

IPv6 Ready Logo Phase 2
Session Initiation Protocol
Interoperability Test Scenario

Version 2.0.2

IPv6 Forum
IPv6 Ready Logo Committee



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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
EP	- SIP Endpoint
B2BUA	- SIP Back to Back User Agent
RG	- SIP Registrar Server
PX	- SIP Proxy 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)

(7) IPv6 Ready Logo Phase 2 Policy for SIP

(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, EP, B2BUA, RG and PX) to acquire Phase 2 Logo based on the *Policy document*, all BASIC functions must be supported in the viewpoint of interoperability, and each ADVANCED function can be selectively supported.

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

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

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

BASIC functions	ADVANCED functions
<ul style="list-style-type: none">- Registration (for Endpoint / Registrar)- Establishment, disconnection, and cancellation of Session- SDP Offer/Answer (INVITE-200)- Digest authentication (REGISTER, Initial INVITE)(for Endpoint)- Digest authentication (Initial INVITE) (for UA / B2BUA)- Hold (Using Re-INVITE) (for B2BUA)- Processing of re-INVITE	<ul style="list-style-type: none">- Registration and Digest authentication for REGISTER (for UA / B2BUA)- Hold (Using Re-INVITE) (for UA / Endpoint)- Forking / Multiple responses- OPTIONS request- Message forwarding (for Proxy)

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	Establishment, disconnection, and cancellation of Session	Interop.2.1-2.6
		SDP Offer/Answer (INVITE-200)	Interop.2.1
		Digest authentication (initial INVITE)	Interop.2.1
		Processing of re-INVITE	Interop.2.7
	ADVANCED	Registration and Digest authentication for REGISTER	Interop.1.1 - 1.4
		Hold	Interop.2.8
		Processing multiple responses	Interop.2.9 - 2.10
		OPTIONS request	Interop.2.11 - 2.12
EP	BASIC	Registration	Interop.1.1 - 1.4
		Establishment, disconnection, and cancellation of Session	Interop.2.1-2.6
		SDP Offer/Answer (INVITE-200)	Interop.2.1
		Digest authentication (REGISTER, initial INVITE)	Interop.1.1, Interop.2.1
		Processing of re-INVITE	Interop.2.7
	ADVANCED	Hold	Interop.2.8
		Processing multiple responses	Interop.2.9 - 2.10
		OPTIONS request	Interop.2.11 - 2.12
B2BUA	BASIC	Establishment, disconnection, and cancellation of Session	Interop.3.1 - 3.5
		SDP Offer/Answer (INVITE-200)	Interop.3.1, Interop.3.4 - 3.5
		Digest authentication (initial INVITE)	Interop.3.1
		Hold	Interop.3.6



Target	Function		Test scenario number
	ADVANCED	Registration	Interop.1.1 - 1.4
		Digest authentication (REGISTER)	Interop.1.1
		Processing multiple responses	Interop.2.9 - 2.10
		OPTIONS request	Interop.2.11 - 2.12
RG	BASIC	Registration	Interop.1.1 - 1.4
		Digest authentication (REGISTER)	Interop.1.1
PX	BASIC	Message forwarding	Interop.2.1 - 2.6
		Digest authentication (initial INVITE)	Interop.2.1
	ADVANCED	Message forwarding	Interop.1.5 (If an applicant implementation obtains Registrar Logo and Proxy Logo, the test is BASIC. In other case, it is ADVANCED)
		Message forwarding	Interop.2.13 - 2.18
		Forking	Interop.2.9 - 2.10
	ADVANCED	OPTIONS request	Interop.2.11 - 2.12

: BASIC
 : ADVANCED



2.2 The architecture for Interoperability test

SIP IPv6 equipment (UA, EP, B2BUA, RG and PX) 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 the applicant implementation is a UA, the UA must pass the interoperability test on the following architecture (Figure 2-2 and Figure 2-3). Also, it is preferable that UA1 is a piece of equipment of the same vendor as the UA (UA0). Moreover, UA1 must support the functions that UA0 supports for this logo, and Server0 must support all BASIC functions.

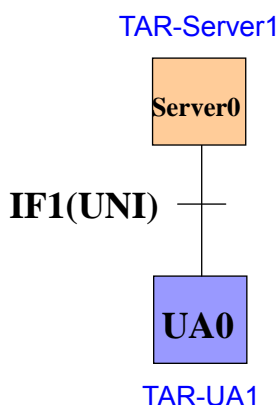


Figure 2-1 Selection method of target nodes for Registration test

TAR-UA1 (UA0)	Applicant Implementation
TAR-Server1 (Server0)	Vendor A/B Registrar Server

* Must set up as the following cases:

Vendor A (Server0)

Vendor B (Server0)

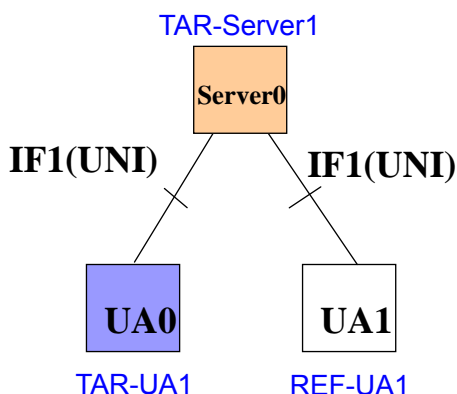


Figure 2-2 Selection method of target nodes for session test

TAR-UA1 (UA0)	Applicant Implementation
TAR-Server1 (Server0)	Vendor A/B Proxy Server or B2BUA
REF-UA1 (UA1)	Any Vendor

* Must set up as the following combinations:

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

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

2.2.2 Endpoint (EP)

When the applicant implementation is an EP, the EP must pass the interoperability test on the following architecture (Figure 2-4 and Figure 2-5). EP is treated as a UA0. Also, it is preferable that UA1 is a piece of equipment of the same vendor as the EP (UA0). Moreover, UA1 must support the functions that EP (UA0) supports for this logo, and Server0 must support all BASIC functions.

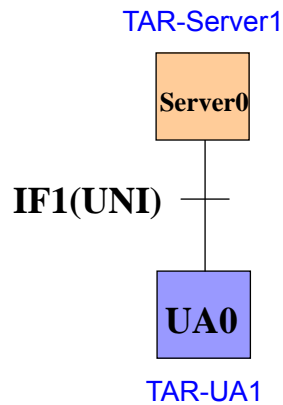


Figure 2-3 Selection method of target nodes for Registration test

TAR-UA1 (UA0)	Applicant Implementation
TAR-Server1 (Server0)	Vendor A/B Registrar Server

* Must set up as the following cases:

- Vendor A (Server0)
- Vendor B (Server0)

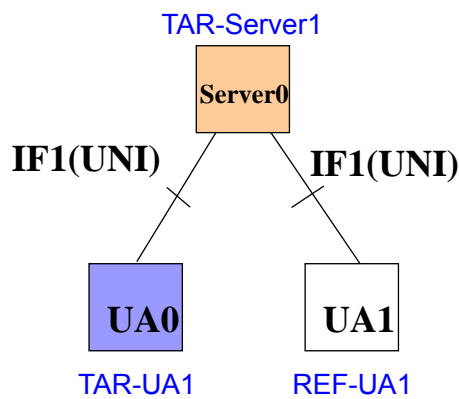


Figure 2-4 Selection method of target nodes for session test

TAR-UA1 (UA0)	Applicant Implementation
TAR-Server1 (Server0)	Vendor A/B Proxy Server or B2BUA
REF-UA1 (UA1)	Any Vendor



- * Must set up as the following combinations:
Vendor A (Server0) ----- Any Vendor (UA1)
Vendor B (Server0) ----- Any Vendor (UA1)

2.2.3 Back-to-Back User Agent (B2BUA)

When the applicant implementation is a B2BUA, the B2BUA must pass the interoperability test on the following architecture (Figure 2-7, 2-8). Also, it is preferable that UA1 is a piece of equipment of the same vendor as the UA (UA0). Moreover, UA1 must support the functions that UA0 supports for this logo, and Server0 must support all BASIC functions.

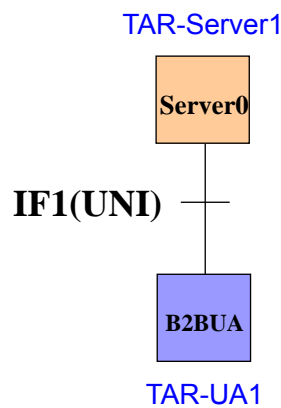


Figure 2-5 Selection method of target nodes for Registration test

TAR-UA1 (B2BUA)	Applicant Implementation
TAR-Server1 (Server0)	Vendor A/B Registrar Server

- * Must set up as the following cases:
Vendor A (Server0)
Vendor B (Server0)

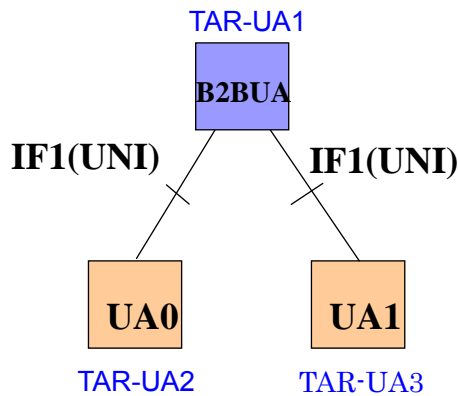


Figure 2-6 Selection method of target nodes for session test

TAR-UA1 (B2BUA)	Applicant Implementation
TAR-UA2 (UA0)	Vendor C/D User Agent
TAR-UA3 (UA1)	Vendor C/D User Agent

* * Must set up as the following combinations:

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

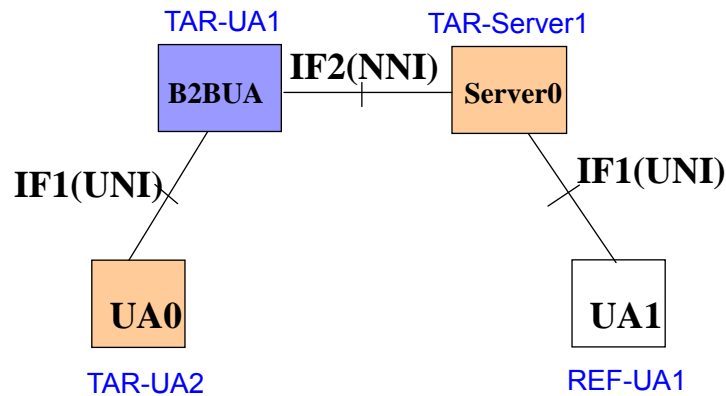


Figure 2-7 Selection method of target nodes with proxies

TAR-UA1 (B2BUA)	Applicant Implementation
TAR-UA2 (UA0)	Vendor C/D User Agent
TAR-Server2 (Server0)	Vendor E/F Proxy Server



REF-UA2 (UA1) Any Vendor

* 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) Vendor D (UA0) ----- Vendor F (Proxy1)

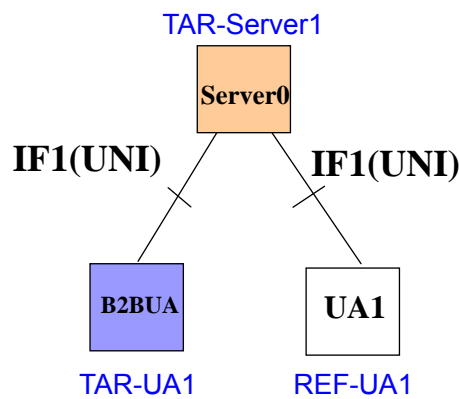


Figure 2-8 Selection method of target nodes for session test

TAR-UA1 (B2BUA)	Applicant Implementation
TAR-Server1 (Server0)	Vendor A/B Proxy Server or B2BUA
REF-UA1 (UA1)	Any Vendor

* Must set up as the following combinations:

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

2.2.4 Registrar Server (RG)

When the applicant implementation is a RG, the RG must pass the interoperability test on the following architecture (Figure 2-2). UA0 must support all BASIC functions for registration.

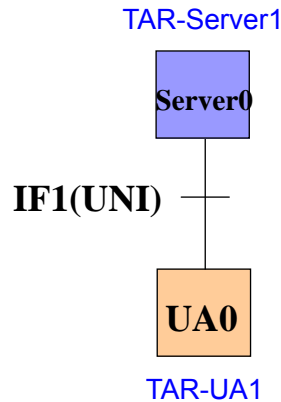


Figure 2-9 Selection method of target nodes for Registration test

TAR-Server1 (Server0)	Applicant Implementation
TAR-UA1 (UA0)	Vendor A/B User Agent

* Must set up as the following cases:

- Vendor A (UA0)
- Vendor B (UA0)

2.2.5 Proxy Server (PX)

When the applicant implementation is a PX, the PX must pass the interoperability test on the following architecture (Figure 2-3). Both UA0 and UA1 must support all BASIC functions.

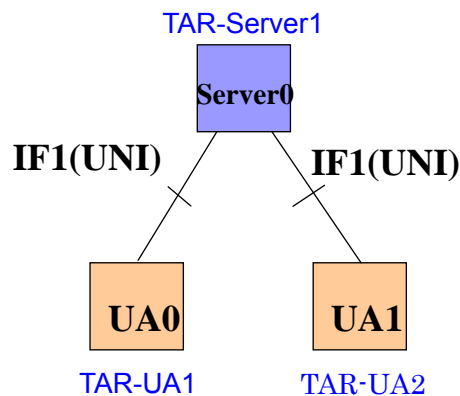


Figure 2-10 Selection method of target nodes for session test



TAR-Server1 (Server0)	Applicant Implementation
TAR-UA1 (UA0)	Vendor C/D User Agent
TAR-UA2 (UA1)	Vendor C/D User Agent

* Must 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 the applicant PX supports NNI, the server must pass the interoperability test on the following architecture (Figure 2-11) after passing the above test (Figure 2-10). 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.

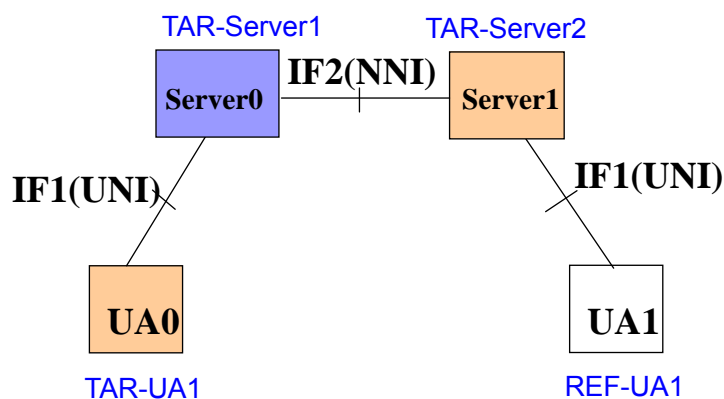


Figure 2-11 Selection method of target nodes on two proxies

TAR-Server1 (Server0)	Applicant Implementation
TAR-Server2 (Server1)	Vendor E/F Proxy Server or B2BUA
TAR-UA1 (UA0)	Vendor C/D User Agent
REF-UA1 (UA1)	Any Vendor

* 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) Vendor D (UA0) ----- Vendor F (Proxy1)



If the applicant implementation obtains Registrar Logo and Proxy Logo, it must pass the interoperability test for forwarding REGISTER request.

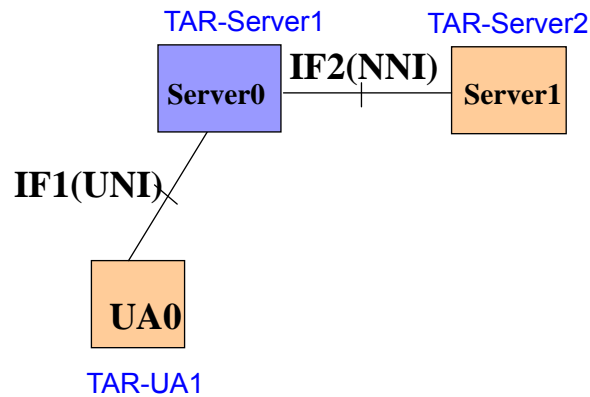


Figure 2-12 Selection method of target nodes for forwarding test (REGISTER)

TAR-Server1 (Server0)	Applicant Implementation
TAR-Server2 (Server1)	Vendor E/F Registrar server
TAR-UA1 (UA0)	Vendor C/D User Agent

* TAR-UA1 and TAR-Server2 should be set up as the following combinations:

- Vendor C (UA0) ----- Vendor E (Server1) Vendor C (UA0) ----- Vendor F (Server1)
- Vendor D (UA0) ----- Vendor E (Server1) Vendor D (UA0) ----- Vendor F (Server1)

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, *ifconfig* 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 as follows.

- <1> Check the required 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> Capture all packets on each link during the test with a device that is not part of the test. For each part of test put the captured packet into individual files within tcpdump format (pcap).
- <5> Write the result ('OK' or 'NG') on the check sheet every scenario.

As for the above <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 <5>, 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
Applicant Implementation	It describes the Applicant Implementation 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.
Applicant Implementation/Target Nodes	The Applicant Implementation/Target Nodes show the necessary nodes in a test based on the required architecture. X : Applicant Implementation T : Target Node R : Reference Node



Table 2-4. The interoperability test scenario

C N	Category	Test num	Test scenario	Applicant Implementation /Target Nodes			
				UA0	UA1	Server 0	Server 1
U A	Registration	Interop.1.1	Initial Registration	X		T	
		Interop.1.2	Refreshing Bindings	X		T	
		Interop.1.3	Removing Bindings	X		T	
		Interop.1.4	Refreshing Bindings according to the expires time	X		T	
	Session	Interop.2.1	Session Establishment and Disconnection (UA0: caller case)	X	R	T	
		Interop.2.2	Session Establishment and Disconnection (UA0: callee case)	X	R	T	
		Interop.2.3	Cancellation of Transmission (UA0: caller case)	X	R	T	
		Interop.2.4	Cancellation of Transmission (UA0: callee case)	X	R	T	
		Interop.2.5	Rejection of Transmission (UA0: caller case)	X	R	T	
		Interop.2.6	Rejection of Transmission (UA0: callee case)	X	R	T	
		Interop.2.7	Session Hold and Hold Release (Receiving re-INVITE)	X	R	T	
		Interop.2.8	Session Hold and Hold Release (Sending re-INVITE)	X	R	T	
		Interop.2.9	Forking / Multiple Responses case1	X	R	T	
		Interop.2.10	Forking / Multiple Responses case2	X	R	T	
		Interop.2.11	OPTIONS proceeding (Sending OPTIONS)	X	R	T	
		Interop.2.12	OPTIONS proceeding (Receiving OPTIONS)	X	R	T	
E P	Registration	Interop.1.1	Initial Registration	X		T	
		Interop.1.2	Refreshing Bindings	X		T	
		Interop.1.3	Removing Bindings	X		T	
		Interop.1.4	Refreshing Bindings according to the expires time	X		T	
	Session	Interop.2.1	Session Establishment and Disconnection	X	R	T	

C N	Category	Test num	Test scenario	Applicant Implementation /Target Nodes			
				UA0	UA1	Server 0	Server 1
		Interop.2.2	Cancellation of Transmission	X	R	T	
		Interop.2.3	Cancellation of Transmission (UA0: caller case)	X	R	T	
		Interop.2.4	Cancellation of Transmission (UA0: callee case)	X	R	T	
		Interop.2.5	Rejection of Transmission (UA0: caller case)	X	R	T	
		Interop.2.6	Rejection of Transmission (UA0: callee case)	X	R	T	
		Interop.2.7	Session Hold and Hold Release (Receiving re-INVITE)	X	R	T	
		Interop.2.8	Session Hold and Hold Release (Sending re-INVITE)	X	R	T	
		Interop.2.9	Forking / Multiple Responses case1	X	R	T	
		Interop.2.10	Forking / Multiple Responses case2	X	R	T	
		Interop.2.11	OPTIONS proceeding (Sending OPTIONS)	X	R	T	
		Interop.2.12	OPTIONS proceeding (Receiving OPTIONS)	X	R	T	
		B 2 B U A	Registration	Interop.1.1	Initial Registration	X	
Interop.1.2	Refreshing Bindings			X		T	
Interop.1.3	Removing Bindings			X		T	
Interop.1.4	Refreshing Bindings according to the expires time			X		T	
Session	Interop.2.9		Forking / Multiple Responses case1	X	R	T	
	Interop.2.10		Forking / Multiple Responses case2	X	R	T	
	Interop.2.11		OPTIONS proceeding (Sending OPTIONS)	X	R	T	
	Interop.2.12		OPTIONS proceeding (Receiving OPTIONS)	X	R	T	
B2BUA	Interop.3.1		Session establishment and disconnection for B2BUA	T	T	X	
	Interop.3.2		Cancellation of Transmission for B2BUA	T	T	X	
	Interop.3.3	Rejection of Transmission for B2BUA	T	T	X		



C N	Category	Test num	Test scenario	Applicant Implementation /Target Nodes			
				UA0	UA1	Server 0	Server 1
		Interop.3.4	Session Establishment and Disconnection with proxy for B2BUA (caller side)	T	R	X	T
		Interop.3.5	Session Establishment and Disconnection with proxy for B2BUA (callee side)	T	R	X	T
		Interop.3.6	Session Hold and Hold Release for B2BUA	T	T	X	
R G	Registration	Interop.1.1	Initial Registration	T		X	
		Interop.1.2	Refreshing Bindings	T		X	
		Interop.1.3	Removing Bindings	T		X	
		Interop.1.4	Refreshing Bindings according to the expires time	T		X	
P X	Session	Interop.1.5	Forwarding REGISTER request	T		X	T
		Interop.2.1	Session Establishment and Disconnection	T	T	X	
		Interop.2.2	Cancellation of Transmission	T	T	X	
		Interop.2.3	Cancellation of Transmission (UA0: caller case)	T	T	X	
		Interop.2.4	Cancellation of Transmission (UA0: callee case)	T	T	X	
		Interop.2.5	Rejection of Transmission (UA0: caller case)	T	T	X	
		Interop.2.6	Rejection of Transmission (UA0: callee case)	T	T	X	
		Interop.2.9	Forking / Multiple Responses case1	T	T x 2	X	
		Interop.2.10	Forking / Multiple Responses case2	T	T x 2	X	
		Interop.2.11	OPTIONS Proceeding (sending OPTIONS)	T	T	X	
		Interop.2.12	OPTIONS Proceeding (receiving OPTIONS)	T	T	X	
		Interop.2.13	Session Establishment and Disconnection with 2 proxies (Server0: caller side)	T	R	X	T
		Interop.2.14	Session Establishment and Disconnection with 2 proxies (Server0: callee side)	T	R	X	T
		Interop.2.15	Cancellation of Transmission for 2 proxies (Server0: caller side)	T	R	X	T
		Interop.2.16	Cancellation of Transmission for 2 proxies (Server0: callee side)	T	R	X	T
Interop.2.17	Rejection of Transmission for 2 proxies (Server0: caller side)	T	R	X	T		



C N	Category	Test num	Test scenario	Applicant Implementation /Target Nodes			
				UA0	UA1	Server 0	Server 1
		Interop.2.18	Rejection of Transmission for 2 proxies (Server0: callee side)	T	R	X	T

: BASIC
 : ADVANCED
 : The architecture on 2 proxies
T: Target Node
X: Applicant Implementation
R: Reference Node



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	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 how to execute the test (i.e. what you must do to execute the test, e.g. Hang up, answer, etc.) and which packets you must observe. For more details about the message example and flow, see [7] Reference.
[6] Observable Results	The Observable Results describes expected result of the test. If we can observe as same result as the description of Observable Results, the applicant implementation passes the test. Which packets you must observe is described in [5] Test Procedure
[7] Reference [7.1] Message Flow [7.2] Message Examples	The Message Flow describes step-by-step instructions with examples of sequence or text message for carrying out the test.



3.1. Interop.1.1 - Initial Registration

[1] Test Number/Title

Interop.1.1

Initial Registration

[2] Purpose

To verify that an applicant implementation can properly register a contact address in REGISTER request.

[3] Resource Requirement

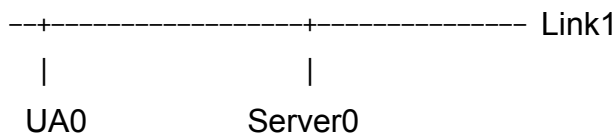
Registration / RFC3261

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
- Server0: A server that has a 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 UA0 is cleared on Server0.
- Set the digest authentication parameter.

[5] Test Procedure

1. Send REGISTER request from UA0 to Server0.
2. Observe the packet transmitted on Link1



[6]Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint / Back-to-Back User Agent Logo]

Applicant Implementation: UA0

Step 2:

- Send REGISTER request. (to Server0)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must contain Server0 AoR.
 - From header : Must contain Server0 AoR.
 - To header : Must contain Server0 AoR.
 - Via header : Must contain UA0 domain name or IP address.

- Receive200 OK response (from Server0)

[Registrar Logo]

Applicant Implementation: Server0

Step 2:

- Receive REGISTER request. (from UA0)
- Send 200 OK response. (to UA0)
 - IP address : Must send to UA0 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



UA0	Server0
----->	1.REGISTER
<-----	2.401 Unauthorized
----->	3.REGISTER
<-----	4.200 OK

[7.2] Message Examples

1. REGISTER UA0 -> Server0

REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com"
nonce="ae9137be",domain="sip:ss.example.com",algorithm=MD5,
opaque="", stale=FALSE
Content-Length: 0



3. REGISTER UA0 -> Server0

```
REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfa
Max-Forwards: 70
Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.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 Server0 -> UA0

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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. Interop.1.2 - Refreshing Bindings

[1] Test Number/Title

Interop.1.2

Refreshing Bindings

[2] Purpose

To verify that an applicant implementation can properly refresh bindings while the registration is valid.

[3] Resource Requirement

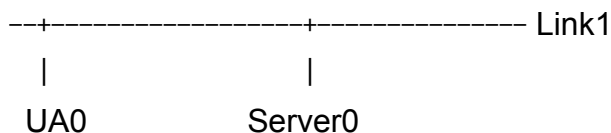
Registration / RFC3261

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
- Server0: A server that has a 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 UA0 is cleared on Server0.
- Set the digest authentication parameter.
- The value "120" is recommended for the expires parameter in Contact or Expires header value.

[5] Test Procedure



1. Send REGISTER request from UA0 to Server0.
2. Observe the packet transmitted on Link1
3. Resend REGISTER request from UA0 to Server0 while the registration is valid.
4. Observe the packet transmitted on Link1

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint / Back-to-Back User Agent Logo]

Applicant Implementation: UA0

Step 2:

- Send REGISTER request. (to Server0)
Expires parameter in Contact header or Expires header:
Must exist.

- Receive 200 OK response (from Server0)
Expires parameter in Contact header or Expires header:
Must exist.

Step 4:

- Hold the registration, and send REGISTER request again.
Must send RESGIETR request while the registration is valid.

- Receive 200 OK response (from Server0)
Expires parameter in Contact header or Expires header value:
Must be updated.

[Registrar Logo]

Applicant Implementation: Server0



Step 2:

- Received REGISTER request. (from UA0)
Expires parameter in Contact header or Expires header:
Must exist.

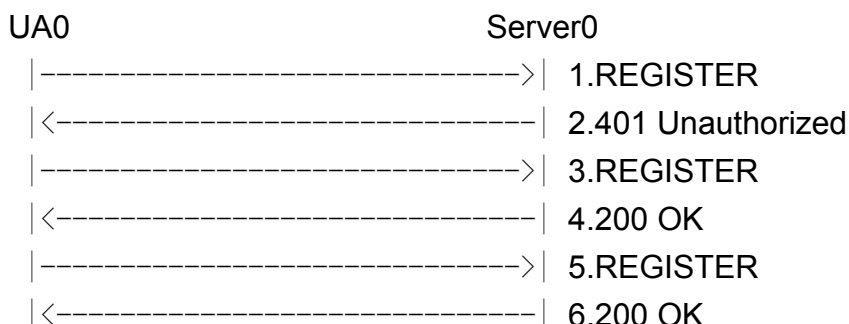
- Send 200 OK response (to UA0)

Step 4:

- Hold registered UA0, and received REGISTER request again.
- Send 200 OK response (to UA0).
Expires parameter in Contact header or Expires header value:
Must be updated.

[7] Reference

[7.1] Message Flow



[7.2] Message Examples

1. REGISTER UA0 -> Server0

```
REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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: 120
Content-Length: 0

2.401 Unauthorized Server0 -> UA0

SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com"
nonce="ae9137be",domain="sip:ss.example.com",algorithm=MD5,
opaque="", stale=FALSE
Content-Length: 0

3. REGISTER UA0 -> Server0

REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfa
Max-Forwards: 70
Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.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: 120
Content-Length: 0

4. 200 OK Server0 -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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=120
Content-Length: 0
Date: Sat, 13 Nov 2010 23:29:00 GMT

5. REGISTER UA0 -> Server0

REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bff
Max-Forwards: 70
Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.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: 120
Content-Length: 0



6. 200 OK Server0 -> UA0

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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=120

Content-Length: 0



3.3. Interop.1.3 - Removing Bindings

[1] Test Number/Title

Interop.1.3

Removing Bindings

[2] Purpose

To verify that an applicant implementation can properly remove the registered address.

