

IPv6 Ready Logo Phase 2  
Session Initiation Protocol  
Interoperability Test Scenario

Version 1.1.0

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IPv6 Forum  
IPv6 Ready Logo Committee



## Modification Record

Version 0.1	Jan. 16, 2007	- First release
Ver.0.1.01-02	Feb. 26, 2007	- Corrected misspellings.
Ver.0.1.03	Mar. 06, 2007	- Modified the parts that Timothy pointed out. - Corrected misspellings.
Ver.0.1.04	Mar. 08, 2007	- Added scenarios related to Fork and OPTIONS request.
Ver.1.0.0	Apr. 27, 2007	-Modified scenarios related to Test set up. -Modified scenarios related to Judgment. -Corrected misspellings. -Added details related to The architecture for Interoperability test
Ver.1.0.1	Jul. 31, 2007	Version 1.0.1 release. Modified scenarios that NICI (Fang-Yu Ling) pointed out.
Ver.1.0.2	May. 30, 2008	Version 1.0.2 release. Modified some misspellings. Added the explanation of check sheet for interoperability test..
Ver.1.1.0	Dec. 12, 2008	Major revision up. (No modification)



# Acknowledgements

**IPv6 Forum would like to acknowledge the efforts of the following organizations and commentators in the development of this test specification.**

- IPv6 Promotion Council  
Certification Working Group  
SIP IPv6 Sub Working Group

Commentators:

Hiroki Yambe  
VoIP System Interoperability Task Force (VoIP/SIP Task Force)

Fang-Yu Ling  
NICI IPv6 Standard and Interoperability Testing Lab. (Telecommunication Laboratories,  
Chunghwa Telecom Co., Ltd.)



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# 1. Overview

This document describes test scenarios to verify the interoperability between SIP IPv6 equipment.

- Interoperability test scenario for the IPv6 Ready Logo Phase 2 program

“Interoperability test scenario for the IPv6 Ready Logo Phase 2 program” includes all the test elements needed for acquisition of the IPv6 Ready Logo Phase 2 program Logo. In consideration of generally used operation, the functions of the test scenario are selected from the BASIC and ADVANCED functions classified in the *Policy document*. The details of functions and corresponding test elements in the test scenario are described in Section 2.

In the following parts, BASIC and ADVANCED functions are called “BASIC” and “ADVANCED”, respectively.

## Acronyms

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

## Reference standards

This documentation covers the functions specified in the RFC and SIP Test Profile listed below.

- (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) Guidelines for Implementation ([http://www.ipv6ready.org/about\\_phase2\\_test.html](http://www.ipv6ready.org/about_phase2_test.html))



(7) IPv6 Ready Logo Phase 2 Policy for SIP

([http://www.ipv6ready.org/about\\_phase2\\_test.html](http://www.ipv6ready.org/about_phase2_test.html))



## 2. Interoperability test scenario for the IPv6 Ready Logo Phase 2 program

### 2.1 Phase 2 certification and support function

In order for SIP equipment (UA and Server) to acquire Phase 2 Logo based on the *Policy document*, all the BASIC must be supported in the viewpoint of interoperability, and each ADVANCED can be selectively supported.

The other SIP equipment that connects to a piece of candidate equipment on a network architecture must support the functions that tested, regardless of BASIC or ADVANCED. In the case of ADVANCED, especially, confirm that all SIP equipment on the architecture support the same functions as those of the candidate.

Table 2-1 shows BASIC and ADVANCED for interoperability test.

**Table 2-1. List of Interoperability test for BASIC and ADVANCED**

BASIC	ADVANCED
<ul style="list-style-type: none"><li>- Registration</li><li>- Establishment, disconnection, and cancellation of Session</li><li>- SDP Offer/Answer (INVITE-200)</li><li>- Digest authentication (REGISTER, Initial INVITE)</li><li>- Message forwarding</li></ul>	<ul style="list-style-type: none"><li>- Hold</li><li>- Forking / Multiple responses</li><li>- OPTIONS request</li></ul>

The relationship between Function (BASIC / ADVANCED) and test scenario number is shown in Table 2-2. Each number in the column, “Test scenario number”, links to the number of “Test num” in Table 2-4, Section 2.4.

**Table 2-2. Requirements and References**

Target	Function		Test scenario number
UA	BASIC	Registration	#1-4
		Establishment, disconnection, and cancellation of Session	#5-7



		SDP Offer/Answer (INVITE-200)	#5
		Digest authentication (REGISTER, initial INVITE)	#5
	ADVANCED	Hold	#8
		Processing multiple responses	#9
		OPTIONS request	#10
Server*	BASIC	Registration	#1-4
		Message forwarding	#5-7 (#11-13 are optional)
		Digest authentication (REGISTER, initial INVITE)	#5
	ADVANCED	Forking	#9
		OPTIONS request	#10

\* Server: SIP proxy server and SIP registrar server

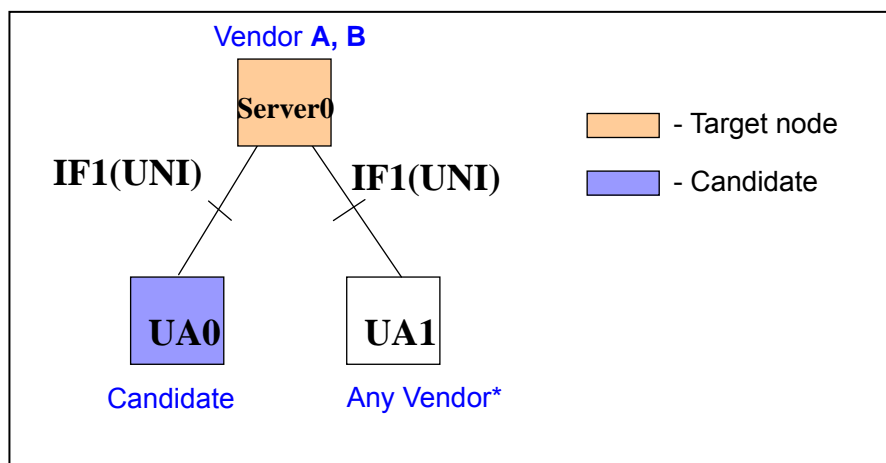


## 2.2 The architecture for Interoperability test

SIP IPv6 equipment (UA and Server) must execute the “Interoperability test scenario for IPv6 Ready Logo Phase 2 program” with two or more different types (different vendors) of equipment to acquire IPv6 Ready Logo Phase 2 program Logo.

### 2.2.1 User Agent (UA)

When a UA is candidate of the Phase 2 logo, the candidate must pass the interoperability test on the following architecture (Figure 2-2). Also, it is preferable that UA1 is a piece of equipment of the same vendor as the candidate (UA0). Moreover, UA1 must support the functions that UA0 supports for this logo, and Server0 must support all BASIC functions.



**Figure 2-2 Selection method of target nodes (Candidate: UA)**

\* Must set up as the following combinations:

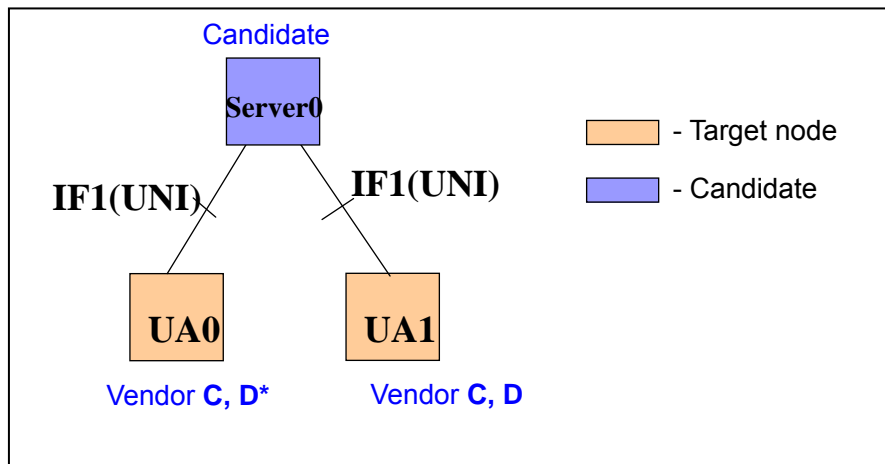
Vendor A (Server0) ----- Any Vender (UA1)

Vendor B (Server0) ----- Any Vender (UA1)

### 2.2.2 Server

When a proxy server is candidate of the Phase 2 logo, the candidate must pass the interoperability test on the following architecture (Figure 2-3). Both UA0 and UA1 must support all BASIC functions.



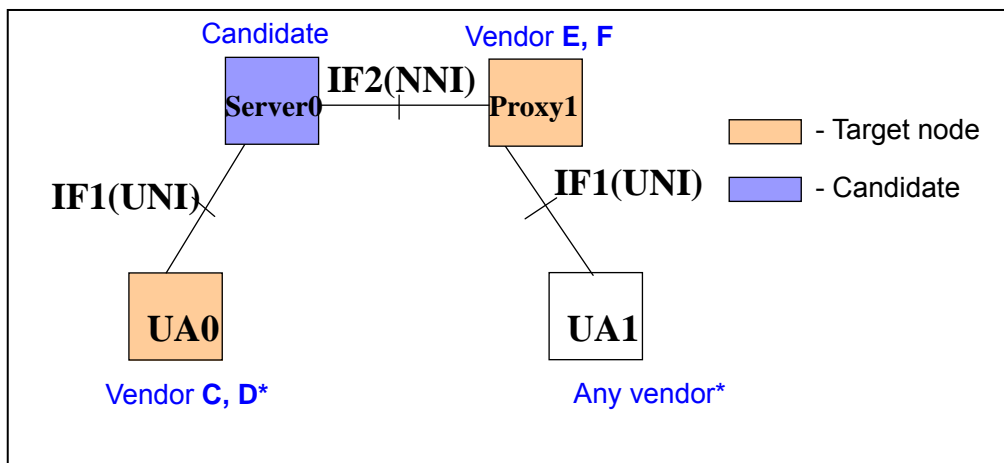


**Figure 2-3 Selection method of target nodes (Candidate: Server)**

\* Both of UAs should be set up as the following combinations:

Vendor C (UA0) ----- Vendor C (UA1)      Vendor D (UA0) ----- Vendor D (UA1)  
Vendor C (UA0) ----- Vendor D (UA1)

If a server (candidate) supports NNI, the server must pass the interoperability test on the following architecture (Figure 2-4) after passing the above test (Figure 2-3). Also, it is preferable that UA1 is a piece of equipment of the same vendor as the target UA (UA0). Moreover, both UA0 and UA1 must support all BASIC functions, and Proxy1 must include the function of forwarding messages through proxy.



**Figure 2-4 Selection method of target nodes on two proxies**

\* Both of UAs should be set up as the following combinations:

Vendor C (UA0) ----- Vendor E (Proxy1)      Vendor C (UA0) ----- Vendor F (Proxy1)



Vendor D (UA0) ----- Vendor E (Proxy1)    Vender D (UA0) ----- Vender F (Proxy1)



### 2.2.3 Domain name resolution

The domain name can be configured by either of the following methods.

- The method that sets DNS server on the networks which execute the interoperability test.
- The static method that adds the domain name to the host file, for example, such as */etc/hosts* directory in UNIX.

### 2.2.4 IPv6 addressing

The IPv6 addressing can be configured by either of the following methods.

Manual configuration.

- The static method that configures the IPv6 address to the interface by manual operation, for example, *inconfig* command or setting file in UNIX configure IPv6 address.

Stateful address auto configuration

- The method that configures IPv6 address to the each terminal with the structure which **automates the assignment of IP addresses** such as DHCP server etc.

Stateless address auto configuration

- The method that configures own IPv6 address from the addressing information such as Router Solicitation(RS), Router Advertisement(RA) etc.

## 2.3 The process of the Interoperability test

The Outline of the “Interoperability test scenario for the IPv6 Ready Logo Phase 2 program” is the follows.

- <1> Check the necessary nodes and scenarios for the interoperability test (See Table 2-4).
- <2> Connect the necessary equipment properly. (See Section 2.2)
- <3> Execute the tests according to the interoperability test scenario.  
(And you need to save the interoperability test logs.)
- <4> Write the result (‘OK’ or ‘NG’) on the check sheet every scenario.



As for the above point <3>, the actual test scenarios are described in Section 4. Each test scenario in the section provides the details of the test scenario to conduct the actual test.

As for the above point <4>, refer to *The explanation of the submission for the SIP IPv6 Ready Logo*.

For checking of the interoperability test results, you can use "sip\_scenario\_check\_sheet.pdf".



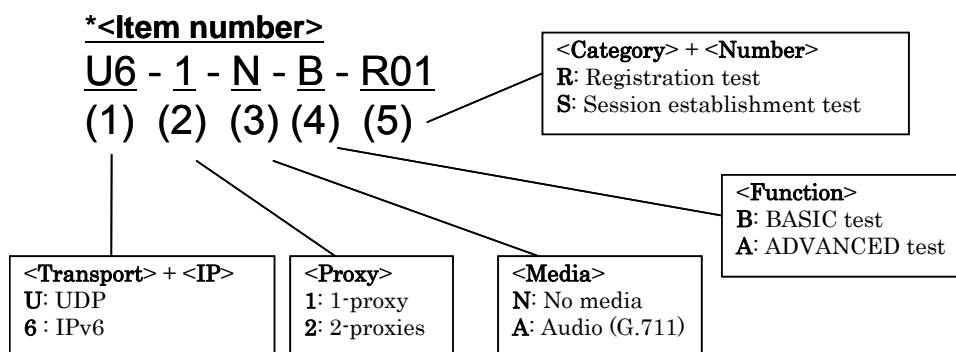
## 2.4 Interoperability test scenario for the IPv6 Ready Logo Phase 2 program

The “Interoperability test scenario for the IPv6 Ready Logo Phase 2 program” was developed from the viewpoint of the Phase 2 certification, as shown in Table 2-4.

The interoperability test should be conducted according to the order of the category in Table 2-4 (Registration and Basic functions.) In each category, it is preferable to start from a test with younger test number. Table 2-3 explains each column in Table 2-4.

