

ACK sip:UA12@under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 ACK

Content-Length: 0

9. 699 response NUT -> UA11

SIP/2.0 699 Error

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com

CSeq: 2 INVITE

Content-Length: 0

10. ACK UA11 -> NUT

ACK sip:UA12@under.test.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 2xTb9vxSit55XU7p8@under.test.com



CSeq: 2 ACK  
Content-Length: 0

#### [JUDGMENT]

\*1:ACK request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_ACK\_for-non2XX

- Header fields:  
- outside of a dialog  
See generic\_make\_ACK\_for-non2XX

\* To  
tag-param: Should equal as that in the original message. [RFC3261-16-123]

- Bodies:  
See generic\_make\_ACK\_for-non2XX

\*2:699 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_make\_response  
Status-Code: Must be "699". [RFC3261 16.7.6]

- Header fields:  
See generic\_make\_response

\* Via  
via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]





## [REFERENCE]

Sequence from RFC3665 Section 3.9.

[RFC3261-16-123]

### 16.7 Response Processing

#### 6. Choosing the best response

3-6xx responses are delivered hop-by-hop. When issuing a 3-6xx response, the element is effectively acting as a UAS, issuing its own response, usually based on the responses received from downstream elements. An element **SHOULD** preserve the To tag when simply forwarding a 3-6xx response to a request that did not contain a To tag.

[RFC3261-13-15]

### 13.2.2.3 4xx, 5xx and 6xx Responses

A single non-2xx final response may be received for the INVITE. 4xx, 5xx and 6xx responses may contain a Contact header field value indicating the location where additional information about the error can be found. Subsequent final responses (which would only arrive under error conditions) **MUST** be ignored.

All early dialogs are considered terminated upon reception of the non-2xx final response.

After having received the non-2xx final response the UAC core considers the INVITE transaction completed. The INVITE client transaction handles the generation of ACKs for the response (see Section 17).

## **4.6.5 RS-1-1-5 - SIP Proxy- Provisional response other than 100 response**

### [NAME]

RS-1-1-5 - SIP Proxy- Provisional response other than a 100 response

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy forwards a provisional response other than 100 response immediately.

# **[REQUIREMENT]**

NONE

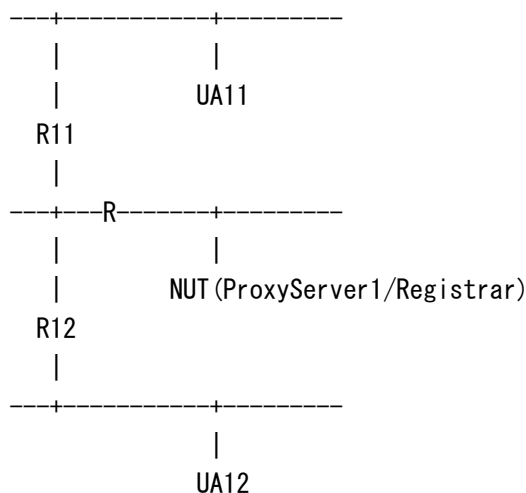
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

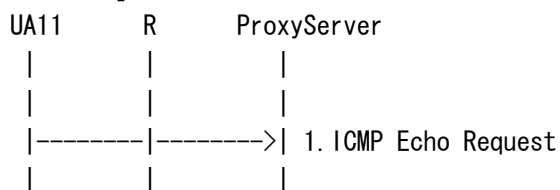
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# **[INITIALIZATION]**



```

|<-----|-----| 2. ICMP Echo Reply
|         |         |

```

1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

UA11	:	Proxy	:	UA12
	:		:	
	:		:	
-----:----->	:		:	1. INVITE
<-----:-----	:		:	2. 407
-----:----->	:		:	3. ACK
	:		:	
-----:----->	:		:	4. INVITE
	:	-----:----->	:	5. INVITE
<-----:-----	:		:	6. 100
	:	<-----:-----	:	7. 199
<-----:-----	:		:	8. 199 (*1)
	:	<-----:-----	:	9. 180
<-----:-----	:		:	10. 180
	:	<-----:-----	:	11. 200
<-----:-----	:		:	12. 200
	:		:	
-----:----->	:		:	13. ACK
	:	-----:----->	:	14. ACK
	:		:	
<=====>	:		:	Both Way RTP Media
	:		:	
	:	<-----:-----	:	15. BYE
<-----:-----	:		:	16. BYE
	:		:	
-----:----->	:		:	17. 200
	:	-----:----->	:	18. 200
	:		:	

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 199 response.

8. UA11 Receive 199 response.
9. UA12 Send 180 Ringing.
10. UA11 Receive 180 Ringing.
11. UA12 Send 200 OK.
12. UA11 Receive 200 OK.
13. UA11 Send ACK.
14. UA12 Receive ACK.
15. UA12 Send BYE.
16. UA11 Receive BYE.
17. UA11 Send 200.
18. UA12 Receive 200.

**=== Message example ===**

7. 199 response UA12 -> NUT

SIP/2.0 199 Going on

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA12@node11.under.test.com>

CSeq: 2 INVITE

Content-Length: 0

8. 199 response NUT -> UA11

SIP/2.0 199 Going on

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA12@node11.under.test.com>

CSeq: 2 INVITE

Content-Length: 0

**[JUDGMENT]**

- \*1:199 response from NUT to UA11.



As a SIP Message,  
Must be sent. [RFC3261-16-104]  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA12  
Status-Code: Must be "199". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-UA12  
See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:  
See generic\_forward\_from-UA12

#### [REFERENCE]

Sequence from RFC3665 Section 3.2.

[RFC3261-16-104]

16.7 Response Processing

#### 5. Check response for forwarding

Until a final response has been sent on the server transaction, the following responses MUST be forwarded immediately:

- Any provisional response other than 100 (Trying)
- Any 2xx response

#### **4.6.6 RS-1-1-6 - SIP Proxy- Receipt of 200 with an unacceptable header field**

##### [NAME]

RS-1-1-6 - SIP Proxy- Receipt of 200 with an unacceptable header field

# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy properly processes when receiving a 200 response with an acceptable header field.

# **[REQUIREMENT]**

NONE

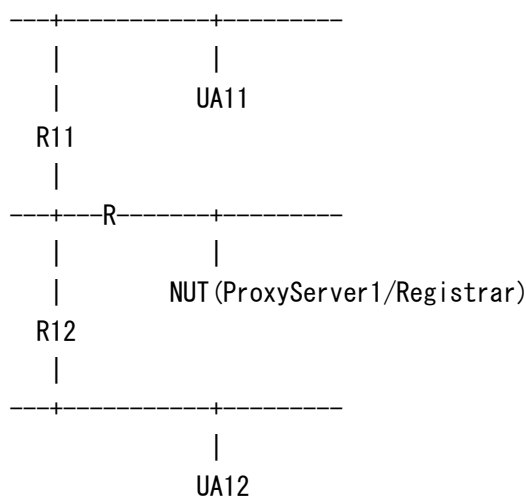
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

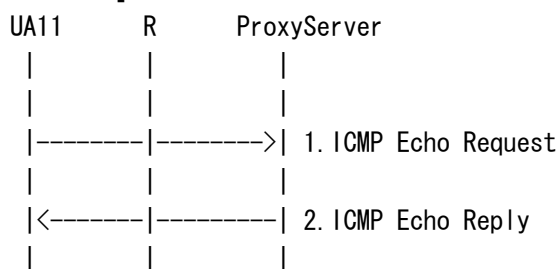
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

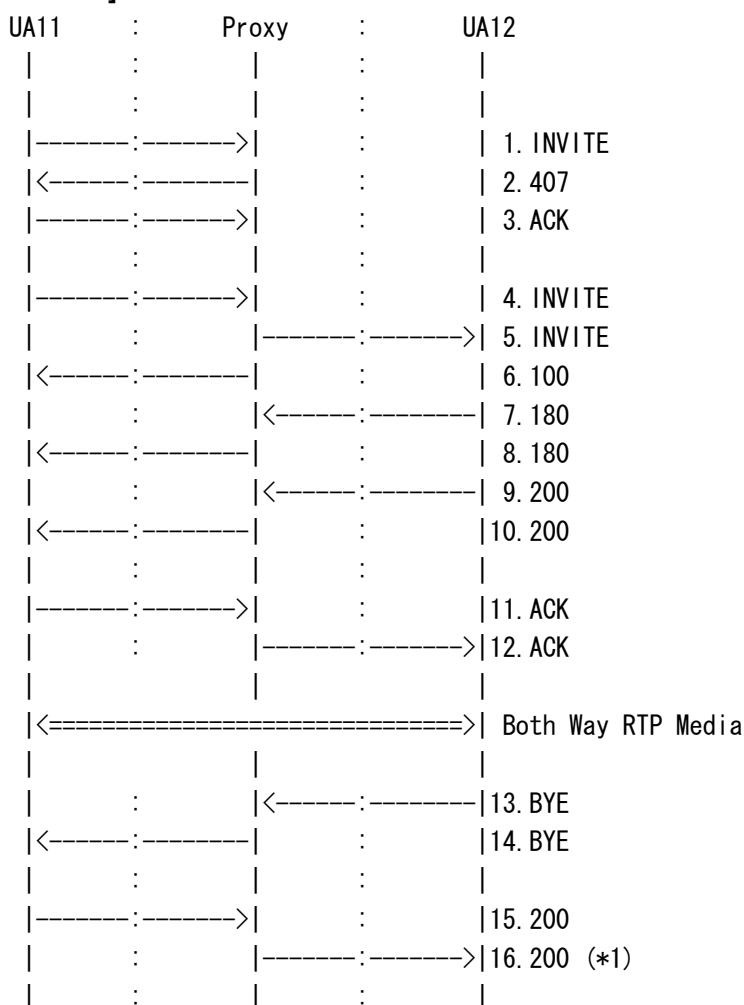
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

## [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.

4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA12 Send BYE.
14. UA11 Receive BYE.
15. UA11 Send 200.
16. UA12 Receive 200.

**=== Message example ===**

15. 200 OK UA11 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK74b43  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node11.under.test.com:5060;branch=z9hG4bKnashds7  
;received=3ffe:501:ffff:2::2

From: UA12 <sip:UA12@under.test.com>;tag=314159

To: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA11@node.under.test.com>

CSeq: 1 BYE

Content-Length: 0

\* Contact header field is "Not applicable" in 2xx response for BYE

**[JUDGMENT]**

\*1:200 response from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA11

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:





See generic\_forward\_from-UA11

See generic\_forward\_response

\* Contact

Should be the same as "9.CANCEL". [RFC3261-7-12, RFC3261-16-13]

- Bodies:

See generic\_forward\_from-UA12

## [REFERENCE]

[RFC3261-16-12, 13]

### 16.3 Request Validation

#### 1. Reasonable syntax check

The request **MUST** be well-formed enough to be handled with a server transaction. Any components involved in the remainder of these Request Validation steps or the Request Forwarding section **MUST** be well-formed. Any other components, well-formed or not, **SHOULD** be ignored and remain unchanged when the message is forwarded. For instance, an element would not reject a request because of a malformed Date header field. Likewise, a proxy would not remove a malformed Date header field before forwarding a request.

[RFC3261-20-4, 5, 6, 7, 8, 9, 10, 11]

### 20 Header field Fields

"Optional" means that an element **MAY** include the header field in a request or response, and a UA **MAY** ignore the header field if present in the request or response (The exception to this rule is the Require header field discussed in 20.32). A "mandatory" header field **MUST** be present in a request, and **MUST** be understood by the UAS receiving the request. A mandatory response header field **MUST** be present in the response, and the header field **MUST** be understood by the UAC processing the response. "Not applicable" means that the header field **MUST NOT** be present in a request. If one is placed in a request by mistake, it **MUST** be ignored by the UAS receiving the request. Similarly, a header field labeled "not applicable" for a response means that the UAS **MUST NOT** place the header field in the response, and the UAC **MUST** ignore the header field in the response.

## 4.7 Forking

### 4.7.1 FK-1-1-1 - SIP Proxy- Forked request with different Via branch

## parameters

### [NAME]

FK-1-1-1 - SIP Proxy- forked request with different Via branch parameters

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly forks requests with each Via branch parameter.

### [REQUIREMENT]

Only when a proxy supports the function of forking.

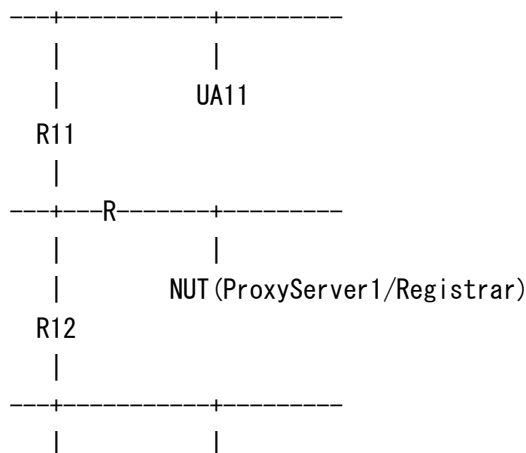
### [PARAMETER]

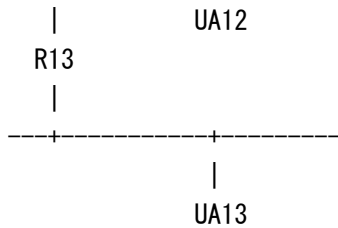
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com
UA13(Contact)	sip:UA13@node12.under.test.com

### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
UA13(IPv6)	3ffe:501:ffff:3::3/64
R(IPv6)	3ffe:501:ffff:50::1/64

### [TOPOLOGY]

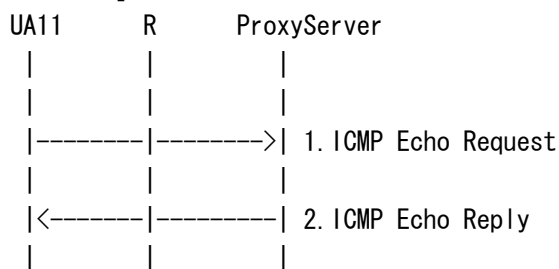




#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

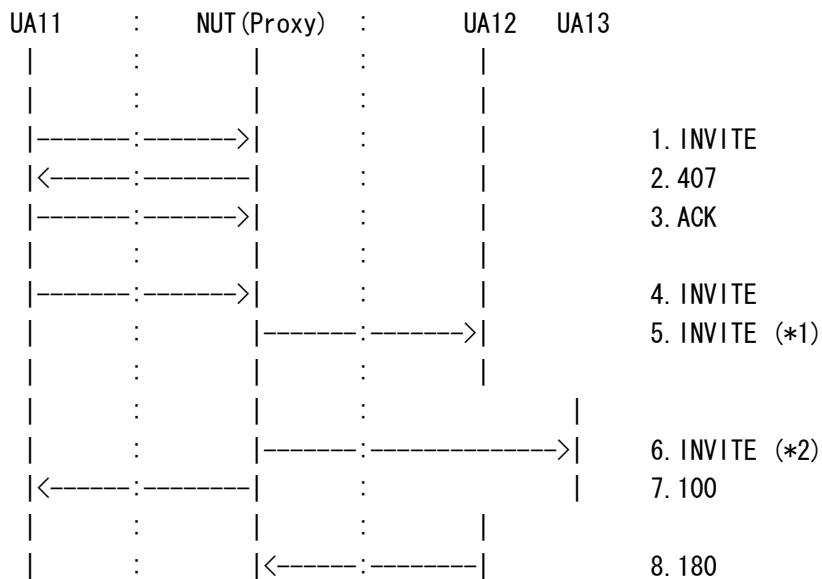
#### [INITIALIZATION]

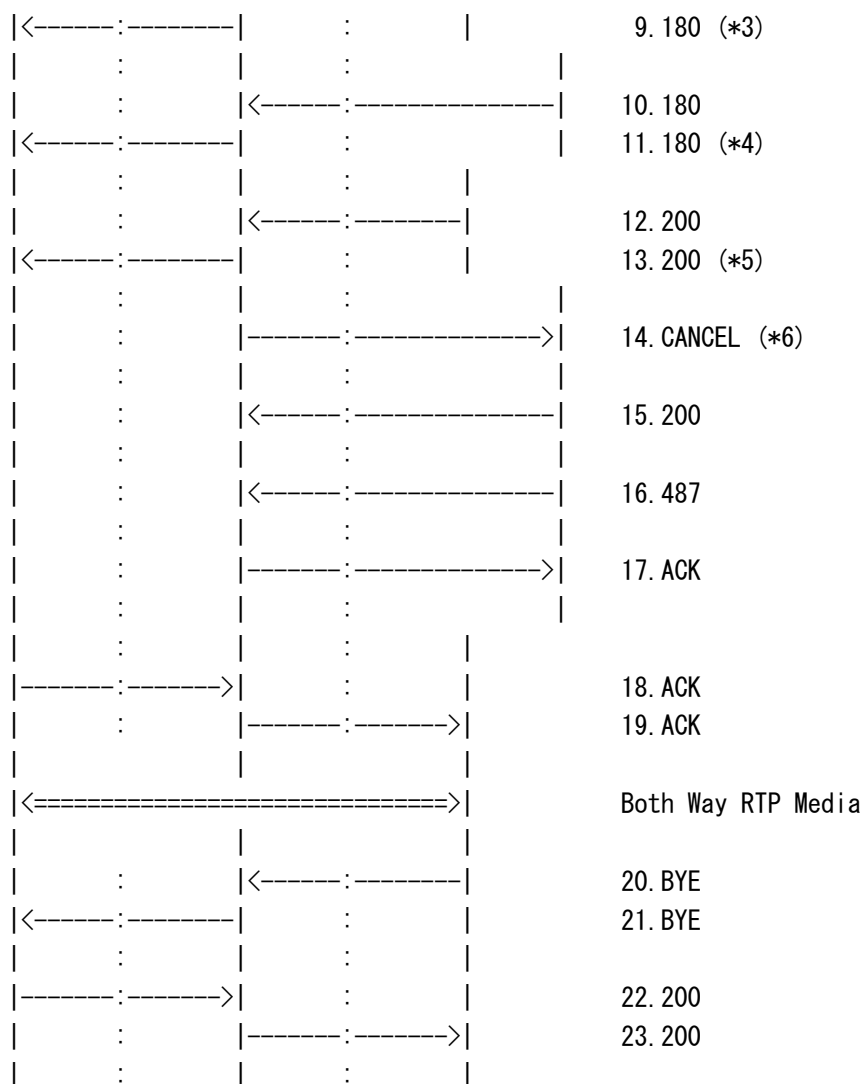


1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

\* UA12@under.test.com is associated with following two contact URI:  
 UA12@node11.under.test.com  
 UA13@node12.under.test.com

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA13 Receive INVITE.
7. UA11 Receive 100 Trying.
8. UA12 Send 180 Ringing.
9. UA11 Receive 180 Ringing.
10. UA13 Send 180 Ringing.
11. UA11 Receive 180 Ringing.
12. UA12 Send 200 OK.
13. UA11 Receive 200 OK.
14. UA13 Receive CANCEL.



15. UA13 Send 200 OK.
16. UA13 Send 487 Request Terminated.
17. UA13 Receive ACK.
18. UA11 Send ACK.
19. UA12 Receive ACK.
20. UA12 Send BYE.
21. UA11 Receive BYE.
22. UA11 Send 200 OK.
23. UA12 Receive 200 OK.

**=== Message example ===**

5. INVITE NUT -> UA12

```
INVITE sip:UA12@node11.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
    ;received=3ffe:501:ffff:1::1
Max-Forwards: 69
Record-Route: <sip:ss.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

6. INVITE NUT -> UA13

```
INVITE sip:UA13@node12.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKf9juth0Ighq
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
    ;received=3ffe:501:ffff:1::1
Max-Forwards: 69
```



Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

\* Via branch parameter is different from that in "5.INVITE".

#### 14. CANCEL NUT -> UA13

CANCEL sip:UA13@node12.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKf9juth0Ighq  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 CANCEL  
Content-Type: application/sdp  
Content-Length: 0

### [JUDGMENT]

\*1:INVITE request from NUT to UA12.

As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11



See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

\*2:INVITE request from NUT to UA13.

As a SIP Message,

See generic\_message

As a SIP request,

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

\* Via

via-branch: Must be different from that in "5.INVITE". [RFC3261-16-80]

- Bodies:

See generic\_forward\_from-UA11

\*3:180 response from NUT to UA11.

Must be forwarded immediately this response. [RFC3261-16-104]

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12



Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

\*4:180 response from NUT to UA11.

Must be forwarded immediately this response. [RFC3261-16-104]

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

\*5:200 response from NUT to UA11.

Must be forwarded immediately this response. [RFC3261-16-104]





As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA12  
Status-Code: Must be "200". [RFC3261-16-104]
- Header fields:  
See generic\_forward\_from-UA12  
See generic\_forward\_response
  - \* Via  
via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]
- Bodies:  
See generic\_forward\_from-UA12

\*6:CANCEL request from NUT to UA13.

As a SIP Message,  
Must generate this request. [RFC3261-16-137]  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_make\_CANCEL
- Header fields:
  - outside of a dialog  
See generic\_make\_CANCEL  
Must be the same dialog ID of original request. [RFC3261-16-2]
- Bodies:  
See generic\_make\_CANCEL

## [REFERENCE]

[RFC3261-16-80]

## 16.6 Request Forwarding

Since each attempt uses a new client transaction, it represents a new branch. Thus, the branch parameter provided with the Via header field inserted in step 8 **MUST** be different for each attempt.

[RFC3261-16-104, 137]

## 16.7 Response Processing

### 5. Check response for forwarding

Until a final response has been sent on the server transaction, the following responses **MUST** be forwarded immediately:

- Any provisional response other than 100 (Trying)
- Any 2xx response

### 10. Generate CANCELs

If the forwarded response was a final response, the proxy **MUST** generate a CANCEL request for all pending client transactions associated with this response context.

## 4.7.2 FK-1-1-2 - SIP Proxy- Choice of response to forked request (6xx response)

### [NAME]

FK-1-1-2 - SIP Proxy- Choice of response to forked request (6xx response)

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly chooses a response in the 6xx class when any response exists.

### [REQUIREMENT]

Only when a proxy supports the function of forking.

### [PARAMETER]

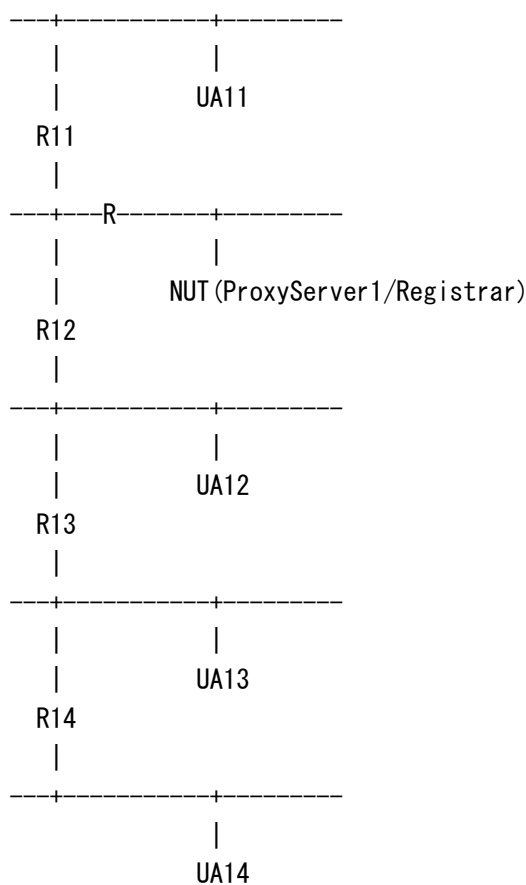
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
-----------------------------	--------------------------

UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com
UA13(AOR)	sip:UA13@under.test.com
UA13(Contact)	sip:UA13@node12.under.test.com
UA14(AOR)	sip:UA14@under.test.com
UA14(Contact)	sip:UA14@node13.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
UA13(IPv6)	3ffe:501:ffff:3::3/64
UA14(IPv6)	3ffe:501:ffff:4::4/64
R(IPv6)	3ffe:501:ffff:50::1/64

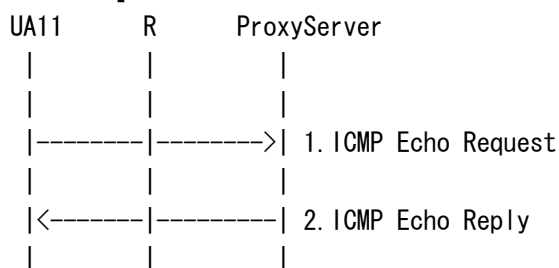
#### [TOPOLOGY]



# [CONFIGURATION for NUT]

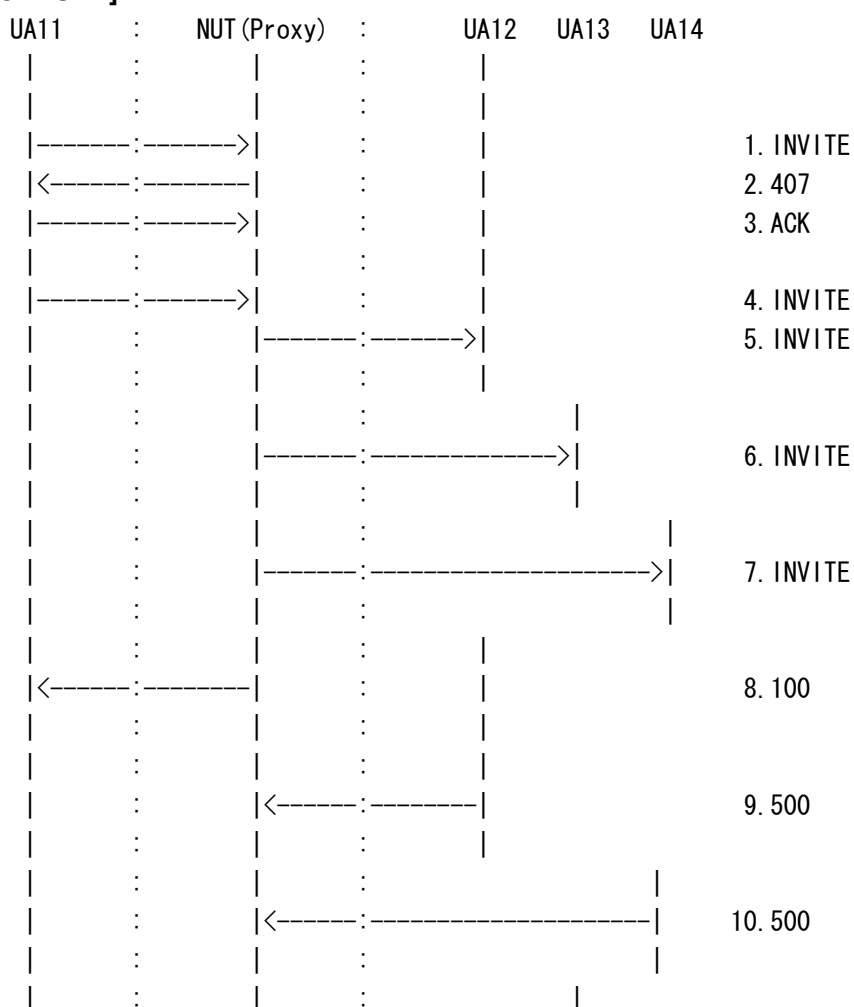
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

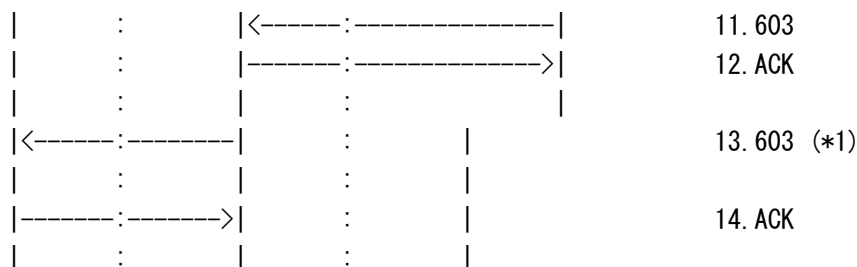
# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA13 Receive INVITE.
7. UA14 Receive INVITE.
8. UA11 Receive 100 Trying.
9. UA12 Send 500 Server Internal Error.
10. UA14 Send 500 Server Internal Error.
11. UA13 Send 603 Decline.
12. UA13 Receive ACK.
13. UA11 Receive 603 Decline.
14. UA11 Send ACK.

**=== Message example ===**

5. INVITE NUT -> UA12

