FRROUTING

RFC Compliance Test Report
BGPPLUS-AS4 Results

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OpenSourceRouting
a project by the Network Device Education Foundation, Inc (www.NetDEF.org)

	Release 2.0.2	Release 3.0.3	Release 4.0	Release 5.0.1	Release 6.0.3	Release 7.0.1	Release 7.1	Release 7.3	Release 7.5	Release 8.0	Release 8.2.2	Release 8.3	Release 8.4	Release 8.4.1	Release 8.4.2
Type	FRR	FRR	FRR	FRR	FRR	FRR	FRR	FRR	FRR	FRR	FRR	FRR	FRR	FRR	FRR
Commit ID	36a7e78	5dff4ec	7a377a1	85f25d8	33e56da	056c0cd	23db048	c0038fc	13a8efb	9931db7	79188bf	d66a1ca	99477bc	70151e2	62ac43d
Commit Date	2017-11-08	2018-01-09	2018-03-12	2018-07-05	2019-05-09	2019-05-13	2019-06-18	2020-02-14	2021-02-27	2021-07-21	2022-03-13	2022-07-19	2022-11-03	2022-11-18	2023-01-10

ANVL-BGPPLUS-AS4-1.1 — MUST

Setup Verification

Setup Verification Tests
Bring up BGP4 Connection using 4-Octet AS capapbiility

	Release 2.0.2	Release 3.0.3	Release 4.0	Release 5.0.1	Release 6.0.3	Release 7.0.1	Release 7.1	Release 7.3	Release 7.5	Release 8.0	Release 8.2.2	Release 8.3	Release 8.4	Release 8.4.1	Release 8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

ANVL-BGPPLUS-AS4-2.1 — MUST

RFC4893 Section 3 Page 2 "Protocol Extensions"

Protocol Extensions
The Capability that is used by a BGP speaker to convey to its BGP
peer the 4-octet Autonomous System number capability, also carries
the 4-octet Autonomous System number of the speaker in the Capability
Value field of the Capability Optional Parameter.

	Release 2.0.2	Release 3.0.3	Release 4.0	Release 5.0.1	Release 6.0.3	Release 7.0.1	Release 7.1	Release 7.3	Release 7.5	Release 8.0	Release 8.2.2	Release 8.3	Release 8.4	Release 8.4.1	Release 8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

ANVL-BGPPLUS-AS4-2.2 — MUST

RFC4893 Section 3 Page 2 "Protocol Extensions"

Protocol Extensions
The Capability   Length field of the Capability is set to 4.

	Release 2.0.2	Release 3.0.3	Release 4.0	Release 5.0.1	Release 6.0.3	Release 7.0.1	Release 7.1	Release 7.3	Release 7.5	Release 8.0	Release 8.2.2	Release 8.3	Release 8.4	Release 8.4.1	Release 8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

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ANVL-BGPPLUS-AS4-2.3 **MUST**	RFC4893 Section 3 Page 2 "Protocol Extensions" Protocol Extensions NEW BGP speakers carry AS path information expressed in terms of 4-octet Autonomous Systems numbers by using the existing AS_PATH attribute, except that each AS number in this attribute is encoded not as a 2-octet, but as a 4-octet entity.	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested
		Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested
		FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested
		FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: pass	FreeBSD 12.2: pass	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested
		Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass
		FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass
ANVL-BGPPLUS-AS4-2.4 **MUST**	RFC4893 Section 3 Page 2 "Protocol Extensions" Protocol Extensions The same applies to the AGGREGATOR attribute - NEW BGP speakers use the same attribute, except that the AS carried in this attribute is encoded as a 4-octet entity.	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested
		Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested
		FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested
		FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: pass	FreeBSD 12.2: pass	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested
		Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass
		FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass
ANVL-BGPPLUS-AS4-2.5 **MUST**	RFC4893 Section 3 Page 2 "Protocol Extensions" Note: Here we check for the flags only Protocol Extensions To preserve AS path information with 4-octet AS numbers across OLD BGP speakers, this document defines a new AS path attribute, called AS4_PATH. This is an optional transitive attribute that contains the AS path encoded with 4-octet AS numbers.	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested
		Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested
		FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested
		FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: pass	FreeBSD 12.2: pass	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested
		Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass
		FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass

