IPv6 Ready Logo Phase II

Interoperability Test Specification

Management(SNMP/MIBs)

Technical Document

Revision 1.0.6

IPv6 Forum *http://www.ipv6forum.org/*
IPv6 Logo Committee *http://www.ipv6ready.org/*
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MODIFICATION RECORD

Version	Date	Note
0.1.0	2007/10/31	SNMPv2C IOT test draft
0.2.0	2008/01/10	restructure according to SNMP management functions
	2008/01/18	NUT to replace TARGET_DEVICE
	2008/02/05	INFORM PDU will not be covered in this version
	2008/02/13	Get is performed to check ipNetToPhysicalTable before prefix configuration
	2008/03/07	1. Hop Limit in IPv6 headers in SNMP response is used for ipv6IpDefaultHopLimit test 2. SNMP commands are added for easy test configuration 3. IPv6Ready/IPv6ReadyLogo is added to test SNMPv2C user defined community feature. IOT tests must follow the test sequence of public/private first and IPv6Ready/IPv6ReadyLogo later when conducting the test. 4. No manual address configuration is used in this test. Only RA autoconfiguration will be used for the test. 5. multiple prefixes test is deleted in ICMP echo interoperability/neighbor cache test 6. Set with more advanced network management functions is used to check network address and ipv6 interface status 7. Set sysContact is deleted because it is already tested in the conformance test.
	2008/03/10	Router must first send RA with prefix PF1 and Host must perform address autoconfiguration in Common Default Configuration
	2008/03/11	1. use net-snmp commands for SNMP commands example 2. udp6 is added before the SNMP commands
	2008/03/12	ipAddressType in ipAddressTable will not be checked due to anycast address result will not do in getNext command in the test OID
	2008/03/17	NICI is deleted in the document appendix is added
0.2.1	2008/03/20	Final inspection for internal review
0.2.2	2008/03/21	public/private is deleted because it is already tested in conformance test
	2008/03/24	1. power on sequence of test machines factor is taken into account for ipNetToPhysicalTable test 2. Rollback to the pre-Set state is recommended but not included for test judgement.
0.2.3	2008/04/06	1. Follow SMI TC inetAddressType, ipv6AddressType definitions(accept both fixed and variable length octet string encoding implementations) 2. Set test scenario is redesigned
	2008/05/21	1. Design principles and test requirement are modification on Requirement
0.2.4	2008/09/25	1. v6SNMPv2CIOT8 ICMPv6 Echo Interoperability/Neighbor Cache modified(modified EUI-64 deleted, GetBulkRequest operation replaced with GetRequest)

		2. Test Topology modified with MAC address
0.2.5	2008/10/06	1. v6SNMPv2CIOT8 ICMPv6 Echo Interoperability/Neighbor Cache procedure 3 TGT-AGENT pings REF-ROUTER/HOST changed to REF-ROUTER/HOST pings TGT-AGENT
1.0.0	2008/12/15	1. Final release for SNMP IOT test specification
1.0.1	2009/11/05	1. v6SNMPv2CIOT7.2 Procedure 5 SNMP command: snmpbulkget –v 2C –Cn0 –Cr2 -c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.32.1.5.3.2.63.254.5.1.255.255 is changed to SNMP command: snmpbulkget –v 2C –Cn0 –Cr2 -c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.34.1.5.3.2.63.254.5.1.255.255
	2009/11/18	1. v6SNMPv2CIOT7.2 Procedure 2 prefix option lifetime is changed to valid lifetime=60 and preferred lifetime=60 seconds. 2. v6SNMPv2CIOT7.2 Max-repetitions=2 in Procedure 3 TGT-MANAGER performs SNMPv2C GetBulkRequest is changed to max-repetitions=3 and Cr2 is changed to Cr3 3. SNMP command: snmpbulkget –v 2C –Cn0 –Cr3 -c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.34.1.5.3.2.63.254.5.1.255.255
	2009/11/24	1. Possible Problems added in v6SNMPv2CIOT7.2 2. Step 3 in v6SNMPv2CIOT7.2 Procedure 7 is changed to Step 4 3. Step 4 in v6SNMPv2CIOT7.2 Procedure 8 is changed to Step 5
1.0.2	2010/06/18	1. ipAddressPrefix in ipAddressTable in v6SNMPv2CIOT6 Address Configuration is changed to the row pointer type defined in RFC 4293
1.0.3	2010/06/29	1. the original ifIndex=3 in all the OID(1.3.6.1.2.1.4.32.1.5.3.2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 in v6SNMPv2CIOT7.1) is changed to ifIndex 2. Purpose in v6SNMPv2CIOT7.2 Multiple Prefix is changed to This test is to examine the NUT's ICMPv6 prefix information changes in the ipAddressPrefixTable when a new prefix(PF2=3ffe:501:ffff:101/64) is added in the network using SNMP commands 3. All ipAddressTable in v6SNMPv2CIOT7.2 is replaced with ipAddressPrefixTable 4. ipAddressTable in Table 1 IPv6 Ready Logo SNMP/MIBs Interoperability Test Criteria v6SNMPv2CIOT7.2 is deleted 5. 1.3.6.1.2.1.4.34.1.5.3.2.63.254.5.1.255.255 in v6SNMPv2CIOT7.2 is changed to 1.3.6.1.2.1.4.32.1.3.ifIndex.2.63.254.5.1.255.255 6. max-repetitions=1 in v6SNMPv2CIOT7.2 test procedure 8 is changed to max-repetitions=2 7. ipAddressPrefixPrefix.ifIndex.2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 and ipAddressPrefixPrefix.ifIndex.2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 in v6SNMPv2CIOT7.2 2.test result from Procedure 5 is changed to 3F.FE.05.01.FF.FF.01.00.00.00.00.00.00.00.00 and

		3F.FE.05.01.FF.FF.01.01.00.00.00.00.00.00.00.00 8. Response PDU from ipAddressPrefixTable after the expiration of prefix 3ffe:501:ffff:101/64 is only ipAddressPrefixPrefix.ifIndex.2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.0.64 in v6SNMPv2CIOT7.2 4.test result from Procedure 8 is changed to Can't find 3F.FE.05.01.FF.FF.01.01.00.00.00.00.00.00.00.00 in Response PDU after the expiration of prefix 3ffe:501:ffff:101/64. Only 3F.FE.05.01.FF.FF.01.00.00.00.00.00.00.00.00.00 is found.
1.0.4	2010/07/22	1. Test Purpose of v6SNMPv2CIOT7.2 Multiple Prefix is changed to "This test is to examine the NUT's IPv6 prefix information changes in the ipAddressPrefixTable when a new prefix(PF2=3ffe:501:ffff:101/64) is added". 2. Test Procedure 2 and 3 of v6SNMPv2CIOT7.2 Multiple Prefix is deleted and Procedure 1 is changed to "Add an IPv6 address with PF2 prefix and valid and preferred lifetime = 60 seconds in TGT-AGENT" 3. 2.Test result from procedure 3 in Judgement of v6SNMPv2CIOT7.2 Multiple Prefix is changed to "received packet with ipAddressPrefix.origin value for PF1=3ffe:501:ffff:100/64 and PF2=3ffe:501:ffff:101/64 in ipAddressPrefixTable". 4. 4.Test result from procedure 6 in Judgement of v6SNMPv2CIOT7.2 Multiple Prefix is changed to "Can't find. ipAddressPrefix.origin value for PF1=3ffe:501:ffff:101/64 in ipAddressPrefixTable. Only ipAddressPrefix.origin value for PF1=3ffe:501:ffff:100/64 is found".
	2010/08/18	1. values for ipAddressPrefixAdvPreferredLifetime and ipAddressPrefixAdvValidLifetime in v6SNMPv2CIOT7.2 1.Test result from procedure 2 is changed to less than 60 seconds according to RFC 4293 definition(ipAddressPrefixAdvPreferredLifetime:the remaining length of time, in seconds, that this prefix will continue to be preferred and ipAddressPrefixAdvValidLifetime: the remaining length of time, in seconds, that this prefix will continue to be valid) 2. Procedure 2 in v6SNMPv2CIOT7.2 must be performed within 60 seconds 3. value for ipAddressPrefixAdvPreferredLifetime in v6SNMPv2CIOT5.2 Part A:1. TGT-AGENT's ipDefaultRouteLifeTime must be less than 1800 secs, the remaining ipDefaultRouterLifeTime value is changed to less than 60 seconds according to RFC 4293(ipDefaultRouterLifetime: the remaining length of time, in seconds, that this router will continue to be useful as a default router)
	2010/09/16	1. ipv6Forwarding is changed to ipv6IpForwarding in v6SNMPv2CIOT1
1.0.5	2010/10/05	1. the wording for ipAddressOrigin for host in v6SNMPv2CIOT 6 Address Configuration is changed from routeradv to linkayer according to RFC 4293 ipAddressOriginTC value is linklayer not routeradv for ipAddressPrefixOriginTC
	2010/12/01	1. ipDefaultRouterAddressType is changed from 4(ipv4z) to 2(ipv6) in

