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SERIES Q: SWITCHING AND SIGNALLING

Testing specifications – Testing specifications for SIP-IMS

Malicious communication identification using IP multimedia core network subsystem; Conformance test specification – Part 2: Test suite structure and test purposes; Network side

Recommendation ITU-T Q.4008.2

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Recommendation ITU-T Q.4008.2

Malicious communication identification using IP multimedia core network subsystem; Conformance test specification – Part 2: Test suite structure and test purposes; Network side

Summary

Recommendation ITU-T Q.4008.2 v.1 (2016) provides the test suite structure and test purposes for the malicious communication identification (MCID) using IP multimedia (IM) core network (CN) subsystem conformance test specification for the network side (based on Recommendation ITU-T Q.3624 v.1).

The version number, v.1, indicates that this is version one of Recommendation ITU-T Q.4008.2, and that it relates to Release 10 of the relevant 3GPP/ETSI standard.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T Q.4008.2 v.1	2016-08-29	11	11.1002/1000/12997

Keywords

IMS, IP multimedia subsystem, malicious communication identification, MCID, testing, test suite structure and test purposes, TSS&TP.

* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

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Malicious communication identification using IP multimedia core network subsystem; Conformance test specification – Part 2: Test suite structure and test purposes; Network side

1 Scope

This Recommendation is part 2 of a multi-part deliverable covering malicious communication identification (MCID) using IP multimedia (IM) core network (CN) subsystem; conformance test specification, as identified below:

Part 1: "Protocol implementation conformance statement (PICS)";

Part 2: "Test suite structure and test purposes (TSS&TP); Network side";

Part 3: "Test suite structure and test purposes (TSS&TP); User side".

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Q.3624 v.1] Recommendation ITU-T Q.3624 v.1 (2016), *Malicious communication identification using IP multimedia core network subsystem – Protocol specification*.

[ITU-T Q.4008.1 v.1] Recommendation ITU-T Q.4008.1 v.1 (2016), *Malicious communication identification using IP multimedia core network subsystem; Conformance test specification – Part 1: Protocol implementation conformance statement*.

3 Definitions

3.1 Terms defined elsewhere

For the purposes of this Recommendation, the terms and definitions given in [ITU-T Q.3624 v.1] and the following apply:

3.1.1 communication information: Information collected and registered by the MCID service.

3.1.2 identity information: Includes all the information identifying a user, including trusted (network generated) and/or untrusted (user generated) identities.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AS Application Server

ID user Identification

IM IP Multimedia

IMS IP Multimedia Subsystem

IP Internet Protocol

ISC IP multimedia subsystem Service Control

MCID Malicious Communication Identification

MIME Multipurpose Internet Mail Extensions

PICS Protocol Implementation Conformance Statement

SIP Session Initiation Protocol

TP Test Purposes

TSS Test Suite Structure

UE User Equipment

XML extensible Markup Language

5 Conventions

None.

6 Test suite structure

Table 6-1 – Test suite structure

MCID			
	terminating_AS		MCID_N01_xxx
	interaction	ECT	MCID_N02_xxx

6.1 Configuration

The scope of this Recommendation is to test the signalling and procedural aspects of the stage 3 requirements described in [ITU-T Q.3624 v.1].Stage 3 describes the requirements for several network entities and terminal devices. Consequently, several interfaces (reference points) are addressed to satisfy the test of the different entities.

In order to test the appropriate entities the configurations below are applicable.

6.1.1 Testing of the application server

The application server (AS) entity is responsible for performing and managing services. The IP multimedia subsystem service control (ISC) interface is the appropriate access point for testing.