```
INVITE sip:UA12@node11.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
;received=3ffe:501:ffff:1::1
Max-Forwards: 69
Record-Route: <sip:ss.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
```



c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 6. INVITE NUT -> UA13

INVITE sip:UA13@node12.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjg8UhtEro04mp  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 7. INVITE NUT -> UA14

INVITE sip:UA14@node13.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK7ht6gBvdpqd3h  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE



Contact: <sip:UA11@node.under.test.com>

Content-Type: application/sdp

Content-Length: 151

v=0

o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1

s=-

c=IN IP6 3ffe:501:ffff:1::1

t=0 0

m=audio 49172 RTP/AVP 0

a=rtpmap:0 PCMU/8000

13. 603 Decline NUT -> UA11

SIP/2.0 603 Decline

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA12@node11.under.test.com>

CSeq: 2 INVITE

Content-Length: 0

## [JUDGMENT]

\*1:603 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "603". [RFC3261-16-111,112,114,115]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

Must be the same dialog ID of original request. [RFC3261-16-2]

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

[RFC3261-16-114, 115]

16.7 Response Processing

Otherwise, the proxy MUST forward a response from the responses stored in the response context. It MUST choose from the 6xx class responses if any exist in the context. If no 6xx class responses are present, the proxy SHOULD choose from the lowest response class stored in the response context. The proxy MAY select any response within that chosen class.

## 4.7.3 FK-1-1-3 - SIP Proxy- Choice of response to forked request (The lowest response class)

### [NAME]

FK-1-1-3 - SIP Proxy- Choice of response to forked request (The lowest response class)

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly chooses a response from the lowest response class when 6xx class responses are not present.

### [REQUIREMENT]

Only when a proxy supports the function of forking.

### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com
UA13(AOR)	sip:UA13@under.test.com
UA13(Contact)	sip:UA13@node12.under.test.com
UA14(AOR)	sip:UA14@under.test.com

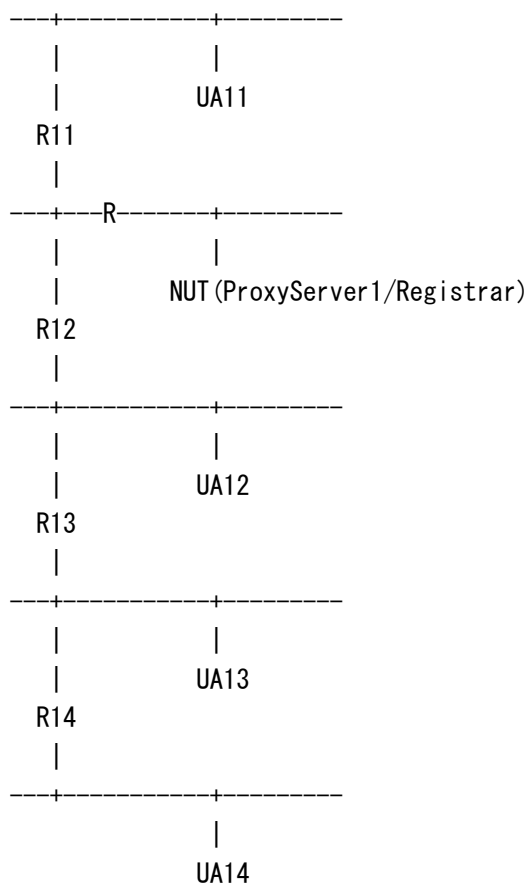


UA14(Contact)	sip:UA14@node13.under.test.com
---------------	--------------------------------

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
UA13(IPv6)	3ffe:501:ffff:3::3/64
UA14(IPv6)	3ffe:501:ffff:4::4/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

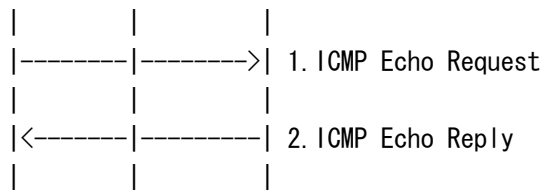


#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

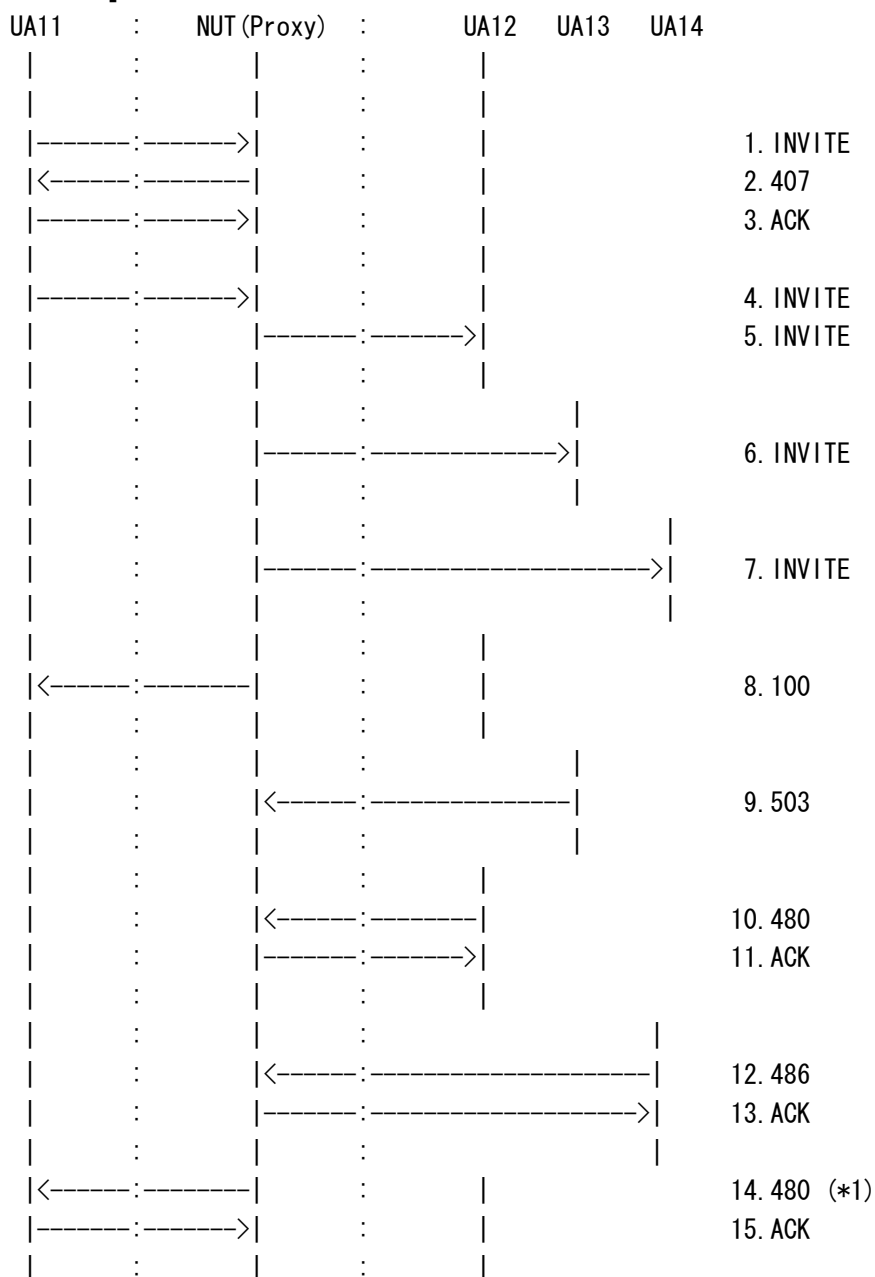
#### [INITIALIZATION]

UA11	R	ProxyServer



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA13 Receive INVITE.
7. UA14 Receive INVITE.
8. UA11 Receive 100 Trying.
9. UA13 Send 503 Service Unavailable.
10. UA12 Send 480 Temporarily Unavailable.
11. UA12 receive ACK
12. UA14 Send 486 Busy Here.
13. UA14 receive ACK.
14. UA11 Receive 480 Temporarily Unavailable.
15. UA11 Send ACK.

**=== Message example ===**

5. INVITE NUT -> UA12

```
INVITE sip:UA12@node11.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
    ;received=3ffe:501:ffff:1::1
Max-Forwards: 69
Record-Route: <sip:ss.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```



## 6. INVITE NUT -> UA13

INVITE sip:UA13@node12.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjg8UhtEro04mp  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

## 7. INVITE NUT -> UA14

INVITE sip:UA14@node13.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK7ht6gBvdpqd3h  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA11@node.under.test.com>  
Content-Type: application/sdp  
Content-Length: 151

v=0  
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1



s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49172 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### 9. 503 Service Unavailable UA13 -> NUT

SIP/2.0 503 Service Unavailable  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjg8UhtEro04mp  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=1301  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

#### 10. 480 Temporarily Unavailable UA12 -> NUT

SIP/2.0 480 Temporarily Unavailable  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=1201  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

#### 12. 486 Busy Here UA14 -> NUT

SIP/2.0 486 Busy Here  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK7ht6gBvdpqd3h



;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=1401  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

#### 14. 480 Temporarily Unavailable NUT -> UA11

SIP/2.0 480 Temporarily Unavailable  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=1201  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

### [JUDGMENT]

\*1:4xx response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA12  
Status-Code: Should be "4xx". [RFC3261-16-111,112,116]

- Header fields:  
See generic\_forward\_from-UA12  
See generic\_forward\_response  
Must be the same dialog ID of original request. [RFC3261-16-2]

\* Via



via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

[RFC3261-116]

#### 16.7 Response Processing

Otherwise, the proxy MUST forward a response from the responses stored in the response context. It MUST choose from the 6xx class responses if any exist in the context. If no 6xx class responses are present, the proxy SHOULD choose from the lowest response class stored in the response context. The proxy MAY select any response within that chosen class.

### 4.7.4 FK-1-1-4 - SIP Proxy- Stateful proxy receiving a CANCEL request

#### [NAME]

FK-1-1-4 - SIP Proxy- Stateful proxy receiving a CANCEL request

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a stateful proxy properly generates CANCEL requests for forking and terminates any pending transactions when receiving a CANCEL request.

#### [REQUIREMENT]

Only when a proxy supports the function of forking.

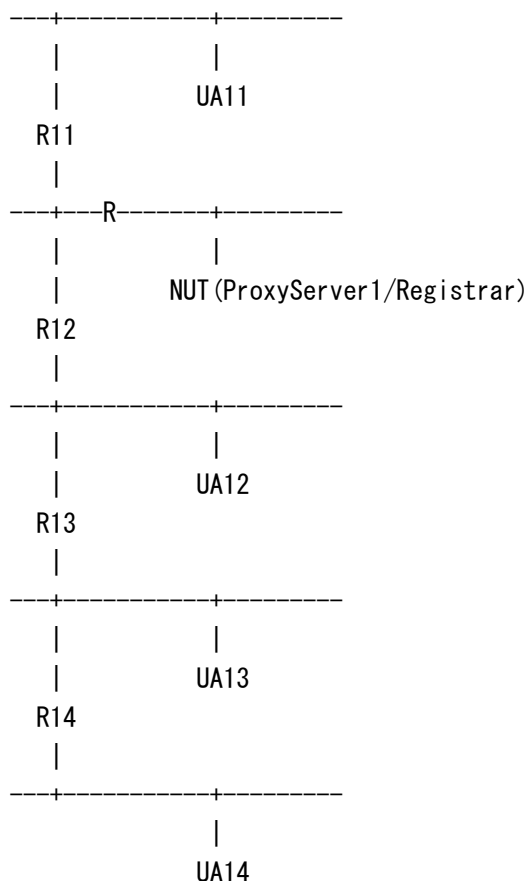
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com
UA13(AOR)	sip:UA13@under.test.com
UA13(Contact)	sip:UA13@node12.under.test.com
UA14(AOR)	sip:UA14@under.test.com
UA14(Contact)	sip:UA14@node13.under.test.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
UA13(IPv6)	3ffe:501:ffff:3::3/64
UA14(IPv6)	3ffe:501:ffff:4::4/64
R(IPv6)	3ffe:501:ffff:50::1/64

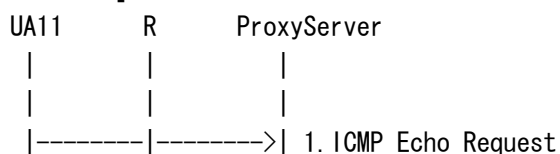
# [TOPOLOGY]



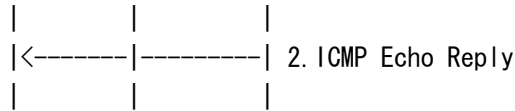
# [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]

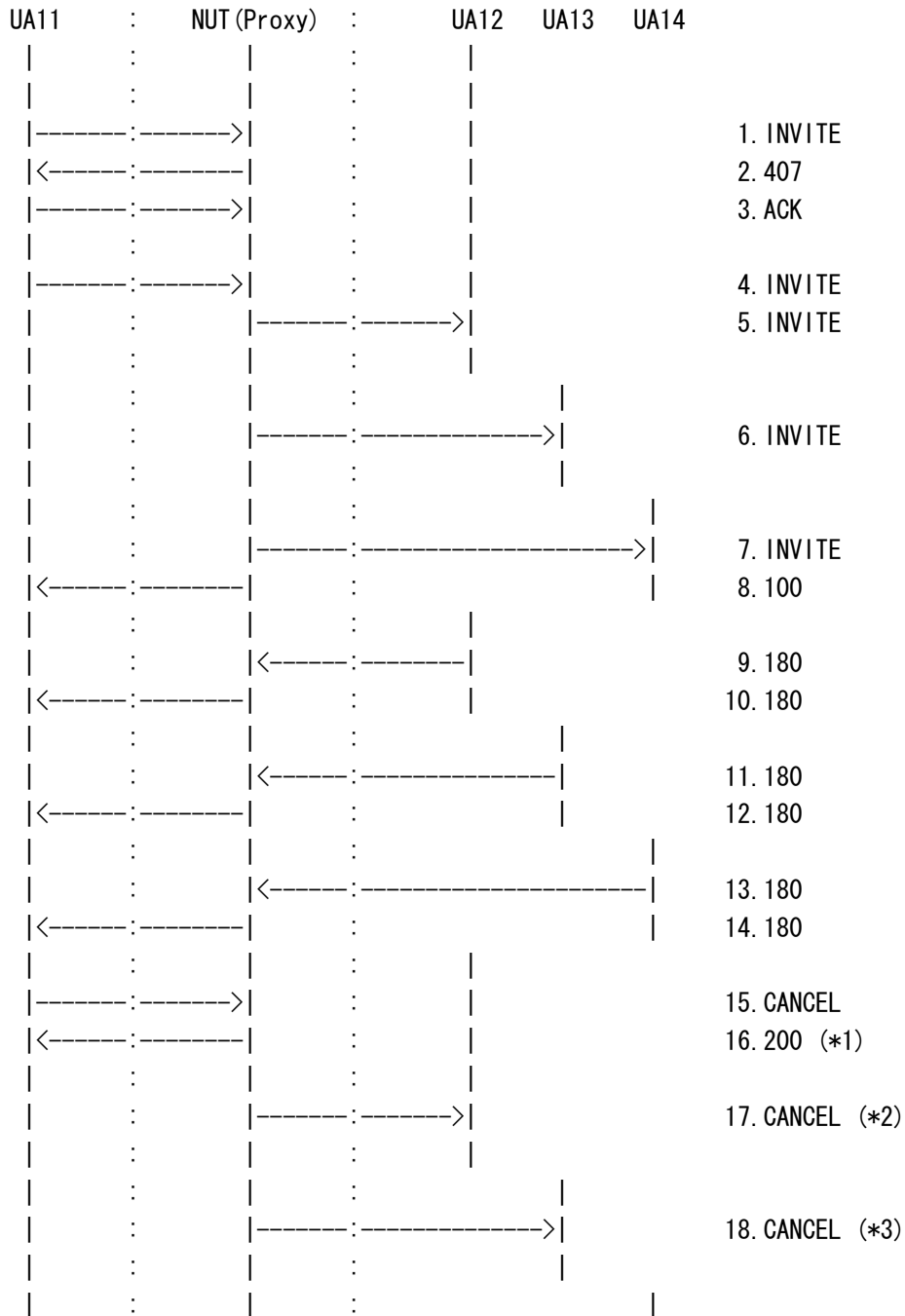


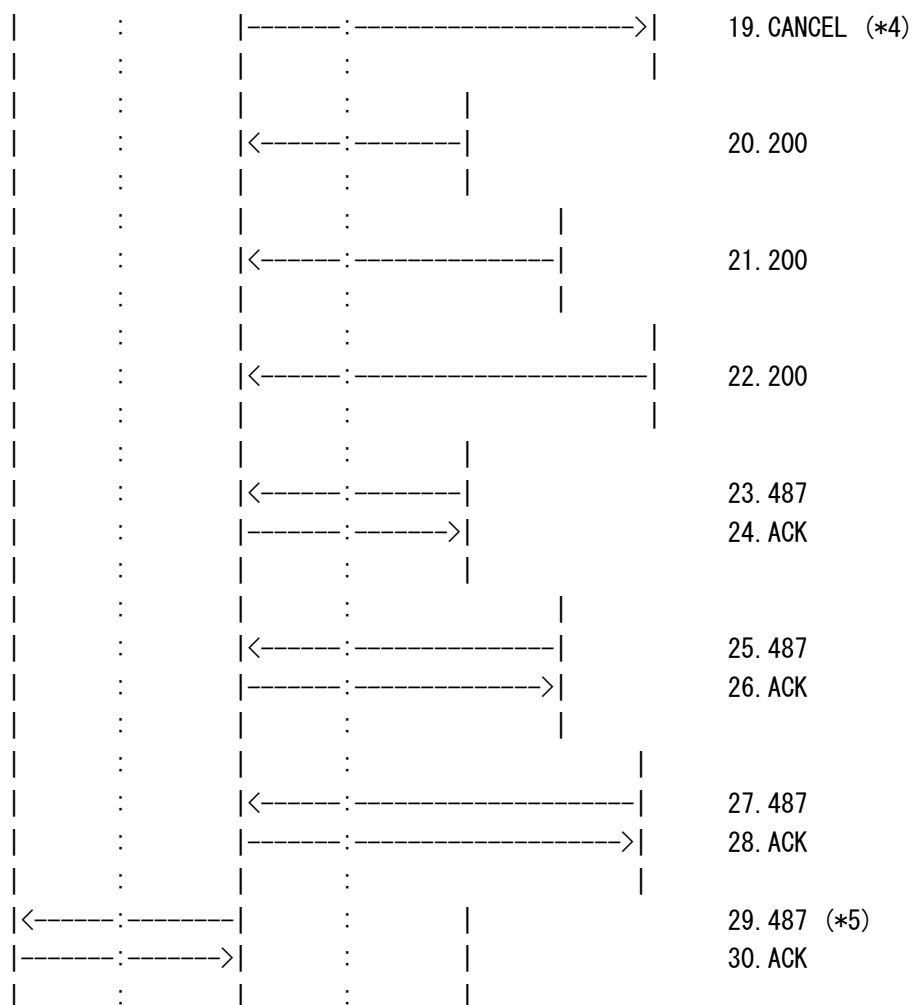




1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA13 Receive INVITE.
7. UA14 Receive INVITE.
8. UA11 Receive 100 Trying.
9. UA12 Send 180 Ringing.
10. UA11 Receive 180 Ringing.
11. UA13 Send 180 Ringing.
12. UA11 Receive 180 Ringing.
13. UA14 Send 180 Ringing.
14. UA11 Receive 180 Ringing.
15. UA11 Send CANCEL.
16. UA11 Receive 200 OK.



17. UA12 Receive CANCEL.
18. UA13 Receive CANCEL.
19. UA14 Receive CANCEL.
20. UA12 Send 200 OK.
21. UA13 Send 200 OK.
22. UA14 Send 200 OK.
23. UA12 Send 487 Request Terminated.
24. UA12 Receive ACK.
25. UA13 Send 487 Request Terminated.
26. UA13 Receive ACK.
27. UA14 Send 487 Request Terminated.
28. UA14 Receive ACK.
29. UA11 Receive 487 Request Terminated.
30. UA11 Send ACK.

**=== Message example ===**

16. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 CANCEL

Contact: <sip:UA12@node11.under.test.com>

Content-Type: application/sdp

Content-Length: 0

17. CANCEL NUT -> UA12

CANCEL sip:UA12@node11.under.test.com SIP/2.0

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKf9juth0Ighq

Max-Forwards: 70

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 CANCEL

Content-Type: application/sdp

Content-Length: 0



#### 18. CANCEL NUT -> UA13

CANCEL sip:UA13@node12.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjgi9pWqk4fg  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 CANCEL  
Content-Type: application/sdp  
Content-Length: 0

#### 19. CANCEL NUT -> UA12

CANCEL sip:UA14@node13.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKyUhg9Ijf7yr  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 CANCEL  
Content-Type: application/sdp  
Content-Length: 0

### [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,

Must immediately return this message. [RFC3261-16-145]

See generic\_message

As a SIP response,

- Status-Line:

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]



\*2-\*4: CANCEL request from NUT to UA12, UA13, UA14.

As a SIP Message,

Must generate for all pending client transaction. [RFC3261-16-144, RFC3261-16-146]

See generic\_message

As a SIP request,

- Request-Line:

See generic\_make\_CANCEL

- Header fields:

- outside of a dialog

See generic\_make\_CANCEL

- Bodies:

See generic\_make\_CANCEL

\*5: 487 response from NUT to UA11

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "487". [RFC3261-9-15]

- Header fields:

See generic\_make\_response

Must be the same dialog ID of original request. [RFC3261-16-2]

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

[RFC3261-16-144, 145, 146]

16.10 CANCEL Processing

A stateful proxy MAY generate a CANCEL to any other request it has generated at any time (subject to receiving a provisional response to that request as described in section 9.1). A proxy MUST cancel any pending client transactions associated with a response context when it receives a matching CANCEL request.

(snip)

While a CANCEL request is handled in a stateful proxy by its own server transaction, a new response context is not created for it. Instead, the proxy layer searches its existing response contexts for the server transaction handling the request associated with this CANCEL. If a matching response context is found, the element MUST immediately return a 200 (OK) response to the CANCEL request. In this case, the element is acting as a user agent server as defined in Section 8.2. Furthermore, the element MUST generate CANCEL requests for all pending client transactions in the context as described in Section 16.7 step 10.

#### 4.7.5 FK-1-1-5 - SIP Proxy- Forked request

##### [NAME]

FK-1-1-5 - SIP Proxy- Forked request

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy properly generates CANCEL requests for the other forked requests when receiving a 603 (Decline) response.

##### [REQUIREMENT]

Only when a proxy supports the function of forking.

##### [PARAMETER]

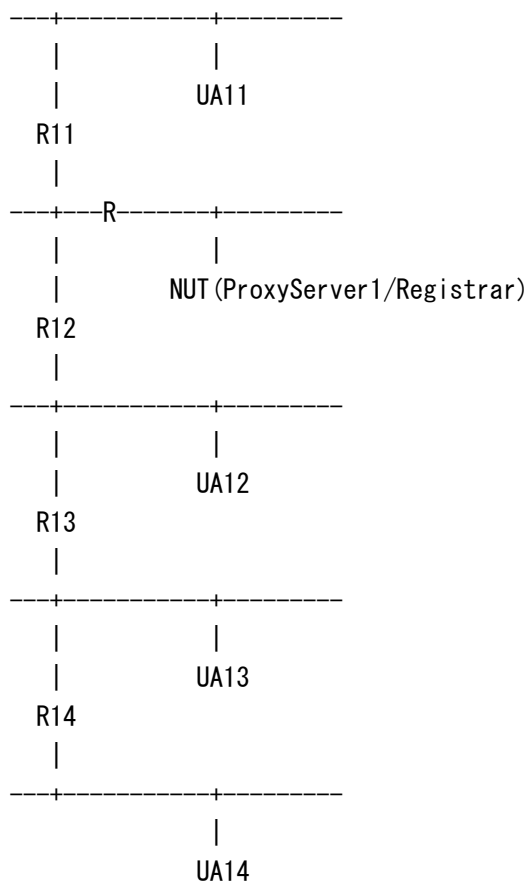
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com
UA13(AOR)	sip:UA13@under.test.com

UA13(Contact)	sip:UA13@node12.under.test.com
UA14(AOR)	sip:UA14@under.test.com
UA14(Contact)	sip:UA14@node13.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
UA13(IPv6)	3ffe:501:ffff:3::3/64
UA14(IPv6)	3ffe:501:ffff:4::4/64
R(IPv6)	3ffe:501:ffff:50::1/64

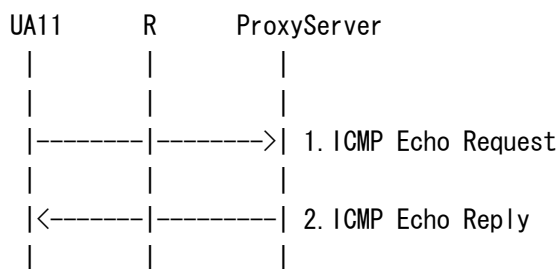
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

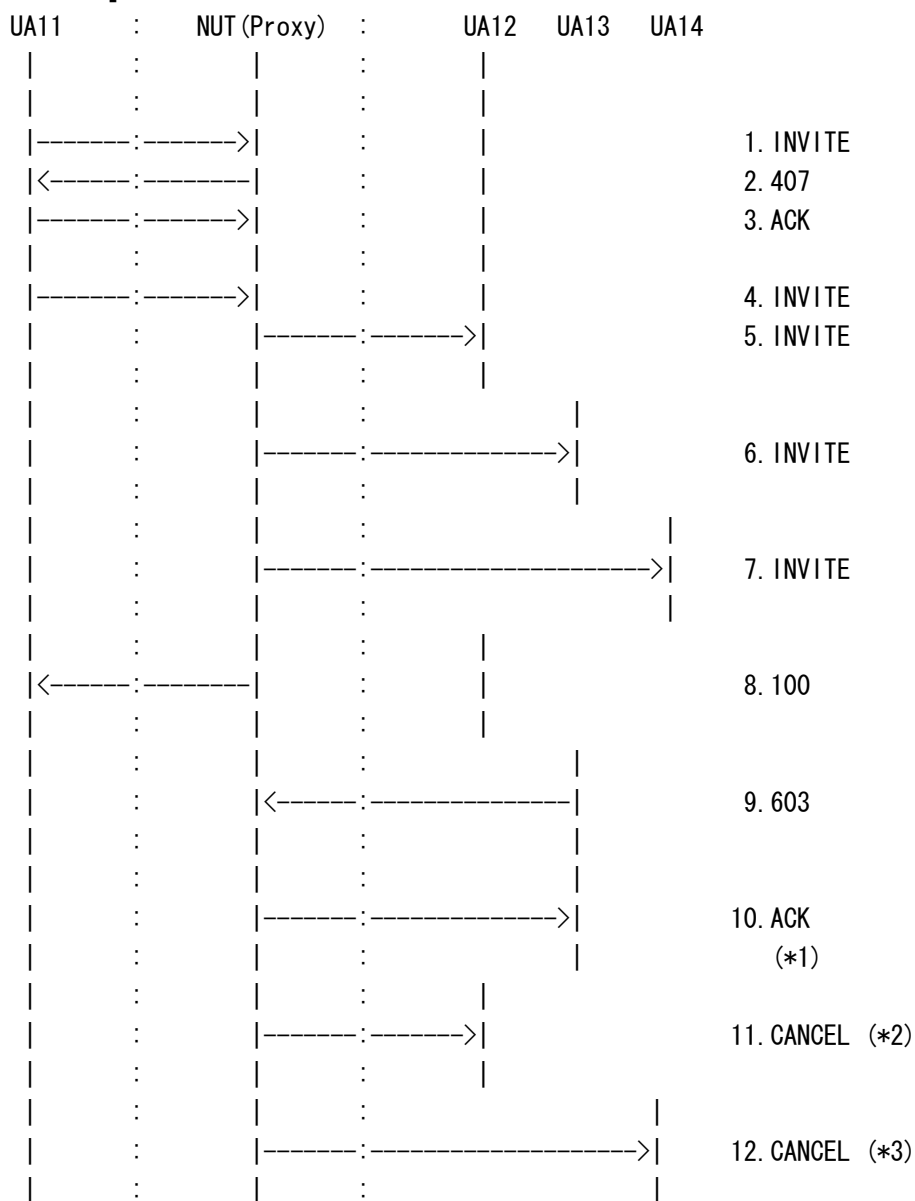
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]

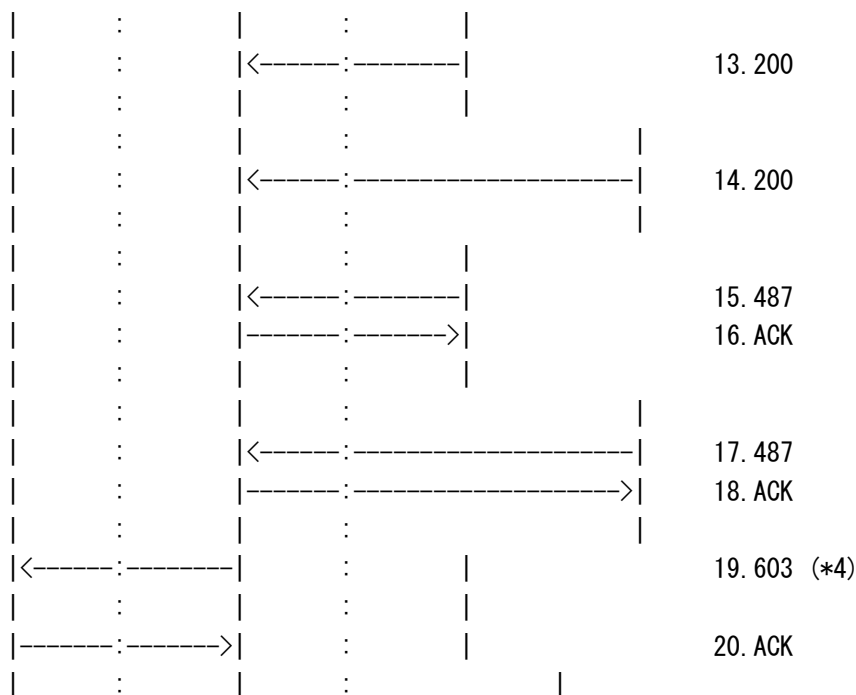


1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

**[PROCEDURE]**







1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA13 Receive INVITE.
7. UA14 Receive INVITE.
8. UA11 Receive 100 Trying.
9. UA13 Send 603 Decline.
10. UA13 Receive ACK.
11. UA12 Receive CANCEL.
12. UA14 Receive CANCEL.
13. UA12 Send 200 OK.
14. UA14 Send 200 OK.
15. UA12 Send 487 Request Terminated.
16. UA12 Receive ACK.
17. UA14 Send 487 Request Terminated.
18. UA14 Receive ACK.
19. UA11 Receive 603 Decline.
20. UA11 Send ACK.

**=== Message example ===**

11. CANCEL NUT -> UA12



CANCEL sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKf9juth0Ighq  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 CANCEL  
Content-Type: application/sdp  
Content-Length: 0

## 12. CANCEL NUT -> UA14

CANCEL sip:UA14@node13.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bKjg9Uie7y67  
Max-Forwards: 70  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA14@under.test.com>  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 CANCEL  
Content-Type: application/sdp  
Content-Length: 0

## 19. 603 Decline NUT -> UA11

SIP/2.0 603 Decline  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Content-Length: 0

### [JUDGMENT]

\*1 After ACK request from NUT to UA13  
Should not immediately forwarded 603 response. [RFC3261-16-105]

\*2: CANCEL request from NUT to UA12.

As a SIP Message,  
Should generate this request. [RFC3261-16-105, RFC3261-16-138]



See generic\_message

As a SIP request,

- Request-Line:

See generic\_make\_CANCEL

- Header fields:

- outside of a dialog

See generic\_make\_CANCEL

\* Via

via-branch: Must not create any new branches. [RFC3261-16-106]

- Bodies:

See generic\_make\_CANCEL

\*3: CANCEL request from NUT to UA14.

As a SIP Message,

Should generate this request. [RFC3261-16-105, RFC3261-16-138]

See generic\_message

As a SIP request,

- Request-Line:

See generic\_make\_CANCEL

- Header fields:

- outside of a dialog

See generic\_make\_CANCEL

\* Via

via-branch: Must not create any new branches. [RFC3261-16-106]

- Bodies:

See generic\_make\_CANCEL

\*4: 603 response from NUT to UA11.

As a SIP Message,

Should not immediately forward this message. [RFC3261-16-108]



See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "603". [RFC3261 16.7.5]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

Must be the same dialog ID of original request. [RFC3261-16-2]

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

[RFC3261-16-80]

### 16.6 Request Forwarding

Since each attempt uses a new client transaction, it represents a new branch. Thus, the branch parameter provided with the Via header field inserted in step 8 MUST be different for each attempt.

[RFC3261-16-105, 106, 108, 109, 137, 138]

### 16.7 Response Processing

#### 5. Check response for forwarding

If a 6xx response is received, it is not immediately forwarded, but the stateful proxy SHOULD cancel all client pending transactions as described in Section 10, and it MUST NOT create any new branches in this context.

(snip)

A stateful proxy MUST NOT immediately forward any other responses. In particular, a stateful proxy MUST NOT forward any 100 (Trying) response. Those responses that are candidates



for forwarding later as the "best" response have been gathered as described in step "Add Response to Context".

(snip)

#### 10. Generate CANCELs

If the forwarded response was a final response, the proxy **MUST** generate a CANCEL request for all pending client transactions associated with this response context. A proxy **SHOULD** also generate a CANCEL request for all pending client transactions associated with this response context when it receives a 6xx response.