[3] Resource Requirement

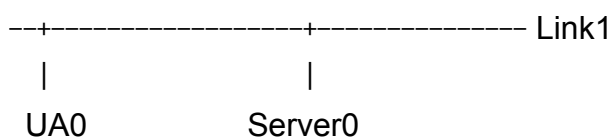
Registration / RFC3261

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
- Server0: A server that has a 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 UA0 is cleared on Server0.
- Set the digest authentication parameter.

[5] Test Procedure

1. Send REGISTER from UA0 to Server0.
2. Observe the packet transmitted on Link1.
3. Send REGISTER for removing bindings from UA0 to Server0.



4. Observe the packet transmitted on Link1.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint / Back-to-Back User Agent Logo]

Applicant Implementation: UA0

Step 2:

- Send REGISTER request. (to Server0)
Expires parameter in Contact header or Expires header:
Must exist.

- Receive 200 OK response (from Server0)
Expires parameter in Contact header or Expires header:
Must exist.

Step 4:

- Hold the registration, and send REGISTER request again.
Must send RESGIEETR request while the registration is valid.
Expires time : Must contain Expire header or Expires parameter “0”
Contact header : Must be “*” or registered SIP URI

- Receive 200 OK response (from Server0)
Contact header : Must be not included the header or must be empty value.
Contact address : Must be removed from the registration.

[Registrar Logo]

Applicant Implementation: Server0

Step 2:

- Receive REGISTER request. (from UA0)
Expires parameter in Contact header or Expires header:



Must exist.

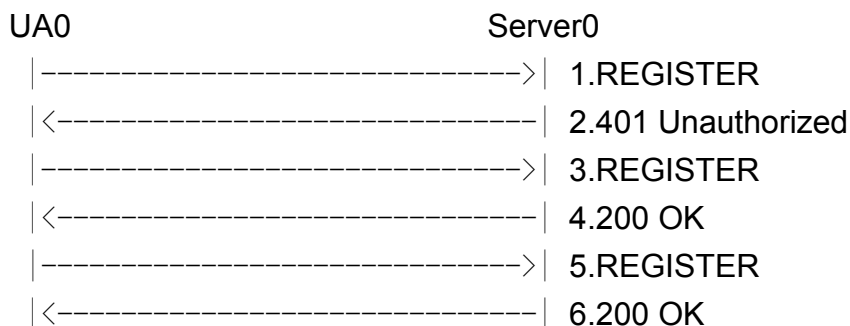
- Send 200 OK response (to UA0)
Expires parameter in Contact header or Expires header:
Must exist.

Step 4:

- Hold registered UA0 and send REGISTER request again.
Must receive RESGIETR request while the registration is valid.
Expires time : Must contain Expire header or Expires parameter "0"
Contact header : Must be "*" or registered SIP URI
- Send 200 OK response (to UA0).
Contact header : Must be not included the header or must be empty value.
Contact address : Must be removed from the registration.

[7] Reference

[7.1] Message Flow



[7.2] Message Examples

1. REGISTER UA0 -> Server0

REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com"
nonce="ae9137be",domain="sip:ss.example.com",algorithm=MD5,
opaque="", stale=FALSE
Content-Length: 0

3. REGISTER UA0 -> Server0

REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfa
Max-Forwards: 70
Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.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 Server0 -> UA0

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

5. REGISTER UA0 -> Server0

REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfg
Max-Forwards: 70
Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.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 Server0 -> UA0

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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. Interop.1.4 - Refreshing Bindings according to expires time

[1] Test Number/Title

Interop.1.4

Refreshing Bindings according to the expires time

[2] Purpose

To verify that an applicant implementation can property update the expiration time according to the expiration time that a registrar indicated.

[3] Resource Requirement

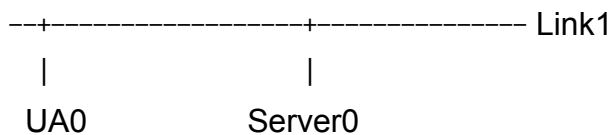
Registration / RFC3261

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
- Server0: A server that has a 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 UA0's contact information is cleared on Server0.
- Set the digest authentication parameter.
- The value "120" is recommended for the expires parameter in Contact or Expires header value in 200 OK response to initial REGISTER request.
- The expires parameter in Contact or Expires header value in the initial REGISTER request must be larger than 120.



[5] Test Procedure

1. Send REGISTER from UA0 to Server0.
2. Observe the packet transmitted on Link1

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint / Back-to-Back User Agent Logo]

Applicant Implementation: UA0

Step 2:

- Send REGISTER request (to Server0)
- Receive 200 OK response (from Server0)
- Hold the registration, and send REGISTER request again.
Must resend REGISTER request while the registration is valid.

- Receive 200 OK response (from Server0)
Expiration time: Must be updated.

[Registrar Logo]

Applicant Implementation: Server0

Step 2:

- Receive REGISTER request (from UA0)
- Send 200 OK response (to UA0)
- Hold registered UA0, and send REGISTER again.
Must receive REGISTER request while the registration is valid.

- Send 200 OK response (to UA0).
Expiration time: Must be updated.

[7] Reference

[7.1] Message Flow



UA0	Server0
----->	1.REGISTER
<-----	2.401 Unauthorized
----->	3.REGISTER
<-----	4.200 OK
----->	5.REGISTER
<-----	6.200 OK

[7.2] Message Examples

1. REGISTER UA0 -> Server0

REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com"



nonce="ae9137be",domain="sip:ss.example.com",algorithm=MD5,
opaque="", stale=FALSE
Content-Length: 0

3. REGISTER UA0 -> Server0

REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfa
Max-Forwards: 70
Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.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 Server0 -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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=120
Content-Length: 0
Date: Sat, 13 Nov 2010 23:29:00 GMT



5. REGISTER UA0 -> Server0

```
REGISTER sip:ss.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bff
Max-Forwards: 70
Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.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 Server0 -> UA0

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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=120
Content-Length: 0
```



3.5. Interop.1.5 – Forwarding REGISTER request

[1] Test Number/Title

Interop.1.5

Forwarding REGISTER request

[2] Purpose

To verify that an applicant implementation can property forward REGISTER request to alternate registrar server.

[3] Resource Requirement

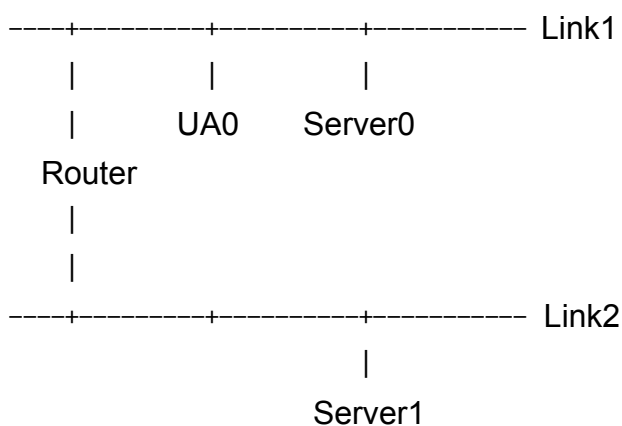
Registration / RFC3261

IPv6 compliant / RFC4566

Authentication / RFC2617

[4] Test Setup

[4.1] Topology



- 1 SIP UA / 2 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,
Link 2	3ffe:501:ffff:50::/64	Server1

4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:5:(InterfaceID)
Server1	3ffe:501:ffff:50:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.instance.com
Server0	ss.example.com
Server1	ss.instance.com

- Digest authentication information

	username	password
UA0	00022221111	sipreadyph2

[4.3] Test Conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: None
- Server0: A server that has Registrar function and Proxy 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 UA0's contact information is cleared on Server1.
- Set the digest authentication parameter.

[5] Test Procedure

1. Send REGISTER from UA0 to Server0.
2. Observe the packet transmitted on Link1.
3. Forward REGISTER from Server0 to Server1.
4. Observe the packet transmitted on Link2.

[6] Observable Results

Applicable "Observable Results" are different depends on the type of applicant implementation.

[Proxy Logo]

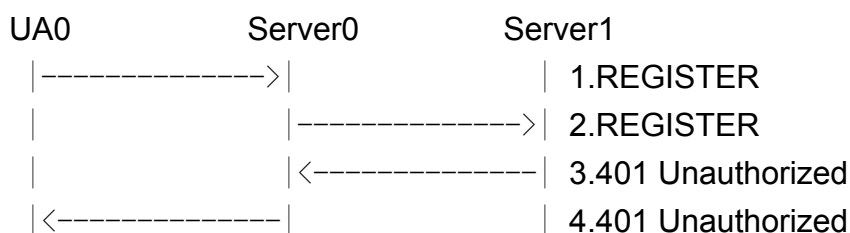
Applicant Implementation: Server0

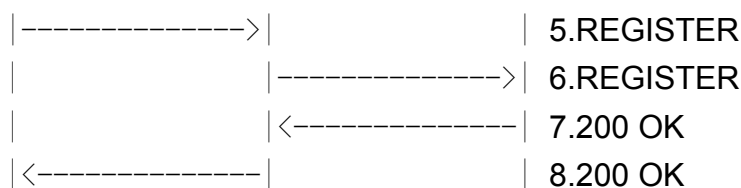
Step 2:

- Receive REGISTER request (from UA0)
- Forward REGISTER request (to Server1)
- Receive 200 OK response (from Server1)
- Forward 200 OK response (to UA0)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1. REGISTER UA0 -> Server0

```
REGISTER sip:ss.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bf9
Max-Forwards: 70
From: <sip:00022221111@aaa.instance.com>;tag=1234567
To: <sip:00022221111@aaa.instance.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. REGISTER Server0 -> Server1

```
REGISTER sip:ss.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bg0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bf9
Max-Forwards: 69
From: <sip:00022221111@aaa.instance.com>;tag=1234567
To: <sip:00022221111@aaa.instance.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
```



3.401 Unauthorized Server1 -> Server0

SIP/2.0 401 Unauthorized
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bg0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bf9
From: <sip:00022221111@aaa.instance.com>;tag=1234567
To: <sip:00022221111@aaa.instance.com>;tag=567890
Call-ID: b84c4d76f6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 1 REGISTER
WWW-Authenticate: Digest realm="ss.instance.com"
nonce="ae9137be",domain="sip:ss.instance.com",algorithm=MD5,
opaque="", stale=FALSE
Content-Length: 0

4.401 Unauthorized Server0 -> UA0

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

5. REGISTER UA0 -> Server0

REGISTER sip:ss.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfa



Max-Forwards: 70
Authorization: Digest realm="ss.instance.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.instance.com",
response="6iib19cef56c9a0a3i5aieff23a234",
algorithm=MD5,opaque=""
From: <sip:00022221111@aaa.instance.com>;tag=1234568
To: <sip:00022221111@aaa.instance.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

6. REGISTER Server0 -> Server1

REGISTER sip:ss.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bgb
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfa
Max-Forwards: 69
Authorization: Digest realm="ss.instance.com",nonce="ae9137be",
username="00022221111",uri="sip:ss.instance.com",
response="6iib19cef56c9a0a3i5aieff23a234",
algorithm=MD5,opaque=""
From: <sip:00022221111@aaa.instance.com>;tag=1234568
To: <sip:00022221111@aaa.instance.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

7. 200 OK Server1 -> Server0



SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bgb

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfa

From: <sip:00022221111@aaa.instance.com>;tag=1234569

To: <sip:00022223333@bbb.instance.com>;tag=567892

Call-ID: b84c4d76f6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 3 REGISTER

Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>;expires=120

Content-Length: 0

8. 200 OK Server0 -> UA0

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK74bfa

From: <sip:00022221111@aaa.instance.com>;tag=1234569

To: <sip:00022223333@bbb.instance.com>;tag=567892

Call-ID: b84c4d76f6@3ffe:501:ffff:5:(InterfaceID)

CSeq: 3 REGISTER

Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>;expires=120

Content-Length: 0



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 μ -law)
- Server0: A call stateful proxy or a B2BUA
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.



- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1.
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link0.
5. Hang up UA1. Confirm the session is disconnected on UA0.
6. Observe the packet transmitted on Link0
7. Hang up UA0.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint Logo]

UA0 : Applicant Implementation

UA1 : Reference User Agent (Any vendor)

Server0 : Target Server (Vendor A/B)

Step 2:

- Send INVITE request. (to UA1)

IP address : Must send to Server0 IP address.
Request-Line : Must contain UA1 AoR.
From header : Must contain UA0 AoR.
To header : Must contain UA1 AoR.
Via header : Must contain UA0 domain name or IP address.

Step 4:

- Receive 200 OK response (from UA1)
- Send ACK request (to UA1)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must be 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 UA1 AoR.
- Via header : Must contain UA0 domain name or IP address.

Step 6:

- Receive BYE request (from UA1)
- Send 200 OK to BYE request. (to UA1)
 - IP address : Must send to Server0 IP address.
 - From header : Must be the same From Header URI that is received as BYE request.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA1 domain name or IP address.

[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

Step 2:

- Receive the INVITE request. (from UA0)
- Forward the INVITE request. (to UA1)

Step 4:

- Receive 200OK to INVITE request. (from UA1)
- Forward 200OK to INVITE request. (to UA0)
- Receive the ACK request. (from UA0)
- Forward the ACK request. (to UA1)

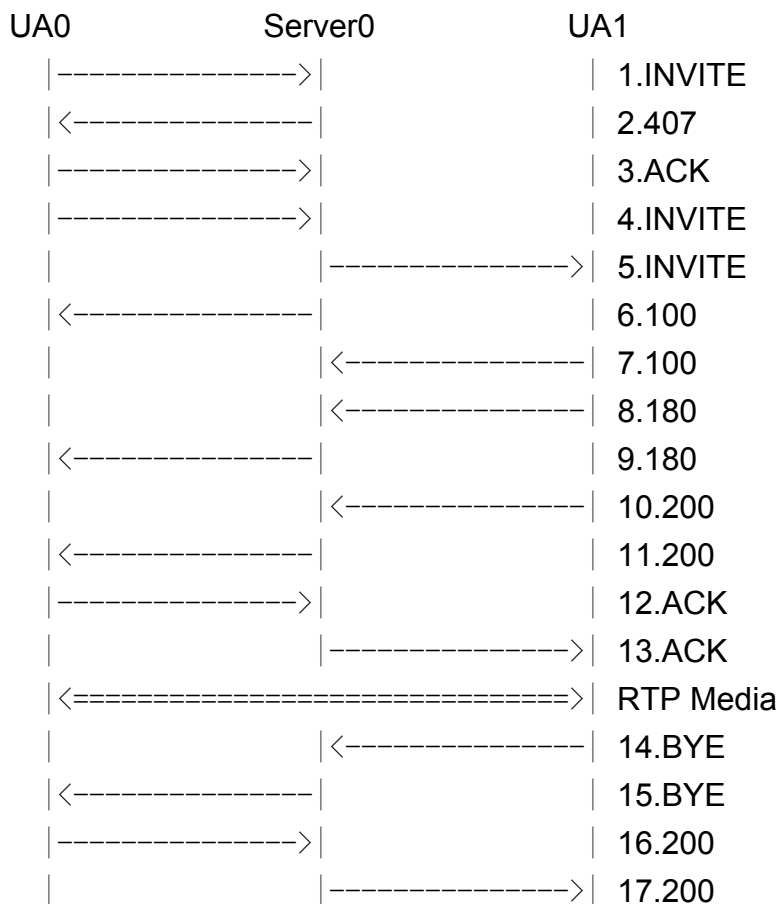
Step 6:

- Receive the BYE request. (from UA1)
- Forward the BYE request. (to UA0)
- Receive 200OK to BYE request. (from UA0)
- Forward 200OK to BYE request. (to UA1)



[7] Reference

[7.1] Message Flow



[7.2] Message Examples

1. INVITE UA0 -> Server0

```
INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA0 -> Server0

ACK sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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 Server0 -> UA1



```
INVITE sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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 Server0 -> UA0

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 ->Server0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

9. 180 Ringing Server0 -> UA0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:



<sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

10. 200 OK UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
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 Server0 -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
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

12. ACK UA0 -> Server0

ACK sip:z3b6tm@[3ffe:501:ffff: 5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2
Route: <sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

13. ACK Server0 -> UA1

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server0

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route: <sip:ss.example.com;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 Server0 -> UA0



BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

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



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 μ -law)
- Server0: A call stateful proxy or a B2BUA
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.



- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA1 to UA0. Confirm the ring on UA0 and the ring back tone on UA1.
2. Observe the packet transmitted on Link1.
3. Answer the call on UA0. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link0.
5. Hang up UA0. Confirm the session is disconnected on UA1.
6. Observe the packet transmitted on Link0
7. Hang up UA1.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint Logo]

UA0 : Applicant Implementation

UA1 : Reference User Agent (Any vendor)

Server0 : Target Server (Vendor A/B)

Step 2:

- Receive INVITE request (from UA1)
- Send200 OK response (to UA1)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must be Contact URI. The URI must is the same value 200 OK response to INVITE request.
 - From header : Must contain UA1 AoR.
 - To header : Must contain UA0 AoR.
 - Via header : Must contain UA1 domain name or IP address.

Step 4:

- Receive ACK request (from UA1)



Step 6:

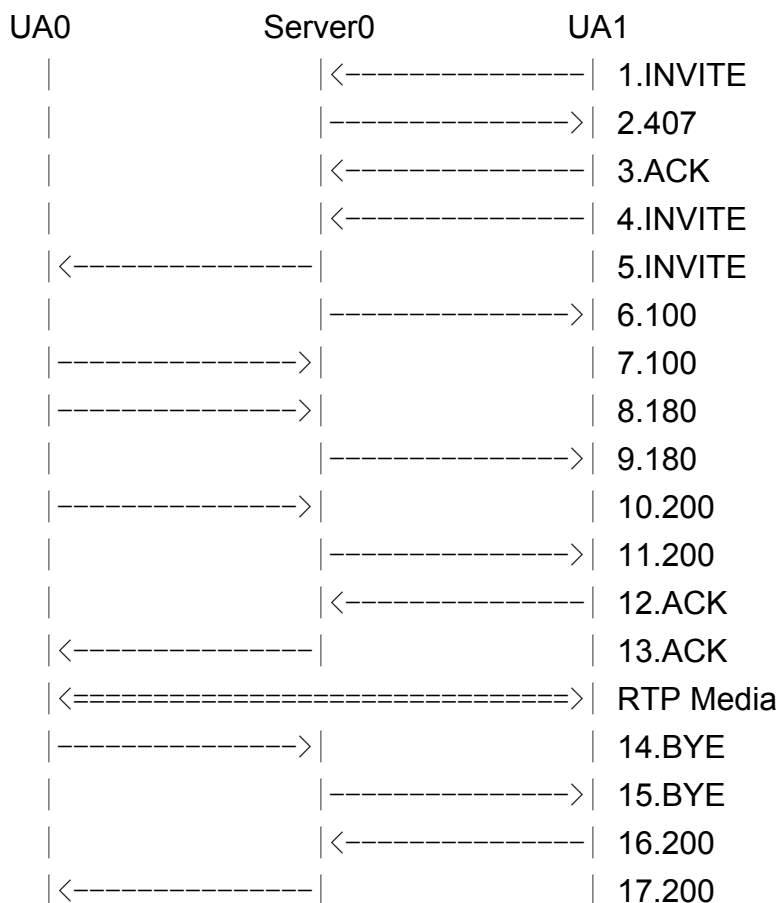
- Send BYE request (to UA1)

- IP address : Must send to Server0 IP address.
- Request-Line : Must be Contact URI. The URI must be the same value in INVITE request.
- From header : Must contain UA0 AoR.
- To header : Must contain UA1 AoR.
- Via header : Must contain UA0 domain name or IP address.

- Receive the final response to BYE request (from UA1).

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1. INVITE UA1-> Server0

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 1 INVITE
Contact: <sip:z3b6tm@[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 server0 -> UA1

```
SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
```



CSeq: 1 INVITE
Proxy-Authenticate: Digest realm="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA1 -> Server0

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

4. INVITE UA1 -> Server0

INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022223333",uri="sip:00022221111@aaa.example.com",
response="6iib19cef56c9a0a3i5aieff23a234",
algorithm=MD5,opaque=""
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip: z3b6tm@[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 Server0 -> UA0

```
INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Max-Forwards: 69
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]
CSeq: 2 INVITE
Contact: <sip: z3b6tm @[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 Server0-> UA0

SIP/2.0 100 Trying

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

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>

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

CSeq: 2 INVITE

Content-Length: 0

7. 100 Trying UA0 -> Server0

SIP/2.0 100 Trying

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

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

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>

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

CSeq: 2 INVITE

Content-Length:0

8. 180 Ringing UA0 -> Server0

SIP/2.0 180 Ringing

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

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

Record-Route:

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

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159



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-Length:0

9. 180 Ringing Server0 -> UA1

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
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-Length:0

10. 200 OK UA0 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
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 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20
```

11. 200 OK Server0 -> UA1

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
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 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
```



a=ptime:20

12. ACK UA1 -> Server0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2
Route: <sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022223333",uri="sip:00022221111@aaa.example.com",
response="6iiib19cef56c9a0a3i5aieff23a234",
algorithm=MD5,opaque=""

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

13. ACK Server0 -> UA0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 69
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

14. BYE UA0 -> Server0



BYE sip: z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff: 5:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route: <sip:ss.example.com;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: 1 BYE
Content-Length: 0

15.BYE Server0 -> UA1

BYE sip: z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff: 5:(InterfaceID)];branch=z9hG4bK4na77gg
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: 1 BYE
Content-Length: 0

16.200 OK UA1-> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff: 5:(InterfaceID)];branch=z9hG4bK4na77gg
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: 1 BYE
Content-Length: 0



17.200 OK Server0-> UA0

SIP/2.0 200 OK

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

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: 1 BYE

Content-Length: 0



3.8. Interop.2.3 - Cancellation of Transmission (UA0: caller case)

[1] Test Number/Title

Interop.2.3

Cancellation of Transmission

[2] Purpose

To verify that an applicant implementation can properly discontinue a session.

[3] Resource Requirement

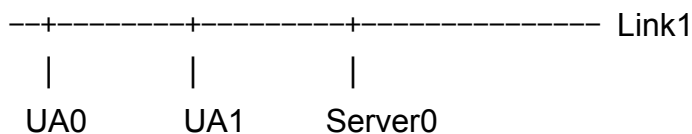
CANCEL function / RFC3261

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 μ -law)
- Server0: A call stateful proxy or a B2BUA
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.
- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.



[5] Test Procedure

1. Call from UA0 to UA1. Wait on UA1. Confirm the ring on UA1 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1
3. Hang up UA0. Confirm the ring stops on UA1.
4. Observe the packet transmitted on Link1

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint Logo]

UA0 : Applicant Implementation

UA1 : Reference User Agent (Any vendor)

Server0 : Target Server (Vendor A/B)

Step 2:

- Send INVITE request (to UA1)

IP address : Must send to Server0 IP address.
Request-Line : Must contain UA1 AoR.
From header : Must contain UA0 AoR.
To header : Must contain UA1 AoR.
Via header : Must contain UA0 domain name or IP address.

Step 4:

- Receive 1XX (ex. 180) response. (from UA1)
- Send CANCEL request (to UA1)

IP address : Must send to Server0 IP address.
Request-Line : Must contain UA1 AoR.
From header : Must contain UA0 AoR.
To header : Must contain UA1 AoR.
Via header : Must contain UA0 domain name or IP address.



- Receive 200 OK to CANCEL request (from UA1)
- Receive 487 Request Terminated (from UA1)
- Send ACK request (to UA1)
 - IP address : Must send to Server0 IP address.
 - From header : Must contain UA 0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.

