



	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x
Туре	FRR	FRR	FRR	FRR	FRR			
Commit ID	79188bf	gd19215c	99477bc	86a5e5a				
Commit Date	2022-03-13	2022-08-07	2022-11-03	2023-03-14				
PIM-SM-1.1	RFC 4601 s3	p7 PIM-SM Pr	otocol Overvie	w				
MUST	PIM protocol path to each	l is to provi n destination	ide the next n subnet.The	e primary rol hop router a MRIB is used Prune message	along a multi I to determin	.cast-capable	2	
	untested	untested	untested	untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.2	NEGATIVE R	FC 4601 s3 p7	PIM-SM Proto	ocol Overview				
MUST	PIM protocol path to each	l is to provi	ide the next n subnet. The	e primary rol hop router a make MRIB is use Prune message Free BSD 10.3 untested	along a multi ed to determi	.cast-capable		
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.3	RFC 4601 s3.	1 p8 Phase Or	ne: RP Tree					•
MAY	traffic destIGMP[6] or I	Tined for a rMLD[4], but of Free BSD 10.3	nulticast groother mechan: Free BSD 10.3	expresses its oup. Typical isms might al	ly it does t	his using		
	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.4	RFC 4601 s3.	.1 p8 Phase Or	ne: RP Tree					
MUST	Join message	es are resent	periodical	ly so long as	the receive	er remains in	1	
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release	Release	Release	Release	Release	Release	Release	Release
	8.2.2	8.3	8.4	8.5	X.X.X	X.X.X	X.X.X	X.X.X
PIM-SM-1.5	NEGATIVE: F	RFC 4601 s3.1	p8 Phase One	: RP Tree				
MUST		ives these ense them onto	_	data packets, cee.	decapsulate	es them,		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.6	RFC 4601 s3.	.2 p9 Phase Tv	vo: Register-St	ор		•	•	•
MUST	reasons, the To do this, from source	e RP will now	rmally choose receives a m G, it will no	continue inde to switch tregister-enca	o native for	rwarding. La packet		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.7	RFC 4601 s3.	.2 p9 Phase Tv	vo: Register-St	ор				
MUST	will be rece the RP start it sends a D	eiving two co	opies of each d the encapsu message back	crive nativel n of these pa llated copy o t to S's DR t	ckets. At the factor of these pactors	nis point, cets, and		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.8	RFC 4601 s3.	.3 p10 Phase T	hree: Shortest	-Path Tree				
MUST	the DR, may	optionally : ific shortest	initiate a tr	on the receiransfer from	the shared t	tree to a		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





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	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-1.9	RFC 4601 s3.	3 p10 Phase 1	hree: Shortest	-Path Tree					
MUST	will be rece one from the the SPT, the	eiving two co e RPT. When t e DR or upst:	opies of the the first tra	data - one faffic starts starts to dro	from the SPT to arrive fr	and			
	untested Ubuntu 18.04:	untested Ubuntu 18.04:	untested Ubuntu 18.04:	untested Ubuntu 18.04:					
	pass	pass	pass	pass					
	Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested untested untested untested								
PIM-SM-1.10	RFC 4601 s3.	.3 p10 Phase 1	hree: Shortest	-Path Tree					
MUST	be receiving RPT. When the upstream routhe RP tree RP. This is (Note: Here	g two copies ne first tra: uter starts . In addition s known as an DUT is cons	of the data  ffic starts to  to drop the pon, it sends  n (S,G,rpt) I  idered as an	ter upstream - one from to arrive from the control of the control	the SPT and on the SPT, to from S that the message that the tree of the tree o	one from the the DR or arrive via cowards the			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-1.11	RFC 4601 s3.	4 p10 Source-	Specific Joins						
MAY	RFC 4601 s3.4 p10 Source-Specific Joins  IGMPv3 permits a receiver to join a group and specify that it only wants to receive traffic for a group if that traffic comes from a particular source.								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-1.12	NEGATIVE R	FC 4601 s3.4	p10 Source-Sp	ecific Joins					
MAY	NEGATIVE RFC 4601 s3.4 p10 Source-Specific Joins  IGMPv3 permits a receiver to join a group and specify that it only wants to receive traffic for a group if that traffic comes from a particular source.  (Note: Send UDP data packet from different source)								
MAY	wants to rec	ceive traffic source.				rom a			
MAY	wants to rec	ceive traffic source.				rom a			
MAY	wants to red particular s (Note: Send Free BSD 10.3	ceive traffic source. UDP data pac Free BSD 10.3	cket from dif	Free BSD 10.3		rom a			





	Release	Release	Release	Release	Pologog	Pologoo	Pologog	Pologog		
	8.2.2	8.3	8.4	8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-1.13	RFC 4601 s3.	4 p10 Source-	Specific Joins							
MAY	The range of is currently groups in the IGMPv3 joins for a group	f multicast a y set aside this range, res. If a PIM in this range	addresses fro for source-speceivers shou router receives, it should		.cast in IPv4 le source-spe	l. For ecific		I		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested untested untested									
PIM-SM-1.14	NEGATIVE R	FC 4601 s3.4 <sub>l</sub>	p10 Source-Sp	ecific Joins						
MAY	is currently groups in the IGMPv3 joins for a group	y set aside fais range, res. If a PIM rein this range	for source-speceivers show router receives, it showld	om 232.0.0.0 pecific multi ald only issures a non-soud ignore it.	cast in IPv4 ne source-spe nrce-specific	l. For ecific c join				
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Bource 11Be)					
	untested	untested	untested	untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-1.15	RFC 4601 s3.	5 p10 Source-	Specific Prune	S						
MAY	only wants to come from a perform a (	specific south, specific south, specific south, specific south, specific sp	raffic for a arce or source normal,	oin a group a group if tha ces. In this	at traffic do	es not	ı	r		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-1.16	RFC 4601 s3.	7 p12 RP Disc	overy							
MAY	for which the automatical through state	ney have (*,0	G) state. Thi pedded-RP), t ation.	ress of the R is address is through a boo	obtained ei	ther				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x
PIM-SM-1.17	RFC 4601 s3.	.7 p12 RP Disc	overy					
MAY	for which the automatical through state	hey have (*,0	G) state. The cedded-RP), tation.	ress of the F is address is through a boo	obtained e	ither		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.18	ANVL Setup \	Verification						
MUST	Quick test to	to verify tha	at DUT sends	Assert messa	ge with meti	ric value		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.19	ANVL Setup \	Verification						
MUST		to verify the		Assert messa	ge with meta	ric		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-1.20	ANVL Setup \	Verification						
MUST	1	to verify tha		Register mes	sage with II	Source set		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-3.1	RFC 4601 s4.	.1.3 p17 (*,G) \$	State				•	•		
MUST	Join(*,G) me	m (*,G) Join, essages, and N interface.			_		1			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested untested untested									
PIM-SM-3.2	RFC 4601 s4.	.1.3 p17 (*,G) \$	State							
MUST	changes ther	F neighbor to n the RPF ne: need to trig	lghbor toward	ds the RP may	change. If	it does				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-3.3	RFC 4601 s4.	.1.3 p17 (*,G) \$	State							
MUST	The last RPF neighbor towards the RP is stored because if the MRIB changes then the RPF neighbor towards the RP may change. If it does so, then we need to trigger a Prune(*,G) to the old upstream neighbor.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-4.1	RFC 4601 s4.	.1.4 p19 (S,G)	State							
MUST	Join(S,G) me	m (S,G) Join, essages, and N interface.			_		1			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-4.2	RFC 4601 s4	.1.4 p19 (S,G)	State								
MUST	changes the	n the RPF ne:	ighbor toward	is stored be ds the S may Din (S,G) to	change. If i	it does					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-4.3	RFC 4601 s4	.1.4 p19 (S,G)	State								
MUST	changes then so, then we neighbor.	n the RPF nem	ighbor toward	is stored be ds the S may (S,G) to the	change. If i	it does		ı			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: FAIL	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-4.4	RFC 4601 s4	.1.4 p19 (S,G)	State								
MUST	If the router detects through a changed GenID in a Hello message that the upstream neighbor towards S has rebooted, then it should re-instantiate state by sending a Join(S,G).										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-4.5	NEGATIVE R	FC 4601 s4.1.	4 p19 (S,G) Sta	ate							
MUST	(S,G) Shortd (S,G) state when the som FALSE, only G. When SP	NEGATIVE RFC 4601 s4.1.4 p19 (S,G) State  The SPTbit is used to indicate whether forwarding is taking place on the (S,G) Shortest Path Tree (SPT) or on the (*,G) tree. A router can have (S,G) state and still be forwarding on (*,G) state during the interval when the source-specific tree is being constructed. When SPTbit is FALSE, only (*,G) forwarding state is used to forward packets from S to G. When SPTbit is TRUE, both (*,G) and (S,G) forwarding state are used. (Note: when SPTbit is FALSE, because JoinDesired(S,G) == FALSE for different source)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-4.6	NEGATIVE R	FC 4601 s4.1.4	4 p19 (S,G) Sta	ate							
MUST	(S,G) Shorte (S,G) state when the sou FALSE, only G. When SPTM	est Path Tree and still be arce-specific (*,G) forwan bit is TRUE,	e (SPT) or or e forwarding c tree is bei rding state i both (*,G) a	ner forwarding the (*,G) to on (*,G) stang on construct s used to found (S,G) for e JoinDesired	ree. A rout te during the ed. When SP rward packet warding stat	ter can have the interval of the interval of the control of the co					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-4.7	RFC 4601 s4.	RFC 4601 s4.1.4 p19 (S,G) State									
MUST	(S,G) Shorte (S,G) state when the sou FALSE, only G. When SP	est Path Tree and still be arce-specific (*,G) forwar	e (SPT) or or e forwarding tree is being state in both (*,G)	ner forwarding the (*,G) to on (*,G) states and construct and (S,G) for and (S,G) for the formal states are the formal states and (S,G) for the formal states are the formal states	ree. A rout te during th ed. When SE rward packet	eer can have ne interval PTbit is as from S to					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-4.8	RFC 4601 s4.	1.4 p20 (S,G)	State								
MUST	rules" - whe	en the RP use	es (S,G) joir	sary for the as to stop en a unnecessari	capsulation,	and then					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





Release Release Release Release Release Release Release Release 8.2.2 8.3 8.4 8.5 X.X.X X.X.X X.X.X X.X.X PIM-SM-5.1 RFC 4601 s4.2 p27 Data Packet Forwarding Rules if( iif == RPF\_interface(S) AND SPTbit(S,G) == TRUE ) { MUST oiflist = inherited\_olist(S,G) } else if( iif == RPF\_interface(RP(G)) AND SPTbit(S,G) == FALSE) { oiflist = inherited\_olist(S,G,rpt) CheckSwitchToSpt(S,G) else { # Note: RPF check failed # A transition in an Assert FSM, may cause an Assert(S,G) # or Assert(\*,G) message to be sent out interface iif. # See section 4.6 for details. if (  $SPTbit(S,G) == TRUE \ AND \ iif is in inherited_olist(S,G)$ ) { send Assert(S,G) on iif } else if ( SPTbit(S,G) == FALSE AND iif is in inherited\_olist(S,G,rpt) { send Assert(\*,G) on iif oiflist = oiflist (-) iif forward packet on all interfaces in oiflist (Note: If the SPT-bit of an (S,G) entry is set, and if incoming interface is the same as a matching (S,G) ifaceIn, the packet is forwarded to the oif-list of (S,G)) Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 untested untested untested untested Ubuntu 18.04: Ubuntu 18.04: Ubuntu 18.04: Ubuntu 18.04: pass pass pass pass Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested untested untested untested