		v6SNMPv2CIOT5.2
	2010/12/16	1. Possible Problems added to allow for two different InetAddress IPv6 address representation
	2010/12/30	1. Redundant (Host) or (Router) in v6SNMPv2CIOT5.2 Judgment for ipAddressPrefixOnLinkFlag are deleted
	2011/01/19	1. Explain why max-repetitions variable in SNMP GetBulk operations in v6SNMPv2CIOT7.2 can be different from sample commands in Possible Problems 2. The 8 trailing zeros in SNMP GetNext commands OIDs in v6SNMPv2CIOT6 are deleted for easier testing operations since the test results are the same using these 8 trailing zeros
1.0.6	2011/07/18	1. Repeat SNMP command in Step 5 in v6SNMPv2CIOT7.2 Step 5 is changed to Step 2 and repeat SNMP command in Step 5 in v6SNMPv2CIOT7.2 Step 6 is changed to Step 3
	2012/02/06	1. same as preferred lifetime in Prefix Information in Judgment of v6SNMPv2CIOT7.1 is changed to < preferred lifetime in Prefix Information or infinity vaule of 4,294,967,295
	2012/02/07	1. manual(2)(ROUTER) or routeradv(5)(HOST) in v6SNMPv2CIOT7.2 Multiple Prefix is changed to manual(2) or routeradv(5) depending on how this prefix is obtained(manually configured or learned from router advertisement)
	2012/02/29	1. < 60 in v6SNMPv2CIOT7.2 Judgement 1 is changed to < 60 or infinity vaule of 4,294,967,295
	2012/04/11	1. Add an IPv6 address with PF2 prefix and valid preferred lifetime = 60 seconds in Procedure 3 in v6SNMPv2CIOT7.2 is changed to Add an IPv6 address with PF2 prefix and valid preferred lifetime = 60 seconds or infinity vaule of 4,294,967,295 in TGT-AGENT 2. Wait for 65 seconds in Procedure 4 in v6SNMPv2CIOT7.2 is changed to Wait for 65 seconds to expire the PF2 prefix. (Note:for routers might not support router valid and preferred lifetime configuration, simply delete TGT-AGENT's PF2 address to reflect the PE2 prefix expiration.) 3. Item 1 in Possible Problem is deleted

ACKNOWLEDGEMENTS

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INTRODUCTION

Overview

The IPv6 forum plays a major role to promote the new generation of IP protocols by forming the IPv6 Ready Logo Committee that designs state-of-the-art interoperability platforms to help harmonize in the design, development and deployment of the new generation Internet Protocol version 6 (IPv6).

To provide the market a strong signal proving the level of interoperability across various products and to give confidence to users that IPv6 is currently operational, IPv6 Ready Logo Committee launched IPv6 Ready Logo Program in 2003 to contribute to the feeling that IPv6 is available and ready to be used.

To further provide verification for those IPv6 equipments' network management capabilities after their network layer functions are IPv6 Ready Logo certified, basic network management functions should also be tested as add-on features for managing these IPv6-capable nodes in the Internet.

The Simple Network Management Protocol (SNMP) is most commonly used protocol to exchange management information between the network management stations and the agents in the network.

How to verify the interoperability functionalities of IPv6 capable network management equipments using SNMPv2C to check the implementation of IP-MIB(RFC 4293) based on related IETF's RFCs is the main goal of this SNMP test. For conformance test, please see the IPv6 Ready Test Specification Management Specification. This document will focus only on SNMP interoperability test scenarios.

Abbreviations and Acronyms

ASN.1	Abstract Syntax Notation One
MIB	Management Information Base
PDU	Protocol Data Unit
SMI	Structure of Management Information
SNMPv2C	Simple Network Management Protocol Version 2 with Community Based
TCP	Transmission Control Protocol
UDP	User Datagram Protocol

TEST ORGANIZATION

This document organizes tests by group based on related test methodology or goals. Each group begins with a brief set of comments pertaining to all tests within that group. This is followed by a series of description blocks; each block describes a single test. The format of the description block is as follows.

Purpose	This is the description of what the test case attempts to achieve.
Resource Requirements	External resources that can help facilitate the test.
Initialization	The Initialization part describes how to initialize and configure TGT-AGENT and TGT-MANAGER before starting the test. If no value is provided, then the default value shall be used.
Procedure	The Procedure will describe the step-by-step instructions for executing the test.
Judgment	The Judgment will describe the expected test results. TGT-AGENT passes the test if description of the Judgment is observed.
References	This References section provides the specifications that are referred to in this documentation.

REQUIREMENTS

To obtain the IPv6 Ready Logo for SNMP management, the NUT(Node Under Test) must satisfy the following requirements

Equipment Type

Every NUT can be either of the following:

SNMP TARGET MANAGER:
A node that undertakes the SNMP manager role to send management commands to the SNMP agent. SNMP application on the SNMP manager must perform Get, GetNext, GetBulk, Set operations and can successfully receive Trap PDUs.

SNMP TARGET AGENT:
A node that undertakes the SNMP agent role receiving management commands from the SNMP manager. The TARGET AGENT can be either HOST or ROUTER. SNMP application on this SNMP agent must send Trap PDUs.

Design principles

Since this work is done under IPv6 Ready Logo Committee so the SNMP management functions focus mainly to check IPv6 specific issues(chiefly in IPv6 Core test specification) for the test engineers. Then the second target is to verify the SNMPv2C operations(including GetRequest, GetNextRequest, GetBulkRequest, SetRequest and Trap) to check for SNMP protocol functionality, and IP-MIB(RFC 4293), not MIB II or SNMPv2 MIB, is used in combination with SNMPv2C protocols when the judgment criteria focus is mainly on RFC 4293.

All the SNMP test cases are designed for the SNMP engineers to conduct this test easily so that the engineers can follow this test specs and get the best NMS functions with respect to IPv6 related MIBs. SNMP commands are, therefore, also provided for user friendly and easy manual-like references. Only the current connection the SNMP communication is active will be checked when examing SNMP MIB entry and OIDs details.

Test Requirement

SNMPv2C (RFC 3416) is the SNMP protocol used in conjunction with RFC 3418 and 4293 IP-MIB for this interoperability test. Acquisition of IPv6 Ready Logo Phase II Core and SNMP conformance test are the prerequisites.

Table 1 is the list of IPv6 Ready Logo Management interop test criteria. B stands for basic(mandatory) test items and A stands for Advanced(optional). To successfully pass this interoperability(IOT) test, NUT must pass all the basic test items.