**Table 2-3. The classification in Table 2-4**

Category	Explanation
Candidate Node (CN)	It describes the candidate node for the Phase 2 logo.
Category	It is categorized into groups for executing the interoperability tests.
Test num	The Test num describes the test number. The number is referred in table 2-2, Section 2.1.
Item num*	The Item number is the original test number to distinguish a test.
Test scenario	The Test scenario is the title of a test.
Candidate/Target Nodes	<p>The candidate/Target Nodes show the necessary nodes in a test based on the required architecture.</p> <p><b>T:</b> Target node  <b>C:</b> Candidate node  <b>X:</b> The necessary nodes for the test, other than the target node and the candidate node</p>



**Table 2-4. The interoperability test scenario**

C N	Category	Test num	Item num	Test scenario	Candidate/Target Nodes			
					UA0	UA1	Server 0	Proxy 1
U A	Registration	1	U6-1-N-B-R01	Initial registration by REGISTER request	C		T	
		2	U6-1-N-B-R02	Registration renewal by REGISTER request	C		T	
		3	U6-1-N-B-R03	Register deleted by REGISTER request	C		T	
		4	U6-1-N-B-R04	Change of expiration time with 200 response to REGISTER	C		T	
	Session	5	U6-1-A-B-S01	Session establishment and disconnection	C	X	T	
		6	U6-1-A-B-S02	Cancellation of transmission	C	X	T	
		7	U6-1-A-B-S03	Rejection of call transmission	C	X	T	
		8	U6-1-A-A-S01	Session hold and hold release	C	X	T	
		9	U6-1-A-A-S02	Forking / Multiple responses	C	X	T	
		10	U6-1-A-A-S03	OPTIONS proceeding	C	X	T	
S e r v e r	Registration	1	U6-1-N-B-R01	Initial registration by REGISTER request	T		C	
		2	U6-1-N-B-R02	Registration renewal by REGISTER request	T		C	
		3	U6-1-N-B-R03	Register deleted by REGISTER request	T		C	
		4	U6-1-N-B-R04	Change of expiration time with 200 response to REGISTER	T		C	
	Session	5	U6-1-A-B-S01	Session establishment and disconnection	T	T	C	
		6	U6-1-A-B-S02	Cancellation of transmission	T	T	C	
		7	U6-1-A-B-S03	Rejection of transmission	T	T	C	
		9	U6-1-A-A-S02	Forking / Multiple response	T	T x 2	C	
		10	U6-1-A-A-S03	OPTIONS proceeding	T	T	C	
		11	U6-2-A-A-S01	Session establishment and disconnection (2 proxies)	T	X	C	T
		12	U6-2-A-A-S02	Cancellation of transmission (2 proxies)	T	X	C	T
		13	U6-2-A-A-S03	Rejection of transmission (2 proxies)	T	X	C	T

■ : BASIC ■ : ADVANCED □ : The architecture on 2 proxies

T: Target C: Candidate X: Necessary node for the test (other than Target and Candidate nodes.)





### 3. Test Procedure for Interoperability test scenario for the IPv6 Ready Logo Phase 2

The interoperability test scenario is described according to the following categories to execute the tests smoothly.

#### Description block

[1] Test number/Title	The Test number/Title is the name and the title of the test.
[2] Purpose and outline	The 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.
[3] Resource requirement	The Resource requirement describes the referred RFCs.
[4] Test setup [4.1] Topology [4.2] Address [4.3] Test conditions [4.4] Test initial conditions	The Test setup describes the configuration of all equipment prior to the start of the test.
[5] Test procedure	The Test procedure describes the points of test procedure. The details are referred to the Message flow or the Coding examples in [7].
[6] Judgment	The Judgment describes expected result. If we can observe as same result as the description of Judgment, the candidate node passes the test.
[7] Reference [7.1] Message flow [7.2] Coding examples	The Message flow describes step-by-step instructions with examples of sequence or text message for carrying out the test.

#### 3.1. U6-1-N-B-R01 - Initial registration by REGISTER request

[1] Test number/Title

-----



U6-1-N-B-R01

Initial registration by REGISTER request

[2] Purpose and outline

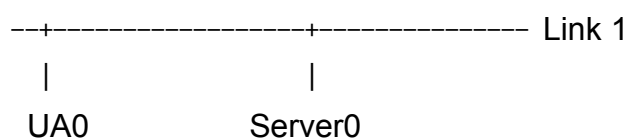
Confirm the proper contact address registration from a terminal by REGISTER request.

[3] Resource requirement

Registration	/ RFC3261
IPv6 compliant	/ RFC4566
Authentication	/ RFC2617

[4] Test setup

[4.1] Topology



- 1 SIP UA / 1 SIP Server

[4.2] Address

4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, Server0

4.2.2 Example of node information

- IP address information



	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
Server0	ss.example.com

- Digest authentication information

	username	password
UA0	00022221111	sipreadyph2

#### [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: None
- Proxy A: Call stateful proxy with Registrar function.
- Authentication: Digest authentication
- Authentication algorithm: MD5

#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Confirm the contact information in Terminal A is cleared on Proxy A.
  - Set the digest authentication parameter.

#### [5] Test procedure

##### 1. Send REGISTER from Terminal A to Proxy A.

- \* Confirm the request and response exchange are properly done according to the message flow.

#### [6] Judgment



Confirm the following:

[UA0]

Execute with UA0 (your UA) as Terminal A.

- Send REGISTER.

IP address : Must send to Proxy A IP address.

Request-Line : Must contain Proxy A AoR.

From header : Must contain Proxy A AoR.

To header : Must contain Proxy A AoR.

Via header : Must contain UA0 domain name or IP address.

- Receive the final response (200 OK)

[Server0]

Execute with Server0 (your Server) as Register.

- Receive REGISTER.

- Send final response (200 OK).

IP address : Must send to Terminal A IP address.

From header : Must be the same value of From header that is received as REGISTER request.

To header : Must be the same value of To header that is received as REGISTER request.

Via header : Must be equal to the value of Via header that is received as REGISTER request.

[7] Reference

[7.1] Message flow

Terminal A

Proxy A (Registrar)



----->	1.REGISTER
<-----	2.401 Unauthorized
----->	3.REGISTER
<-----	4.200 OK

## [7.2] Coding examples

### 1. REGISTER Terminal A -> Proxy A

REGISTER sip:ss.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK74bf9  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=1234567  
To: <sip:00022221111@aaa.example.com>  
Call-ID: b84c4d76f6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 1 REGISTER  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Expires: 3600  
Content-Length: 0

### 2.401 Unauthorized Proxy A -> Terminal A

SIP/2.0 401 Unauthorized  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK74bf9  
From: <sip:00022221111@aaa.example.com>;tag=1234567  
To: <sip:00022221111@aaa.example.com>;tag=567890  
Call-ID: b84c4d76f6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 1 REGISTER  
WWW-Authenticate: Digest realm="aaa.example.com"  
nonce="ae9137be",domain="sip:aaa.example.com",algorithm=MD5,  
opaque="", stale=FALSE  
Content-Length: 0



### 3. REGISTER Terminal A -> Proxy A

REGISTER sip:ss.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK74bfa  
Max-Forwards: 70  
Authorization: Digest realm="aaa.example.com",nonce="ae9137be",  
username="00022221111",uri="sip:aaa.example.com",  
response="6iib19cef56c9a0a3i5aieff23a234",  
algorithm=MD5,opaque=""  
From: <sip:00022221111@aaa.example.com>;tag=1234568  
To: <sip:00022221111@aaa.example.com>  
Call-ID: b84c4d76f6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 REGISTER  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Expires: 3600  
Content-Length: 0

### 4. 200 OK Terminal A -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK74bfa  
From: <sip:00022221111@aaa.example.com>;tag=1234568  
To: <sip:00022221111@aaa.example.com>;tag=567891  
Call-ID: b84c4d76f6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 REGISTER  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>;expires=3600  
Content-Length: 0  
Date: Sat, 13 Nov 2010 23:29:00 GMT

## 3.2. U6-1-N-B-R02 - Registration renewal by REGISTER request

[1] Test number/Title



U6-1-N-B-R02

Registration renewal by REGISTER request

[2] Purpose and outline

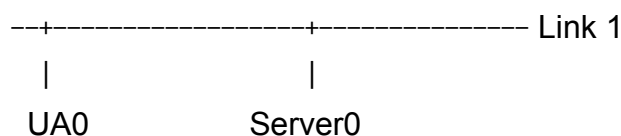
Send REGISTER request from a terminal while registration is valid. Confirm the contact address is properly renewed.

[3] Resource requirement

Registration	/ RFC3261
IPv6 compliant	/ RFC4566
Authentication	/ RFC2617

[4] Test setup

[4.1] Topology



- 1 SIP UA / 1 SIP Server

[4.2] Address

4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, Server0

4.2.2 Example of node information

- IP address information



	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
Server0	ss.example.com

- Digest authentication information

	username	password
UA0	00022221111	sipreadyph2

#### [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: None
- Proxy A: Call stateful proxy with Registrar function.
- Authentication: Digest authentication
- Authentication algorithm: MD5

#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Confirm the contact information in Terminal A is cleared on Proxy A.
  - Set the digest authentication parameter.

#### [5] Test procedure

##### 1. Send REGISTER from Terminal A to Proxy A.

- \* Confirm the request and response exchange are properly done according to the message flow.
- \* Confirm the registration of contact address on Proxy A.





- \* Confirm the Contact header on REGISTER received by Proxy A contains expires parameter or Expires header, and the level is 180.
  - \* Confirm the Contact header on the 200 response received by Proxy A contains expires parameter or Expires header.
2. Resend REGISTER from Terminal A to Proxy A while the registration is valid.
- \* Confirm the receipt of REGISTER on Proxy A while the registration is valid.
  - \* Confirm the term of validity of the Contact address registered in 1. is extended on Proxy A.

#### [6] Judgment

Confirm the following:

#### [UA0]

Execute with UA0 (your UA) as Terminal A.

- Must be satisfied with the [6] Judgment in U6-N-B-R01
- Receive the final response (200 OK)
- Hold the registration, and send REGISTER again.
- Receive the final response (200 OK)

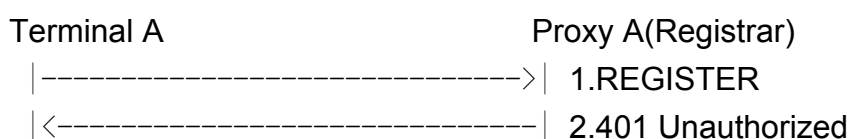
#### [Server0]

Execute with Server0 (your Server) as Register.

- Must be satisfied with the [6] Judgment in U6-N-B-R01
- Hold registered Terminal A, and send REGISTER again.
- Send final response (200 OK).

#### [7] Reference

##### [7.1] Message flow





----->	3.REGISTER
<-----	4.200 OK
----->	5.REGISTER
<-----	6.200 OK

## [7.2] Coding examples

\* See U6-1-N-B-R01 for coding examples of 1. -4.

### 5. REGISTER Terminal A -> Proxy A

REGISTER sip:ss.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK74bff  
Max-Forwards: 70  
Authorization: Digest realm="aaa.example.com",nonce="ae9137be",  
username="00022221111",uri="sip:aaa.example.com",  
response="6iib19cef56c9a0a3i5aieff23a234",  
algorithm=MD5,opaque=""  
From: <sip:00022221111@aaa.example.com>;tag=1234569  
To: <sip:00022221111@aaa.example.com>  
Call-ID: b84c4d76f6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 3 REGISTER  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Expires: 3600  
Content-Length: 0

### 6. 200 OK Terminal A -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK74bff  
From: <sip:00022221111@aaa.example.com>;tag=1234569  
To: <sip:00022223333@bbb.example.com>;tag=567892  
Call-ID: b84c4d76f6@[3ffe:501:ffff:5:(InterfaceID)]



CSeq: 3 REGISTER

Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>;expires=3600

Content-Length: 0

### 3.3. U6-1-N-B-R03 - Registration deleted by REGISTER request

[1] Test number/Title

U6-1-N-B-R03

Registration deleted by REGISTER request

[2] Purpose and outline

After the registration of contact address, send REGISTER request from a terminal.

Confirm the registered address is properly eliminated.

[3] Resource requirement

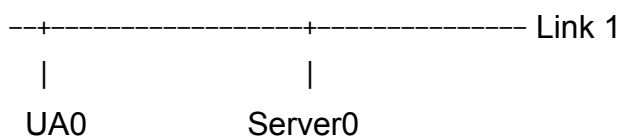
Registration / RFC3261

IPv6 compliant / RFC4566

Authentication / RFC2617

[4] Test setup

[4.1] Topology



- 1 SIP UA / 1 SIP Server

[4.2] Address

4.2.1 Example of link information (Prefix)



	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, Server0

#### 4.2.2 Example of node information

##### - IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

##### - SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
Server0	ss.example.com

##### - Digest authentication information

	username	password
UA0	00022221111	sipreadyph2

#### [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: None
- Proxy A: Call stateful proxy with Registrar function.
- Authentication: Digest authentication
- Authentication algorithm: MD5

#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Confirm the contact information in Terminal A is cleared on Proxy A.
  - Set the digest authentication parameter.



## [5] Test procedure

### 1. Send REGISTER from Terminal A to Proxy A.

- \* Confirm the request and response exchange are properly done according to the message flow.
- \* Confirm the registration of contact address on Proxy A.
- \* Confirm the Contact header on REGISTER received by Proxy A contains expires parameter or Expires header, and the level is 180.
- \* Confirm the Contact header on the 200 response received by Proxy A contains expires parameter or Expires header.

### 2. Send REGISTER of registration deletion from Terminal A to Proxy A.

- \* Confirm the receipt of REGISTER on Proxy A while the registration is valid.
- \* Confirm REGISTER received by Proxy A contains both "Contact: \*" and "Expires: 0", or contains "expires=0" parameter in Contact header.
- \* Confirm the Contact address registered in 1. is eliminated on Proxy A.

## [6] Judgment

Confirm the following:

### [UA0]

Execute with UA0 (your UA) as Terminal A.

- Must be satisfied with the [6] Judgment in U6-N-B-R01
- Receive the final response (200 OK)
- Hold the registration, and send REGISTER again.
  - Expires time : Must contain Expire header or Expires parameter "0"
  - Contact header : Must be "\*" or registered SIP URI
- Receive the final response (200 OK)



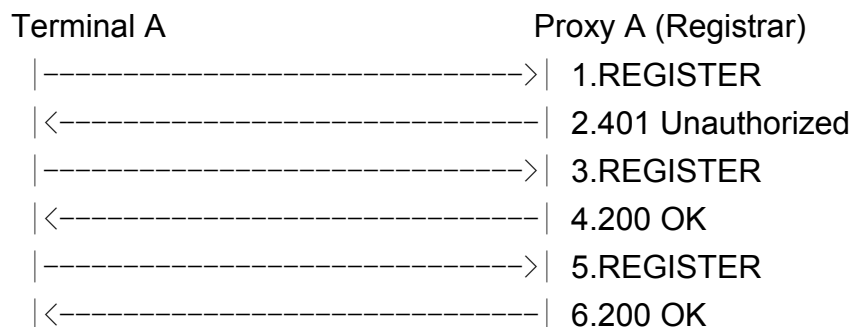
[Server0]

Execute with Server0 (your Server) as Register.