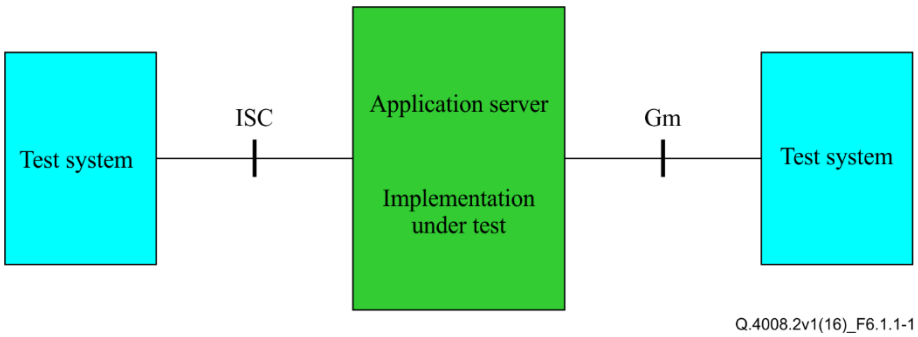

Figure 6.1.1-1 – Applicable interface to test AS functionalities

If the ISC interface is not accessible it is also possible to perform the tests of the AS using any NNI (Mw, Mg, Mx) (see Figure 4.1.1-2). In case only the Gm interface is accessible this interface can be used instead for testing, but the verification of all requirements may not be possible.

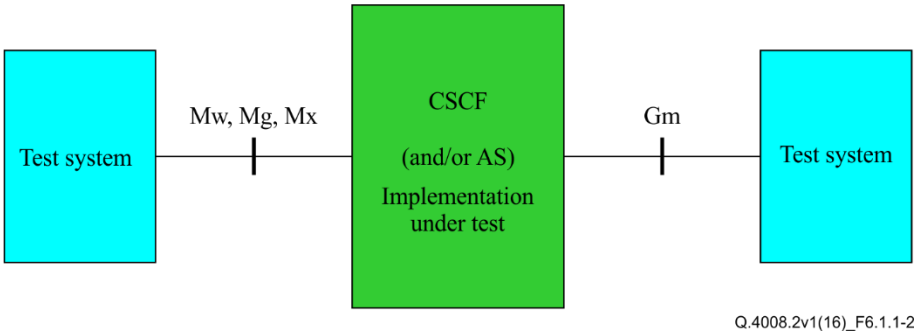

Figure 6.1.1-2 – Applicable interfaces for tests using a (generic) NNI

7 Test purposes

7.1 Introduction

For each test requirement a test purpose (TP) is defined.

7.1.1 TP naming convention

Test purposes (TPs) are numbered, starting at 001, within each group. Groups are organized according to the test suite structure (TSS). Additional references are added to identify the actual test suite and whether it applies to the network or the user (see Table 7.1.1-1).

Table 7.1.1-1 – TP identifier naming convention scheme

Identifier: **<ss>_<iut><group>_<nnn>**		
<ss> = supplementary service:	e.g., "MCID"	
<iut> = type of IUT:	U N	User equipment Network entity
<group> = group	2 digit field representing group reference according to TSS	
<nnn> = sequential number	(001-999)	

7.1.2 Test strategy

As the base standard [ITU-T Q.3624 v.1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the protocol implementation conformance statement (PICS) specification [ITU-T Q.4008.1 v.1]. The criteria applied include the following:

– Whether or not a test case can be built from the TP is not considered.

7.2 TPs for malicious communication identification

7.2.1 Actions at the AS of the terminating user

TSS	**TP**	**MCID reference**	**Selection expression**
MCID/terminating_AS	MCID_N01_001	Clause 4.5.2.5.2 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/2 [ITU-T Q.4008.1 v.1]

Test purpose

The AS holds the call state after a BYE from the originating user equipment (UE)

Ensure that the AS holds the confirmed call state while $T_{MCID-BYE}$ is running, if MCID is subscribed by the called user and a BYE was received from the originating user UE. When $T_{MCID-BYE}$ is expired, the BYE is forwarded to the terminating UE.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

Comments:

Test equipment (ISC)		**AS**		**Test equipment (Gm)**
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
BYE	→	$T_{MCID-BYE}$ started		
200 OK BYE	←			
		$T_{MCID-BYE}$ expires		
			→	BYE
			←	200 OK BYE

TSS	**TP**	**MCID reference**	**Selection expression**
MCID/terminating_AS	MCID_N01_002	Clause 4.5.2.5.2 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/2 [ITU-T Q.4008.1 v.1]