#### PIM Results



Release Release Release Release Release Release Release Release 8.2.2 8.3 8.4 8.5 X.X.X x.x.x X.X.X X.X.X PIM-SM-5.2 NEGATIVE RFC 4601 s4.2 p27 Data Packet Forwarding Rules if( iif == RPF\_interface(S) AND SPTbit(S,G) == TRUE ) { MUST oiflist = inherited\_olist(S,G) } else if( iif == RPF\_interface(RP(G)) AND SPTbit(S,G) == FALSE) { oiflist = inherited\_olist(S,G,rpt) CheckSwitchToSpt(S,G) else { # Note: RPF check failed # A transition in an Assert FSM, may cause an Assert(S,G) # or Assert(\*,G) message to be sent out interface iif. # See section 4.6 for details. if (  $SPTbit(S,G) == TRUE \ AND \ iif is in inherited_olist(S,G)$ ) { send Assert(S,G) on iif } else if ( SPTbit(S,G) == FALSE AND iif is in inherited\_olist(S,G,rpt) { send Assert(\*,G) on iif oiflist = oiflist (-) iif forward packet on all interfaces in oiflist (Note: If the SPT-bit of an (S,G) entry is set, and if incoming interface is same as RPF\_interface(s), the packet is forwarded to the oif-list of (S,G)) Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 untested untested untested untested Ubuntu 18.04: Ubuntu 18.04: Ubuntu 18.04: Ubuntu 18.04: pass pass pass pass Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested untested untested untested



#### PIM Results



Release Release Release Release Release Release Release Release 8.2.2 8.3 8.4 8.5 X.X.X x.x.x X.X.X X.X.X PIM-SM-5.3 RFC 4601 s4.2 p27 Data Packet Forwarding Rules if( iif == RPF\_interface(S) AND SPTbit(S,G) == TRUE ) { MUST oiflist = inherited\_olist(S,G) } else if( iif == RPF\_interface(RP(G)) AND SPTbit(S,G) == FALSE) { oiflist = inherited\_olist(S,G,rpt) CheckSwitchToSpt(S,G) else { # Note: RPF check failed # A transition in an Assert FSM, may cause an Assert(S,G) # or Assert(\*,G) message to be sent out interface iif. # See section 4.6 for details. if (  $SPTbit(S,G) == TRUE \ AND \ iif is in inherited_olist(S,G)$ ) { send Assert(S,G) on iif } else if ( SPTbit(S,G) == FALSE AND iif is in inherited\_olist(S,G,rpt) { send Assert(\*,G) on iif oiflist = oiflist (-) iif forward packet on all interfaces in oiflist (Note: On receiving multicast data packet if SPT-bit of an (S,G) entry is cleared, and ifaceIn differs than a matching (S,G) ifaceIn but matches with a (\*,G) ifaceIn, packet is forwarded to the oif-list of (\*,G)) Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 untested untested untested untested Ubuntu 18.04: Ubuntu 18.04: Ubuntu 18.04: Ubuntu 18.04: pass pass pass pass Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested untested untested untested