## 4.8 Transaction

### 4.8.1 TS-1-1-1 - SIP Proxy- INVITE client transaction (Stop of retransmission of INVITE upon Timer B fired)

#### [NAME]

TS-1-1-1 - SIP Proxy- INVITE client transaction (Stop of retransmission of INVITE upon Timer B fired)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy stops retransmitting and informs the UAC of failure of forwarding the request.

#### [REQUIREMENT]

NONE

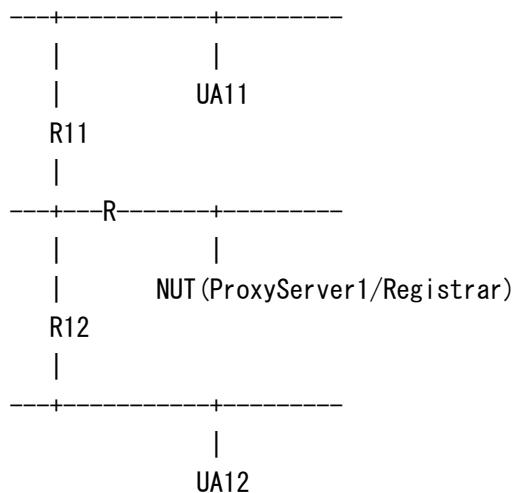
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

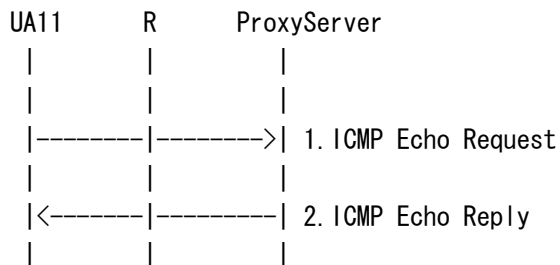
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]

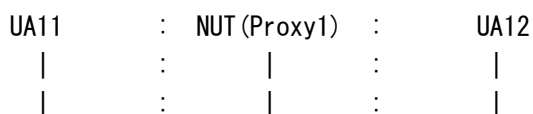


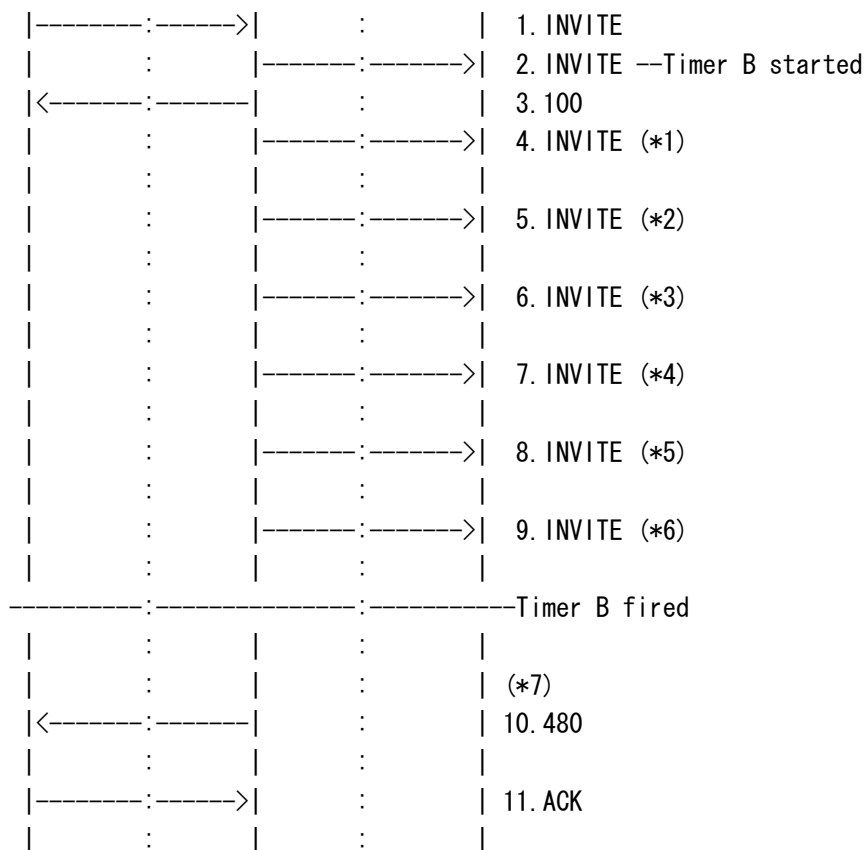
1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

Note: This sequence is an example.

The number of retransmission changes depending on a case.





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Receive INVITE.
5. UA12 Receive INVITE.
6. UA12 Receive INVITE.
7. UA12 Receive INVITE.
8. UA12 Receive INVITE.
9. UA12 Receive INVITE.
10. UA11 Receive 480 Temporary Unavailable.
11. UA11 Send ACK.

#### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked)

\*1:INVITE request from NUT to UA12.

Must be retransmitted after Timer A(= T1 sec.) fired.  
[RFC3261-17-4][RFC3261-17-7]



Recommended not to be retransmitted with intervals that is shorter than 500msec.  
[RFC3261-17-12]

\*2:INVITE request from NUT to UA12.

Must be retransmitted with intervals that double after each transmission( $2*T1$ ).  
[RFC3261-17-8][RFC3261-17-9][RFC3261-17-10][RFC3261-17-14]

\*3:INVITE request from NUT to UA12.

Must be retransmitted with intervals that double after each transmission( $2*T1$ ).  
[RFC3261-17-8][RFC3261-17-9][RFC3261-17-10][RFC3261-17-14]

\*4:INVITE request from NUT to UA12.

Must be retransmitted with intervals that double after each transmission( $2*T1$ ).  
[RFC3261-17-8][RFC3261-17-9][RFC3261-17-10][RFC3261-17-14]

\*5:INVITE request from NUT to UA12.

Must be retransmitted with intervals that double after each transmission( $2*T1$ ).  
[RFC3261-17-8][RFC3261-17-9][RFC3261-17-10][RFC3261-17-14]

\*6:INVITE request from NUT to UA12.

Must be retransmitted with intervals that double after each transmission( $2*T1$ ).  
[RFC3261-17-8][RFC3261-17-9][RFC3261-17-10][RFC3261-17-14]

\*7:INVITE request from NUT to UA12.

INVITE request Must not be retransmitted after Timer B( $64*T1$ ) fired.  
[RFC3261-17-6][RFC3261-17-11]

Must not send ACK request. [RFC3261-17-16]

## [REFERENCE]

[RFC3261-12-56, 57]

12.2.1.2 Processing the Responses





The UAC will receive responses to the request from the transaction layer. If the client transaction returns a timeout, this is treated as a 408 (Request Timeout) response.

If the response for a request within a dialog is a 481 (Call/Transaction Does Not Exist) or a 408 (Request Timeout), the UAC SHOULD terminate the dialog. A UAC SHOULD also terminate a dialog if no response at all is received for the request (the client transaction would inform the TU about the timeout.)

For INVITE initiated dialogs, terminating the dialog consists of sending a BYE.

[RFC3261-17-4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16]

#### 17.1.1.2 Formal Description

\*snip\* If an unreliable transport is being used, the client transaction MUST start timer A with a value of T1.

\*snip\* For any transport, the client transaction MUST start timer B with a value of  $64 \cdot T1$  seconds (Timer B controls transaction timeouts).

When timer A fires, the client transaction MUST retransmit the request by passing it to the transport layer, and MUST reset the timer with a value of  $2 \cdot T1$ . The formal definition of retransmit within the context of the transaction layer is to take the message previously sent to the transport layer and pass it to the transport layer once more.

When timer A fires  $2 \cdot T1$  seconds later, the request MUST be retransmitted again (assuming the client transaction is still in this state). This process MUST continue so that the request is retransmitted with intervals that double after each transmission. These retransmissions SHOULD only be done while the client transaction is in the "calling" state.

\*snip\*

The default value for T1 is 500 ms. T1 is an estimate of the RTT between the client and server transactions. Elements MAY (though it is NOT RECOMMENDED) use smaller values of T1 within closed, private networks that do not permit general Internet connection. T1 MAY be



chosen larger, and this is RECOMMENDED if it is known in advance (such as on high latency access links) that the RTT is larger. Whatever the value of T1, the exponential backoffs on retransmissions described in this section MUST be used.

If the client transaction is still in the "Calling" state when timer B fires, the client transaction SHOULD inform the TU that a timeout has occurred. The client transaction MUST NOT generate an ACK. The value of  $64 \cdot T1$  is equal to the amount of time required to send seven requests in the case of an unreliable transport.

#### 4.8.2 TS-1-1-2 - SIP Proxy- INVITE client transaction (Stop of retransmission upon Receipt of 180 Ringing)

##### [NAME]

TS-1-1-2 - SIP Proxy- INVITE client transaction (Stop of retransmission upon Receipt of 180 Ringing)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy stops retransmitting when receiving a 180 Ringing.

##### [REQUIREMENT]

NONE

##### [PARAMETER]

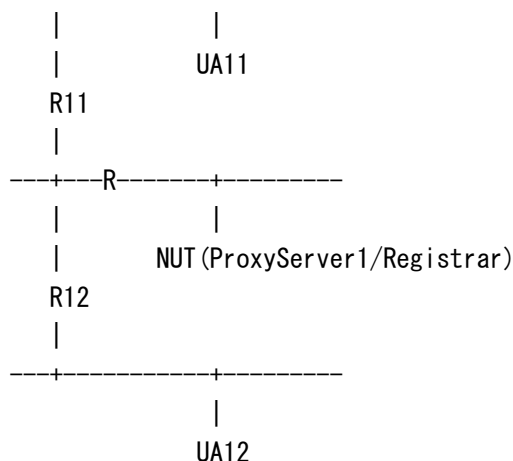
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

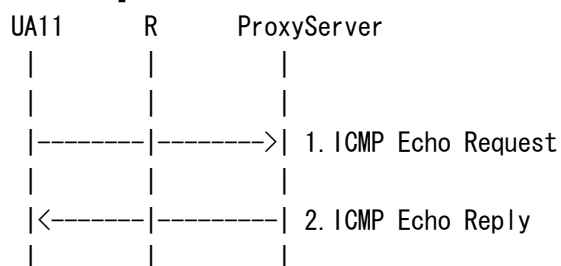
-----+-----+-----



### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

### [INITIALIZATION]

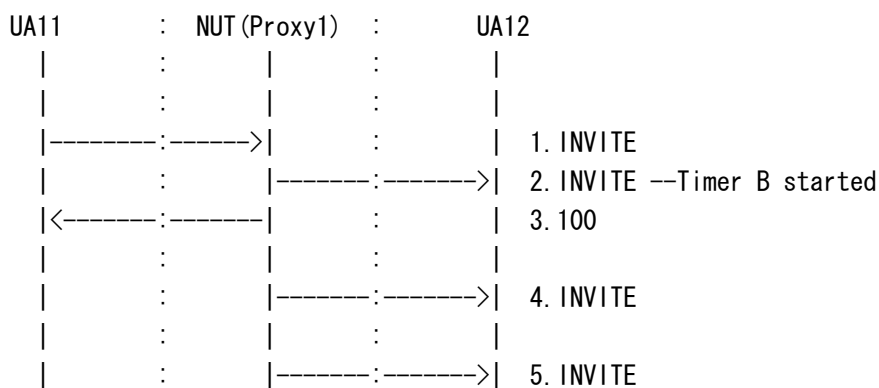


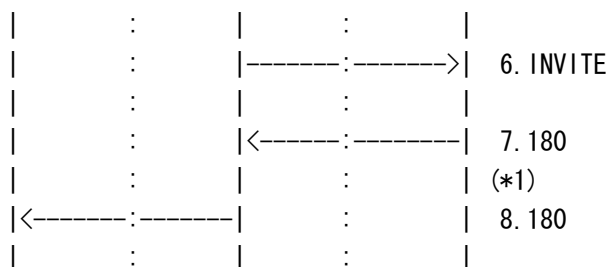
1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]

Note: This sequence is an example.

The number of retransmission changes depending on a case.





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Receive INVITE.
5. UA12 Receive INVITE.
6. UA12 Receive INVITE.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.

#### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked)

\*1:after 180 response from UA12 to NUT.

Should not retransmit INVITE request. [RFC3261-17-11][RFC3261-17-17]

#### [REFERENCE]

[RFC3261-17-11, 12, 17]

17.1.1.2 Formal Description

\*snip\*

These retransmissions SHOULD only be done while the client transaction is in the "calling" state.

If the client transaction receives a provisional response while in the "Calling" state, it transitions to the "Proceeding" state. In the "Proceeding" state, the client transaction SHOULD NOT retransmit the request any longer. \*snip\*

### 4.8.3 TS-1-1-3 - SIP Proxy- INVITE client transaction (Stop of ACK upon Timer D fired)

#### [NAME]

TS-1-1-3 - SIP Proxy- INVITE client transaction (Stop of ACK upon Timer D fired)

# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy stops sending an ACK for 300-699 response when Timer D is fired.

# **[REQUIREMENT]**

NONE

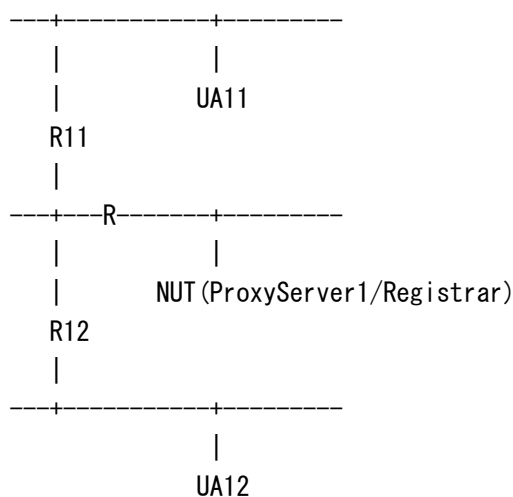
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

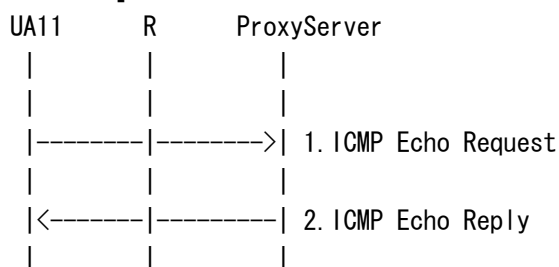
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

## [INITIALIZATION]

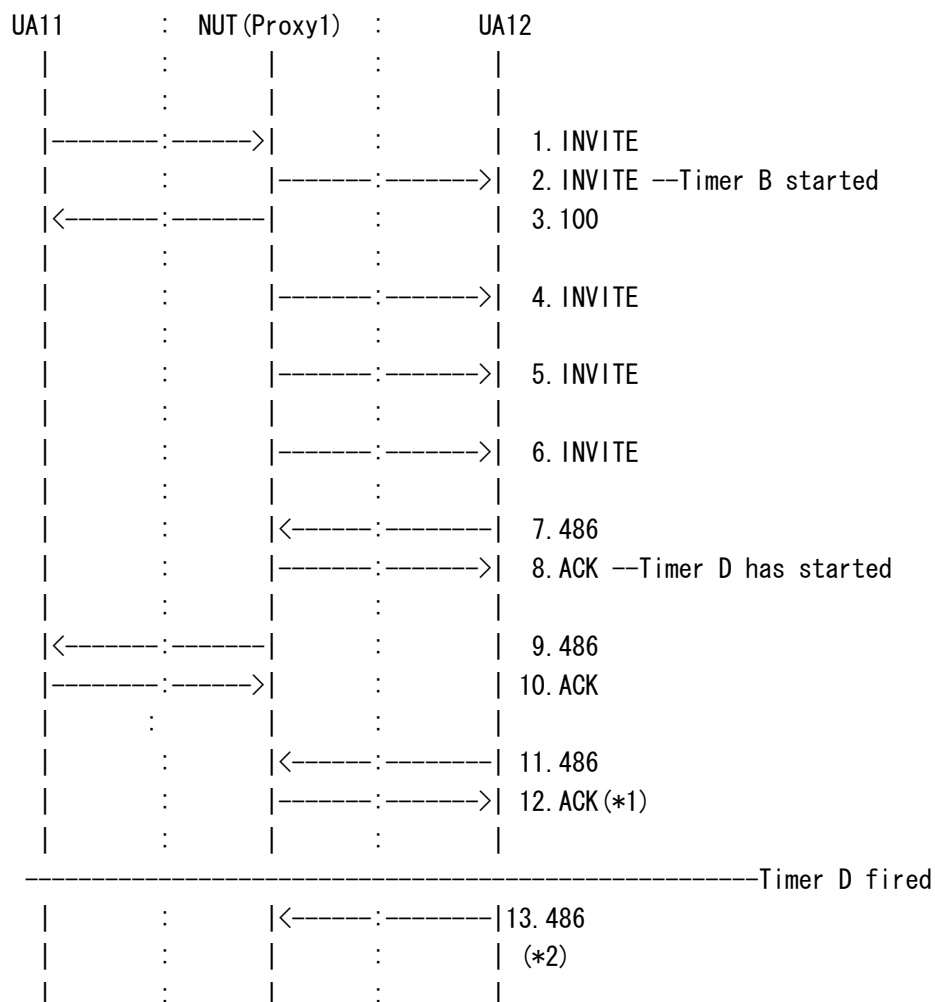


1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]

Note: This sequence is an example.

The number of retransmission changes depending on a case.



1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Receive INVITE.
5. UA12 Receive INVITE.
6. UA12 Receive INVITE.
7. UA12 Send 486 Busy Here.
8. UA12 Receive ACK.
9. UA11 Receive 486 Busy Here.
10. UA11 Send ACK.
11. UA12 Send 486 Busy Here.
12. UA12 Receive ACK.
13. UA12 Send 486 Busy Here.

#### [JUDGMENT]

- \*\* this scenario checks only timing (message format is not checked)
- \*\* response(486 is used below) may be 300-699 response.

\*1:ACK

ACK request Must be retransmitted before Timer D( $\geq 32$ sec.) fires.  
[RFC3261-17-24][RFC3261-17-25]

\*2:after 486 response(Timer D is already fired) from UA12.

ACK request Must not be retransmitted. [RFC3261-17-27]

#### [REFERENCE]

[RFC3261-17-20, 24, 27]

##### 17.1.1.2 Formal Description

When in either the "Calling" or "Proceeding" states, reception of a response with status code from 300-699 MUST cause the client transaction to transition to "Completed". \*snip\* The client transaction SHOULD start timer D when it enters the "Completed" state, with a value of at least 32 seconds for unreliable transports, and a value of zero seconds for reliable transports. \*snip\*

When in either the "Calling" or "Proceeding" states, reception of a 2xx response MUST cause the client transaction to enter the "Terminated" state, and \*snip\*



If timer D fires while the client transaction is in the "Completed" state, the client transaction MUST move to the terminated state.

#### 4.8.4 TS-2-1-1 - SIP Proxy- Non-INVITE Client Transaction (Stop of retransmission of CANCEL upon Timer F fired)

**[NAME]**

TS-2-1-1 - SIP Proxy- Non-INVITE Client Transaction (Stop of retransmission of CANCEL upon Timer F fired)

**[TARGET]**

SIP Proxy (NUT)

**[PURPOSE]**

Verify that a proxy stops retransmitting a CANCEL request and informs the UAC of time out of the request when Timer F is fired.

**[REQUIREMENT]**

NONE

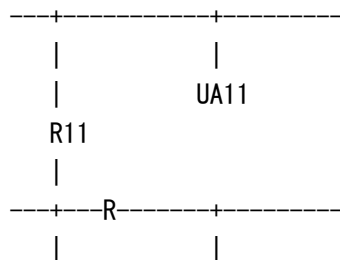
**[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

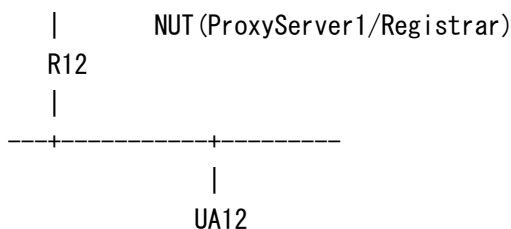
**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

**[TOPOLOGY]**



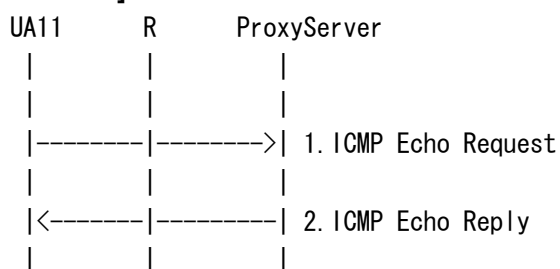




#### [CONFIGURATION for NUT]

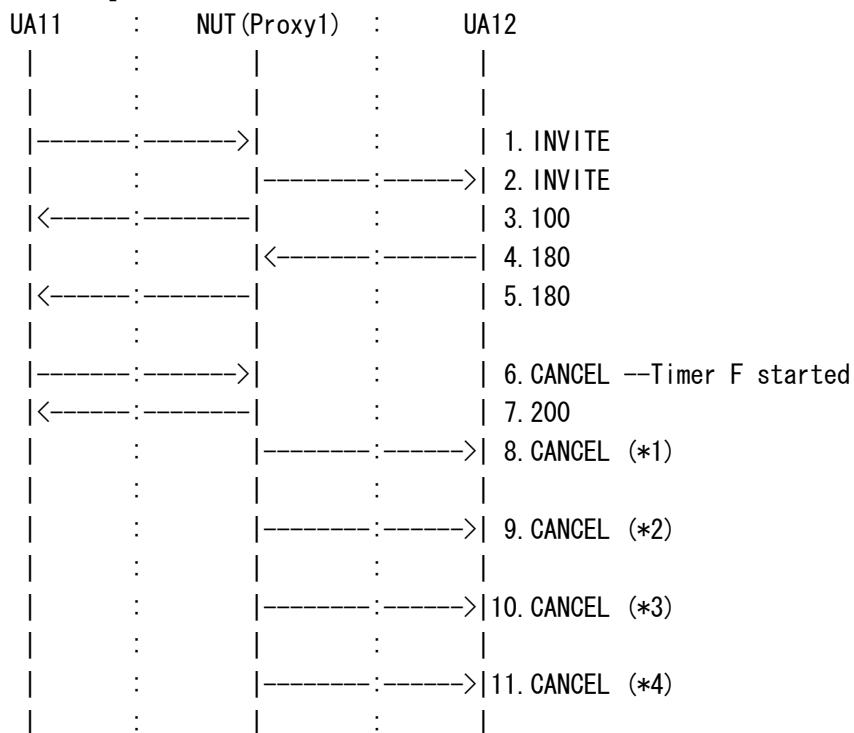
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

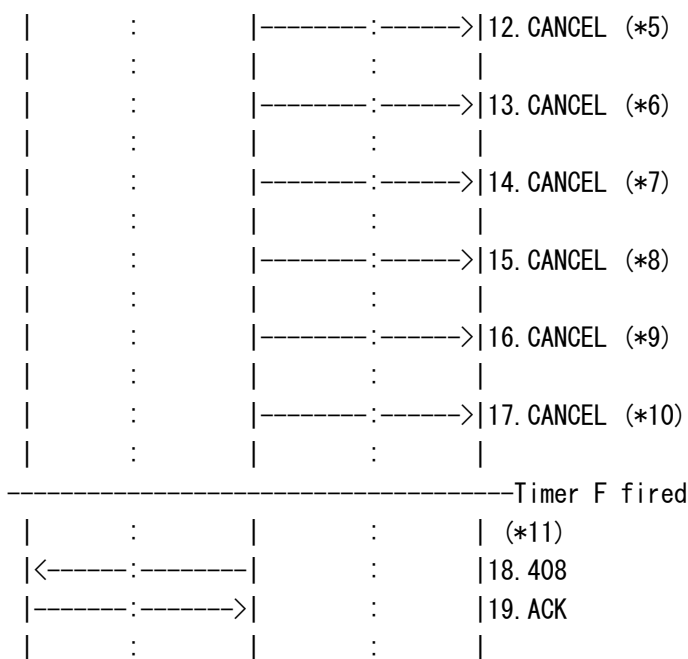
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Send 180 Ringing.
5. UA11 Receive 180 Ringing.
6. UA11 Send CANCEL.
7. UA11 Receive 100 Trying.
8. UA12 Receive CANCEL.
9. UA12 Receive CANCEL.
10. UA12 Receive CANCEL.
11. UA12 Receive CANCEL.
12. UA12 Receive CANCEL.
13. UA12 Receive CANCEL.
14. UA12 Receive CANCEL.
15. UA12 Receive CANCEL.
16. UA12 Receive CANCEL.
17. UA12 Receive CANCEL.
18. UA11 Receive 408 Request Timeout.
19. UA11 Send ACK.

### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked)

\*1: CANCEL request from NUT to UA12.



Must be retransmitted after Timer E(= T1 sec.) fired.  
[RFC3261-17-40][RFC3261-17-41][RFC3261-17-42]

\*2:CANCEL request from NUT to UA12.

Must be retransmitted after MIN( $2 \cdot T1$ , T2) sec. [RFC3261 17.1.2.2]

\*3:CANCEL request from NUT to UA12.

Must be retransmitted after MIN( $2 \cdot T1$ , T2) sec. [RFC3261 17.1.2.2]

\*4:CANCEL request from NUT to UA12.

Must be retransmitted after MIN( $2 \cdot T1$ , T2) sec. [RFC3261 17.1.2.2]

\*5:CANCEL request from NUT to UA12.

Must be retransmitted after MIN( $2 \cdot T1$ , T2) sec. [RFC3261 17.1.2.2]

\*6:CANCEL request from NUT to UA12.

Must be retransmitted after MIN( $2 \cdot T1$ , T2) sec. [RFC3261 17.1.2.2]

\*7:CANCEL request from NUT to UA12.

Must be retransmitted after MIN( $2 \cdot T1$ , T2) sec. [RFC3261 17.1.2.2]

\*8:CANCEL request from NUT to UA12.

Must be retransmitted after MIN( $2 \cdot T1$ , T2) sec. [RFC3261 17.1.2.2]

\*9:CANCEL request from NUT to UA12.

Must be retransmitted after MIN( $2 \cdot T1$ , T2) sec. [RFC3261 17.1.2.2]



\*10: CANCEL request from NUT to UA12.

Must be retransmitted after  $\text{MIN}(2 \cdot T1, T2)$  sec. [RFC3261 17.1.2.2]

\*11: before 200 response (Timer F (=  $64 \cdot T1$  sec.) is already fired) from Proxy.

CANCEL request Must not be retransmitted. [RFC3261-16-113, RFC3261-17-43,44]

## [REFERENCE]

[RFC3261-17-40, 41, 42, 43, 44, 47, 48, 51, 52, 53, 54, 56, 57]

17.1.2.2 Formal Description

.....

The "Trying" state is entered when the TU initiates a new client transaction with a request. When entering this state, the client transaction SHOULD set timer F to fire in  $64 \cdot T1$  seconds. The request MUST be passed to the transport layer for transmission. If an unreliable transport is in use, the client transaction MUST set timer E to fire in  $T1$  seconds. If timer E fires while still in this state, the timer is reset, but this time with a value of  $\text{MIN}(2 \cdot T1, T2)$ . When the timer fires again, it is reset to a  $\text{MIN}(4 \cdot T1, T2)$ . This process continues so that retransmissions occur with an exponentially increasing interval that caps at  $T2$ . The default value of  $T2$  is 4s, and it represents the amount of time a non-INVITE server transaction will take to respond to a request, if it does not respond immediately. For the default values of  $T1$  and  $T2$ , this results in intervals of 500 ms, 1 s, 2 s, 4 s, 4 s, 4 s, etc.

If Timer F fires while the client transaction is still in the "Trying" state, the client transaction SHOULD inform the TU about the timeout, and then it SHOULD enter the "Terminated" state. If a provisional response is received while in the "Trying" state,  
\*snip\* If a final response (status codes 200-699) is received while in the "Trying" state, the response MUST be passed to the TU, and the client transaction MUST transition to the "Completed" state.

\*snip\* If timer F fires while in the



"Proceeding" state, the TU MUST be informed of a timeout, and the client transaction MUST transition to the terminated state. If a final response (status codes 200-699) is received while in the "Proceeding" state, the response MUST be passed to the TU, and the client transaction MUST transition to the "Completed" state.

\*snip\* The "Completed" state exists to buffer any additional response retransmissions that may be received (which is why the client transaction remains there only for unreliable transports). T4 represents the amount of time the network will take to clear messages between client and server transactions. The default value of T4 is 5s. A response is a retransmission when it matches the same transaction, using the rules specified in Section 17.1.3. If Timer K fires while in this state, the client transaction MUST transition to the "Terminated" state.

Once the transaction is in the terminated state, it MUST be destroyed immediately.

[RFC3261-10-10]

## 10.2 Constructing the REGISTER Request

[RFC3261 Page 58 Paragraph 5]

UAs MUST NOT send a new registration (that is, containing new Contact header field values, as opposed to a retransmission) until they have received a final response from the registrar for the previous one or the previous REGISTER request has timed out.

[RFC3261-10-20]

### 10.2.7 Transmitting a Request

[RFC3261 Page 63 Paragraph 1]

If the transaction layer returns a timeout error because the REGISTER yielded no response, the UAC SHOULD NOT immediately re-attempt a registration to the same registrar.

An immediate re-attempt is likely to also timeout. Waiting some reasonable time interval for the conditions causing the timeout to be corrected reduces unnecessary load on the network. No specific interval is mandated.

[RFC3261-16-113]

## 16.7 Response Processing

If there are no final responses in the context, the proxy MUST send a 408 (Request Timeout) response to the server transaction.

#### 4.8.5 TS-2-1-2 - SIP Proxy- Non-INVITE Client Transaction (Stop of retransmission of BYE upon Timer F fired)

##### [NAME]

TS-2-1-2 - SIP Proxy- Non-INVITE Client Transaction (Stop of retransmission of BYE upon Timer F fired)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy doesn't forwards a BYE request when Timer F is fired.