Table 1 IPv6 Ready Logo SNMP/MIBs Interoperability Test Criteria

Management Group	**Test Item**	**Test Name**	**RFC 4293 IP-MIB**	**SNMP operation**	**Required**
Interface Index	v6SNMPv2CIOT1	Interface Index Determination	ipv6AddressTable	Get	B(*)
ipv6Forwarding	v6SNMPv2CIOT2	ipv6IpForwarding	ipv6IpForwarding	Get	B
ipv6IpDefaultHopLimit	v6SNMPv2CIOT3	ipv6IpDefaultHopLimit	ipv6IpDefaultHopLimit	Get	B
ipv6InterfaceTable	v6SNMPv2CIOT4	ipv6InterfaceTable	ipv6InterfaceTable	Get	B
Router Advertisement Check	v6SNMPv2CIOT5	Router Advertisement Check			
	v6SNMPv2CIOT5.1	ipv6RouterAdvertTable	ipv6RouterAdvertTable	Get	B(Router only)
	v6SNMPv2CIOT5.2	ipDefaultRouterTable	ipDefaultRouterTable	Get	B(Host only) (*)
Address Configuration	v6SNMPv2CIOT6	ipAddressTable	ipAddressTable	GetNext	B
prefix information check	v6SNMPv2CIOT7	Prefix Information Check			
	v6SNMPv2CIOT7.1	single prefix	ipAddressPrefixTable	Get	B(*)
	v6SNMPv2CIOT7.2	multiple prefix	ipAddressPrefixTable	Get GetBulk	B(*)
ICMPv6 Echo Interoperability/Neighbor Cache	v6SNMPv2CIOT8	neighbor cache check	ipNetToPhysicalTable	Get	B(*)
Trap operation check	v6SNMPv2CIOT9	SNMP Trap Operation check	coldStart(power on/off)	Trap	B
Set operation check	v6SNMPv2CIOT10	SNMPv2C Set operation check	ipAddressTable(ipAddressStatus)	Set	A(*)

Note:(*) Please see Possible Problems in Test Details

REFERENCES

The following documents are referenced in this text

[ADDR] R. Hinden, S. Deering, Internet Protocol Version 6 (IPv6) Addressing Architecture, RFC 3315, April 2003.

[ICMPv6] A. Conta, S. Deering, M. Gupta, Ed., Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification, RFC 4443, March 2006.

[INA-TC] M. Daniele, B. Haberman, S. Routhier, J. Schoenwaelder, Textual Conventions for Internet Network Addresses, RFC 4001, February 2005.

[IPv6-SPEC] Hinden, R., S. Deering, Internet Protocol, version 6 (IPv6) Specification, RFC 2460, December 1998.

[IPv6-core] IPv6 Ready Logo Phase-2 IPv6 Core Protocols Test Specification (http://www.ipv6ready.org/about_phase2_test.html)

[IPv6-MGT] IPv6 READY Logo Phase II Test Specification Management (Conformance)

[MIB-DEF] M. Rose, K. McCloghrie, Concise MIB definitions, RFC 1212, March 1991.

[MIB-II] K. McCloghrie, M. Rose, Management Information Base for Network Management of TCP/IP-based internets MIB-II, RFC 1213, March 1991

[MIB for IP] Shawn A. Routhier, Management Information Base for the Internet Protocol (IP), RFC 4293, April 2006.

[SIMI] M. Rose, K. McCloghrie, Structure and Identification of Management Information for TCP/IP-based Internets, RFC 1155, May 1990.

[SMIv2] K. McCloghrie, D. Perkins, J. Schoenwaelder, Structure of Management Information version 2 (SMIv2), RFC 2578, April 1999.

[SMIv2-cS] K. McCloghrie, D. Perkins, J. Schoenwaelder, Conformance Statements for SMIv2. RFC 2580, April 1999.

[SMIv2-TC] K. McCloghrie, D. Perkins, J. Schoenwaelder, Textual Conventions for SMIv2, RFC 2579, April 1999.

[SNMPv1] J. Case, M. Fedor, M. Schoffstall, J. Davin, A Simple Network Management Protocol (SNMPv1), RFC 1157, May 1990.

[SNMP] William Stallings, SNMP, SNMPv2, SNMPv3, and RMON 1 and 2, 3rd ed., 1999.

[SNMPv2] J. Case, K.McCloghire, M.Rose S. Waldbusser , Protocol Operations for version 2 of the Simple Network Management Protocol, RFC 3416, December 2002.

[SNMPv2C] J. Case, K.McCloghire, M.Rose S. Waldbusser , Introduction to Community-based SNMPv2, RFC 1901, January 1996.

[SNMPv2-MIB] Management Information Base (MIB) for the Simple Network Management Protocol (SNMP), RFC 3418, December 2002.

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TEST DETAILS

Detailed information including terminology used in this test will be described.

Terminology

ROUTER	: An IPv6 node that forwards packets based on path discovery using routing protocols
HOST	: A device which is not a router
REF-HOST	: Reference Host
REF-ROUTER	: Reference Router
TARGET-AGENT	: SNMP agent
TARGET-MANAGER	: SNMP manager

Common Default Configuration

TARGET-MANAGER communicates with TARGET-AGENT via SNMP over UDP over IPv6. The communication between TARGET-MANAGER and TARGET-AGENT must be normal before this interop test.

ROUTER must first send RA with prefix PF1(3ffe:501:ffff:100::/64) and HOST must perform stateless address autoconfiguration.

Common SNMP Configuration

The version of SNMPv2C packets between TARGET-MANAGER and TARGET-AGENT is version 2. Two pairs of community string, public/private and IPv6Ready/IPv6ReadyLogo for read/write operations, are designed for the SNMPv2C testing. But since public/private test cases have been performed in conformance test. In this test only IPv6Ready/IPv6ReadyLogo, read/write community string will be tested.

The UDP port for TARGET-AGENT is 161 and the Trap UDP port for TARGET-MANAGER is 162.

Common SNMP Packets

For TGT-MANAGER to TGT-AGENT packets:

IP Header	Source Address	TGT-MANAGER_ADDRESS
	Destination Address	TGT-AGENT_ADDRESS
UDP Header	Source Port	any
	Destination Port	161
SNMP message	version	1
	community	IPv6Ready/IPv6ReadyLogo

	PDU		Get/GetNext/**GetBulk**/Inform/Set Request
	request-id		any
	error-status/**non-repeaters**		0/*
	error-index/**max-repetitions**		0/*
	Variable bindings	name	*
		value	NULL

For TGT-AGENT to TGT_MANGER packets:

IP Header	Source Address		TGT-AGENT_ADDRESS
	Destination Address		TGT_MANGER_ADDRESS
UDP Header	Source Port		161
	Destination Port		Same as source port in the previous SNMP request packet
SNMP message	version		1
	community		Same as the community string previously received
	PDU		Response
	request-id		Same as the request-id in the previous SNMP message value
	error-status		0
	error-index		0
	Variable bindings	name	*
		value	*

Note: non-repeaters and max-repetitions are for GetBulk only and * indicates variables.

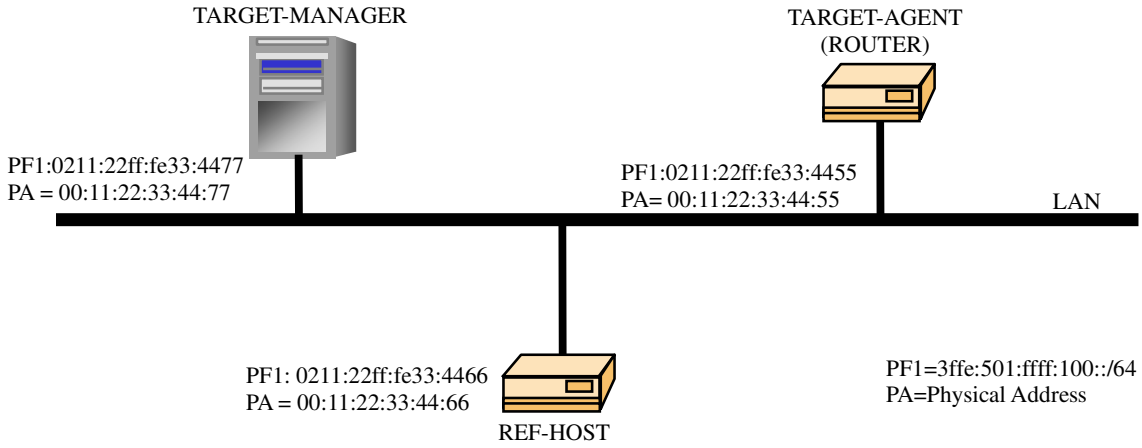
For Trap PDUs:

IP Header	Source Address		TGT-AGENT_ADDRESS
	Destination Address		TGT-MANAGER_ADDRESS
UDP Header	Source Port		any
	Destination Port		162
SNMP message	version		1
	community		IPv6Ready
	PDU		Trap
	request-id		any
	error-status		0
	error-index		0
	Variable	name	1.3.6.1.2.1.1.3.0

	bindings		(sysUpTime.0)
		value	TimeTicks
		name	1.3.6.1.6.3.1.1.4.1.0 (snmpTrapOID.0)
		value	Trap OID