#### PIM Results



Release Release Release Release Release Release Release Release 8.2.2 8.3 8.4 8.5 X.X.X x.x.x X.X.X X.X.X PIM-SM-5.4 RFC 4601 s4.2 p27 Data Packet Forwarding Rules if( iif == RPF\_interface(S) AND SPTbit(S,G) == TRUE ) { MUST oiflist = inherited\_olist(S,G) } else if( iif == RPF\_interface(RP(G)) AND SPTbit(S,G) == FALSE) { oiflist = inherited\_olist(S,G,rpt) CheckSwitchToSpt(S,G) else { # Note: RPF check failed # A transition in an Assert FSM, may cause an Assert(S,G) # or Assert(\*,G) message to be sent out interface iif. # See section 4.6 for details. if (  $SPTbit(S,G) == TRUE \ AND \ iif is in inherited_olist(S,G)$ ) { send Assert(S,G) on iif } else if ( SPTbit(S,G) == FALSE AND iif is in inherited\_olist(S,G,rpt) { send Assert(\*,G) on iif oiflist = oiflist (-) iif forward packet on all interfaces in oiflist (Note: On receiving multicast data packet, if incoming interface does not match (S,G) ifaceIn or (\*,G) ifaceIn, the packet is not forwarded) Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 untested untested untested untested Ubuntu 18.04: Ubuntu 18.04: Ubuntu 18.04: Ubuntu 18.04: pass pass pass pass Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-5.5	RFC 4601 s4.	2 p27 Data Pa	cket Forwardir	ng Rules							
MUST	<pre>oiflist = inherited_olist(S,G) } else if( iif == RPF_interface(RP(G)) AND SPTbit(S,G) == FALSE) {     oiflist = inherited_olist(S,G,rpt)     CheckSwitchToSpt(S,G) } else {     # Note: RPF check failed     # A transition in an Assert FSM, may cause an Assert(S,G)     # or Assert(*,G) message to be sent out interface iif.     # See section 4.6 for details.     if ( SPTbit(S,G) == TRUE AND iif is in inherited_olist(S,G) ) {         send Assert(S,G) on iif     } else if ( SPTbit(S,G) == FALSE AND</pre>										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-5.6	RFC 4601 s4.2 p27 Data Packet Forwarding Rules										
MUST	<pre>if ( SPTbit(S,G) == TRUE AND iif is in inherited_olist(S,G) ) {    send Assert(S,G) on iif } else if ( SPTbit(S,G) == FALSE AND</pre>										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x
PIM-SM-5.7	RFC 4601 s4.	2 p27 Data Pa	cket Forwardin	g Rules				
MUST	send Asser } else if ( send Asser } (Note: On re	st(S,G) on is SPTbit(S,G) iif is in in ert(*,G) on i	f == FALSE ANI herited_olis iif a from S to C	st(S,G,rpt) { G on interfac		·	SE,	
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-6.1	RFC 4601 s4.	2.2 p29 Setting	g and Clearing	the (S,G) SPT	bit			
MUST	void Update_SPTb: if ( iif = AND AND  Set SP: }	it(S,G,iif) == RPF_interi JoinDesired ( DirectlyCo OR RPF_int OR inherit OR ( ( RPF	[ face(S) (S,G) == TRUE connected(S) == cerface(S) != ced_olist(S,G) (F'(S,G) == RE (F'(S,G) != NU Assert_Loser TRUE	== TRUE = RPF_interfa G,rpt) == NUI PF'(*,G) ) AN	.ce(RP(G)) .L ID			
				is different (*,G) Join m		PF interface		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x
PIM-SM-6.2	RFC 4601 s4.	2.2 p29 Setting	g and Clearing	the (S,G) SPT	bit			
MUST	void Update_SPTb: if ( iif: AND AND  Set SP: } Here the Jo:	it(S,G,iif) == RPF_interi JoinDesired ( DirectlyCo OR RPF_int OR inherit OR ( RPF	<pre>{ cace(S) (S,G) == TRUI connected(S) = cerface(S) != ced_olist(S,G) (F'(S,G) == RI (F'(S,G) != NU Assert_Lose TRUE  G) is set to</pre>	== TRUE = RPF_interfa G,rpt) == NUL PF'(*,G) ) AN	.ce(RP(G)) .L ID			
	Free BSD 10.3	RUE & for (*,	Free BSD 10.3	Free BSD 10.3				
	untested	untested	untested	untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-6.5	RFC 4601 s4.	2.2 p29 Setting	g and Clearing	the (S,G) SPT	bit			
MUST	void Update_SPTb:     if ( iif :         AND         AND          Set SP:     } } Here the Jo:     is set to FA Here no RP :	it(S,G,iif) == RPF_interi JoinDesired ( DirectlyCo OR RPF_int OR inherit OR ( RPF	[ face(S) (S,G) == TRUI connected(S) == cerface(S) != ced_olist(S,G) f'(S,G) == RI f'(S,G) != NU Assert_Lose TRUE  g) is set to cerface(S) is t by (*,G) on	== TRUE = RPF_interfa G,rpt) == NUL PF'(*,G) ) AN	ce(RP(G)) L D { lyConnected(F_interface(R	S)		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-6.6	RFC 4601 s4.	2.2 p29 Setting	g and Clearing	the (S,G) SPT	bit					
MUST	Thus, when a void Update_SPTb:    if ( iif:         AND         AND         Set SP:    } } Here the Jo:    is set to Fi inherited_o:	a packet arrival arriv	Eves, the (S, Eace(S)   S,G) == TRUE   Dinnected(S)   Event   Event	G,G) SPTbit is  TRUE  RPF_interfa  G,rpt) == NUI  PF'(*,G) ) AN  JLL ) )  c(S,G,iif) )  TRUE, Directs  s same as RPF  through (*,	updated as  ace(RP(G))  L  TD  { clyConnected(F_interface(RT))	S)				
	Free BSD 10.3 untested  Ubuntu 18.04:	Free BSD 10.3 untested  Ubuntu 18.04:	Free BSD 10.3 untested  Ubuntu 18.04:	Free BSD 10.3 untested						
	pass	pass	pass	pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-7.1	RFC 4601 s4.	3.1 p30 Sendii	ng Hello Messa	ages						
MUST	PIM Hello messages are sent periodically on each PIM-enabled interface. Hello messages must be sent every <hello-period> seconds.</hello-period>									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-7.2	RFC 4601 s4.	3.1 p30 Sendii	ng Hello Messa	ages						
MUST	point-to-po	Modern   Property								
	Ubuntu 18.04: pass									
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-7.3	RFC 4601 s4.	.3.1 p31 Sendi	ng Hello Messa	ages						
MUST	When PIM is enabled on an interface or a router first starts, the hello timer of that interface is set to a random value between 0 and Triggered_Hello_Delay.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-7.5	NEGATIVE R	FC 4601 s4.3.	1 p31 Sending	Hello Message	es					
MAY	Note that neighbors will not accept Join/Prune or Assert messages from a router unless they have first heard a Hello message from that router.  (Note: This test is for (*,G) join state)  Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 Free BSD 10.3									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-7.6	NEGATIVE R	FC 4601 s4.3.	1 p31 Sending	Hello Message	es					
MAY	Note that neighbors will not accept Join/Prune or Assert messages from a router unless they have first heard a Hello message from that router. (Note: This test is for (S,G) join state)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-7.7	RFC 4601 s4.	.3.1 p31 Sendi	ng Hello Messa	ages RFC 4601	s4.6 p83 PIM	Assert Messa	ges			
MUST	a router und AND If a router and it has n	receives an	ve first hear Assert messa	Join/Prune of a Hello me age from a pasage from that without furth	essage from t articular IP at source add	chat router. source addre				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-7.8	RFC 4601 s4	.3.1 p31 Sendi	ng Hello Messa	ages		•		•	
SHOULD	The DR_Priority Option SHOULD be included in every Hello message, even if no DR Priority is explicitly configured on that interface.								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-7.9	RFC 4601 s4	.3.1 p31 Sendi	ng Hello Messa	ages					
SHOULD	included in configured of DR election	rity Option S every Hello on that inter is only enal re capable of	message, ever face. This oled when all	is necessary L neighbors o	because pri	ority-based ace advertise			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-7.10	RFC 4601 s4	.3.1 p31 Sendi	ng Hello Messa	ages					
SHOULD	The Generation_Identifier (GenID) Option SHOULD be included in all Hello messages								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-7.11	RFC 4601 s4.	.3.1 p31 Sendi	ng Hello Messa	ages					
MUST	is regenera	ption contain ted each time rface, includ	e PIM forward	ding is start	ed or restar	ted			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x
PIM-SM-7.12	RFC 4601 s4	.3.1 p31 Sendi	ng Hello Messa	ages		•	•	•
SHOULD		ne Delay Opt: ti-access LAI		e included ir	n all Hello r	messages		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-8.1	RFC 4601 s4.	.3.2 p33 DR El	ection			<u> </u>	1	l
MUST	The function used for comparing DR "metrics" on interface I is:  Bool dr_is_better(a,b,I) {    if( there is a neighbor n on I for which n.dr_priority_present     is false ) {      return a.primary_ip_address > b.primary_ip_address   } else {      return ( a.dr_priority > b.dr_priority ) OR							
	neighbor wi	DR-priority th the highes	st IP address	s is elected		age, the	1	T
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-8.2	RFC 4601 s4.	.3.2 p33 DR El	ection					
MUST	The function used for comparing DR "metrics" on interface I is:  Bool dr_is_better(a,b,I) {    if( there is a neighbor n on I for which n.dr_priority_present     is false ) {      return a.primary_ip_address > b.primary_ip_address   } else {      return ( a.dr_priority > b.dr_priority ) OR							
	DR Priority larger prior	-priority opt is a 32-bit rity is alway s elected as	unsigned num	mber and the		. The		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-8.3	RFC 4601 s4.	.3.2 p33 DR El	ection								
MUST	<pre>if( there     is fa.     return } else     return  } Note: If DR- DR Priority larger prior</pre>	<pre>Bool dr_is_better(a,b,I) {    if( there is a neighbor n on I for which n.dr_priority_present       is false ) {       return a.primary_ip_address &gt; b.primary_ip_address    } else {       return ( a.dr_priority &gt; b.dr_priority ) OR</pre>									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-8.4	RFC 4601 s4.	.3.2 p33 DR El	ection								
MUST	Bool dr_is_l if( there     is fa:     return } else     return  } Note: If DR- with the DR- address is e	better(a,b,I is a neighbours lse ) { n a.primary_i } n ( a.dr_prio	or n on I for ip_address &g  prity > b  prity == b.dn  y_ip_address  tion is specification is the ne DR.	"metrics" on a which n.dr_gt; b.primary dr_priority AN > b.primatified in a Heat of the other	priority_pre r_ip_address ) OR ID ry_ip_addres	esent  ss )  the neighbor	or				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-8.5	RFC 4601 s4.	3.2 p33 DR El	ection							
MUST	The function used for comparing DR "metrics" on interface I is:  Bool dr_is_better(a,b,I) {     if( there is a neighbor n on I for which n.dr_priority_present         is false ) {          return a.primary_ip_address > b.primary_ip_address     } else {          return ( a.dr_priority > b.dr_priority ) OR									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-8.6	RFC 4601 s4.3.2 p33 DR Election									
MUST	The Neighbor Liveness Timer (NLT(N,I)) is reset to Hello_Holdtime (from the Hello Holdtime option) whenever a Hello message is received containing a Holdtime option, or to Default_Hello_Holdtime if the Hello message does not contain the Holdtime option.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-8.7	RFC 4601 s4.	.3.2 p33 DR El	ection							
MUST	RFC 4601 s4.3.2 p33 DR Election  The Neighbor Liveness Timer (NLT(N,I)) is reset to Hello_Holdtime (from the Hello Holdtime option) whenever a Hello message is received containing a Holdtime option, or to Default_Hello_Holdtime if the Hello message does not contain the Holdtime option.  (Note: ANVL sends Hello message that contains Holdtime option, from <mcast-router-b>, NLT is set to Hello_Holdtime)</mcast-router-b>									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-8.8	RFC 4601 s4.	3.2 p34 DR El	ection							
MAY	a PIM Hello a router's o		received, who	n an interfac en a neighbor						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-8.9	RFC 4601 s4.	3.2 p34 DR El	ection							
MUST	a PIM Hello a router's o		received, who	n an interfac en a neighbor nges)						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-8.10	RFC 4601 s4.3.2 p34 DR Election									
MAY	A router's idea of the current DR on an interface can change when a PIM Hello message is received, when a neighbor times out, or when a router's own DR priority changes. If the router becomes the DR or ceases to be the DR, this will normally cause the DR Register state-machine to change state.  (Here selection of the new DR to be one with the highest IP address)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-9.1	RFC 4601 s4.	3.3 p34 Reduc	ing Prune Pro	pagation Delay	on LANs					
MUST	the LAN Pruma link adventor (Note: when & Effective	ne Delay opti ctise the opt lan_delay_er	ion is not us tion. nabled is FAI terval(I) ret	ne informationsed unless all unless all uses. SE, both Efficurn Propagat	l neighbors	on agation_Delay	γ(I),			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release	Release	Release	Release	Release	Release	Release	Release	
	8.2.2	8.3	8.4	8.5	X.X.X	x.x.x	x.x.x	x.x.x	
PIM-SM-9.3	RFC 4601 s4.	.3.3 p35 Reduc	ing Prune Prop	pagation Delay	on LANs				
MUST	Propagation those advert	Delay differ	rent from the n neighbor is	position to e default, th s chosen. lay(I) & (*,G	ne largest va	alue from			
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3					
	untested	untested	untested	untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-9.5	RFC 4601 s4.	.3.3 p36 Reduc	ing Prune Pro	pagation Delay	on LANs				
MUST	Interval dis	fferent from by each neigh	the default,	position to the largesten.	value from				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0	Free BSD 12.0	Free BSD 12.0	Free BSD 12.0					
	untested	untested	untested	untested					
PIM-SM-10.1	RFC 4601 s4.	.4 p38 PIM Reg	gister Message	s					
MUST	The Designated Router (DR) on a LAN or point-to-point link encapsulates multicast packets from local sources to the RP for the relevant group unless it recently received a Register Stop message for that (S,G) or (*,G) from the RP.								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-10.2	NEGATIVE R	FC 4601 s4.4 <sub> </sub>	p38 PIM Regis	ter Messages					
MUST	encapsulates	s multicast p	packets from ss it recentl	or point-to- local source ly received a n the RP.	es to the RP				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-10.3	RFC 4601 s4.	.4 p38 PIM Re	gister Message	es						
MUST	The Designated Router (DR) on a LAN or point-to-point link encapsulates multicast packets from local sources to the RP for the relevant group unless it recently received a Register-Stop message for that (S,G) or (*,G) from the RP.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-10.4	RFC 4601 s4.	4 p38 PIM Reg	gister Message	s						
MUST	a Register S Stop timer	Stop timer to expires, the	maintain th DR sends a N	o message fro nis state. Ju Null-Register Stop inform	st before th Message to	ne Register the RP to				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-11.1	RFC 4601 s4.	4.1 p39 Sendi	ng Register Me	essages from th	ne DR					
MUST	In Join(J) state if DR receives RegisterStop Message, then it will go to Prune(P) state by removing register tunnel and set Register-Stop Timer.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-11.2	RFC 4601 s4.	4.1 p39 Sendi	ng Register Me	essages from th	ne DR					
MUST	go to NoInfo	o(NI) State 8	remove reg -> FALSE	G) becomes f tunnel is achieved		will				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x
PIM-SM-11.3	RFC 4601 s4.	4.1 p39 Sendi	ng Register Me	essages from th	ne DR			
MUST	In Join(J) s	state if RP(	G) changes, t	then the DR u	pdates Regis	ster tunnel		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-11.4	RFC 4601 s4.	4.1 p39 Sendi	ng Register Me	essages from th	ne DR			
MUST		_	te if RegStor	o timer expir ster tunnel	res then the	DR will go		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-11.5	RFC 4601 s4.	4.1 p39 Sendi	ng Register Me	essages from th	ne DR			
MUST	In Join Pending(JP) state if RP changed then the DR will go to Join(J) state by adding the register tunnel and cancel the Register-Stop Timer.							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-11.6	RFC 4601 s4.	4.1 p39 Sendi	ng Register Me	essages from th	ne DR			
MUST	In Join Pending(JP) state if CouldRegister(S,G) becomes false then it will go to NoInfo(NI) State Here CouldRegister(S,G) -> FALSE is achieved by making I_am_DR(RPF_interface(S))-> FALSE							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release	Release	Release	Release	Release	Release	Release	Release	
	8.2.2	8.3	8.4	8.5	X.X.X	X.X.X	X.X.X	X.X.X	
PIM-SM-11.7	RFC 4601 s4.	4.1 p39 Sendii	ng Register Me	essages from th	ne DR				
MUST		_		is received to randomis		_			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-11.8	RFC 4601 s4.	4.1 p39 Sendii	ng Register Me	essages from th	ne DR				
MUST	In Prune(P) state if Register-Stop timer expires then the DR will send Null-Register message								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-11.9	RFC 4601 s4.	.4.1 p39 Sendii	ng Register Me	essages from th	ne DR			•	
MUST	go to NoInfo Here CouldRe	o(NI) State	-> FALSE	is achieved		it will			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-11.10	RFC 4601 s4.	4.1 p39 Sendi	ng Register Me	essages from th	ne DR				
MUST				then the DR gister-Stop T	~	n(J) state			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-11.11	RFC 4601 s4.	4.1 p39 Sendi	ng Register Me	ssages from th	ne DR						
MUST	go to Join(d Here CouldRe	J) State, add	ling register -> TRUE i	becomes true tunnel s achieved b		1					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-11.12	RFC 4601 s4.	4.1 p42 Sendii	ng Register Me	ssages from th	ne DR						
MUST		FC 4601 s4.4.1 p42 Sending Register Messages from the DR  Register-Stop(*,G) should be treated as a Register-Stop(S,G) for all  S,G) Register state machines									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: FAIL							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-12.1	RFC 4601 s4.	4.2 p43 Recei	ving Register M	lessages at the	RP						
MUST	<pre>When an RP receives a Register message, the course of action is decided according to the following pseudocode: packet_arrives_on_rp_tunnel( pkt ) {      if(SPTbit(S,G) OR         (SwitchToSptDesired(S,G) AND</pre>										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-12.2	NEGATIVE R	FC 4601 s4.4.2	2 p43 Receivin	g Register Mes	ssages at the F	RP				
MUST	<pre>When an RP receives a Register message, the course of action is decided according to the following pseudocode: packet_arrives_on_rp_tunnel( pkt ) {    if( I_am_RP(G) AND outer.dst == RP(G) ) {          if( !SPTbit(S,G) AND !pkt.NullRegisterBit ) {             decapsulate and forward the inner packet to             inherited_olist(S,G,rpt) # Note (+)         } }</pre>									
	with Null-Re	}  Note: If (S,G) entry with SPT bit set to TRUE, and received Register with Null-Register-Bit set to FALSE then RP don't decapsulate and bass the inner packet to the normal forwarding path.)								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-12.3	NEGATIVE R	FC 4601 s4.4.2	2 p43 Receivin	g Register Mes	ssages at the F	₹P				
MUST	decided accordance	receives a Re ording to the ves_on_rp_tur RP(G) AND out	e following p nnel( pkt ) {	seudocode:	se of action	ı is				
	if( }	_	e and forward	allRegisterBi d the inner p a) # Note (+)	acket to					
	with Null-Re	} } (Note: If (S,G) entry with SPT bit set to TRUE, and received Register with Null-Register-Bit set to TRUE then RP don't decapsulate and pass the inner packet to the normal forwarding path.)								
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3						
	untested	untested	untested	untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested untested untested untested									





