

USGv6 Test Selection Tables*

IPv6 Basic Requirements (IPv6 Specification, ICMPv6, PMTU, ND)

F1-Conformance: IPv6 Basic Requirements v1.3

Applicable Profile: NIST SP 500-267 A profile for IPv6 in the U.S. Government - Version 1.0, July 2008.

Configuration Option: None

Test Specification Id:

- [[Core-Conformance](#)] IPv6 Ready Test Specification Core Protocols, Version 4.0.8, September 2018, [editor: [IPv6 Ready Logo](#)].

Reference:

- [RFC 1981] McCann, J., S. Deering, and J. Mogul, Path MTU Discovery for IPv6, RFC 1981, August 1996.
- [RFC 2460] Hinden, R., S. Deering, Internet Protocol, Version 6 (IPv6) Specification, RFC 2460, December 1998.
- [RFC 4443] Conta, A., S. Deering M. Gupta, Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification, RFC 4443, March 2006.
- [RFC 4861] Narten, T., Nordmark, E., and W. Simpson, H. Soliman, Neighbor Discovery for IP Version 6 (IPv6), RFC 4861, September 2007.
- [RFC 5095] Abley, J, Savola, P. Neville-Neil, G. Deprecation of Type 0 Routing Headers in IPv6, RFC 5095, December 2007

IPv6 Specification Test Check List				
Reference	Test Specification Id	Test Number	Device Type	Passed
RFC 2460	Core-Conformance	v6LC.1.1.1 Version Field	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.1.2 Traffic Class Non-Zero - End Node	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.1.3 Traffic Class Non-Zero - Intermediate Node	Router	
RFC 2460	Core-Conformance	v6LC.1.1.4 Flow Label Non-Zero (A)(B)	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.1.5 Payload Length (A)(B)(C)	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.1.6 No Next Header After IPv6 Header (A)(B)	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.1.8 Hop Limit Zero - End Node	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.1.9 Hop Limit Decrement - Intermediate Node	Router	
RFC 2460	Core-Conformance	v6LC.1.2.2 No Next Header after Extension Header (A)(B)	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.2.4 Extension Header Processing Order (A)(B)(C)(D)	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.2.5 Option Processing Order (A)(B)(C)	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.2.6 Options Processing, Hop-by-Hop Options Header - End Node (A)(B)(C)(D)(E)(F)(G)(H)	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.2.7 Options Processing, Hop-by-Hop Options Header - Intermediate Node (A)(B)(C)(D)(E)(F)(G)(H)	Router	
RFC 2460	Core-Conformance	v6LC.1.2.8 Options Processing, Destination Options Header (A)(B)(C)(D)(E)(F)(G)(H)	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.3.1 Fragment Reassembly (A)(B)(C)(D)(E)(F) Note: Time Exceeded Message Generation is not Required.	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.3.2 Reassembly Time Exceeded (A)(B)(C)(D)(E) Note: Time Exceeded Message Generation is not Required.	Host/Router	
RFC 2460	Core-Conformance	v6LC.1.3.4 Stub Fragment Header	Host/Router	

Neighbor Discovery for IPv6 Test Check List				
Reference	Test Specification Id	Test Number	Device Type	Passed
RFC 4861	Core-Conformance	v6LC.2.1.1 On-Link Determination (A)(B)(C)	Host/Router	