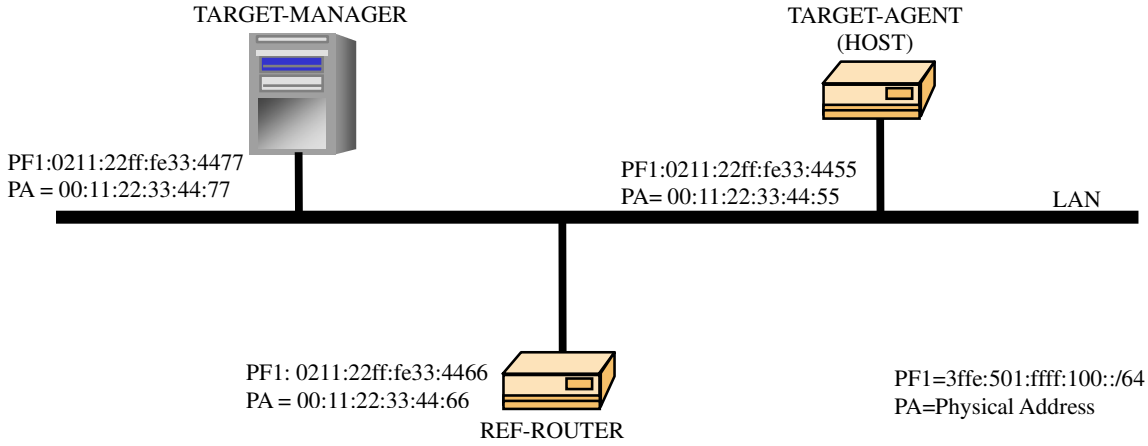
Test Topology

For TARGET-AGENT that is a router, please refer Topology 1. Manually configure TARGET_AGENT to have global address with prefix PF1 before sending Router Advertisement. REF-HOST must perform stateless address autoconfiguration after receiving RA from ROUTER. Address assignment for TARGET-MANAGER can be manual configuration or stateless address autoconfiguration. MAC address(Physical Address) in the following topology is only for demonstration purpose.



Topology 1 TGT-AGENT as ROUTER

For TARGET-AGENT that is a host, please refer Topology 2. Manually configure REF-ROUTER to have global address with prefix PF1 before sending Router Advertisement. TARGET-AGENT must receive RA messages and perform stateless address autoconfiguration. Address assignment for TARGET-MANAGER can be manual configuration or stateless address autoconfiguration. MAC address in the following topology is only for demonstration purpose.



Topology 2 TGT-AGENT as HOST

Possible problems

When InetAddress(defined in RFC 4001 Textual Conventions for Internet Network Addresses as a variable length OCTET STRING) is used as index to retrieve an MIB object using SNMP Get operations, two implementaions to represent the IPv6 address, one with 16 length sub-identifier in front of 16 bytes IPv6 address decimal and the other without the length sub-identifier, are found.

Example:
Two different implemenations will probably be encountered when SNMP GetRequest is used to retrieve the ipAddressIfIndex from ipAddressTable with 3fffe:501:ffff:100:0213:49ff:fe00:1 as the NUT IPv6 address for SNMP IOT testings,

- ipAddressIfIndex.2.16.63.254.5.1.255.255.1.0.2.19.73.255.254.0.0.1 or
- ipAddressIfIndex.2.63.254.5.1.255.255.1.0.2.19.73.255.254.0.0.1

Both implementations will generate the same test results but they will create some interoperability complexity.

Special attention is advised when performing the following test cases where this 16 length sub-identifier issue will affect the success of the SNMP GetRequest operation:
v6SNMPv2CIOT1
v6SNMPv2CIOT5.2
v6SNMPv2CIOT7.1
v6SNMPv2CIOT7.2
v6SNMPv2CIOT8
v6SNMPv2CIOT9

v6SNMPv2CIOT1 Interface Index Determination

Purpose

Determine the interface index on which TGT-AGENT is using to communicate with TGT-MANAGER by checking ipAddressTable using SNMP GetRequest operation.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration

Procedure

TGT-MANAGER determines TGT-AGENT's interface index in ipAddressTable using the following SNMPv2C GetRequest command to TGT-AGENT.

SNMP command: snmpget –v 2C –c IPv6Ready
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.3.2.16.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.85
or
SNMP command: snmpget –v 2C –c IPv6Ready
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.3.2.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.85

SNMP Message	PDU		GetRequest
	Variable bindings	name	1.3.6.1.2.1.4.34.1.3.2.16.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.85 or 1.3.6.1.2.1.4.34.1.3.2.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.85 (ipAddressIfIndex)
		value	NULL

Judgment

TGT-MANAGER receives SNMPv2C Response from TGT-AGENT with current ipv6AddressIfIndex value in the following packet format:

SNMP Message	PDU		Response
	Variable bindings	name	1.3.6.1.2.1.4.34.1.3.2.16.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.85 or 1.3.6.1.2.1.4.34.1.3.2.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.85 (ipAddressIfIndex)
		value	ifIndex of TGT-AGENT with which to talk with TGT-MANAGER

TGT-AGENT's ifIndex value should be with correct type and within defined range value.

Note: This ifIndex value shall be used for the following tests.

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT2 ipv6IpForwarding

Purpose

The following test is designed to verify that SNMP agent has correct ipv6IpForwarding value and cross examine this configuration data with the corresponding information in SNMP MIB.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration

Procedure

TGT-MANAGER sends SNMPv2C GetRequest with ipv6IpForwarding to get TGT-AGENT's ipv6Forwarding in IP-MIB.

SNMP command: snmpget –v 2C –c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.25.0

SNNP message	PDU	GetRequest	
	Variable bindings	name	1.3.6.1.2.1.4.25.0 (ipv6IpForwarding)
		value	NULL

Judgment

TGT-MANAGER received the following packet

SNNP message	PDU	Response	
	Variable bindings	name	1.3.6.1.2.1.4.25.0 (ipv6IpForwarding)
		value	TGT-AGENT's ipv6IpForwarding

1. TGT-AGENT's ipv6IpForwarding in the machine configuration data must equal to the value in the TGT-MANAGER's response PDU.
2. TGT-AGENT's ipv6IpForwarding is 1(Forwarding) for routers and 2(not forwarding) for hosts.

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5

RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT3 ipv6IpDefaultHopLimit

Purpose

This test is designed to verify that SNMP agent has correct ipv6IpDefaultHopLimit value and check if this value matches hop limit value in IPv6 header in the SNMP response packet.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration

Procedure

TGT-MANAGER sends SNMPv2C GetRequest with ipv6IpDefaultHopLimit to get TGT-AGENT's ipv6IpDefaultHopLimit in IP-MIB.

SNMP command: snmpget –v 2C –c IPv6Ready upd6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.26.0

SNNP message	PDU	GetRequest	
	Variable bindings	name	1.3.6.1.2.1.4.26.0 (ipv6IpDefaultHopLimit)
		value	NULL

Judgment

TGT-MANAGER receives the following packet

SNNP message	PDU	Response	
	Variable bindings	name	1.3.6.1.2.1.4.26.0 (ipv6IpDefaultHopLimit)
		value	TGT-AGENT's ipv6IpDefaultHopLimit

TGT-AGENT's ipv6IpDefaultHopLimit must be equal to hop limit value in IPv6 header in the SNMP response packet the TGT-MANAGER received after sending the SNMP GetRequest.

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management

Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT4 ipv6InterfaceTable

Purpose

This test will examine ipv6InterfaceIdentifier, ipv6InterfaceEnableStatus, ipv6InterfaceForwarding in ipv6InterfaceTable with interface index(ifIndex) obtained from v6SNMPv2CIOT1

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration
ifIndex from v6SNMPv2CIOT1 shall be used for this test

Procedure

TGT-MANAGER gets TGT-AGENT's ipv6InterfaceIdentifier, ipv6InterfaceEnableStatus, and ipv6InterfaceForwarding in ipv6InterfaceTable using GetRequest.