##### [REQUIREMENT]

NONE

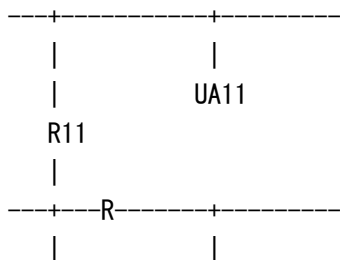
##### [PARAMETER]

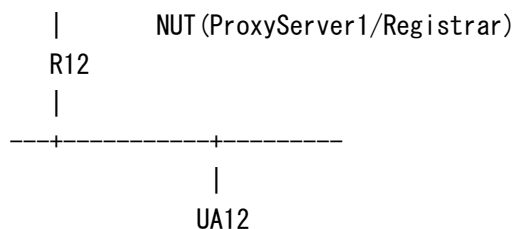
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

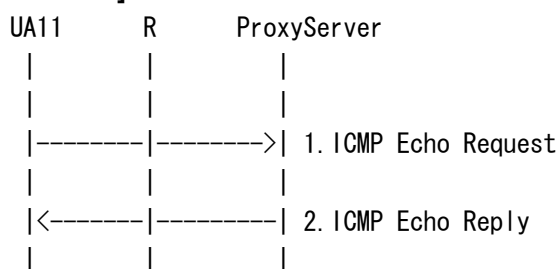




#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]

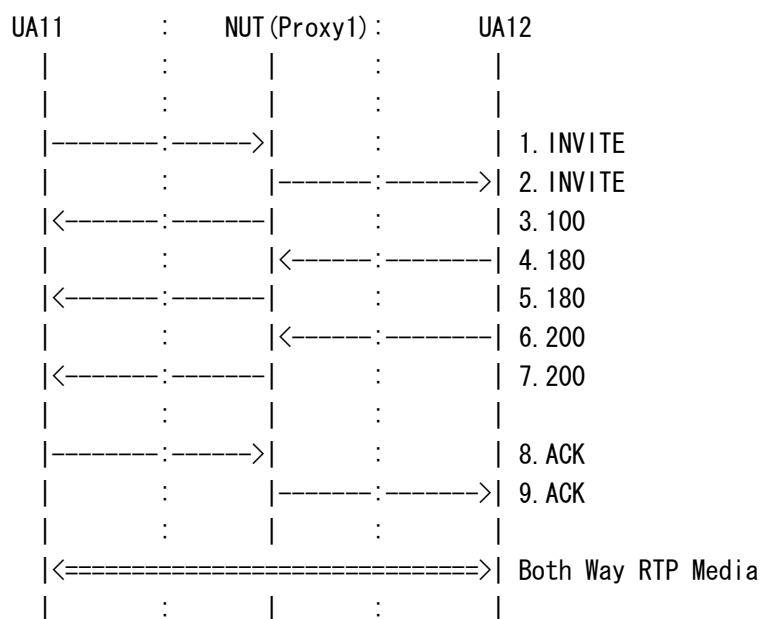


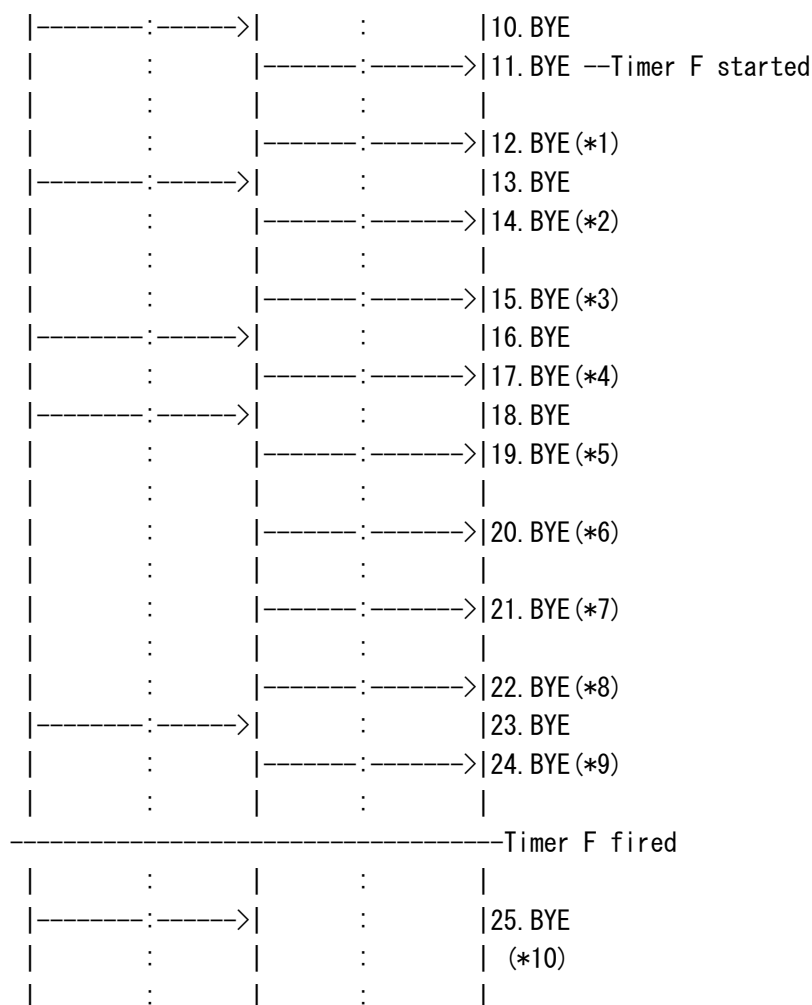
1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

Note: This sequence is an example.

The number of retransmission changes depending on a case.





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Send 180 Ringing.
5. UA11 Receive 180 Ringing.
6. UA12 Send 200 OK.
7. UA11 Receive 200 OK.
8. UA11 Send ACK.
9. UA12 Receive ACK.
10. UA11 Send BYE.
11. UA12 Receive BYE.
12. UA12 Receive BYE.
13. UA11 Send BYE.
14. UA12 Receive BYE.
15. UA12 Receive BYE.
16. UA11 Send BYE.





17. UA12 Receive BYE.
18. UA11 Send BYE.
19. UA12 Receive BYE.
20. UA12 Receive BYE.
21. UA12 Receive BYE.
22. UA12 Receive BYE.
23. UA11 Send BYE.
24. UA12 Receive BYE.
25. UA11 Send BYE.

- \* Break off BYE request from UA11 at NUT.
- \* BYE request from NUT retransmitting based retransmit interval.

#### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked)

\*1:BYE request from NUT.

Must be retransmitted after Timer E(= T1 sec.) fired.  
[RFC3261-17-40][RFC3261-17-41][RFC3261-17-42]

\*2:BYE request from NUT.

Must be retransmitted after MIN(2\*T1, T2) sec. [RFC3261 17.1.2.2]

\*3:BYE request from NUT.

Must be retransmitted after MIN(2\*T1, T2) sec. [RFC3261 17.1.2.2]

\*4:BYE request from NUT.

Must be retransmitted after MIN(2\*T1, T2) sec. [RFC3261 17.1.2.2]

\*5:BYE request from NUT.

Must be retransmitted after MIN(2\*T1, T2) sec. [RFC3261 17.1.2.2]

\*6:BYE request from NUT.



Must be retransmitted after  $\text{MIN}(2 \cdot T1, T2)$  sec. [RFC3261 17.1.2.2]

\*7:BYE request from NUT.

Must be retransmitted after  $\text{MIN}(2 \cdot T1, T2)$  sec. [RFC3261 17.1.2.2]

\*8:BYE request from NUT.

Must be retransmitted after  $\text{MIN}(2 \cdot T1, T2)$  sec. [RFC3261 17.1.2.2]

\*9:BYE request from NUT.

Must be retransmitted after  $\text{MIN}(2 \cdot T1, T2)$  sec. [RFC3261 17.1.2.2]

\*10:before 200 response(Timer F(=64\*T1 sec.) is already fired) from Proxy.

BYE request Must not be retransmitted. [RFC3261-17-43,44]

#### [REFERENCE]

[RFC3261-17-40, 41, 42, 43, 44, 47, 48, 51, 52, 53, 54, 56, 57]

17.1.2.2 Formal Description

.....

The "Trying" state is entered when the TU initiates a new client transaction with a request. When entering this state, the client transaction SHOULD set timer F to fire in  $64 \cdot T1$  seconds. The request MUST be passed to the transport layer for transmission. If an unreliable transport is in use, the client transaction MUST set timer E to fire in  $T1$  seconds. If timer E fires while still in this state, the timer is reset, but this time with a value of  $\text{MIN}(2 \cdot T1, T2)$ . When the timer fires again, it is reset to a  $\text{MIN}(4 \cdot T1, T2)$ . This process continues so that retransmissions occur with an exponentially increasing interval that caps at  $T2$ . The default value of  $T2$  is 4s, and it represents the amount of time a non-INVITE server transaction will take to respond to a request, if it does not respond immediately. For the default values of  $T1$  and  $T2$ , this results in intervals of 500 ms, 1 s, 2 s, 4 s, 4 s, 4 s, etc.



If Timer F fires while the client transaction is still in the "Trying" state, the client transaction SHOULD inform the TU about the timeout, and then it SHOULD enter the "Terminated" state. If a provisional response is received while in the "Trying" state, \*snip\* If a final response (status codes 200-699) is received while in the "Trying" state, the response MUST be passed to the TU, and the client transaction MUST transition to the "Completed" state.

\*snip\* If timer F fires while in the "Proceeding" state, the TU MUST be informed of a timeout, and the client transaction MUST transition to the terminated state. If a final response (status codes 200-699) is received while in the "Proceeding" state, the response MUST be passed to the TU, and the client transaction MUST transition to the "Completed" state.

\*snip\* The "Completed" state exists to buffer any additional response retransmissions that may be received (which is why the client transaction remains there only for unreliable transports). T4 represents the amount of time the network will take to clear messages between client and server transactions. The default value of T4 is 5s. A response is a retransmission when it matches the same transaction, using the rules specified in Section 17.1.3. If Timer K fires while in this state, the client transaction MUST transition to the "Terminated" state.

Once the transaction is in the terminated state, it MUST be destroyed immediately.

[RFC3261-10-10]

#### 10.2 Constructing the REGISTER Request

[RFC3261 Page 58 Paragraph 5]

UAs MUST NOT send a new registration (that is, containing new Contact header field values, as opposed to a retransmission) until they have received a final response from the registrar for the previous one or the previous REGISTER request has timed out.

[RFC3261-10-20]

#### 10.2.7 Transmitting a Request

[RFC3261 Page 63 Paragraph 1]



If the transaction layer returns a timeout error because the REGISTER yielded no response, the UAC SHOULD NOT immediately re-attempt a registration to the same registrar.

An immediate re-attempt is likely to also timeout. Waiting some reasonable time interval for the conditions causing the timeout to be corrected reduces unnecessary load on the network. No specific interval is mandated.

#### **4.8.6 TS-2-1-3 - Non-INVITE Client Transaction (Receipt of 100 response to CANCEL and reset of Timer E with T2 )**

**[NAME]**

TS-2-1-3 - SIP Proxy- Non-INVITE Client Transaction (receipt of 100 response to CANCEL and reset of Timer E with T2 )

**[TARGET]**

SIP Proxy (NUT)

**[PURPOSE]**

Verify that a proxy resets Timer E with T2 when receiving a 100 response to previous CANCEL request.

**[REQUIREMENT]**

NONE

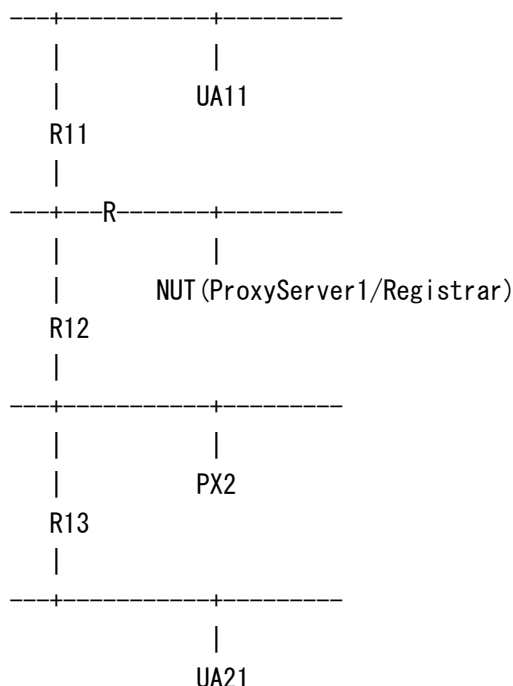
**[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

**[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

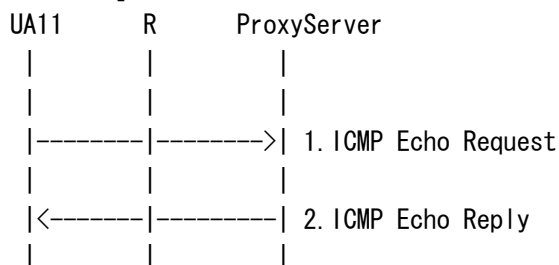
**[TOPOLOGY]**



#### [CONFIGURATION for NUT]

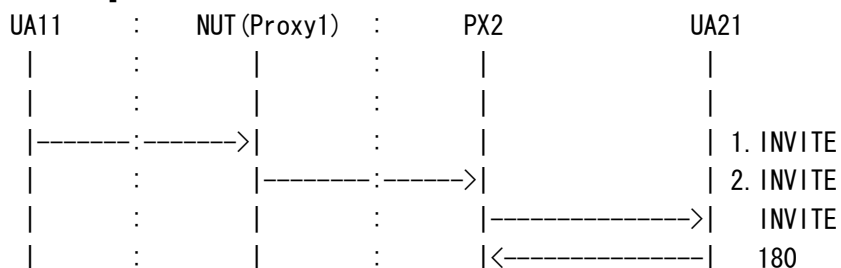
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

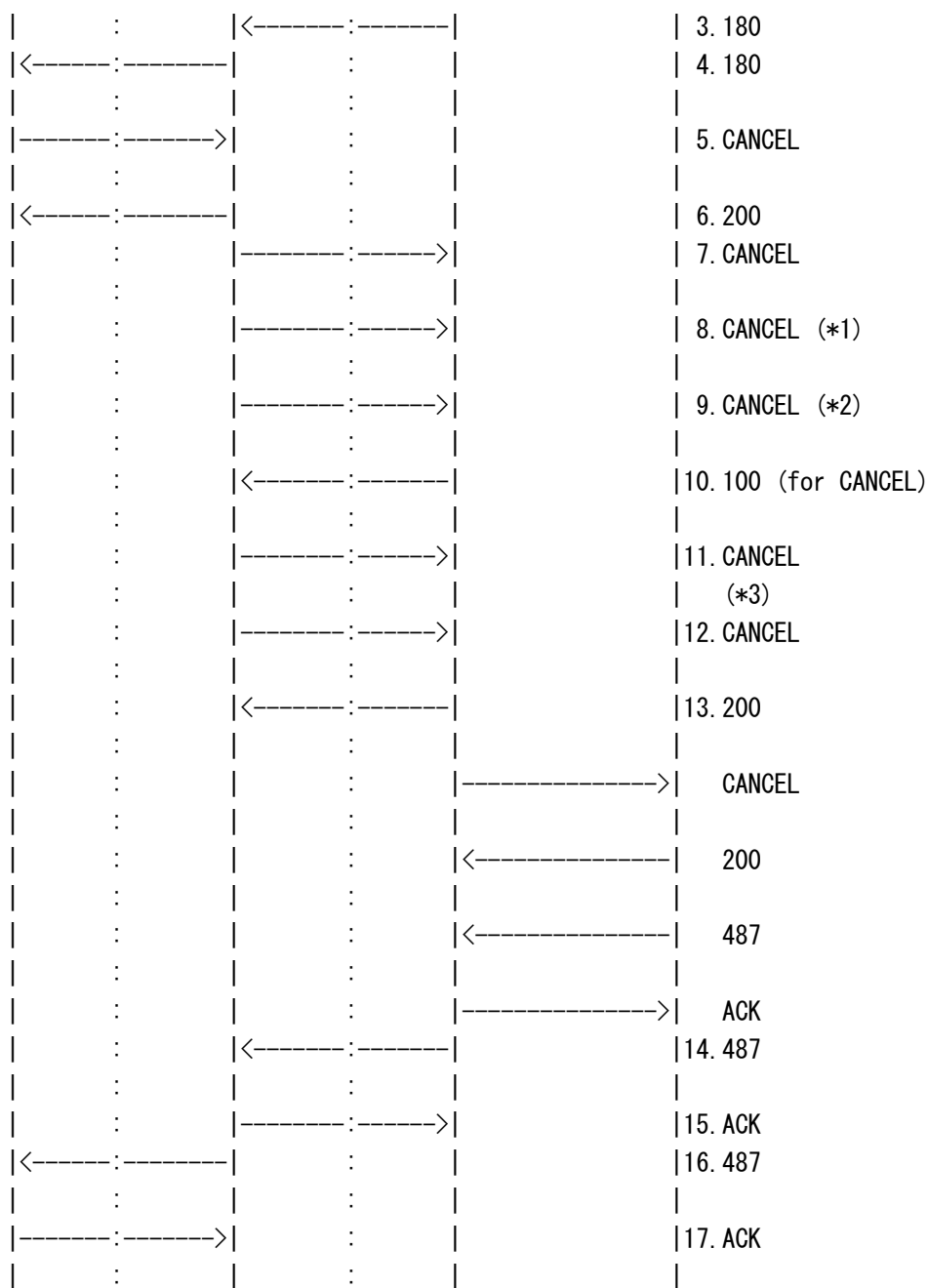
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. PX2 Receive INVITE.
3. PX2 Send 180 Ringing.
4. UA11 Receive 180 Ringing.
5. UA11 Send CANCEL.
6. UA11 Receive 200 OK.
7. PX2 Receive CANCEL.
8. PX2 Receive CANCEL.



9. PX2 Receive CANCEL.
10. PX2 Send 100 Trying.
11. PX2 Receive CANCEL.
12. PX2 Receive CANCEL.
13. PX2 Send 200 OK.
14. PX2 Send 487 Request Terminated.
15. PX2 Receive ACK.
16. UA11 Receive 487 Request Terminated.
17. UA11 Send ACK.

#### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked)

\*1: CANCEL request from NUT.

Must be retransmitted after Timer E(= T1 sec.) fired. [RFC3261-17-42]

\*2: CANCEL request from NUT.

Further retransmit Must be MIN(2\*T1, T2) sec., but not equal T2.  
[RFC3261 17.1.2.2]

\*3: after 100 response from Proxy.

Should be retransmitted after T2 sec. [RFC3261-17-49][RFC3261-17-50]

#### [REFERENCE]

[RFC3261-17-45, 46, 49, 50]

17.1.2.2 Formal Description

.....

\*snip\* If a provisional response is received while in the "Trying" state, the response MUST be passed to the TU, and then the client transaction SHOULD move to the "Proceeding" state. \*snip\*

.....

If Timer E fires while in the "Proceeding" state, the request MUST be



passed to the transport layer for retransmission, and Timer E MUST be reset with a value of T2 seconds.

#### 4.8.7 TS-2-1-4 - SIP Proxy- Non-INVITE Client Transaction (Receipt of 100 response to BYE and reset of Timer E with T2)

##### [NAME]

TS-2-1-4 - SIP Proxy- Non-INVITE Client Transaction (receipt of 100 response to BYE and reset of Timer E with T2)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy resets Timer E with T2 when receiving a 100 response to previous BYE request.

##### [REQUIREMENT]

NONE

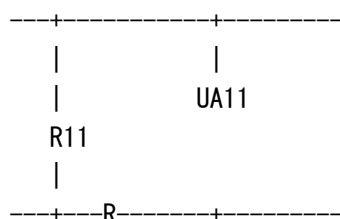
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA21(AOR)	sip:UA21@biloxi.example.com
UA21(Contact)	sip:UA21@client.biloxi.example.com
PX2	sip:ss2.biloxi.example.com

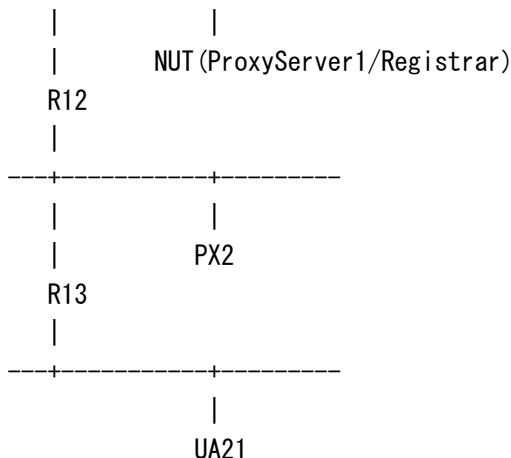
##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA21(IPv6)	3ffe:501:ffff:2::2/64
PX2(IPv6)	3ffe:501:ffff:20::20/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]



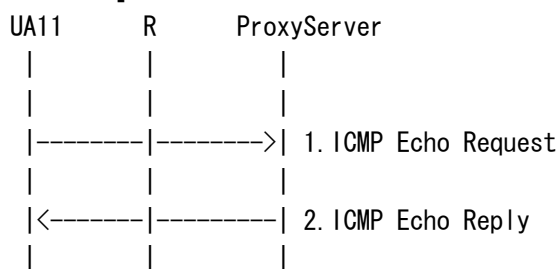




#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]

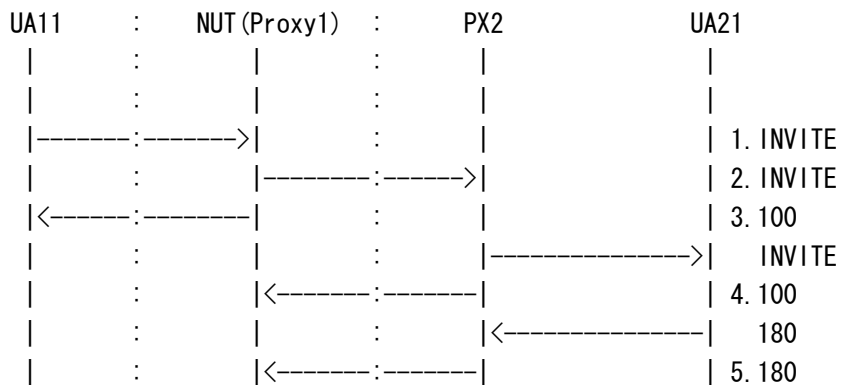


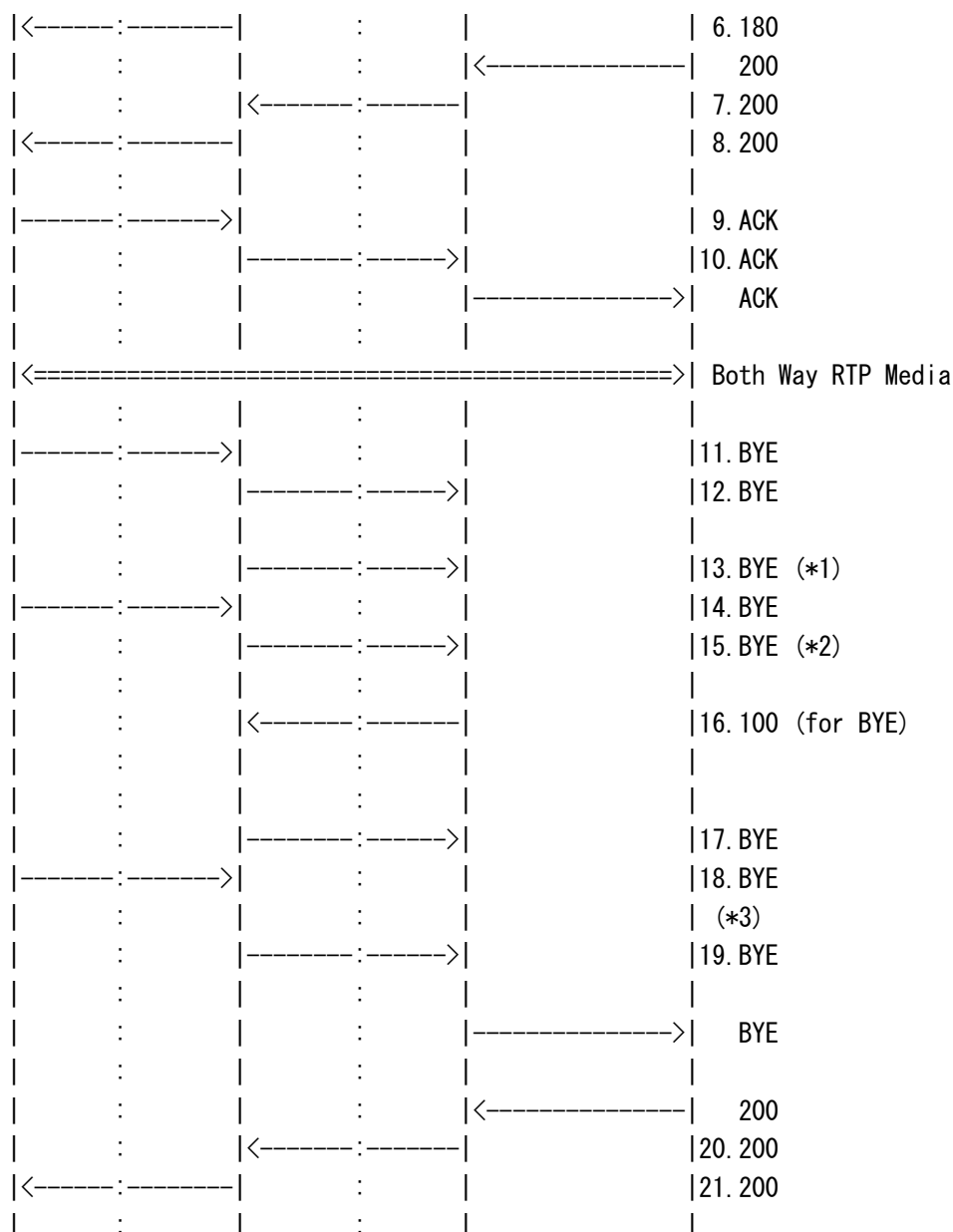
1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

Note: This sequence is an example.

The number of retransmission changes depending on a case.





1. UA11 Send INVITE.
2. PX2 Receive INVITE.
3. UA11 Receive 100 Trying.
4. PX2 Send 100 Trying.
5. PX2 Send 180 Ringing.
6. UA11 Receive 180 Ringing.
7. PX2 Send 200 OK.
8. UA11 Receive 200 OK.
9. UA11 Send ACK.
10. PX2 Receive ACK.

11. UA11 Send BYE.
12. PX2 Receive BYE.
13. PX2 Receive BYE.
14. UA11 Send BYE.
15. PX2 Receive BYE.
16. PX2 Send 100 Trying.
17. PX2 Receive BYE.
18. UA11 Send BYE.
19. PX2 Receive BYE.
20. PX2 Send 200 OK.
21. UA11 Receive 200 OK.

#### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked)

\*1:BYE request from NUT.

Must be retransmitted after Timer E(= T1 sec.) fired. [RFC3261-17-42]

\*2:BYE request from NUT.

Further retransmit Must be MIN(2\*T1,T2) sec., but not equal T2.  
[RFC3261 17.1.2.2]

\*3:after 100 response from Proxy.

Should be retransmitted after T2 sec. [RFC3261-17-49][RFC3261-17-50]

#### [REFERENCE]

[RFC3261-17-45, 46, 49, 50]

17.1.2.2 Formal Description

.....

\*snip\* If a  
provisional response is received while in the "Trying" state, the  
response MUST be passed to the TU, and then the client transaction  
SHOULD move to the "Proceeding" state. \*snip\*

.....



If Timer E fires while in the "Proceeding" state, the request MUST be passed to the transport layer for retransmission, and Timer E MUST be reset with a value of T2 seconds.

#### 4.8.8 TS-3-1-1 - SIP Proxy- INVITE Server Transaction (Response after Timer H fired)

##### [NAME]

TS-3-1-1 - INVITE Server Transaction (Response after Timer H fired)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy doesn't forward 4xx-6xx responses to the requests that has the same to-tag as one of response after Timer H is fired. Also, verify that the proxy retransmits 4xx-6xx response to the requests, when the to-tag of that request is different from that before time-out of Timer H, after Timer H is fired.

##### [REQUIREMENT]

NONE

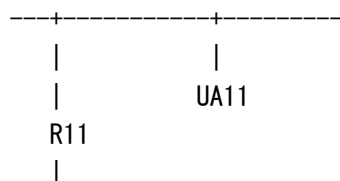
##### [PARAMETER]

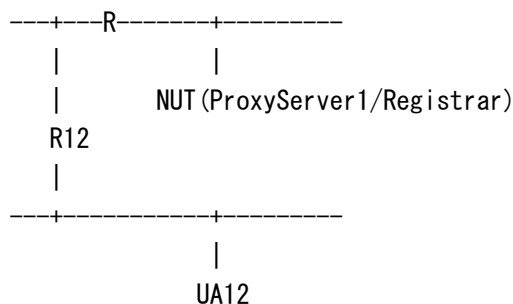
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

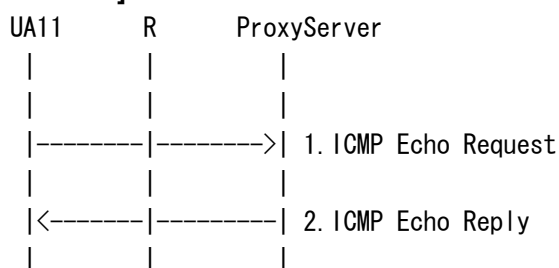




#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]

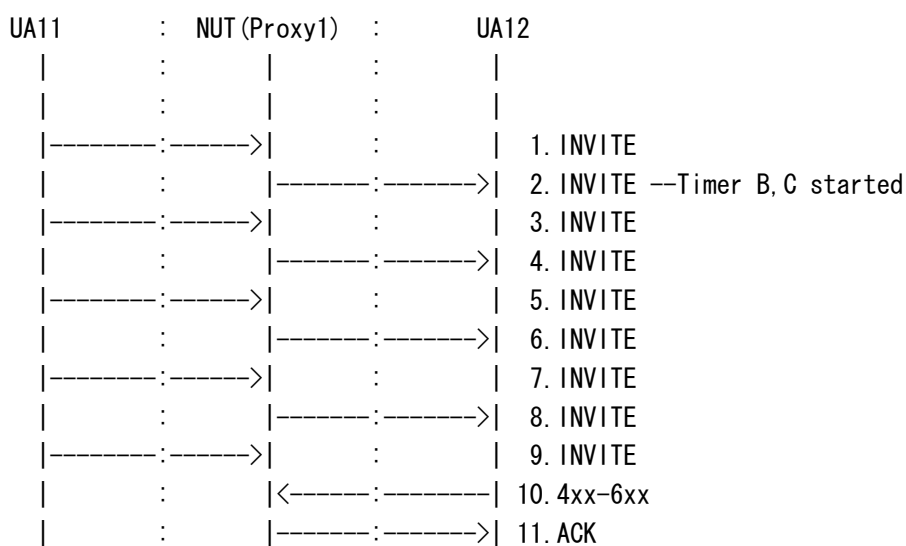


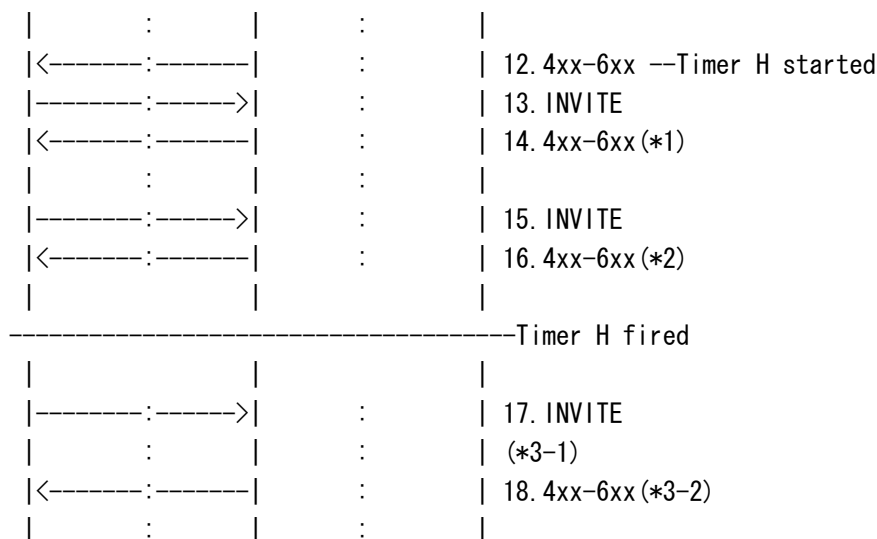
1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

Note: This sequence is an example.