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ANVL-BGPPLUS-AS4-2.6 **MUST**	RFC4893 Section 3 Page 2 "Protocol Extensions" Note: Here we check for the value in the field `Protocol Extensions` `To preserve AS path information with 4-octet AS numbers across OLD BGP speakers, this document defines a new AS path attribute, called AS4_PATH.This is an optional transitive attribute that contains the AS path encoded with 4-octet AS numbers.`	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested
		Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested
		FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested
		FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: pass	FreeBSD 12.2: pass	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested
		Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass
		FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass
ANVL-BGPPLUS-AS4-2.7 **MUST**	RFC4893 Section 3 Page 3 "Protocol Extensions" Note: Here we check the attribute flags `Protocol Extensions` `Similarly, this document defines a new aggregator attribute called AS4_AGGREGATOR, which is optional transitive.`	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: pass	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested
		Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: pass	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested
		FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: pass	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested
		FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: FAIL	FreeBSD 12.2: FAIL	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested
		Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: FAIL	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass
		FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: FAIL	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass
ANVL-BGPPLUS-AS4-2.8 **MUST**	RFC4893 Section 3 Page 3 "Protocol Extensions" Note: Here we check the attribute value `Protocol Extensions` `Similarly, this document defines a new aggregator attribute called AS4_AGGREGATOR, which is optional transitive.`	FreeBSD 10.3: FAIL	FreeBSD 10.3: FAIL	FreeBSD 10.3: FAIL	FreeBSD 10.3: FAIL	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested	FreeBSD 10.3: untested
		Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: FAIL	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested	Ubuntu 16.04: untested
		FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: FAIL	FreeBSD 12.0: FAIL	FreeBSD 12.0: FAIL	FreeBSD 12.0: FAIL	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested	FreeBSD 12.0: untested
		FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: FAIL	FreeBSD 12.2: FAIL	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested	FreeBSD 12.2: untested
		Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: untested	Ubuntu 18.04: FAIL	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass
		FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: untested	FreeBSD 12.3: FAIL	FreeBSD 12.3: pass	FreeBSD 12.3: pass	FreeBSD 12.3: pass

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ANVL-BGPPLUS-AS4-2.9 **MUST**	RFC4893 Section 3 Page 3 "Protocol Extensions" — Protocol Extensions. We denote this special AS number as AS_TRANS for ease of description in the rest of this specification. This AS number is also placed in the "My Autonomous System" field of the OPEN message originated by a NEW BGP speaker, if the speaker does not have a (globally unique) 2-octet AS number.															
	FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
	Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
	FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
	FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
	Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
	FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
ANVL-BGPPLUS-AS4-3.1 **SHOULD**	RFC4893 Section 4.1 Page 3 "Interaction Between NEW BGP Speakers" Note: For AS4_PATH attribute — Interaction Between NEW BGP Speakers. The new attributes, AS4_PATH and AS4_AGGREGATOR SHOULD NOT be carried in the UPDATE messages between NEW BGP peers.															
	FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
	Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
	FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
	FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
	Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
	FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
ANVL-BGPPLUS-AS4-3.2 **SHOULD**	RFC4893 Section 3 Page 3 "Protocol Extensions" Note: For AS4_AGGREGATOR attribute — Interaction Between NEW BGP Speakers. The new attributes, AS4_PATH and AS4_AGGREGATOR SHOULD NOT be carried in the UPDATE messages between NEW BGP peers.															
	FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
	Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
	FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
	FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
	Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
	FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