[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

Step 2:

- Receive INVITE request (from UA0)
- Forward INVITE request (to UA1)

Step 4:

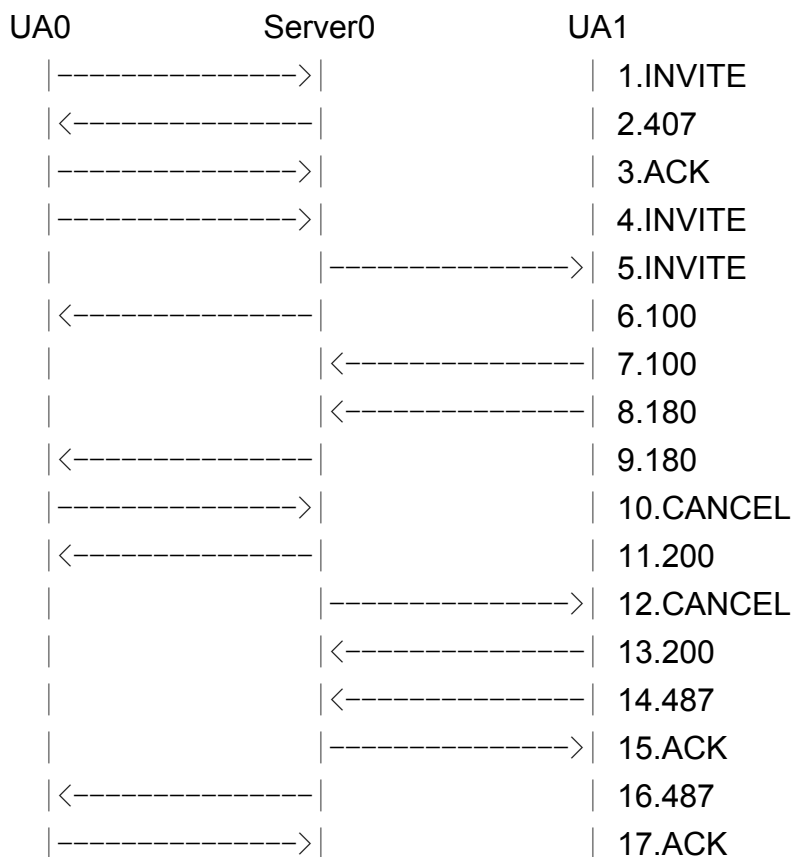
- Receive CANCEL request (from UA0)
- Send 200 OK to CANCEL request (to UA0)
 - IP address : Must send to Terminal A IP address.
 - From header : Must be the same From Header URI (Terminal A AoR) that received as CANCEL request.
 - To header : Must be the same To Header URI (UA0) that received as CANCEL request.
 - Via header : Must be the same value or Via Header URI that received as CANCEL request.
- Forward CANCEL request (to UA1)
- Receive 200 OK to CANCEL request (from UA1)
- Receive 487 Request Terminated (from UA1)
- Send ACK request (to UA1)
- Forward 487 Request Terminated (to UA0)



- Receive ACK request (from UA0)

[7] Reference

[7.1] Message Flow



[7.2] Message Examples

* See Message Examples 1. - 9. in 3.6. Interop.2.1.*

10.CANCEL UA0 -> Server0

```
CANCEL sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

CANCEL sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server0

SIP/2.0 487 Request Terminated

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

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

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

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 487 Request Terminated

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

ACK sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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



3.9. Interop.2.4 - Cancellation of Transmission (UA0: callee case)

[1] Test Number/Title

Interop.2.4

Cancellation of Transmission

[2] Purpose

To verify that an applicant implementation can properly discontinue a session.

[3] Resource Requirement

CANCEL function / 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 μ -law)
- Server0: A call stateful proxy or a B2BUA
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.
- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.



[5] Test Procedure

1. Call from UA1 to UA0. Wait on UA0. Confirm the ring on UA0 and the ring back tone on UA1.
2. Observe the packet transmitted on Link1
3. Hang up UA1. Confirm the ring stops on UA0.
4. Observe the packet transmitted on Link1

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint Logo]

UA0 : Applicant Implementation

UA1 : Reference User Agent (Any vendor)

Server0 : Target Server (Vendor A/B)

Step 2:

- Receive INVITE request (from UA1)
- Send 1XX (ex. 180) response (to UA1)

Step 4:

- Receive CANCEL request (from UA1)
- Send 200 OK to CANCEL request. (to UA1)
 - IP address : Must send to Server0 IP address.
 - From header : Must be the same From Header URI (UA1 AoR) that received as CANCEL request
 - To header : Must be the same To Header URI (UA0 AoR) 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 (to UA1)
 - 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.

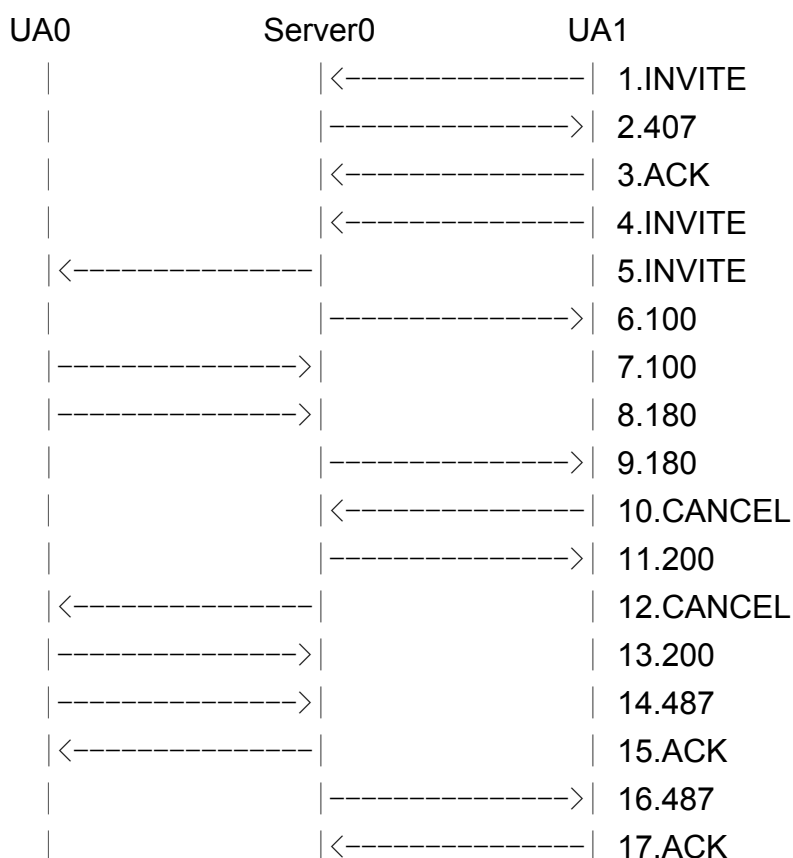
To header : Must be the same To Header URI (UA0) that received as INVITE request.

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

- Receive ACK request. (from UA1)

[7] Reference

[7.1] Message Flow



[7.2] Message Examples

* See Message Examples 1. - 9. in 3.7. Interop.2.2.*

10.CANCEL UA1 -> Server0



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

11.200 OK Server0 -> UA1

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

12.CANCEL Server0 -> UA0

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

13.200 OK UA0 -> Server0



SIP/2.0 200 OK

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

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

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

CSeq: 2 CANCEL

Content-Length: 0

14.487 Request Terminated UA0 -> Server0

SIP/2.0 487 Request Terminated

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

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

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

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

CSeq: 2 INVITE

Content-Length: 0

15.ACK Server0 -> UA0

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

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

Max-Forwards: 70

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

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

CSeq: 2 ACK

Content-Length: 0

16.487 Request Terminated Server0 -> UA1



SIP/2.0 487 Request Terminated

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

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

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

CSeq: 2 INVITE

Content-Length: 0

17.ACK UA1 -> Server0

ACK sip:00022221111@aaa.example.com SIP/2.0

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

Max-Forwards: 70

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

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

CSeq: 2 ACK

Content-Length: 0



3.10. Interop.2.5 - Rejection of Transmission (UA0: caller case)

[1] Test Number/Title

Interop.2.5

Rejection of Transmission

[2] Purpose

To verify that an applicant implementation can properly acknowledge the rejection.

[3] Resource Requirement

Session establishment function / RFC3261

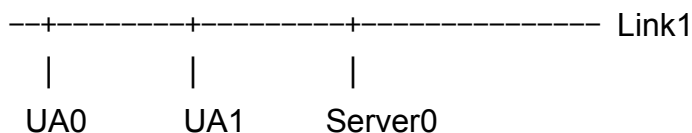
Rejection of transmission / RFC3261

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 μ -law)
- Server0: A call stateful proxy or a B2BUA
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.
- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.



[5] Test Procedure

1. Call from UA0 to UA1.
2. Observe the packet transmitted on Link1.
3. Reject the call from UA0 on UA1. Confirm busy tone on UA0.
4. Observe the packet transmitted on Link1.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint Logo]

UA0 : Applicant Implementation

UA1 : Reference User Agent (Any vendor)

Server0 : Target Server (Vendor A/B)

Step 2:

- Send INVITE request (to UA1).

IP address : Must send to Server0 IP address.
Request-Line : Must contain UA1 AoR
From header : Must contain UA0 AoR.
To header : Must contain UA1 AoR.
Via header : Must contain UA0 domain name or IP address.

Step 4:

- Receive 4XX/6XX response (from UA1)
Must receive 480 or 486 (or any 4xx) or 603 response
- Send ACK request (to UA1)
IP address : Must send to Server0 IP address.
From header : Must contain UA0 AoR.
To header : Must contain UA1 AoR.



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

[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

Step 2:

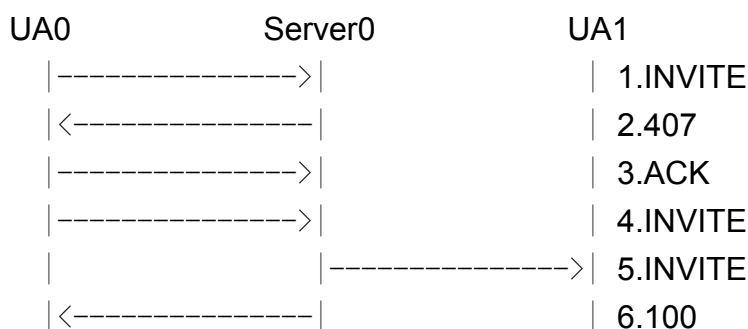
- Receive INVITE request (from UA0)
- Forward INVITE request (to UA1)

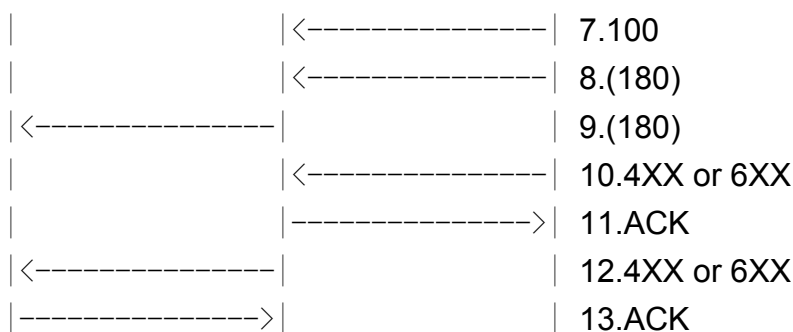
Step 4:

- Receive 4XX or 6XX response (from UA1)
- Send ACK request (to UA1)
 - IP address : Must send to UA1 IP address.
 - From header : Must contain UA0 AoR
 - To header : Must contain UA1 AoR.
 - Via header : Must be the same value of Via header field that received as 4XX or 6XX response.
- Forward 4XX or 6XX response (to UA0)
- Receive ACK request (from UA0)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

* See Message Examples 1. - 9. in "3.6. Interop.2.1".

10. 480 Temporarily Unavailable UA1 -> Server0

SIP/2.0 480 Temporarily Unavailable

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

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

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

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 480 Temporarily Unavailable

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

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

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



3.11. Interop.2.6 - Rejection of Transmission (UA0: callee case)

[1] Test Number/Title

Interop.2.6

Rejection of Transmission

[2] Purpose

To verify that an applicant implementation can properly acknowledge the rejection.

[3] Resource Requirement

Session establishment function / RFC3261

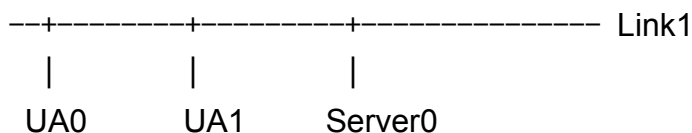
Rejection of transmission / RFC3261

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 μ -law)
- Server0: A call stateful proxy or a B2BUA
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.
- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.



[5] Test Procedure

1. Call from UA1 to UA0.
2. Observe the packet transmitted on Link1.
3. Reject the call from UA1 on UA0. Confirm busy tone on UA1.
4. Observe the packet transmitted on Link1.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint Logo]

UA0 : Applicant Implementation

UA1 : Reference User Agent (Any vendor)

Server0 : Target Server (Vendor A/B)

Step 2:

- Receive INVITE request. (from UA1)

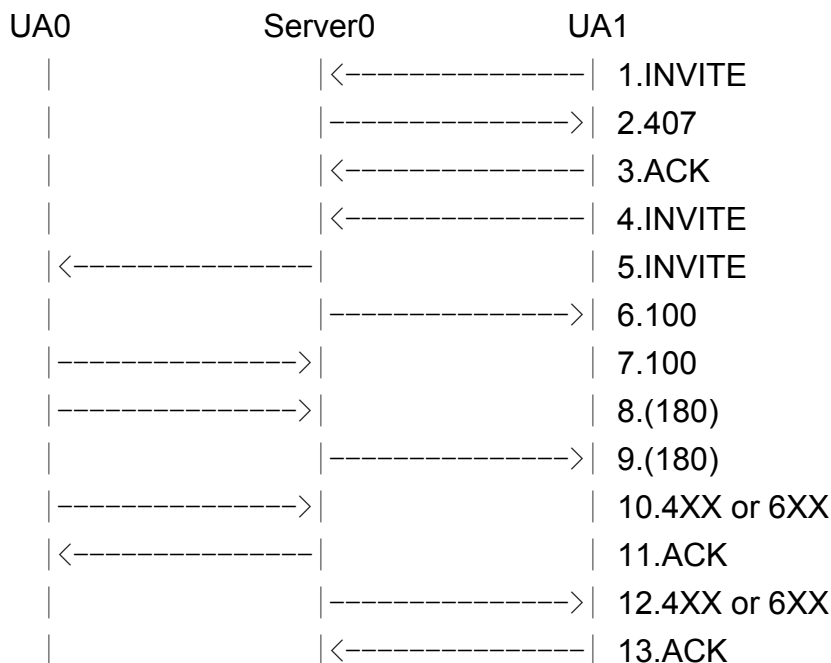
Step 4:

- Send 4XX or 6XX response to INVITE request (to UA1)
 - Must send 480 or 486 (or any 4xx) or 603 response
 - IP address : Must send to Server0 IP address.
 - From header : Must be the same From Header URI (UA0 AoR) that received as INVITE request.
 - To header : Must be the same To Header URI(UA1) 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 request. (from UA1)



[7] Reference

[7.1] Message Flow



[7.2] Message Examples

* See Message Examples 1. - 9. in "3.7. Interop.2.2".

10. 480 Temporarily Unavailable UA0 -> Server0

SIP/2.0 480 Temporarily Unavailable

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

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

From: <sip:00022223333@bbb.example.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

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

CSeq: 2 INVITE

Content-Length: 0



11.ACK Server0 -> UA0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Max-Forwards: 70
From: <sip:00022223333@bbb.example.com>;tag=a6c85cf
To<sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

12. 480 Temporarily Unavailable Server0 -> UA0

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

13.ACK UA0 -> Server0

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



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 μ -law)
- Server0: A call stateful proxy or a B2BUA
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.



- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link1.
5. Suspend the line on UA1. Confirm that neither UA0 nor UA1 can hear any sound (except on-hold tone) or voice from the other.
6. Observe the packet transmitted on Link1.
7. Release the hold on UA1. Confirm that both UA0 and UA1 hear any voice from the other.
8. Observe the packet transmitted on Link1.
9. Hang up UA1. Confirm the line is disconnected on UA0.
10. Observe the packet transmitted on Link1.
11. Hang up UA0.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint Logo]

UA0: Applicant Implementation

UA1: Reference User Agent (Any vendor)

Server0: Target Server (Vendor A/B)

Step 2:

- Send INVITE request. (to UA1)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must contain UA1 AoR.



From header : Must contain UA0 AoR.
To header : Must contain UA1 AoR.
Via header : Must contain UA0 domain name or IP address.

Step 4:

- Receive 200 OK response (from UA1)
- Send ACK request. (to UA1)

IP address : Must send to Server0 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 UA1 AoR.
Via header : Must contain UA0 domain name or IP address.

Step 6:

- Receive re-INVITE (Hold on) request (from UA1)
- Send 200 OK to re-INVITE (Hold on) request. (to UA1)

IP address : Must send to Server0 IP address.
From header : Must be the same From header URI(UA1 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 request (from UA1)

Step 8:

- Receive Re- INVITE (Hold release) request (from UA1)
- Send 200 OK to re-INVITE(Hold release) request (to UA1)

IP address : Must send to Server0 IP address.
From header : Must be the same From Header URI (UA1 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 request (from UA1)

Step 10:

- Receive BYE request (from UA1)
- Send the final response 200 OK to the BYE request. (to UA1)

IP address : Must send to Server0 IP address.

From header : Must be the same From Header URI (UA1 AoR) that received as BYE request.

To header : Must contain UA0 AoR.

Via header : Must contain UA1 domain name or IP address.

[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

Step 2:

- Receive INVITE request (from UA0)
- Forward INVITE request (to UA1)

Step 4:

- Receive 200 OK to INVITE request (from UA1)
- Forward 200 OK to INVITE request (to UA0)
- Receive ACK request (from UA0)
- Forward ACK request (to UA1)

Step 6:



- Receive re-INVITE (Hold on) request (from UA1)
- Forward re-INVITE (Hold on) request (to UA0)
- Receive 200 OK to re-INVITE request (from UA0)
- Forward 200 OK to re-INVITE request (to UA1)

- Receive ACK request (from UA1)
- Forward ACK request (to UA0)

Step 8:

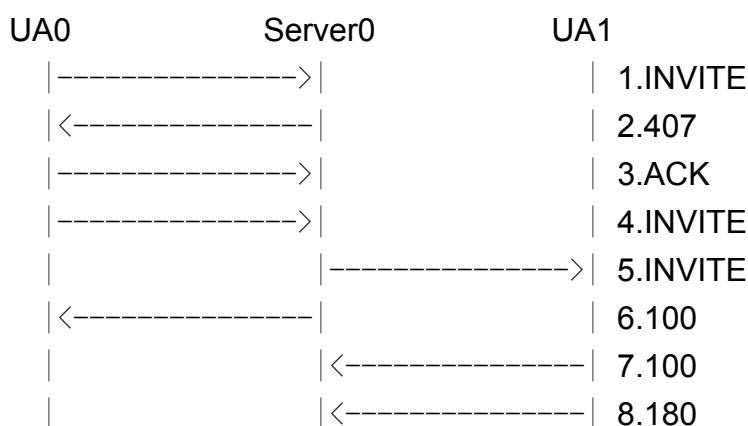
- Receive re-INVITE (Hold release) request (from UA1)
- Forward re-INVITE (Hold release) request (to UA0)
- Receive 200 OK to re-INVITE request (from UA0)
- Forward 200 OK to re-INVITE request (to UA1)
- Receive ACK request (from UA1)
- Forward ACK request (to UA0)

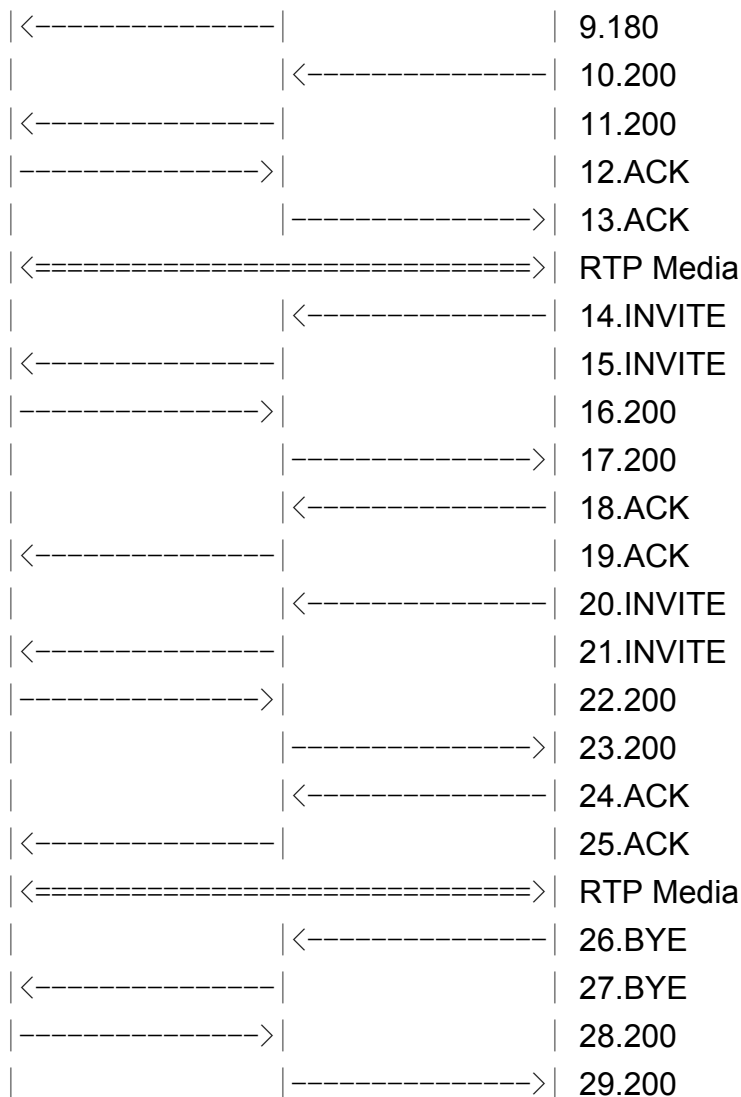
Step 10:

- Receive BYE request (from UA1)
- Forward BYE request (to UA0)
- Receive re-200 OK to BYE request (from UA0)
- Forward re-200 OK to BYE request (to UA1)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

* See Message Examples “1. - 13. ” in 3.6. Interop.2.1

14.INVITE UA1 -> Server0

```
INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggu
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
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 Server0 -> UA0

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bs
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
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 UA0 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bs
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggw
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
Content-Type: application/sdp
Content-Length: 0

19.ACK Server0 -> UA0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bt
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
Content-Type: application/sdp
Content-Length: 0