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x				
PIM-SM-12.4	RFC 4601 s4.	RFC 4601 s4.4.2 p43 Receiving Register Messages at the RP										
MUST	When an RP receives a Register message, the course of action is decided according to the following pseudocode: packet_arrives_on_rp_tunnel( pkt ) {   if( I_am_RP(G) AND outer.dst == RP(G) ) {											
	<pre>if( !SPTbit(S,G) AND !pkt.NullRegisterBit ) {     decapsulate and forward the inner packet to         inherited_olist(S,G,rpt) # Note (+)     } }</pre>											
	<pre> } If there is no (S,G) entry, i.e. SPTbit set to FALSE and received Register has Null-Register-Bit set to FALSE then RP decapsulate and pass the inner packet to the normal forwarding path for forwarding on the (*,G) tree. </pre>											
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-12.5	RFC 4601 s4.	4.2 p43 Recei	ving Register M	lessages at the	e RP							
MUST	<pre>When an RP receives a Register message, the course of action is decided according to the following pseudocode: packet_arrives_on_rp_tunnel( pkt ) {      if( I_am_RP( G ) &amp;&amp; outer.dst == RP(G) ) {      } else {         send Register-Stop(S,G) to outer.src         # Note (*) }</pre>											
	Here it is to Message	tested if (I_	_am_RP( G ) -	-> FALSE)	RP sent a Re	egister-Stop						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x				
PIM-SM-12.6	RFC 4601 s4.	RFC 4601 s4.4.2 p43 Receiving Register Messages at the RP										
MUST	When an RP receives a Register message, the course of action is decided according to the following pseudocode: packet_arrives_on_rp_tunnel( pkt ) {											
	<pre>if( I_am_RP( G ) &amp;&amp; outer.dst == RP(G) ) {</pre>											
	<pre> } else {     send Register-Stop(S,G) to outer.src     # Note (*) }  Here it is tested if (I_am_RP(G) -&gt; FALSE) RP does not forward the data</pre>											
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3								
	untested	untested	untested	untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-12.7	RFC 4601 s4.	4.2 p43 Recei	ving Register M	lessages at the	e RP							
MUST	<pre>When an RP receives a Register message, the course of action is decided according to the following pseudocode: packet_arrives_on_rp_tunnel(pkt) {      if (I_am_RP(G) &amp;&amp; outer.dst == RP(G)) {      } else {         send Register-Stop(S,G) to outer.src         # Note (*)     } } Here (outer.dst == RP(G))-&gt;FALSE</pre>											
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3								
	untested	untested	untested	untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x				
PIM-SM-12.8	RFC 4601 s4.	4.2 p43 Recei	ving Register N	lessages at the	e RP							
MUST	When an RP receives a Register message, the course of action is decided according to the following pseudocode: packet_arrives_on_rp_tunnel( pkt ) {    if( I_am_RP(G) AND outer.dst == RP(G) ) {											
	if( } }	decapsulate	and forward	ullRegisterBi d the inner p	acket to							
	and received RP doesn't	If there is no (S,G) entry, i.e. SPTbit set to FALSE and received Register has Null-Register-Bit set to TRUE then RP doesn't decapsulate and pass the inner packet to the normal forwarding path for forwarding on the (*,G) tree.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-12.9	RFC 4601 s4.	4.2 p44 Recei	ving Register N	lessages at the	e RP							
MUST	When forwarding a packet from the Register Tunnel, the TTL of the original data packet is decremented after it is decapsulated.											
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-12.10	NEGATIVE R	FC 4601 s4.4.2	2 p44 Receivin	g Register Mes	ssages at the F	RP						
MUST	When forwarding a packet from the Register Tunnel, the TTL of the original data packet is decremented after it is decapsulated.											
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-12.11	RFC 4601 s4.	4.2 p44 Recei	ving Register N	lessages at the	e RP							
MUST		oits should b		om the IP hea	der of the F	Register						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-14.1	-		_								
MAY	RFC 4601 s4.5.2 p49 Receiving (*,G) Join/Prune Messages  If the RP in the message does not match RP(G) the Join(*,G) should be silently dropped.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.2	RFC 4601 s4.	.5.2 p49 Recei	ving (*,G) Join/	Prune Messag	es						
MAY	BSR message		choose to a	e.g. has not accept Join(*	_						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.3	RFC 4601 s4.	.5.2 p49 Recei	ving (*,G) Join/	Prune Messag	es						
MUST	Received Prune(*,G) messages are processed even if the RP in the message does not match RP(G).										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.4	RFC 4601 s4.	.5.2 p49 Recei	ving (*,G) Join/	Prune Messag	es						
MAY	BSR message		choose to a	e.g. has not accept Prune(	_						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-14.5	RFC 4601 s4.	5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es						
MUST	In NoInfo(NI) state by receiving Prune(*,G) message the (*,G) downstream state machine on interface I remains in the NoInfo state.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.6	RFC 4601 s4.	.5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es						
MUST		_		in(*,G) messa ce I transiti							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.7	NEGATIVE R	FC 4601 s4.5.2	2 p50 Receivin	g (*,G) Join/Pr	une Messages	i					
MUST	In NoInfo(NI) state by receiving Join(*,G) message the (*,G) downstream state machine on interface I transitions to the Join state.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.8	RFC 4601 s4.	.5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es						
MUST		state machine		une(*,G) mess ce I remains	_	3)					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-14.9	RFC 4601 s4.	.5.2 p50 Recei	l vina (*.G) Join/	L Prune Messag	es						
MUST	In Join(J) state by receiving Join(*,G) message the (*,G) downstream state machine on interface I remains in Join state, and the Expiry Timer (ET) is restarted, set to maximum of its current value and the HoldTime from the triggering Join/Prune message.  (Note: When current value is smaller than HoldTime from the triggering Join/Prune message)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.10	RFC 4601 s4.	.5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es						
MUST	downstream s the Expiry T value and th	state by recestate machine Fimer (ET) is the HoldTime for current valuessage)  Free BSD 10.3	e on interfaces restarted, From the trig	ce I remains set to maxim ggering Join/	in Join stat num of its cu Prune messag	ırrent ge.					
	untested	untested	untested	untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.11 MUST	RFC 4601 s4.5.2 p50 Receiving (*,G) Join/Prune Messages  In Join(J) state by receiving Join(*,G) message the (*,G) downstream state machine on interface I remains in Join state.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.12	RFC 4601 s4.5.2 p50 Receiving (*,G) Join/Prune Messages										
MUST	state maching The Prune-Per J/P_Override that interface expire immediately.	state by rece ne on interfa ending Timer e_Interval(I) ace; otherwis diately. e-Pending Tir	ace I transit is started; ) if the rout se it is set	tions to the it is set to ter has more to zero caus	Prune-Pendir the than one ne	ng state.					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release	Release	Release	Release	Release	Release	Release	Release			
	8.2.2	8.3	8.4	8.5	x.x.x	x.x.x	x.x.x	X.X.X			
PIM-SM-14.13	RFC 4601 s4.	5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es						
MUST	In Join(J) state by receiving Prune(*,G) message the (*,G) downstream state machine on interface I transitions to the Prune-Pending state. The Prune-Pending timer is started; it is set to the J/P_Override_Interval(I) if the router has more than one neighbor on that interface;										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.14	RFC 4601 s4.	.5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es		<u> </u>	<u> </u>			
MUST	state machin	ne on interfa	ace I expires	for the (*,s. The (*,G)	downstream s						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.15	RFC 4601 s4.	5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es						
MUST	(*,G) downst		machine on ir	ving Prune(*, nterface I re		the					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.16	RFC 4601 s4.	5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es		•	•			
MUST	(*,G) downst	tream state r	nachine on in ne-Pending ti	ving Join(*,G nterface I tr imer is cance	ansitions to						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release	Release	Release	Release	Release	Release	Release	Release			
	8.2.2	8.3	8.4	8.5	x.x.x	x.x.x	x.x.x	x.x.x			
PIM-SM-14.17	NEGATIVE R	FC 4601 s4.5.2	2 p50 Receivin	g (*,G) Join/Pro	une Messages						
MUST	In Prune-Pending(PP) state by receiving Join(*,G) message the (*,G) downstream state machine on interface I transitions to the Join state. The Prune-Pending timer is canceled (without triggering an expiry event).										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.18	RFC 4601 s4.	5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es		•				
MUST	In Prune-Pending(PP) state by receiving Join(*,G) message the (*,G) downstream state machine on interface I transitions to the Join state. The Expiry Timer is restarted, set to maximum of its current value and the HoldTime from the triggering Join/Prune message.  (Note: When current value is greater than HoldTime from the triggering Join/Prune message)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.19	RFC 4601 s4.5.2 p50 Receiving (*,G) Join/Prune Messages										
MUST	In Prune-Pending(PP) state if the Expiry Timer for the (*,G) downstream state machine on interface I expires. The (*,G) downstream state machine on interface I transitions to the NoInfo state.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-14.20	RFC 4601 s4.	5.2 p50 Recei	ving (*,G) Join/	Prune Messag	es						
MUST	downstream a	state machine state machine uneEcho(*,G)	e on interface e on interface	rune-Pending ce I expires. ce I transiti o the subnet	The (*,G) ons to the N	JoInfo					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-14.21	RFC 4601 s4.	5.2 p52 Recei	/ing (*,G) Join/	Prune Messag	es					
MUST	(*,G) downs: the Join sta its current message. (Note: When Join/Prune t	ream state rate. The Expirate. The Expirate value and the current valuessage)	machine on in Try Timer is ne HoldTime f ne is smaller	ving Join(*,G nterface I tr restarted, s From the trig than HoldTi	ransitions to set to maximu ggering Join/	nm of Prune				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-15.1	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messaç	ges					
миѕт	· ·	· -	_	ne(S,G) mess	-					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	211 0110 1101111					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-15.2	RFC 4601 s4.5.3 p54 Receiving (S,G) Join/Prune Messages									
MUST	In NoInfo(NI) state by receiving Join(S,G) message the (S,G) downstream state machine on interface I transitions to the Join state.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-15.3	NEGATIVE R	FC 4601 s4.5.3	3 p54 Receivin	g (S,G) Join/Pı	rune Messages	5				
MUST		_		in(S,G) messa ce I transiti						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-15.4	RFC 4601 s4.	.5.3 p54 Recei	ving (S,G) Join	/Prune Messaç	jes				
MUST		state by recestate machine	_			e.			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-15.5	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messa	jes		I	l	
MUST	downstream s the Expiry T value and th	state by recestate machine filmer (ET) is ne HoldTime int value is smessage)	e on interfaces restarted, From the trig	ce I remains set to maxin ggering Join/ HoldTime fro	in Join stat num of its cu Prune messag	rrent ge.			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-15.6	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messaç	ges				
MUST	In Join(J) state by receiving Join(S,G) message the (S,G) downstream state machine on interface I remains in Join state, and the Expiry Timer (ET) is restarted, set to maximum of its current value and the HoldTime from the triggering Join/Prune message.  (When current value is smaller than HoldTime from the triggering Join/Prune message)  Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 untested untested untested								
	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:						
	pass	pass	pass	pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-15.7	RFC 4601 s4.	.5.3 p54 Recei	ving (S,G) Join	/Prune Messaç	jes				
MUST	downstream s Prune-Pendir started; it router has r it is set to	state by recestate machine of state. The is set to the contract of the contrac	e on interface Prune-Pendine J/P_Overrie neighbor or	ce I transitiing Timer is ide_Interval( n that interfire immediate	ons to the  I) if the  ace; otherwi	se			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04:	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04:					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-15.8	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messag	jes		ı				
MUST	In Join(J) state by receiving Prune(S,G) message the (S,G) downstream state machine on interface I transitions to the Prune-Pending state. The Prune-Pending timer is started; it is set to the J/P_Override_Interval(I) if the router has more than one neighbor on that interface; (Note: router has more than one neighbor on that interface)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-15.9	RFC 4601 s4.5.3 p54 Receiving (S,G) Join/Prune Messages										
MUST	state machin	ne on interfa	ace I expires	f for the (S, s. The (S,G) to the NoInfo	downstream s						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-15.10	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messag	jes						
MUST	In Prune-Pending(PP) state by receiving Prune(S,G) message the (S,G) downstream state machine on interface I remains into the Prune-Pending state.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-15.11	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messag	jes						
MUST	(S,G) downst	ream state r	nachine on ir ne-Pending ti	ving Join(S,G nterface I tr imer is cance	ansitions to						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-15.12	NEGATIVE R	FC 4601 s4.5.	3 p54 Receivin	g (S,G) Join/Pi	une Messages	S			
MUST	(S,G) downst	tream state r	machine on in ne-Pending ti	ving Join(S,0 nterface I tr imer is cance	ansitions to				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-15.13	RFC 4601 s4.	.5.3 p54 Recei	ving (S,G) Join	/Prune Messaç	jes				
MUST	In Prune-Pending(PP) state by receiving Join(S,G) message the (S,G) downstream state machine on interface I transitions to the Join state The Expiry Timer is restarted, set to maximum of its current value and the HoldTime from the triggering Join/Prune message.  (Note: When current value is greater than HoldTime from the triggering Join/Prune message)								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-15.14	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messag	ges				
MUST	In Prune-Pending(PP) state by receiving Join(S,G) message the (S,G) downstream state machine on interface I transitions to the Join state The Expiry Timer is restarted, set to maximum of its current value and the HoldTime from the triggering Join/Prune message.  (Note: When current value is smaller than HoldTime from the triggering Join/Prune message)								
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3					
	untested	untested	untested	untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-15.15	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messaç	jes				
MUST	downstream s	state machine state machine	e on interfac	xpiry Timer f ce I expires. ce I transiti	The (S,G)	)			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
	•								