The number of retransmission changes depending on a case.





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Send INVITE.
4. UA12 Receive INVITE.
5. UA11 Send INVITE.
6. UA12 Receive INVITE.
7. UA11 Send INVITE.
8. UA12 Receive INVITE.
9. UA11 Send INVITE.
10. UA12 Send 4xx-6xx.
11. UA12 Receive ACK.
12. UA11 Receive 4xx-6xx.
13. UA11 Send INVITE.
14. UA11 Receive 4xx-6xx.
  
15. UA11 Send INVITE.
16. UA11 Receive 4xx-6xx.
17. UA11 Send INVITE.
18. UA11 Receive 4xx-6xx.

#### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked, except 1xx response)

\*1:4xx-6xx response from NUT to UA11.

Must be retransmitted after Timer G(= T1 sec.) fired.  
[RFC3261-17-67, RFC3261-17-68]



\*2:4xx-6xx response from NUT to UA11.

further retransmit Must be  $\text{MIN}(2 \cdot T1, T2)$  sec.  
[RFC3261 17.1.2.2]

\*3-1:after Timer H( $=64 \cdot T1$  sec.) fired.

4xx-6xx response Must not be retransmitted. [RFC3261-17-69, RFC3261-17-72, RFC3261-17-73]

\*3-2:4xx-6xx response from NUT to UA11.

To tag Must be different from retransmitted 4xx-6xx response before Timer H fires.  
[RFC3261 17.1.2.2]

## [REFERENCE]

[RFC3261-17-67, 68, 69, 70, 72, 73]

17.2.1 INVITE Server Transaction

.....

While in the "Proceeding" state, if the TU passes a response with status code from 300 to 699 to the server transaction, the response MUST be passed to the transport layer for transmission, and the state machine MUST enter the "Completed" state. For unreliable transports, timer G is set to fire in T1 seconds, and is not set to fire for reliable transports.

This is a change from RFC 2543, where responses were always retransmitted, even over reliable transports.

When the "Completed" state is entered, timer H MUST be set to fire in  $64 \cdot T1$  seconds for all transports. Timer H determines when the server transaction abandons retransmitting the response. Its value is chosen to equal Timer B, the amount of time a client transaction will continue to retry sending a request. If timer G fires, the response is passed to the transport layer once more for retransmission, and timer G is set to fire in  $\text{MIN}(2 \cdot T1, T2)$  seconds. From then on, when timer G fires, the response is passed to the transport again for

transmission, and timer G is reset with a value that doubles, unless that value exceeds T2, in which case it is reset with the value of T2. This is identical to the retransmit behavior for requests in the "Trying" state of the non-INVITE client transaction. Furthermore, while in the "Completed" state, if a request retransmission is received, the server SHOULD pass the response to the transport for retransmission.

.....

If timer H fires while in the "Completed" state, it implies that the ACK was never received. In this case, the server transaction MUST transition to the "Terminated" state, and MUST indicate to the TU that a transaction failure has occurred.

#### 4.8.9 TS-3-1-2 - SIP Proxy- INVITE Server Transaction (Stop of retransmission after Timer H fired)

##### [NAME]

TS-3-1-2 - SIP Proxy- INVITE Server Transaction (Stop retransmission after Timer H fired)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a UA stops retransmitting a 4xx-6xx response and after Timer H is fired.

##### [REQUIREMENT]

NONE

##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

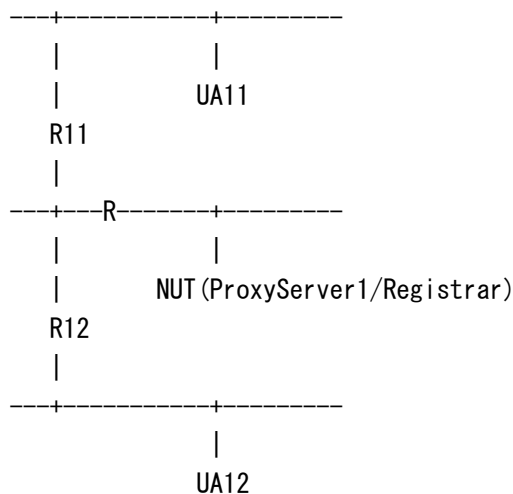
##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64



R(IPv6)	3ffe:501:ffff:50::1/64
---------	------------------------

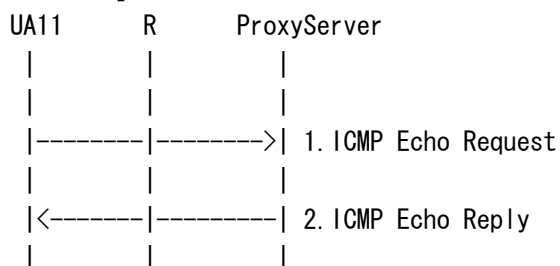
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

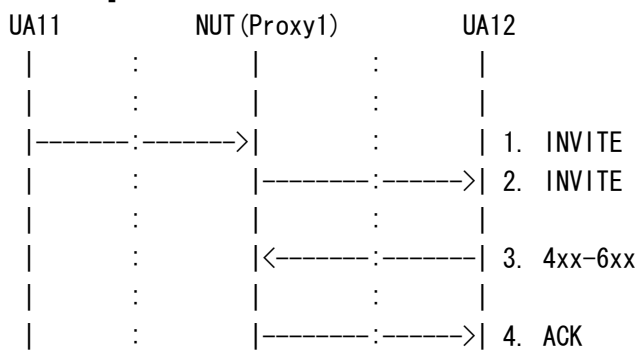
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

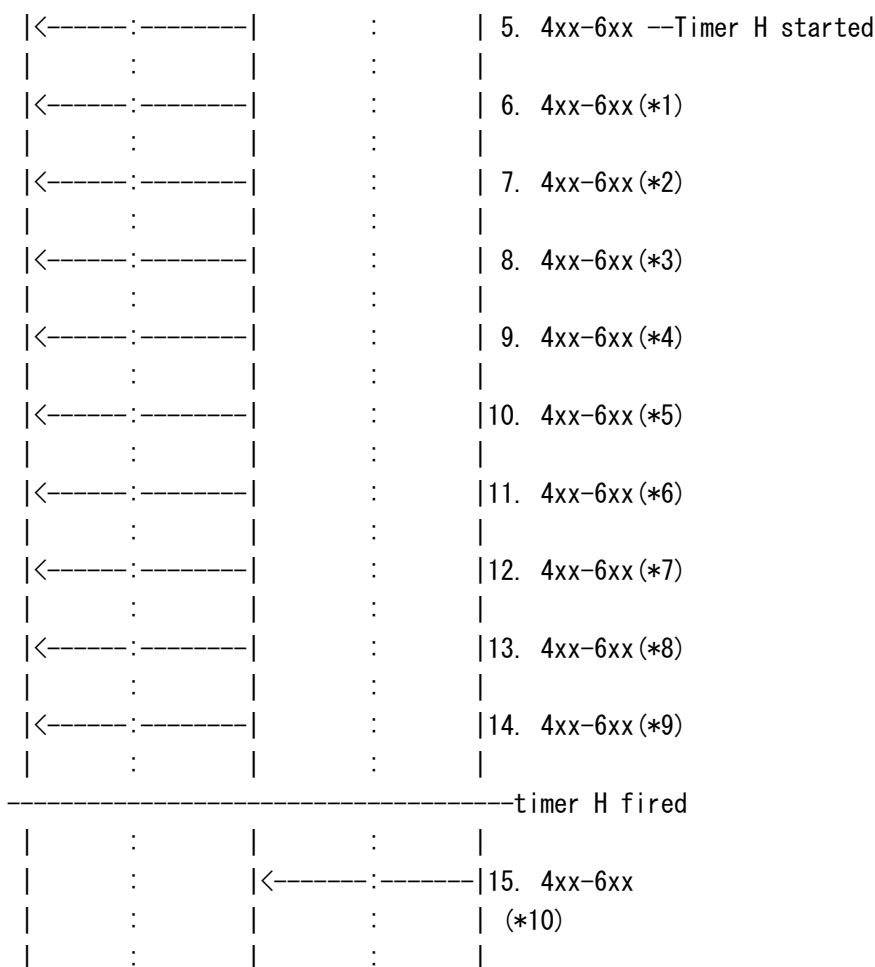
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA12 Send 4xx-6xx.
4. UA12 Receive ACK.
5. UA11 Receive 4xx-6xx.
6. UA11 Receive 4xx-6xx.
7. UA11 Receive 4xx-6xx.
8. UA11 Receive 4xx-6xx.
9. UA11 Receive 4xx-6xx.
10. UA11 Receive 4xx-6xx.
11. UA11 Receive 4xx-6xx.
12. UA11 Receive 4xx-6xx.
13. UA11 Receive 4xx-6xx.
14. UA11 Receive 4xx-6xx.
15. UA12 Send 4xx-6xx.

## [JUDGMENT]



- \*\* this scenario checks only timing (message format is not checked)
- \*\* Target receives INVITE with To-tag, and Tester expects 481 response.
- \*\* But target may do any way that like for sending 4xx-6xx response.

\*1:4xx-6xx response from NUT.

Must be retransmitted after Timer G(= T1 sec.) fired. [RFC3261-17-67, RFC3261-17-68]

\*2:INVITE request from NUT.

Must be retransmitted after MIN(2\*T1,T2) sec. [RFC3261 17.1.2.2]

\*3:INVITE request from NUT.

Must be retransmitted after MIN(2\*T1,T2) sec. [RFC3261 17.1.2.2]

\*4:INVITE request from NUT.

Must be retransmitted after MIN(2\*T1,T2) sec. [RFC3261 17.1.2.2]

\*5:INVITE request from NUT.

Must be retransmitted after MIN(2\*T1,T2) sec. [RFC3261 17.1.2.2]

\*6:INVITE request from NUT.

Must be retransmitted after MIN(2\*T1,T2) sec. [RFC3261 17.1.2.2]

\*7:INVITE request from NUT.

Must be retransmitted after MIN(2\*T1,T2) sec. [RFC3261 17.1.2.2]

\*8:INVITE request from NUT.

Must be retransmitted after MIN(2\*T1,T2) sec. [RFC3261 17.1.2.2]



\*9:INVITE request from NUT.

Must be retransmitted after  $\text{MIN}(2 \cdot T1, T2)$  sec. [RFC3261 17.1.2.2]

\*10:after Timer H( $=64 \cdot T1$  sec.) fired.

4xx-6xx response Must not be retransmitted. [RFC3261-17-69, RFC3261-17-72, RFC3261-17-73]

## [REFERENCE]

[RFC3261-17-67, 68, 69, 70, 72, 73]

### 17.2.1 INVITE Server Transaction

.....

While in the "Proceeding" state, if the TU passes a response with status code from 300 to 699 to the server transaction, the response **MUST** be passed to the transport layer for transmission, and the state machine **MUST** enter the "Completed" state. For unreliable transports, timer G is set to fire in T1 seconds, and is not set to fire for reliable transports.

This is a change from RFC 2543, where responses were always retransmitted, even over reliable transports.

When the "Completed" state is entered, timer H **MUST** be set to fire in  $64 \cdot T1$  seconds for all transports. Timer H determines when the server transaction abandons retransmitting the response. Its value is chosen to equal Timer B, the amount of time a client transaction will continue to retry sending a request. If timer G fires, the response is passed to the transport layer once more for retransmission, and timer G is set to fire in  $\text{MIN}(2 \cdot T1, T2)$  seconds. From then on, when timer G fires, the response is passed to the transport again for transmission, and timer G is reset with a value that doubles, unless that value exceeds T2, in which case it is reset with the value of T2. This is identical to the retransmit behavior for requests in the "Trying" state of the non-INVITE client transaction. Furthermore, while in the "Completed" state, if a request retransmission is received, the server **SHOULD** pass the response to the transport for retransmission.

.....



If timer H fires while in the "Completed" state, it implies that the ACK was never received. In this case, the server transaction MUST transition to the "Terminated" state, and MUST indicate to the TU that a transaction failure has occurred.

#### 4.8.10 TS-3-1-4 - SIP Proxy- INVITE Server Transaction (Stop of retransmission of 4xx-6xx response upon receipt of ACK)

##### [NAME]

TS-3-1-4 - SIP Proxy- INVITE Server Transaction (Stop of retransmission of 4xx-6xx response upon receipt of ACK)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy properly stops retransmitting a 4xx-6xx response when receiving an ACK.

##### [REQUIREMENT]

NONE

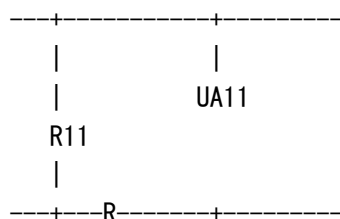
##### [PARAMETER]

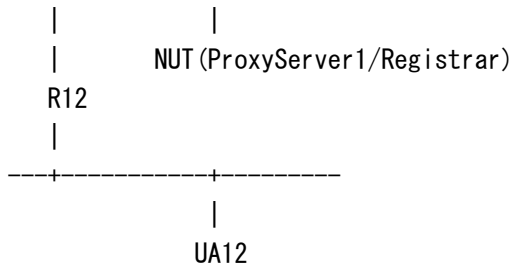
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

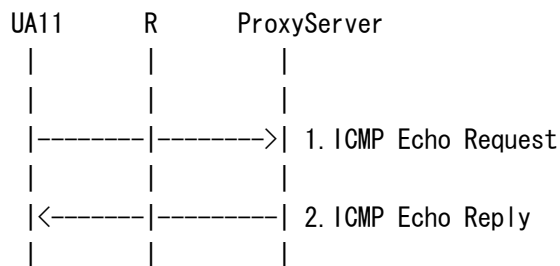




#### [CONFIGURATION for NUT]

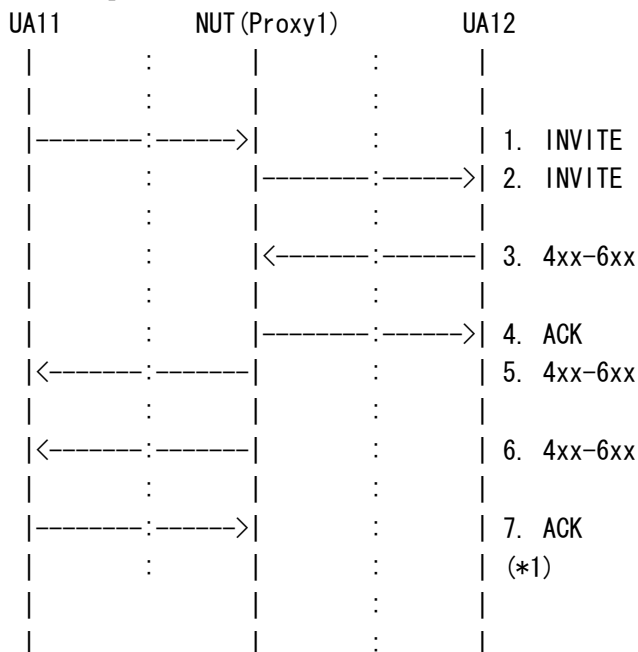
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA12 Send 4xx-6xx.
4. UA12 Receive ACK.
5. UA11 Receive 4xx-6xx.
6. UA11 Receive 4xx-6xx.
7. UA11 Send ACK.

#### [JUDGMENT]

- \*\* this scenario checks only timing (message format is not checked)
- \*\* Target receives INVITE with To-tag, and Tester expects 481 response.
- \*\* But target may do any way that like for sending 4xx-6xx response.

\*1:after ACK request from UA11.

4xx-6xx response Must not be retransmitted. [RFC3261-17-71]

#### [REFERENCE]

[RFC3261-17-67, 68, 71]

##### 17.2.1 INVITE Server Transaction

.....

While in the "Proceeding" state, if the TU passes a response with status code from 300 to 699 to the server transaction, the response MUST be passed to the transport layer for transmission, and the state machine MUST enter the "Completed" state. For unreliable transports, timer G is set to fire in T1 seconds, and is not set to fire for reliable transports.

.....

If an ACK is received while the server transaction is in the "Completed" state, the server transaction MUST transition to the "Confirmed" state. As Timer G is ignored in this state, any retransmissions of the response will cease.

#### **4.8.11 TS-3-1-5 - SIP Proxy- 487 to CANCEL for INVITE request after 64\*T1 fired**

#### [NAME]

TS-3-1-5 - SIP Proxy- 487 to CANCEL for INVITE request after 64\*T1 fired

# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy doesn't send any response to that downstream when receiving a 487 response to previous CANCEL request for INVITE request after 64\*T1 is fired

# **[REQUIREMENT]**

NONE

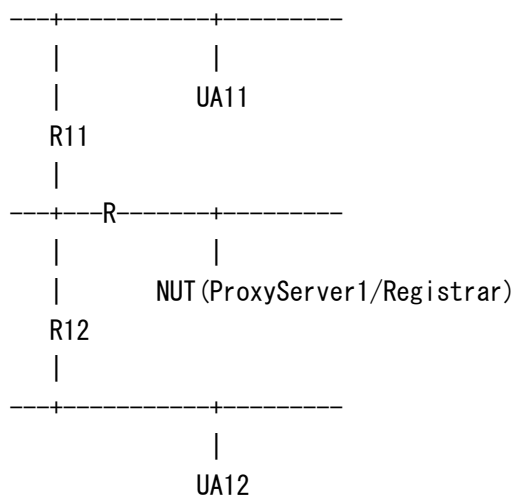
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

# **[TOPOLOGY]**

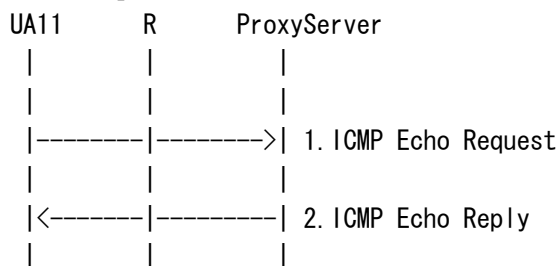


# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

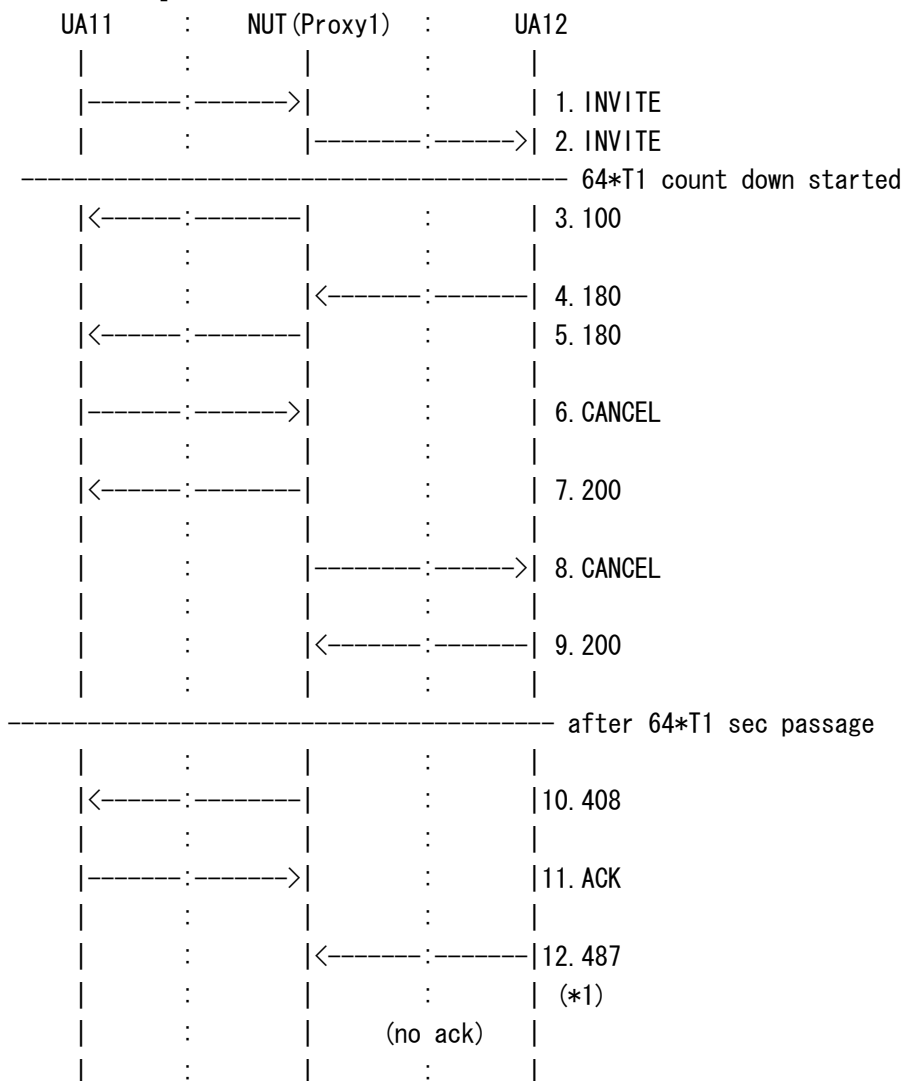


# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Send 180 Ringing.
5. UA11 Receive 180 Ringing.
6. UA11 Send CANCEL.
7. UA11 Receive 200 OK.
8. UA12 Receive CANCEL.
9. UA12 Send 200 OK.
10. UA11 Receive 408 Request Timeout.
11. UA11 Send 200 OK.
12. UA12 Send 487 Request Terminated.

#### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked)

\*1:after 487 response from UA12.

\* Should not send ACK request. [RFC3261-9-12][RFC3261-9-13]

#### [REFERENCE]

[RFC3261-9-12, 13]

9.1 Client Behavior

[RFC3261 Page 54 Paragraph 8]

Note that both the transaction corresponding to the original request and the CANCEL transaction will complete independently. However, a UAC canceling a request cannot rely on receiving a 487 (Request Terminated) response for the original request, as an RFC 2543-compliant UAS will not generate such a response. If there is no final response for the original request in  $64 \cdot T_1$  seconds ( $T_1$  is defined in Section 17.1.1.1), the client SHOULD then consider the original transaction cancelled and SHOULD destroy the client transaction handling the original request.

#### **4.8.12 TS-4-1-1 - SIP Proxy- Non-INVITE Server Transaction (Response for CANCEL after Timer J fired)**

##### [NAME]

TS-4-1-1 - SIP Proxy- Non-INVITE Server Transaction (response for CANCEL after Timer J fired)

# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a UA properly sends an error response for a CANCEL request after Timer J is fired.

# **[REQUIREMENT]**

NONE

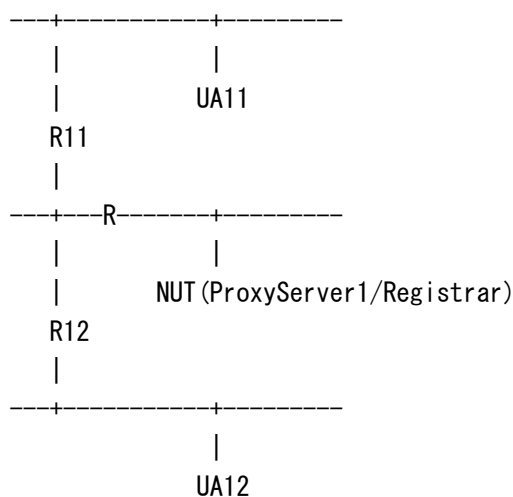
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

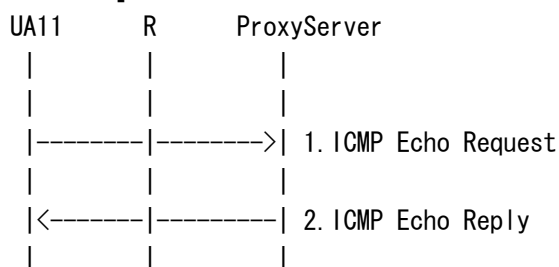
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

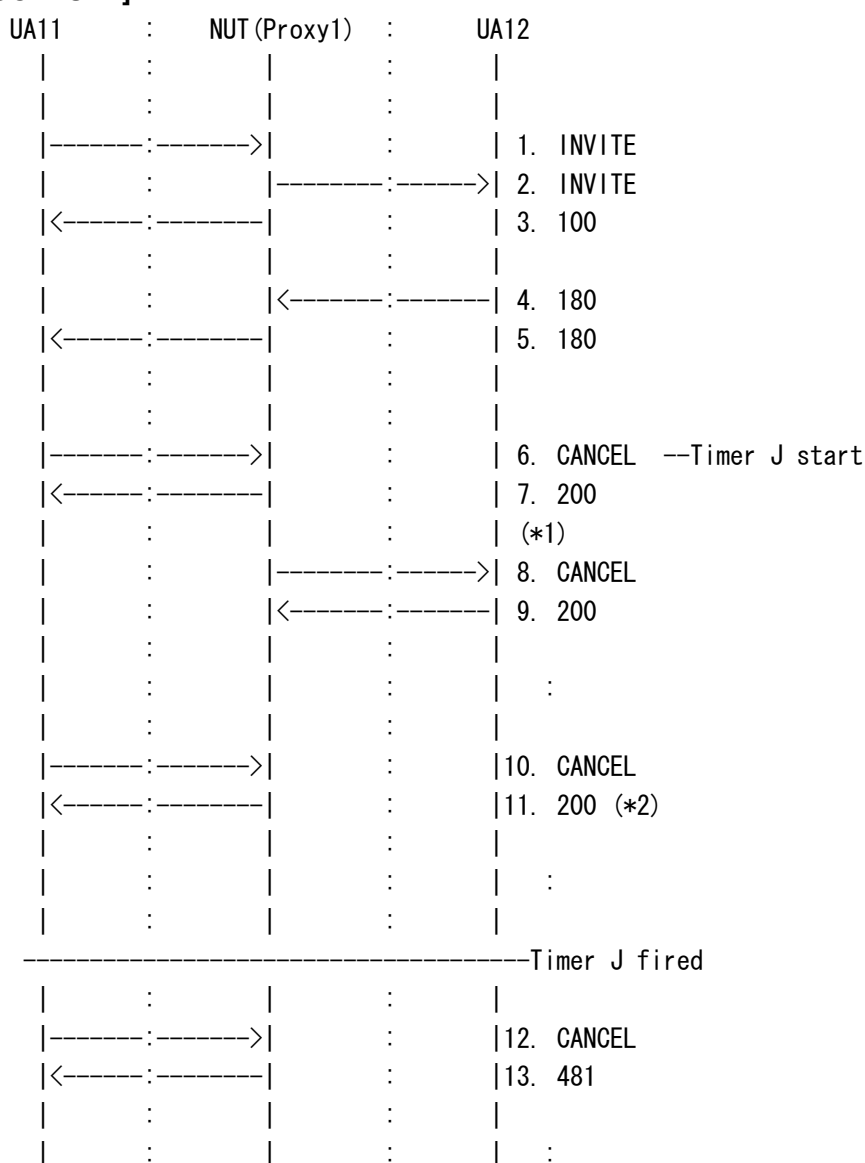
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]



| : | : |

1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Send 180 Ringing.
5. UA11 Receive 180 Ringing.
6. UA11 Send CANCEL.
7. UA11 receive 200 OK.
8. UA12 receive CANCEL.
9. UA12 send 200 OK.
10. UA11 send CANCEL.
11. UA11 receive 200 OK.
12. UA11 Send CANCEL.
13. UA11 Receive 481 Call/Transaction Does Not Exist.

#### [JUDGMENT]

- \*\* this scenario checks only timing (message format is not checked, except 1xx response)
- \*\* response(481 is used below) may be 300-699 response.

\*1:after 200 response from NUT.

Must not retransmit further 200 response. [RFC3261-17-83, 84, 85, 86]

\*2:200 response from NUT. (CANCEL is sent every 2 seconds)

Must send 200 response. [RFC3261-17-80][RFC3261-17-81][RFC3261-17-82]  
Must send response before Timer J(=64\*T1 sec.) fires. [RFC3261-17-83]

\*3:after Timer J fired.(CANCEL is sent every 2 seconds)

Must send 481 response. [RFC3261-17-85][RFC3261-17-86]

#### [REFERENCE]

[RFC3261-17-82, 83, 84, 85, 86]

##### 17.2.2 Non-INVITE Server Transaction

When the server transaction enters the "Completed" state, it MUST set Timer J to fire in 64\*T1 seconds for unreliable transports, and zero

seconds for reliable transports. While in the "Completed" state, the server transaction MUST pass the final response to the transport layer for retransmission whenever a retransmission of the request is received. Any other final responses passed by the TU to the server transaction MUST be discarded while in the "Completed" state. The server transaction remains in this state until Timer J fires, at which point it MUST transition to the "Terminated" state.

The server transaction MUST be destroyed the instant it enters the "Terminated" state.

#### 4.8.13 TS-4-1-2 - SIP Proxy- Non-INVITE Server Transaction (Forwarding of BYE upon Timer J fired)

##### [NAME]

TS-4-1-2 - SIP Proxy- Non-INVITE Server Transaction (forwarding of BYE upon Timer J fired)

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a UA forwards a BYE request to that upstream after Timer J is fired.