SNMP command: snmpget –v 2C –c IPv6Ready
upd6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.30.1.3.[ifIndex]
1.3.6.1.2.1.4.30.1.5.[ifIndex]
1.3.6.1.2.1.4.30.1.8.[ifIndex]

SNMP message	PDU		GetRequest
	Variable bindings	name	1.3.6.1.2.1.4.30.1.3.[ifIndex] (ipv6InterfaceIdentifier)
		value	NULL
		name	1.3.6.1.2.1.4.30.1.5.[ifIndex] (ipv6InterfaceEnableStatus)
		value	NULL
		name	1.3.6.1.2.1.4.30.1.8.[ifIndex] (ipv6InterfaceForwarding)
		value	NULL

Judgment

TGT-MANAGER must receive SNMP Response from TGT_AGNET with the following values

SNMP message	PDU		Response
	Variable bindings	name	1.3.6.1.2.1.4.30.1.3.[ifIndex] (ipv6InterfaceIdentifier)
		value	0211:22ff:fe33:4455
		name	1.3.6.1.2.1.4.30.1.5.[ifIndex] (ipv6InterfaceEnableStatus)
		value	Up(1)
		name	1.3.6.1.2.1.4.30.1.8.[ifIndex] (ipv6InterfaceForwarding)
		value	Forwarding(1)(for router) or notForwarding(2)(for host)

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT5 Router Advertisement Check

v6SNMPv2CIOT5.1 ipv6RouterAdvertTable(Router Only)

Purpose

This test will correlate Router Advertisement(RA) message this NUT sends with the values in ipv6RouterAdvertTable. This test is performed on routers only.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration
ifIndex from v6SNMPv2CIOT1 shall be used

Procedure

TGT-MANAGER gets TGT-AGENT's Router Advertisement parameters values in ipv6RouterAdvertTable using GetRequest.

SNMP command: snmpget –v 2C –c IPv6Ready
upd6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.39.1.2.[ifIndex]
1.3.6.1.2.1.4.39.1.7.[ifIndex]
1.3.6.1.2.1.4.39.1.8.[ifIndex]
1.3.6.1.2.1.4.39.1.9.[ifIndex]
1.3.6.1.2.1.4.39.1.10.[ifIndex]
1.3.6.1.2.1.4.39.1.11.[ifIndex]

SNMP message	PDU		GetRequest
	Variable bindings	name	1.3.6.1.2.1.4.39.1.2.[ifIndex] (ipv6RouterAdvertSendAdverts)
		value	NULL
		name	1.3.6.1.2.1.4.39.1.7.[ifIndex] (ipv6RouterAdvertLinkMTU)
		value	NULL
		name	1.3.6.1.2.1.4.39.1.8.[ifIndex] (ipv6RouterAdvertReachableTime)
		value	NULL
		name	1.3.6.1.2.1.4.39.1.9.[ifIndex] (ipv6RouterAdvertRetransmitTime)
		value	NULL

		name	1.3.6.1.2.1.4.39.1.10.[ifIndex] (ipv6RouterAdvertCurHopLimit)
		value	NULL
		name	1.3.6.1.2.1.4.39.1.11.[ifIndex] (ipv6RouterAdvertDefaultLifetime)
		value	NULL

Judgment

Returned values in response PDU must be equal to RA parameters in the previously received RA packet.

SNMP message	PDU		GetRequest
	Variable bindings	name	1.3.6.1.2.1.4.39.1.2.[ifIndex] (ipv6RouterAdvertSendAdverts)
		value	true(1)(Router sends RA packet)
		name	1.3.6.1.2.1.4.39.1.7.[ifIndex] (ipv6RouterAdvertLinkMTU)
		value	same as MTU in RA MTU option
		name	1.3.6.1.2.1.4.39.1.8.[ifIndex] (ipv6RouterAdvertReachableTime)
		value	same as Reachable Timer value in RA packet
		name	1.3.6.1.2.1.4.39.1.9.[ifIndex] (ipv6RouterAdvertRetransmitTime)
		value	same as Retrans Timer value in RA packet
		name	1.3.6.1.2.1.4.39.1.10.[ifIndex] (ipv6RouterAdvertCurHopLimit)
		value	same as Cur hop limit in RA packet
		name	1.3.6.1.2.1.4.39.1.11.[ifIndex] (ipv6RouterAdvertDefaultLifetime)
		value	same as Router lifetime in RA packet

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT5.2 ipDefaultRouterTable(Host Only)

Purpose

This test will correlate the NUT's configuration(ipv6 default route) with those in the ipDefaultRouterTable. This test is for TGT-AGENT hosts only.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration
ifIndex from v6SNMPv2CIOT1 shall be used for this test

Procedure

Part A: ipDefaultRouterTable with router lifetime set to 1800 secs

1. REF-ROUTER sends RA router lifetime = 1800 secs
2. TGT-MANAGER gets TGT-AGENT's ipDefaultRouteLifeTime in ipDefaultRouterTable using GetRequest OID ipDefaultRouteLifeTime.ipDefaultRouterAddressType.ipDefaultRouterAddress.ipDefaultRouterIfIndex
   where ipDefaultRouteLifeTime=1.3.6.1.2.1.4.37.1.4, ipDefaultRouterAddressType = 2(ipv6), ipDefaultRouterAddress=ROUTER link-local address(254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85) and ipDefaultRouterIfIndex=same as ifIndex from v6SNMPv2CIOT1.

   SNMP command: snmpget –v 2C –c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.37.1.4.2.16.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex]
   or
   SNMP command: snmpget –v 2C –c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.37.1.4.2.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex]

SNMP message	PDU		GetRequest
	Variable bindings	name	1.3.6.1.2.1.4.37.1.4.2.16.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex] or 1.3.6.1.2.1.4.37.1.4.2.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex]

			(ipDefaultRouteLifeTime)
		value	NULL

Part B: ipDefaultRouterTable with RA router lifetime is zero

1. REF-ROUTER sends RA router lifetime=0
2. Same as Step 2 in Part A
3. Wait for TGT-AGENT's Response.

SNMP message	PDU		GetRequest
	Variable bindings	name	1.3.6.1.2.1.4.37.1.4.2.16.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex] or 1.3.6.1.2.1.4.37.1.4.2.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex] (ipDefaultRouteLifeTime)
		value	NULL

Judgment

Part A:

1. TGT-AGENT's ipDefaultRouteLifeTime must be less than 1800 secs, the remaining ipDefaultRouterLifeTime value.

SNMP message	PDU		GetResponse
	Variable bindings	name	1.3.6.1.2.1.4.37.1.4.2.16.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex] or 1.3.6.1.2.1.4.37.1.4.2.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex]
		value	< 1800

Part B:

1. ipDefaultRouteLifeTime value in TGT-AGENT's Response must be noSuchInstance.

SNMP message	PDU		GetResponse
	Variable bindings	name	1.3.6.1.2.1.4.37.1.4.2.16.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex] or 1.3.6.1.2.1.4.37.1.4.2.254.128.0.0.0.0.0.0.2.17.34.255.254.51.68.85.[ifIndex]

		value	noSuchInstance

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT6 Address Configuration

Purpose

Verify that TGT-AGENT can perform lexicographical ordering correctly on ipAddressTable after receiving GetNext from TGT-MANAGER.

Resource Requirements

•Packet generator
•Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration

Procedure

TGT-MANAGER performs SNMPv2C GetNextRequest operation on TGT-AGENT's ipAddressTable to get ipAddressIfIndex, ipAddressType, ipAddressPrefix and ipAddressOrigin with ipAddressType=2(ipv6) and ipAddressAddr(3ffe:501:ffff:100::0).