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-15.16	RFC 4601 s4.	5.3 p54 Recei	ving (S,G) Join	/Prune Messag	jes				
MUST	In Prune-Pending(PP) state if the Prune-Pending Timer for the (S,G) downstream state machine on interface I expires. The (S,G) downstream state machine on interface I transitions to the NoInfo state. A PruneEcho(S,G) is sent onto the subnet connected to interface I.								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-16.1	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	oin/Prune Mes	sages				
MUST		_		n(S,G,rpt) m ce I remains		_			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-16.2	RFC 4601 s4.5.4 p58 Receiving (S,G,rpt) Join/Prune Messages								
MUST	downstream s stateTh J/P_Override that interfa	state machine ne Prune-Penc e_Interval(I; ace; otherwis	e on interfacting timer is if the routes it is set	nne(S,G,rpt) ce I transiti s started; it cer has more to causing i ream neighbor  Free BSD 10.3	ons to Prune is set to t than one nei t to expire	e-Pending(PP) The Ighbor on			
	untested	untested	untested	untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-16.3	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	oin/Prune Mes	sages				
MUST	downstream s state. The I J/P_Override that interfa	state machine Prune-Pending e_Interval(I) ace	e on interfact g timer is st ) if the rout	nne(S,G,rpt) ce I transiti carted; it is cer has more	ons to Prune s set to the than one nei	e-Pending(PP)			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-16.4	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	loin/Prune Mes	sages					
MUST	(S,G,rpt) do		ate machine o	iving Prune(S on interface	_					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-16.5	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	loin/Prune Mes	sages					
MUST	(S,G,rpt) do the Prune-Pe contain (S,0	ownstream sta ending-Tmp(PI	ate machine o P') state. If Prune informa	tving Join(*, on interface the (*,G) mation the down o state	I transition message does	ns to not				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-16.6	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	loin/Prune Mes	sages					
MUST	In Prune-Pending (PP) state by receiving Join(S,G,rpt) message the (S,G,rpt) downstream state machine on interface I transitions to NoInfo state. ET and PPT are canceled.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: FAIL	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-16.7	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	loin/Prune Mes	sages					
MUST	downstream s	state machine	e on interfac	Prune-Pending ce I expires. ce I transiti	The (S,G,r	ot)	)			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release	Release	Release	Release	Release	Release	Release	Release
	8.2.2	8.3	8.4	8.5	X.X.X	x.x.x	x.x.x	x.x.x
PIM-SM-16.8	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	loin/Prune Mes	sages			
MUST	In Pruned(P) state by receiving Join(*,G) message the (S,G,rpt) downstream state machine on interface I transitions to PruneTmp state. The end of the compound Join/Prune message is reached. The (S,G,rpt) downstream state machine on interface I transitions to the NoInfo state. ET is canceled.  (Note: Here DUT has only one downstream neighbor)							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-16.9	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	loin/Prune Mes	sages			
MUST		_		n(S,G,rpt) me ce I transiti		_		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-16.10	RFC 4601 s4.	.5.4 p58 Recei	ving (S,G,rpt) J	loin/Prune Mes	sages			
MUST		_		ne(S,G,rpt) m ce I remains		_		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-16.11	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	loin/Prune Mes	sages			
MUST	downstream s Expiry Times and the Hold (Note: When triggering s	state machine r (ET) is res dTime from th current valu Join/Prune me	e on interfactions on interfactions of the control	ne(S,G,rpt) model I remains to maximum of Join/Prune than HoldTim	in Pruned st f its currer message.	ate. The		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release	Release	Release	Release	Release	Release	Release	Release			
	8.2.2	8.3	8.4	8.5	X.X.X	X.X.X	X.X.X	X.X.X			
PIM-SM-16.12	RFC 4601 s4.	.5.4 p58 Recei	ving (S,G,rpt) J	oin/Prune Mes	sages						
MUST	In Pruned(P) state by receiving Prune(S,G,rpt) message the (S,G,rpt) downstream state machine on interface I remains in Pruned state. The Expiry Timer (ET) is restarted, set to maximum of its current value and the HoldTime from the triggering Join/Prune message.  (Note: When current value is smaller than HoldTime from the triggering Join/Prune message)										
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3							
	untested	untested	untested	untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0	Free BSD 12.0	Free BSD 12.0	Free BSD 12.0							
	untested	untested	untested	untested							
PIM-SM-16.13	RFC 4601 s4.	5.4 p58 Recei	ving (S,G,rpt) J	oin/Prune Mes	sages						
MUST	In Pruned(P state machin	) state if the ne on interface I to	ne Expiry Tin ace I expires	mer for the (s. The (S,G,r	S,G,rpt) downstre		_				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-18.1	RFC 4601 s4.5.6 p66 Sending (*,G) Join/Prune Messages										
MUST	changes this	Assert occurs router's ic to ensure the routers by se	dea of the up nat the Asser	ostream neigh rt winner is	nbor, it show aware of	ıld					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-18.2	RFC 4601 s4.	5.6 p67 Sendi	ng (*,G) Join/P	rune Messages	3						
MUST	The downstreinterface is True. The up Join(*,G) to	(*,G) becomes eam state for s in immediat pstream (*,G) the appropriation to the control of the	c (*,G) has c te_olist(*,G) ) state machi ciate upstrea	, making Joi ne transitio	nDesired(*,0	G) become d state. Send	1				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-18.3	RFC 4601 s4.	.5.6 p67 Sendi	ng (*,G) Join/P	rune Messages	3		•	•			
MUST	JoinDesired(*,G) becomes True  The downstream state for (*,G) has changed so that at least one interface is in immediate_olist(*,G), making JoinDesired(*,G) become  True. The upstream (*,G) state machine transitions to Joined state. Send  Join(*,G) to the appropriate upstream neighbor, which is RPF'(*,G).  (Note: Here WC and RPT Bit are checked)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 Free BSD 12.0 untested untested untested untested										
PIM-SM-18.4	RFC 4601 s4.	.5.6 p67 Sendi	ng (*,G) Join/P	rune Messages	3						
MUST	JoinDesired(*,G) becomes False The downstream state for (*,G) has changed so no interface is in immediate_olist(*,G), making JoinDesired(*,G) become False. The upstream (*,G) state machine transitions to NotJoined state. Send Prune(*,G) to the appropriate upstream neighbor, which is RPF'(*,G). (Note: Here Prune List verified)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04:	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0	Free BSD 12.0	Free BSD 12.0	Free BSD 12.0							
	untested	untested	untested	untested							
PIM-SM-18.5	RFC 4601 s4.	.5.6 p67 Sendi	ng (*,G) Join/P	rune Messages	3						
MUST	JoinDesired(*,G) becomes False The downstream state for (*,G) has changed so no interface is in immediate_olist(*,G), making JoinDesired(*,G) become False. The upstream (*,G) state machine transitions to NotJoined state. Send Prune(*,G) to the appropriate upstream neighbor, which is RPF'(*,G).  (Note: Here WC and RPT Bit are checked)  Free BSD 10.3 Free BSD 10.3 Free BSD 10.3 Free BSD 10.3										
	untested	untested	untested	untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
		pass		paoo							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-18.6	untested	Free BSD 12.0	Free BSD 12.0 untested	Free BSD 12.0 untested	6						
PIM-SM-18.6 MUST	when the upston Join Timer Join(*,G) to	Free BSD 12.0 untested  5.6 p67 Sending stream (*,G) (JT) expires the appropriate the appropri	Free BSD 12.0 untested  ng (*,G) Join/P state-machin, indicating riate upstrea	Free BSD 12.0 untested  rune Messages ne is in Join time to send	ned state, if l a Join(*,G) which is						
	when the upgoin Timer Join(*,G) to RPF'(*,G). I	Free BSD 12.0 untested  5.6 p67 Sending stream (*,G) (JT) expires the appropriate the appropri	Free BSD 12.0 untested  ng (*,G) Join/P state-machin, indicating riate upstrea	Free BSD 12.0 untested  rune Messages ne is in Join time to send	ned state, if l a Join(*,G) which is						
	when the upground of the state	Free BSD 12.0 untested  5.6 p67 Sending stream (*,G) (JT) expires the appropriate the appropriate seconds.  Free BSD 10.3	Free BSD 12.0 untested  ng (*,G) Join/P state-machin, indicating riate upstrea Join Timer (3)	Free BSD 12.0 untested  rune Messages ne is in Join time to send am neighbor, TT) to expire	ned state, if l a Join(*,G) which is						