##### [REQUIREMENT]

NONE

##### [PARAMETER]

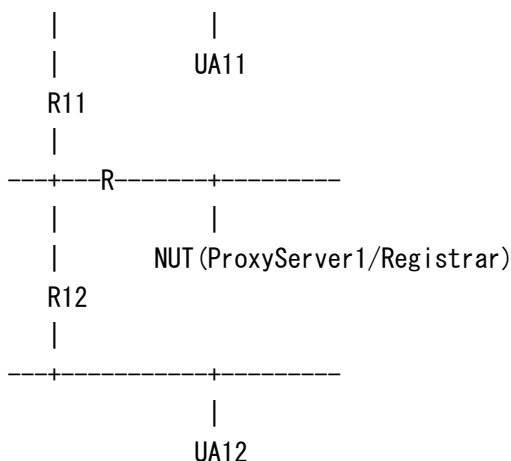
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

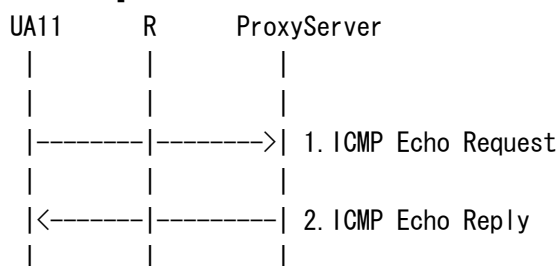
-----+-----+-----



### [CONFIGURATION for NUT]

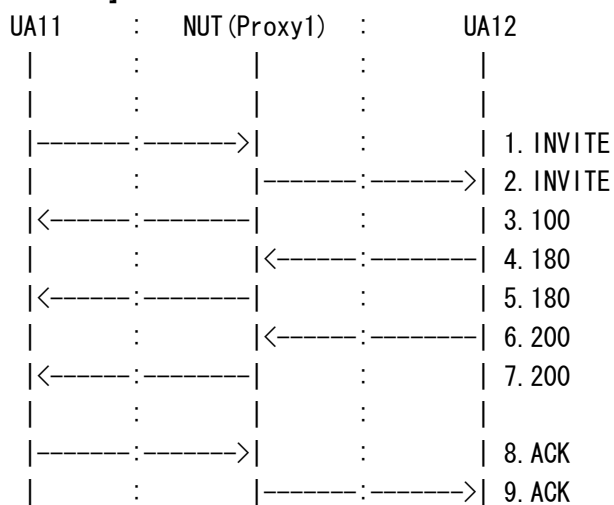
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

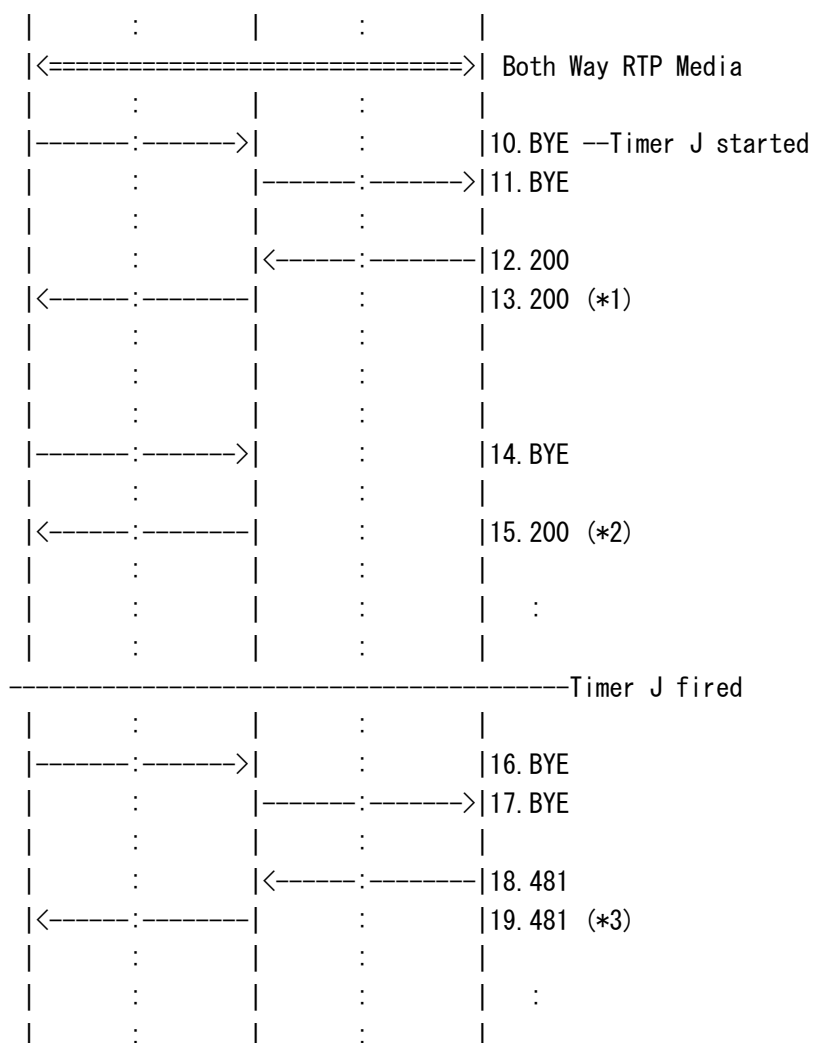
### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]





1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Send 180 Ringing.
5. UA11 Receive 180 Ringing.
6. UA12 Send 200 OK.
7. UA11 Receive 200 OK.
8. UA11 Send ACK.
9. UA12 Receive ACK.
10. UA11 Send BYE.
11. UA12 Receive BYE.
12. UA12 Send 200 OK.
13. UA11 Receive 200 OK.
14. UA11 Send BYE.
15. UA11 Receive 200 OK.





16. UA11 Send BYE.
17. UA12 Receive BYE.
18. UA12 Send 481 Call/Transaction Does Not Exist.
19. UA11 Receive 481 Call/Transaction Does Not Exist.

#### [JUDGMENT]

\*\* this scenario checks only timing (message format is not checked, except lxx response)

\*\* response(481 is used below) may be 300-699 response.

\*1:after 200 response from NUT.

Must not retransmit further 200 response. [RFC3261-17-83, 84, 85, 86]

\*2:200 response from NUT.(BYE is sent every 2 seconds)

Must send 200 response. [RFC3261-17-80][RFC3261-17-81][RFC3261-17-82]

Must send response before Timer J(=64\*T1 sec.) fires. [RFC3261-17-83]

\*3:after Timer J fired.(BYE is sent every 2 seconds)

Must send 481 response. [RFC3261-17-85][RFC3261-17-86]

#### [REFERENCE]

[RFC3261-17-82, 83, 84, 85, 86]

##### 17.2.2 Non-INVITE Server Transaction

When the server transaction enters the "Completed" state, it MUST set Timer J to fire in 64\*T1 seconds for unreliable transports, and zero seconds for reliable transports. While in the "Completed" state, the server transaction MUST pass the final response to the transport layer for retransmission whenever a retransmission of the request is received. Any other final responses passed by the TU to the server transaction MUST be discarded while in the "Completed" state. The server transaction remains in this state until Timer J fires, at which point it MUST transition to the "Terminated" state.

The server transaction MUST be destroyed the instant it enters the "Terminated" state.

#### 4.8.14 TS-5-1-1 - SIP Proxy- Session Establishment Through One Proxy

## without Provisional Response in the same domain

### [NAME]

TS-5-1-1 - SIP Proxy- Session Establishment Through One Proxy without Provisional Response in the same domain

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy properly processes when a session through a proxy is established without a provisional response in the same domain.

### [REQUIREMENT]

NONE

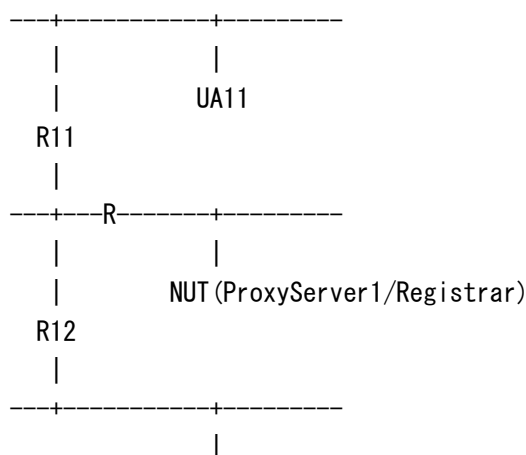
### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

### [TOPOLOGY]

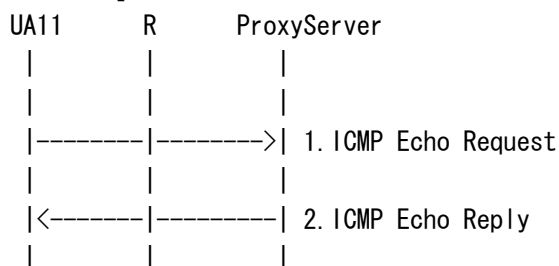


UA12

# [CONFIGURATION for NUT]

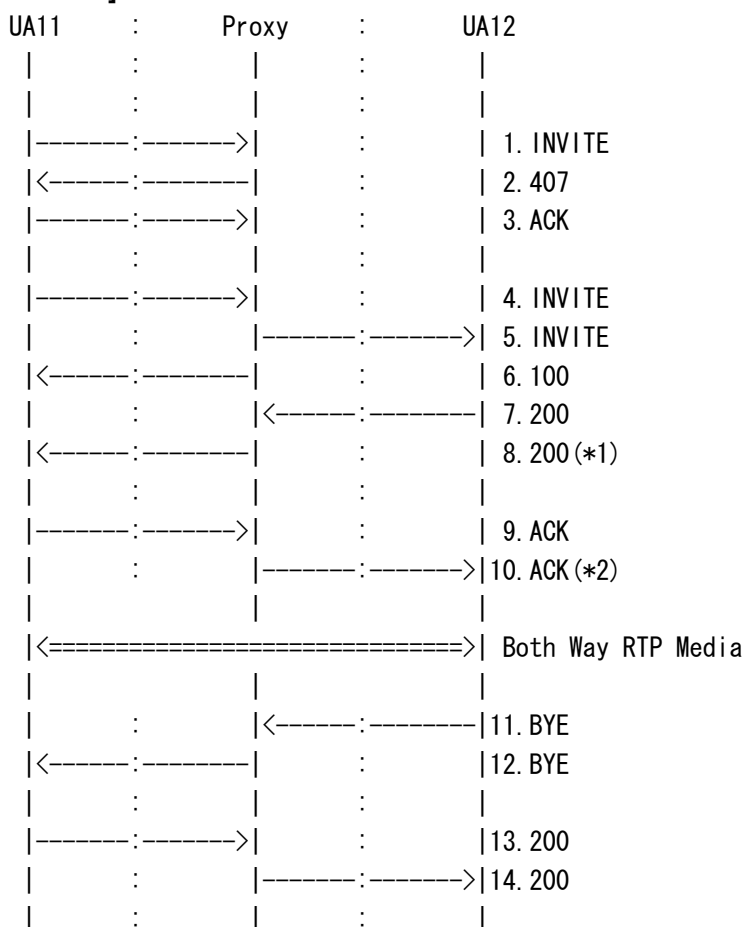
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 200 OK.
8. UA11 Receive 200 OK.
9. UA11 Send ACK.
10. UA12 Receive ACK.
11. UA12 Send BYE.
12. UA11 Receive BYE.
13. UA11 Send 200.
14. UA12 Receive 200.

**=== Message example ===**

4. INVITE UA11 -> NUT

```
INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
Max-Forwards: 70
Proxy-Authorization: Digest username="UA11",
  realm="under.test.com",
  nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",
  qop=auth, nc=00000004, cnonce="6f54a149",
  uri="sip:UA12@under.test.com",
  response="b51e504e73af54829e4f2bd7f8dc4654"
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151

v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```



/\* Proxy(NUT) accepts the credentials and forwards the INVITE to UA12  
2. Client for UA11 prepares to receive data on port 49172 from the  
network. \*/

5. INVITE NUT -> UA12

```
INVITE sip:UA12@node11.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
    ;received=3ffe:501:ffff:1::1
Max-Forwards: 69
Record-Route: <sip:ss.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

7. 200 OK UA12 -> NUT

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
    ;received=3ffe:501:ffff:50::50
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
    ;received=3ffe:501:ffff:1::1
Record-Route: <sip:ss.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>;tag=314159
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA12@node11.under.test.com>
```



Content-Type: application/sdp

Content-Length: 147

v=0

o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

8. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA12@node11.under.test.com>

Content-Type: application/sdp

Content-Length: 147

v=0

o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

9. ACK UA11 -> NUT

ACK sip:UA12@node11.under.test.com SIP/2.0

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76

Max-Forwards: 70

Proxy-Authorization: Digest username="UA11",

realm="under.test.com",

nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",

qop=auth, nc=00000004, cnonce="6f54a149",

uri="sip:UA12@under.test.com",



response="b51e504e73af54829e4f2bd7f8dc4654"  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

10. ACK NUT -> UA12

ACK sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK721e418c4.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 0

#### [JUDGMENT]

\*1:200 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,  
Must forward this response. [RFC3261-17-28]

- Status-Line:  
See generic\_forward\_from-UA12  
Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-UA12  
See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:



See generic\_forward\_from-UA12

\*2:ACK request from NUT to UA12.

As a SIP Message,

See generic\_message

As a SIP request,

Must forward this request. [RFC3261-17-28]

- Request-Line:

See generic\_forward\_from-UA11

See generic\_forward\_R-URI\_responsible-domain

- Header fields:

- outside of a dialog

See generic\_forward\_from-UA11

See generic\_forward\_request

- Bodies:

See generic\_forward\_from-UA11

## [REFERENCE]

[RFC3261-17-28, 29]

### 17 Transactions

#### 17.1 Client Transaction

##### 17.1.1 INVITE Client Transaction

###### 17.1.1.2 Formal Description

When in either the "Calling" or "Proceeding" states, reception of a 2xx response MUST cause the client transaction to enter the "Terminated" state, and the response MUST be passed up to the TU. The handling of this response depends on whether the TU is a proxy core or a UAC core. A UAC core will handle generation of the ACK for this response, while a proxy core will always forward the 200 (OK) upstream. The differing treatment of 200 (OK) between proxy and UAC is the reason that handling of it does not take place in the transaction layer.



#### 4.8.15 TS-5-1-2 - SIP Proxy- Session Establishment Through One Proxy with Multiple Provisional Responses in the same domain

##### [NAME]

TS-5-1-2 - SIP Proxy- Session Establishment Through One Proxy with Multiple Provisional Responses in the same domain

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy properly processes when a session through a proxy is established with multiple provisional responses in the same domain.

##### [REQUIREMENT]

NONE

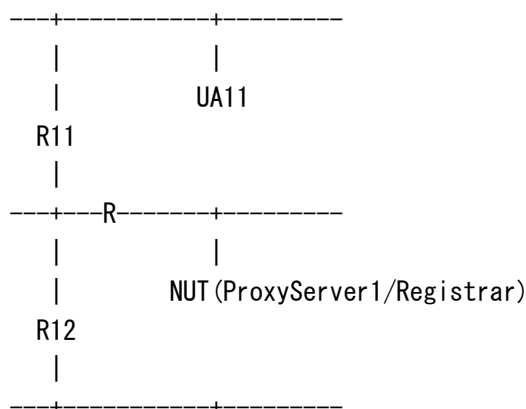
##### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

##### [TOPOLOGY]

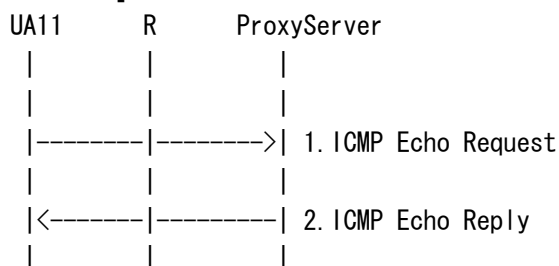


UA12

### [CONFIGURATION for NUT]

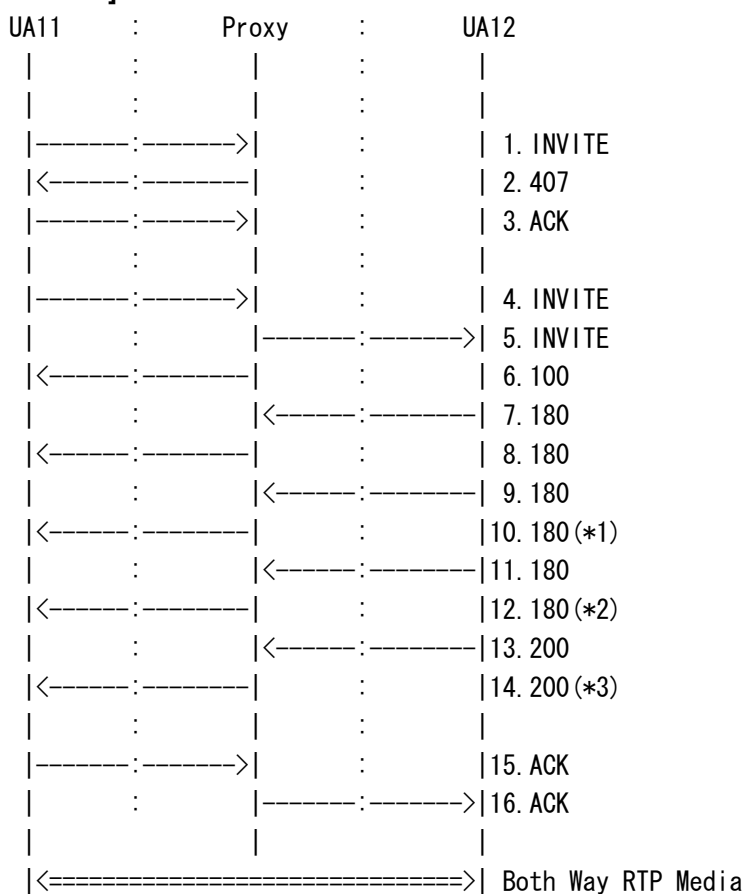
NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]





	:	<-----:-----	17. BYE
<-----:-----	:		18. BYE
	:		:
-----:----->	:		19. 200
	:	-----:----->	20. 200
	:		:

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 180 Ringing.
10. UA11 Receive 180 Ringing.
11. UA12 Send 180 Ringing.
12. UA11 Receive 180 Ringing.
13. UA12 Send 200 OK.
14. UA11 Receive 200 OK.
15. UA11 Send ACK.
16. UA12 Receive ACK.
17. UA12 Send BYE.
18. UA11 Receive BYE.
19. UA11 Send 200.
20. UA12 Receive 200.

**=== Message example ===**

7.9.11. 180 Ringing UA12 -> NUT

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1

;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA12@node11.under.test.com>

CSeq: 2 INVITE



Content-Length: 0

8.10.12 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com:lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA12@node11.under.test.com>

CSeq: 2 INVITE

Content-Length: 0

#### [JUDGMENT]

\*1 \*2:180 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

Must forward this response. [RFC3261-17-63]

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

\*3:200 response from NUT to UA11.

As a SIP Message,

See generic\_message



As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

- \* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

## [REFERENCE]

[RFC3261-17-63]

17 Transactions

### 17.2 Server Transaction

#### 17.2.1 INVITE Server Transaction

The TU passes any number of provisional responses to the server transaction. So long as the server transaction is in the "Proceeding" state, each of these MUST be passed to the transport layer for transmission. They are not sent reliably by the transaction layer (they are not retransmitted by it) and do not cause a change in the state of the server transaction.

## 4.8.16 TS-5-1-3 - SIP Proxy- Retransmission of INVITE Request Before Session Establishment Through One Proxy

### [NAME]

TS-5-1-3 - SIP Proxy- Retransmission of INVITE Request Before Session Establishment Through One Proxy

### [TARGET]

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy sends a 180 response to that downstream when receiveing an INVITE request before establishing a session through a proxy.

# **[REQUIREMENT]**

NONE

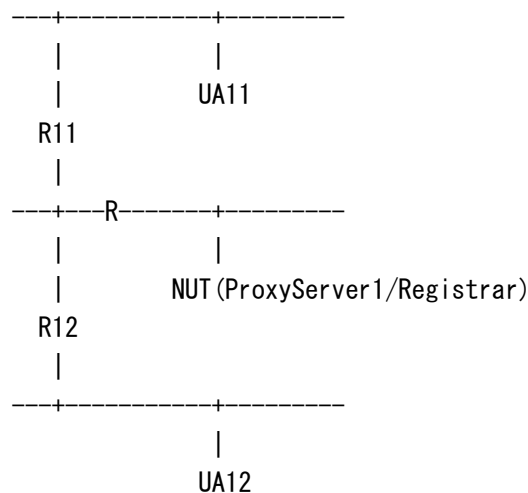
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

# **[TOPOLOGY]**

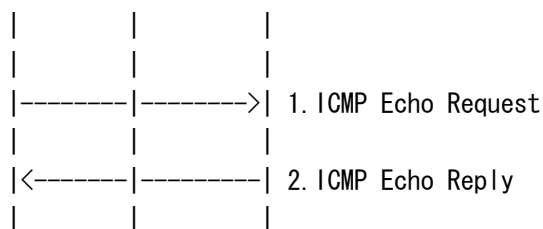


# **[CONFIGURATION for NUT]**

NUT	sip:ss.under.test.com
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

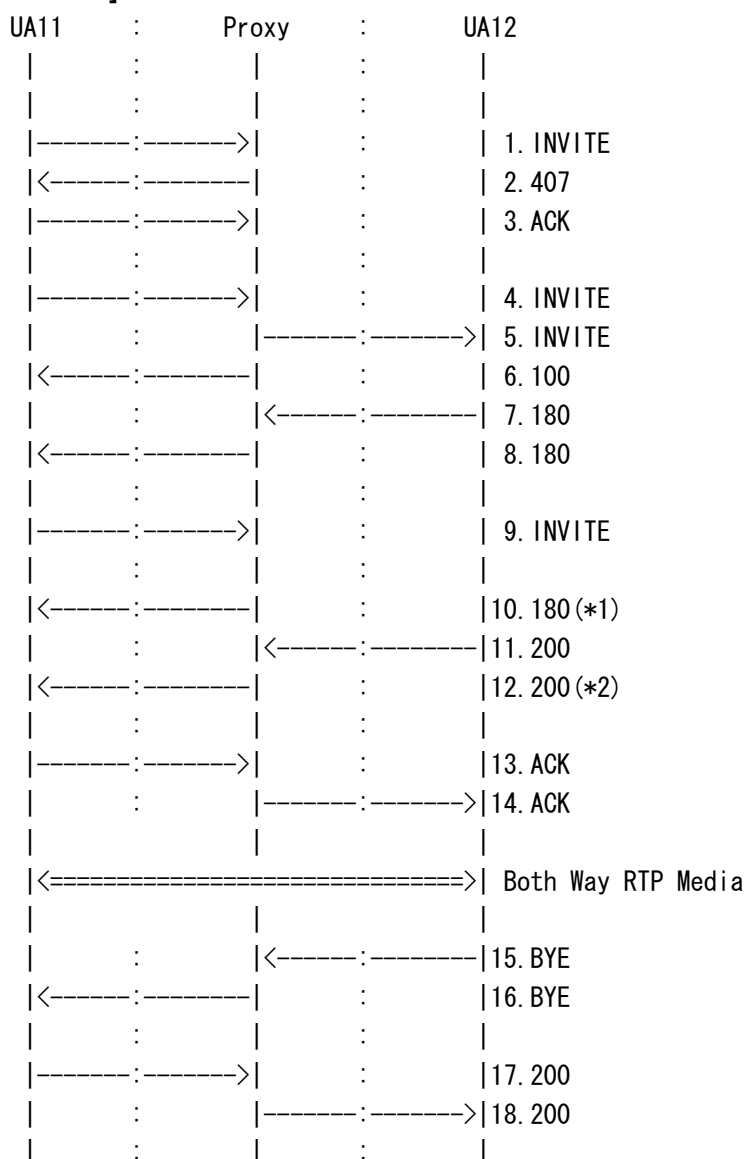
# **[INITIALIZATION]**

UA11      R      ProxyServer



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.



2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA11 Send INVITE.
10. UA11 Receive 180 Ringing.
11. UA12 Send 200 OK.
12. UA11 Receive 200 OK.
13. UA11 Send ACK.
14. UA12 Receive ACK.
15. UA12 Send BYE.
16. UA11 Receive BYE.
17. UA11 Send 200.
18. UA12 Receive 200.

**=== Message example ===**

9. INVITE UA11 -> NUT

```
INVITE sip:UA12@node11.under.test.com SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
;received=3ffe:501:ffff:1::1
Max-Forwards: 69
Record-Route: <sip:ss.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 151

v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```





10. 180 Ringing NUT -> UA11

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

Contact: <sip:UA12@node11.under.test.com>

CSeq: 2 INVITE

Content-Length: 0

12. 200 OK NUT -> UA11

SIP/2.0 200 OK

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9

;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA12@node11.under.test.com>

Content-Type: application/sdp

Content-Length: 147

v=0

o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2

s=-

c=IN IP6 3ffe:501:ffff:2::2

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

#### [JUDGMENT]

\*1:180 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

Must send 180 response. [RFC3261-17-64]



- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

\*2:200 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "200". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

- Bodies:

See generic\_forward\_from-UA12

## [REFERENCE]

[RFC3261-17-64]

17 Transactions

17.2 Server Transaction

## 17.2.1 INVITE Server Transaction

If a request retransmission is received while in the "Proceeding" state, the most recent provisional response that was received from the TU MUST be passed to the transport layer for retransmission. A request is a retransmission if it matches the same server transaction based on the rules of Section 17.2.3.

## 4.9 Session Progress

### 4.9.1 PG-1-1-1 - SIP Proxy- Session Progress response

#### [NAME]

PG-1-1-1 - SIP Proxy- Session Progress response

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy properly processes a 183 (Session Progress) response.

#### [REQUIREMENT]

NONE

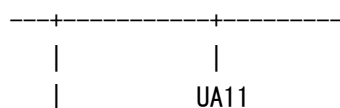
#### [PARAMETER]

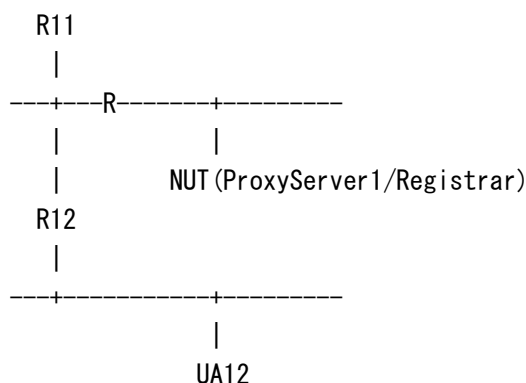
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

#### [TOPOLOGY]

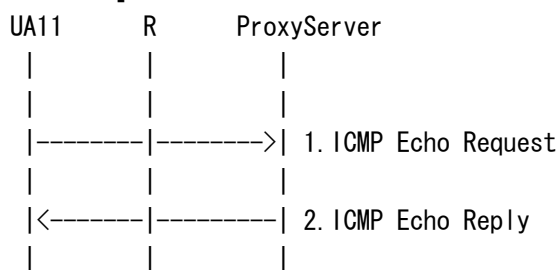




#### [CONFIGURATION for NUT]

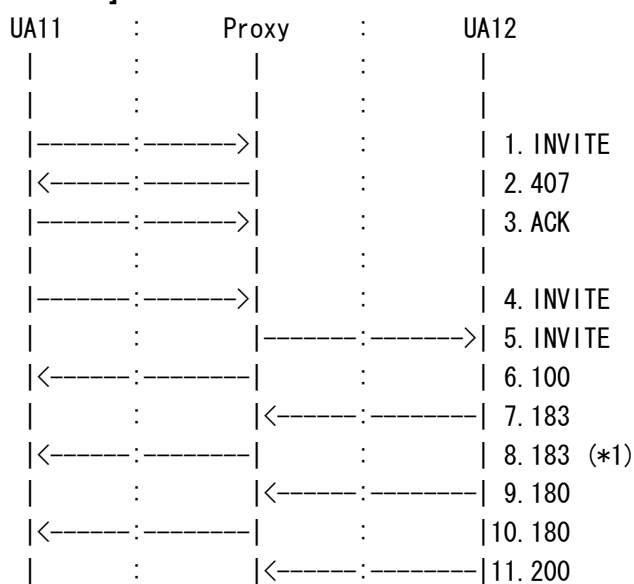
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

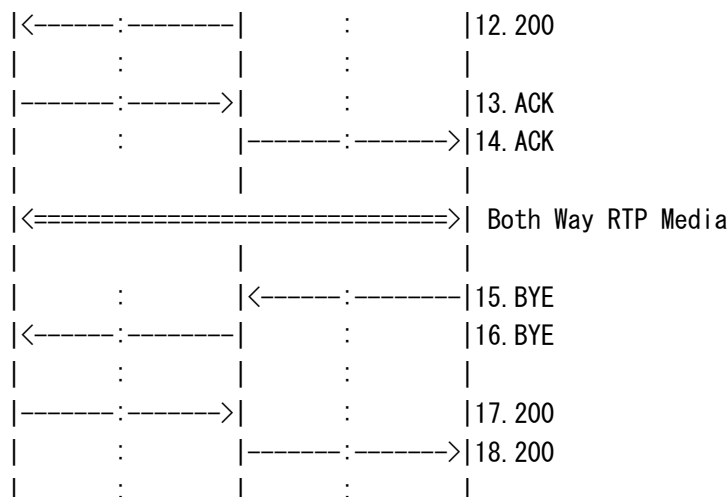
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 183 Session Progress.
8. UA11 Receive 183 Session Progress.
9. UA12 Send 180 Ringing.
10. UA11 Receive 180 Ringing.
11. UA12 Send 200 OK.
12. UA11 Receive 200 OK.
13. UA11 Send ACK.
14. UA12 Receive ACK.
15. UA12 Send BYE.
16. UA11 Receive BYE.
17. UA11 Send 200.
18. UA12 Receive 200.

**=== Message example ===**

7. 183 Session Progress UA12 -> NUT

SIP/2.0 183 Session Progress

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl



To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

8. 183 Session Progress NUT -> UA11

SIP/2.0 183 Session Progress  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
Contact: <sip:UA12@node11.under.test.com>  
CSeq: 2 INVITE  
Content-Length: 0

#### [JUDGMENT]

\*1:183 response from NUT to UA11.

As a SIP Message,  
Must be sent. [RFC3261-16-104]  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-UA12  
Status-Code: Must be "183". [RFC3261-16-104]

- Header fields:  
See generic\_forward\_from-UA12  
See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter  
contains a domain name. [RFC3261-18-27]  
via-received: Must contain the source address from which the packet was  
received. [RFC3261-18-28]

- Bodies:  
See generic\_forward\_from-UA12



#### [REFERENCE]

Sequence from RFC3665 Section 3.2.

[RFC3261-16-104]

#### 16.7 Response Processing

##### 5. Check response for forwarding

Until a final response has been sent on the server transaction, the following responses MUST be forwarded immediately:

- Any provisional response other than 100 (Trying)
- Any 2xx response

### 4.9.2 PG-1-1-2 - SIP Proxy- INVITE Client Transaction (Extension of Timer C)

#### [NAME]

PG-1-1-2 - SIP Proxy- INVITE Client Transaction (extension of Timer C)

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy resets Timer C when the provisional responses with status codes 101 to 199.