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ANVL-BGPPLUS-AS4-3.3 **SHOULD**	NEGATIVE RFC4893, Sect. 4.1, Page 3, Interaction Between NEW BGP Speakers Note: This is for AS4_PATH attribute `Interaction Between NEW BGP Speakers` `A NEW BGP speaker that receives the AS4_PATH and AS4_AGGREGATOR` `path attributes in an UPDATE message from a NEW BGP speaker SHOULD` `discard these path attributes and continue processing` `the UPDATE message.`															
	FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
	Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
	FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
	FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
	Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
	FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
ANVL-BGPPLUS-AS4-3.4 **SHOULD**	NEGATIVE RFC4893, Sect. 4.1, Page 3, Interaction Between NEW BGP Speakers Note: This is for AS4_AGGREGATOR attribute `Interaction Between NEW BGP Speakers` `A NEW BGP speaker that receives the AS4_PATH and AS4_AGGREGATOR` `path attributes in an UPDATE message from a NEW BGP speaker SHOULD` `discard these path attributes and continue processing` `the UPDATE message.`															
	FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
	Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
	FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
	FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
	Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
	FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
ANVL-BGPPLUS-AS4-4.1 **MUST**	RFC4893 Section 4.2.2 Page 4 "Generating Updates" `Generating Updates (NEW-OLD BGP Speaker)` `When communicating with an OLD BGP speaker, a NEW speaker MUST send` `the AS path information in the AS_PATH attribute encoded with 2-octet` `AS numbers.`															
	FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
	Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
	FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
	FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
	Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
	FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

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ANVL-BGPPLUS-AS4-4.2 **MUST**	RFC4893 Section 4.2.2 Page 4 "Generating Updates" Note: For AS4_PATH attribute															

Generating Updates (NEW-OLD BGP Speaker)
The NEW speaker MUST also send the AS path information in the
AS4_PATH attribute (encoded with 4-octet AS numbers), except
for the case where the entire AS path information is composed of
2-octet AS numbers only. In this case, the NEW speaker SHOULD NOT
send the AS4_PATH attribute.

	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

| ANVL-BGPPLUS-AS4-4.3 **MUST** | RFC4893 Section 4.2.2 Page 4 "Generating Updates" |

Generating Updates (NEW-OLD BGP Speaker)
In the AS_PATH attribute encoded with 2-octet AS numbers, non-mappable
4-octet AS numbers are represented by the well-known 2-octet AS number,
AS_TRANS.

	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

| ANVL-BGPPLUS-AS4-4.4 **MUST** | RFC4893 Section 4.2.2 Page 4 "Generating Updates" |

Generating Updates (NEW-OLD BGP Speaker)
Similarly, if the NEW speaker has to send the AGGREGATOR attribute,
and if the aggregating Autonomous System"s AS number is truly 4-octets,
then the speaker constructs the AS4_AGGREGATOR attributes by taking
the attribute length and attribute value from the AGGREGATOR attribute
and placing them into the attribute length and attribute value
of the AS4_AGGREGATOR attribute, and sets the AS number field
in the existing AGGREGATOR attribute to the reserved AS number,
AS_TRANS.

	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

ANVL-BGPPLUS-AS4-4.5 — SHOULD

RFC4893 Section 4.2.2 Page 4 "Generating Updates"

```
Generating Updates (NEW-OLD BGP Speaker)
Note that if the AS number is 2-octets only, then the AS4_AGGREGATOR
attribute SHOULD NOT be sent.
```

	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

ANVL-BGPPLUS-AS4-5.1 — MUST

RFC4893 Section 4.2.3 Page 4 "Processing Received Updates"

```
Processing Received Updates (OLD-NEW BGP Speakers)
If the AS4_PATH attribute is also received, both the attributes
will be used to construct the exact AS path information, and
therefore the information carried by both the attributes will be
considered for AS path loop detection.
```

	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	FAIL	FAIL	FAIL	FAIL	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	FAIL	FAIL	FAIL	FAIL	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	FAIL	FAIL	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	FAIL	FAIL	FAIL	FAIL
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	FAIL	FAIL	FAIL	FAIL

ANVL-BGPPLUS-AS4-5.2 — MUST

RFC4893, Section 4.2.3 Page 5 "Processing Received Updates"
Note: This is for testing ignored AS4_PATH attribute

```
Processing Received Updates (OLD-NEW BGP Speakers)
When both the attributes are received, if the AS number in the
AGGREGATOR attribute is not AS_TRANS, then:
- the AS4_AGGREGATOR attribute and the AS4_PATH attribute SHALL
be ignored
- the AS_PATH attribute SHALL be taken as the AS path information.
```