20.INVITE UA1 -> Server0

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggx
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
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 Server0 -> UA0

```
INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bu
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
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 UA0 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bu
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via:SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggy
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
Content-Type: application/sdp
Content-Length: 0

25.ACK Server0 -> UA0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bv



Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
Content-Type: application/sdp
Content-Length: 0

“26. – 29.” are omitted.

*See Message Examples “14. - 17. ” in 3.6. Interop.2.1



3.13. Interop.2.8 - Session Hold and Hold Release (Sending re-INVITE)

[1] Test Number/Title

Interop.2.8

Session Hold and Hold Release

[2] Purpose

To verify that an applicant implementation can properly perform the originated and terminated call hold and resume.

[3] Resource Requirement

Session establishment, disconnection and re-INVITE function / RFC3261

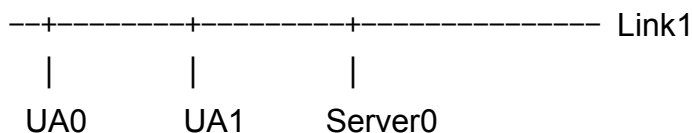
Media exchange (SDP), hold and hold release / RFC3264, RFC4566

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, 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 μ -law)
- Server0: A call stateful proxy or a B2BUA
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.



- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA1 to UA0. Confirm the ring on UA0 and the ring back tone on UA1.
2. Observe the packet transmitted on Link1
3. Answer the call on UA0. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link1.
5. Suspend the line on UA0. Confirm that neither UA0 nor UA1 can hear any sound (except on-hold tone) or voice from the other.
6. Observe the packet transmitted on Link1.
7. Release the hold on UA0. Confirm that both UA0 and UA1 hear any voice from the other.
8. Observe the packet transmitted on Link1.
9. Hang up UA0. Confirm the line is disconnected on UA1.
10. Observe the packet transmitted on Link1.
11. Hang up UA1.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint Logo]

UA0: Applicant Implementation

UA1: Reference User Agent (Any vendor)

Server0: Target Server (Vendor A/B)

Step 2:

- Recieve INVITE request (from UA1)

Step 4:



- Send 200 OK (to UA1)

- IP address : Must send to Server0 IP address.
- From header : Must be the same From header URI(UA1 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 request (from UA1)

Step 6:

- Send re-INVITE(Hold on) request (to UA1)

- IP address : Must send to Server0 IP address.
- Request-Line : Must be UA1 Contact URI. The URI must be the same value INVITE request.
- From header : Must contain UA0 AoR.
- To header : Must contain UA1 AoR.
- Via header : Must contain UA0 domain name or IP address.

- Receive 200 OK to re-INVITE(Hold on) request. (from UA1)

- Send ACK request (to UA1)

- IP address : Must send to Server0 IP address.
- Request-Line : Must be UA1 Contact URI. The URI must be the same value INVITE request.
- From header : Must contain UA0 AoR.
- To header : Must contain UA1 AoR.
- Via header : Must contain UA0 domain name or IP address.

Step 8:

- Send Re-INVITE (Hold release) request (to UA1)

- IP address : Must send to Server0 IP address.
- Request-Line : Must be UA1 Contact URI. The URI must be the same value



INVITE request.

- From header : Must contain UA0 AoR.
- To header : Must contain UA1 AoR.
- Via header : Must contain UA0 domain name or IP address.

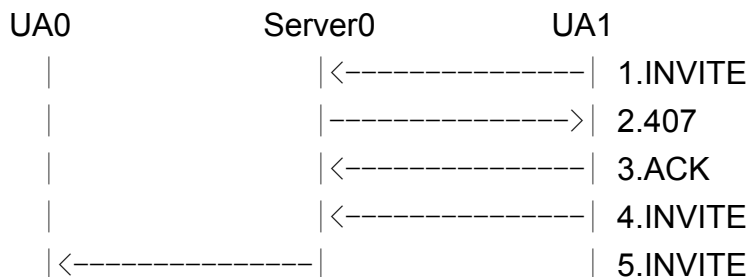
- Receive 200 OK to re-INVITE(Hold release) request. (from UA1)
- Send ACK request (to UA1)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must be UA1 Contact URI. The URI must be the same value INVITE request.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.

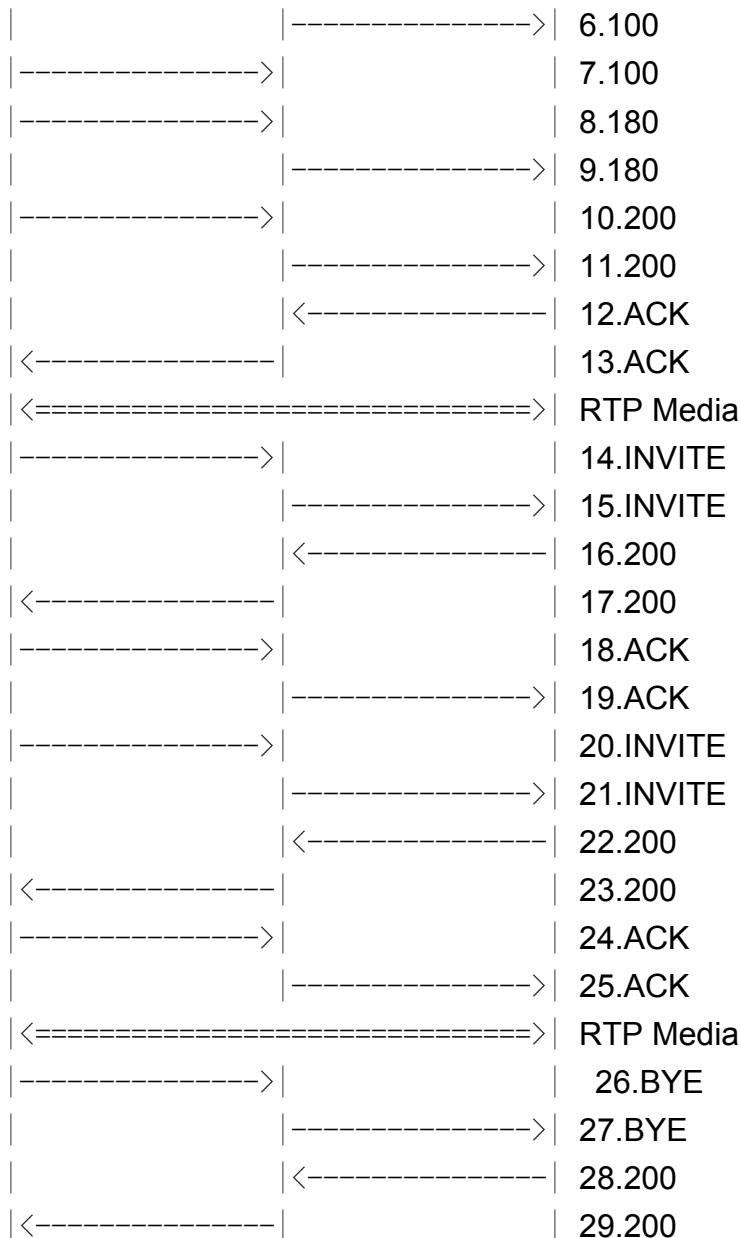
Step 10:

- Send BYE request (to UA1)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must be UA1 Contact URI. The URI must be the same value iINVITE request.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.
- Receive 200 OK to BYE response (from UA1)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

* See Message Examples “1. - 13. ” in 3.7. Interop.2.2

14.INVITE UA0 -> Server0

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



Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggu
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
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 Server0 -> UA1

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bs
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
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 UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bs
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggu
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
Content-Type: application/sdp
Content-Length: 0

19.ACK Server0 -> UA1

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bt
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
Content-Type: application/sdp
Content-Length: 0

20.INVITE UA0 -> Server0

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggw
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
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 Server0 -> UA1

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bu
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
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 UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bu
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via:SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggy
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
Content-Type: application/sdp
Content-Length: 0

25.ACK Server0 -> UA1



ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bv
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
Content-Type: application/sdp
Content-Length: 0

“26. – 29.” are omitted.

*See Message Examples “14. - 17. ” in 3.7. Interop.2.2



3.14. Interop.2.9 – Forking / Multiple Responses case1

[1] Test Number/Title

Interop.2.9

Forking / Multiple Responses case1

[2] Purpose

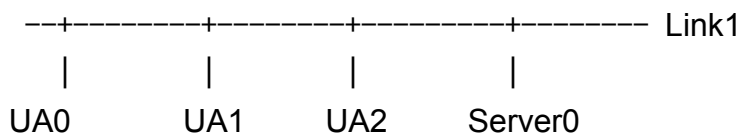
To verify that an applicant implementation can properly distinguish multiple dialog IDs.

[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



- 3 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	00022223333@bbb.example.com
Server0	ss.example.com

[4.3] Test Conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio (G.711 μ -law)
- Server0: 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.
- Register UA0, UA1 and UA2 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set the same telephone number (AoR) the UA1 and UA2.
- Set the different Contact URI the UA1 and UA2.
- Set UA1 and UA2 for sending 180 response to INVITE.
- Set Server0 as an outbound proxy of UA0, UA1 and UA2.



- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1 and UA2 (the same telephone number (AoR)). Confirm the ring on UA1 and UA2 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1.
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1 and the ringing stopped on UA2.
 - * Important: Confirm that UA0 received 180 response from UA1 earlier than receive 180 response from UA2.
4. Observe the packet transmitted on Link1.
5. Hang up UA1. Confirm the line is disconnected on UA0.
6. Observe the packet transmitted on Link1.
7. Hang up UA0.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint / Back-to-Back User Agent Logo]

UA0: Applicant Implementation

UA1: Reference User Agent (Any vendor)

UA2: Reference User Agent (Any vendor)

Server0: Target Server (Vendor A/B)

Step 2:

- Send INVITE request (to UA1)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must contain UA1 AoR
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.



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

Step 4:

- Receive 180 Ringing sent by UA1 (from Server0)
- Receive 180 Ringing sent by UA2 (from Server0)
- Receive 200 OK sent by UA1 (from Server0)
- Send ACK request (to UA1)

IP address : Must send to Server0 IP address.

Request-Line : Must be UA1 Contact URI. The URI must be the same value as the 200 OK response to INVITE request.

From header : Must contain UA0 AoR.

To header : Must contain UA1 AoR.

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

Step 6:

- Receive BYE request (from UA1)
- Send 200 OK to BYE request.(to UA1)

IP address : Must send to Server0 IP address.

From header : Must be the same From header URI (UA1 AoR) that is received as BYE request.

To header : Must contain UA0 AoR.

Via header : Must contain UA1 domain name or IP address.

[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

UA2: Reference User Agent (Any vendor)

Step 2:

- Receive INVITE request (from UA0)



- Forward INVITE request (to UA1)
- Forward INVITE request (to UA2)

Step 4:

- Receive 180 response to INVITE request (from UA1)
- Forward 180 response to INVITE request (to UA0)
- Receive 180 response to INVITE request (from UA2)
- Forward 180 response to INVITE request (to UA0)
- Receive 200 to INVITE request (from UA1)
- Forward 200 to INVITE request (to UA0)
- Send CANCEL request (to UA2)
 - IP address : Must send to UA2 IP address.
 - Request-Line : Must contain UA2 Contact Address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.
- Receive 200 OK to CANCEL request (from UA1)
- Receive 487 Request Terminated (from UA1)
- Send ACK request (to UA2)
 - IP address : Must send to UA2 IP address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.
- Receive ACK request (from UA1)
- Forward ACK request (to UA0)

Step 6:

- Receive BYE request (from UA1)
- Forward BYE request (to UA0)
- Receive 200 OK to BYE request (from UA0)
- Forward 200 OK to BYE request (to UA1)



[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Reference User Agent (Any vendor)

UA2: Target User Agent (Vendor A/B)

Step 2:

- Receive INVITE request (from UA0)
- Forward INVITE request (to UA1)
- Forward INVITE request (to UA2)
- Receive 200 OK to INVITE request (from UA2)
- Forward 200 OK to INVITE request (to UA0)

Step 4:

- Send CANCEL request (to UA1)
 - IP address : Must send to UA1 IP address.
 - Request-Line : Must contain UA1 Contact Address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.

- Receive 200 OK to CANCEL (from UA1)
- Receive 487 Request Terminated (from UA1)
- Send ACK request (to UA1)
 - IP address : Must send to UA1 IP address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.

- Receive ACK request (from UA0)
- Forward ACK request (to UA1)

Step 6:

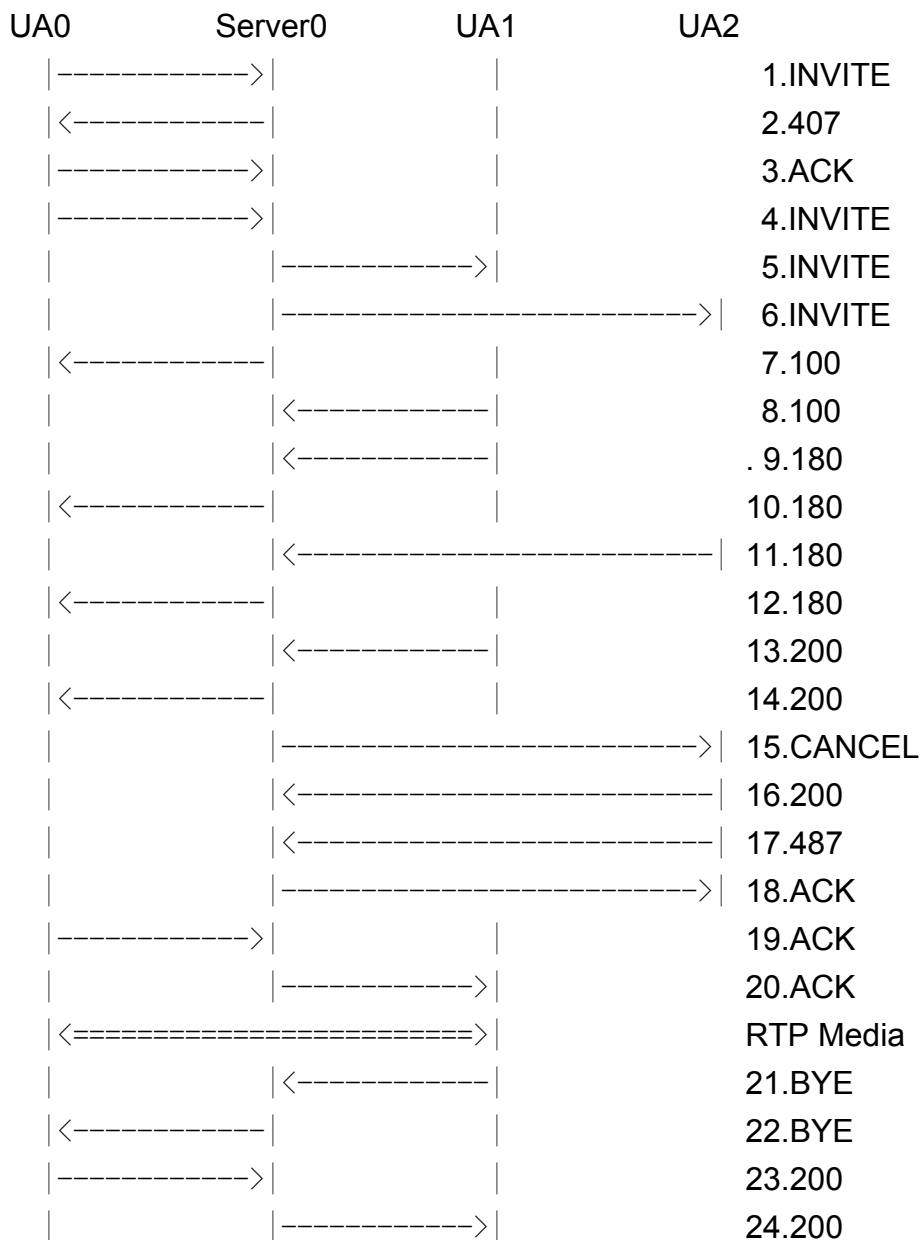
- Receive BYE request (from UA1)
- Forward BYE request (to UA0)



- Receive 200 OK to BYE request (from UA0)
- Forward 200 OK to BYE request (to UA1)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1. INVITE UA0 -> Server0

```
INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

```
SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
```



domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA0 -> Server0

ACK sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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 Server0 -> UA1

INVITE sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
 <sip:ss.example.com;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 Server0 -> UA2

```
INVITE sip:z3b7am@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77i
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
  <sip:ss.example.com;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 Server0 -> UA1

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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. 100 Trying UA1 -> Server0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

9. 180 Ringing UA1 -> Server0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
 <sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

10. 180 Ringing Server0 -> UA0

SIP/2.0 180 Ringing



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

Record-Route:

<sip:ss.example.com;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)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

11. 180 Ringing UA2 -> Server0

SIP/2.0 180 Ringing

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

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

Record-Route:

<sip:ss.example.com;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)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

12. 180 Ringing Server0 -> UA0

SIP/2.0 180 Ringing

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

Record-Route:

<sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

13. 200 OK UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
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. 200 OK Server0 -> UA0



SIP/2.0 200 OK

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

Record-Route:

<sip:ss.example.com;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)]>

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

15.CANCEL Server0 -> UA2

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

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

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



16.200 OK UA2 -> Server0

SIP/2.0 200 OK

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

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

17. 487 Request Terminated UA2 -> Server0

SIP/2.0 487 Request Terminated

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

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

18.ACK Server0 -> UA2

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

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

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

19. ACK UA0 -> Server0

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK6na77v
Route: <sip:ss.example.com;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

20. ACK Server0-> UA1

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

21. BYE UA1 -> Server0

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK7na77q
Max-Forwards: 70



Route: <sip:ss.example.com;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

22.BYE Server0 -> UA1

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

23.200 OK UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

24.200 OK Server0 -> UA



SIP/2.0 200 OK

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



3.15. Interop.2.10 – Forking / Multiple Responses case2

[1] Test Number/Title

Interop.2.10

Forking / Multiple Responses case2

[2] Purpose

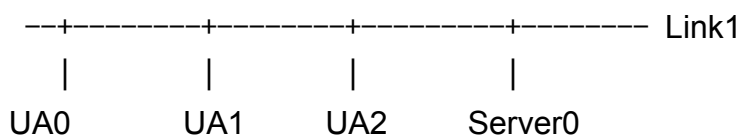
To verify that an applicant implementation can properly distinguish multiple dialog IDs.

[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



- 3 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	00022223333@bbb.example.com
Server0	ss.example.com

[4.3] Test Conditions

- IP network: IPv6
- SIP transport protocol: UDP
- Media: audio (G.711 μ -law)
- Server0: 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.
- Register UA0, UA1 and UA2 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set the same telephone number (AoR) the UA1 and UA2.
- Set the different Contact URI the UA1 and UA2.
- Set UA1 and UA2 for sending 180 response to INVITE.
- Set Server0 as an outbound proxy of UA0, UA1 and UA2.



- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1 and UA2 (the same telephone number (AoR)). Confirm the ring on UA1 and UA2 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1.
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1 and the ringing stopped on UA2.
 - * Important: Confirm that UA0 received 180 response from UA1 later than receive 180 response from UA2.
4. Observe the packet transmitted on Link1.
5. Hang up UA1. Confirm the line is disconnected on UA0.
6. Observe the packet transmitted on Link1.
7. Hang up UA0.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint / Back-to-Back User Agent Logo]

UA0: Applicant Implementation

UA1: Reference User Agent (Any vendor)

UA2: Reference User Agent (Any vendor)

Server0: Target Server (Vendor A/B)

Step 2:

- Send INVITE request. (to UA1)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must contain UA1 AoR
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.



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

Step 4:

- Receive 180 Ringing sent by UA2 (from Server0)
- Receive 180 Ringing sent by UA1 (from Server0)
- Receive 200 OK sent by UA1 (from Server0)
- Send ACK request (to UA1)

IP address : Must send to Server0 IP address.

Request-Line : Must be UA1 Contact URI. The URI must be the same value as the 200 OK response to INVITE request.

From header : Must contain UA0 AoR.

To header : Must contain UA1 AoR.

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

Step 6:

- Receive BYE request (from UA1)
- Send 200 OK to BYE request. (to UA0)

IP address : Must send to Server0 IP address.

From header : Must be the same From header URI (UA1 AoR) that is received as BYE request.

To header : Must contain UA0 AoR.

Via header : Must contain UA1 domain name or IP address.

[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

UA2: Reference User Agent (Any vendor)

Step 2:

- Receive INVITE request (from UA0)



- Forward INVITE request (to UA1)
- Forward INVITE request (to UA2)

Step 4:

- Receive 180 response to INVITE request (from UA2)
- Forward 180 response to INVITE request (to UA0)
- Receive 180 response to INVITE request (from UA1)
- Forward 180 response to INVITE request (to UA0)
- Receive 200 to INVITE request (from UA1)
- Forward 200 to INVITE request (to UA0)
- Send CANCEL request (to UA2)
 - IP address : Must send to UA2 IP address.
 - Request-Line : Must contain UA2 Contact Address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.
- Receive 200 OK to CANCEL request (from UA2)
- Receive 487 Request Terminated (from UA2)
- Send ACK request (to UA2)
 - IP address : Must send to UA2 IP address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.
- Receive ACK request (from UA0)
- Forward ACK request (from UA1)

Step 6:

- Receive BYE request (from UA1)
- Forward BYE request (to UA0)
- Receive 200 OK to BYE request (from UA0)
- Forward 200 OK to BYE request (to UA1)



[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Reference User Agent (Any vendor)

UA2: Target User Agent (Vendor A/B)

Step 2:

- Receive INVITE request (from UA 0)
- Forward INVITE request (to UA1)
- Forward INVITE request (to UA2)
- Receive 200 OK to INVITE request (from UA2)
- Forward 200 OK to INVITE request (to UA0)

Step 4:

- Send CANCEL request (to UA2)
 - IP address : Must send to UA1 IP address.
 - Request-Line : Must contain UA1 Contact Address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.
- Receive 200 OK to CANCEL (from UA2)
- Receive 487 Request Terminated (from UA2)
- Send ACK request (to UA1)
 - IP address : Must send to UA1 IP address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.
- Receive ACK request (from UA0)
- Forward ACK request (to UA1)

Step 6:

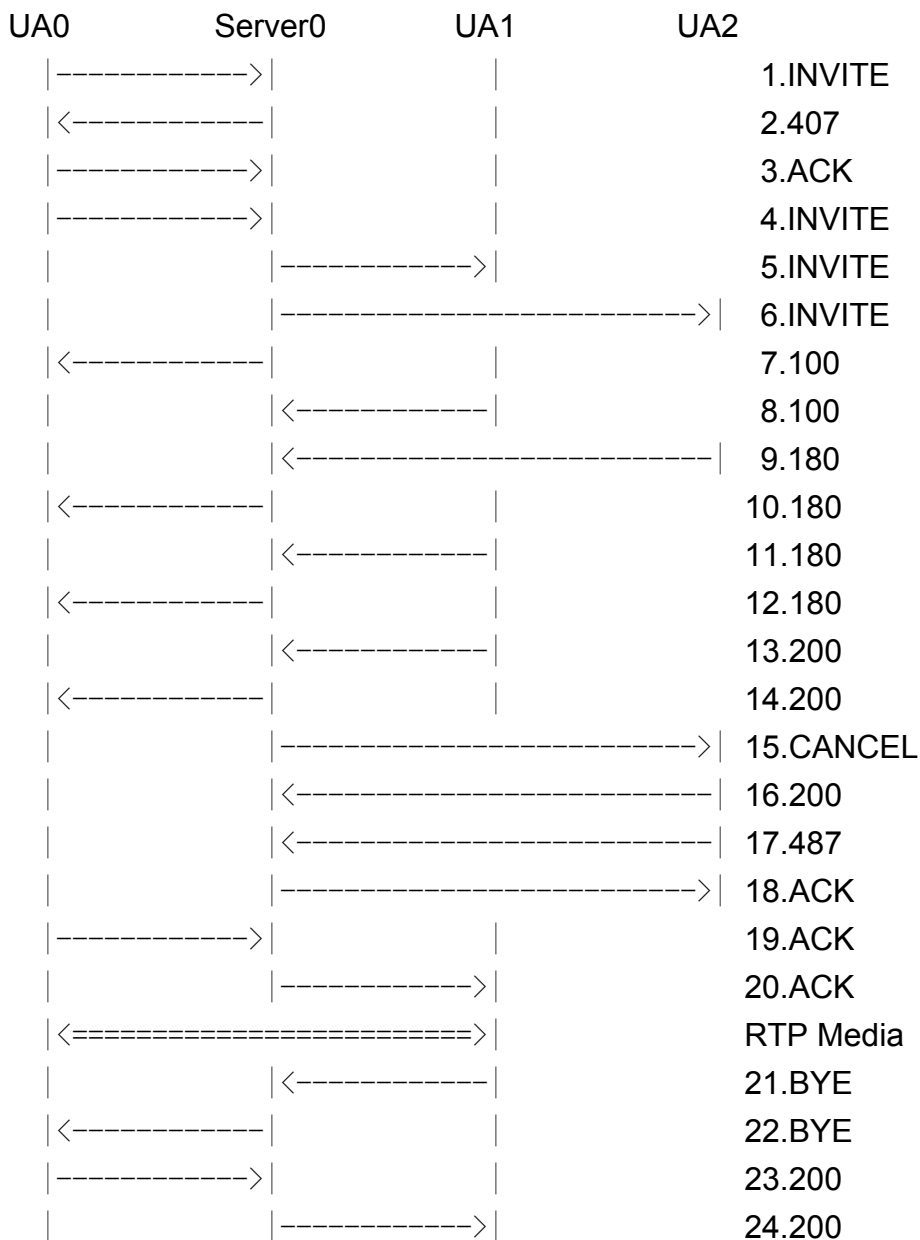
- Receive BYE request (from UA1)
- Forward BYE request (to UA0)



- Receive 200 OK to BYE request (from UA0)
- Forward 200 OK to BYE request (to UA1)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1. INVITE UA0 -> Server0

```
INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

```
SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

ACK sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

INVITE sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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 Server0 -> UA2

```
INVITE sip:z3b7am@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77i
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
  <sip:ss.example.com;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 Server0 -> UA1

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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. 100 Trying UA1 -> Server0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

9. 180 Ringing UA2 -> Server0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77i
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
 <sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

10. 180 Ringing Server0 -> UA0

SIP/2.0 180 Ringing



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

Record-Route:

<sip:ss.example.com;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)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

11. 180 Ringing UA1 -> Server0

SIP/2.0 180 Ringing

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

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

Record-Route:

<sip:ss.example.com;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)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

12. 180 Ringing Server0 -> UA0

SIP/2.0 180 Ringing

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

Record-Route:

<sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

13. 200 OK UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
 <sip:ss.example.com;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)]>
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. 200 OK Server0 -> UA0



SIP/2.0 200 OK

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

Record-Route:

<sip:ss.example.com;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)]>

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

15.CANCEL Server0 -> UA2

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

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

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



16.200 OK UA2 -> Server0

SIP/2.0 200 OK

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

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

17. 487 Request Terminated UA2 -> Server0

SIP/2.0 487 Request Terminated

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

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

18.ACK Server0 -> UA2

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

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

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

19. ACK UA0 -> Server0

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK6na77v
Route: <sip:ss.example.com;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

20. ACK Server0-> UA1

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

21. BYE UA1 -> Server0

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK7na77q
Max-Forwards: 70



Route: <sip:ss.example.com;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

22.BYE Server0 -> UA1

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

23.200 OK UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

24.200 OK Server0 -> UA



SIP/2.0 200 OK

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



3.16. Interop.2.11 - OPTIONS Proceeding (sending OPTIONS)

[1] Test Number/Title

Interop.2.11

OPTIONS Proceeding

[2] Purpose

To verify that an applicant implementation can properly confirm the terminated device ability with OPTIONS request.

[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 μ -law)
- Server0: call stateful proxy or B2BUA

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.
- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Send OPTIONS request from UA0 to UA1.
2. Observe the packet transmitted on Link1

[6] Observable Results



Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint / Back-to-Back User Agent Logo]

UA0: Applicant Implementation

UA1: Reference User Agent (Any vendor)

Server0: Target Server (Vendor A/B)

Step 2:

- Send OPTIONS request. (to UA1)
 - IP address : Must send to Server0IP address.
 - Request-Line : Must contain UA1 AoR.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain UA0 domain name or IP address.

- Receive 200 OK to OPTIONS request (from UA1)

[Proxy Logo]

Server0: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

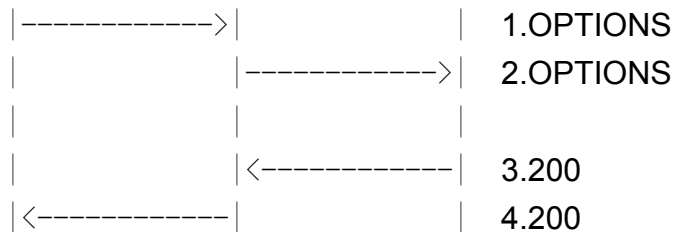
Step 2:

- Receive OPTIONS request. (from UA0)
- Forward OPTIONS request. (to UA1)
- Receive 200 OK to OPTIONS request. (from UA1)
- Forward 200 OK to OPTIONS request from UA1 to UA0. (to UA0)

[7] Reference

[7.1] Message Flow

UA0 Server0 UA1



[7.2] Message Examples

1.OPTIONS UA0 -> Server0

```
OPTIONS sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

```
OPTIONS sip:z3b6tm@[3ffe:501:ffff:1:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77a
Record-Route:
<sip:ss.example.com;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 UA1 -> Server0

SIP/2.0 200 OK

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

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

Record-Route:

<sip:ss.example.com;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)]>

Allow: ACK,BYE,CANCEL,INVITE,OPTIONS

Accept: application/sdp

Content-Length: 0

4. 200 OK Server0 -> UA0

SIP/2.0 200 OK

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

Record-Route:

<sip:ss.example.com;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)]>

Allow: ACK,BYE,CANCEL,INVITE,OPTIONS

Accept: application/sdp

Accept-Language: en



Content-Length: 0



3.17. Interop.2.12 - OPTIONS Proceeding (receiving OPTIONS)

[1] Test Number/Title

Interop.2.12

OPTIONS Proceeding

[2] Purpose

To verify that an applicant implementation can properly confirm the terminated device ability with OPTIONS request.

[3] Resource Requirement

OPTIONS function

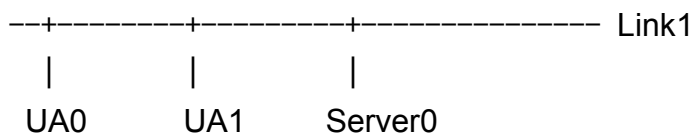
/ RFC3261

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 μ -law)
- Server0: call stateful proxy or B2BUA

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set Server0 as an outbound proxy of UA0 and UA1.
- Confirm no call remains on Server0. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

3. Send OPTIONS request from UA0 to UA1.
4. Observe the packet transmitted on Link1

[6] Observable Results



Applicable “Observable Results” are different depends on the type of applicant implementation.

[User Agent / Endpoint / Back-to-Back User Agent Logo]

UA0: Applicant Implementation

UA1: Reference User Agent (Any vendor)

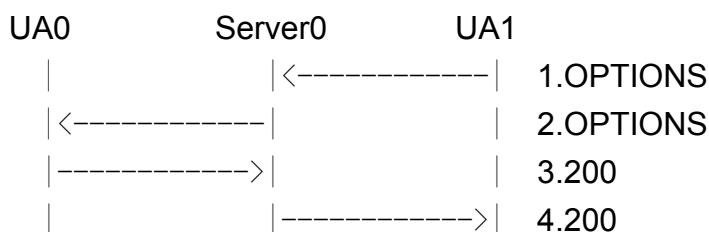
Server0: Target Server (Vendor A/B)

Step 2:

- Recieve OPTIONS request (from UA1)
- Send 200 OK to OPTIONS request. (to UA1)
- IP address : Must send to Server0 IP address.
- From header : Must be the same From header URI(UA1 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.

[7] Reference

[7.1] Message Flow



[7.2] Message Examples

1.OPTIONS UA1 -> Server0



OPTIONS sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: < sip:00022223333@bbb.example.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]
CSeq: 2 OPTIONS
Contact: < sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] >
Allow: ACK,BYE,CANCEL,INVITE,OPTIONS
Content-Length: 0

2. OPTIONS Server0 -> UA0

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

3. 200 OK UA0 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77f
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77a
Record-Route:
< sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr >



From: < sip:00022223333@bbb.example.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 OPTIONS
Contact: < sip:y3a6sn@[3ffe:501:ffff:1:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE,OPTIONS
Accept: application/sdp
Content-Length: 0

4. 200 OK Server0 -> UA1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77a
Record-Route:
 < sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
From: < sip:00022223333@bbb.example.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 OPTIONS
Contact: < sip:y3a6sn@[3ffe:501:ffff:1:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE,OPTIONS
Accept: application/sdp
Accept-Language: en
Content-Length: 0



3.18. Interop.2.13 - Session Establishment and Disconnection with 2 proxies (Server0: Caller side)

[1] Test Number/Title

Interop.2.13

Session Establishment and Disconnection

[2] Purpose

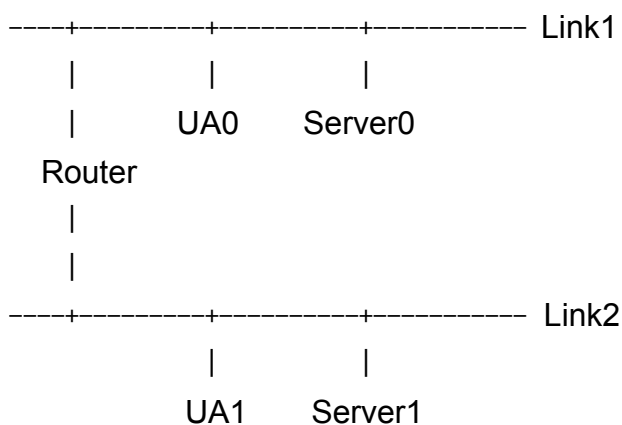
To verify that an applicant implementation can properly perform the session establishment, voice transmission and disconnection via 2 proxies.