#### [REQUIREMENT]

NONE

#### [PARAMETER]

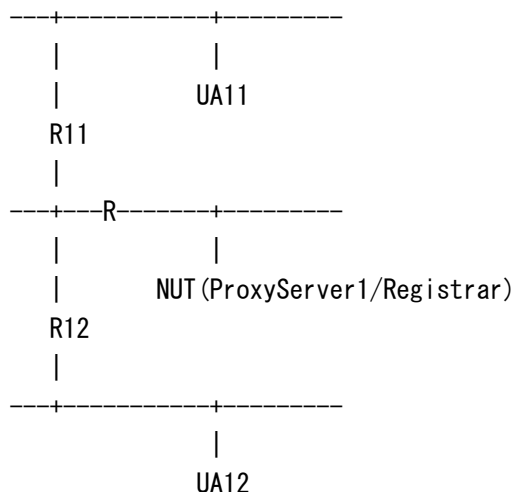
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64

R(IPv6)	3ffe:501:ffff:50::1/64
---------	------------------------

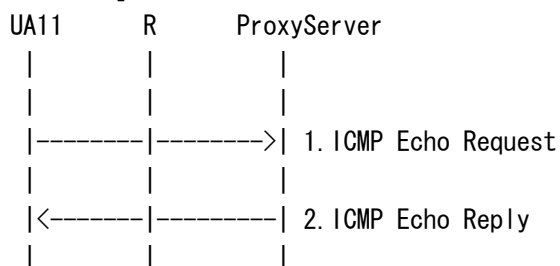
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

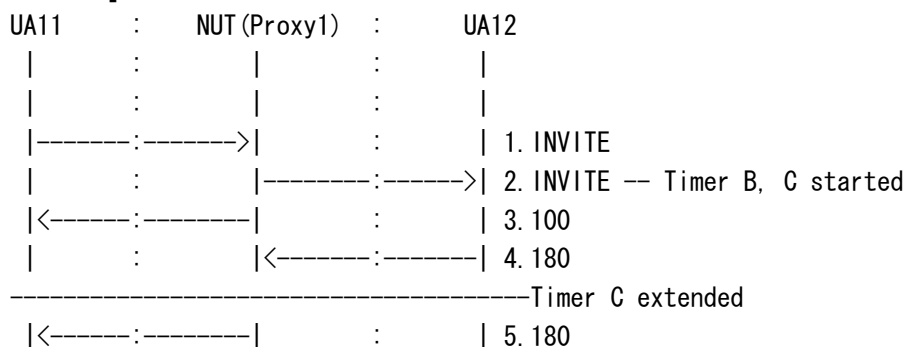
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]

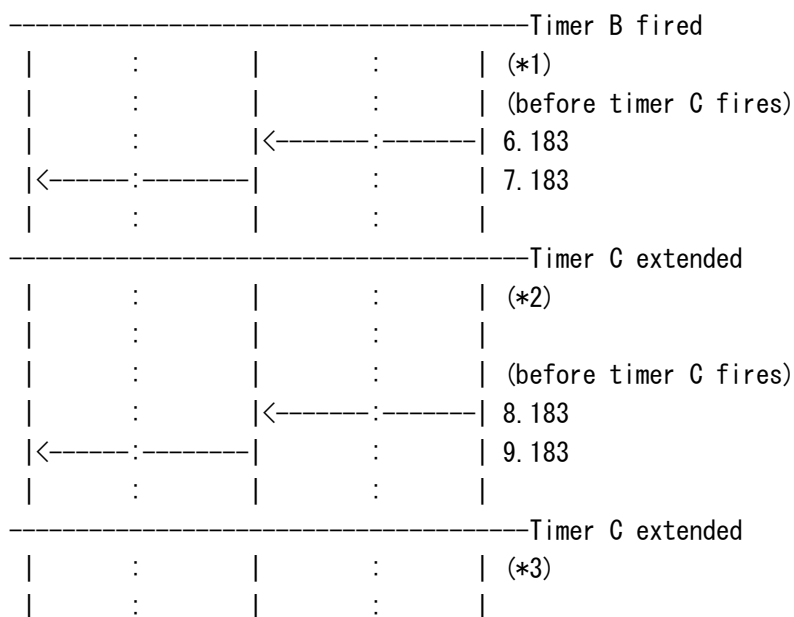


1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]







1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Send 180 Ringing.
5. UA11 Receive 180 Ringing.
6. UA12 Send 183 Session Progress.
7. UA11 Receive 183 Session Progress.
8. UA12 Send 183 Session Progress.
9. UA11 Receive 183 Session Progress.

#### [JUDGMENT]

- \*\* this scenario checks only timing (message format is not checked)
- \*\* We assume that default value of Timer C as 3 minutes.
- \*\* We don't support resetting timer after Timer C fired.

\*1: before timer C fires.

Must not send any message to other node. [RFC3261-16-90,91]

\*2: after 183 response from UA12 to NUT.

Must not cancel the client transaction (that is, no CANCEL request sent from NUT). [RFC3261-16-90,95]

\*3: after 183 response from UA12 to NUT.



Must not cancel the client transaction (that is, no CANCEL request sent from NUT). [RFC3261-16-90,95]

#### **[REFERENCE]**

[RFC3261-16-90, 91]

#### 16.6 Request Forwarding

##### 11. Set timer C

In order to handle the case where an INVITE request never generates a final response, the TU uses a timer which is called timer C. Timer C **MUST** be set for each client transaction when an INVITE request is proxied. The timer **MUST** be larger than 3 minutes. Section 16.7 bullet 2 discusses how this timer is updated with provisional responses, and Section 16.8 discusses processing when it fires.

[RFC3261-16-95, 96]

#### 16.7 Response Processing

##### 2. Update timer C for provisional responses

For an INVITE transaction, if the response is a provisional response with status codes 101 to 199 inclusive (i.e., anything but 100), the proxy **MUST** reset timer C for that client transaction. The timer **MAY** be reset to a different value, but this value **MUST** be greater than 3 minutes.

### **4.9.3 PG-1-2-1 - SIP Proxy- INVITE Client Transaction (Reset of Timer C)**

#### **[NAME]**

PG-1-2-1 - SIP Proxy- INVITE Client Transaction (reset of Timer C)

#### **[TARGET]**

SIP Proxy (NUT)

#### **[PURPOSE]**

Verify that a proxy properly resets Timer C when Timer C is fired.

#### **[REQUIREMENT]**

NONE

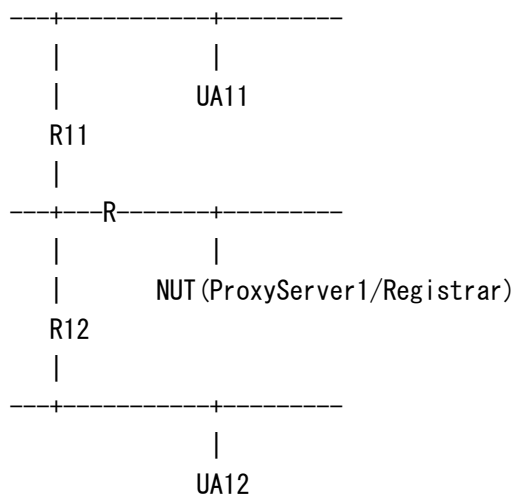
# [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

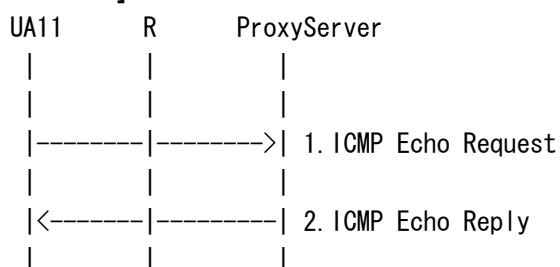
# [TOPOLOGY]



# [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

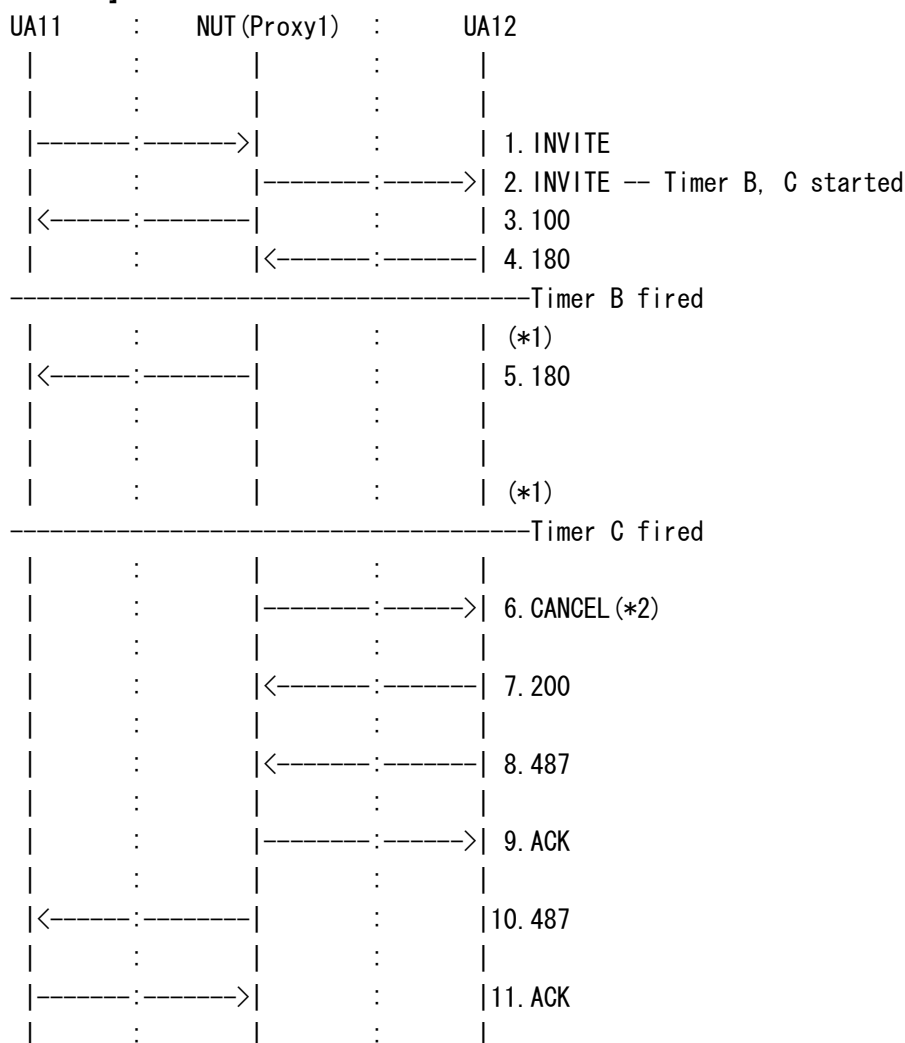
# [INITIALIZATION]



1. Send ICMP Echo Request.

## 2. Receive ICMP Echo Reply.

### [PROCEDURE]



1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA12 Send 180 Ringing.
5. UA11 Receive 180 Ringing.
6. UA12 Receive CANCEL.
7. UA12 Send 200 OK.
8. UA12 Send 487 Request Terminated.
9. UA12 Receive ACK.
11. UA11 Receive 487 Request Terminated.
12. UA11 Send ACK.



## [JUDGMENT]

- \*\* this scenario checks only timing (message format is not checked)
- \*\* We assume that default value of Timer C as 3 minutes.
- \*\* We don't support resetting timer after Timer C fired.

\*1: before Timer C fires.

Must not send any message to other node. [RFC3261-16-90,91]

\*2: CANCEL request from NUT to UA12.

Must be sent. [RFC3261-16-90,140,141]

## [REFERENCE]

[RFC3261-16-90, 91]

16.6 Request Forwarding

11. Set timer C

In order to handle the case where an INVITE request never generates a final response, the TU uses a timer which is called timer C. Timer C **MUST** be set for each client transaction when an INVITE request is proxied. The timer **MUST** be larger than 3 minutes. Section 16.7 bullet 2 discusses how this timer is updated with provisional responses, and Section 16.8 discusses processing when it fires.

[RFC3261-16-139, 140, 141]

16.8 Processing Timer C

If timer C should fire, the proxy **MUST** either reset the timer with any value it chooses, or terminate the client transaction. If the client transaction has received a provisional response, the proxy **MUST** generate a CANCEL request matching that transaction. If the client transaction has not received a provisional response, the proxy **MUST** behave as if the transaction received a 408 (Request Timeout) response.

## **4.9.4 PG-1-2-2 - SIP Proxy- INVITE Client Transaction (No provisional response after Timer C fired)**

### [NAME]

PG-1-2-2 - SIP Proxy- INVITE Client Transaction (no provisional response after Timer C

fired)

# [TARGET]

SIP Proxy (NUT)

# [PURPOSE]

Verify that a proxy sends a 408 (Request Timeout) response when not having received any provisional response after Timer C fires.

# [REQUIREMENT]

NONE

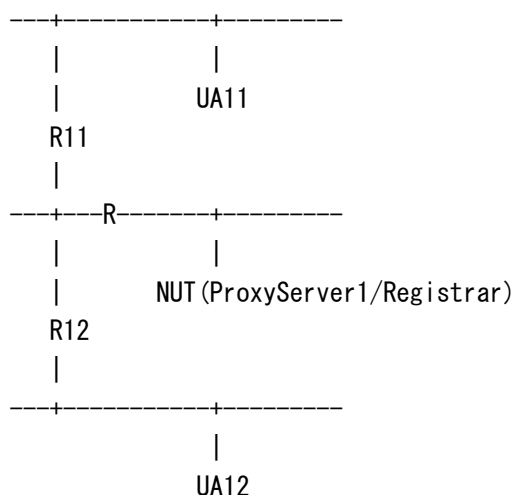
# [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

# [TOPOLOGY]

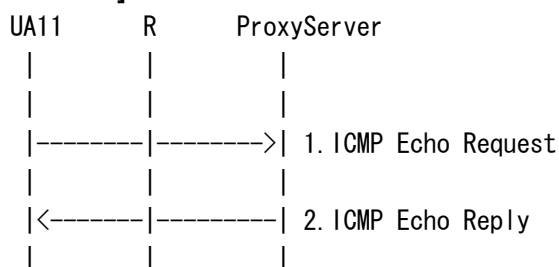


# [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
-----	--------------------------

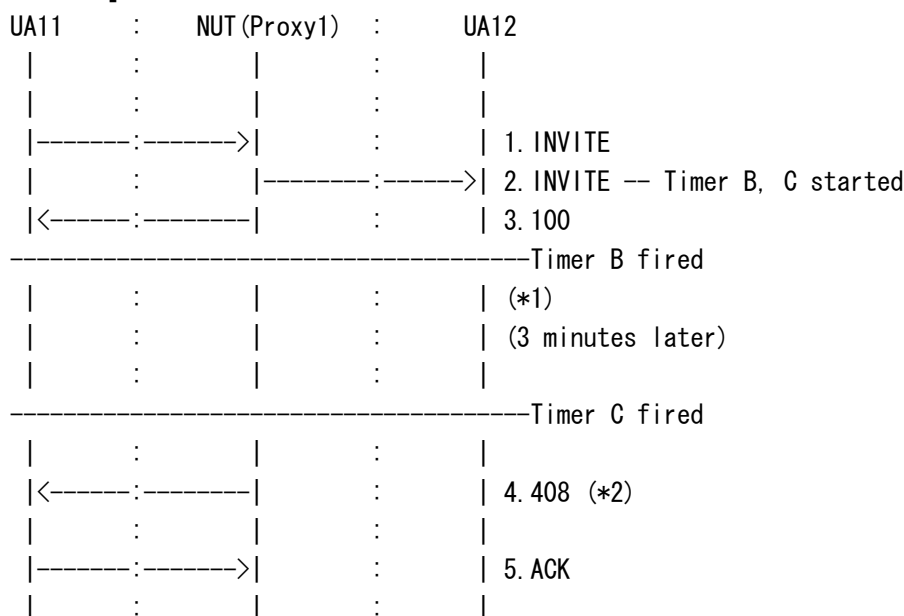
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)
----------------	--------------------------------

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.
2. UA12 Receive INVITE.
3. UA11 Receive 100 Trying.
4. UA11 Receive 480 Temporarily Unavailable.
5. UA11 Send ACK.

#### [JUDGMENT]

- \*\* this scenario checks only timing (message format is not checked)
- \*\* We assume that default value of Timer C as 3 minutes.
- \*\* We don't support resetting timer after Timer C fired.



\*1: before timer C fires.

Must not send any message to other node. [RFC3261-16-90,91]

\*2: 408 response from NUT to UA11.

Must be sent. [RFC3261-16-90,140,141]

## [REFERENCE]

[RFC3261-90,91]

## 16.6 Request Forwarding

### 11. Set timer C

In order to handle the case where an INVITE request never generates a final response, the TU uses a timer which is called timer C. Timer C **MUST** be set for each client transaction when an INVITE request is proxied. The timer **MUST** be larger than 3 minutes. Section 16.7 bullet 2 discusses how this timer is updated with provisional responses, and Section 16.8 discusses processing when it fires.

[RFC3261-16-139,140,141]

### 16.8 Processing Timer C

If timer C should fire, the proxy **MUST** either reset the timer with any value it chooses, or terminate the client transaction. If the client transaction has received a provisional response, the proxy **MUST** generate a CANCEL request matching that transaction. If the client transaction has not received a provisional response, the proxy **MUST** behave as if the transaction received a 408 (Request Timeout) response.

## 4.10 Transport

### 4.10.1 TP-1-1-1 - SIP Proxy- Receiving INVITE with additional bytes in a transport packet

#### [NAME]

TP-1-1-1 - SIP Proxy- Receiving INVITE with additional bytes in a transport packet



# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy properly processes when receiving an INVITE request with additional bytes in a transport packet.

# **[REQUIREMENT]**

NONE

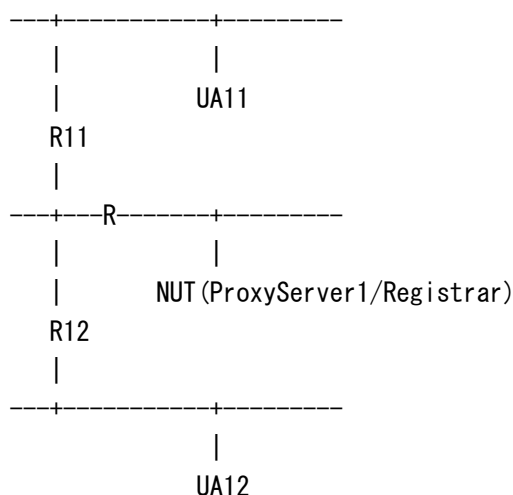
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

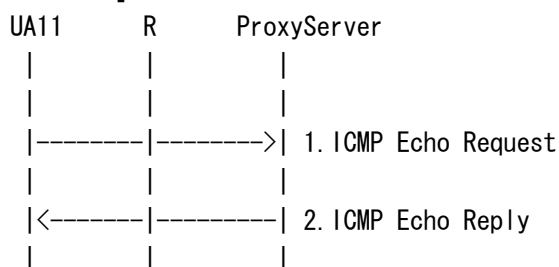
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

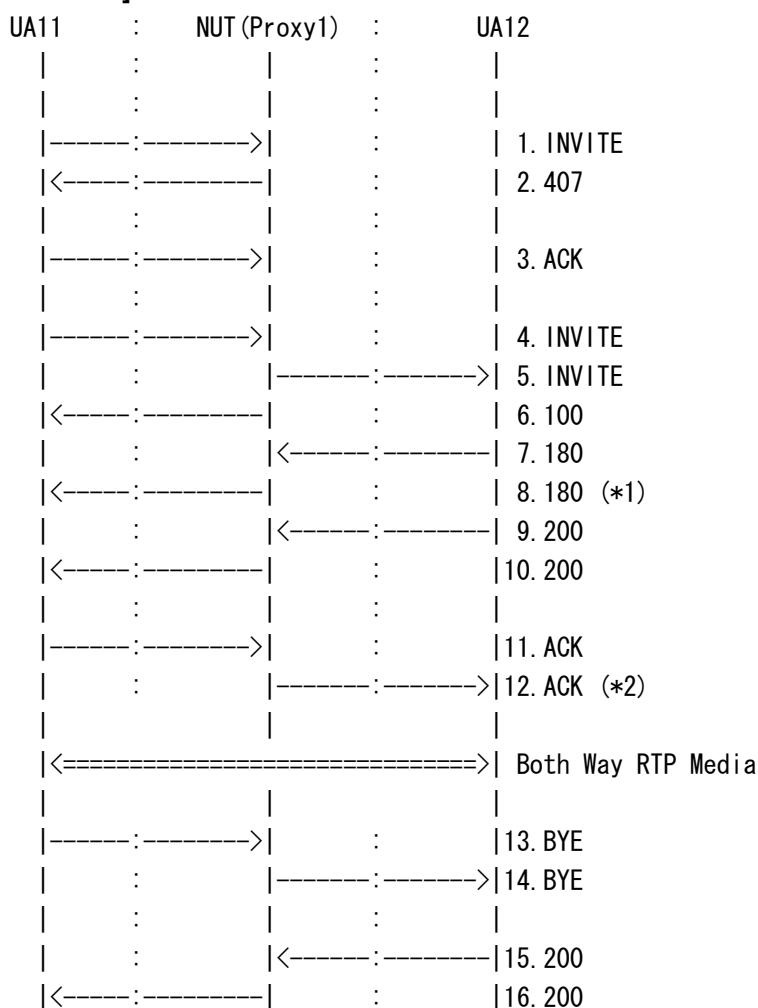
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

## [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.

4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA11 Send BYE.
14. UA12 Receive BYE.
15. UA12 Send 200 OK.
16. UA11 Receive 200 OK.

**=== Message example ===**

5. INVITE NUT -> UA12

```
INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
;received=3ffe:501:ffff:1::1
Max-Forwards: 69
Record-Route: <sip:ss.under.test.com;lr>
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 0
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=-
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

\* Content-Length: 0

12. ACK NUT -> UA12



ACK sip:UA12@node11.under.test.com SIP/2.0  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b76  
;received=3ffe:501:ffff:1::1  
Max-Forwards: 69  
Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 ACK  
Content-Length: 151

v=0  
o=UA1 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1  
s=-  
c=IN IP6 3ffe:501:ffff:1::1  
t=0 0  
m=audio 49170 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

\* Answer is included.

The port number in the m= line is different from 1.INVITE's.

#### [JUDGMENT]

\*1:180 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_forward\_from-UA12

Status-Code: Must be "180". [RFC3261-16-104]

- Header fields:

See generic\_forward\_from-UA12

See generic\_forward\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]



- Bodies:  
See generic\_forward\_from-UA12

\*2:ACK request from NUT to UA12.

- As a SIP Message,  
See generic\_message

As a SIP request,

- Request-Line:  
See generic\_forward\_from-UA11  
See generic\_forward\_R-URI\_non-responsible-domain

- Header fields:
  - outside of a dialog  
See generic\_forward\_from-UA11
  - See generic\_forward\_request

- Bodies:  
See generic\_forward\_from-UA11

## [REFERENCE]

[RFC3261-16-42, 43, 44, 45, 46]

## 16.6 Request Forwarding

### 1. Copy request

The proxy starts with a copy of the received request. The copy MUST initially contain all of the header fields from the received request. Fields not detailed in the processing described below MUST NOT be removed. The copy SHOULD maintain the ordering of the header fields as in the received request. The proxy MUST NOT reorder field values with a common field name (See Section 7.3.1). The proxy MUST NOT add to, modify, or remove the message body.

An actual implementation need not perform a copy; the primary requirement is that the processing for each next hop begin with the same request.

## 4.10.2 TP-1-2-1 - SIP Proxy- Transport packet of response ending before

## the end of the message body

### [NAME]

TP-1-2-1 - SIP Proxy- Transport packet of response ending before the end of the message body

### [TARGET]

SIP Proxy (NUT)

### [PURPOSE]

Verify that a proxy doesn't forwards a transport packet of a response that ends before the end of a message body.

### [REQUIREMENT]

NONE

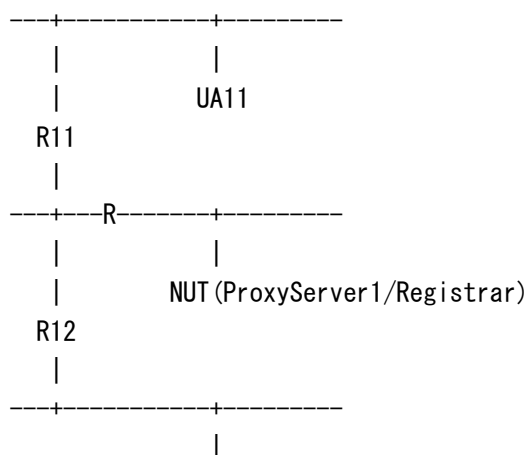
### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

### [TOPOLOGY]

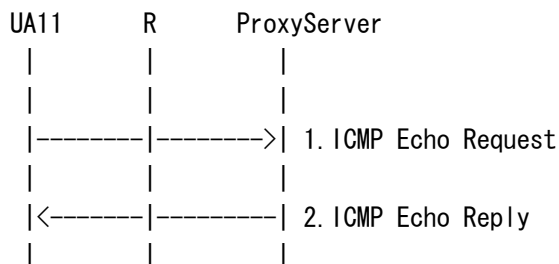


## UA12

### [CONFIGURATION for NUT]

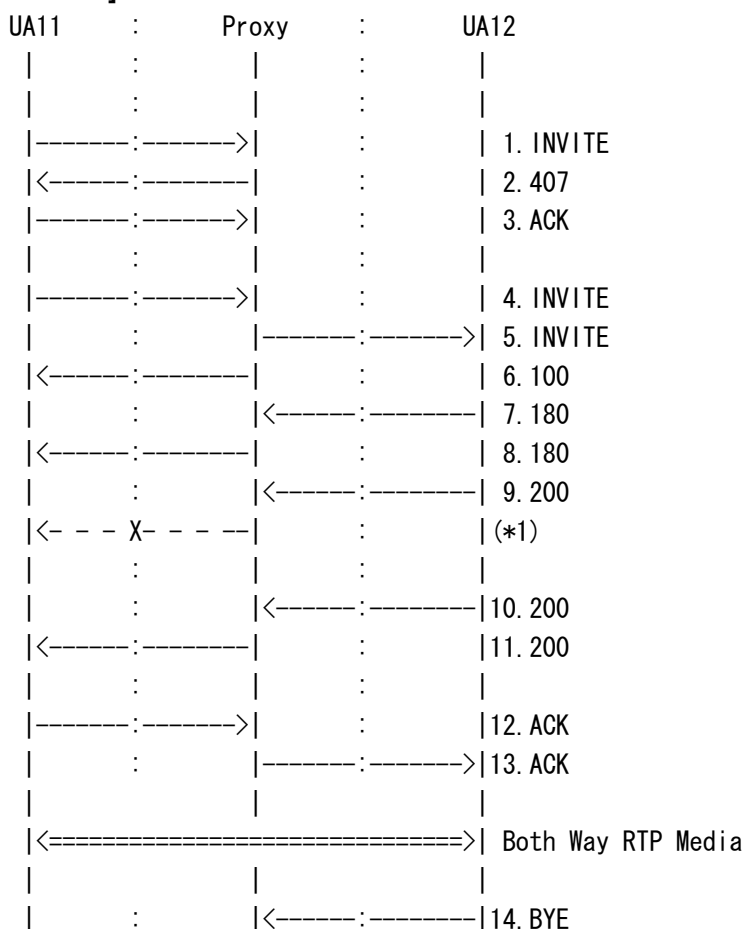
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

### [PROCEDURE]





<-----:-----	:	15. BYE
:	:	
-----:----->	:	16. 200
:           -----:----->	:	17. 200
:	:	

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK with invalid Content-Length header field.
10. UA12 Send 200 OK.
11. UA11 Receive 200 OK.
12. UA11 Send ACK.
13. UA12 Receive ACK.
14. UA12 Send BYE.
15. UA11 Receive BYE.
16. UA11 Send 200.
17. UA12 Receive 200.

**=== Message example ===**

9. 200 OK UA12 -> NUT

SIP/2.0 200 OK

Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1

Record-Route: <sip:ss.under.test.com;lr>

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=314159

Call-ID: 3848276298220188511@under.test.com

CSeq: 2 INVITE

Contact: <sip:UA12@node11.under.test.com>

Content-Type: application/sdp

Content-Length: 350

v=0

o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2





s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

\* Larger Content-Length value.  
Actual body size is equal to 148 bytes.

10. 200 OK UA12 -> NUT

SIP/2.0 200 OK  
Via: SIP/2.0/UDP ss.under.test.com:5060;branch=z9hG4bK2d4790.1  
;received=3ffe:501:ffff:50::50  
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9  
;received=3ffe:501:ffff:1::1  
Record-Route: <sip:ss.under.test.com;lr>  
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl  
To: UA12 <sip:UA12@under.test.com>;tag=314159  
Call-ID: 3848276298220188511@under.test.com  
CSeq: 2 INVITE  
Contact: <sip:UA12@node11.under.test.com>  
Content-Type: application/sdp  
Content-Length: 148

v=0  
o=UA12 2890844527 2890844527 IN IP6 3ffe:501:ffff:2::2  
s=-  
c=IN IP6 3ffe:501:ffff:2::2  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000

#### [JUDGMENT]

\*1:after 200 response from UA12 to NUT.

Must not forward this message to UA11, because Content-Length value is larger than size of body. [RFC3261-18-39]

#### [REFERENCE]

[RFC3261-18-38, 39]  
18.3 Framing



In the case of message-oriented transports (such as UDP), if the message has a Content-Length header field, the message body is assumed to contain that many bytes. If there are additional bytes in the transport packet beyond the end of the body, they **MUST** be discarded. If the transport packet ends before the end of the message body, this is considered an error. If the message is a response, it **MUST** be discarded. If the message is a request, the element **SHOULD** generate a 400 (Bad Request) response. If the message has no Content-Length header field, the message body is assumed to end at the end of the transport packet.

#### **4.10.3 TP-1-2-2 - SIP Proxy- Transport packet of request ending before the end of the message body**

##### **[NAME]**

TP-1-2-2 - SIP Proxy- Transport packet of request ending before the end of the message body

##### **[TARGET]**

SIP Proxy (NUT)

##### **[PURPOSE]**

Verify that a proxy properly generate a 400 (Bad Request) response when receiving a transport packet of a request that ends before the end of a message body.

##### **[REQUIREMENT]**

NONE

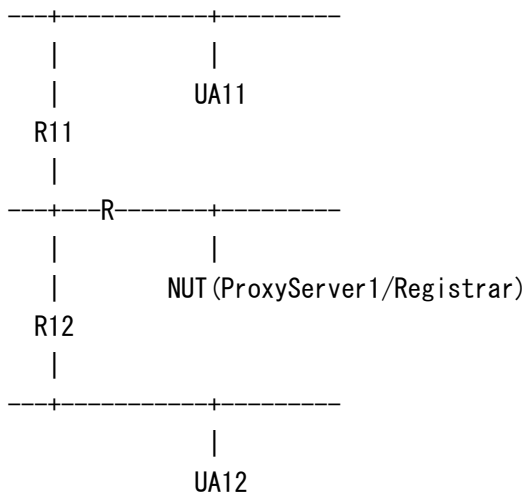
##### **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

##### **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

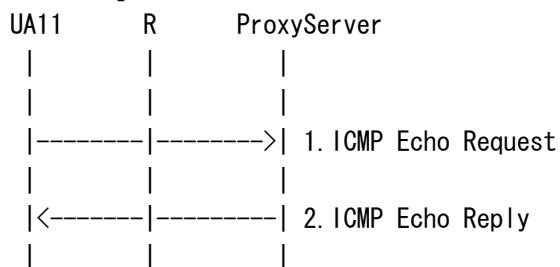
##### **[TOPOLOGY]**



#### [CONFIGURATION for NUT]

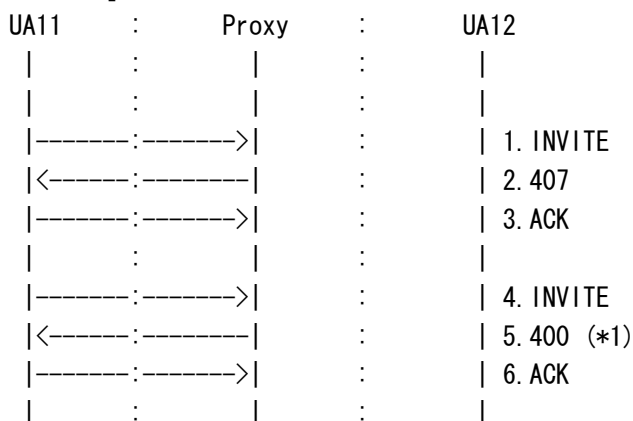
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA11 Receive 400 Bad Request.
6. UA11 Send ACK.

**=== Message example ===**

4. INVITE UA11 -> NUT

```
INVITE sip:UA12@under.test.com SIP/2.0
Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74bf9
Max-Forwards: 70
Proxy-Authorization: Digest username="UA11",
  realm="under.test.com",
  nonce="f84f1cec41e6cbe5aea9c8e88d359", opaque="",
  qop=auth, nc=00000004, cnonce="6f54a149",
  uri="sip:UA12@under.test.com",
  response="b51e504e73af54829e4f2bd7f8dc4654"
From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl
To: UA12 <sip:UA12@under.test.com>
Call-ID: 3848276298220188511@under.test.com
CSeq: 2 INVITE
Contact: <sip:UA11@node.under.test.com>
Content-Type: application/sdp
Content-Length: 350
```

```
v=0
o=UA11 2890844526 2890844526 IN IP6 3ffe:501:ffff:1::1
s=
c=IN IP6 3ffe:501:ffff:1::1
t=0 0
m=audio 49172 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```

- \* Larger Content-Length value.  
Actual body size is equal to 148 bytes.