- Must be satisfied with the [6] Judgment in U6-N-B-R01
- Hold registered Terminal A, and send REGISTER again.
- Send final response (200 OK).  
Contact header : Must be not included the header or must be empty value.

[7] Reference

[7.1] Message flow



[7.2] Coding examples

\* See U6-1-N-B-R01 for coding examples of 1. -4.

5. REGISTER Terminal A -> Proxy A

```
REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK74bfg
Max-Forwards: 70
Authorization: Digest realm="aaa.example.com",nonce="ae9137be",
  username="00022221111",uri="sip:aaa.example.com",
  response="6iib19cef56c9a0a3i5aieff23a234",
  algorithm=MD5,opaque=""
From: <sip:00022221111@aaa.example.com>;tag=123456a
```



To: <sip:00022221111@aaa.example.com>  
Call-ID: b84c4d76f6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 3 REGISTER  
Contact: \*  
Expires: 0  
Content-Length: 0

#### 6. 200 OK Terminal A -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK74bff  
From: <sip:00022221111@aaa.example.com>;tag=123456a  
To: <sip:00022221111@aaa.example.com>;tag=567898  
Call-ID: b84c4d76f6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 3 REGISTER  
Content-Length: 0

### 3.4. U6-1-N-B-R04 - Change of expiration time by the 200 response to REGISTER

[1] Test number/Title

U6-1-N-B-R04

Change of expiration time by the 200 response to REGISTER

[2] Purpose and outline

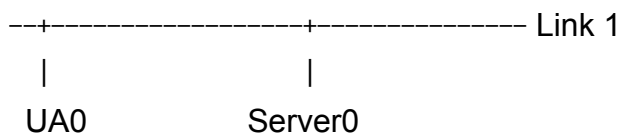
When the registration of contact address is done by REGISTER request from a terminal, set the different term of validity from that of Registrar request. Confirm the proper re-registration based on the term.

[3] Resource requirement

Registration	/ RFC3261
IPv6 compliant	/ RFC4566
Authentication	/ RFC2617

#### [4] Test setup

##### [4.1] Topology



- 1 SIP UA / 1 SIP Server

##### [4.2] Address

###### 4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, Server0

###### 4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
Server0	ss.example.com

- Digest authentication information

	username	password
UA0	00022221111	sipreadyph2





#### [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: None
- Proxy A: Call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5

#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Confirm Terminal A's contact information is cleared on Proxy A.
  - Set the digest authentication parameter.

#### [5] Test procedure

1. Configure the server that register any expires as fixed value of expires, and send 200response including the value to the terminal.
2. Send REGISTER from Terminal A to Proxy A.
  - \* Confirm the request and response exchange are properly done according to the message flow.

#### [6] Judgment

Confirm the following:

##### [UA0]

Execute with UA0 (your UA) as Terminal A.

- Must be satisfied with the [6] Judgment in U6-N-B-R01



- Receive the final response (200 OK)
- Hold the registration, and send REGISTER again.  
Must resend REGISTER after half of “4.200.OK” expire time passed.
- Receive the final response (200 OK)

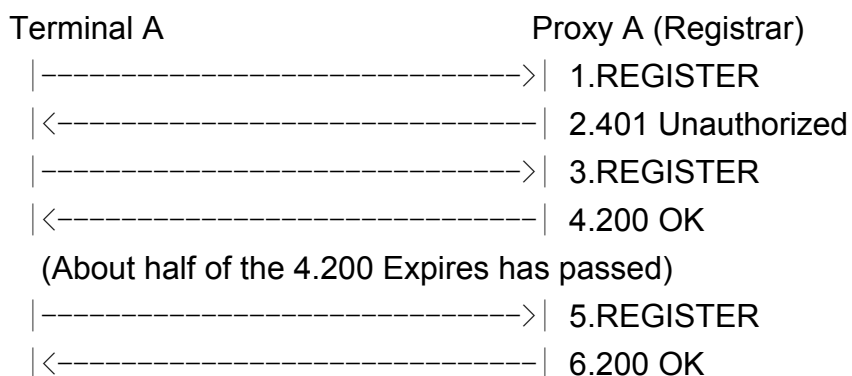
#### [Server0]

Execute with Server0 (your Server) as Proxy A Register.

- Must be satisfied with the [6] Judgment in U6-N-B-R01
- Must be different “4.200 OK” Expire parameters from “3.REGISTER”.
- Hold registered Terminal A, and send REGISTER again.
- Send final response (200 OK).

#### [7] Reference

##### [7.1] Message flow



##### [7.2] Coding examples

Omitted.

\* Expires levels of 3. and 4. are different.

### 3.5. U6-1-A-B-S01 - Session establishment and disconnection

#### [1] Test number/Title



U6-1-A-B-S01

Session establishment and disconnection

[2] Purpose and outline

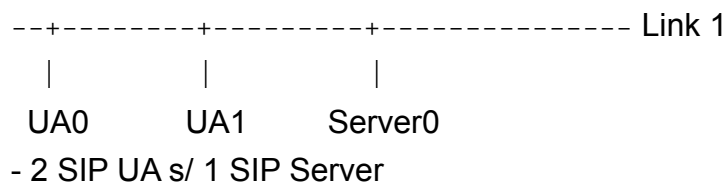
Establish the connection from the sender to the receiver via a proxy. Confirm proper session establishment, voice transmission and disconnection.

[3] Resource requirement

Session establishment and disconnection function	/ RFC3261
Media exchange (SDP)	/ RFC3264, RFC4566
IPv6 compliant	/ RFC4566
Authentication	/ RFC2617

[4] Test setup

[4.1] Topology



[4.2] Address

4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, Server0

4.2.2 Example of node information

- IP address information



	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
Server0	ss.example.com

- Digest authentication information

	username	password
UA0	00022221111	sipreadyph2
UA1	00022223333	sipreadyph2

[4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio (G.711 $\mu$ -law)
- Proxy A: call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A and Terminal B send REGISTER to Proxy A for location registration.
- Set Proxy A as an outbound proxy of Terminal A.
- Confirm no call remains on Proxy A. (All transactions and dialogs are cleared.)
  - Set the digest authentication parameter.



#### [5] Test procedure

1. Call from Terminal A to Terminal B.
  - \* Confirm the ring on Terminal B.
  - \* Confirm the ring back tone on Terminal A.
2. Answer Terminal B.
  - \* Confirm the voice transmission on both Terminal A and Terminal B.
3. Hang up Terminal B.
  - \* Confirm the session is disconnected on Terminal A.
4. Hang up Terminal A.

#### [6] Judgment

Confirm the following:

##### [UA0]

Execute with UA0 (your UA) as Terminal A.

- Send INVITE.

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive the final response (200 OK)

- Send ACK

IP address : Must send to Proxy A IP address.  
Request-Line : Must be Contact URI. The URI must be the same value 200 OK response to INVITE request.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.



- Receive BYE
- Send the final response 200 OK to BYE request.

IP address : Must send to Proxy A IP address.  
From header : Must be the same From Header URI that is received as BYE request.

To header : Must contain Terminal B AoR.  
Via header : Must contain Terminal B domain name or IP address.

[UA0]

Execute with UA0 (your UA) as Terminal B.

- Receive INVITE.

IP address : Must send to Proxy A IP address.  
From header : Must be the same From Header URI(Terminal B AoR) that received as INVITE request.  
To header : Must be the same To Header field URI(UA0) of AoR that received as INVITE request.  
Via header : Must be the same value of Via field that received as INVITE request.

- Receive ACK
- Send BYE

IP address : Must send to Proxy A IP address.  
Request-Line : Must be Contact URI. The URI must be the same value 200 OK response to INVITE request.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive the final response to BYE request.

[Server0]

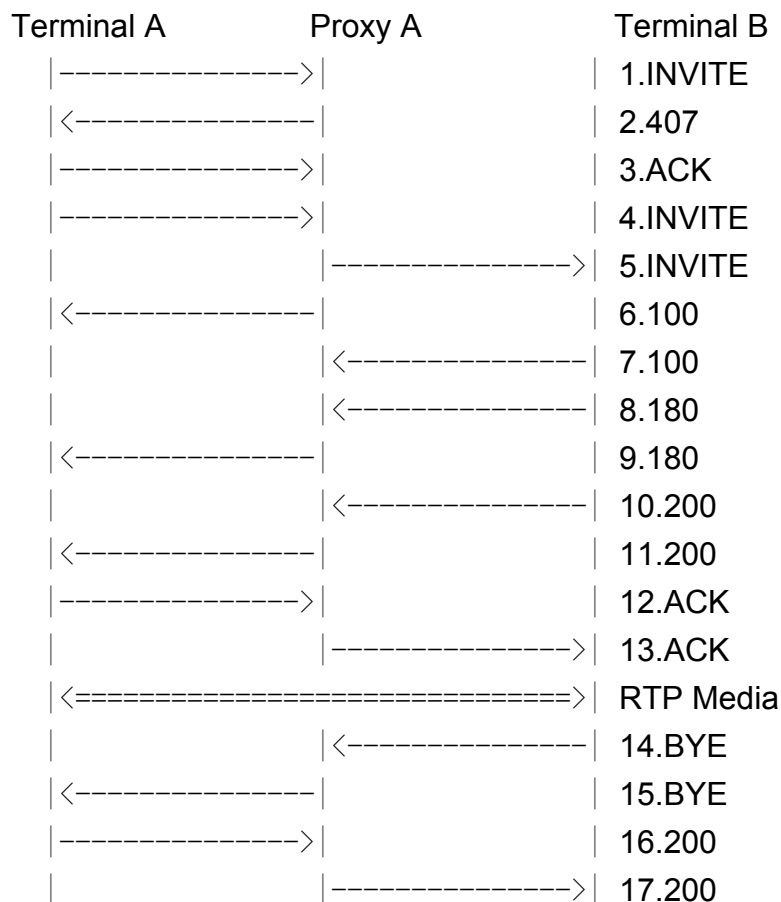
Execute with Server0 (your Server) as Proxy A.



- Must forward the following message to sender for session establishment and disconnection.
  - INVITE
  - 200 OK (to INVITE)
  - ACK
  - BYE
  - 200 OK (to INVITE)

## [7] Reference

### [7.1] Message flow



### [7.2] Coding examples



## 1. INVITE Terminal A -> Proxy A

INVITE sip:00022223333@bbb.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 1 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0  
o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

## 2.407 Proxy Authorization Required Proxy A -> Terminal A

SIP/2.0 407 Proxy Authorization Required  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=3flal12sf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="aaa.example.com",nonce="ae9137be",  
domain="sip:aaa.example.com",algorithm=MD5,opaque="", stale=FALSE





Content-Length: 0

### 3. ACK Terminal A -> Proxy A

ACK sip:00022223333@bbb.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=3flal12sf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 1 ACK  
Content-Length: 0

### 4. INVITE Terminal A -> Proxy A

INVITE sip:00022223333@bbb.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
Proxy-Authorization: Digest realm="aaa.example.com",nonce="ae9137be",  
username="00022223333",uri="sip:00022223333@bbb.example.com",  
response="6iib19cef56c9a0a3i5aieff23a234",  
algorithm=MD5,opaque=""  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)



s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

## 5. INVITE Proxy A-> Terminal B

INVITE sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Record-Route:  
<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
Max-Forwards: 69 From:  
<sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0  
o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20



## 6. 100 Trying Proxy A -> Terminal A

SIP/2.0 100 Trying

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Content-Length: 0

## 7. 100 Trying Terminal B ->Proxy A

SIP/2.0 100 Trying

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Content-Length:0

## 8. 180 Ringing Terminal B ->Proxy A

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>



Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

#### 9. 180 Ringing Proxy A ->Terminal A

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

#### 10. 200 OK Terminal B ->Proxy A

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>

Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125



v=0  
o=- 0 0 IN IP6 3ffe:501:ffff: 5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff: 5:(InterfaceID)  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

#### 11. 200 OK Proxy A -> Terminal A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Record-Route:  
<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Contact: <sip:z3b6tm@[3ffe:501:ffff: 5:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0  
o=- 0 0 IN IP6 3ffe:501:ffff: 5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff: 5:(InterfaceID)  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20



## 1 2. ACK Terminal A -> Proxy A

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g2  
Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
Max-Forwards: 70  
Proxy-Authorization: Digest realm="aaa.example.com",nonce="ae9137be",  
username="00022223333",uri="sip:00022223333@bbb.example.com",  
response="6iib19cef56c9a0a3i5aieff23a234",  
algorithm=MD5,opaque=""  
  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 ACK  
Content-Length: 0

## 1 3. ACK Proxy A -> Terminal B

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK8374921  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g2  
Max-Forwards: 69  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 ACK  
Content-Length: 0

## 14. BYE Terminal B -> Proxy A

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77gg



Max-Forwards: 70  
Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff: 5:(InterfaceID)  
CSeq: 1 BYE  
Content-Length: 0

#### 15. BYE Proxy A -> Terminal A

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497b  
Via: SIP/2.0/UDP [3ffe:501:ffff: 5:(InterfaceID)]:5060;branch=z9hG4bK4na77gg  
Max-Forwards: 69  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 1 BYE  
Content-Length: 0

#### 16. 200 OK Terminal A -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497b  
Via: SIP/2.0/UDP [3ffe:501:ffff: 5:(InterfaceID)]:5060;branch=z9hG4bK4na77gg  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff: 5:(InterfaceID)  
CSeq: 1 BYE  
Content-Length: 0

#### 17. 200 OK Proxy A -> Terminal B



SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff: 5:(InterfaceID)]:5060;branch=z9hG4bK4na77gg

From: <sip:00022223333@bbb.example.com>;tag=314159

To: <sip:00022221111@aaa.example.com>;tag=a6c85cf

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 1 BYE

Content-Length: 0

### 3.6. U6-1-A-B-S02 - Cancellation of transmission

[1] Test number/ Title

U6-1-A-B-S02

Cancellation of transmission

[2] Purpose and outline

The sender sends INVITE to the receiver via a proxy followed by CANCEL.  
Confirm the session is discontinued.