RFC 4861	Core-Conformance	v6LC.2.1.2 Resolution Wait Queue (A)(B)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.3 Prefix Information Option Processing, On-link Flag	Host	
RFC 4861	Core-Conformance	v6LC.2.1.4 Host Prefix List (A)(B)	Host	
RFC 4861	Core-Conformance	v6LC.2.1.5 Neighbor Solicitation Origination, Address Resolution (A)(B)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.6 Neighbor Solicitation Origination, Reachability Confirmation (A)(B)(C)(D)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.7 Invalid Neighbor Solicitation Handling (A)(B)(C)(D)(E)(F)(G)(H)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.8 Neighbor Solicitation Processing, No NCE (A)(B)(C)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.9 Neighbor Solicitation Processing, NCE State INCOMPLETE (A)(B)(C)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.10 Neighbor Solicitation Processing, NCE State REACHABLE (A)(B)(C)(D)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.11 Neighbor Solicitation Processing, NCE State STALE (A)(B)(C)(D)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.12 Neighbor Solicitation Processing, NCE State PROBE (A)(B)(C)(D)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.13 Neighbor Solicitation Processing, IsRouterFlag (A)(B)(C)	Host	
RFC 4861	Core-Conformance	v6LC.2.1.15 Invalid Neighbor Advertisement Handling (A)(B)(C)(D)(E)(F)(G)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.16 Neighbor Advertisement Processing, No NCE (A)(B)(C)(D)(E)(F)(G)(H)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.17 Neighbor Advertisement Processing, NCE State INCOMPLETE (A)(B)(C)(D)(E)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.18 Neighbor Advertisement Processing, NCE State REACHABLE (A)(B)(C)(D)(E)(F)(G)(H)(I)(J)(K)(L)(M)(N)(O)(P)(Q)(R)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.19 Neighbor Advertisement Processing, NCE State STALE (A)(B)(C)(D)(E)(F)(G)(H)(I)(J)(K)(L)(M)(N)(O)(P)(Q)(R)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.20 Neighbor Advertisement Processing, NCE State PROBE (A)(B)(C)(D)(E)(F)(G)(H)(I)(J)(K)(L)(M)(N)(O)(P)(Q)(R)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.1.21 Neighbor Advertisement Processing, R-bit Change	Host	
RFC 4861	Core-Conformance	v6LC.2.2.2 Router Solicitations, Solicited Router Advertisement (A)(B)(C)	Host	
RFC 4861	Core-Conformance	v6LC.2.2.3 Host Ignores Router Solicitations (A)(B)(C)	Host	
RFC 4861	Core-Conformance	v6LC.2.2.4 Router Ignores Invalid Router Solicitations (A)(B)(C)(D)(E)(F)	Router	
RFC 4861	Core-Conformance	v6LC.2.2.5 Router Sends Valid Router Advertisement	Router	
RFC 4861	Core-Conformance	v6LC.2.2.6 Router Does Not Send Router Advertisements on Non-advertising Interface (A)(B)	Router	
RFC 4861	Core-Conformance	v6LC.2.2.7 Sending Unsolicited Router Advertisements (C)(D)(E)(F)	Router	
RFC 4861	Core-Conformance	v6LC.2.2.8 Ceasing to Be An Advertising Interface	Router	
RFC 4861	Core-Conformance	v6LC.2.2.9 Processing Router Solicitations (A)(B)	Router	
RFC 4861	Core-Conformance	v6LC.2.2.10 Router Solicitation Processing, Neighbor Cache (A)(B)(C)(D)(E)(F)(G)(H)(I)	Router	
RFC 4861	Core-Conformance	v6LC.2.2.11: Default Router Switch	Host	
	Core-			

RFC 4861	Conformance	v6LC.2.2.12 Router Advertisement Processing, Validity (A)(B)(C)(D)(E)(F)	Host	
RFC 4861	Core-Conformance	v6LC.2.2.13 Router Advertisement Processing, Cur Hop Limit (A)	Host/Router	
RFC 4861	Core-Conformance	v6LC.2.2.14 Router Advertisement Processing, Router Lifetime (A)(B)(C)	Host	
RFC 4861	Core-Conformance	v6LC.2.2.15 Router Advertisement Processing, Reachable Time (B)	Router	
RFC 4861	Core-Conformance	v6LC.2.2.16 Router Advertisement Processing, Neighbor Cache (A)(B)(C)(D)(E)(F)(G)(H)(I)(J)(K)	Host	
RFC 4861	Core-Conformance	v6LC.2.2.17 Router Advertisement Processing, IsRouter flag (A)(B)(C)	Host	
RFC 4861	Core-Conformance	v6LC.2.2.18 Next-hop Determination	Host	
RFC 4861	Core-Conformance	v6LC.2.2.19 Router Advertisement Processing, On-link determination	Host	
RFC 4861	Core-Conformance	v6LC.2.3.16 Redirect - Transmit (A)(B)(C)(D)	Router	
RFC 4861	Core-Conformance	v6LC.2.3.17 Redirect - Receive	Router	