	Release	Release	Release	Release	Release	Release	Release	Release				
	8.2.2	8.3	8.4	8.5	x.x.x	x.x.x	x.x.x	x.x.x				
PIM-SM-18.7	RFC 4601 s4.	5.6 p67 Sendi	ng (*,G) Join/P	rune Messages	5							
MUST	When the upstream (*,G) state-machine is in Joined state, if the Join Timer (JT) expires, indicating time to send a Join(*,G). Send Join(*,G) to the appropriate upstream neighbor, which is RPF'(*,G). Restart the Join Timer (JT) to expire after t_periodic seconds. (Note: See Join(*,G) to RPF'(*,G), Increase Join Timer to t_joinsuppress)											
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-18.8	RFC 4601 s4.	5.6 p67 Sendi	ng (*,G) Join/P	rune Messages	3							
MUST	Join Timer Join(*,G) to RPF'(*,G). I t_periodic s	(JT) expires of the appropriate the appropriat	, indicating riate upstrea Join Timer (3	ne is in Join time to send am neighbor, JT) to expire Decrease Joi	l a Join(*,G which is e after							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
		RFC 4601 s4.5.6 p67 Sending (*,G) Join/Prune Messages										
PIM-SM-18.9	RFC 4601 s4.	5.6 p67 Sendi	ng (*,G) Join/P	rune Messages	3							
PIM-SM-18.9 MUST	When the ups	stream (*,G) enID changes	state-machin	rune Messages ne is in Joir stream (*,G)	ned state, if							
	When the ups	stream (*,G) enID changes	state-machin	ne is in Joir	ned state, if							
	When the ups RPF'(*,G) Ge in Joined st Free BSD 10.3	stream (*,G) enID changes tate.	state-machir then the ups	ne is in Joinstream (*,G)	ned state, if							
	When the ups RPF'(*,G) Ge in Joined st Free BSD 10.3 untested  Ubuntu 18.04:	stream (*,G) enID changes tate.  Free BSD 10.3 untested  Ubuntu 18.04:	state-maching then the ups  Free BSD 10.3 untested  Ubuntu 18.04:	ree is in Join stream (*,G)  Free BSD 10.3  untested  Ubuntu 18.04:	ned state, if							
	When the ups RPF'(*,G) Ge in Joined st  Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested	Free BSD 12.0 untested	state-maching then the ups  Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested	Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0	ed state, if							
MUST	When the ups RPF'(*,G) Ge in Joined st  Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  RFC 4601 s4.  If a (S,G) A changes this be prepared	stream (*,G) enID changes tate.  Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  5.7 p71 Sending Assert occurs a router's icuto ensure the	Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  org (S,G) Join/Free Son the upsted sof the upsted state of the upsted state of the upsted state at the Assertant state of the upsted state state of the upsted state state state state of the upsted state	Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested	state maching st	ne remains						
MUST PIM-SM-19.1	When the ups RPF'(*,G) Ge in Joined st  Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  RFC 4601 s4.  If a (S,G) A changes this be prepared	stream (*,G) enID changes tate.  Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  5.7 p71 Sending Assert occurs a router's icuto ensure the	Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  org (S,G) Join/Free Son the upsted sof the upsted state of the upsted state of the upsted state at the Assertant state of the upsted state state of the upsted state state state state of the upsted state	Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  Prune Message cream interfacestream neight	state maching st	ne remains						
MUST PIM-SM-19.1	When the ups RPF'(*,G) Ge in Joined st  Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  RFC 4601 s4.  If a (S,G) A changes this be prepared downstream 1 Free BSD 10.3	stream (*,G) enID changes tate.  Free BSD 10.3 untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  5.7 p71 Sending Assert occurs as router's icute ensure the course by service of the course of the	state-maching then the upst then the upst then the upst then the upst the upst the upst the upst the upst the Assertant page of the upst the Assertant page and upst the Assertant page that the Asser	ree BSD 10.3  untested  Ubuntu 18.04: pass  Free BSD 12.0 untested  Prune Message  cream interfacestream neight winner is n(S,G) almost  Free BSD 10.3	state maching st	ne remains						





	Release	Release	Release	Release	Release	Release	Release	Release
	8.2.2	8.3	8.4	8.5	X.X.X	X.X.X	X.X.X	X.X.X
PIM-SM-19.2		•	<u> </u>	Prune Message				
MUST	JoinDesired has changed	(S,G) becomes	s True, The d least one int	ne is in NotJ downstream st terface is in ins the Sourc	ate for (S,G inherited_c	G) plist(S,G).		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-19.3	RFC 4601 s4.	.5.7 p72 Sendi	ng (S,G) Join/F	Prune Message	s RFC 4601 s	4.9.5.1 p124 G	roup Set Sour	ce List Rules
MUST	address of the full len	the source S	, the Source- IP address, a ddress cleare		-Len set to			
	untested	untested	untested	untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-19.4	RFC 4601 s4.	.5.7 p72 Sendi	ng (S,G) Join/F	Prune Message	s			
MUST	JoinDesired(S,G) becomes False The downstream state for (S,G) has changed so no interface is in inherited_olist(S,G), making JoinDesired(S,G) become False. The upstream (S,G) state machine transitions to NotJoined state. Send Prune(S,G) to the appropriate upstream neighbor, which is RPF'(S,G) (Here Prune List verified)							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-19.5	RFC 4601 s4.	.5.7 p72 Sendi	ng (S,G) Join/F	Prune Message	S	•	•	•
MUST	The downstre inherited_oi upstream (S Prune(S,G)	list(S,G), ma ,G) state mad	r (S,G) has o aking JoinDes chine transit priate upstre	changed so no sired(S,G) be tions to NotJ eam neighbor,	come False. Toined state.	The Send		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-19.6	RFC 4601 s4.	5.7 p72 Sendi	ng (S,G) Join/F	Prune Message	s					
MUST	Join Timer Join(S,G) to	(JT) expires the approp Restart the G	, indicating riate upstrea	ne is in Joir time to send am neighbor, JT) to expire	l a Join(S,G) which is					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-19.7	RFC 4601 s4.	5.7 p72 Sendi	ng (S,G) Join/F	rune Message	S	•	•	•		
MUST	When the upstream (S,G) state-machine is in Joined state, if the Join Timer (JT) expires, indicating time to send a Join(S,G). Send Join(S,G) to the appropriate upstream neighbor, which is RPF'(S,G). Restart the Join Timer (JT) to expire after t_periodic seconds.  (Note: See Join(S,G) to RPF'(S,G), Increase Join Timer to t_joinsuppress)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-19.8	RFC 4601 s4.	5.7 p72 Sendi	ng (S,G) Join/F	Prune Message	s					
MUST	When the upstream (S,G) state-machine is in Joined state, if the Join Timer (JT) expires, indicating time to send a Join(S,G). Send Join(S,G) to the appropriate upstream neighbor, which is RPF'(S,G). Restart the Join Timer (JT) to expire after t_periodic seconds.  (Note: See Prune(S,G) to RPF'(S,G), Decrease Join Timer to t_override)									
	Free BSD 10.3	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-19.9	RFC 4601 s4.	5.7 p75 Sendi	ng (S,G) Join/F	rune Message	s			•		
MUST	sees Prune(	*,G) to RPF' n t_override	(S,G), If the	ne is in Joir Join Timer set it so tha	is set to ex	kpire				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-19.10	RFC 4601 s4.	.5.7 p76 Sendiı	ng (S,G) Join/F	Prune Message	s		•	•		
MUST	_	enID changes		ne is in Join stream (S,G)						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-20.1	RFC 4601 s4.5.9 p78 State Machine for (S,G,rpt) Triggered Messages									
MUST			f PruneDesire	ed(S,G,rpt)-& (S,G,rpt)	gt;TRUE the	action				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-20.2	RFC 4601 s4.5.9 p78 State Machine for (S,G,rpt) Triggered Messages									
MUST	If the router is in the Pruned(S,G,rpt) state, and PruneDesired(S,G,rpt) changes to FALSE, this could be because the router no longer has RPTJoinDesired(G) true, or it now wishes to receive traffic from S again. If it is not the former the action is to send a Join(S,G,rpt) to RPF'(S,G,rpt)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-20.3	RFC 4601 s4.	5.9 p78 State	Machine for (S	,G,rpt) Triggere	ed Messages					
MUST	a Join(S,G,		(S,G,rpt) to	ride Timer ex override the	-					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-20.5	RFC 4601 s4.	5.10 p82 Back	ground: (*,*,RF	P) and (S,G,rpt	) Interaction		•	•	
MUST	cancel (S,G Join(*,G) by interface. (Note: for	rpt) prune s y itself does (*,G) Join)	state on that s cancel (S,0	pin(*,*,RP) k interface, G,rpt) prune	whereas rece	eiving a			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-21.1	RFC 4601 s4.	.6.1 p84 (S,G)	Assert Messag	e State Machir	ne		•	•	
MUST		has lost an G onto inter		on interfac	e I. It must	not forward	1		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: FAIL	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-21.2	NEGATIVE: F	RFC 4601 s4.6.	1 p84 (S,G) As	ssert Message	State Machine				
MUST		has lost an G onto inter		on interfac	e I. It must	not forward	l		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-21.3	RFC 4601 s4.	6.1 p84 (S,G)	Assert Messag	e State Machir	ne				
MUST	set CouldAss Set Assert S Store self a Store spt_as (Note: The N	RFC 4601 s4.6.1 p84 (S,G) Assert Message State Machine  In NoInfo state, if an Inferior Assert is received with RPT bit set CouldAssert(S,G,I) is TRUE, then Send Assert(S,G)  Set Assert Timer to (Assert_Time - Assert_Override_Interval)  Store self as AssertWinner(S,G,I)  Store spt_assert_metric(S,I) as AssertWinnerMetric(S,G,I)  (Note: The winning router sends an Assert message containing its own metric to that outgoing interface(State machine))							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-21.4	RFC 4601 s4.	6.1 p84 (S,G)	Assert Messag	e State Machir	ne						
MUST	When in NoInfo state, if an inferior assert is received for (S,G) with the RPT bit cleared and CouldAssert(S,G,I) == TRUE, We transition to the "I am Assert Winner" state										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-21.5	RFC 4601 s4.6.1 p84 (S,G) Assert Message State Machine										
MUST	bit set(it's	When in NoInfo state, if an assert is received for (S,G) with the RPT bit set(it's a (*,G) assert) and CouldAssert(S,G,I) == TRUE, We Send Assert(S,G).									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-21.6	RFC 4601 s4.	6.1 p84 (S,G)	Assert Messag	je State Machir	ne						
MUST	CouldAssert		RUE, We trans	ata packet co sition to the		rface I and					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-21.7	RFC 4601 s4.	6.1 p84 (S,G)	Assert Messag	je State Machir	ne						
MUST		nfo state, if		ata packet co Assert(S,G)	omes on Inter	rface I and					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-21.8	RFC 4601 s4	6.1 n84 (S.G.)	L Δssert Messac	I je State Machir	<u> </u>					
MUST	When in "I am Assert Winner" State, if we receive an (S,G) assert or (*,G) assert mentioning S that has a worse metric than our own.  Whoever sent the assert is in error, and so we remains in  "I am Assert Winner" State  (Note: for (S,G) assert)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
DIM SM 24.0	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-21.9	RFC 4601 s4.	6.1 p84 (S,G)	Assert Messag	je State Machir	ne					
MUST	or (*,G) ass Whoever sent and restart (Note: for	sert mentions t the assert the Assert (S,G) assert	ing S that hat is in error Fimer (Action	· I	etric than ou	ır own.		ı		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-21.10	RFC 4601 s4.	6.1 p84 (S,G)	Assert Messag	je State Machir	ne					
MUST	RFC 4601 s4.6.1 p84 (S,G) Assert Message State Machine  When in "I am Assert Winner" State, if we receive an (S,G) assert or (*,G) assert mentioning S that has a worse metric than our own. Whoever sent the assert is in error, and so we re-send an (S,G) Assert, and restart the Assert Timer (Action A3 below). Set Assert Timer to (Assert_Time - Assert_Override_Interval) (Note: for (S,G) assert)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-21.11	RFC 4601 s4.	.6.1 p84 (S,G)	Assert Messag	je State Machir	ne					
MUST	or (*,G) ass Whoever sent "I am Assert	sert mention:	ing S that ha is in error ate	if we receives as a worse me, and so we r	etric than ou					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-21.12	RFC 4601 s4	6 1 n84 (S G)	L Assert Messac	le State Machir	l						
MUST	When in "I a	am Assert Wir	nner" State,	if we receiv	re an (S,G) a						
	Whoever sent	the assert	is in error, Timer (Action	as a worse me and so we read as a below).							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-21.13	RFC 4601 s4.6.1 p84 (S,G) Assert Message State Machine When in "I am Assert Winner" State, if we receive an (S,G) assert										
MUST	or (*,G) ass Whoever sent and restart (Assert_Time	sert mentions the assert the Assert 1	ing S that hat is in error, Gimer (Action verride_Inter	as a worse me and so we r n A3 below).	etric than ou re-send an (S	ır own. G,G) Assert,					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-21.14	RFC 4601 s4.6.1 p84 (S,G) Assert Message State Machine										
MUST	When in "I am Assert Winner" State, if We receive an (S,G) assert that has a better metric than our own. We transition to "I am Assert Loser" state										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: FAIL	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-21.15	RFC 4601 s4.	6.1 p88 (S,G)	Assert Messag	e State Machir	ne						
MUST	FALSE, we can so we trans- includes ser Send Assert(	an no longer ition to NoIr nding a "cano Cancel(S,G) I	perform the nfo state and celing assert Delete assert	if CouldAsse actions of t d perform act " with an ir info (Asser return their	the assert with ions A4 (belt if inite metrical terms of the control of the contr	nner, and low). This lc					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