	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

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ANVL-BGPPLUS-AS4-5.3 — MUST

RFC4893, Section 4.2.3 Page 5 "Processing Received Updates"

```
Processing Received Updates (OLD-NEW BGP Speakers)
-  the AGGREGATOR attribute SHALL be taken as the information
about the aggregating node
```

OS	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	unpredict	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

ANVL-BGPPLUS-AS4-5.4 — MUST

RFC4893 Section 4.2.3 Page 5 "Processing Received Updates"

```
Processing Received Updates (OLD-NEW BGP Speakers)
Otherwise,
-  the AGGREGATOR attribute SHALL be ignored,
-  the AS4_AGGREGATOR attribute SHALL be taken as the information
about the aggregating node
```

OS	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

ANVL-BGPPLUS-AS4-5.5 — MUST

RFC4893 Section 4.2.3 Page 6 "Processing Received Updates"

```
Processing Received Updates (OLD-NEW BGP Speakers)
If the number of AS numbers in the AS_PATH attribute is less than the
number of AS numbers in the AS4_PATH attribute, then the AS4_PATH
attribute SHALL be ignored, and the AS_PATH attribute SHALL be taken
as the AS path information.
```

OS	2.0.2	3.0.3	4.0	5.0.1	6.0.3	7.0.1	7.1	7.3	7.5	8.0	8.2.2	8.3	8.4	8.4.1	8.4.2
FreeBSD 10.3	FAIL	FAIL	FAIL	FAIL	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	FAIL	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	FAIL	FAIL	FAIL	FAIL	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	FAIL	FAIL	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	FAIL	FAIL	FAIL	FAIL
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	FAIL	FAIL	FAIL	FAIL

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ANVL-BGPPLUS-AS4-5.6 — MUST

RFC4893 Section 4.2.3 Page 6 "Processing Received Updates"

```
Processing Received Updates (OLD-NEW BGP Speakers)
If the number of AS numbers in the AS_PATH attribute is larger than
or equal to the number of AS numbers in the AS4_PATH attribute, then
the AS path information SHALL be constructed by taking as many AS
numbers and path segments as necessary from the leading part of the
AS_PATH attribute, and then prepending them to the AS4_PATH attribute
so that the AS path information has an identical number of AS numbers
as the AS_PATH attribute.
```

	Release 2.0.2	Release 3.0.3	Release 4.0	Release 5.0.1	Release 6.0.3	Release 7.0.1	Release 7.1	Release 7.3	Release 7.5	Release 8.0	Release 8.2.2	Release 8.3	Release 8.4	Release 8.4.1	Release 8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass

ANVL-BGPPLUS-AS4-6.1 — MUST

draft-ietf-idr-error-handling-01.txt Section 5.1 Page 6 " AGGREGATOR"

```
Revised Update Message Error Handling According to New Draft
The AGGREGATOR attribute SHALL be considered malformed if any of the
following applies:
Its length is not 6 (when the "4-octet AS number capability" is
not advertised to, or not received from the peer [RFC4893]).
Its length is not 8 (when the "4-octet AS number capability" is
both advertised to, and received from the peer).
An UPDATE message with a malformed AGGREGATOR attribute SHALL be
handled using the approach of "attribute discard".
NOTE:This test checks for second condition(Its length is not 8)
```

	Release 2.0.2	Release 3.0.3	Release 4.0	Release 5.0.1	Release 6.0.3	Release 7.0.1	Release 7.1	Release 7.3	Release 7.5	Release 8.0	Release 8.2.2	Release 8.3	Release 8.4	Release 8.4.1	Release 8.4.2
FreeBSD 10.3	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested
Ubuntu 16.04	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	pass	untested	untested	untested	untested
FreeBSD 12.0	untested	untested	untested	untested	pass	pass	pass	pass	untested	untested	untested	untested	untested	untested	untested
FreeBSD 12.2	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	untested	untested	untested	untested
Ubuntu 18.04	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass
FreeBSD 12.3	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	untested	pass	pass	pass	pass