[3] Resource requirement

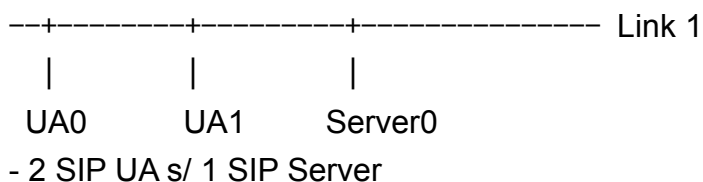
CANCEL function / RFC3261

IPv6 compliant / RFC4566

Authentication / RFC2617

[4] Test setup

[4.1] Topology







## [4.2] Address

### 4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, Server0

### 4.2.2 Example of node information

#### - IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

#### - SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
Server0	ss.example.com

#### - Digest authentication information

	username	password
UA0	00022221111	sipreadyph2
UA1	00022223333	sipreadyph2

## [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio(G.711 $\mu$ -law)
- Proxy A: Call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5



#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A and Terminal B send REGISTER to Proxy A for location registration.
- Set Proxy A as an outbound proxy of Terminal A.
- Confirm no call remains on Proxy A. (All transactions and dialogs are cleared.)
  - Set the digest authentication parameter.

#### [5] Test procedure

1. Call from Terminal A to Terminal B. Wait on Terminal B.
  - \* Confirm the ring on Terminal B.
  - \* Confirm the ring back tone on Terminal A.
  - \* Confirm the 180 response from Terminal B on Terminal A.
2. Hang up Terminal A.
  - \* Confirm the ring stops on Terminal B.
  - \* Confirm the receipt of CANCEL on Terminal B.
  - \* Confirm the receipt of the 200 response to CANCEL and the 487 response to INVITE on Terminal A.

#### [6] Judgment

Confirm the following:

##### [UA0]

Execute with UA0 (your UA) as Terminal A.

- Send INVITE

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR.  
From header : Must contain UA0 AoR.



To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Send CANCEL

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive 200 OK (to CANCEL)

- Receive 487 Request Terminated

- Send ACK

IP address : Must send to Proxy A IP address.  
From header : Must contain UA 0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

[UA0]

Execute with UA0 (your UA) as Terminal B.

- Receive INVITE

- Receive CANCEL

- Send 200 OK (to CANCEL)

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Send CANCEL

IP address : Must send to Proxy A IP address.  
From header : Must be the same From Header URI (Terminal B AoR) that  
received as CANCEL request.  
To header : Must be the same To Header URI (UA0) that received as



CANCEL request.

Via header : Must be the same value or Via Header URI that received as CANCEL request.

- Send 487 Request Terminated

IP address : Must send to Proxy A IP address.

From header : Must be the same From Header URI (Terminal B AoR) that received as INVITE request.

To header : Must be the same To Header URI (UA0) that received as INVITE request.

Via header : Must be the same value or Via Header URI that received as INVITE request.

- Receive ACK

[Server0]

Execute with Server0 (your Server) as Proxy A.

Must forward, send, or receive the following message to cancel the session.

- Receive INVITE

- Forward INVITE

- Receive CANCEL

- Send the 200 OK (to CANCEL)

IP address : Must send to Terminal A IP address.

From header : Must be the same From Header URI (Terminal A AoR) that received as CANCEL request.

To header : Must be the same To Header URI (UA0) that received as CANCEL request.

Via header : Must be the same value or Via Header URI that received as CANCEL request.

- Forward CANCEL

- Receive 200 OK (to CANCEL)

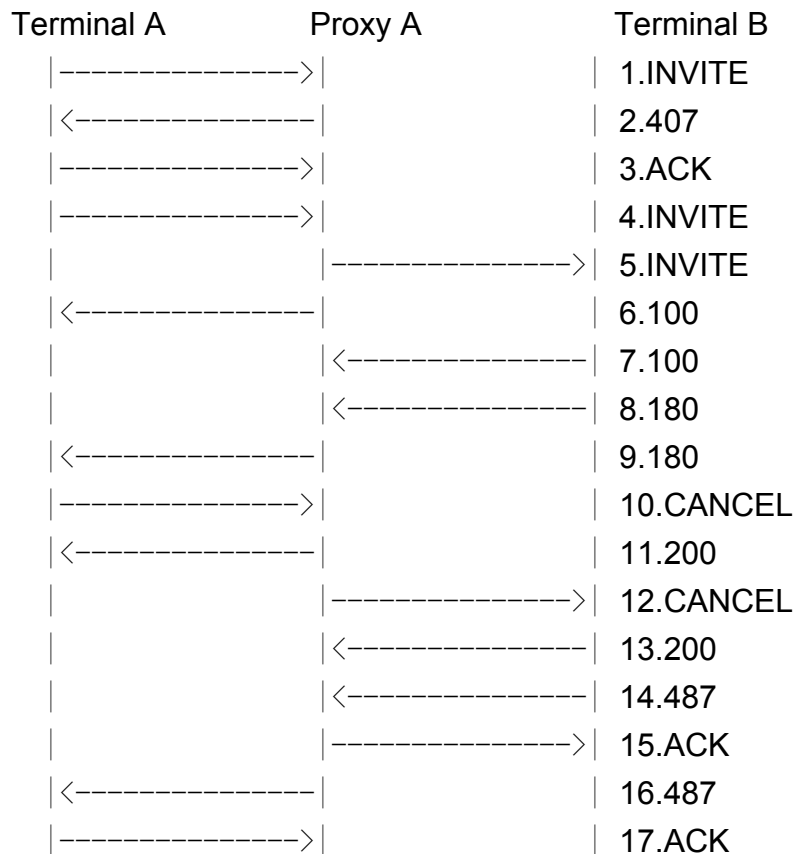
- Receive 487 Request Terminated



- Send ACK
- Forward 487
- Receive ACK

## [7] Reference

### [7.1] Message flow



### [7.2] Coding examples

\* See U6-1-A-B-S01 for coding examples of 1. -9.

10.CANCEL Terminal A -> Proxy A

CANCEL sip:00022223333@bbb.example.com SIP/2.0

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Max-Forwards: 70



From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 CANCEL  
Content-Length: 0

#### 11.200 OK Proxy A -> Terminal A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 CANCEL  
Content-Length: 0

#### 12.CANCEL Proxy A -> Terminal B

CANCEL sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 CANCEL  
Content-Length: 0

#### 13.200 OK Terminal B -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf



To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 CANCEL  
Content-Length: 0

#### 14.487 Request Terminated Terminal B -> Proxy A

SIP/2.0 487 Request Terminated  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

#### 15.ACK Proxy A -> Terminal B

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 ACK  
Content-Length: 0

#### 16.487 Request Terminated Proxy A -> Terminal A

SIP/2.0 487 Request Terminated  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf



To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

#### 17.ACK Terminal A -> Proxy A

ACK sip:00022223333@bbb.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 ACK  
Content-Length: 0

### 3.7. U6-1-A-B-S03 - Rejection of transmission

#### [1] Test number / Title

U6-1-A-B-S03

Rejection of transmission

#### [2] Purpose and outline

The sender sends INVITE to the receiver via a proxy and the receiver rejects the transmission. Confirm the session is not established.

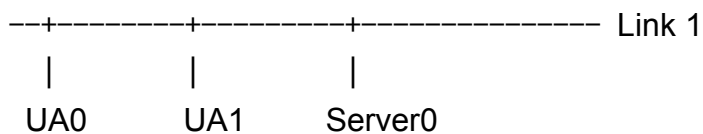
#### [3] Resource requirement

Session establishment function	/ RFC3261
Rejection of transmission	/ RFC3261
IPv6 compliant	/ RFC4566
Authentication	/ RFC2617



#### [4] Test setup

##### [4.1] Topology



- 2 SIP UA s/ 1 SIP Server

##### [4.2] Address

###### 4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, Server0

###### 4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
Server0	ss.example.com

- Digest authentication information

	username	password
UA0	00022221111	sipreadyph2
UA1	00022223333	sipreadyph2



#### [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio(G.711 $\mu$ -law)
- Proxy A: Call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5

#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A and Terminal B send REGISTER to Proxy A for location registration.
- Set Proxy A as an outbound proxy of Terminal A.
- Confirm no call remains on Proxy A. (All transactions and dialogs are cleared.)
  - Set the digest authentication parameter.

#### [5] Test procedure

1. Call from Terminal A to Terminal B.
2. Reject the call from Terminal A on Terminal B.
  - \* Confirm busy tone on Terminal A.
  - \* Confirm the receipt of the 480 or the 486 (or any 4xx) or the 603 response on Terminal A.

#### [6] Judgment

Confirm the following:

[UA0]



Execute with UA0 (your UA) as Terminal A.

- Send INVITE.

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive 4XX/6XX
- Send ACK

IP address : Must send to Proxy A IP address.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

[UA0]

Execute with UA0 (your UA) as Terminal B.

- Receive INVITE.
- Send 4XX or 6XX (to INVITE)

IP address : Must send to Proxy A IP address.  
From header : Must be the same From Header URI (Terminal A AoR) that received as INVITE request.  
To header : Must be the same To Header URI(UA0) of AoR that received as INVITE request.  
Via header : Must be the same value of Via header field that received as INVITE request.

- Receive ACK

[Server0]



Execute with Server0 (your Server) as Proxy A.

Must forward, send, or receive the following message to reject the session.

- Receive INVITE
- Forward INVITE
- Receive 4XX or 6XX
- Send ACK

IP address : Must send to Terminal B IP address.

From header : Must contain Terminal A AoR

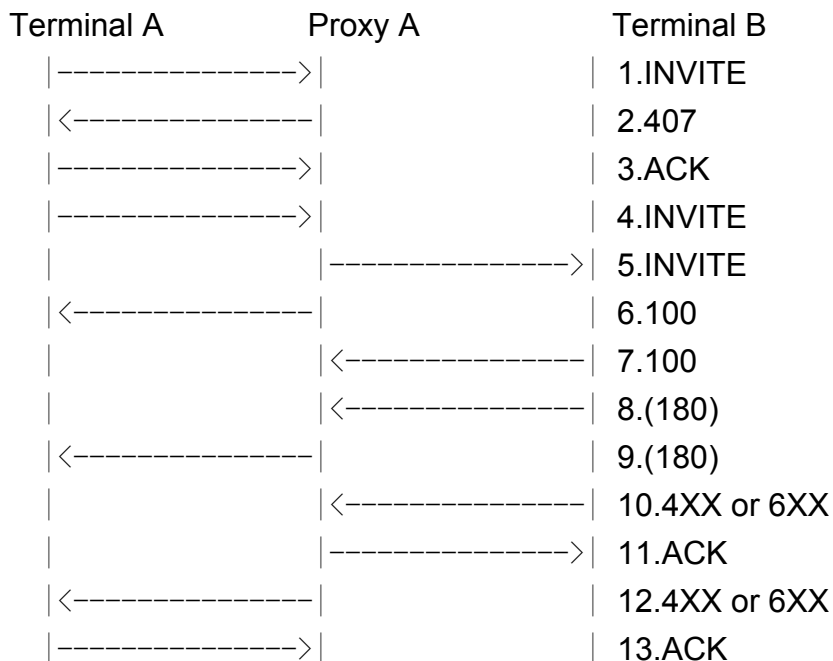
To header : Must contain Terminal B AoR.

Via header : Must be the same value of Via header field that received as 4XX or 6XX request.

- Forward 4XX or 6XX
- Receive ACK

## [7] Reference

### [7.1] Message flow





## [7.2] Coding examples

\* See U6-1-A-B-S01 for coding examples of 1. -9.

### 10. 480 Temporarily Unavailable Terminal B -> Proxy A

SIP/2.0 480 Temporarily Unavailable

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Content-Length: 0

### 11. ACK Proxy A -> Terminal B

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Max-Forwards: 70

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 ACK

Content-Length: 0

### 12. 480 Temporarily Unavailable Proxy A -> Terminal A

SIP/2.0 480 Temporarily Unavailable

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf



To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

### 13.ACK Terminal A -> Proxy A

ACK sip:00022223333@bbb.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 ACK  
Content-Length: 0

## 3.8. U6-1-A-A-S01 - Session hold and hold release

### [1] Test number / Title

U6-1-A-A-S01

Session hold and hold release

### [2] Purpose and outline

After establishing the connection from the sender to the receiver via a proxy, confirm that hold and hold release are done from one side of the Terminal

\* 2 tests are performed to confirm hold and hold release from both the sender and the receiver.

### [3] Resource requirement

Session establishment, disconnection and re-INVITE function / RFC3261

Media exchange (SDP), hold and hold release

/ RFC3264, RFC4566

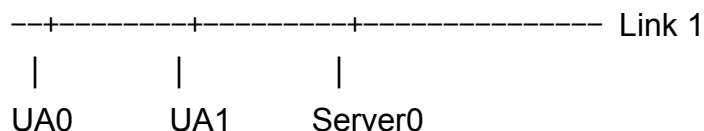


IPv6 compliant  
Authentication

/ RFC4566  
/ RFC2617

#### [4] Test setup

##### [4.1] Topology



- 2 SIP UA s/ 1 SIP Server

##### [4.2] Address

###### 4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, Server0

###### 4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
Server0	ss.example.com

- Digest authentication information



	username	password
UA0	00022221111	sipreadyph2
UA1	00022223333	sipreadyph2

#### [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio(G.711μ-law)
- Proxy A: Call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5

#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A and Terminal B send REGISTER to Proxy A for location registration.
- Set Proxy A as an outbound proxy of Terminal A.
- Confirm no call remains on Proxy A. (All transactions and dialogs are cleared.)
  - Set the digest authentication parameter.

#### [5] Test procedure

1. Call from Terminal A to Terminal B.
  - \* Confirm the ring on Terminal B.
  - \* Confirm the ring back tone on Terminal A.
2. Answer Terminal B.
  - \* Confirm the voice transmission on both Terminal A and Terminal B.
3. Suspend the line on Terminal B.
  - \* Confirm that neither Terminal A or Terminal B hears the voice from the other. (Consequently, on-hold tone or no sound is heard.)
4. Release hold on Terminal B.
  - \* Confirm that both Terminal A and Terminal B hear the voice from the





other.

5. Hang up Terminal B.

\* Confirm the line is disconnected on Terminal A.

6. Hang up Terminal A.

[6] Judgment

Confirm the following:

[UA0]

Execute with UA0 (your UA) as Terminal A.

- Send INVITE.

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive the final response (200 OK)

- Send ACK

IP address : Must send to Proxy A IP address.  
Request-Line : Must be Contact URI. The URI must be the same value 200 OK response to INVITE request.

From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive re-INVITE(Hold on)

- Send the final response 200 OK to re-INVITE(Hold on) request.