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	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-21.16	RFC 4601 s4.	6.1 p88 (S,G)	Assert Messag	je State Machir	ne				
MUST	When in "I am Assert Loser" State, we receive an assert that is better than that of the current assert winner. We stay in Loser state, and perform actions A2 below Store new assert winner as AssertWinner(S,G,I) and assert winner metric as AssertWinnerMetric(S,G,I). Set Assert Timer to Assert_Time								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-21.17	RFC 4601 s4.	.6.1 p88 (S,G)	Assert Messag	je State Machir	ne				
MUST	current asse (although the We stay in I assert winne	ert winner th ne metric may Loser state, er as AssertW	nat is better be worse the and perform Winner(S,G,I)	we receive and than our own an the winner actions A2 b and assert at Timer to A	n metric for er's previous pelow St winner metri	this (S,G) metric).			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-21.18	RFC 4601 s4.	6.1 p89 (S,G)	Assert Messag	je State Machir	ne				
MUST	expires. We assert info	e transition rmation (acti	to NoInfo ston A5 below	The (S,G) Ass tate, deletin ). ime according	g the (S,G)				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-21.19	RFC 4601 s4.	6.1 p89 (S,G)	Assert Messag	je State Machir	ne				
MUST	When in "I am Assert Loser" State, if we receive an assert from the current assert winner that is worse than our own metric for this group (typically the winner's metric became worse or because it is an assert cancel). We transition to NoInfo state, deleting the (S,G) assert information and allowing the normal PIM Join/Prune mechanisms to operate.								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					



### FRROUTING RFC Compliance Test Report PIM Results



	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x				
PIM-SM-21.20	RFC 4601 s4.	6.1 p89 (S,G)	Assert Messag	e State Machir	ne							
MUST	We transition (action A5)	am Assert Los on to NoInfo pelow) I rMetric(S,G,I	state, delet Delete assert	ing the (S,0 info (Asser	3) assert inf ctWinner(S,G	formation (I) and						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-21.21	RFC 4601 s4.	6.1 p89 (S,G)	Assert Messag	je State Machir	ne							
MUST	from the cur previously or or router had assume it no	as gone down	reporting a his indicates (and may haw ws it was the	different Gesthat the curve come back winner. We	enID from the arrent winner up), and so transition t	e one it r's interface we must to the NoInfo		Γ				
	untested	untested	untested	untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-21.22	RFC 4601 s4.	.6.1 p89 (S,G)	Assert Messag	je State Machir	ne							
MUST	When in "I am Assert Loser" State, my_assert_metric(S,G,I) has changed so that now my assert metric for (S,G) is better than the metric we have stored for current assert winner. This might happen the underlying routing metric changes, or when CouldAssert(S,G,I) becomes true; for example, when SPTbit(S,G) becomes true. We transition to NoInfo state, delete this (S,G) assert state (action A5 below), and allow the normal PIM Join/Prune mechanisms to operate.  (Note: underlying routing metric changed)											
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-21.23	RFC 4601 s4.	6.1 p89 (S,G)	Assert Messag	je State Machir	ne							
MUST	interface for deleting the info (Assertaturn their	am Assert Los or S, and nov is (S,G) asset Winner(S,G,I r default val	w it is not. ert state (ad I) and Assert lues).	We transition A5 below WinnerMetric	on to NoInfo	state, ete assert						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								



### FRROUTING RFC Compliance Test Report PIM Results



	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-21.24	RFC 4601 s4.	6.1 p89 (S,G)	Assert Messag	e State Machir	ne					
MUST	When in "I am Assert Loser" State, we receive a Join(S,G) that has the Upstream Neighbor Address field set to my primary IP address on interface I. The action is to transition to NoInfo state, and delete this (S,G) assert state (action A5 below), and allow the normal PIM Join/Prune mechanisms to operate.									
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3						
	untested	untested	untested	untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-22.1	RFC 4601 s4.	6.2 p91 (*,G) A	Assert Messag	e State Machin	е					
MUST		has lost an G onto inter		on interfac	e I. It must	not forward	1			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-22.2	NEGATIVE: F	RFC 4601 s4.6.	2 p91 (*,G) As	sert Message S	State Machine					
MUST		has lost an G onto inter		on interfac	e I. It must	not forward	1			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-22.3	RFC 4601 s4.	.6.2 p92 (*,G) <i>F</i>	Assert Messag	e State Machin	e					
MUST		router send e - Assert_Ov		Set Assert T	imer to					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-22.4	RFC 4601 s4.	.6.2 p94 (*,G) <i>F</i>	L Assert Message	e State Machin	<u> </u>					
MUST	I, AND Could state, and p to (Assert_S Store rpt_as	dAssert(*,G, perform Actio Time – Assert	I)==TRUE  ons A1 (below  C_Override_Ir  (G,I) as Asse	we transition  we transition  we transition  we send  terval) Store  ertWinnerMetr  ed)  Free BSD 10.3	on to the "I Assert(*,G) re self as As	am Assert Wi Set Assert T	nner" 'imer			
	untested	untested	untested	untested						
	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL	Ubuntu 18.04: FAIL						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-22.5	RFC 4601 s4.	RFC 4601 s4.6.2 p94 (*,G) Assert Message State Machine								
MUST	I, AND Could state, and p to (Assert_: Store rpt_as	dAssert(*,G, perform Actio Time – Assert	I)==TRUE ons A1 (below c_Override_Ir (G,I) as Asse	we transition  we transition  Send  nterval) StorertWinnerMetr  Free BSD 10.3	on to the "I Assert(*,G) re self as As	am Assert Wi Set Assert T	nner" 'imer			
	untested Ubuntu 18.04:	untested Ubuntu 18.04:	untested Ubuntu 18.04:	untested Ubuntu 18.04:						
	inconclusive	inconclusive	inconclusive	inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-22.6	RFC 4601 s4.	.6.2 p95 (*,G) A	Assert Message	e State Machin	е					
MUST	RFC 4601 s4.6.2 p95 (*,G) Assert Message State Machine  When in "I am Assert Winner" State, The (*,G) Assert Timer expires.  As we're in the Winner state, then we must still have (*,G) forwarding state that is actively being kept alive. To prevent unnecessary thrashing of the forwarder and periodic flooding of duplicate packets, we resend the (*,G) Assert and restart the Assert Timer (Actions A3 below).  (Note: Set Assert Timer to (Assert_Time - Assert_Override_Interval) according to A1)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





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	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-22.7	RFC 4601 s4.	.6.2 p95 (*,G) A	Assert Message	e State Machin	е				
MUST	When in "I am Assert Winner" State, The (*,G) Assert Timer expires. The (*,G) Assert Timer expires. As we're in the Winner state, then we must still have (*,G) forwarding state that is actively being kept alive. To prevent unnecessary thrashing of the forwarder and periodic flooding of duplicate packets, we re-send the (*,G) Assert, and restart the Assert Timer (Action A3 below).  (Note: we must still have (*,G) forwarding state)								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-22.8	RFC 4601 s4.	.6.2 p95 (*,G)	Assert Messag	e State Machin	е				
MUST	When in "I am Assert Winner" State, We receive a (*,G) assert that has a worse metric than our own. Whoever sent the assert has lost, and so we re-send a (*,G) Assert, and restart the Assert Timer (Action A3 below) Send Assert(*,G) Set Assert Timer to (Assert_Time - Assert_Override_Interval) (Note: Here check that RPT bit is set for the Assert sent by Assert Winner)								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-22.9	RFC 4601 s4.	.6.2 p95 (*,G) A	Assert Messag	e State Machin	е				
MUST	When in "I am Assert Winner" State, we receive a (*,G) assert that has a better metric than our own. We transition to "I am Assert Loser" state and perform actions A2 (below).								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-22.10	RFC 4601 s4.	.6.2 p95 (*,G) A	Assert Messag	e State Machin	е				
MUST	RPF interface We can no lost transition to Send Assert@Ass	ce changed so onger perform to NoInfo sta Cancel(*,G) I	o as to make n the actions ate and perfo Delete assert I) will then	if our (*,G) CouldAssert( s of the asse orm actions A info (Asser return their	*,G,I) becoment winner, and (below)	ne false. and so we ,I) and			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
Ī	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release	Release	Release	Release	Release	Release	Release	Release			
	8.2.2	8.3	8.4	8.5	X.X.X	X.X.X	X.X.X	X.X.X			
PIM-SM-22.11	RFC 4601 s4.	6.2 p95 (*,G) A	Assert Messag	e State Machin	е						
MUST	is better th		the current a	Ve receive a assert winner							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-22.12	RFC 4601 s4.6.2 p95 (*,G) Assert Message State Machine										
MUST	current asset	nen in "I am Assert Loser" State, We receive a (*,G) assert from the arrent assert winner that is better than our own metric for this group although the metric may be worse than the winner's previous metric).  E stay in Loser state, and perform actions A2 below.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-22.13	RFC 4601 s4.	.6.2 p96 (*,G) A	Assert Messag	e State Machin	е						
MUST	current asse (typically b cancel). We	ert winner th because the w transition t	nat is worse vinner's metr to NoInfo sta	We receive and than our own ric became wo ate, delete t IM Join/Prune	metric for erse or is no his (*,G) as	this group w an assert sert state					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-22.14	RFC 4601 s4.	.6.2 p96 (*,G) A	Assert Messag	e State Machin	е						
MUST	We transition (action A5). AssertWinner	on to NoInfo	state and de assert info [) will then	The (*,G) Ass elete this (* (AssertWinne return their	(,G) assert i er(*,G,I) and	nfo l					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-22.15	RFC 4601 s4.	.6.2 p96 (*,G) A	Assert Messag	e State Machin	е					
MUST	When in "I am Assert Loser" State, we receive a Hello message from the current winner reporting a different GenID from the one it previously reported. This indicates that the current winner's interface or router has gone down (and may have come back up), and so we must assume it no longer knows it was the winner. We transition to the NoInfo state, deleting the (*,G) assert information (action A5).									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-22.16	RFC 4601 s4.	.6.2 p96 (*,G) A	Assert Messag	e State Machin	e					
MUST	rpt_assert_r for (*,G) is winner. We state (action to operate.	am Assert Los metric(G,I), s better than transition ton A5), and a	has changed n the metric to NoInfo sta allow the non	so that now we have stor ate, and dele rmal PIM Joir	my assert me ed for curre ete this (*,0	ent assert 3) assert				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-22.17	RFC 4601 s4.	.6.2 p97 (*,G) A	Assert Messag	e State Machin	е					
MUST	interface fo	am Assert Los or RP(G), and this (*,G) as	d now it is n	not. We trans						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-22.18	RFC 4601 s4.	.6.2 p97 (*,G) A	Assert Messag	e State Machin	е					
MUST	Join(*,*,RP primary IP a NoInfo state the normal I	am Assert Los (G)) that has address on ir e, and delete PIM Join/Prur sition to No	s the Upstream nterface I. e this (*,G) ne mechanisma	am Neighbor A The action i assert state s to operate.	address field s to transit e (action A5)	l set to my ion to				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						