Path MTU Discovery for IPv6 Test Check List

Reference	Test Specification Id	Test Number	Device Type	Passed
RFC 1981	Core-Conformance	v6LC.4.1.1 Confirm Plug (A)(B)(C)	Host	
RFC 1981	Core-Conformance	v6LC.4.1.3 Non-zero ICMPv6 Code	Host	
RFC 1981	Core-Conformance	v6LC.4.1.4 Reduce PMTU On-link	Host	
RFC 1981	Core-Conformance	v6LC.4.1.5 Reduce PMTU Off-link	Host	
RFC 1981	Core-Conformance	v6LC.4.1.6 Receiving MTU Below IPv6 MTU (A)(B)	Host	
RFC 1981	Core-Conformance	v6LC.4.1.7 Increase Estimate (A)(B)	Host	
RFC 1981	Core-Conformance	v6LC.4.1.9 Checking for Increase in PMTU	Host	

ICMPv6 Test Check List

Reference	Test Specification Id	Test Number	Device Type	Passed
RFC 4443	Core-Conformance	v6LC.5.1.2 Replying to Echo Requests (A)(B)	Host/Router	
RFC 4443	Core-Conformance	v6LC.5.1.4 Packet Too Big Message Generation (A)(B)	Router	
RFC 4443	Core-Conformance	v6LC.5.1.5 Hop Limit Exceeded (Time Exceeded Generation) (A)(B)	Router	
RFC 4443	Core-Conformance	v6LC.5.1.6 Erroneous Header Field (Parameter Problem Generation)	Host/Router	
RFC 4443	Core-Conformance	v6LC.5.1.7 Unrecognized Next Header (Parameter Problem Generation)	Host/Router	
RFC 4443	Core-Conformance	v6LC.5.1.8 Unknown Informational Message Type	Host/Router	
RFC 4443	Core-Conformance	v6LC.5.1.9 Error Condition With ICMPv6 Error Message (A)(B)(C)(D)(E)(F)	Router	
RFC 4443	Core-Conformance	v6LC.5.1.10 Error Condition With Multicast Destination (A)(B)	Host/Router	
RFC 4443	Core-Conformance	v6LC.5.1.11 Error Condition With Non-Unique Source - Unspecified (A)(B)(C)(D)	Host/Router	
RFC 4443	Core-Conformance	v6LC.5.1.12 Error Condition With Non-Unique Source - Multicast (A)(B)(C)(D)	Host/Router	
RFC 4443	Core-Conformance	v6LC.5.1.13 Error Condition with Non-Unique Source - Anycast (A)(B)(C)(D)	Router	

Deprecation of Type 0 Routing Headers Test Check List

Reference	Test Specification Id	Test Number	Device Type	Passed
RFC 5095	Core-Conformance	v6LC.1.2.9: Unrecognized Routing Type - End Node (A)(B)	Host/Router	
RFC 5095	Core-Conformance	v6LC.1.2.10: Unrecognized Routing Type - Intermediate Node (A)(B)	Host/Router	

NOTE: The following tests are considered a **S** for the IPv6 Basic Requirements as per the USGv6-V1 Profile.

Redirect Functionality "Should" for Host

Reference	Test Specification Id	Test Number	Device Type	Passed
RFC 4861	Core-Conformance	v6LC.2.3.1 Redirected On-link: Valid (A)(B)(C)(D)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.2 Redirected On-link: Suspicious (A)(B)(C)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.3 Redirected On-link: Invalid (A)(B)(C)(D)(E)(F)(G)(H)(I)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.4 Redirected to Alternate Router: Valid (A)(B)(C)(D)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.5 Redirected to Alternate Router: Suspicious (A)(B)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.6 Redirected to Alternate Router: Invalid (A)(B)(C)(D)(E)(F)(G)(H)(I)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.7 Redirected Twice	Host	
RFC 4861	Core-Conformance	v6LC.2.3.8 Invalid Option (A)(B)(C)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.9 No Destination Cache Entry	Host	
RFC 4861	Core-Conformance	v6LC.2.3.10 Neighbor Cache Updated, No Neighbor Cache Entry (A)(B)(C)(D)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.11 Neighbor Cache Updated from State INCOMPLETE (A)(B)(C)(D)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.12 Neighbor Cache Updated from State REACHABLE (A)(B)(C)(D)(E)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.13 Neighbor Cache Updated from State STALE (A)(B)(C)(D)(E)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.14 Neighbor Cache Updated from State PROBE (A)(B)(C)(D)(E)	Host	
RFC 4861	Core-Conformance	v6LC.2.3.15 Invalid Redirect does not Update Neighbor Cache (A)(B)(C)(D)(E)(F)(G)(H)(I)	Host	

NOTE: The following tests are considered a **S** for the IPv6 Basic Requirements as per the USGv6-V1 Profile.