IP address : Must send to Proxy A IP address.  
From header : Must be the same From header URI(Terminal B AoR) that is received as INVITE request.  
To header : Must be the same To header URI(UA0) of AoR that is received as INVITE request.  
Via header : Must be the same value of Via header that is received as INVITE request.

- Recieve ACK
- Receive Re- INVITE (Hold release)
- Send the final response 200 OK (to re-INVITE(Hold release))

IP address : Must send to Proxy A IP address.  
From header : Must be the same From Header URI (Terminal B AoR) that received as INVITE request.  
To header : Must be the same To Header URI(UA0) of AoR that received as INVITE request.  
Via header : Must be the same value of Via header that received as INVITE request.

- Receive ACK
- Receive BYE
- Send the final response 200 OK to the BYE request.

IP address : Must send to Proxy A IP address.  
From header : Must be the same From Header URI (Terminal B AoR) that received as BYE request.  
To header : Must contain Terminal A AoR.  
Via header : Must contain Terminal B domain name or IP address.

[UA0]

Execute with UA0 (your UA) as Terminal B.

- Recieve INVITE.
- Send the final response 200 OK.



IP address : Must send to Proxy A IP address.  
From header : Must be the same From header URI(Terminal B AoR) that is received as INVITE request.  
To header : Must be the same To header URI(UA0) of AoR that is received as INVITE request.  
Via header : Must be the same value of Via header that is received as INVITE request.

- Receive ACK
- Send re-INVITE(Hold on)

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal A AoR.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal A AoR.  
Via header : Must contain UA0 domain name or IP address.

- Recieve the final response 200 to re-INVITE(Hold on) request.
- Send ACK

IP address : Must send to Proxy A IP address.  
Request-Line : Must be Terminal A Contact URI. The URI must is the same value 200 OK response to INVITE request.

From header : Must contain UA0 AoR.  
To header : Must contain Terminal A AoR.  
Via header : Must contain UA0 domain name or IP address.

- Send Re-INVITE (Hold release)

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal A AoR.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal A AoR.  
Via header : Must contain UA0 domain name or IP address.



- Receive the final response 200 OK to re-INVITE(Hold release) request.
- Send ACK
  - IP address : Must send to Proxy A IP address.
  - Request-Line : Must be Terminal A Contact URI. The URI must be the same value 200 OK to INVITE request.
  - From header : Must contain UA0 AoR.
  - To header : Must contain Terminal A AoR.
  - Via header : Must contain UA0 domain name or IP address.
- Send BYE
  - IP address : Must send to Proxy A IP address.
  - Request-Line : Must be Terminal A Contact URI. The URI must be the same value 200 OK to INVITE request.
  - From header : Must contain UA0 AoR.
  - To header : Must contain Terminal A AoR.
  - Via header : Must contain UA0 domain name or IP address.
- Receive the final response 200 OK to BYE response

[Server0]

Execute with Server0 (your Server) as Proxy A.

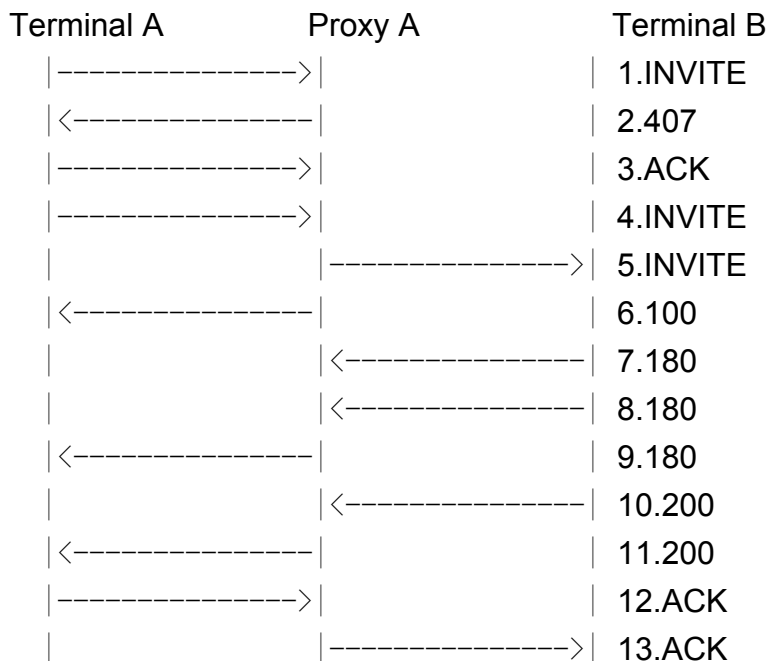
- Must forward the following message for session registration and forwarding.
- Receive INVITE
- Forward INVITE
- Receive 200 (to INVITE)
- Forward 200 (to INVITE)
- Receive ACK
- Forward ACK
- Receive re-INVITE (Hold on)
- Forward re-INVITE (Hold on)
- Receive ACK
- Forward ACK

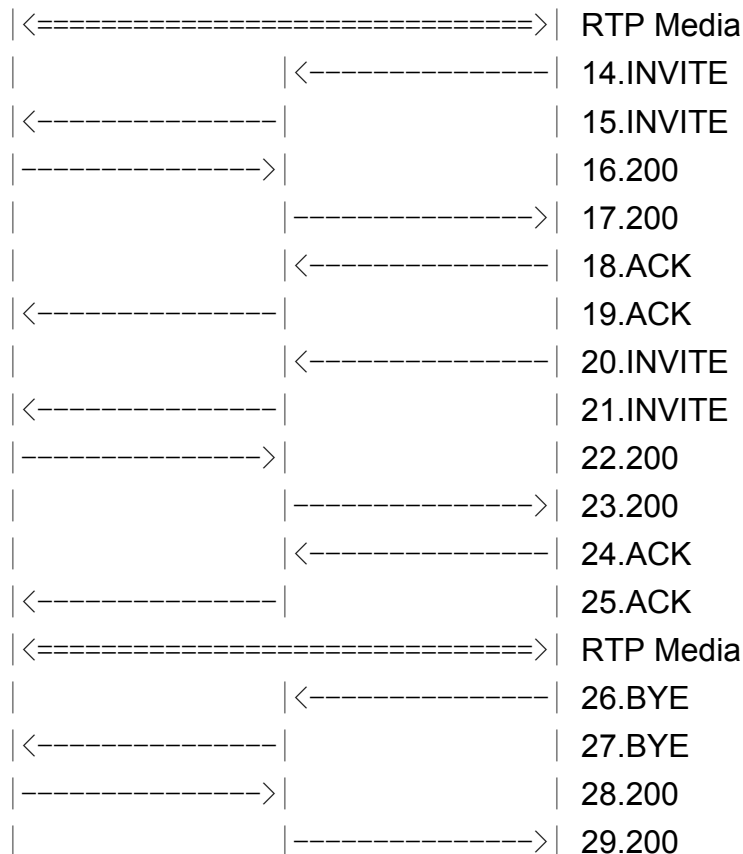


- Receive re-INVITE (Hold on)
- Forward re-INVITE (Hold on)
- Receive re-200 OK (to re-INVITE)
- Forward re-200 OK (to re-INVITE)
- Receive ACK
- Forward ACK
- Receive re-INVITE (Hold release)
- Forward re-INVITE (Hold release)
- Receive re-200 OK (to re-INVITE)
- Forward re-200 OK (to re-INVITE)
- Receive ACK
- Forward ACK
- Receive BYE
- Forward BYE
- Receive re-200 OK (to BYE)
- Forward re-200 OK (to BYE)

## [7] Reference

### [7.1] Message flow





## [7.2] Coding examples

\* See U6-1-A-B-S01 for coding examples of 1. -13. and 26. -29.

### 14.INVITE Terminal B -> Proxy A

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
 Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggu  
 Max-Forwards: 70  
 Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
 From: <sip:00022223333@bbb.example.com>;tag=314159  
 To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
 Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
 CSeq: 1 INVITE  
 Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>



Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 137

v=0

o=- 0 1 IN IP6 3ffe:501:ffff:5:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:5:(InterfaceID)

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=sendonly

a=ptime:20

#### 15. INVITE Proxy A -> Terminal A

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]:5060SIP/2.0

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497bs

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggu

Max-Forwards: 69

From: <sip:00022223333@bbb.example.com>;tag=314159

To: <sip:00022221111@aaa.example.com>;tag=a6c85cf

Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]

CSeq: 1 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>

Allow:ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 137

v=0

o=- 0 1 IN IP6 3ffe:501:ffff:5:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:5:(InterfaceID)

t=0 0



m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendonly  
a=ptime:20

#### 16.200 OK Terminal A -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497bs  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggu  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 1 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 137

v=0  
o=- 0 1 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=recvonly  
a=ptime:20

#### 17.200 OK Proxy A -> Terminal B

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggu





From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 1 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 137

v=0  
o=- 0 1 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=recvonly  
a=ptime:20

#### 18.ACK Terminal B -> Proxy A

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggw  
Max-Forwards: 70  
Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 1 ACK  
Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Content-Type: application/sdp  
Content-Length: 0



## 19.ACK Proxy A ->Terminal A

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497bt  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggw  
Max-Forwards: 69  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 1 ACK  
Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Content-Type: application/sdp  
Content-Length: 0

## 20.INVITE Terminal B -> Proxy A

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggx  
Max-Forwards: 70  
Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 INVITE  
Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 137

v=0  
o=- 0 2 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0



m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendrecv  
a=ptime:20

## 21. INVITE Proxy A -> Terminal A

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837499bu  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggx  
Max-Forwards: 69  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 INVITE  
Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 137

v=0  
o=- 0 2 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendrecv  
a=ptime:20

## 22.200 OK Terminal A -> Proxy A

SIP/2.0 200 OK

-----



Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837499bu  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggx  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 137

v=0  
o=- 0 2 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendrecv  
a=ptime:20

23.200 OK Proxy A -> Terminal B

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggx  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 137

-----



v=0  
o=- 0 2 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=sendrecv  
a=ptime:20

#### 24.ACK Terminal A -> Proxy A

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via:SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggy  
Max-Forwards: 70  
Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 ACK  
Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Content-Type: application/sdp  
Content-Length: 0

#### 25.ACK Proxy A -> Terminal A

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837499bv  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77ggy  
Max-Forwards: 69  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]



CSeq: 2 ACK

Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>

Content-Type: application/sdp

Content-Length: 0

### 3.9. U6-1-A-A-S02 – Forking / Multiple responses

[1] Test number/Title

U6-1-A-A-S01

Forking / Multiple responses

[2] Purpose and outline

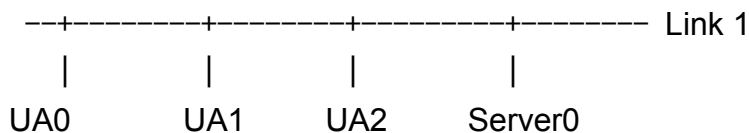
Establish the connection from the sender to the multiple receivers via a proxy.  
Confirm proper session establishment, voice transmission and disconnection.

[3] Resource requirement

Session establishment and disconnection function	/ RFC3261
Forking function	/ RFC3261
Media exchange (SDP)	/ RFC3264, RFC4566
IPv6 compliant	/ RFC4566
Authentication	/ RFC2617

[4] Test setup

[4.1] Topology



- 2 SIP UA s/ 1 SIP Server

[4.2] Address

#### 4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, UA2, Server0

#### 4.2.2 Example of node information

##### - IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
UA2	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

##### - SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
UA2	00022225555@bbb.example.com
Server0	ss.example.com

#### [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio (G.711μ-law)
- Proxy A: call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5

#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A, B and Terminal C send REGISTER to Proxy A for location



registration.

- Set the same telephone number (AoR) the Terminal B and Terminal C.
- Set the different Contact URI the Terminal B and Terminal C.
- Set Proxy A as an outbound proxy of Terminal A.
- Confirm no call remains on Proxy A. (All transactions and dialogs are cleared.)
  - Set the digest authentication parameter.

#### [5] Test procedure

1. Call from Terminal A to Terminal B, C (same telephone number (AoR)).
  - \* Confirm the ring on Terminal B and Terminal C.
  - \* Confirm the ring back tone on Terminal A.
2. Answer Terminal B.
  - \* Confirm the voice transmission on both Terminal A and Terminal B.
  - \* Confirm the ringing stopped on Terminal C.
3. Hang up Terminal B.
  - \* Confirm the line is disconnected on Terminal A.
4. Hang up Terminal A.

\* Execute the above the Test procedure for answering terminal C.

#### [6] Judgment

#### [6] Judgment

Confirm the following:

#### [UA0]

Establish the session Terminal A as UA0 with terminal B

- Send INVITE.

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR  
From header : Must contain UA0 AoR.





To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive the final response (200 OK)
- Send ACK

IP address : Must send to Proxy A IP address.  
Request-Line : Must be Terminal B Contact URI. The URI must be the same value 200 OK response to INVITE request.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive BYE
- Send the final response 200 OK to BYE request.

IP address : Must send to Proxy A IP address.  
From header : Must be the same From header URI(Terminal B AoR) that is received as BYE request.  
To header : Must contain Terminal A AoR.  
Via header : Must contain Terminal B domain name or IP address.

Establish the session Terminal A as UA0 with terminal C

- Send INVITE

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Send the final response 200 OK.
- Send ACK

IP address : Must send to Proxy A IP address.



Request-Line : Must be Terminal C Contact URI. The URI must be the same value 200 OK response to INVITE request.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive BYE
- Send the final response 200 OK to BYE request.
  - IP address : Must send to Proxy A IP address.
  - From header : Must be the same From header URI(Terminal B AoR) that is received as BYE request.
  - To header : Must contain Terminal A AoR.
  - Via header : Must contain Terminal C domain name or IP address.

[Server0]

Execute with Server0 (your Server) as Proxy A. And Terminal A establish the session with and Terminal B

- Must forward the following message for receiving, forwarding, and sending.

- Receive INVITE
- Forward INVITE (to Terminal B)
- Forward INVITE (to Terminal C)
- Receive 200 (to INVITE) from Terminal B
- Forward 200 (to INVITE) to Terminal A
- Send CANCEL to Terminal C
  - IP address : Must send to Terminal C IP address.
  - Request-Line : Must contain Terminal C Contact Address.
  - From header : Must contain UA0 AoR.
  - To header : Must contain Terminal B AoR.
  - Via header : Must contain Terminal A domain name or IP address.

- Receive 200 OK(to CANCEL)
- Receive 487
- Send ACK (to Terminal C)



IP address : Must send to Terminal C IP address.  
From header : Must contain Terminal A AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain Terminal A domain name or IP address.