[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
Link1	3ffe:501:ffff:5::/64	UA0, Server0
Link2	3ffe:501:ffff:50::/64	UA1, Server1

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)
Server1	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
Server1	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 μ -law)
- Server1: 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.
- Register UA0 to registrar of Link1 domain for using location service.
(Connect a registrar server to Link1, if necessary.)
- Register UA1 to registrar of Link2 domain for using location service.
(Connect a registrar server to Link2, if necessary.)
- Set Server0 as an outbound proxy of UA0.
- Set Server1 as an outbound proxy of UA1.
- Set Server0 and Server1 so that when these receive a message containing SIP-URI, which is not under control of these, the message is forwarded to another server.
- Confirm no call remain on neither Server0 nor Server1. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0
2. Observe the packet transmitted on Link1 and Link2
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link1 and Link2
5. Hang up UA1. Confirm the line is disconnected on UA0.
6. Observe the packet transmitted on Link1 and Link2
7. Hang up UA0.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.



[Proxy Logo]

Server0: Applicant Implementation

Server1: Target Proxy server (Vendor C/D)

UA0: Target User Agent (Vendor A/B)

UA1: Reference User Agent (any Vendor)

Step 2:

- Receive INVITE request (from UA0)
- Forward INVITE request (to Server1)

Step 4:

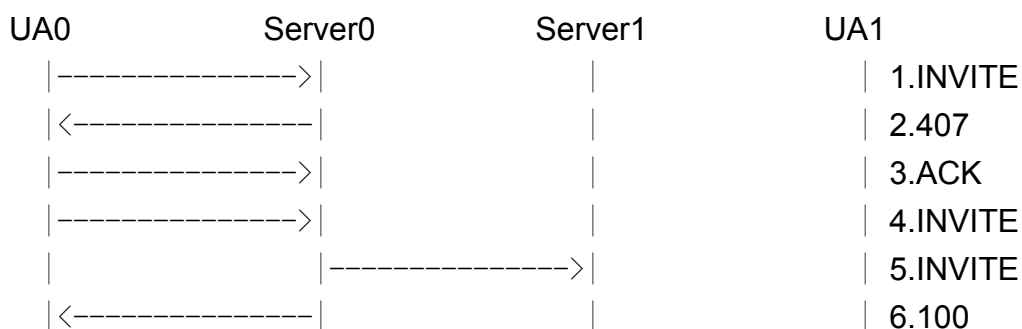
- Receive 200 OK to INVITE request (from Server1)
- Forward 200 OK (to UA0)
- Receive ACK request (from UA0)
- Forward ACK request (to Server1)

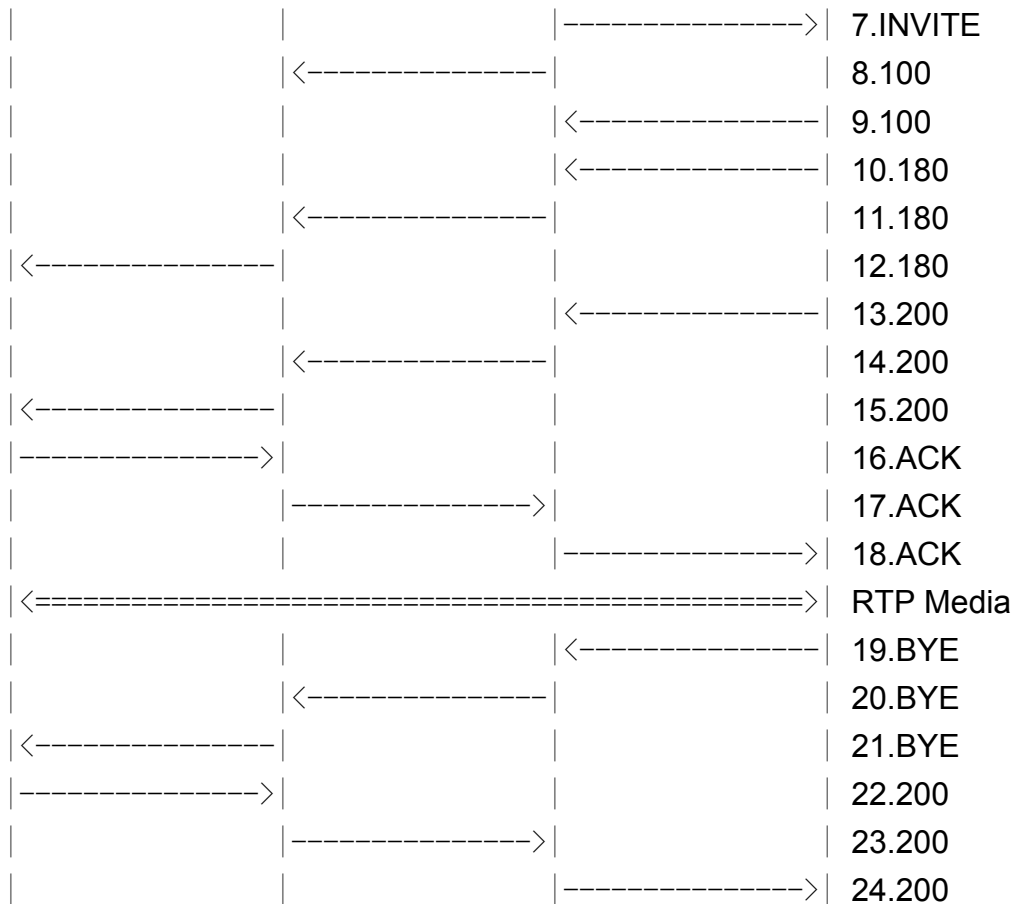
Step 6:

- Receive BYE request (from Server1)
- Forward BYE request (to UA0)
- Receive 200 OK to BYE request (from UA0)
- Forward 200 OK (to Server1)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1.INVITE UA0 -> Server0

```

INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA0 -> Server0

ACK sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

```
INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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
```

5. INVITE Server0 -> Server1

```
INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
```



Record-Route:

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

Max-Forwards: 69

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 Server0 -> UA0

SIP/2.0 100 Trying

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server1 -> UA1



INVITE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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

8. 100 Trying Server1 -> Server0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

9. 100 Trying UA1 -> Server1

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server1

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0



11. 180 Ringing Server1 -> Server0

SIP/2.0 180 Ringing

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

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

Record-Route:

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

Record-Route:

<sip:ss.example.com;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:50:(InterfaceID)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

12. 180 Ringing Server0 -> UA0

SIP/2.0 180 Ringing

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

Record-Route:

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

Record-Route:

<sip:ss.example.com;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:50:(InterfaceID)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0



13. 200 OK UA1 -> Server1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

15. 200 OK Server0 -> UA0

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



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

Record-Route:

<sip:ss.example.com;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:50:(InterfaceID)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:50:(InterfaceID)

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

16. ACK UA0 -> Server0

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

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2

Max-Forwards: 70

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

Route: <sip:ss.example.com;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 ACK

Content-Length: 0



17. ACK Server0 -> Server1

ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 69
Route: <sip:ss.example.com;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 ACK
Content-Length: 0

18. ACK Server1 -> UA1

ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77x
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server1

BYE sip:y3a6sn@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route: <sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>



Route: <sip:ss.example.com;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:5:(InterfaceID)]
CSeq: 3 BYE
Content-Length: 0

20. BYE Server1 -> Server0

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 69
Route: <sip:ss.example.com;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:5:(InterfaceID)]
CSeq: 3 BYE
Content-Length: 0

21. BYE Server0 -> UA0

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];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:5:(InterfaceID)]
CSeq: 3 BYE
Content-Length: 0



22.200 OK UA -> Server0

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

23.200 OK UA -> Server0

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

24.200 OK Server1 -> UA1

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





3.19. Interop.2.14 - Session Establishment and Disconnection with 2 proxies (Server0: Callee side)

[1] Test Number/Title

Interop.2.14

Session Establishment and Disconnection

[2] Purpose

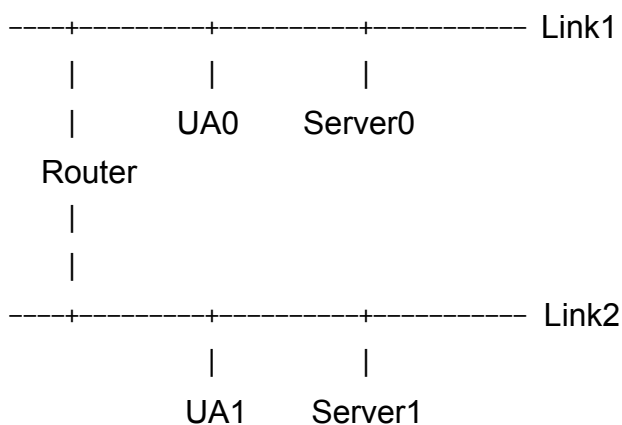
To verify that an applicant implementation can properly perform the session establishment, voice transmission and disconnection via 2 proxies.

[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
Link1	3ffe:501:ffff:5::/64	UA0, Server0
Link2	3ffe:501:ffff:50::/64	UA1, Server1

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)
Server1	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
Server1	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 μ -law)
- Server1: 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.
- Register UA0 to registrar of Link1 domain for using location service.
(Connect a registrar server to Link1, if necessary.)
- Register UA1 to registrar of Link2 domain for using location service.
(Connect a registrar server to Link2, if necessary.)
- Set Server0 as an outbound proxy of UA0.
- Set Server1 as an outbound proxy of UA1.
- Set Server0 and Server1 so that when these receive a message containing SIP-URI, which is not under control of these, the message is forwarded to another server.
- Confirm no call remain on neither Server0 nor Server1. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA1 to UA0. Confirm the ring on UA0 and the ring back tone on UA1
2. Observe the packet transmitted on Link1 and Link2
3. Answer the call on UA0. Confirm the voice transmission on both UA0 and UA1
4. Observe the packet transmitted on Link1 and Link2
5. Hang up UA0. Confirm the line is disconnected on UA1
6. Observe the packet transmitted on Link1 and Link2
7. Hang up UA1

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.



[Proxy Logo]

Server0: Applicant Implementation

Server1: Target Proxy server (Vendor C/D)

UA0: Target User Agent (Vendor A/B)

UA1: Reference User Agent (any Vendor)

Step 2:

- Receive INVITE request (from Server1)
- Forward INVITE request (to UA0)

Step 4:

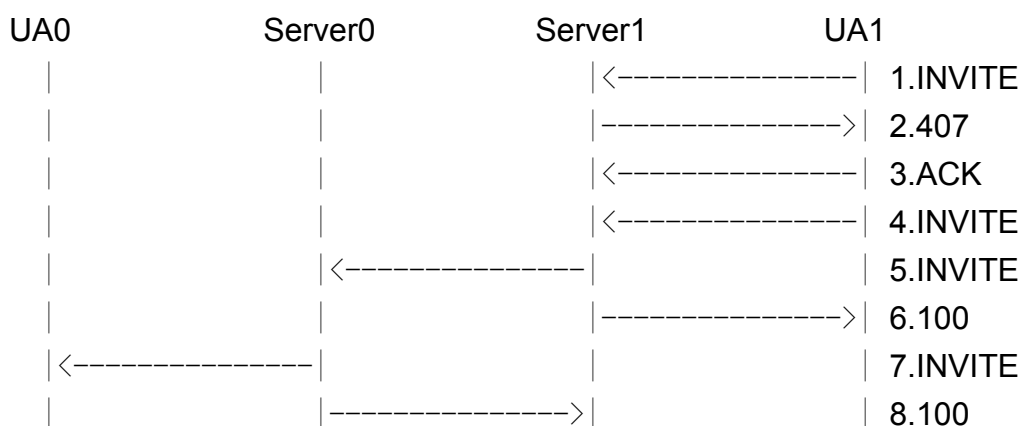
- Receive 200 OK to INVITE request (from UA0)
- Forward 200 OK (to Server1)
- Receive ACK request (from Server1)
- Forward ACK request (to UA0)

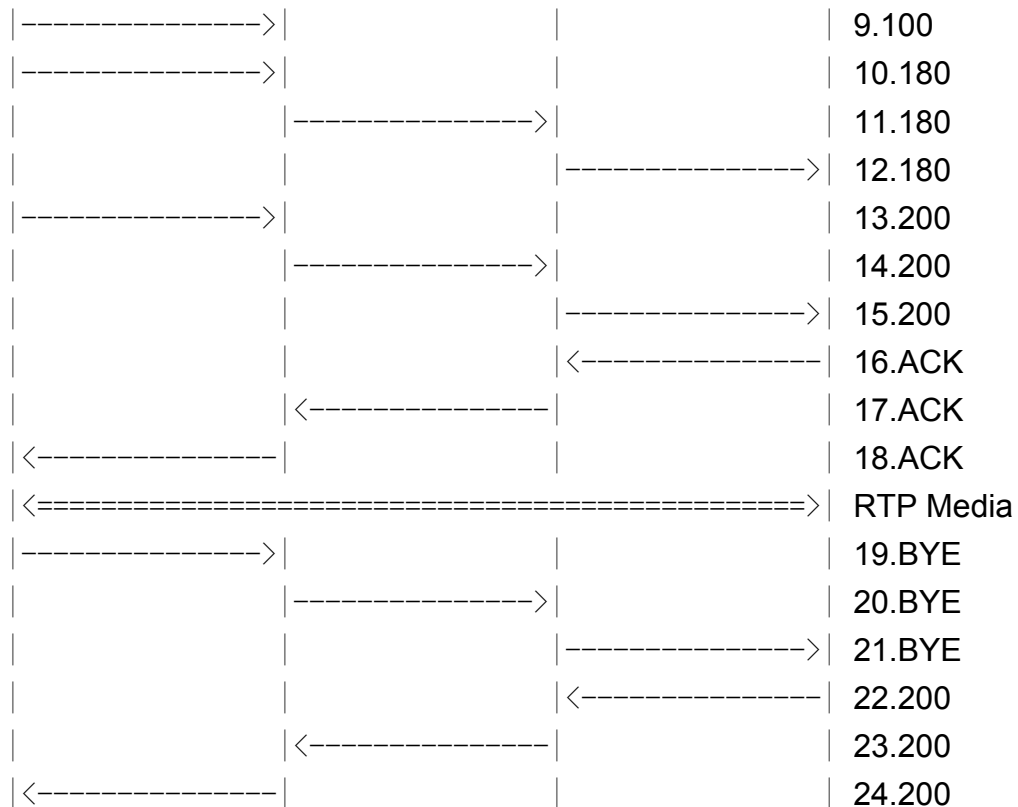
Step 6:

- Receive BYE request (from UA0)
- Forward BYE request (to Server1)
- Receive 200 OK to BYE request (from Server1)
- Forward 200 OK (to UA0)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1.INVITE UA1 -> Server1

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 1 INVITE
Contact: < sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] >
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125
```



v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

2.407 Proxy Authorization Required Server1 -> UA1

SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77a
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=3flal12sf
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 1 INVITE
Proxy-Authenticate: Digest realm="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA1 -> Server1

ACK sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=3flal12sf
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 1 ACK
Content-Length: 0



4. INVITE UA1 -> Server1

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.instance.com",nonce="ae9137be",
  username="00022223333",uri="sip:00022221111@aaa.example.com ",
  response="6iib19cef56c9a0a3i5aieff23a234",
  algorithm=MD5,opaque=""
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125
```

```
v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20
```

5. INVITE Server1-> Server0

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
```



Max-Forwards: 69
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >;
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: < sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] >
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

6. 100 Trying Server1 -> UA1

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length: 0

7. INVITE Server0 -> UA0

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c



Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Max-Forwards: 68
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

8. 100 Trying Server0 -> Server1

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE



Content-Length:0

9. 100 Trying Server1 -> UA1

SIP/2.0 100 Trying

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf

To: < sip:00022221111@aaa.example.com >

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

Content-Length:0

10. 180 Ringing UA0 -> Server0

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

Record-Route:

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

Record-Route:

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

From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf

To: < sip:00022221111@aaa.example.com >

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

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

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0



11. 180 Ringing Server0 -> Server1

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

Record-Route:

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

Record-Route:

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

From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf

To: < sip:00022221111@aaa.example.com >;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

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

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

12. 180 Ringing Server1 -> UA1

SIP/2.0 180 Ringing

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

Record-Route:

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

Record-Route:

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

From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf

To: < sip:00022221111@aaa.example.com >;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

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

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0



13. 200 OK UA0 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route: <sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:y3a65n@[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 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

15. 200 OK Server1 -> UA1

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



Record-Route:

< sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: < sip:y3a65n@[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 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

16. ACK UA1 -> Server1

ACK sip:y3a65n@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 70
Route: < sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Route: < sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0



17. ACK Server1 -> Server0

ACK sip:y3a65n@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 69
Route: <sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
From: < sip:00022223333@bbb.instance.com >;tag=a6c85cf
To: < sip:00022221111@aaa.example.com >;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

18. ACK Server0 -> UA0

ACK sip:y3a65n@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77x
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 68
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

19. BYE UA0 -> Server0

BYE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route: <sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Route: <sip:ss.instance.com;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:50:(InterfaceID)
CSeq: 3 BYE
Content-Length: 0

20. BYE Server0 -> Server1

BYE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 69
Route: <sip:ss.example.com;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:50:(InterfaceID)
CSeq: 3 BYE
Content-Length: 0

21. BYE Server1 -> UA1

BYE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
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:50:(InterfaceID)
CSeq: 3 BYE
Content-Length: 0



22.200 OK UA1 -> Server1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
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: 3 BYE
Content-Length: 0

23.200 OK Server1 -> Server0

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

24.200 OK Server0 -> UA0

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





3.20. Interop.2.15 - Cancellation of Transmission for 2 proxies (Server0: Caller side)

[1] Test Number/Title

Interop.2.15

Cancellation of Transmission

[2] Purpose

To verify that an applicant implementation can properly discontinue the session via 2 proxies.

[3] Resource Requirement

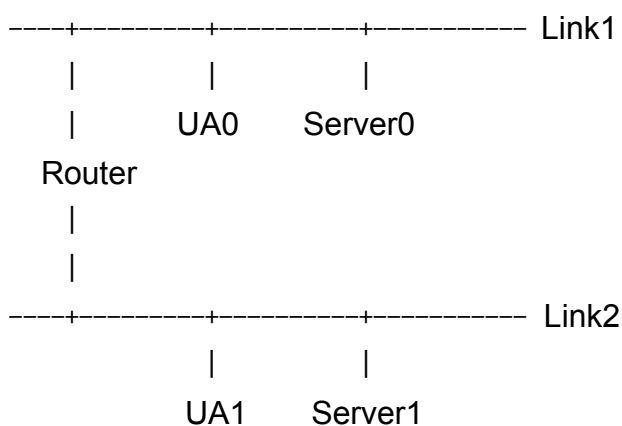
CANCEL function / RFC3261

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
Link1	3ffe:501:ffff:5::/64	UA0, Server0
Link2	3ffe:501:ffff:50::/64	UA1, Server1

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)
Server1	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
Server1	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 μ -law)
- Server1: 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.
- Register UA0 to registrar of Link1 domain for using location service.
(Connect a registrar server to Link1, if necessary.)
- Register UA1 to registrar of Link2 domain for using location service.
(Connect a registrar server to Link2, if necessary.)
- Set Server0 as an outbound proxy of UA0.
- Set Server1 as an outbound proxy of UA1.
- Set Server0 and Server1 so that when these receive a message containing SIP-URI, which is not under control of these, the message is forwarded to another server.
- Confirm no call remain on neither Server0 nor Server1. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1 and Link2
3. Hang up UA0. Confirm the ring stops on UA1.
4. Observe the packet transmitted on Link1 and Link2

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Proxy Logo]

Server0: Applicant Implementation

Server1: Target Proxy server (Vendor C/D)

UA0: Target User Agent (Vendor A/B)



UA1: Reference User Agent (any Vendor)

Step 2:

- Receive INVITE request (from UA0)
- Forward INVITE request (to Server1)
- Receive 1XX (ex. 180) response (from Server1)
- Forward 1XX (ex. 180) response (to UA0)

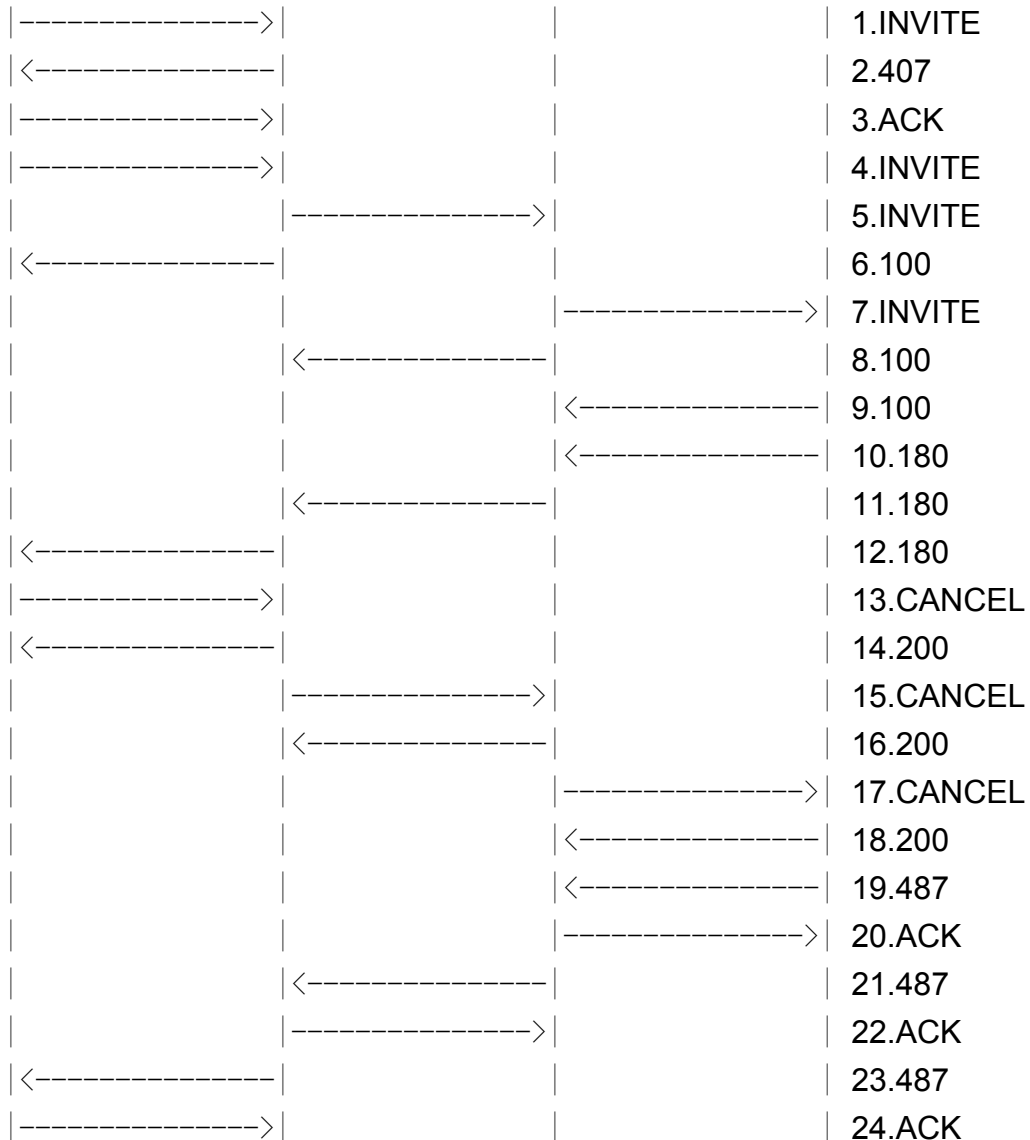
Step 4:

- Receive CANCEL request (from UA0)
- Send the final response 200 OK to CANCEL request (to UA0)
 - IP address : Must send to UA0 IP address.
 - From header : Must be the same From Header URI (UA1 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 request (to Server0)
- Receive 200 OK to CANCEL request (from Server1)
- Receive 487 Request Terminated (from Server1)
- Send ACK request to 487 response (to Server1)
 - IP address : Must send to Server0 IP address.
 - From header : Must contain UA AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain Server0 domain name or IP address.
- Forward 487 Request Terminated (to UA0)
- Receive ACK request (from UA0)

[7] Reference

[7.1] Message Flow

UA0 Server0 Server1 UA1



[7.2] Message Examples

1.INVITE UA0 -> Server0

```

INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA0 -> Server0

ACK sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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



5. INVITE Server0 -> Server1

```
INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Max-Forwards: 69
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 Server0 -> UA0

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server1 -> UA1

```
INVITE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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
```

8. 100 Trying Server1 -> Server0



SIP/2.0 100 Trying

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

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

9. 100 Trying UA1 -> Server1

SIP/2.0 100 Trying

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

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

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server1

SIP/2.0 180 Ringing

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

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

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

Record-Route:

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

Record-Route:

<sip:ss.instance.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

11. 180 Ringing Server1 -> Server0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

12. 180 Ringing Server0 -> UA0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

13.CANCEL UA0 -> Server0

CANCEL sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0

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

15.CANCEL Server0 -> Server1

CANCEL sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
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

16.200 OK Server1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
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 Server1 -> UA1

CANCEL sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];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 UA1 -> Server1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];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 UA1 -> Server1

SIP/2.0 487 Request Terminated
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server1 -> UA1

ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];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

21.487 Request Terminated Server1 -> Server0

SIP/2.0 487 Request Terminated
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e



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

22.ACK Server0 -> Server1

ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
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 Server0 -> UA0

SIP/2.0 487 Request Terminated
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

ACK sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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



3.21. Interop.2.16 - Cancellation of Transmission for 2 proxies (Server0: Callee side)

[1] Test Number/Title

Interop.2.16

Cancellation of Transmission

[2] Purpose

To verify that an applicant implementation can properly discontinue the session via 2 proxies.