Path MTU Discovery "Should" for Router

Reference	Test Specification Id	Test Number	Device Type	Passed
RFC 1981	Core-Conformance	v6LC.4.1.1 Confirm Plug (A)(B)(C)	Router	
RFC 1981	Core-Conformance	v6LC.4.1.3 Non-zero ICMPv6 Code	Router	
RFC 1981	Core-Conformance	v6LC.4.1.4 Reduce PMTU On-link	Router	
RFC 1981	Core-Conformance	v6LC.4.1.5 Reduce PMTU Off-link	Router	
RFC 1981	Core-Conformance	v6LC.4.1.6 Receiving MTU Below IPv6 MTU (A)(B)	Router	
RFC 1981	Core-Conformance	v6LC.4.1.7 Increase Estimate (A)(B)	Router	
RFC 1981	Core-Conformance	v6LC.4.1.9 Checking for Increase in PMTU	Router	

NOTE: The following tests have been omitted from the USGv6 Test Program for the IPv6 Basic Requirements. These tests are considered **SHOULDs** as defined by the IETF or covered by other requirements for the program.

Not Required

Reference	Test Specification Id	Test Number	Device Type
RFC 2460	Core-Conformance	v6LC.1.1.7: Unrecognized Next Header (A)(B)	Host/Router
RFC 2460	Core-Conformance	v6LC.1.1.10 Forwarding - Source and Destination Address - Intermediate Node (A)(B)(C)(D)(E)(F)(G)(H)(I)(J)(K)	Router
RFC 2460	Core-Conformance	v6LC.1.2.1: Next Header Zero	Host/Router
RFC 2460	Core-Conformance	v6LC.1.2.3: Unrecognized Next Header in Extension Header - End Node (A)(B)	Host/Router
RFC 2460	Core-Conformance	v6LC.1.3.3: Fragment Header M-Bit set, Payload Length Invalid	Host/Router
RFC 4861	Core-Conformance	v6LC.2.1.14: Neighbor Solicitation Processing, Anycast	Router
RFC 4861	Core-Conformance	v6LC.2.2.1 Router Solicitations	Host
RFC 4861	Core-Conformance	v6LC.2.2.2 Router Solicitations, Solicited Router Advertisement (D)(E)(F)	Host
RFC 4861	Core-Conformance	v6LC.2.2.7 Sending Unsolicited Router Advertisements (A)(B)	Router
RFC 4861	Core-Conformance	v6LC.2.2.13 Router Advertisement Processing, Cur Hop Limit (B)	Host/Router
RFC 4861	Core-Conformance	v6LC.2.2.15 Router Advertisement Processing, Reachable Time (A)	Host
RFC 1981	Core-Conformance	v6LC.4.1.2: Stored MTU	Host/Router
RFC 1981	Core-Conformance	v6LC.4.1.8 Router Advertisement with MTU Option	Host
RFC 1981	Core-Conformance	v6LC.4.1.10 Multicast Destination - One Router	Host/Router
RFC 1981	Core-Conformance	v6LC.4.1.11 Multicast Destination - Two Routers	Host/Router

RFC 4443	Core-Conformance	v6LC.5.1.1 Transmitting Echo Requests	Host/Router
RFC 4443	Core-Conformance	v6LC.5.1.2: Replying to Echo Requests (C)(D)(E)(F)	Host/Router
RFC 4443	Core-Conformance	v6LC.5.1.3 Destination Unreachable Message Generation (A)(B)(C)(D)(E)	Host/Router

* The objective of this test selection sheet is to provide a reference for available test specifications that identifies tests applicable to the USGv6 Profile.