- Receive ACK
- Forward ACK
- Receive BYE
- Forward BYE
- Receive 200 OK (to BYE)
- Forward 200 OK (to BYE)

#### [Server0]

Execute with Server0 (your Server) as Proxy A. And Terminal A establish the session with and Terminal C

- Must forward the following message for receiving, forwarding, and sending.

- Receive INVITE
- Forward INVITE (to Terminal B)
- Forward INVITE (to Terminal C)
- Receive 200 (to INVITE) from Terminal C
- Forward 200 (to INVITE) to Terminal A
- Send CANCEL to Terminal B

IP address : Must send to Terminal B IP address.  
Request-Line : Must contain Terminal B Contact Address.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain Terminal A domain name or IP address.

- Receive 200 OK(to CANCEL)
- Receive 487
- Send ACK (to Terminal B)

IP address : Must send to Terminal B IP address.  
From header : Must contain Terminal A AoR.

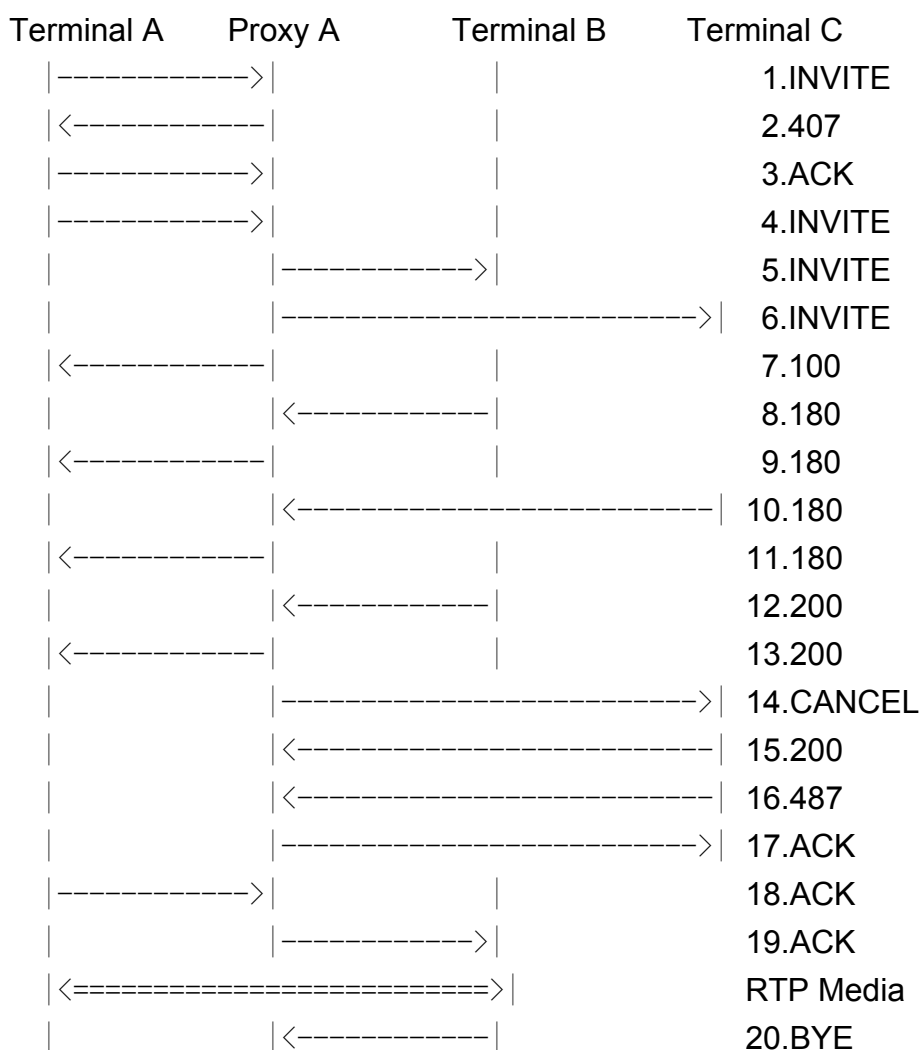


To header : Must contain Terminal B AoR.  
Via header : Must contain Terminal A domain name or IP address.

- Receive ACK
- Forward ACK
- Receive BYE
- Forward BYE
- Receive 200 OK (to BYE)
- Forward 200 OK (to BYE)

## [7] Reference

### [7.1] Message flow





## [7.2] Coding examples

### 1. INVITE Terminal A -> Proxy A

INVITE sip:00022223333@bbb.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 1 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0  
o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

### 2.407 Proxy Authorization Required Proxy A -> Terminal A

SIP/2.0 407 Proxy Authorization Required  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a



From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=3flal12sf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 1 INVITE  
Proxy-Authenticate: Digest realm="aaa.example.com",nonce="ae9137be",  
domain="sip:aaa.example.com",algorithm=MD5,opaque="", stale=FALSE  
Content-Length: 0

### 3. ACK Terminal A -> Proxy A

ACK sip:00022223333@bbb.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=3flal12sf  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 1 ACK  
Content-Length: 0

### 4. INVITE Terminal A -> Proxy A

INVITE sip:00022223333@bbb.example.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
Proxy-Authorization: Digest realm="aaa.example.com",nonce="ae9137be",  
username="00022221111",uri="sip:00022223333@bbb.example.com",  
response="6iib19cef56c9a0a3i5aieff23a234",  
algorithm=MD5,opaque=""  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>



Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:5:(InterfaceID)

t=0 0

m=audio 5004 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

## 5. INVITE Proxy A-> Terminal B

INVITE sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77f

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

Max-Forwards: 69

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>

Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]

CSeq: 2 INVITE

Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:5:(InterfaceID)



t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

## 6. INVITE Proxy A-> Terminal C

INVITE sip:z3b7am@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77i  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Record-Route:  
    <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
Max-Forwards: 69  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0  
o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

## 7. 100 Trying Proxy A -> Terminal A





SIP/2.0 100 Trying

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Content-Length: 0

## 8. 180 Ringing Terminal B ->Proxy A

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77f

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

## 9. 180 Ringing Proxy A ->Terminal A

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE



Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Length:0

#### 10. 180 Ringing Terminal C ->Proxy A

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77i  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Record-Route:  
<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 INVITE  
Contact: <sip:z3b7am@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Length:0

#### 11. 180 Ringing Proxy A ->Terminal A

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Record-Route:  
<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 INVITE  
Contact: <sip:z3b7am@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Length:0



## 12. 200 OK Terminal B ->Proxy A

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77f

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>

Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:5:(InterfaceID)

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

## 13. 200 OK Proxy A -> Terminal A

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159



Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 INVITE  
Contact: <sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0  
o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

#### 14.CANCEL Proxy A -> Terminal C

CANCEL sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77i  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 CANCEL  
Content-Length: 0

#### 15.200 OK Terminal C -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77i  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g



From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 CANCEL  
Content-Length: 0

#### 16. 487 Request Terminated Terminal C -> Proxy A

SIP/2.0 487 Request Terminated  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77i  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314177  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

#### 17.ACK Proxy A -> Terminal C

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77i  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314177  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 ACK  
Content-Length: 0

#### 18. ACK Terminal A -> Proxy A

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0



Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK6na77v  
Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 ACK  
Content-Length: 0

#### 19. ACK Proxy A -> Terminal B

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK8374921  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77v  
Max-Forwards: 69  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 ACK  
Content-Length: 0

#### 20. BYE Terminal B -> Proxy A

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK7na77q  
Max-Forwards: 70  
Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 1 BYE  
Content-Length: 0



## 21. BYE Proxy A -> Terminal A

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497b  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK7na77q  
Max-Forwards: 69  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 1 BYE  
Content-Length: 0

## 22. 200 OK Terminal A -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497b  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK7na77q  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 1 BYE  
Content-Length: 0

## 23. 200 OK Proxy A -> Terminal B

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK7na77q  
From: <sip:00022223333@bbb.example.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@[3ffe:501:ffff:1:(InterfaceID)]  
CSeq: 1 BYE  
Content-Length: 0



### 3.10. U6-1-A-A-S03 - OPTIONS proceeding

[1] Test number/Title

U6-1-A-A-S05

OPTIONS proceeding

[2] Purpose and outline

Confirm the UAC check over the ability of the target UAS using OPTIONS proceeding.

[3] Resource requirement

OPTIONS function

/ RFC3261

IPv6 compliant

/ RFC4566

[4] Test setup

[4.1] Topology



- 2 SIP UA s/ 1 SIP Server

[4.2] Address

4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, Server0

4.2.2 Example of node information





- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
Server0	ss.example.com

[4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio (G.711 $\mu$ -law)
- Proxy A: call stateful proxy

[4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A and Terminal B send REGISTER to Proxy A for location registration.
- Set Proxy A as an outbound proxy of Terminal A.
  - Confirm no call remains on Proxy A. (All transactions and dialogs are cleared.)
  - Set the digest authentication parameter.

[5] Test procedure

1. Send OPTIONS request from Terminal A to Terminal B.
  - \* Confirm the packet Packet Capture File (e.g. tcpdump (pcap)).
2. Answer Terminal B (send 200OK response from Terminal B to Terminal A).



\* Confirm the packet Packet Capture File (e.g. tcpdump (pcap)).

## [6] Judgment

Confirm the following:

### [UA0]

Execute with UA0 (your UA) as Terminal A.

- Send OPTIONS.

IP address : Must send to Proxy A IP address.  
Request-Line : Must contain Terminal B AoR.  
From header : Must contain UA0 AoR.  
To header : Must contain Terminal B AoR.  
Via header : Must contain UA0 domain name or IP address.

- Receive 200 OK (to OPTIONS)  
- Send the final response 200 OK to BYE request.

### [UA0]

Execute with UA0 (your UA) as Terminal B.

- Receive OPTIONS.  
- Send 200 OK to OPTIONS request.

IP address : Must send to Proxy A IP address.  
From header : Must be the same From header URI(Terminal A AoR) that is received as OPTIONS request.  
To header : Must be the same To header URI(UA0) of AoR that is received as OPTIONS request.  
Via header : Must be the same value of Via header that is received as OPTIONS request.



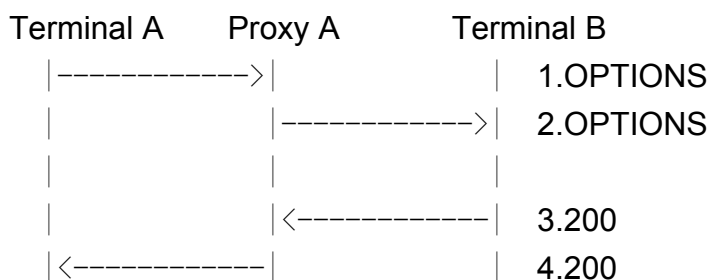
[Server0]

Execute with Server0 (your Server) as Proxy A.

- Must forward the following message for OPTIONS.
- Receive OPTIONS
- Forward OPTIONS (Terminal A to Terminal B)
- Receive 200 OK (to OPTIONS)
- Forward 200 OK (to OPTIONS) from Terminal A to Terminal B.

## [7] Reference

### [7.1] Message flow



### [7.2] Coding examples

#### 1.OPTIONS Terminal A -> Proxy A

```
OPTIONS sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf
To: <sip:00022223333@bbb.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 OPTIONS
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE,OPTIONS
Content-Length: 0
```



## 2. OPTIONS Proxy A-> Terminal B

OPTIONS sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77f  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a  
Record-Route:  
    <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
Max-Forwards: 69  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 OPTIONS  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE,OPTIONS  
Content-Length: 0

## 3. 200 OK Terminal B ->Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77f  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a  
Record-Route:  
    <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.example.com>;tag=314159  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 OPTIONS  
Contact: <sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE,OPTIONS  
Accept: application/sdp  
Content-Length: 0



#### 4. 200 OK Proxy A -> Terminal A

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 OPTIONS

Contact: <sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)]:5060>

Allow: ACK,BYE,CANCEL,INVITE,OPTIONS

Accept: application/sdp

Accept-Language: en

Content-Length: 0

### 3.11. U6-2-A-A-S01 - Session establishment and disconnection (2 proxies)

[1] Test number/Title

U6-2-A-A-S01

Session establishment and disconnection

[2] Purpose and outline

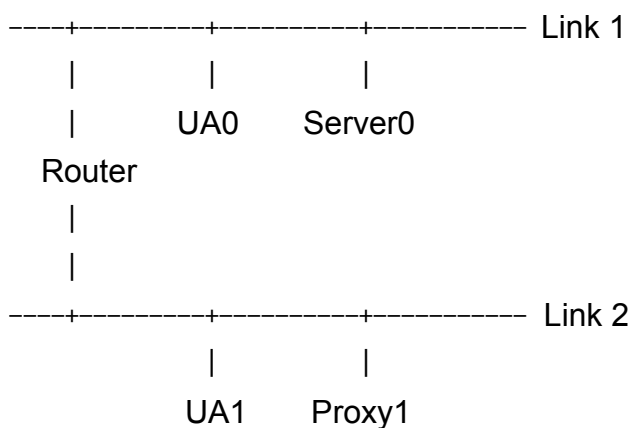
Establish the connection from the sender to the receiver via 2 proxies. Confirm proper session establishment, voice transmission and disconnection.

[3] Resource requirement

Session establishment and disconnection function	/ RFC3261
Media exchange (SDP)	/ RFC3264, RFC4566
IPv6 compliant	/ RFC4566
Authentication	/ RFC2617

#### [4] Test setup

##### [4.1] Topology



- 2 SIP UA s/ 2 SIP Servers

##### [4.2] Address

###### 4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, Server0
Link 2	3ffe:501:ffff:50::/64	UA1, proxy1

###### 4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:50:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)
Proxy1	3ffe:501:ffff:50:(InterfaceID)



- SIP URI information

	AoR(SIP URI)
UA0	<a href="mailto:00022221111@aaa.example.com">00022221111@aaa.example.com</a>
UA1	<a href="mailto:00022223333@bbb.instance.com">00022223333@bbb.instance.com</a>
Server0	ss.example.com
Proxy1	ss.instance.com

- Digest authentication information

	username	Password
UA0	00022221111	sipreadyph2
UA1	00022223333	sipreadyph2

[4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio(G.711 $\mu$ -law)
- Proxy A: call stateful proxy
- Proxy B: call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A sends REGISTER to Proxy A and Terminal B sends REGISTER to Proxy B for location registration.
- Set Proxy A as an outbound proxy of Terminal A.
- Set the proxies so that when a proxy receives a message containing SIP-URI, which is not under control of the proxy, the message is forwarded to another proxy.
- Confirm no call remains on neither Proxy A nor Proxy B. (All transactions and dialogs are cleared.)
  - Set the digest authentication parameter.