SNMP command: snmpgetnext –v 2C –c IPv6Ready
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.3.2.16.63.254.5.1.255.255.1.0
1.3.6.1.2.1.4.34.1.4.2.16.63.254.5.1.255.255.1.0
1.3.6.1.2.1.4.34.1.5.2.16.63.254.5.1.255.255.1.0
1.3.6.1.2.1.4.34.1.6.2.16.63.254.5.1.255.255.1.0
or
SNMP command: snmpgetnext –v 2C –c IPv6Ready
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.3.2.63.254.5.1.255.255.1.0
1.3.6.1.2.1.4.34.1.4.2.63.254.5.1.255.255.1.0
1.3.6.1.2.1.4.34.1.5.2.63.254.5.1.255.255.1.0
1.3.6.1.2.1.4.34.1.6.2.63.254.5.1.255.255.1.0

SNMP message	PDU		GetNextRequest
	Variable bindings	name	1.3.6.1.2.1.4.34.1.3.2.16.63.254.5.1.255.255.1.0 or 1.3.6.1.2.1.4.34.1.3.2.63.254.5.1.255.255.1.0
		value	NULL
		name	1.3.6.1.2.1.4.34.1.4.2.16.63.254.5.1.255.255.1.0

			or 1.3.6.1.2.1.4.34.1.4.2.63.254.5.1.255.255.1.0
		value	NULL
		name	1.3.6.1.2.1.4.34.1.5.2.16.63.254.5.1.255.255.1.0 or 1.3.6.1.2.1.4.34.1.5.2.63.254.5.1.255.255.1.0
		value	NULL
		name	1.3.6.1.2.1.4.34.1.6.2.16.63.254.5.1.255.255.1.0 or 1.3.6.1.2.1.4.34.1.6.2.63.254.5.1.255.255.1.0
		value	NULL

Judgment

Returned variable bindings value fields in TGT_AGENT's Response are values for the test interface index in ipAddressTable with correct syntax type and within the defined value range. Please see the following for the correct format.

SNMP message	PDU		Response
	Variable bindings	name	ipAddressIfIndex.ipv6.16.63.254.4.0.0.255.255.1.0.2.17.34.255.254.51.68.85 or ipAddressIfIndex.ipv6.63.254.0.0.255.255.1.0.2.17.34.255.254.51.68.85
		value	same as the ifIndex from v6SNMPv2CIOT1
		name	ipAddressType.ipv6.16.63.254.0.0.255.255.1.0.2.17.34.255.254.51.68.85 or ipAddressType.ipv6.63.254.0.0.255.255.1.0.2.17.34.255.254.51.68.85
		value	Unicast(1)
		name	ipAddressPrefix.ipv6.16.63.254.0.0.255.255.1.0.2.17.34.255.254.51.68.85

			or ipAddressPrefix.ipv6.63.254.0.0 .255.255.1.0.2.17.34.255.254.51. 68.85
		value	the row pointer value to the row in the prefix table to which this address belongs
		name	ipAddressOrigin.ipv6.16.63.254. 0.0.255.255.1.0.2.17.34.255.254. 51.68.85 or ipAddressOrigin.ipv6.63.254.0.0 .255.255.1.0.2.17.34.255.254.51. 68.85
		value	manual(2)(for router) or linklayer (5)(for host)

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.1
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.1

v6SNMPv2CIOT7 Prefix Information Check

v6SNMPv2CIOT7.1 Single Prefix

Purpose

This test is to correlate the prefix information for PF1, learned through RA for hosts or from manual configuration for routers, with those in the ipAddressPrefixTable using SNMP commands.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration

Procedure

TGT-MANAGER gets TGT-AGENT's ipAddressPrefixOrigin, ipAddressPrefixOnLinkFlag, ipAddressPrefixAutonomousFlag, ipAddressPrefixAdvPreferredLifetime, ipAddressPrefixAdvValidLifetime in ipAddressPrefixTable indexed by ipAddressPrefixIfIndex ipAddressPrefixType(2), ipAddressPrefixPrefix(3ffe:501:ffff:100) and ipAddressPrefixLength(64) using GetRequest.

SNMP command: snmpget –v 2C –c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.32.1.5.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.6.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.8.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.9.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
or
SNMP command: snmpget –v 2C –c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.32.1.5.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.6.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.7.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.8.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.9.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64

SNMP	PDU	GetRequest

message	Variable bindings	name	1.3.6.1.2.1.4.32.1.5.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.5.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixOrigin)
		value	NULL
		name	1.3.6.1.2.1.4.32.1.6.[ifIndex].2.16.63.254.6.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.6.[ifIndex].2.63.254.6.1.255.255.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixOnLinkStatus)
		value	NULL
		name	1.3.6.1.2.1.4.32.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.7.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAutonomousFlag)
		value	NULL
		name	1.3.6.1.2.1.4.32.1.8.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.8.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAdvPreferredLifetime)
		value	NULL
		name	1.3.6.1.2.1.4.32.1.9.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.9.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64

			(ipAddressPrefixAdvValidLifetime)
		value	NULL

Judgment

TGT-MANAGER receives the following Response PDU's from TGT-AGENT and these values match the Prefix Information on link, auto, valid lifetime and preferred lifetime values in RA packet.

SNMP message	PDU		Response
	Variable bindings	name	1.3.6.1.2.1.4.32.1.5.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.5.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixOrigin)
		value	manual(2) or routeradv(5)
		name	1.3.6.1.2.1.4.32.1.6.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.6.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixOnLinkStatus)
		value	true(1)
		name	1.3.6.1.2.1.4.32.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.7.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAutonomousFlag)
		value	true(1) (HOST) or false(2) (ROUTER)
		name	1.3.6.1.2.1.4.32.1.8.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.8.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64

			(ipAddressPrefixAdvPreferredLifetime)
		value	< preferred lifetime in Prefix Information orInfinity vaule of 4,294,967,295
		name	1.3.6.1.2.1.4.32.1.9.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.9.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAdvValidLifetime)
		value	< preferred lifetime in Prefix Information or Infinity vaule of 4,294,967,295

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT7.2 Multiple Prefix

Purpose

This test is to examine the NUT's IPv6 prefix information changes in the ipAddressPrefixTable when a new prefix(PF2=3ffe:501:ffff:101/64) is added.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration

Procedure

1. Add an IPv6 address with PF2 prefix and valid preferred lifetime = 60 seconds or infinity vaule of 4,294,967,295 in TGT-AGENT
2. TGT-MANAGER gets TGT-AGENT's ipAddressPrefixOrigin, ipAddressPrefixOnLinkFlag, ipAddressPrefixAutonomousFlag ipAddressPrefixAdvPreferredLifetime, ipAddressPrefixAdvValidLifetime in ipAddressPrefixTable indexed by ipAddressPrefixIfIndex obtained in SNMPv2CIOT1 ipAddressPrefixType(2), ipAddressPrefixPrefix(3ffe:501:ffff:101) and ipAddressPrefixLength(64) using GetRequest within 30 seconds.

SNMP command: snmpget –v 2C –c IPv6Ready
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.32.1.5.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.6.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.8.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.9.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
or
SNMP command: snmpget –v 2C –c IPv6Ready
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.32.1.5.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.6.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.7.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.8.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64
1.3.6.1.2.1.4.32.1.9.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64

SNMP message	PDU		GetRequest
	Variable bindings	name	1.3.6.1.2.1.4.32.1.5.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.5.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixOrigin)
		value	NULL
		name	1.3.6.1.2.1.4.32.1.6.[ifIndex].2.16.63.254.6.1.255.255.1.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.6.[ifIndex].2.63.254.6.1.255.255.1.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixOnLinkStatus)
		value	NULL
		name	1.3.6.1.2.1.4.32.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.7.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAutonomousFlag)
		value	NULL
		name	1.3.6.1.2.1.4.32.1.8.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.8.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAdvPreferredLifetime)
		value	NULL
		name	1.3.6.1.2.1.4.32.1.9.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.9.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.0.0.64

			(ipAddressPrefixAdvValidLifetime)
		value	NULL

3. TGT-MANAGER performs SNMPv2C GetBulkRequest(non-repeaters=0, max-repetitions=3) to get all the prefixes in TGT-AGENT's ipAddressPrefixTable with OID 1.3.6.1.2.1.4.32.1.3.[ifIndex].2.16.63.254.5.1.255.255 or 1.3.6.1.2.1.4.32.1.3.[ifIndex].2.63.254.5.1.255.255 within another 30 seconds.