Test purpose

The AS holds the early dialogue state after a CANCEL from the originating UE

Ensure that the AS holds the early dialogue state while $T_{MCID-BYE}$ is running, if MCID is subscribed by the called user and a CANCEL was received from the originating user UE. When $T_{MCID-BYE}$ is expired, the CANCEL is forwarded to the terminating UE.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

Comments:

Test equipment (ISC)		**AS**		**Test equipment (Gm)**
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
CANCEL	→	$T_{MCID-BYE}$ started		
200 OK CANCEL	←			
487 Request Terminated	←			
ACK	→			
		$T_{MCID-BYE}$ expires		
			→	CANCEL
			←	200 OK CANCEL
			←	487 Request Terminated
			→	ACK

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_003	Clause 4.5.2.5.2 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/2 [ITU-T Q.4008.1 v.1]

Test purpose

MCID request containing a mcid XML body. The AS holds the call state after a BYE from the originating UE in the confirmed dialogue

MCID is subscribed by the called user and a BYE was received from the originating user UE in the confirmed dialogue. Ensure that the AS holds the call state while $T_{MCID-BYE}$ is running.

If a reINVITE and the 'mcid' XML body is present to invoke the MCID service was received while $T_{MCID-BYE}$ is running, ensure that the BYE is forwarded to the terminating UE when $T_{MCID-BYE}$ is expired.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

reINVITE without session modification
XML mcid
request
McidRequestIndicator = 1

Comments:

Test equipment (ISC)		AS		Test equipment (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
BYE	→	$T_{MCID-BYE}$ started		
200 OK BYE	←			
			←	Re-INVITE requesting MCID
			→	200 OK INVITE
			←	ACK
		$T_{MCID-BYE}$ expires		
			→	BYE
			←	200 OK BYE

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_004	Clause 4.5.2.5.2 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/2 [ITU-T Q.4008.1 v.1]

Test purpose

MCID request a mcid XML body is not present. The AS holds the call state after a BYE from the originating UE in the confirmed dialogue

MCID is subscribed in Temporary Mode by the called user and a BYE was received from the originating user UE in the confirmed dialogue. Ensure that the AS holds the call state while $T_{MCID-BYE}$ is running.

If a reINVITE and the 'mcid' XML body is not present to invoke the MCID service was received while $T_{MCID-BYE}$ is running, ensure that the BYE is forwarded to the terminating UE when $T_{MCID-BYE}$ is expired.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

reINVITE without session modification

Comments:

Test equipment (ISC)		AS		Test equipment (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
BYE	→	$T_{MCID-BYE}$ started		
200 OK BYE	←			
			←	Re-INVITE requesting MCID
			→	200 OK INVITE
			←	ACK
		$T_{MCID-BYE}$ expires		
			→	BYE
			←	200 OK BYE

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_005	Clause 4.5.2.5.2 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/2 [ITU-T Q.4008.1 v.1]

Test purpose

MCID request containing a mcid XML body in the confirmed dialogue

MCID is subscribed with Temporary Mode by the called user Ensure that a reINVITE and the 'mcid' XML body is present to invoke the MCID service was received in the confirmed state the reINVITE is not sent toward the originating UE.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

reINVITE without session modification
XML mcid
request
McidRequestIndicator = 1

Comments:

Test equipment (ISC)		AS		Test equipment (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
			←	Re-INVITE requesting MCID
			→	200 OK INVITE
			←	ACK

Apply post test routine

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_006	Clause 4.5.2.5.2 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/2 [ITU-T Q.4008.1 v.1]

Test purpose

MCID request a mcid XML body is not present in the confirmed dialogue

MCID is subscribed with Temporary Mode by the called user A reINVITE and the 'mcid' XML body is not present to invoke the MCID service was received in the confirmed state the reINVITE is possible sent toward the originating UE.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

reINVITE without session modification

Comments:

Test equipment (ISC)		AS		Test equipment (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
CASE A				
			←	Re-INVITE requesting MCID
			→	200 OK INVITE
			←	ACK
CASE B				
Re-INVITE	←		←	Re-INVITE requesting MCID
200 OK INVITE	→		→	200 OK INVITE
ACK	←		←	ACK

Apply post test routine

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_007	Clause 4.5.2.5.2 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/2 [ITU-T Q.4008.1 v.1]

Test purpose

MCID request containing a mcid XML body. The AS holds the call state after a CANCEL from the originating UE in the early dialogue

MCID is subscribed with Temporary Mode by the called user and a CANCEL was received from the originating user UE in the early dialogue. Ensure that the AS holds the call state while $T_{MCID-BYE}$ is running.