**[JUDGMENT]**

- \*1:400 response from NUT to UA11.  
As a SIP Message,  
See generic\_message



As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "400", because Content-Length value is larger than size of body. [RFC3261-18-39,40,42]

- Header fields:

See generic\_make\_response

- \* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

[RFC3261-18-38,39]

#### 18.3 Framing

In the case of message-oriented transports (such as UDP), if the message has a Content-Length header field, the message body is assumed to contain that many bytes. If there are additional bytes in the transport packet beyond the end of the body, they MUST be discarded. If the transport packet ends before the end of the message body, this is considered an error. If the message is a response, it MUST be discarded. If the message is a request, the element SHOULD generate a 400 (Bad Request) response. If the message has no Content-Length header field, the message body is assumed to end at the end of the transport packet.

#### 4.10.4 TP-2-1-1 - SIP Proxy- Receipt of "ICMP time exceeded" for a sent request

##### [NAME]

TP-2-1-1 - SIP Proxy- Receiving "ICMP time exceeded" for a sent request

##### [TARGET]

SIP Proxy (NUT)

##### [PURPOSE]

Verify that a proxy retransmits the request when receiving a "ICMP time exceeded" for previously a sent request.

# **[REQUIREMENT]**

NONE

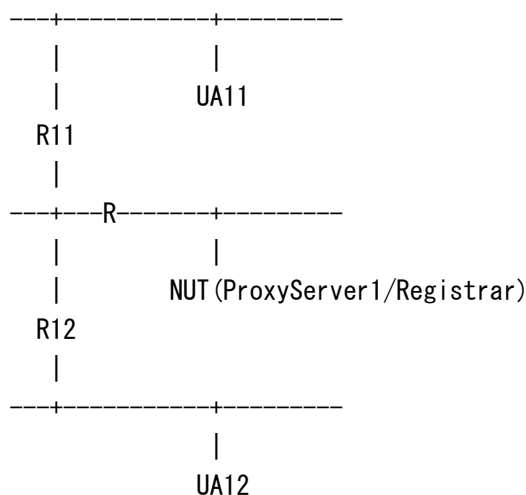
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

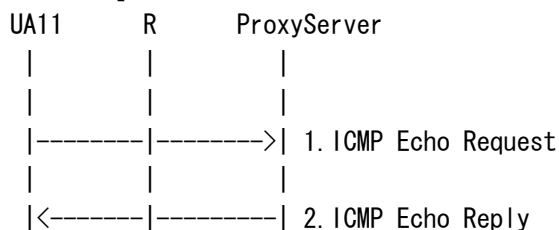
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

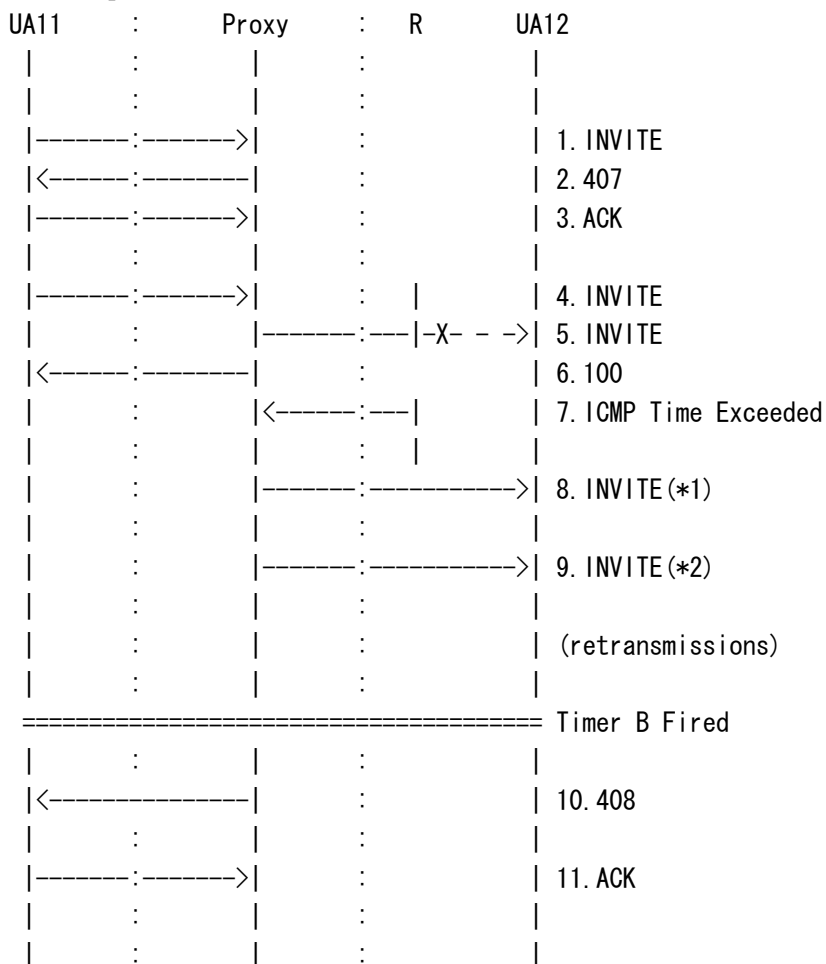
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# **[INITIALIZATION]**



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. R Receive INVITE.
6. UA11 Receive 100 Trying.
7. R Send ICMP Time Exceeded.
8. UA12 Receive INVITE.
9. UA12 Receive INVITE.
10. UA11 Receive 408 Request Timeout.

11. UA11 Send ACK.

#### [JUDGMENT]

\*1:INVITE request from NUT to UA12.

Should be the same (retransmitted) INVITE. [RFC3261-18-43]

\*2 INVITE request from NUT to UA12.

Must be retransmitted with intervals that double after each transmission(2\*T1).  
[RFC3261-8-41, RFC3261-17-8,9,10,14, RFC3261-18-43]

#### [REFERENCE]

[RFC3261-18-43]

18.4 Error Handling

If the transport user asks for a message to be sent over an unreliable transport, and the result is an ICMP error, the behavior depends on the type of ICMP error. Host, network, port or protocol unreachable errors, or parameter problem errors SHOULD cause the transport layer to inform the transport user of a failure in sending. Source quench and TTL exceeded ICMP errors SHOULD be ignored.

### 4.10.5 TP-2-1-2 - SIP Proxy- Receipt of “ICMP time exceeded” for a sent response

#### [NAME]

TP-2-1-2 - SIP Proxy- Receipt of “ICMP time exceeded” for a sent response

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy retransmits the response when receiving a “ICMP time exceeded” message for previously a sent response.

#### [REQUIREMENT]

NONE

#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com

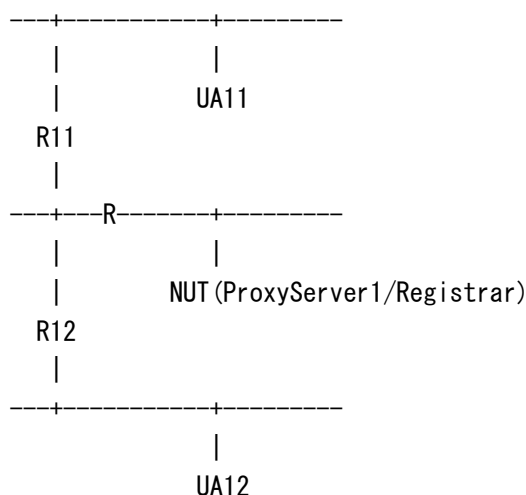


UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

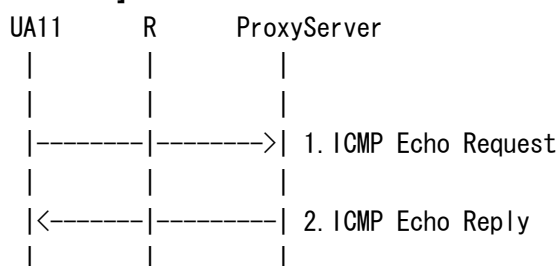
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

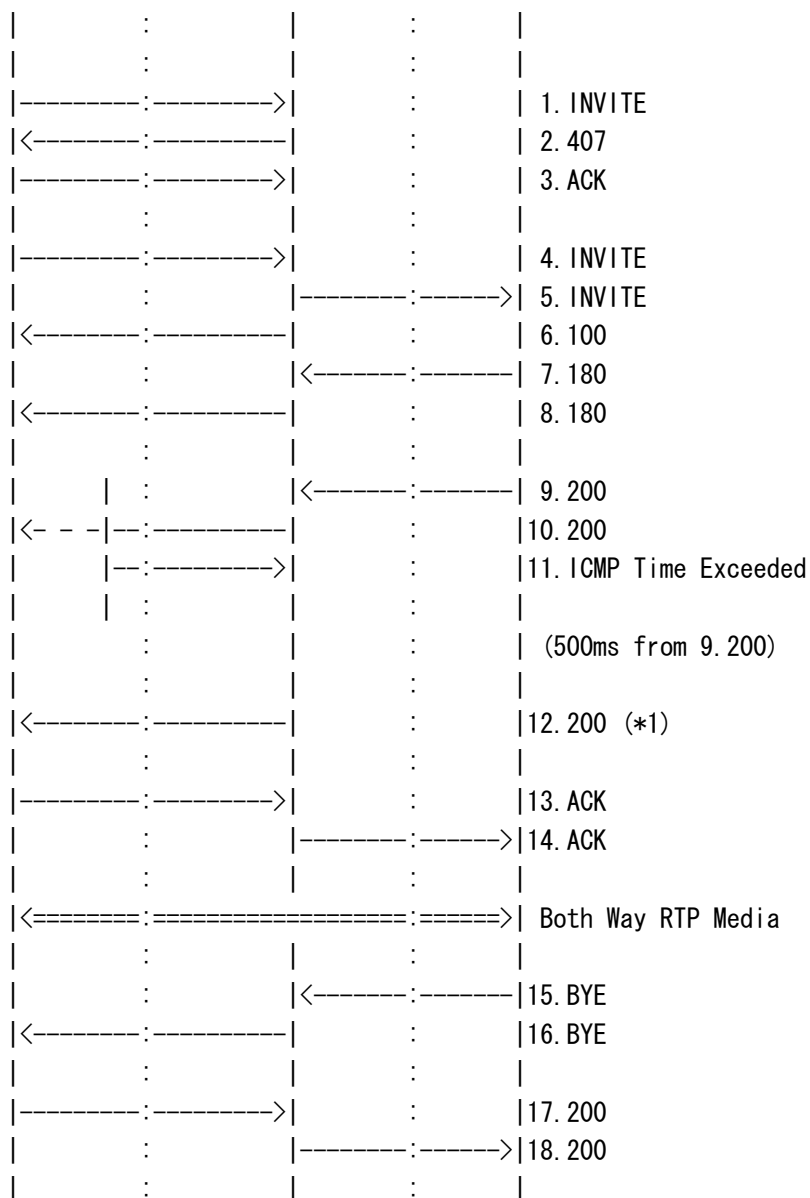
#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

#### [PROCEDURE]

UA11    R    :    NUT (Proxy)    :    UA12



1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. R Receive 200 OK.
11. R Send ICMP Time Exceeded.

12. UA11 Receive 200 OK.
13. UA11 Send ACK.
14. UA12 Receive ACK.
15. UA12 Send BYE.
16. UA11 Receive BYE.
17. UA11 Send 200 OK.
18. UA12 Receive 200 OK.

**[JUDGMENT]**

\*1:200 response from NUT to UA11.

Should be the same (retransmitted) 200 response. [RFC3261-18-43]

**[REFERENCE]**

[RFC3261-18-42, 43]

18.4 Error Handling

If the transport user asks for a message to be sent over an unreliable transport, and the result is an ICMP error, the behavior depends on the type of ICMP error. Host, network, port or protocol unreachable errors, or parameter problem errors SHOULD cause the transport layer to inform the transport user of a failure in sending. Source quench and TTL exceeded ICMP errors SHOULD be ignored.

**4.10.6 TP-2-2-1 - SIP Proxy- Receipt of the “ICMP destination unreachable” message for a sent request**

**[NAME]**

TP-2-2-1 - SIP Proxy- Receiving the “ICMP destination unreachable” message for a sent request

**[TARGET]**

SIP Proxy (NUT)

**[PURPOSE]**

Verify that a proxy sends a 500 (Internal Server Error) to the UAC when receiving the “ICMP destination unreachable” message.

**[REQUIREMENT]**

NONE

**[PARAMETER]**

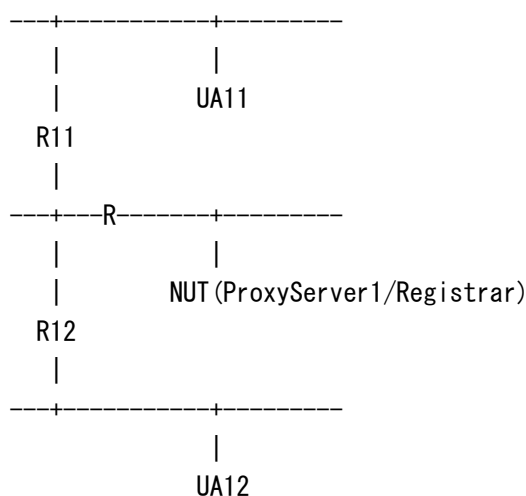
NUT(ProxyServer1/Registrar)	sip:ss.under.test.com:lr
-----------------------------	--------------------------

UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

#### [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

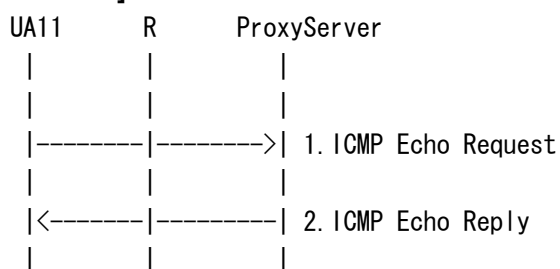
#### [TOPOLOGY]



#### [CONFIGURATION for NUT]

NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

#### [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]

UA11	:	Proxy	:	R11	:	UA12
	:		:		:	
	:		:		:	
----->	:		:		:	1. INVITE
<-----	:		:		:	2. 407
----->	:		:		:	3. ACK
	:		:		:	
----->	:		:		:	4. INVITE
	:	----->	:		:	5. INVITE
<-----	:		:		:	6. 100
	:	<-----	:		:	7. ICMP Destination Unreachable
	:		:		:	
<-----	:		:		:	8. 500 (*1)
----->	:		:		:	9. ACK
	:		:		:	

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. R11 Receive INVITE.
6. UA11 Receive 100 Trying.
7. R11 Send ICMP Destination Unreachable.
8. UA11 Receive 500 Internal Server Error.
9. UA11 Send ACK.

## [JUDGMENT]

\*1: 500 response from NUT to UA11.

As a SIP Message,  
See generic\_message

As a SIP response,

- Status-Line:  
See generic\_forward\_from-PX2  
Status-Code: Must be "500". [RFC3261 16.7.6]

- Header fields:  
See generic\_forward\_from-PX2  
See generic\_forward\_response  
\* Via



via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

## [REFERENCE]

[RFC3261-16-118, 119]

### 16.7 Response Processing

#### 6. Choosing the best response

A proxy which receives a 503 (Service Unavailable) response SHOULD NOT forward it upstream unless it can determine that any subsequent requests it might proxy will also generate a 503.

In other words, forwarding a 503 means that the proxy knows it cannot service any requests, not just the one for the Request-URI in the request which generated the 503. If the only response that was received is a 503, the proxy SHOULD generate a 500 response and forward that upstream.

[RFC3261-16-142]

### 16.9 Handling Transport Errors

If the transport layer notifies a proxy of an error when it tries to forward a request (see Section 18.4), the proxy MUST behave as if the forwarded request received a 503 (Service Unavailable) response.

[RFC3261-18-42, 43]

### 18.4 Error Handling

If the transport user asks for a message to be sent over an unreliable transport, and the result is an ICMP error, the behavior depends on the type of ICMP error. Host, network, port or protocol unreachable errors, or parameter problem errors SHOULD cause the transport layer to inform the transport user of a failure in sending. Source quench and TTL exceeded ICMP errors SHOULD be ignored.

## 4.11 Authentication

### 4.11.1 AU-1-1-1 - SIP Proxy- BYE request with user authentication

#### [NAME]

AU-1-1-1 - SIP Proxy- BYE request with user authentication

# **[TARGET]**

SIP Proxy (NUT)

# **[PURPOSE]**

Verify that a proxy sends a 407 (Proxy Authentication Required) response when receiving a BYE request with user authentication.

# **[REQUIREMENT]**

Only when a proxy supports authentication for BYE request.

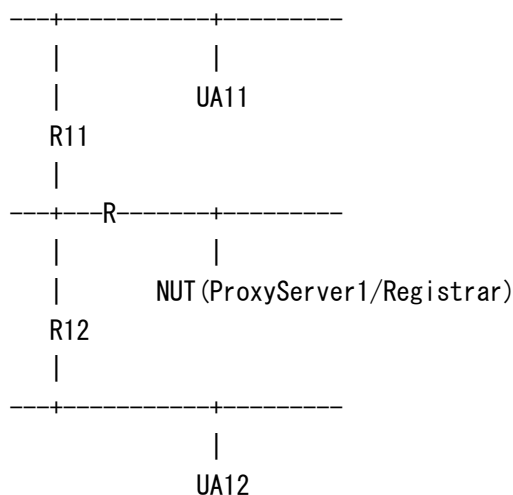
# **[PARAMETER]**

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# **[ADDRESS]**

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

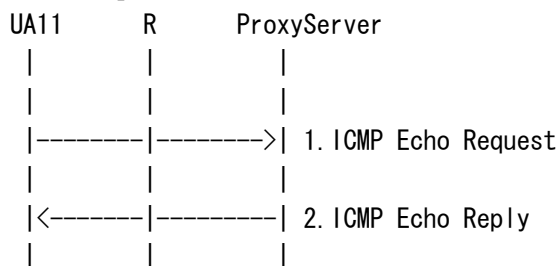
# **[TOPOLOGY]**



# **[CONFIGURATION for NUT]**

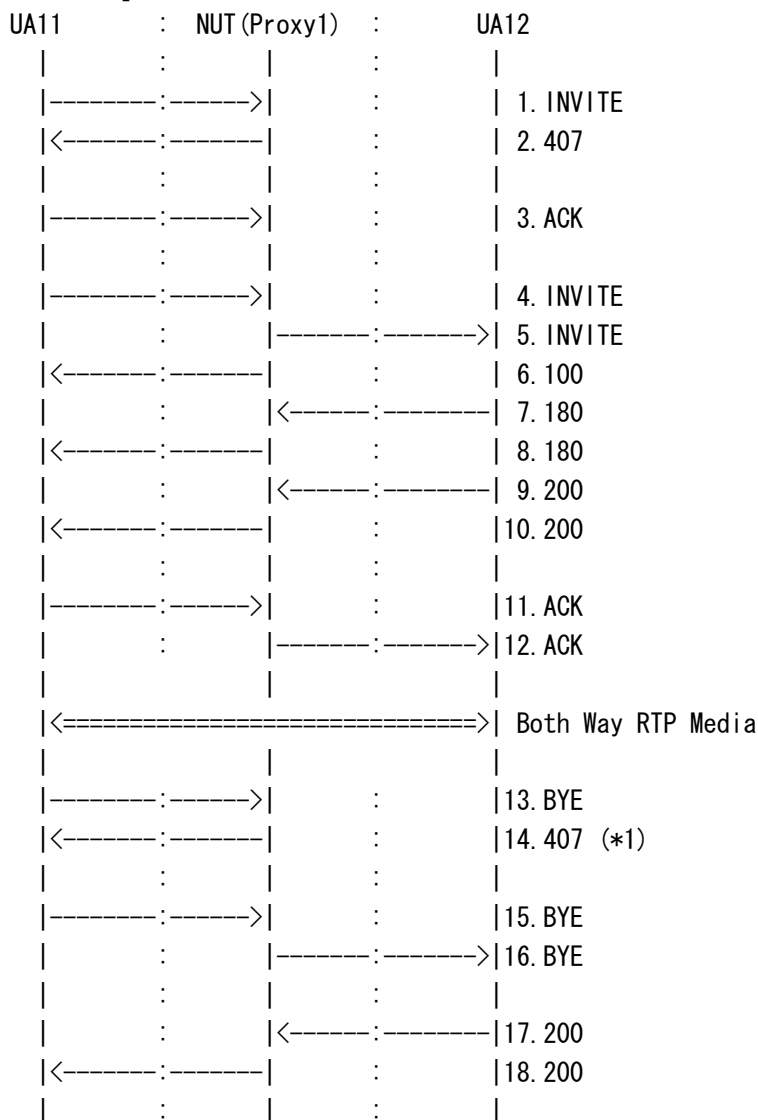
NUT	sip:ss.under.test.com;lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

## [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

## [PROCEDURE]





1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA11 Send BYE.
14. UA11 Receive 407 Proxy Authentication Required.
15. UA11 Send BYE.
16. UA12 Receive BYE.
17. UA12 Send 200 OK.
18. UA11 Receive 200 OK.

**=== Message example ===**

14. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf

Call-ID: 3848276298220188511@under.test.com

CSeq: 3 BYE

Proxy-Authenticate: Digest realm="under.test.com", qop="auth",

nonce="f84f1cec41e6cbe5aea9c8e88d359",

opaque="", stale=FALSE, algorithm=MD5

Content-Length: 0

/\* Proxy(NUT) challenges UA11 for authentication to BYE request \*/

**[JUDGMENT]**

\*\* precondition for testing this scenario:

- NUT must be able to send an authentication challenge to BYE

\*1:407 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:

See generic\_make\_response

See generic\_proxy-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

#### [REFERENCE]

NONE

### 4.11.2 AU-1-1-2 - SIP Proxy- re-INVITE with user authentication

#### [NAME]

AU-1-1-2 - SIP Proxy- re-INVITE with user authentication

#### [TARGET]

SIP Proxy (NUT)

#### [PURPOSE]

Verify that a proxy sends a 407 (Proxy Authentication Required) response when receiving a re-INVITE request with user authentication.

#### [REQUIREMENT]

Only when a proxy supports authentication for re-INVITE request.

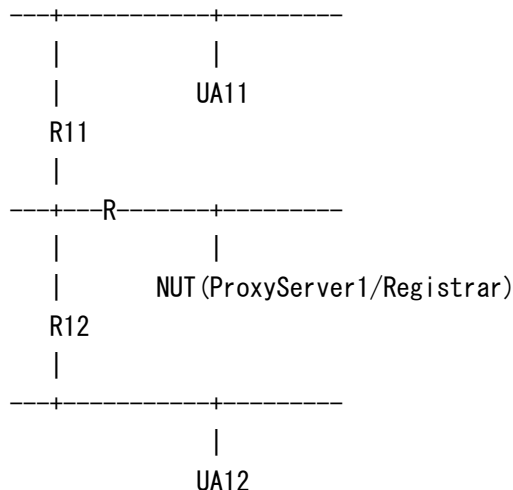
#### [PARAMETER]

NUT(ProxyServer1/Registrar)	sip:ss.under.test.com;lr
UA11(AOR)	sip:UA11@under.test.com
UA11(Contact)	sip:UA11@node.under.test.com
UA12(AOR)	sip:UA12@under.test.com
UA12(Contact)	sip:UA12@node11.under.test.com

# [ADDRESS]

NUT(ProxyServer1/Registrar) (IPv6)	3ffe:501:ffff:50::50/64
UA11(IPv6)	3ffe:501:ffff:1::1/64
UA12(IPv6)	3ffe:501:ffff:2::2/64
R(IPv6)	3ffe:501:ffff:50::1/64

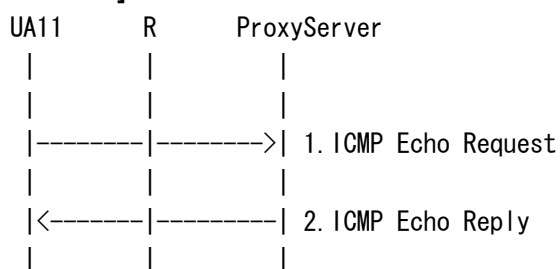
# [TOPOLOGY]



# [CONFIGURATION for NUT]

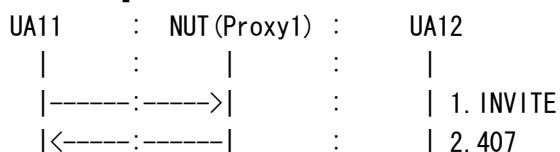
NUT	sip:ss.under.test.com:lr
NUT(IPADDRESS)	3ffe:501:ffff:50::50/64 (IPv6)

# [INITIALIZATION]



1. Send ICMP Echo Request.
2. Receive ICMP Echo Reply.

# [PROCEDURE]



-----:----->	:		3. ACK
:	:		
-----:----->	:		4. INVITE
:	-----:----->		5. INVITE
<-----:-----	:		6. 100 Trying
:	<-----:-----		7. 180 Ringing
<-----:-----	:		8. 180 Ringing
:	<-----:-----		9. 200 OK
<-----:-----	:		10. 200 OK
:	:		
-----:----->	:		11. ACK
:	-----:----->		12. ACK
<=====			Both Way RTP Media Established
:	:		HOLD
:	:		
-----:----->	:		13. INVITE
<-----:-----	:		14. 407 (*1)
-----:----->	:		15. ACK
:	:		
-----:----->	:		16. INVITE
:	-----:----->		17. INVITE
:	<-----:-----		18. 200 OK
<-----:-----	:		19. 200 OK
-----:----->	:		20. ACK
:	-----:----->		21. ACK
:	:		
:	:		HOLD Release
:	:		
-----:----->	:		22. INVITE
<-----:-----	:		23. 407 (*2)
-----:----->	:		24. ACK
:	:		
-----:----->	:		25. INVITE
:	-----:----->		26. INVITE
:	<-----:-----		27. 200 OK
<-----:-----	:		28. 200 OK
-----:----->	:		29. ACK
:	-----:----->		30. ACK
<=====			New RTP Media Stream

```

|-----:----->|      :      |31. BYE
|      :      |-----:----->|32. BYE
|      :      |<-----:-----|33. 200 OK
|<-----:-----|      :      |34. 200 OK
|      :      |      :      |

```

1. UA11 Send INVITE.
2. UA11 Receive 407 Proxy Authentication Required.
3. UA11 Send ACK.
4. UA11 Send INVITE.
5. UA12 Receive INVITE.
6. UA11 Receive 100 Trying.
7. UA12 Send 180 Ringing.
8. UA11 Receive 180 Ringing.
9. UA12 Send 200 OK.
10. UA11 Receive 200 OK.
11. UA11 Send ACK.
12. UA12 Receive ACK.
13. UA11 Send INVITE.
14. UA11 Receive 407 Proxy Authentication Required.
15. UA11 Send ACK.
16. UA11 Send INVITE.
17. UA12 Receive INVITE
18. UA12 Send 200 OK.
19. UA11 Receive 200 OK.
20. UA11 Send ACK.
21. UA12 Receive ACK.
22. UA11 Send INVITE.
23. UA11 Receive 407 Proxy Authentication Required.
24. UA11 Send ACK.
25. UA11 Send INVITE.
26. UA12 Receive INVITE.
27. UA12 Send 200 OK.
28. UA11 Receive 200 OK.
29. UA11 Send ACK.
30. UA12 Receive ACK.
31. UA11 Send BYE.
32. UA12 Receive BYE.
33. UA12 Send 200 OK.
34. UA11 Receive 200 OK.

**=== Message example ===**



#### 14. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK74b43

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf

Call-ID: 3848276298220188511@under.test.com

CSeq: 6 INVITE

Proxy-Authenticate: Digest realm="under.test.com", qop="auth",

nonce="thkr983j76h5gut77meka93ol43m2",

opaque="", stale=FALSE, algorithm=MD5

Content-Length: 0

/\* Proxy(NUT) challenges UA11 for authentication to re-INVITE \*/

#### 23. 407 Proxy Authentication Required NUT -> UA11

SIP/2.0 407 Proxy Authentication Required

Via: SIP/2.0/UDP node.under.test.com:5060;branch=z9hG4bK87jyHtgh8

;received=3ffe:501:ffff:1::1

From: UA11 <sip:UA11@under.test.com>;tag=9fxced76sl

To: UA12 <sip:UA12@under.test.com>;tag=3flal12sf

Call-ID: 3848276298220188511@under.test.com

CSeq: 7 INVITE

Proxy-Authenticate: Digest realm="under.test.com", qop="auth",

nonce="f84f1cec41e6cbe5aea9c8e88d359",

opaque="", stale=FALSE, algorithm=MD5

Content-Length: 0

/\* Proxy(NUT) challenges UA11 for authentication to re-INVITE \*/

### [JUDGMENT]

\*\* precondition for testing this scenario:

- NUT must be able to send an authentication challenge to re-INVITE

\*1:407 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,



- Status-Line:

See generic\_make\_response

Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:

See generic\_make\_response

See generic\_proxy-auth

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

\*2:407 response from NUT to UA11.

As a SIP Message,

See generic\_message

As a SIP response,

- Status-Line:

See generic\_make\_response

See generic\_proxy-auth

Status-Code: Must be "407". [RFC3261 22.3]

- Header fields:

See generic\_make\_response

\* Via

via-received: Must be added if the host portion of the "sent-by" parameter contains a domain name. [RFC3261-18-27]

via-received: Must contain the source address from which the packet was received. [RFC3261-18-28]

**[REFERENCE]**

NONE



\*\*\*\*\*

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This original documentation is produced by SIP IPv6 SWG members of Certification WG in the IPv6 Promotion Council. The SWG members currently include Nippon Telegraph and Telephone Corporation (NTT), Yokogawa Electric Corporation, University of New Hampshire InterOperability Laboratory (UNH-IOL), and NTT Advanced Technology Corporation (NTT-AT).

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