SNMP command: snmpbulkget –v 2C –Cn0 –Cr3 -c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.32.1.3.[ifIndex].2.16.63.254.5.1.255.255
or
SNMP command: snmpbulkget –v 2C –Cn0 –Cr3 -c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.32.1.3.[ifIndex].2.63.254.5.1.255.255

SNNP message	PDU		GetBulkRequest
	non-repeaters		0
	max-repetitions		3
	Variable bindings	name	1.3.6.1.2.1.4.32.1.3.[ifIndex].2.16.63.254.5.1.255.255 or 1.3.6.1.2.1.4.32.1.3.[ifIndex].2.63.254.5.1.255.255
		value	NULL

4. Wait for 65 seconds to expire the PF2 prefix. (Note:for routers might not support router valid and preferred lifetime configuration, simply delete TGT-AGENT's PF2 address to reflect the PE2 prefix expiration.)
5. TGT-MANAGER gets again TGT-AGENT's ipAddressPrefixOrigin, ipAddressPrefixOnLinkStatus , ipAddressPrefixAutonomousFlag ipAddressPrefixAdvPreferredLifetime, ipAddressPrefixAdvValidLifetime in ipAddressPrefixTable using GetRequest(repeat SNMP command in Step 2)
6. TGT-MANAGER performs SNMPv2C GetBulkRequest(non-repeaters=0, max-repetitions=2) to get all the prefixes on TGT-AGENT's ipAddressPrefixTable with OID 1.3.6.1.2.1.4.32.1.3.[ifIndex].2.16.63.254.5.1.255.255 or 1.3.6.1.2.1.4.32.1.3.[ifIndex].2.63.254.5.1.255.255.(Repeat Step 3 SNMP command with max-repetitions=2)
7. End this test by removing this prefix(PF2) from TGT-AGENT.

Judgment

1.Test result from procedure 2:

Received Response from TGT-AGENT with the following format:

SNMP message	PDU		Response
	Variable bindings	name	1.3.6.1.2.1.4.32.1.5.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.5.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixOrigin)
		value	manual(2) or routeradv(5) depending on how this prefix is obtained(manually configured or learned from router advertisement)
		name	1.3.6.1.2.1.4.32.1.6.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.6.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixOnLinkStatus)
		value	true(1)
		name	1.3.6.1.2.1.4.32.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.7.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAutonomousFlag)
		value	true(1) or false(2)
		name	1.3.6.1.2.1.4.32.1.8.[ifIndex].2.16.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.8.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAdvPreferredLifetime)
		value	< 60 or Infinity vaule of 4,294,967,295
		name	1.3.6.1.2.1.4.32.1.9.[ifIndex].2.16.6

			3.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 or 1.3.6.1.2.1.4.32.1.9.[ifIndex].2.63.254.5.1.255.255.1.1.0.0.0.0.0.0.0.0.64 (ipAddressPrefixAdvValidLifetime)
		value	< 60 or Infinity vaule of 4,294,967,295

2.Test result from procedure 3:
received packet with ipAddressPrefix.origin value for PF1=3ffe:501:ffff:100/64 and PF2=3ffe:501:ffff:101/64 in ipAddressPrefixTable.

3.Test result from procedure 5:
After 65 seconds, all entries from ipAddressPrefixTable response PDU for PF2 are noSuchInstance.

4.Test result from procedure 6:
Can't find ipAddressPrefix.origin value for PF1=3ffe:501:ffff:101/64 in ipAddressPrefixTable. Only ipAddressPrefix.origin value for PF1=3ffe:501:ffff:100/64 is found.

Possible Problem

Different test targets might have differenet IP address prefix row entries in IPAddressPrefixTable for SNMP GetBulk operatons to examine IP address prefix changes. The max-repetitions variable in the SNMP GetBulk commands is allowed to be different from the sample commands as long as this GetBulk command can reflect the IP address prefix changes.

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT8 ICMPv6 Echo Interoperability/Neighbor Cache

Purpose

Verify that SNMP agent has implemented ipNetToPhysicalTable(neighbor cache) correctly.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration.

Procedure

The test sequence is as follows:

1. TGT-AGENT clears neighbor cache.
2. TGT-MANAGER checks TGT-AGENT's ipNetToPhysicalTable does not have REF-ROUTER/HOST's physical address entry.

   SNMP command: snmpget –v 2C –c IPv6Ready
   udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
   1.3.6.1.2.1.4.35.1.4.[ifIndex].2.16.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.102
   or
   SNMP command: snmpget –v 2C –c IPv6Ready
   udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
   1.3.6.1.2.1.4.35.1.4.[ifIndex].2.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.102

3. REF-ROUTER/HOST pings TGT-AGENT.
4. TGT-MANAGER checks TGT-AGENT's ipNetToPhysicalAddressTable again to see if REF-ROUTER/HOST's physical address is already in the table.

   SNMP command: snmpget –v 2C –c IPv6Ready
   udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
   1.3.6.1.2.1.4.35.1.4.[ifIndex].2.16.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.102
   or
   SNMP command: snmpget –v 2C –c IPv6Ready
   udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
   1.3.6.1.2.1.4.35.1.4.[ifIndex].2.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.102

Judgment

1.Test result from procedure 2 : Can't find REF-ROUTER/HOST's physical address

entry in TGT-AGENT's ipNetToPhysicalTable.

SNNP message	PDU		Response
	Variable bindings	name	1.3.6.1.2.1.4.35.1.4.[ifIndex].2.16.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.102 or 1.3.6.1.2.1.4.35.1.4.[ifIndex].2.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.102 (ipNetToPhysicalPhysAddress)
		value	noSuchInstance

2. Test result from procedure 4: Find the following variable bindings in the received Response from TGT-AGENT's GetRequest

SNMP message	PDU		Response
	Variable bindings	name	1.3.6.1.2.1.4.35.1.4.[ifIndex].2.16.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.102 or 1.3.6.1.2.1.4.35.1.4.[ifIndex].2.63.254.5.1.255.255.1.0.2.17.34.255.254.51.68.102 (ipNetToPhysicalPhysAddress)
		value	00:11:22:33:44:66

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

Possible Problems

Power on sequence will determine the link local address entries in the ipNetToPhysicalTable. To simplicity the test, only global address will be judged for this test.

Clearing the neighbor cache will flush all entries in ipNetToPhysicalTable.

v6SNMPv2CIOT9 SNMPv2C Trap Operation check

Purpose

Verify that TGT-AGENT can properly send Trap PDU to the SNMPv2C MANAGER.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Configure TGT-AGENT Trap PDU destination address=TGT_MANAGER address, destination port=162
TGT-AGENT starts trap daemon
TGT-MANAGER must have the trap receiver function
Refer Common Default Configuration and Common SNMP Configuration

Procedure

1. Shutdown TGT-AGENT(SNMP agent) to generate SNMPv2C Trap PDU to TGT-MANAGER
2. Power on TGT-AGENT to generate SNMPv2C Trap PDU to TGT-MANAGER.
3. TGT-MANAGER receives this trap and does not need to respond.

Judgment

TGT-MANAGER will receive the SNMPv2C Trap with sysUpTime, sysTrapOID with cause value.
Shutdown TRAP PDU:

SNMP message	version		1
	community		public
	PDU		Trap
	request-id		any
	error-status		0
	error-index		0
	Variable bindings	name	1.3.6.1.2.1.1.3.0 (sysUpTime.0)
		value	TimeTicks
		name	1.3.6.1.6.3.1.1.4.1.0 (snmpTrapOID.0)

		value	coldStart(0)

Power-On TRAP PDU

SNMP message	version		1
	community		public
	PDU		Trap
	request-id		any
	error-status		0
	error-index		0
	Variable bindings	name	1.3.6.1.2.1.1.3.0 (sysUpTime.0)
		value	TimeTicks
		name	1.3.6.1.6.3.1.1.4.1.0 (snmpTrapOID.0)
		value	coldStart(0)

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.1

RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2

v6SNMPv2CIOT10 SNMPv2C Set operation check

Purpose

Verify that TGT-MANAGER can properly Set TGT-AGENT to bring down and up ipAddressStatus(Read/Create object in ipAddressTable) correctly.