#### [5] Test procedure

1. Call from Terminal A to Terminal B.
  - \* Confirm the ring on Terminal B.
  - \* Confirm the ring back tone on Terminal A.
2. Answer Terminal B.
  - \* Confirm the voice transmission on both Terminal A and Terminal B.
3. Hang up Terminal B.
  - \* Confirm the line is disconnected on Terminal A.
4. Hang up Terminal A.

#### [6] Judgment

##### [Server0]

Execute with Server0 (your Server) as Proxy A.

- Must forward or receive the following message for establishment and disconnection.
- Receive INVITE
- Forward INVITE (Terminal A to Proxy B)
- Receive 200 OK (to INVITE)
- Forward 200 OK (Proxy B to Terminal A)
- Receive ACK
- Forward ACK
- Receive BYE
- Forward BYE
- Receive 200 OK (to BYE)
- Forward 200 OK (Terminal A to Proxy B)

##### [Server0]

Execute with Server0 (your Server) as Proxy B.



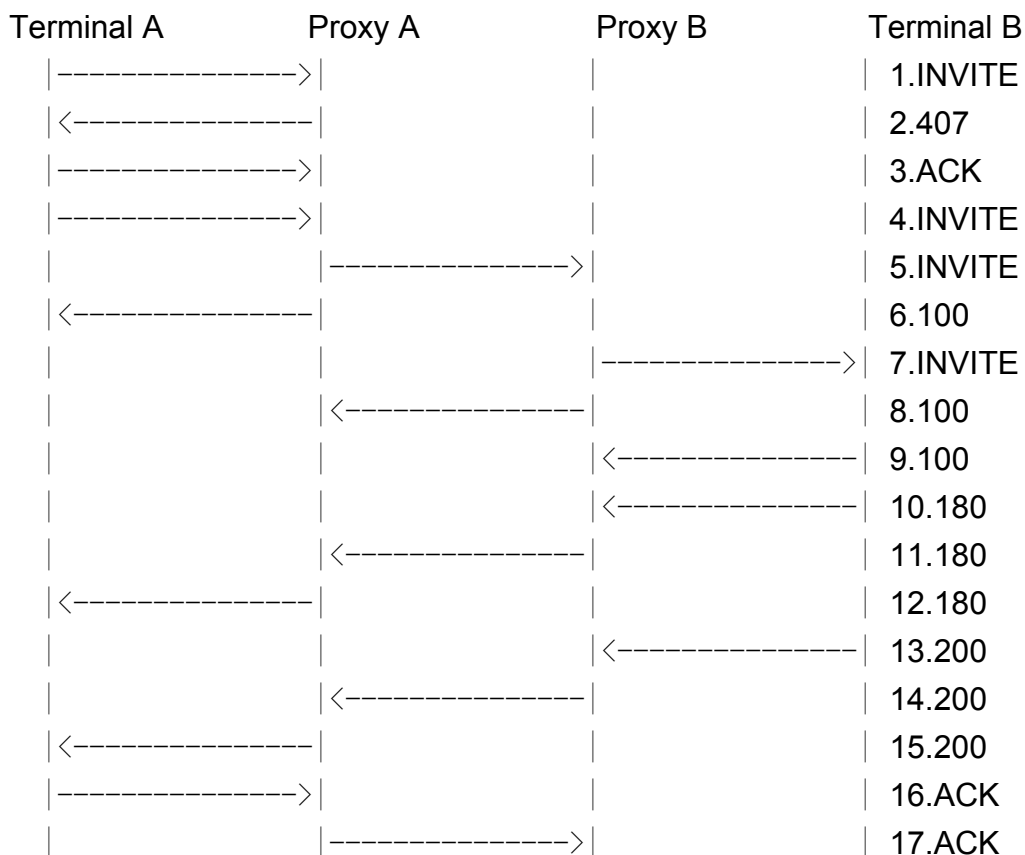


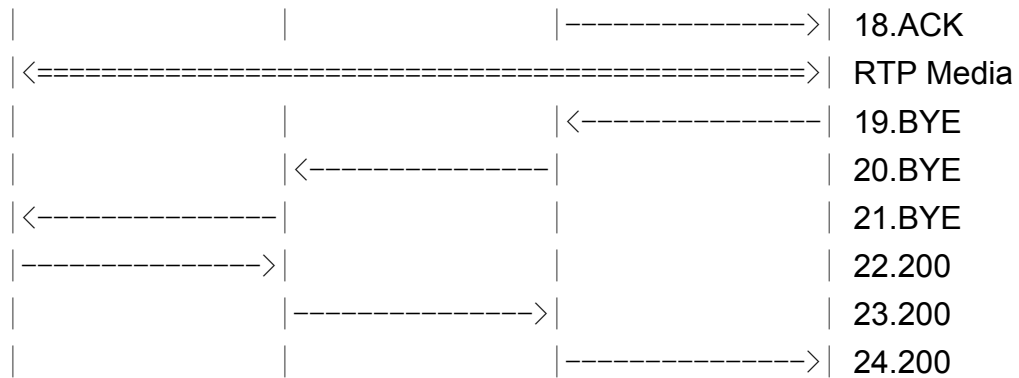
Must forward or receive the following message for establishment and disconnection.

- Receive INVITE
- Forward INVITE (Proxy A to Terminal B )
- Receive 200 OK (to INVITE)
- Forward 200 OK (Terminal B to Proxy A)
- Receive ACK
- Forward ACK
- Receive BYE
- Forward BYE
- Receive 200 OK (to BYE)
- Forward 200 OK (Proxy A to TerminalB)

## [7] Reference

### [7.1] Message flow





## [7.2] Coding examples

\* Coding examples between Proxy A and Proxy B are omitted.

### 1. INVITE Terminal A -> Proxy A

```

INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf
To: <sip:00022223333@bbb.instance.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 1 INVITE
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125
  
```

```

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
  
```



a=ptime:20

## 2.407 Proxy Authorization Required Proxy A -> Terminal A

SIP/2.0 407 Proxy Authorization Required

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.instance.com>;tag=3flal12sf

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 1 INVITE

Proxy-Authenticate: Digest realm="bbb.example.com",nonce="ae9137be",  
domain="sip:bbb.example.com",algorithm=MD5,opaque="", stale=FALSE

Content-Length: 0

## 3. ACK Terminal A -> Proxy A

ACK sip:00022223333@bbb.instance.com SIP/2.0

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77a

Max-Forwards: 70

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.instance.com>;tag=3flal12sf

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 1 ACK

Content-Length: 0

## 4. INVITE Terminal A -> Proxy A

INVITE sip:00022223333@bbb.instance.com SIP/2.0

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Max-Forwards: 70

Proxy-Authorization: Digest realm="bbb.instance.com",nonce="ae9137be",  
username="00022221111",uri="sip:00022223333@bbb.instance.com",



response="6iib19cef56c9a0a3i5aieff23a234",  
algorithm=MD5,opaque=""  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0  
o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:5:(InterfaceID)  
t=0 0  
m=audio 5004 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

## 6. 100 Trying Proxy A -> Terminal A

SIP/2.0 100 Trying  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

## 7. INVITE Proxy B-> Terminal B

INVITE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]:5060 SIP/2.0



Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.instance.com:5060;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

Max-Forwards: 68

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.instance.com>

Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]

CSeq: 2 INVITE

Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:5:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:5:(InterfaceID)

t=0 0

m=audio 5004 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

## 9. 100 Trying Terminal B -> Proxy B

SIP/2.0 100 Trying

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf



To: <sip:00022223333@bbb.instance.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length:0

#### 10. 180 Ringing Terminal B -> Proxy B

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

Record-Route:

<sip:ss.instance.com:5060;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.instance.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)]:5060>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

#### 11. 180 Ringing Proxy B -> Proxy A

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.instance.com:5060;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>



From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Contact: <sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Length:0

## 12. 180 Ringing Proxy A -> Terminal A

SIP/2.0 180 Ringing  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Record-Route:  
<sip:ss.instance.com:5060;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>  
Record-Route:  
<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Contact: <sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Length:0

## 13. 200 OK Terminal B ->Proxy B

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Record-Route:  
<sip:ss.instance.com:5060;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>



Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.instance.com>;tag=314159

Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]

CSeq: 2 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)]:5060>

Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:1:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:1:(InterfaceID)

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

## 15. 200 OK Proxy A -> Terminal A

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

Record-Route:

<sip:ss.instance.com:5060;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>

Record-Route:

<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.instance.com>;tag=314159

Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]

CSeq: 2 INVITE





Contact: <sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)]:5060>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Type: application/sdp  
Content-Length: 125

v=0  
o=- 0 0 IN IP6 3ffe:501:ffff:1:(InterfaceID)  
s=-  
c=IN IP6 3ffe:501:ffff:1:(InterfaceID)  
t=0 0  
m=audio 3456 RTP/AVP 0  
a=rtpmap:0 PCMU/8000  
a=ptime:20

#### 16. ACK Terminal A -> Proxy A

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g2  
Max-Forwards: 70  
Route: <sip:ss.instance.com:5060;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>  
Route: <sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]  
CSeq: 2 ACK  
Content-Length: 0

#### 18. ACK Proxy B -> Terminal B

ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77x  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK8374921  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g2



Max-Forwards: 68  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 ACK  
Content-Length: 0

#### 19. BYE Terminal B -> Proxy B

BYE sip:y3a6sn@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0  
Via: SIP/2.0/UDP  
[3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK4na77gg  
Max-Forwards: 70  
Route:  
<sip:ss.instance.com:5060;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>  
Route:  
<sip:ss.example.com:5060;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>  
From: <sip:00022223333@bbb.instance.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:1:(InterfaceID)  
CSeq: 1 BYE  
Content-Length: 0

#### 21. BYE Proxy A -> Terminal A

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497b  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77h  
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK4na77gg  
Max-Forwards: 68  
From: <sip:00022223333@bbb.instance.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:1:(InterfaceID)



CSeq: 1 BYE  
Content-Length: 0

22.200 OK Terminal A -> Proxy A

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK837497b  
Via: SIP/2.0/UDP [3ffe:501:ffff:520:(InterfaceID)]:5060;branch=z9hG4bK5na77h  
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK4na77gg  
From: <sip:00022223333@bbb.instance.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:1:(InterfaceID)  
CSeq: 1 BYE  
Content-Length: 0

24.200 OK Proxy B -> Terminal B

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:1:(InterfaceID)]:5060;branch=z9hG4bK4na77gg  
From: <sip:00022223333@bbb.instance.com>;tag=314159  
To: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
Call-ID: a84b4c76e6@3ffe:501:ffff:1:(InterfaceID)  
CSeq: 1 BYE  
Content-Length: 0

### 3.12. U6-2-A-A-S02 - Cancellation of transmission (2 proxies)

[1] Test number/ Title

U6-2-A-A-S02

Cancellation of transmission

[2] Purpose and outline



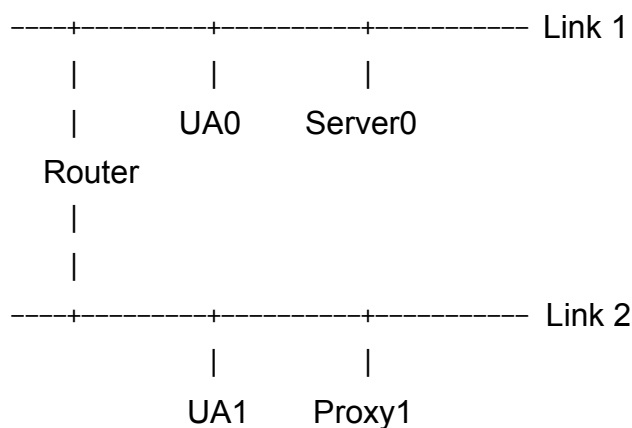
The sender sends INVITE to the receiver via 2 proxies followed by CANCEL.  
Confirm the session is discontinued.

### [3] Resource requirement

CANCEL function / RFC3261  
IPv6 compliant / RFC4566  
Authentication / RFC2617

### [4] Test setup

#### [4.1] Topology



- 2 SIP UA s/ 2 SIP Servers

#### [4.2] Address

##### 4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, Server0
Link 2	3ffe:501:ffff:50::/64	UA1, proxy1

##### 4.2.2 Example of node information



- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:50:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)
Proxy1	3ffe:501:ffff:50:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	<a href="mailto:00022221111@aaa.example.com">00022221111@aaa.example.com</a>
UA1	<a href="mailto:00022223333@bbb.instance.com">00022223333@bbb.instance.com</a>
Server0	ss.example.com
Proxy1	ss.instance.com

- Digest authentication information

	username	Password
UA0	00022221111	sipreadyph2
UA1	00022223333	sipreadyph2

[4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio(G.711 $\mu$ -law)
- Proxy A: Call stateful proxy
- Proxy B: Call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A sends REGISTER to Proxy A and Terminal B sends REGISTER to Proxy B for location registration.



- Set Proxy A as an outbound proxy of Terminal A.
- Set the proxies so that when a proxy receives a message containing SIP-URI, which is not under control of the proxy, the message is forwarded to another proxy.
- Confirm no call remains on neither Proxy A nor Proxy B. (All transactions and dialogs are cleared.)
  - Set the digest authentication parameter.

#### [5] Test procedure

1. Call from Terminal A to Terminal B. Wait on Terminal B.
  - \* Confirm the ring on Terminal B.
  - \* Confirm the ring back tone on Terminal A.
  - \* Confirm the 180 response from Terminal B on Terminal A.
2. Hang up Terminal A.
  - \* Confirm the ring stops on Terminal B.
  - \* Confirm the receipt of CANCEL on Terminal B.
  - \* Confirm the receipt of the 200 response to CANCEL and the 487 response to INVITE on Terminal A.

#### [Server0]

Execute with Server0 (your Server) as Proxy A.

Must forward, send, or receive the following message to Cancel the session.

- Receive INVITE
- Forward INVITE (Terminal A to Proxy B)
- Receive Cancel
- Send the final response 200 OK to Cancel
  - IP address : Must send to Terminal A IP address.
  - From header : Must be the same From Header URI (Terminal B AoR) that is received as CANCEL request.
  - To header : Must be the same To Header URI of AoR that is received as



CANCEL request.

Via header : Must be the same value of Via header that received as CANCEL request..

- Forward Cancel

- Receive 200 OK to Cancel

- Receive 487

- Send ACK to Cancel

IP address : Must send to Proxy B IP address.

From header : Must contain Terminal A AoR.