If a reINVITE to invoke the MCID service was received and the 'mcid' XML body is present while $T_{MCID-BYE}$ is running, ensure that the CANCEL is forwarded to the terminating UE when timer $T_{MCID-BYE}$ is expired.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

reINVITE without session modification
XML mcid
request
McidRequestIndicator = 1

Comments:

Test equipment (ISC)		AS		Test equipment (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
CANCEL	→	$T_{MCID-BYE}$ started		
200 OK CANCEL	←			
487 Request Terminated	←			
ACK	→			
			←	Re-INVITE requesting MCID
			→	200 OK INVITE
			←	ACK
		$T_{MCID-BYE}$ expires		
			→	CANCEL
			←	200 OK CANCEL
			←	487 Request Terminated
			→	ACK

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_008	Clause 4.5.2.5.2 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/2 [ITU-T Q.4008.1 v.1]

Test purpose

MCID request a mcid XML body is not present. The AS holds the call state after a CANCEL from the originating UE in the early dialogue

MCID is subscribed in Temporary Mode by the called user and a CANCEL was received from the originating user UE in the early dialogue. Ensure that the AS holds the call state while $T_{MCID-BYE}$ is running.

If a reINVITE to invoke the MCID service was received and the 'mcid' XML body is not present while $T_{MCID-BYE}$ is running, ensure that the CANCEL is forwarded to the terminating UE when timer $T_{MCID-BYE}$ is expired.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

reINVITE without session modification

Comments:

Test equipment (ISC)		AS		Test equipment (Gm)
INVITE	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
CANCEL	→	$T_{MCID-BYE}$ started		
200 OK CANCEL	←			
487 Request Terminated	←			
ACK	→			
			←	Re-INVITE requesting MCID
			→	200 OK INVITE
			←	ACK
		$T_{MCID-BYE}$ expires		
			→	CANCEL
			←	200 OK CANCEL
			←	487 Request Terminated
			→	ACK

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_009	Clause 4.5.2.5.3 [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/3 [ITU-T Q.4008.1 v.1]

Test purpose

Requesting the originating identity not received in the initial INVITE; response received containing the requested Identity

An INVITE request was received and a P-Asserted. Identity is not present. Ensure that the AS, having sent an INFO message containing a XML 'mcid' body with MCID XML Request schema requesting the originating ID, on receipt of an INFO message containing a XML 'mcid' body with MCID XML Response schema and the originating identity, passes on the 180 Ringing from the called user.

Preconditions: Called user has MCID subscription (Permanent Mode or Temporary Mode)

SIP header values:

INVITE: without P-Asserted-Identity

INFO1

XML mcid

request

McidRequestIndicator = 1

INFO2

XML mcid

Response

McidResponseIndicator = 1

OrigPartyIdentity (optional)

OrigPartyPresentationRestriction (optional)

GenericNumber (optional)

GenericNumberPresentationRestriction (optional)

Comments:

Test equipment (ISC)		**AS**		**Test equipment (Gm)**
INVITE	→			
100 Trying	←			
CASE A				
INFO1 (MIME body)	←	T_{O-ID} started	→	INVITE
200 OK INFO	→		←	100 Trying
			←	180 Ringing
INFO2 (MIME body)	→	T_{O-ID} stopped		
200 OK INFO	←			
180 Ringing	←			
CASE B				
INFO1 (MIME body)	←	T_{O-ID} started		
200 OK INFO	→			
INFO2 (MIME body)	→	T_{O-ID} stopped	→	INVITE
200 OK INFO	←		←	100 Trying
180 Ringing	←		←	180 Ringing
		Apply post test routine		

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_010	Clause 4.5.2.5.3 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/3 [ITU-T Q.4008.1 v.1]

Test purpose

Requesting the originating identity not received in the initial INVITE; response received without originating Identity

An INVITE request was received and a P-Asserted-Identity is not present.