Resource Requirements

- Packet generator
- Monitor to capture packets

Initialization

Network Topology

Please refer Test Topology

Setup

Please see Common Default Configuration and Common SNMP Configuration

Procedure

1. TGT-MANAGER creates a new row with PF1::100(setting ipAddressRowStatus to createAndWait and then to active after all the columns are also set) by sending the following SetRequests:

SNMP command: snmpset –v 2C –c IPv6ReadyLogo udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.34.1.10.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 integer 5
or
SNMP command: snmpset –v 2C –c IPv6ReadyLogo udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.34.1.10.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 integer 5

snmpset -v 2C -c IPv6ReadyLogo udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 ipAddressIfIndex.ipv6.\"3f:fe:05:01:ff:ff:01:00:00:00:00:00:00:00:01:00\" integer 4 ipAddressType.ipv6.\"3f:fe:05:01:ff:ff:01:00:00:00:00:00:00:00:01:00\" integer 1 ipAddressRowStatus.ipv6.\"3f:fe:05:01:ff:ff:01:00:00:00:00:00:00:00:01:00\" integer 5

TGT-MANAGER brings down the current ipAddressStatus of PF1:100(set ipAddressStatus to invalid) by the following SetRequest.

SNMP command: snmpset –v 2C –c IPv6ReadyLogo udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.34.1.10.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 integer 3
or

SNMP command: snmpset –v 2C –c IPv6ReadyLogo
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.10.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 integer 3

SNMP command: snmpset –v 2C –c IPv6ReadyLogo
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
ipAddressStatus.ipv6.\"3f:fe:05:01:ff:ff:01:00:00:00:00:00:00:01:00\" integer 3

SNMP command: snmpset –v 2C –c IPv6ReadyLogo
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 integer 3
or
SNMP command: snmpset –v 2C –c IPv6ReadyLogo
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.7.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 integer 3

SNMP message	community		IPv6ReadyLogo
	PDU		SetRequest
	Variable bindings	name	1.3.6.1.2.1.4.34.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 or 1.3.6.1.2.1.4.34.1.7.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 (ipAddressStatus)
		value	invalid(3)

2. TGT-MANAGER verifies the new ipv6 address status using GetRequest.

SNMP command: snmpget –v 2C –c IPv6Ready
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100
or
SNMP command: snmpget –v 2C –c IPv6Ready
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455
1.3.6.1.2.1.4.34.1.7.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100

3. TGT-MANAGER pings PF1::100.
4. TGT-MANAGER brings back the current ipAddressStatus.

SNMP command: snmpset –v 2C –c IPv6ReadyLogo
udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455

1.3.6.1.2.1.4.34.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 integer 1
or
SNMP command: snmpset –v 2C –c IPv6ReadyLogo udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.34.1.7.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 integer 1

SNMP message	community		IPv6ReadyLogo
	PDU		SetRequest
	Variable bindings	name	1.3.6.1.2.1.4.34.1.7.[ifIndex].2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 or 1.3.6.1.2.1.4.34.1.7.[ifIndex].2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 (ipAddressStatus)
		value	preferred(1)

5. TGT-MANAGER verifies the current ipv6 address status again

SNMP command: snmpget –v 2C –c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.30.1.5.3.ifIndex.2.16.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100
or
SNMP command: snmpget –v 2C –c IPv6Ready udp6:3ffe:501:ffff:100:0211:22ff:fe33:4455 1.3.6.1.2.1.4.30.1.5.3.ifIndex.2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100

6. TGT-MANAGER pings PF1::100

Judgment

Step 1:
ipAddressRowStatus of PF1::100 is CreateAndWait and then Active
Step 2:
TGT-MANAGER received SNMPv2C response from TGT-AGENT responding to SNMPv2C SetRequest correctly.
Step 3:
Ping is not successful
Step 4:
TGT-MANAGER received SNMPv2C response from TGT-AGENT responding to SNMPv2C SetRequest correctly with the preferred ipAddressStatus.

SNMP	community	private

message	PDU		Response
	Variable bindings	name	1.3.6.1.2.1.4.34.1.7.ifIndex.2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 (ipAddressStatus)
		value	preferred(1)

Step 5:
TGT-MANAGER receives the same Response PDU as Judgment 4.

SNMP message	community		public
	PDU		Response
	Variable bindings	name	1.3.6.1.2.1.4.34.1.7.ifIndex.2.63.254.5.1.255.255.1.0.0.0.0.0.0.0.0.100 (ipAddressStatus)
		value	preferred(1)

Step 6:
Receives response from PF1::100

Note: Rollback operation to the pre SET state is highly recommended to complete this test. But they will not be used for test judgment.

References

RFC 3416, Protocol Operations for version 2 of the Simple Network Management Protocol, Sec 4.2.5
RFC 4293, Management Information Base for the Internet Protocol (IP), Sec 3.2.2
RFC 2579, Textual Conventions for SMIv2

Appendix Required Data

The logs must be submitted for application of an IPv6 Ready Logo Phase II(SNMP). In this appendix, the detail requirement for the test log shall be described.

1. Required Data Type

a) Topology Map

Network topology figure or address list with IPv6 address and MAC address of this IOT LAN interface are required. Please see Topology 1 for network topology example. Address List example is as follows:

1. Interface Index Determination

```
TGT-MANAGER
        |               |
--------+---------------+------------ Link 1
        |               |
TGT-AGENT    REF-HOST
```

Link 1:
prefix: 3ffe:501:ffff:100::/64

TGT-MANAGER:
Vendor name: VendorA / Device name: ModelType
Version: 1.0

Link 1:eth0

Global Address: 3ffe:0501:ffff:0100:0211:22ff:fe33:4477
Link-Local Address: fe80:0000:0000:0000:0211:22ff:fe33:4477
MAC Address: 00:11:22:33:44:77

b) Command Log

SNMP commands are used for this IOT test and Ping is also used to check the status of the network connection. Any SNMP tools are also acceptable as long as the SNMP commands can be correctly sent and received.

Please save the command log and attach it into each file. Save the command files for each node for each test.

c) Packet Capture File

Capture all packets for LAN during the test. Hub which is not part of the test can be used to facilitate the test.

Make separate tcpdump(pcap) format file for each test.

For tcpdump, please specify packet size as 4096.
Example: tcpdump –I if0 –s 4096 –w 1.VendorA.dump

d) Test Result Table

Collect all test result tables in a file and fill the tables as required. This file must contain a table where all passes are clearly marked.

2. Data File Name Syntax

Please follow the data file name syntax described below:
a**) Topology Map**
Syntax:Chapter.[Section.]ON.topology

For "ON", use the Node's vendor name which behaves as an Opposite Side Target Node(ON)

If the test device is a SNMP agent and a router, the name should be like the following:
ON: SNMPAgentRouter[vendor: vendor A, model: rhost1, version: 1.0]
1.VendorA.Router.topology

If the test device is a SNMP agent and a host, the name should be like the following:
ON: SNMPAgentHost[vendor: vendor A, model: rhost1, version: 1.0]
1.VendorA.Host.topology

If the test device is a SNMP manager, the name should be like the following:
ON: SNMPManager[vendor: vendor A, model: rhost1, version: 1.0]
1.VendorA.topology

b) **Command Results**
Syntax: Chapter[.Section].SRC.DST.result

For SRC, use the vendor name on which the SNMP commands are run. If SRC is a Reference Host or Router, just specify "REF" as SRC. "DST" stands for destination of SNMP and ping commands. If DST is a Reference Host or Router, just specify "REF" as DST

1 Interface Index Determination
1.VendorA.VendorB.result

8 Neighbor Cache
8.VendorA.VendorB.result
8.REF.VendorA.result

c) Captured packet file

Syntax:Chapter[.Section].ON.Link.dump
For link, use the captured link name
For "ON", use the Node's vendor name which behaves as an Opposite Side Target Node(ON)

Example: 8. Neighbor Cache

8.VendorA.Link0.dump

d) Test Result Table
Syntax:VendorName_Model_Version.table

Test Case	Vendor A	Vendor B
1. Interface Index Determination		

For failures, please briefly summarize the failed test results.

3. Data Archive

Please organize the final test data using the following directory structure

$VendorName_Model_Version/
Conformance/
Interoperability/

Put all conformance data file under "Conformance" and all interoperability data file under "Interoperability" directory.

Make a tar.gz format archive file and put all the files under "VendorName_Model_Version" in this tar.gz file.