To header : Must contain Terminal B AoR.

Via header : Must contain Terminal A domain name or IP address.

- Forward 487(Terminal A to Proxy B)

- Receive ACK

[Server0]

Execute with Server0 (your Server) as Proxy B.

Must forward, send, or receive the following message to Cancel the session.

- Receive INVITE

- Forward INVITE (Proxy A to Terminal B)

- Receive Cancel

- Send the final response 200 OK to Cancel

IP address : Must send to Terminal B IP address.

From header : Must be the same From Header field URI(Terminal A AoR) that is received as CANCEL request.

To header : Must be the same From Header field URI(Terminal B AoR) that is received as CANCEL request.

Via header : Must be the same value of Via header that received as CANCEL request..

- Forward Cancel

- Receive 200 OK to Cancel

- Receive 487

- Send ACK to Cancel

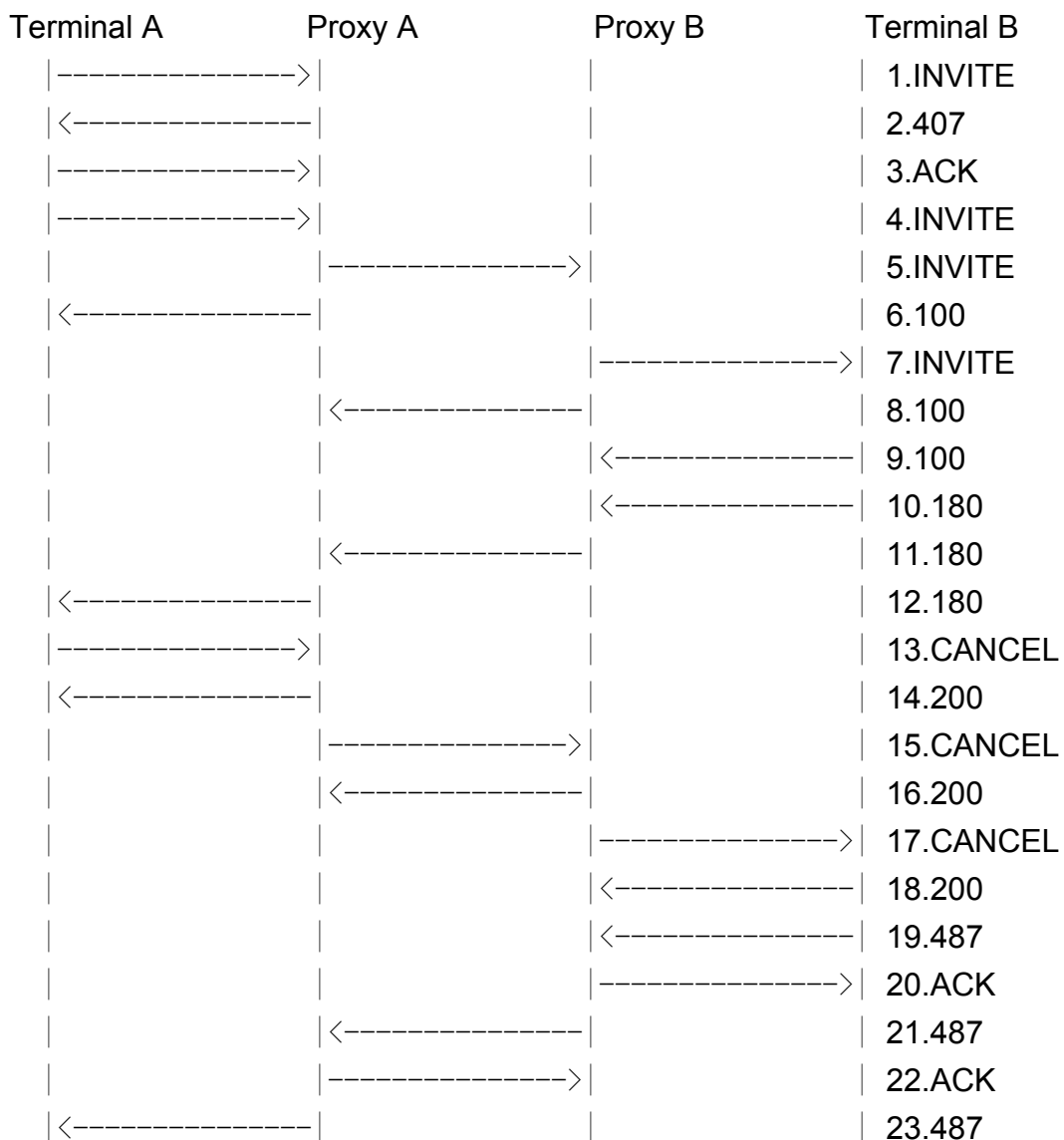


IP address : Must send to Terminal B IP address.  
 From header : Must contain Terminal A AoR.  
 To header : Must contain Terminal B AoR.  
 Via header : Must contain Terminal A domain name or IP address.

- Forward 487(Terminal B to Proxy A)
- Receive ACK

## [7] Reference

### [7.1] Message flow







|----->|

| 24.ACK

## [7.2] Coding examples

- \* See U6-2-A-B-S01 for coding examples of 1. -12.
- \* Coding examples between Proxy A and Proxy B are omitted.

### 13.CANCEL Terminal A -> Proxy A

```
CANCEL sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g
Max-Forwards: 70
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf
To: <sip:00022223333@bbb.instance.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 CANCEL
Content-Length: 0
```

### 14.200 OK Proxy A -> Terminal A

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf
To: <sip:00022223333@bbb.instance.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 CANCEL
Content-Length: 0
```

### 17.CANCEL Proxy B -> Terminal B

```
CANCEL sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]:5060 SIP/2.0
```



Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 CANCEL  
Content-Length: 0

#### 18.200 OK Terminal B -> Proxy B

SIP/2.0 200 OK  
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 CANCEL  
Content-Length: 0

#### 19.487 Request Terminated Terminal B -> Proxy B

SIP/2.0 487 Request Terminated  
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

#### 20.ACK Proxy B -> Terminal B



ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]:5060 SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

#### 23.487 Request Terminated Proxy B -> Proxy A

SIP/2.0 487 Request Terminated  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

#### 24.ACK Proxy A -> Proxy B

ACK sip:00022223333@bbb.instance.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

### 3.13. U6-2-A-A-S03 - Rejection of transmission (2 proxies)

[1] Test number / Title



U6-2-A-A-S03

Rejection of transmission

[2] Purpose and outline

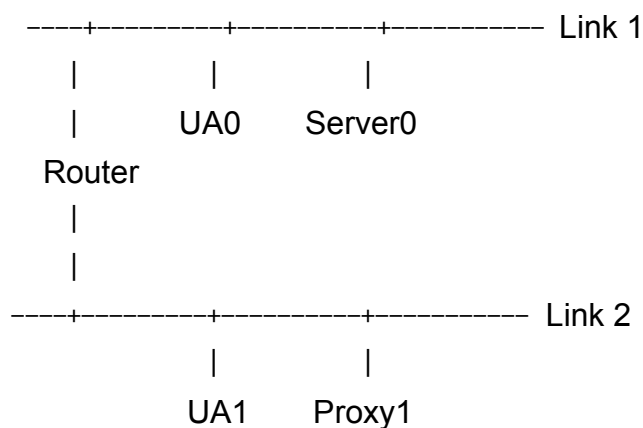
The sender sends INVITE to the receiver via 2 proxies and the receiver rejects the transmission. Confirm the session is not established.

[3] Resource requirement

Session establishment function	/ RFC3261
Rejection of transmission	/ RFC3261
IPv6 compliant	/ RFC4566
Authentication	/ RFC2617

[4] Test setup

[4.1] Topology



- 2 SIP UA s/ 2 SIP Servers

[4.2] Address

4.2.1 Example of link information (Prefix)



	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, Server0
Link 2	3ffe:501:ffff:50::/64	UA1, proxy1

#### 4.2.2 Example of node information

##### - IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:50:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)
Proxy1	3ffe:501:ffff:50:(InterfaceID)

##### - SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.instance.com
Server0	ss.example.com
Proxy1	ss.instance.com

##### - Digest authentication information

	username	password
UA0	00022221111	sipreadyph2
UA1	00022223333	sipreadyph2

#### [4.3] Test conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio(G.711μ-law)
- Proxy A: Call stateful proxy
- Proxy B: Call stateful proxy
- Authentication: Digest authentication
- Authentication algorithm: MD5



#### [4.4] Test initial conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- The Terminal A sends REGISTER to Proxy A and Terminal B sends REGISTER to Proxy B for location registration.
- Set Proxy A as an outbound proxy of Terminal A.
- Set the proxies so that when a proxy receives a message containing SIP-URI, which is not under control of the proxy, the message is forwarded to another proxy.
- Confirm no call remains on neither Proxy A or Proxy B. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

#### [5] Test procedure

##### 1. Call from Terminal A to Terminal B.

- \* Confirm the ring on Terminal B.
- \* Confirm the ring back tone on Terminal A.
- \* Confirm the 100 response from Terminal B on Terminal A.

##### 2. Reject the call from Terminal A on Terminal B.

- \* Confirm busy tone on Terminal A.
- \* Confirm the receipt of the 4XX or the 6XX response on Terminal A.

#### [6] Judgment

Confirm the following:

##### [Server0]

Execute with Server0 (your Server) as Proxy A.

- Must forward, send, or receive the following message to cancel the session.
- Receive INVITE
- Forward INVITE (Terminal A to Proxy B)



- Receive 4XX/6XX
- Send the ACK to 4XX/6XX
  - IP address : Must send to Proxy B IP address.
  - From header : Must contain Terminal A AoR.
  - To header : Must contain Terminal B AoR.
  - Via header : Must contain Terminal A domain name or IP address.
- Forward 4XX/6XX (Proxy B to Terminal A)
- Receive ACK

#### [Server0]

Execute with Server0 (your Server) as Proxy B.

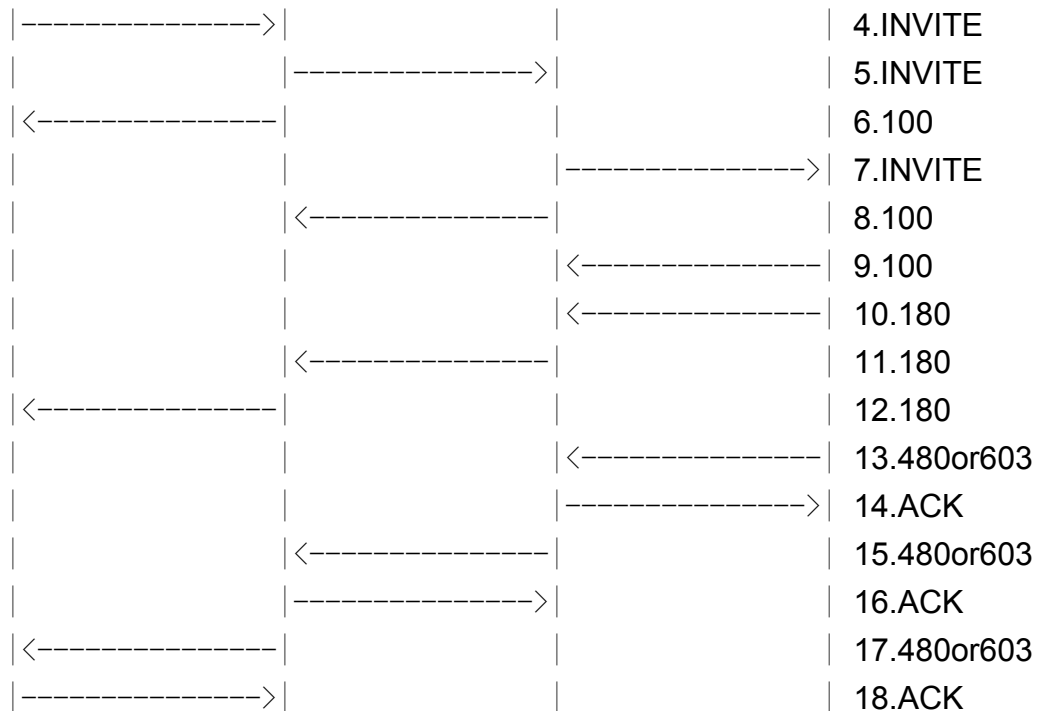
Must forward, send, or receive the following message to cancel the session.

- Receive INVITE
- Forward INVITE (Proxy A to Terminal B)
- Receive 4XX/6XX
- Send the ACK to 4XX/6XX
  - IP address : Must send to Terminal B IP address.
  - From header : Must contain Terminal A AoR.
  - To header : Must contain Terminal B AoR.
  - Via header : Must contain Terminal A domain name or IP address.
- Forward 4XX/6XX (Terminal B to Proxy A)
- Receive ACK

#### [7] Reference

##### [7.1] Message flow





## [7.2] Coding examples

- \* See U6-2-A-B-S01 for coding examples of 1. -12.
- \* Coding examples between Proxy A and Proxy B are omitted.

### 13. 480 Temporarily Unavailable Terminal B -> Proxy B

SIP/2.0 480 Temporarily Unavailable

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g

From: <sip:00022221111@aaa.example.com>;tag=a6c85cf

To: <sip:00022223333@bbb.instance.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 2 INVITE

Content-Length: 0





#### 14.ACK Proxy B -> Terminal B

ACK sip:00022223333@bbb.instance.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)]:5060;branch=z9hG4bK5na77c  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK5na77e  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 ACK  
Content-Length: 0

#### 17. 480 Temporarily Unavailable Proxy A -> Terminal A

SIP/2.0 480 Temporarily Unavailable  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 INVITE  
Content-Length: 0

#### 18.ACK Terminal A -> Proxy A

ACK sip:00022223333@bbb.instance.com SIP/2.0  
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)]:5060;branch=z9hG4bK4na77g  
Max-Forwards: 70  
From: <sip:00022221111@aaa.example.com>;tag=a6c85cf  
To: <sip:00022223333@bbb.instance.com>;tag=314159  
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)  
CSeq: 2 ACK  
Content-Length: 0





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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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## Authors' List

Hiroshi Miyata (Yokogawa Electric Corporation)

Yukiyo Akisada (Yokogawa Electric Corporation)

Timothy Winters (UNH-IOL)

James Swan (UNH-IOL)

Yoshio Yoshida (NTT-AT)

Kenzo Kodama (NTT-AT)

Yoshihiro Inoue (NTT-AT)

Natsuko Ishibashi (NTT-AT)

Rumi Suyama (NTT-AT)

Naomi Orimo (NTT-AT)