[3] Resource Requirement

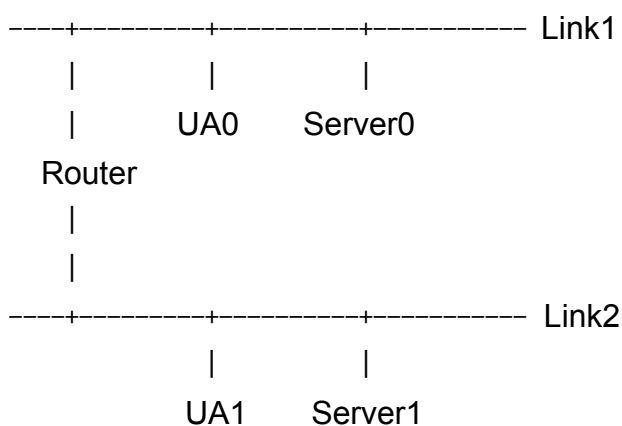
CANCEL function / RFC3261

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
Link1	3ffe:501:ffff:5::/64	UA0, Server0
Link2	3ffe:501:ffff:50::/64	UA1, Server1

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)
Server1	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
Server1	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 μ -law)
- Server1: 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.
- Register UA0 to registrar of Link1 domain for using location service.
(Connect a registrar server to Link1, if necessary.)
- Register UA1 to registrar of Link2 domain for using location service.
(Connect a registrar server to Link2, if necessary.)
- Set Server0 as an outbound proxy of UA0.
- Set Server1 as an outbound proxy of UA1.
- Set Server0 and Server1 so that when these receive a message containing SIP-URI, which is not under control of these, the message is forwarded to another server.
- Confirm no call remain on neither Server0 nor Server1. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA1 to UA0. Confirm the ring on UA0 and the ring back tone on UA1.
2. Observe the packet transmitted on Link1 and Link2
3. Hang up UA1. Confirm the ring stops on UA0.
4. Observe the packet transmitted on Link1 and Link2

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Proxy Logo]

Server0: Applicant Implementation

Server1: Target Proxy server (Vendor C/D)

UA0: Target User Agent (Vendor A/B)



UA1: Reference User Agent (any Vendor)

Step 2:

- Receive INVITE request (from Server1)
- Forward INVITE request (to UA0)
- Receive 1XX (ex. 180) response (from Server1)
- Forward 1XX (ex. 180) response (to UA0)

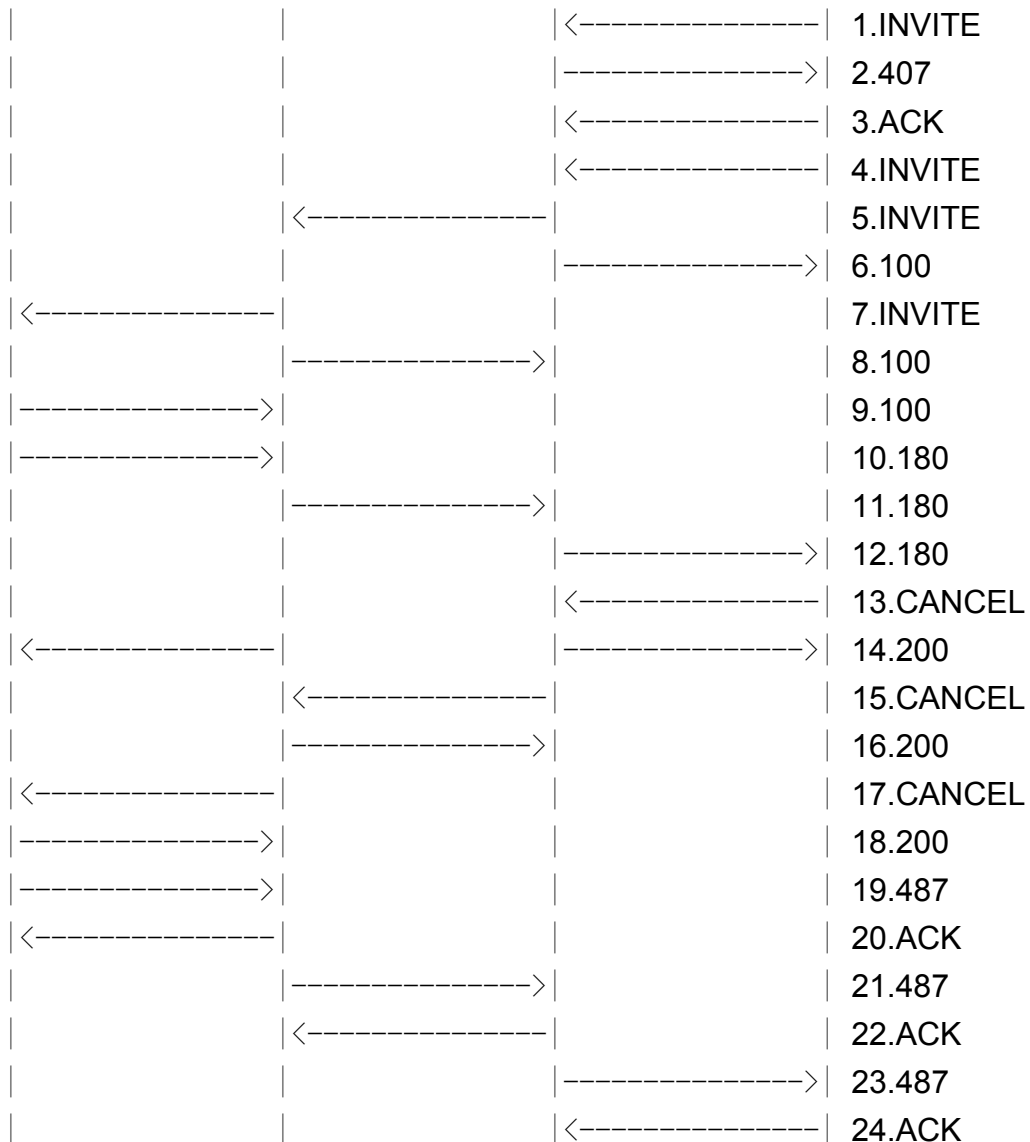
Step 4:

- Receive CANCEL request (from Server1)
- Send the final response 200 OK to CANCEL request (to Server1)
 - IP address : Must send to Server1 IP address.
 - From header : Must be the same From Header field URI(UA1 AoR) that is received as CANCEL request.
 - To header : Must be the same To Header field URI(UA0 AoR) that is received as CANCEL request.
 - Via header : Must be the same value of Via header that received as CANCEL request.
- Forward CANCEL request (to UA0)
- Receive 200 OK to CANCEL request (from UA0)
- Receive 487 Request Terminated (from UA0)
- Send ACK request to 487 response (to UA0)
 - IP address : Must send to Server1 IP address.
 - From header : Must contain UA1 AoR.
 - To header : Must contain UA0 AoR.
 - Via header : Must contain Server0 domain name or IP address.
- Forward 487 Request Terminated (to Server1)
- Receive ACK request (from Server1)

[7] Reference

[7.1] Message Flow

UA0 Server0 Server1 UA1



[7.2] Message Examples

1.INVITE UA1 -> Server1

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfacelD)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
```



Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 1 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

2.407 Proxy Authorization Required Server1 -> UA1

SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77a
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=3flal12sf
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 1 INVITE
Proxy-Authenticate: Digest realm="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA 1-> Server1

ACK sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77a
Max-Forwards: 70



From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=3flal12sf
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 1 ACK
Content-Length: 0

4. INVITE UA1 -> Server1

INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.example.com",nonce="ae9137be",
username="00022223333",uri=" sip:00022221111@aaa.example.com ",
response="6iib19cef56c9a0a3i5aieff23a234",
algorithm=MD5,opaque=""
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20



5. INVITE Server1 -> Server0

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Max-Forwards: 69
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125
```

```
v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20
```

6. 100 Trying Server1 -> UA1

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
```



Content-Length: 0

7. INVITE Server0 -> UA0

```
INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Max-Forwards: 68
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125
```

```
v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20
```

8. 100 Trying Server0 -> Server1



SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length:0

9. 100 Trying UA0 -> Server0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length:0

10. 180 Ringing UA0 -> Server0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159



Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

11. 180 Ringing Server0 -> Server1

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

12. 180 Ringing Server1 -> UA1

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159



Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

13.CANCEL UA1 -> Server1

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

14.200 OK Server1 -> UA1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 CANCEL
Content-Length: 0

15.CANCEL Server1 -> Server0

CANCEL sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Max-Forwards: 70



From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 CANCEL
Content-Length: 0

16.200 OK Server0 -> Server1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 CANCEL
Content-Length: 0

17.CANCEL Server0 -> UA0

CANCEL sip:y3a65n@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Max-Forwards: 70
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 CANCEL
Content-Length: 0

18.200 OK UA1 -> Server1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf



To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 CANCEL
Content-Length: 0

19.487 Request Terminated UA0 -> Server0

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

20.ACK Server0 -> UA0

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

21.487 Request Terminated Server0 -> Server1

SIP/2.0 487 Request Terminated
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e



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

22.ACK Server1 -> UA1

ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Max-Forwards: 70
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 INVITE
Content-Length: 0

23.487 Request Terminated Server1 -> UA1

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

24.ACK UA1 -> Server1

ACK sip: 00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g



Max-Forwards: 70

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

Content-Length: 0



3.22. Interop.2.17 - Rejection of Transmission for 2 proxies (Server0: Caller side)

[1] Test Number/Title

Interop.2.17

Rejection of Transmission

[2] Purpose

To verify that an applicant implementation can properly acknowledge the rejection via 2 proxies.

[3] Resource Requirement

Session establishment function / RFC3261

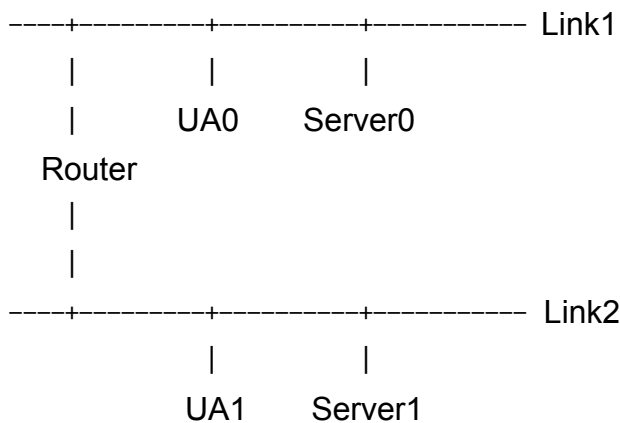
Rejection of transmission / RFC3261

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, Server1

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)
Server1	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
Server1	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 μ -law)



- Server1: 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.
- Register UA0 to registrar of Link1 domain for using location service.
(Connect a registrar server to Link1, if necessary.)
- Register UA1 to registrar of Link2 domain for using location service.
(Connect a registrar server to Link2, if necessary.)
- Set Server0 as an outbound proxy of UA0.
- Set Server1 as an outbound proxy of UA1.
- Set Server0 and Server1 so that when these receive a message containing SIP-URI, which is not under control of these, the message is forwarded to another server.
- Confirm no call remain on neither Server0 nor Server1. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1 and Link2
3. Reject the call on UA1. Confirm busy tone on UA0.
4. Observe the packet transmitted on Link1 and Link2

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Proxy Logo]

Server0: Applicant Implementation

Server1: Target Proxy server (Vendor C/D)



UA0: Target User Agent (Vendor A/B)
 UA1: Reference User Agent (any Vendor)

Step 2:

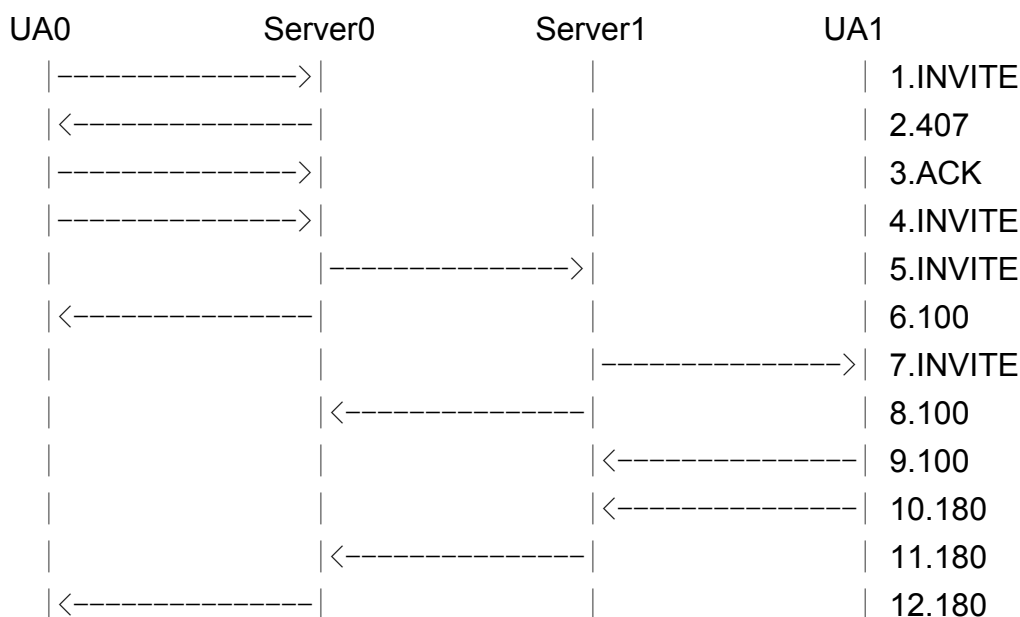
- Receive INVITE request (from UA0)
- Forward INVITE request (to Server1)

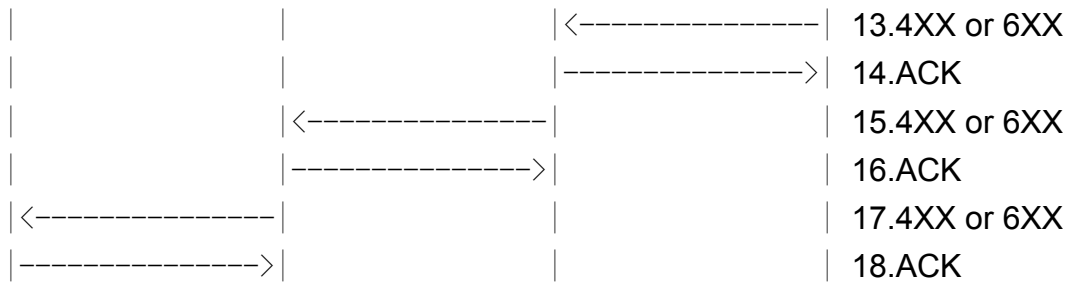
Step 4:

- Receive 4XX/6XX response (from Server1)
- Send the ACK request to 4XX/6XX response (to Server1)
 - IP address : Must send to Server1 IP address.
 - From header : Must contain UA0 AoR.
 - To header : Must contain UA1 AoR.
 - Via header : Must contain Server0 domain name or IP address.
- Forward 4XX/6XX response (to UA0)
- Receive ACK request (from UA0)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1. INVITE UA0 -> Server0

```
INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA0



SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA0 -> Server0

ACK sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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

5. INVITE Server0 -> Server1

INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Max-Forwards: 69
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 Server0 -> UA0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server1 -> UA1

INVITE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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

8. 100 Trying Server1 -> Server0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

9. 100 Trying UA1 -> Server1

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server1

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

11. 180 Ringing Server1 -> Server0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

12. 180 Ringing Server0 -> UA0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

13. 480 Temporarily Unavailable UA1 -> Server1

SIP/2.0 480 Temporarily Unavailable
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server1 -> UA1

ACK sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

15. 480 Temporarily Unavailable Server1 -> Server0

SIP/2.0 480 Temporarily Unavailable
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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

16.ACK Server0 -> Server1

ACK sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
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 Server0 -> UA0

SIP/2.0 480 Temporarily Unavailable
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> Server0

ACK sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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



3.23. Interop.2.18 - Rejection of Transmission for 2 proxies (Server0: Callee side)

[1] Test Number/Title

Interop.2.18

Rejection of Transmission

[2] Purpose

To verify that an applicant implementation can properly acknowledge the rejection via 2 proxies.

[3] Resource Requirement

Session establishment function / RFC3261

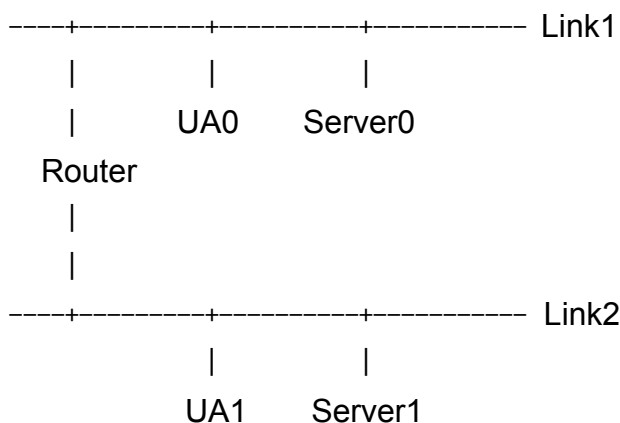
Rejection of transmission / RFC3261

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, Server1

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)
Server1	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
Server1	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 μ -law)



- Server1: 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.
- Register UA0 to registrar of Link1 domain for using location service.
(Connect a registrar server to Link1, if necessary.)
- Register UA1 to registrar of Link2 domain for using location service.
(Connect a registrar server to Link2, if necessary.)
- Set Server0 as an outbound proxy of UA0.
- Set Server1 as an outbound proxy of UA1.
- Set Server0 and Server1 so that when these receive a message containing SIP-URI, which is not under control of these, the message is forwarded to another server.
- Confirm no call remain on neither Server0 nor Server1. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA1 to UA0. Confirm the ring on UA0 and the ring back tone on UA1.
2. Observe the packet transmitted on Link1 and Link2
3. Reject the call on UA0. Confirm busy tone on UA1.
4. Observe the packet transmitted on Link1 and Link2

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Proxy Logo]

Server0: Applicant Implementation

Server1: Target Proxy server (Vendor C/D)



UA0: Target User Agent (Vendor A/B)

UA1: Reference User Agent (any Vendor)

Step 2:

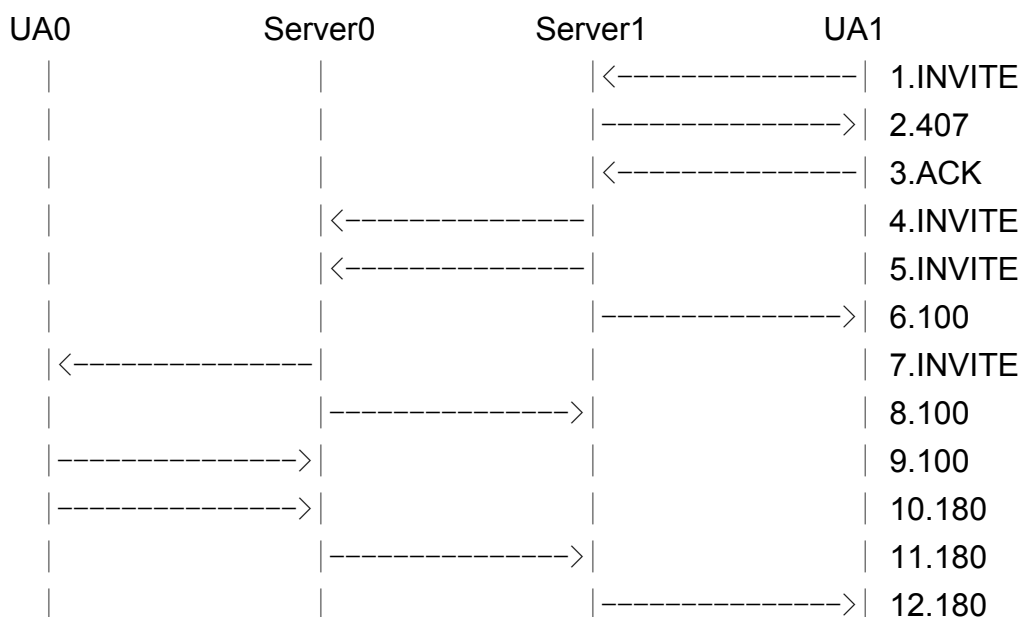
- Receive INVITE request (from Server1)
- Forward INVITE request (to UA0)

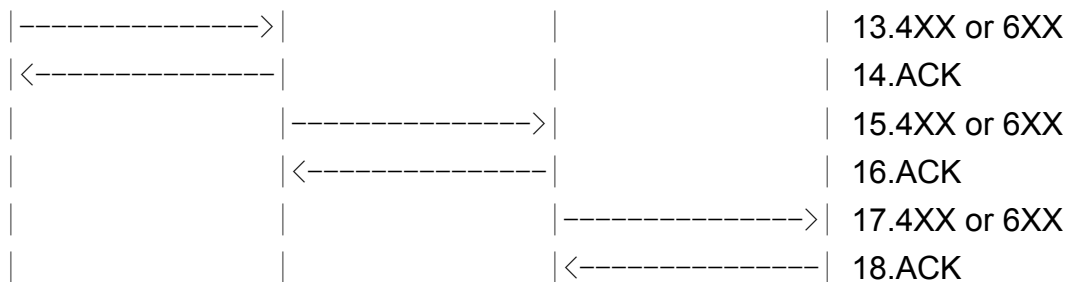
Step 4:

- Receive 4XX/6XX response (from UA0)
- Send the ACK request to 4XX/6XX response (to UA0)
 - IP address : Must send to UA0 IP address.
 - From header : Must contain UA1 AoR.
 - To header : Must contain UA0 AoR.
 - Via header : Must contain Server0 domain name or IP address.
- Forward 4XX/6XX response (to Server0)
- Receive ACK request (from UA0)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1. INVITE UA1 -> Server1

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 1 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125
```

```
v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20
```

2.407 Proxy Authorization Required Server1 -> UA1



SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfacelD)];branch=z9hG4bK4na77a
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfacelD)
CSeq: 1 INVITE
Proxy-Authenticate: Digest realm=" ss.instance.com",nonce="ae9137be",
domain=" sip:ss.instance.com ",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA1 -> Server1

ACK sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfacelD)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=3flal12sf
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfacelD)
CSeq: 1 ACK
Content-Length: 0

4. INVITE UA1 -> Server1

INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfacelD)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.instance.com",nonce="ae9137be",
username="00022223333",uri=" sip:00022221111@aaa.example.com ",
response="6iiib19cef56c9a0a3i5aieff23a234",
algorithm=MD5,opaque=""
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;



Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

5. INVITE Server1 -> Server0

INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Max-Forwards: 69
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0



o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

6. 100 Trying Server1 -> UA1

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length: 0

7. INVITE Server0 -> UA0

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Max-Forwards: 68
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE



Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

8. 100 Trying Server0 -> Server1

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length:0

9. 100 Trying UA0 -> Server0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;



Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length:0

10. 180 Ringing UA0 -> Server0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:y3a5sn@[3ffe:501:ffff:5:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

11. 180 Ringing Server0 -> Server1

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159



Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:y3a5sn@[3ffe:501:ffff:5:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

12. 180 Ringing Server1 -> UA1

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:y3a5sn@[3ffe:501:ffff:5:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

13. 480 Temporarily Unavailable UA0 -> Server0

SIP/2.0 480 Temporarily Unavailable
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length: 0



14.ACK Server0 -> UA0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Max-Forwards: 70
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

15. 480 Temporarily Unavailable Server0 -> Server1

SIP/2.0 480 Temporarily Unavailable
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length: 0

16.ACK Server1 -> Server0

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



Content-Length: 0

17. 480 Temporarily Unavailable Server1 -> UA1

SIP/2.0 480 Temporarily Unavailable

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

Content-Length: 0

18.ACK UA1 -> Server1

ACK sip:00022221111@aaa.example.com SIP/2.0

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

Max-Forwards: 70

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 ACK

Content-Length: 0



	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, B2BUA

4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
B2BUA	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
B2BUA	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 μ -law)
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)



- Set B2BUA as an outbound proxy of UA0 and UA1.
- Confirm no call remains on B2BUA. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1.
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link0.
5. Hang up UA1. Confirm the session is disconnected on UA0.
6. Observe the packet transmitted on Link0
7. Hang up UA0.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Back-to-Back User Agent Logo]

B2BUA : Applicant Implementation.

UA0 : Target User Agent (Vendor A/B)

UA1 : Target User Agent (Vendor A/B)

Step 2:

- Receive INVITE request (from UA0).
- Send INVITE request (to UA1).
 - IP address : Must send to UA1 IP address.
 - Via header : Must contain B2BUA domain name or IP address.

Step 4:

- Receive 200 OK (from UA1).
- Send 200 OK (to UA0).
 - IP address : Must send to UA0 IP address.
 - From header : Must be the same as From header field in received INVITE



- request.
- To header : Must contain the same To URI of the received INVITE request.
- Via header : Must contain the same Via header field of the received INVITE request (and add some parameters, if necessary).
- Receive ACK request (from UA0).
 - Send ACK request (to UA1).
 - IP address : Must send to UA1 IP address.
 - Request-Line : Must be Contact URI. The URI must be same value of received 200 OK response for INVITE request.
 - From header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - To header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.
 - The case that applicant implementation does not control media packets, Media packets (ex. RTP packets) flow between UA0 and UA1.
 - The case that applicant implementation controls media packets, Media packets flow between UA0 and B2BUA
Media packets flow between B2BUA and UA1.

Step 6:

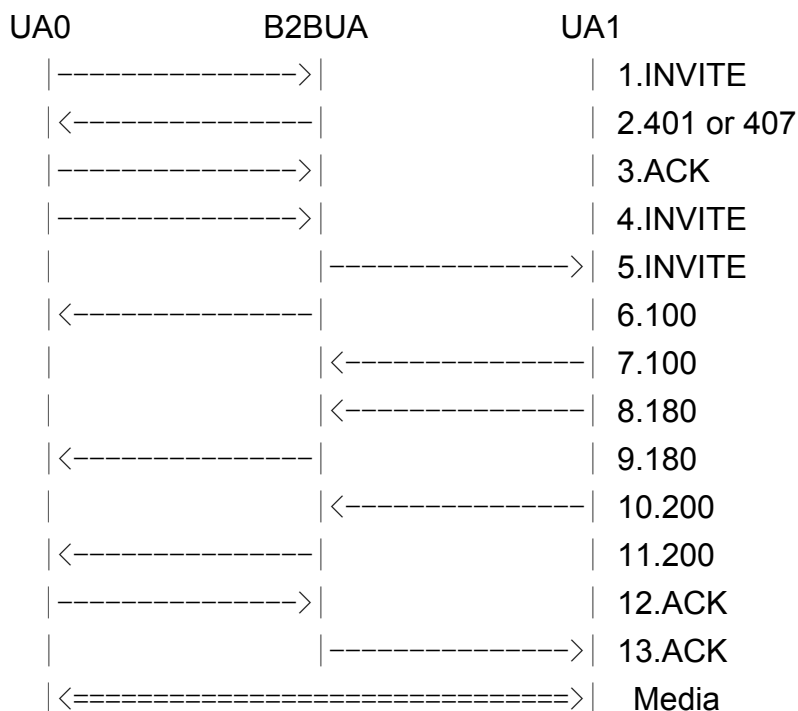
- Receive BYE request (from UA1).
- Send BYE request (to UA0).
 - IP address : Must send to UA0 IP address.
 - Request-Line : Must be the same Contact URI value In INVITE request that was received by B2BUA.
 - From header : Must be the same To header field in 200 OK for INVITE request. that was received by B2BUA.
 - To header : Must be the same From header field in 200 OK for INVITE request. that was received by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.

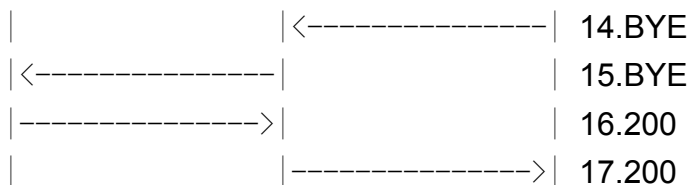


- Receive 200 OK for BYE request (from UA0).
- Send 200 OK for BYE request (to UA1).
 - IP address : Must send to UA1 IP address.
 - From header : Must be the same From Header field in BYE request that was received by B2BUA
 - To header : Must contain UA1 AoR.
 - Via header : Must contain the same Via header field in BYE request that received by B2BUA.
(and add some parameters, if necessary)
- The case that applicant implementation does not control media packets,
Media packets (ex. RTP packets) finish flowing between UA0 and UA1.
- The case that applicant implementation controls media packets,
Media packets finish flowing between UA0 and B2BUA
Media packets finish flowing between B2BUA and UA1.

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1. INVITE UA0 -> B2BUA