Ensure that the AS, having sent an INFO message containing a XML 'mcid' body with MCID XML Request schema requesting the originating ID, on receipt of an INFO message not containing the originating identity, passes on the 180 Ringing from the called user.

Preconditions: Called user has MCID subscription (Permanent Mode or Temporary Mode)

SIP header values:

INVITE: without P-Asserted-Identity

INFO1

XML mcid
request
McidRequestIndicator = 1

INFO2

XML mcid
response
McidResponseIndicator = 0
without originating identity

Comments:

Test equipment (ISC)		**AS**		**Test equipment (Gm)**
INVITE	→			
100 Trying	←			
CASE A				
INFO1 (MIME body)	←	T_{O-ID} started	→	INVITE
200 OK INFO	→		←	100 Trying
			←	180 Ringing
INFO2 (MIME body)	→	T_{O-ID} stopped		
200 OK INFO	←			
180 Ringing	←			
CASE B				
INFO1 (MIME body)	←	T_{O-ID} started		
200 OK INFO	→			
INFO2 (MIME body)	→	T_{O-ID} stopped	→	INVITE
200 OK INFO	←		←	100 Trying
180 Ringing	←		←	180 Ringing

Apply post test routine

TSS	TP	MCID reference	Selection expression
MCID/terminating_AS	MCID_N01_011	Clause 4.5.2.5.3 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/3 [ITU-T Q.4008.1 v.1]

Test purpose

Requesting the originating identity not received in the initial INVITE; no response received

An INVITE request was received and a P-Asserted. Identity is not present.

Ensure that the AS, having sent an INFO message containing a XML 'mcid' body with MCID XML Request schema requesting the originating ID, on the expiry of $T_{O\text{-}ID}$, passes on the 180 Ringing from the called user.

Preconditions: Called user has MCID subscription (Permanent Mode or Temporary Mode)

SIP header values:

INFO

XML mcid

request

McidRequestIndicator = 1

Comments:

Test equipment (ISC)		**AS**		**Test equipment (Gm)**
INVITE	→			
100 Trying	←			
CASE A				
INFO (MIME body)	←	$T_{O\text{-}ID}$ started	→	INVITE
200 OK INFO	→		←	100 Trying
			←	180 Ringing
180 Ringing	←	$T_{O\text{-}ID}$ expires		
CASE B				
INFO1 (MIME body)	←	$T_{O\text{-}ID}$ started		
200 OK INFO	→			
		$T_{O\text{-}ID}$ expires	→	INVITE
			←	100 Trying
180 Ringing	←		←	180 Ringing
		Apply post test routine		

7.3 Interaction with other services

7.3.1 Explicit communication transfer (ECT)

TSS	**TP**	**MCID reference**	**Selection expression**
MCID/interaction/ECT	MCID_N02_001	Clause 4.6.10 of [ITU-T Q.3624 v.1]	PICS 4.5.1/2 AND PICS 4.7.1/4 [ITU-T Q.4008.1 v.1]

Test purpose

MCID request is rejected if a communication is transferred

MCID is subscribed in Temporary Mode by the called user and the confirmed communication is set on hold. Ensure that a MCID request is rejected if a communication was transferred before by the called user.

Preconditions: Called user has MCID subscription with Temporary Mode

SIP header values:

INVITE

XML mcid request

McidRequestIndicator = 1

Comments:

Test equipment (ISC)		**AS**		**Test equipment (Gm)**
INVITE 1	→		→	INVITE
100 Trying	←		←	100 Trying
180 Ringing	←		←	180 Ringing
200 OK INVITE	←		←	200 OK INVITE
ACK	→		→	ACK
INVITE	←		←	INVITE 2 (sendonly)
200 OK INVITE	→		→	200 OK INVITE (recvonly)
ACK	←		←	ACK
			←	REFER
			→	202 Accepted
			←	INVITE 3
			→	488 Not Acceptable Here
			←	ACK
		Apply post test routine		

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