```
INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA0

SIP/2.0 407 Proxy Authorization Required



Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA0 -> B2BUA

ACK sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> B2BUA

INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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 B2BUA -> UA1

INVITE sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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 B2BUA -> UA0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g



Record-Route:

```
<sip:ss.example.com;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)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Length:0
```

9. 180 Ringing B2BUA -> UA0

SIP/2.0 180 Ringing

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

Record-Route:

```
<sip:ss.example.com;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)]>  
Allow: ACK,BYE,CANCEL,INVITE  
Content-Length:0
```

10. 200 OK UA1 -> B2BUA

SIP/2.0 200 OK

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

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

Record-Route:

```
<sip:ss.example.com;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)]>
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 B2BUA -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
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 UA0 -> B2BUA

ACK sip:z3b6tm@[3ffe:501:ffff: 5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2
Route: <sip:ss.example.com;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 B2BUA -> UA1

ACK sip:z3b6tm@[3ffe:501:ffff: 5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route: <sip:ss.example.com;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 B2BUA -> UA0

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> B2BUA

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA1

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



3.25. Interop.3.2 - Cancellation of Transmission for B2BUA

[1] Test Number/Title

Interop.3.2

Cancellation of Transmission for B2BUA

[2] Purpose

To verify that an applicant implementation can properly discontinue a session.

[3] Resource Requirement

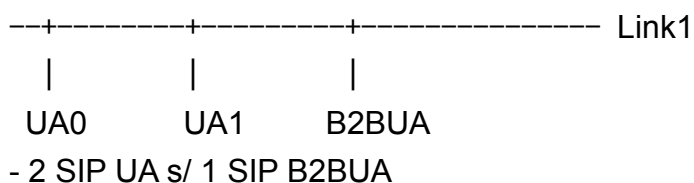
CANCEL function / RFC3261

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, B2BUA

4.2.2 Example of node information



- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
B2BUA	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
B2BUA	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 μ -law)
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set B2BUA as an outbound proxy of UA0 and UA1.
- Confirm no call remains on B2BUA. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.



[5] Test Procedure

1. Call from UA0 to UA1. Wait on UA1. Confirm the ring on UA1 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1
3. Hang up UA0. Confirm the ring stops on UA1.
4. Observe the packet transmitted on Link1

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Back-to-Back User Agent Logo]

B2BUA: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

Step 2:

- Receive INVITE request (from UA0)
- Send INVITE request (to UA1)
 - IP address : Must send to Server0 IP address.
 - Via header : Must contain UA0 domain name or IP address.

Step 4:

- Receive 1XX (ex. 180) response (from UA1).
- Send 1XX response (to UA0).
 - IP address : Must send to UA0 IP address.
 - From header : Must be the same as From header field in received INVITE request.
 - To header : Must contain the same To URI of the received INVITE request.
 - Via header : Must contain the same Via header field of the received INVITE request (and add some parameters, if necessary).
- Receive CANCEL request (from UA0)



- Send 200 OK to CANCEL request (to UA0)
 - IP address : Must send to UA0 IP address.
 - From header : Must be the same as From header field in received CANCEL request.
 - To header : Must contain the same To URI of the received CANCEL request.
 - Via header : Must contain the same Via header field of the received CANCEL request (and add some parameters, if necessary).

- Send CANCEL request (to UA1)
 - IP address : Must send to UA1 IP address.
 - Request-Line : Must contain UA1 AoR.
 - From header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - To header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.

- Receive 200 OK to CANCEL request (from UA1)
- Receive 487 Request Terminated (from UA1)
- Send ACK request (to UA1)
 - IP address : Must send to UA1 IP address.
 - From header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - To header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.

- Send 487 Request Terminated (to UA0)
 - IP address : Must send to UA0 IP address.
 - From header : Must be the same as From header field in received INVITE request.
 - To header : Must contain the same To URI of the received INVITE request.

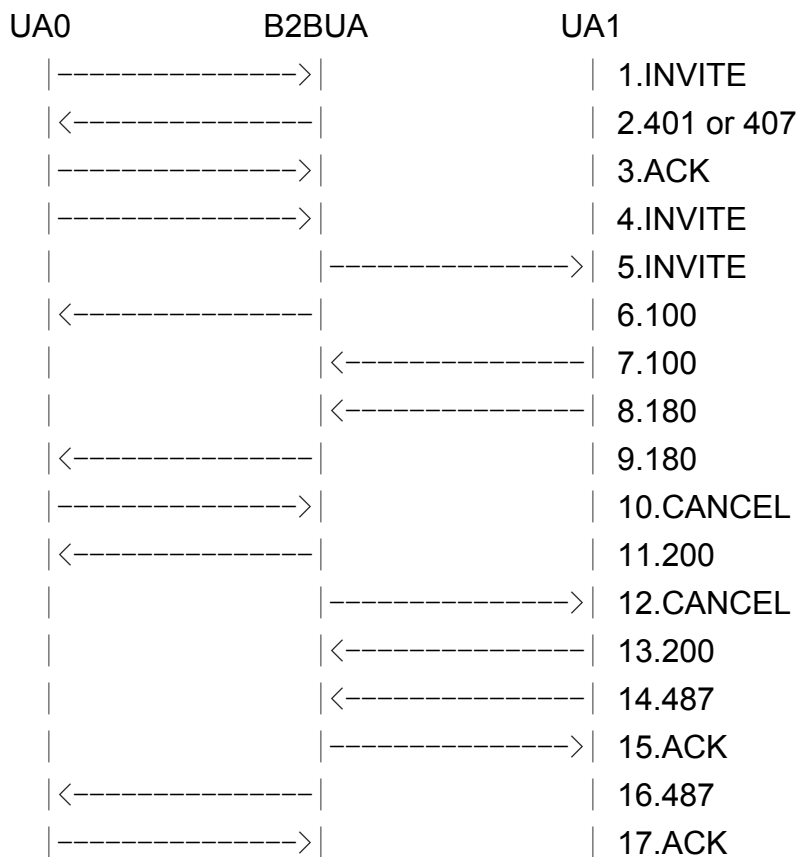


Via header : Must contain the same Via header field of the received INVITE request (and add some parameters, if necessary).

- Recieve ACK request (from UA0)

[7] Reference

[7.1] Message Flow



[7.2] Message Examples

1. INVITE UA0 -> B2BUA

```
INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA0

SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA0 -> B2BUA

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



Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> B2BUA

INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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 B2BUA -> UA1

```
INVITE sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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 B2BUA -> UA0

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

9. 180 Ringing B2BUA -> UA0



SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

10.CANCEL UA0 -> B2BUA

CANCEL sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA1

CANCEL sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

SIP/2.0 487 Request Terminated
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA1

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA0

SIP/2.0 487 Request Terminated
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> B2BUA

ACK sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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





3.26. Interop.3.3 - Rejection of Transmission for B2BUA

[1] Test Number/Title

Interop.3.3

Rejection of Transmission

[2] Purpose

To verify that an applicant implementation can properly acknowledge the rejection.

[3] Resource Requirement

Session establishment function / RFC3261

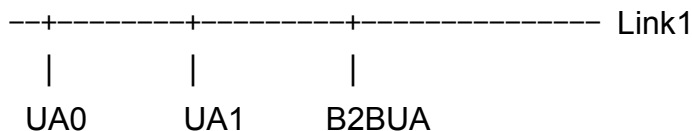
Rejection of transmission / RFC3261

IPv6 compliant / RFC4566

Authentication / RFC2617

[4] Test Setup

[4.1] Topology



- 2 SIP UA s/ 1 SIP B2BUAr

[4.2] Address

4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, B2BUA

4.2.2 Example of node information



- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
B2BUA	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
B2BUA	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 μ -law)
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set B2BUA as an outbound proxy of UA0 and UA1.
- Confirm no call remains on B2BUA. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.



[5] Test Procedure

1. Call from UA0 to UA1.
2. Observe the packet transmitted on Link1.
3. Reject the call from UA0 on UA1. Confirm busy tone on UA0.
4. Observe the packet transmitted on Link1.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Back-to-Back User Agent Logo]

B2BUA: Applicant Implementation

UA0: Target User Agent (Vendor A/B)

UA1: Target User Agent (Vendor A/B)

Step 2:

- Receive INVITE request (from UA0)
- Send INVITE request. (to UA1)
 - IP address : Must send to UA1 IP address.
 - Via header : Must contain B2BUA domain name or IP address.

Step 4:

- Receive 4XX/6XX response (from UA1)
- Send ACK request (to UA1)
 - IP address : Must send to UA1 IP address.
 - From header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - To header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.

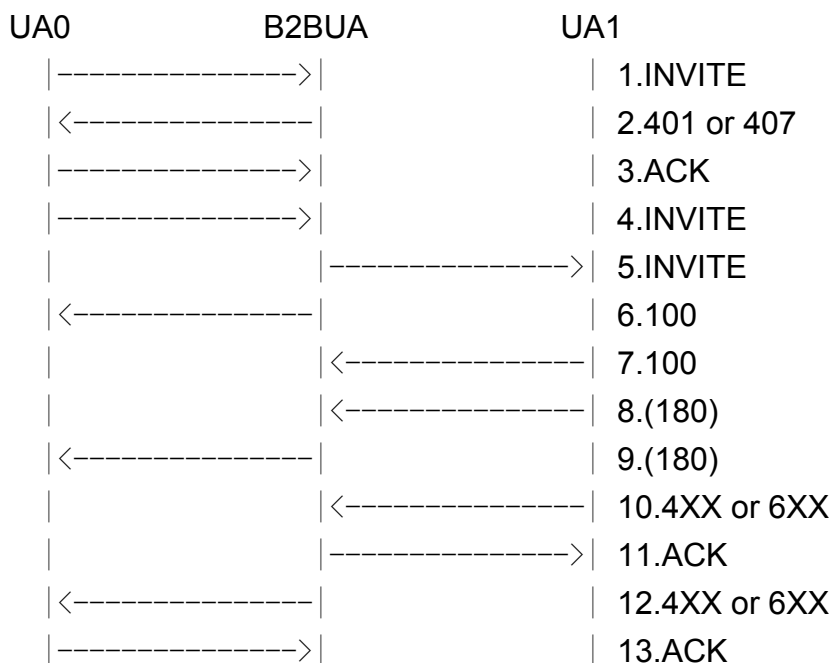


- Send 4XX/6XX response (to UA0)
 - IP address : Must send to UA0 IP address.
 - From header : Must be the same as From header field in received INVITE request.
 - To header : Must contain the same To URI of the received INVITE request.
 - Via header : Must contain the same Via header field of the received INVITE request (and add some parameters, if necessary).

- Receive ACK request (from UA0)

[7] Reference

[7.1] Message Flow



[7.2] Message Examples

1. INVITE UA0 -> B2BUA



INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA0

SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0



3. ACK UA0 -> B2BUA

ACK sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> B2BUA

INVITE sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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 B2BUA -> UA1

INVITE sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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 B2BUA -> UA0

SIP/2.0 100 Trying



Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0



9. 180 Ringing B2BUA -> UA0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

10. 480 Temporarily Unavailable UA1 -> B2BUA

SIP/2.0 480 Temporarily Unavailable
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA1

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA0

SIP/2.0 480 Temporarily Unavailable
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> B2BUA

ACK sip:00022223333@bbb.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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



3.27. Interop.3.4 - Session Establishment and Disconnection with proxy for B2BUA (caller side)

[1] Test Number/Title

Interop.3.4

Session Establishment and Disconnection with proxy

[2] Purpose

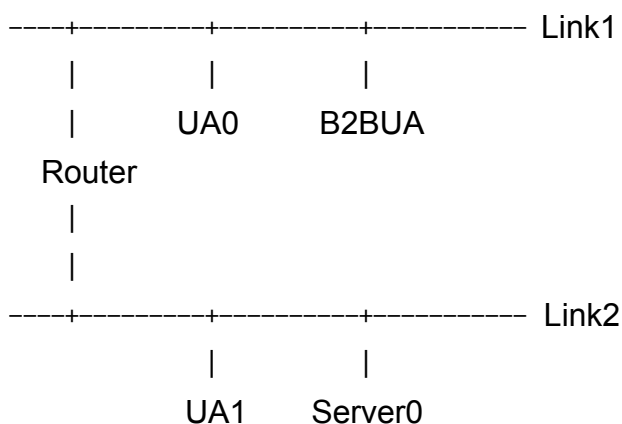
- (1) To verify that an applicant implementation can properly establish the session via a proxy.
- (2) To verify that an applicant implementation can properly finish the session via a proxy.

[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/ 1 SIP B2BUA / 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, B2BUA
Link 2	3ffe:501:ffff:50::/64	UA1, Server0

4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:50:(InterfaceID)
B2BUA	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:50:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.instance.com
B2BUA	ss.example.com
Server0	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 μ -law)
- Server0: 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.
- Register UA0 to registrar of Link1 domain for using location service.
(Connect a registrar server to Link1, if necessary.)
- Register UA1 to registrar of Link2 domain for using location service.
(Connect a registrar server to Link2, if necessary.)
- Set B2BUA as an outbound proxy of UA0.
- Set Server0 as an outbound proxy of UA1.
- Set B2BUA so that when it receives a message containing SIP-URI, which is not under control of it, the message is forwarded to Server0.
- Set Server0 so that when it receives a message containing SIP-URI, which is not under control of it, the message is forwarded to B2BUA.
- Set Server0 so that it uses Record-Route header.
- Confirm no call remains on B2BUA (All transactions and dialogs are cleared).
- Confirm no call remains on Server0 (All transactions and dialogs are cleared).
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0
2. Observe the packet transmitted on Link1 and Link2
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link1 and Link2
5. Hang up UA1. Confirm the line is disconnected on UA0.
6. Observe the packet transmitted on Link1 and Link2
7. Hang up UA0.



[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Back-to-Back User Agent Logo]

B2BUA : Applicant Implementation

UA0 : Target User Agent (Vendor A/B)

UA1 : Reference User Agent (any Vendor)

Server0 : Target Proxy server (Vendor C/D)

Step 2:

- Receive INVITE request (from UA0)
- Send INVITE request to (Server0)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must contain UA1 AoR.
 - To header : Must contain UA1 AoR
 - Via header : Must contain B2BUA domain name or IP address.

Step 4:

- Receive 200 OK to INVITE request (from Server0)
- Send 200 OK to INVITE request (to UA0)
 - IP address : Must send to UA0 IP address.
 - From header : Must be the same as From header field in received INVITE request.
 - To header : Must contain the same To URI of the received INVITE request.
 - Via header : Must contain the same Via header field of the received INVITE request (and add some parameters, if necessary).
- Receive ACK request (from UA0)
- Send ACK request (to Server0)
 - IP address : Must send to Server0 IP address.
 - Request-Line : Must be Contact URI. The URI must be same value of received 200 OK response for INVITE request.
 - From header : Must be same as the From header field in INVITE request



- that was sent by B2BUA.
- To header : Must be same as the From header field in INVITE request that was sent by B2BUA.
- Via header : Must contain B2BUA domain name or IP address.

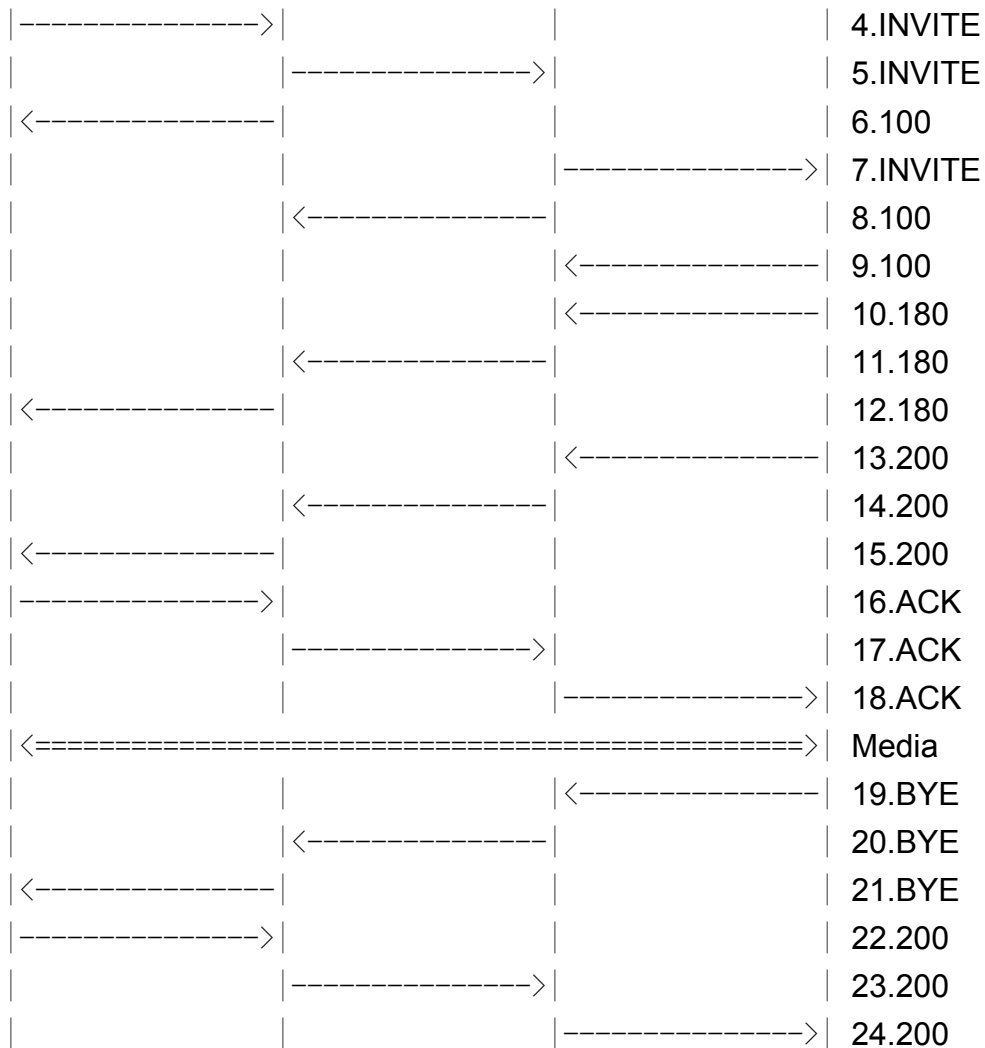
Step 6:

- Receive BYE request (from Server0)
- Send BYE request (to UA0)
 - IP address : Must send to UA0 IP address.
 - Request-Line : Must be the same Contact URI value In INVITE request that was received by B2BUA.
 - From header : Must be the same To header field in 200 OK for INVITE request. that was received by B2BUA.
 - To header : Must be the same From header field in 200 OK for INVITE request. that was received by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.
- Receive 200 OK to BYE request (from UA0)
- Send 200 OK to BYE request (to Server0)
 - IP address : Must send to Server0 IP address.
 - From header : Must be the same From Header field in BYE request that was received by B2BUA
 - To header : Must contain UA1 AoR.
 - Via header : Must contain the same Via header field in BYE request that received by B2BUA.
(and add some parameters, if necessary)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1.INVITE UA0 -> B2BUA

```

INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA0

SIP/2.0 407 Proxy Authorization Required
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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="ss.example.com",nonce="ae9137be",
domain="sip:ss.example.com",algorithm=MD5,opaque="", stale=FALSE
Content-Length: 0

3. ACK UA0 -> B2BUA

ACK sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA0 -> B2BUA

```
INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.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
```

5. INVITE B2BUA -> Server0



INVITE sip:00022223333@bbb.instance.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;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

6. 100 Trying B2BUA -> UA0

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 Server0 -> UA1

```
INVITE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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
```

8. 100 Trying Server0 -> B2BUA

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
```




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

9. 100 Trying UA1 -> B2BUA

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

11. 180 Ringing Server0 -> B2BUA

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

12. 180 Ringing B2BUA -> UA0

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Length:0

13. 200 OK UA1 -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Record-Route:
<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

14. 200 OK Server0 -> B2BUA



SIP/2.0 200 OK

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

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

Record-Route:

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

Record-Route:

<sip:ss.example.com;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:50:(InterfaceID)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:50:(InterfaceID)

t=0 0

m=audio 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

15. 200 OK B2BUA -> UA0

SIP/2.0 200 OK

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

Record-Route:

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

Record-Route:

<sip:ss.example.com;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:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125

v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

16. ACK UA0 -> B2BUA

ACK sip:z3b6tm@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 70
Route: <sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Route: <sip:ss.instance.com;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 ACK
Content-Length: 0

17. ACK B2BUA -> Server0



ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 68
Route: <sip:ss.instance.com;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 ACK
Content-Length: 0

18. ACK Server0 -> UA1

ACK sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77x
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> Server0

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route:
 <sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Route:
 <sip:ss.example.com;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: 3 BYE
Content-Length: 0

20. BYE Server0 -> B2BUA

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route:
<sip:ss.example.com;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: 3 BYE
Content-Length: 0

21. BYE B2BUA -> UA0

BYE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];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: 3 BYE
Content-Length: 0



22.200 OK UA0 -> B2BUA

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];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: 3 BYE
Content-Length: 0

23.200 OK B2BUA -> Server0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];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: 3 BYE
Content-Length: 0

24.200 OK Server0 -> UA1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];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: 3 BYE
Content-Length: 0





3.28. Interop.3.5 - Session Establishment and Disconnection with proxy for B2BUA (callee side)

[1] Test Number/Title

Interop.3.5

Session Establishment and Disconnection with proxy

[2] Purpose

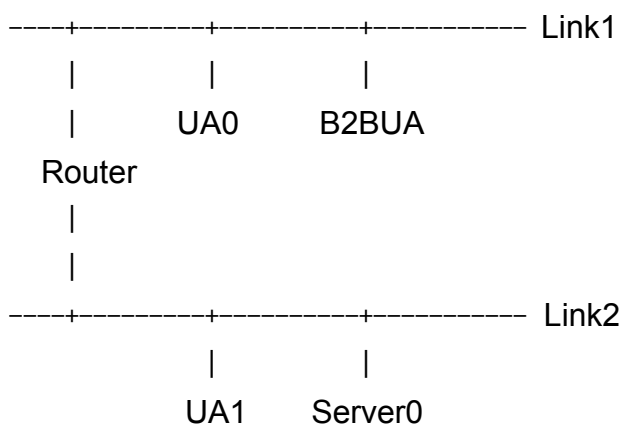
- (1) To verify that an applicant implementation can properly establish the session via a proxy.
- (2) To verify that an applicant implementation can properly finish the session via a proxy.

[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/ 1 SIP B2BUA / 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, B2BUA
Link 2	3ffe:501:ffff:50::/64	UA1, Server0

4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:50:(InterfaceID)
B2BUA	3ffe:501:ffff:5:(InterfaceID)
Server0	3ffe:501:ffff:50:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.instance.com
B2BUA	ss.example.com
Server0	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 μ -law)
- Server0: 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.
- Register UA0 to registrar of Link1 domain for using location service.
(Connect a registrar server to Link1, if necessary.)
- Register UA1 to registrar of Link2 domain for using location service.
(Connect a registrar server to Link2, if necessary.)
- Set B2BUA as an outbound proxy of UA0.
- Set Server0 as an outbound proxy of UA1.
- Set B2BUA so that when it receives a message containing SIP-URI, which is not under control of it, the message is forwarded to Server0.
- Set Server0 so that when it receives a message containing SIP-URI, which is not under control of it, the message is forwarded to B2BUA.
- Set Server0 so that it use Record-Route header.
- Confirm no call remains on B2BUA (All transactions and dialogs are cleared).
- Confirm no call remains on Server0 (All transactions and dialogs are cleared).
- Set the digest authentication parameter.

[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0
2. Observe the packet transmitted on Link1 and Link2
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link1 and Link2
5. Hang up UA1. Confirm the line is disconnected on UA0.
6. Observe the packet transmitted on Link1 and Link2
7. Hang up UA0.



[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Back-to-Back User Agent Logo]

B2BUA : Applicant Implementation

UA0 : Target User Agent (Vendor A/B)

UA1 : Reference User Agent (any Vendor)

Server0 : Target Proxy server (Vendor C/D)

Step 2:

- Receive INVITE request (from Server0)
- Send INVITE request (to UA0)

Step 4:

- Receive 200 OK to INVITE request (from UA0)
- Send 200 OK to INVITE request (to Server0)
- Receive ACK request (from Server0)
- Send ACK request (to UA0)

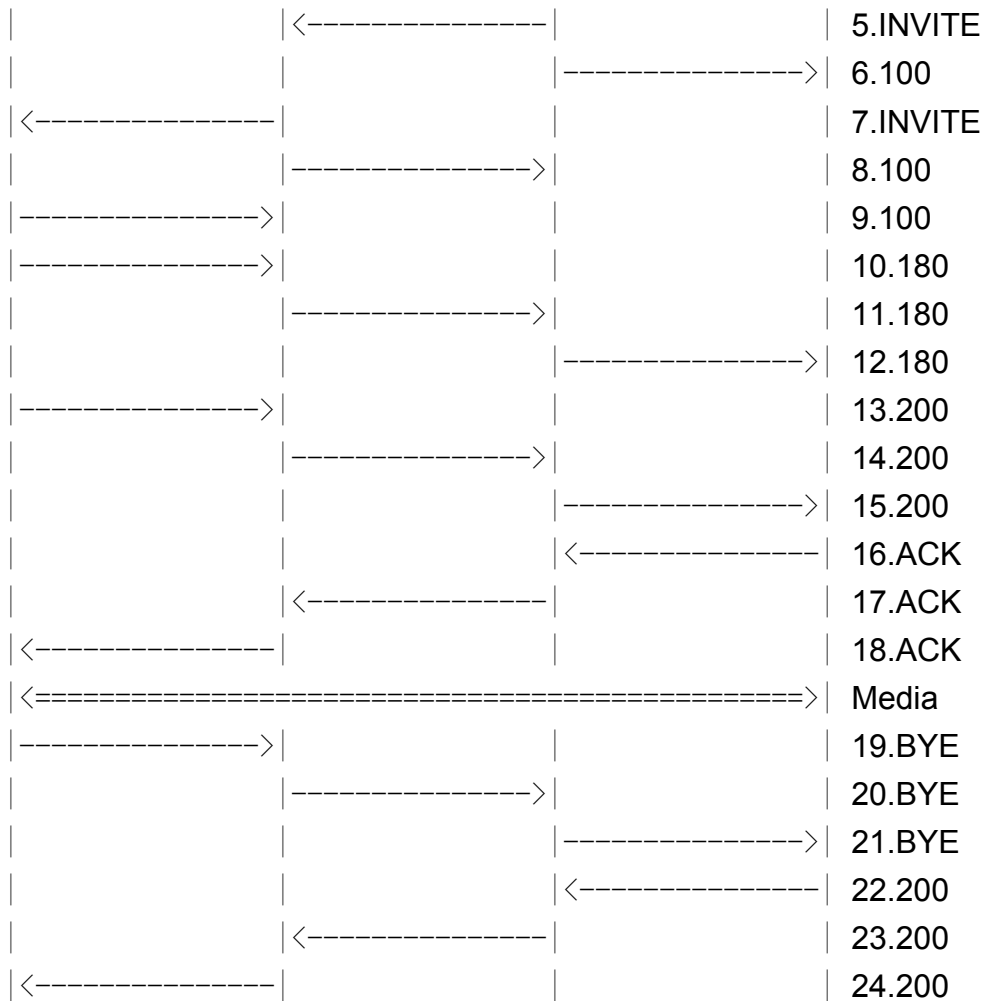
Step 6:

- Receive BYE request (from UA0)
- Send BYE request (to Server0)
- Receive 200 OK to BYE request (from Server0)
- Send 200 OK to BYE request (to UA0)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

1.INVITE UA1 -> Server0

```

INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77a
Max-Forwards: 70
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 1 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>

```



Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:50:(InterfaceID)

t=0 0

m=audio 5004 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

2.407 Proxy Authorization Required Server0 -> UA1

SIP/2.0 407 Proxy Authorization Required

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77a

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=3flal12sf

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 1 INVITE

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

Content-Length: 0

3. ACK UA1 -> Server0

ACK sip:00022221111@aaa.example.com SIP/2.0

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77a

Max-Forwards: 70

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=3flal12sf

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)



CSeq: 1 ACK
Content-Length: 0

4. INVITE UA1 -> Server0

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Max-Forwards: 70
Proxy-Authorization: Digest realm="ss.example.com",nonce="ae9137be",
  username="00022223333",uri=" sip:00022221111@aaa.example.com ",
  response="6iib19cef56c9a0a3i5aieff23a234",
  algorithm=MD5,opaque=""
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=3flal12sf
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125
```

```
v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20
```

5. INVITE Server0 -> B2BUA

```
INVITE sip:00022221111@aaa.example.com SIP/2.0
```



Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

Record-Route:

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

Max-Forwards: 68

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>

Allow: ACK,BYE,CANCEL,INVITE

Content-Type: application/sdp

Content-Length: 125

v=0

o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)

s=-

c=IN IP6 3ffe:501:ffff:50:(InterfaceID)

t=0 0

m=audio 5004 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

6. 100 Trying Server0 -> UA1

SIP/2.0 100 Trying

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

Content-Length: 0



7. INVITE B2BUA -> UA0

```
INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
Max-Forwards: 68
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@[3ffe:501:ffff:5:(InterfaceID)]
CSeq: 2 INVITE
Contact: <sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)]>
Allow: ACK,BYE,CANCEL,INVITE
Content-Type: application/sdp
Content-Length: 125
```

```
v=0
o=- 0 0 IN IP6 3ffe:501:ffff:50:(InterfaceID)
s=-
c=IN IP6 3ffe:501:ffff:50:(InterfaceID)
t=0 0
m=audio 5004 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20
```

8. 100 Trying B2BUA -> Server0

```
SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
```



From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 INVITE
Content-Length:0

9. 100 Trying UA0 -> B2BUA

SIP/2.0 100 Trying
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 INVITE
Content-Length:0

10. 180 Ringing UA0 -> B2BUA

SIP/2.0 180 Ringing
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
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-Length:0

11. 180 Ringing B2BUA -> Server0

SIP/2.0 180 Ringing

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

Record-Route:

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

Record-Route:

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

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

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

Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

12. 180 Ringing Server0 -> UA1

SIP/2.0 180 Ringing

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

Record-Route:

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

Record-Route:

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

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)

CSeq: 2 INVITE

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



Allow: ACK,BYE,CANCEL,INVITE

Content-Length:0

13. 200 OK UA0 -> B2BUA

SIP/2.0 200 OK

Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77c

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e

Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g

Record-Route:

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

Record-Route:

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

From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf

To: <sip:00022221111@aaa.example.com>;tag=314159

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 3456 RTP/AVP 0

a=rtpmap:0 PCMU/8000

a=ptime:20

14. 200 OK B2BUA -> Server0



SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77e
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(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 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

15. 200 OK Server0 -> UA1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g
Record-Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Record-Route:
<sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf



To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(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 3456 RTP/AVP 0
a=rtpmap:0 PCMU/8000
a=ptime:20

16. ACK UA1 -> Server0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 70
Route: <sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Route: <sip:ss.instance.com;maddr=[3ffe:501:ffff:50:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

17. ACK Server0 -> B2BUA

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



Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 68
Route: <sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:50:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

18. ACK B2BUA -> UA0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK5na77x
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK8374921
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK4na77g2
Max-Forwards: 68
From: <sip:00022223333@bbb.instance.com>;tag=a6c85cf
To: <sip:00022221111@aaa.example.com>;tag=314159
Call-ID: a84b4c76e6@3ffe:501:ffff:5:(InterfaceID)
CSeq: 2 ACK
Content-Length: 0

19. BYE UA0 -> B2BUA

BYE z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route:
<sip:ss.example.com;maddr=[3ffe:501:ffff:5:(InterfaceID)];lr>
Route:
<sip:ss.instance.com;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: 3 BYE
Content-Length: 0

20. BYE B2BUA -> Server0

BYE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
Max-Forwards: 70
Route:
 <sip:ss.instance.com;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:50:(InterfaceID)
CSeq: 3 BYE
Content-Length: 0

21. BYE Server0 -> UA1

BYE sip:z3b6tm@[3ffe:501:ffff:50:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK837497b
Via: SIP/2.0/UDP [3ffe:501:ffff:50:(InterfaceID)];branch=z9hG4bK5na77h
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
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:50:(InterfaceID)
CSeq: 3 BYE
Content-Length: 0



22.200 OK UA1 -> Server0

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

23.200 OK Server0 -> B2BUA

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

24.200 OK B2BUA -> UA0

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77gg
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: 3 BYE
Content-Length: 0



3.29. Interop.3.6 - Session Hold and Hold Release for B2BUA

[1] Test Number/Title

Interop.3.6

Session Hold and Hold Release

[2] Purpose

To verify that an applicant implementation can properly perform the originated and terminated call hold and resume.

[3] Resource Requirement

Session establishment, disconnection and re-INVITE function / RFC3261

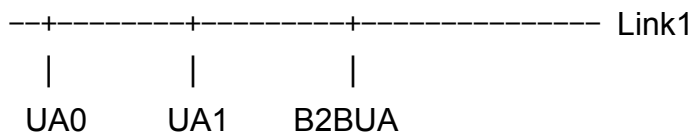
Media exchange (SDP), hold and hold release / RFC3264, RFC4566

IPv6 compliant / RFC4566

Authentication / RFC2617

[4] Test Setup

[4.1] Topology



- 2 SIP UA s/ 1 SIP B2BUA

[4.2] Address

4.2.1 Example of link information (Prefix)

	IP address	Node
Link 1	3ffe:501:ffff:5::/64	UA0, UA1, B2BUA



4.2.2 Example of node information

- IP address information

	IP address
UA0	3ffe:501:ffff:5:(InterfaceID)
UA1	3ffe:501:ffff:5:(InterfaceID)
B2BUA	3ffe:501:ffff:5:(InterfaceID)

- SIP URI information

	AoR(SIP URI)
UA0	00022221111@aaa.example.com
UA1	00022223333@bbb.example.com
B2BUA	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 μ -law)
- Authentication: Digest authentication
- Authentication algorithm: MD5

[4.4] Test Initial Conditions

- Send Ping to confirm the connectivity from each node to IPv6 routers.
- Register UA0 and UA1 for using location service.
(Connect a registrar server to Link1, if necessary.)
- Set B2BUA as an outbound proxy of UA0 and UA1.
- Confirm no call remains on B2BUA. (All transactions and dialogs are cleared.)
- Set the digest authentication parameter.



[5] Test Procedure

1. Call from UA0 to UA1. Confirm the ring on UA1 and the ring back tone on UA0.
2. Observe the packet transmitted on Link1
3. Answer the call on UA1. Confirm the voice transmission on both UA0 and UA1.
4. Observe the packet transmitted on Link1.
5. Suspend the line on UA1. Confirm that neither UA0 nor UA1 can hear any sound (except on-hold tone) or voice from the other.
6. Observe the packet transmitted on Link1.
7. Release the hold on UA1. Confirm that both UA0 and UA1 hear any voice from the other.
8. Observe the packet transmitted on Link1.
9. Hang up UA1. Confirm the line is disconnected on UA0.
10. Observe the packet transmitted on Link1.
11. Hang up UA0.

[6] Observable Results

Applicable “Observable Results” are different depends on the type of applicant implementation.

[Back-to-Back User Agent Logo]

B2BUA : Applicant Implementation.

UA0 : Target User Agent (Vendor A/B)

UA1 : Target User Agent (Vendor A/B)

Step 2:

- Receive INVITE request (from UA0).
- Send INVITE request (to UA1).
 - IP address : Must send to UA1 IP address.
 - Via header : Must contain B2BUA domain name or IP address.

Step 4:



- Receive 200 OK (from UA1).
- Send 200 OK (to UA0).
 - IP address : Must send to UA0 IP address.
 - From header : Must be the same as From header field in received INVITE request.
 - To header : Must contain the same To URI of the received INVITE request.
 - Via header : Must contain the same Via header field of the received INVITE request (and add some parameters, if necessary).

- Receive ACK request (from UA0).
- Send ACK request (to UA1).
 - IP address : Must send to UA1 IP address.
 - Request-Line : Must be Contact URI. The URI must be same value of received 200 OK response for INVITE request.
 - From header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - To header : Must be same as the From header field in INVITE request that was sent by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.

Step 6:

- Receive re-INVITE (Hold on) request (from UA1)
- Send re-INVITE (Hold on) request (to UA0)
 - IP address : Must send to UA0 IP address.
 - Request-Line : Must be Contact URI. The URI must be same value of the INVITE request when you received.
 - From header : Must be the same as To header field in received INVITE request.
 - To header : Must contain the same From URI of the received INVITE request.
 - Via header : Must contain B2BUA domain name or IP address.

- Receive 200 OK to re-INVITE request (from UA0)
- Send 200 OK to re-INVITE request (to UA1)



IP address : Must send to UA1 IP address.
From header : Must be the same as From header field in received re-INVITE request.
To header : Must contain the same To URI of the received re-INVITE request.
Via header : Must contain the same Via header field of the received re-INVITE request (and add some parameters, if necessary).

- Receive ACK request (from UA1)

- Send ACK request (to UA0)

IP address : Must send to UA0 IP address.
Request-Line : Must be Contact URI. The URI must be same value of received 200 OK response for re-INVITE request.
From header : Must be same as the From header field in re-INVITE request that was sent by B2BUA.
To header : Must be same as the From header field in re-INVITE request that was sent by B2BUA.
Via header : Must contain B2BUA domain name or IP address.

Step 8:

- Receive re-INVITE (Hold release) request (from UA1)

- Send re-INVITE (Hold release) request (to UA0)

IP address : Must send to UA0 IP address.
Request-Line : Must be Contact URI. The URI must be same value of the INVITE request when you received.
From header : Must be the same as To header field in received INVITE request.
To header : Must contain the same From URI of the received INVITE request.
Via header : Must contain B2BUA domain name or IP address.

- Receive 200 OK to re-INVITE request (from UA0)

- Send 200 OK to re-INVITE request (to UA1)

IP address : Must send to UA1 IP address.



- From header : Must be the same as From header field in received re-INVITE request.
 - To header : Must contain the same To URI of the received re-INVITE request.
 - Via header : Must contain the same Via header field of the received re-INVITE request (and add some parameters, if necessary).
- Receive ACK request (from UA1)
 - Send ACK request (to UA0)
 - IP address : Must send to UA0 IP address.
 - Request-Line : Must be Contact URI. The URI must be same value of received 200 OK response for re-INVITE request.
 - From header : Must be same as the From header field in re-INVITE request that was sent by B2BUA.
 - To header : Must be same as the From header field in re-INVITE request that was sent by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.

Step 10:

- Receive BYE request (from UA1).
- Send BYE request (to UA0).
 - IP address : Must send to UA0 IP address.
 - Request-Line : Must be the same Contact URI value In INVITE request that was received by B2BUA.
 - From header : Must be the same To header field in 200 OK for INVITE request. that was received by B2BUA.
 - To header : Must be the same From header field in 200 OK for INVITE request. that was received by B2BUA.
 - Via header : Must contain B2BUA domain name or IP address.
- Receive 200 OK for BYE request (from UA0).
- Send 200 OK for BYE request (to UA1).
 - IP address : Must send to UA1 IP address.
 - From header : Must be the same From Header field in BYE request



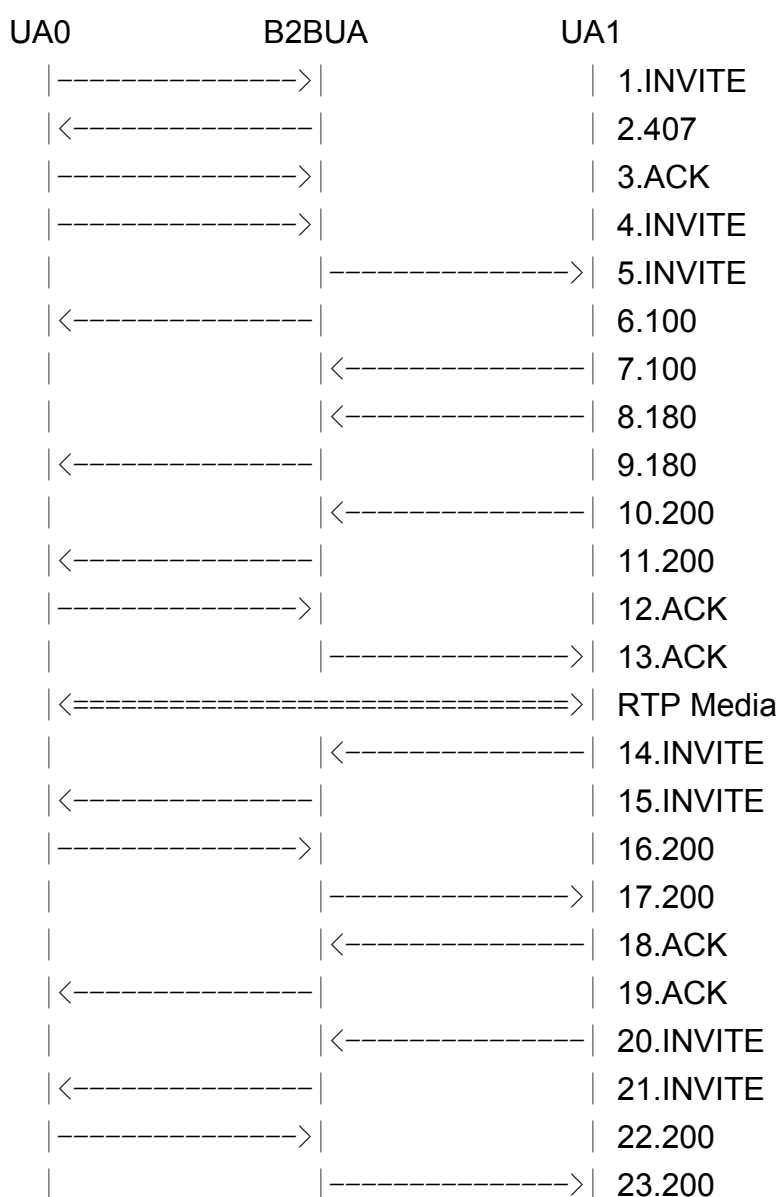
that was received by B2BUA

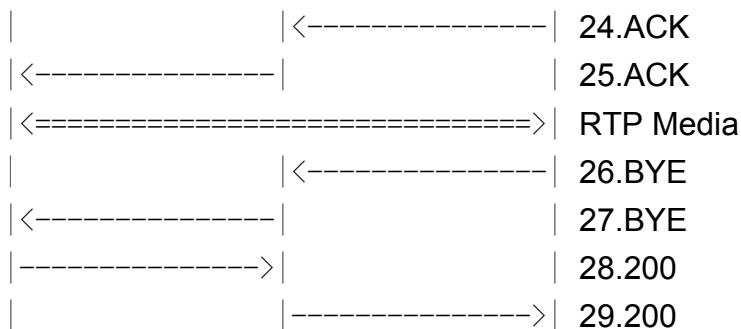
To header : Must contain UA1 AoR.

Via header : Must contain the same Via header field in BYE request that received by B2BUA.
(and add some parameters, if necessary)

[7] Reference

[7.1] Message Flow





[7.2] Message Examples

* See Message Examples "1. - 13. " in 3.23 Interop.3.1

14.INVITE UA1 -> B2BUA

```
INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggu
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
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 B2BUA -> UA0

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)]SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bs
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
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 UA0 -> B2BUA

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bs
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA1

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggw
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
Content-Type: application/sdp
Content-Length: 0

19.ACK B2BUA -> UA0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837497bt
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>



Content-Type: application/sdp
Content-Length: 0

20. INVITE UA1 -> B2BUA

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggx
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
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 B2BUA -> UA0

INVITE sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bu
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
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 UA0 -> B2BUA

SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bu
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 B2BUA -> UA1

```
SIP/2.0 200 OK
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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 UA1 -> B2BUA

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via:SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK4na77ggy
Max-Forwards: 70
Route: <sip:ss.example.com;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)]>
Content-Type: application/sdp
Content-Length: 0

25.ACK B2BUA -> UA0

ACK sip:y3a6sn@[3ffe:501:ffff:5:(InterfaceID)] SIP/2.0
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];branch=z9hG4bK837499bv
Via: SIP/2.0/UDP [3ffe:501:ffff:5:(InterfaceID)];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)]>
Content-Type: application/sdp
Content-Length: 0

“26. – 29.” are omitted.

*See Message Examples “14. - 17. ” in 3.23 Interop.3.1



4. Topology Map for Interoperability test scenario for the IPv6 Ready Logo Phase 2

Topology Map

(* This form is required for the each session of Interoperability test.)

Please describe the topology map based on the test environment.

* Some examples are described below, see Example-1 to Example-3.



Form-2)

=====

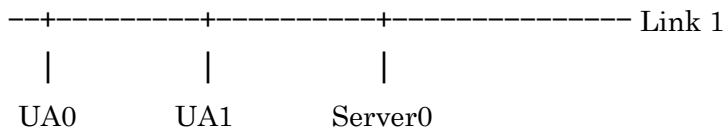
Please describe the topology map.

Interoperability Test Scenario Item Num : _____

UA0 : Vender Name : _____ Device Name : _____

UA1 : Vender Name : _____ Device Name : _____

Server0 : Vender Name : _____ Device Name : _____



IP Address Information

Link

Link1

Network Prefix: _____

User Agent Node

UA0

Global Address : _____

Link Local Address: _____

MAC Address : _____

UA1

Global Address : _____

Link Local Address: _____

MAC Address : _____

Server Node

Server0

Global Address : _____

Link Local Address: _____

MAC Address : _____



MAC Address : _____

Link2

Global Address : _____

Link Local Address: _____

MAC Address : _____

User Agent Node

UA0

Global Address : _____

Link Local Address: _____

MAC Address : _____

UA1

Global Address : _____

Link Local Address: _____

MAC Address : _____

Server Node

Server0

Global Address : _____

Link Local Address: _____

MAC Address : _____

Server1

Global Address : _____

Link Local Address: _____

MAC Address : _____

=====





MAC Address : _____

Link2

Global Address : _____

Link Local Address: _____

MAC Address : _____

User Agent Node

UA0

Global Address : _____

Link Local Address: _____

MAC Address : _____

UA1

Global Address : _____

Link Local Address: _____

MAC Address : _____

B2BUA Node

B2BUA

Global Address : _____

Link Local Address: _____

MAC Address : _____

Server Node

Server0

Global Address : _____

Link Local Address: _____

MAC Address : _____

=====



Example-1)

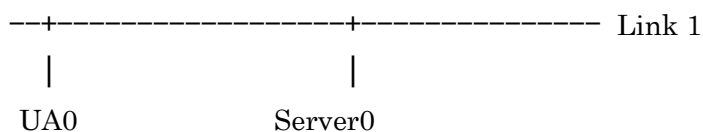
Topology Map

=====

Please describe the topology map.

Interoperability Test Scenario Item Num : U6-1-N-B-R01

UA0 : Vender Name :Hoge Corp Device Name :Hoge UA
Server0 : Vender Name :FooBar Corp Device Name :FooBar Server



IP Address Information

Link

Link1

Network Prefix: 3ffe:0501:ffff:0005::/64

User Agent Node

UA0

Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0100

Link Local Address: fe80::0200:00ff:fe00:0100

MAC Address : 00:00:00:00:01:00

Server Node

Server0

Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0200

Link Local Address: fe80::0200:00ff:fe00:0200

MAC Address : 00:00:00:00:02:00

=====



Example-2)

Topology Map

=====

Please describe the topology map.

Interoperability Test Scenario Item Num : U6-1-A-B-S01

- UA0 : Vender name :Hoge Corp Device name :Hoge UA
- UA1 : Vender name :Fuga Corp Device name :Fuga UA
- Server0 : Vender name :FooBar Corp Device name :FooBar Server



IP Address Information

Link

Link1

Network Prefix: 3ffe:0501:ffff:0005::/64

User Agent Node

UA0

Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0100

Link Local Address: fe80::0200:00ff:fe00:0100

MAC Address : 00:00:00:00:01:00

UA1

Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0101

Link Local Address: fe80::0200:00ff:fe00:0101

MAC Address : 00:00:00:00:01:01

Server Node

Server0

Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0200

Link Local Address: fe80::0200:00ff:fe00:0200

MAC Address : 00:00:00:00:02:00



=====
Example-3)

Topology Map
=====

Please describe the topology map.

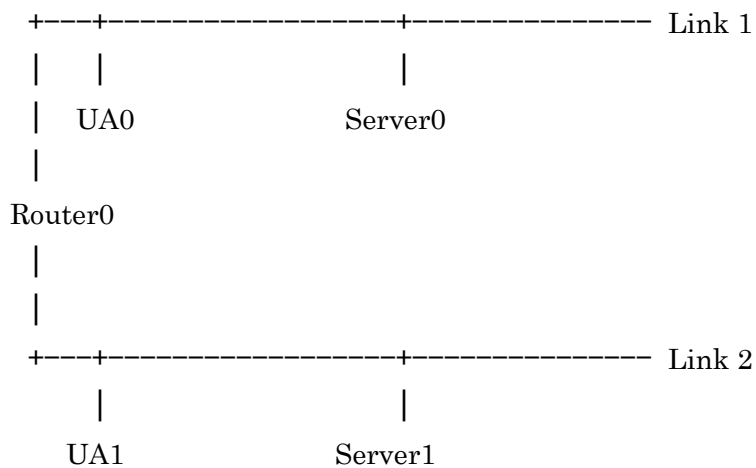
Interoperability Test Scenario Item Num : U6-2-A-A-S01

UA0 : Vender name :Hoge Corp Device name :Hoge UA

UA1 : Vender name :Fuga Corp Device name :Fuga UA

Server0 : Vender name :Foo Corp Device name :Foo Server

Server1 : Vender name :Bar Corp Device name :Bar Server



IP Address Information

Link

Link1

Network Prefix: 3ffe:0501:ffff:0005::/64

Link2

Network Prefix: 3ffe:0501:ffff:0006::/64

ROUTER

(* Router is indicated according to Topology Map.)

Router0

Link1



Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0001

Link Local Address: fe80::0200:00ff:fe00:0001

MAC Address : 00:00:00:00:00:01

Link2

Global Address : 3ffe:0501:ffff:0006:0200:00ff:fe00:0002

Link Local Address: fe80::0200:00ff:fe00:0002

MAC Address : 00:00:00:00:00:02

User Agent Node

UA0

Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0100

Link Local Address: fe80::0200:00ff:fe00:0100

MAC Address : 00:00:00:00:01:00

UA1

Global Address : 3ffe:0501:ffff:0006:0200:00ff:fe00:0101

Link Local Address: fe80::0200:00ff:fe00:0101

MAC Address : 00:00:00:00:01:01

Server Node

Server0

Global Address : 3ffe:0501:ffff:0005:0200:00ff:fe00:0200

Link Local Address: fe80::0200:00ff:fe00:0200

MAC Address : 00:00:00:00:02:00

Server1

Global Address : 3ffe:0501:ffff:0006:0200:00ff:fe00:0202

Link Local Address: fe80::0200:00ff:fe00:0202

MAC Address : 00:00:00:00:02:01



5. Result Table for Interoperability test scenario for the IPv6 Ready Logo Phase 2

Result Table

(* This is need per one application.)

Please fill in the blanks relating to your executed test results as example below.

For UA

=====

UA is a candidate for Phase 2 certification.

IO test result

Target	Server0-1	Server0-2
UA0		

=====

For Endpoint

=====

Endpoint is a candidate for Phase 2 certification.

IO test result

J

Target	Server0-1	Server0-2
UA0		

=====



For B2BUA

=====

B2BUA is a candidate for Phase 2 certification.

IO test result

* This form is for Interop.1.1-1.4, Interop.2.9-2.12

Target	Server0-1	Server0-2
UA0		

IO test result

* This form is for Interop.3.1-3.3, Interop.3.6

Target	UA0-1 -- UA1-1	UA0-1 -- UA1-2	UA0-2 -- UA1-2
B2BUA			

IO test result

* This form is for Interop.3.4-3.5

Target	UA0-1 -- Server0-1	UA0-1 -- Server0-2	UA0-2 -- Server0-1	UA0-2 -- Server2-1
B2BUA				

=====



For Registrar

=====

UA is a candidate for Phase 2 certification.

IO test result

Target	UA0	UA1
Server0		

=====

for Proxy

=====

Server is a candidate for Phase 2 certification.

IO test result

* This form is for BASIC architecture

Target	UA0-1 -- UA1-1	UA0-1 -- UA1-2	UA0-2 -- UA1-2
Server0			

IO test result

* This form is for ADVANCED architecture and Interop.1.5.

for ADVANCED architecture

Target	UA0-1 – Server1-1	UA0-1 – Server1-2	UA0-2 – Server1-1	UA0-2 – Server1-2
Server0				

for Interop.1.5

Target	UA0-1 – Server1-1	UA0-1 – Server1-2	UA0-2 – Server1-1	UA0-2 – Server1-2
Server0				

=====



Example)

For UA

=====
UA is a candidate for Phase 2 certification.

IO test result

Target	Server0-1	Server0-2
UA0	PASS	PASS

=====
for Proxy

=====
Server is a candidate for Phase 2 certification.

IO test result

* This form is for BASIC architecture

Target	UA0-1 -- UA1-1	UA0-1 -- UA1-2	UA0-2 -- UA1-2
Server0	PASS	PASS	PASS

IO test result

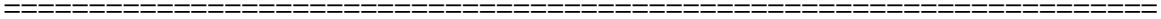
* This form is for ADVANCED architecture and Interop.1.5..

for ADVANCED architecture

Target	UA0-1 – Server1-1	UA0-1 – Server1-2	UA0-2 – Server1-1	UA0-2 – Server1-2
Server0	SKIP	SKIP	SKIP	SKIP

for Interop.1.5

Target	UA0-1 – Server1-1	UA0-1 – Server1-2	UA0-2 – Server1-1	UA0-2 – Server1-2
Server0	PASS	PASS	PASS	PASS





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