### FRROUTING RFC Compliance Test Report PIM Results



	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-23.1	RFC 4601 s4.	.6.3 p98 Assert	Metrics						
MUST	that sourced highest IP a	-	message is i	y IP address used as a tie					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-23.2	RFC 4601 s4.	.6.3 p98 Assert	Metrics			•			
MUST	that sourced highest IP a	_	message is i	y IP address used as a tie					
	untested	untested	untested	untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: FAIL					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-24.2	RFC 4601 s4.	7.1 p105 Grou	p-to-RP Mappi	ing					
MAY	Note that if the set of possible group-range-to-RP mappings changes, each router will need to check whether any existing groups are affected. This may, for example, cause a DR or acting DR to re-join a group, or cause it to re-start register encapsulation to the new RP.  (Note: This is done for (*,G) Join)								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-25.1	RFC 4601 s4.	.8 p106 Source	-Specific Multi	cast		•	•		
MUST	and FF3x::/3 semantics is data packets	32 for IPv6, s determined s and PIM mes	is reserved by the multi ssages.	rently 232.0. for SSM, and icast group a ess is in SSM	the choice ddress in bo	of			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
-	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release	Release	Release	Release	Release	Release	Release	Release		
	8.2.2	8.3	8.4	8.5	X.X.X	x.x.x	X.X.X	x.x.x		
PIM-SM-25.2	RFC 4601 s4.	.8 p106 Source	e-Specific Multi	cast						
MUST	A range of multicast addresses, currently 232.0.0.0/8 in IPv4 and FF3x::/32 for IPv6, is reserved for SSM, and the choice of semantics is determined by the multicast group address in both data packets and PIM messages.  ((S,G) Join Message with group address is in SSM range)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
PIM-SM-26.1	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
	RFC 4601 s4.8.1 p106 Protocol Modifications for SSM Destination Addresses									
MUST		ST NOT send a		essage for an	y packet tha	at is				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-26.2	RFC 4601 s4.	.8.1 p106 Proto	ocol Modification	ons for SSM De	stination Addr	esses				
MUST		_	P MUST NOT fo destination a	orward any Re address.	gister-encar	sulated				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-26.3	RFC 4601 s4.	.8.1 p107 Proto	ocol Modificatio	ons for SSM De	stination Addr	esses				
SHOULD	an SSM addre	ess. If so,	it SHOULD re	tise itself a espond with a a packet dest	Register-St	op message				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-27.1	RFC 4601 s4.	8.2 p108 PIM-	SSM-Only Rou	ıters						
MUST	Additionally, the Packet forwarding rules of Section 4.2 can be simplified in a PIM-SSM-only router:  If (iif == RPF_interface(S) AND UpstreamJPState(S,G) == Joined ) {   oiflist = inherited_olist(S,G) } else if(iif is in inherited_olist(S,G) ) {    send Assert(S,G) on iif }									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-27.2	RFC 4601 s4.8.2 p108 PIM-SSM-Only Routers									
MUST	Additionally, the Packet forwarding rules of Section 4.2 can be simplified in a PIM-SSM-only router: if (iif == RPF_interface(S) AND UpstreamJPState(S,G) == Joined ) { oiflist = inherited_olist(S,G) } else if( iif is in inherited_olist(S,G) ) { send Assert(S,G) on iif } oiflist = oiflist (-) iif forward packet on all interfaces in oiflist									
	Free BSD 10.3	ret on all 11 Free BSD 10.3	Free BSD 10.3	Free BSD 10.3			1			
	untested	untested	untested	untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-28.1	RFC 4601 s4.9 p108 PIM Packet Formats									
MUST				otocol number	103.					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-28.2	RFC 4601 s4.	9 p109 PIM Pa	acket Formats							
MUST		on transmiss	· ·	ed upon recei	pt.					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-28.3	RFC 4601 s4.	.9 p109 PIM Pa	acket Formats							
MUST	The checksum is a standard IP checksum, i.e. the 16-bit one's Complement of the one's complement sum of the entire PIM message, excluding the "Multicast data packet" section of the Register message.									
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3						
	untested	untested	untested	untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-28.4	RFC 4601 s4.	.9 p110 PIM Pa	acket Formats							
MUST	or a message it MUST be dadministrate	e's destinat: discarded and or in a rate	ion does not		to the table	above,				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-29.1	RFC 4601 s4.	.9.1 p111 Enco	ded Source ar	nd Group Addre	ess Formats	•	•	•		
MUST	If the message is sent for a single group then the Mask length must equal the address length in bits for the given Address Family and Encoding Type. (e.g. 32 for IPv4 native encoding, 128 for IPv6 native encoding).									
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3						
	untested	untested	untested	untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-29.2	RFC 4601 s4.	.9.1 p111 Enco	ded Source ar	nd Group Addre	ess Formats					
MUST		ne group rang		Bidirection						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release	Release	Release	Release	Release	Release	Release	Release		
	8.2.2	8.3	8.4	8.5	X.X.X	x.x.x	X.X.X	x.x.x		
PIM-SM-29.3	RFC 4601 s4.	9.1 p111 Enco	ded Source ar	nd Group Addre	ess Formats					
MUST	Admin Scope [Z]one indicates the group range is an admin scope zone.  This is used in the Bootstrap Router Mechanism [11] only. For all other purposes, this bit is set to zero and ignored on receipt.  (Here we are considering Non-BSR message)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-29.4	NEGATIVE R	FC 4601 s4.9.	1 p111 Encode	ed Source and	Group Address	Formats				
MUST	This is used other purpos	d in the Boot	strap Router is set to z	oup range is Mechanism [ zero and igno	11] only. F	or all				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-29.5	RFC 4601 s4.	9.1 p112 Enco	ded Source ar	nd Group Addre	ess Formats					
MUST	The Sparse b	oit is a 1 b	it value, set	to 1 for PI	M-SM.		,	,		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-29.6	RFC 4601 s4.	9.1 p112 Enco	ded Source ar	nd Group Addre	ess Formats					
MUST	messages. (Saddress of the length of the Encoded-Sour (Note: check)	S,G) source : the source S ne IP address rce-Address o the WC bit	list entries, the Sources and have be cleared.  & RPT bit)	value for use have the Sou -Address Mask oth the WC ar	rce-Address -Len set to	set to the the full				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-29.7	RFC 4601 s4	.9.1 p112 Enco	ded Source ar	nd Group Addre	ess Formats				
MUST	The RPT (or with PIM Jos	Rendezvous I in/Prune mess PT bit MUST k	Point Tree) k sages (see Se	oit is a 1 bi	t value for				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-29.8	NEGATIVER	-C 4601 s4.9.1	p112 Encode	d Source and C	Group Address	Formats			
MUST	with PIM Jo	Rendezvous I in/Prune mess PT bit MUST k	sages (see Se						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-30.1	RFC 4601 s4.9.2 p114 Hello Message Format								
SHOULD	(see Section the receiving information	an interface n 4.3.1). The ng routers sh for the send esting is dor neighbor)	ese are effections are discould immediately der.	ctively goodk ately time ou	ye messages It the neighb	and			
	untested	untested	untested	untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-30.2	RFC 4601 s4	.9.2 p114 Hello	Message For	mat					
MUST	RFC 4601 s4.9.2 p114 Hello Message Format  Hello messages with a Holdtime value set to `0' are also sent by a router on an interface about to go down or changing IP address (see Section 4.3.1). These are effectively goodbye messages and the receiving routers should immediately time out the neighbor information for the sender.  (Note: change of IP address)								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x				
PIM-SM-30.3	RFC 4601 s4.	.9.2 p114 Hello	Message For	mat			•	•				
MUST	a router on (see Section the receiving information	an interfacen 4.3.1). The	e about to go ese are effect hould immedia der.	e set to `0' o down or cha ctively goodk ately time ou	nging IP add	dress and						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-31.1	RFC 4601 s4.	RFC 4601 s4.9.3 p117 Register Message Format										
MUST	for Register	rs is done on he PIM headen	nly on the fi	ulation overh irst 8 bytes kt 4 bytes, e	of the packe	et,						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-31.2	RFC 4601 s4.	.9.3 p117 Regi	ster Message F	-ormat		•		•				
MUST	If the route it sets the		or a source t	that it is di	rectly conne	ected to,						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-32.1	RFC 4601 s4.	.9.4 p119 Regi	ster-Stop Mess	sage Format				1				
MUST	length * 8	_	IPv4 native	eld contains encoding), i								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x	
PIM-SM-33.1	RFC 4601 s4	.9.5 p122 Join/	Prune Messag	e Format			<u> </u>		
MUST		ce addresses		all the Multi Source addres	_				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-34.1	RFC 4601 s4	.9.5.1 p122 Gro	oup Set Source	e List Rules					
MUST	- the begins field and the mask length for IPv4 or (This test	ning of the me prefix lend field of the ff00::/8 for IPv4)	multicast addingth of the me Multicast (	ed by the ent dress range i multicast add Group Address	n the group lress range i	address n the			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-34.2	RFC 4601 s4	9.5.1 p123 Gr	oup Set Source	List Rules					
MUST	(*,G) source list entries have the Source-Address set to the address of the RP for group G, the Source-Address Mask-Len set to the full length of the IP address and have both the WC and RPT bits of the Encoded-Source-Address set.								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-34.3	RFC 4601 s4	9.5.1 p124 Gro	oup Set Source	List Rules					
MUST	address of the	the source S	, the Source- s and have bo	Source-Addres -Address Mask oth the WC ar	-Len set to	the full			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release	Release	Release	Release	Release	Release	Release	Release	
	8.2.2	8.3	8.4	8.5	X.X.X	x.x.x	X.X.X	x.x.x	
PIM-SM-35.1	RFC 4601 s4.	9.6 p127 Asse	rt Message Fo	rmat					
MUST	<pre>RPT-bit is a 1 bit value. The RPT-bit is set to 1 for Assert(*,G) messages and 0 for Assert(S,G) messages. (Note: for (*,G) Asserts)</pre>								
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-35.2	RFC 4601 s4.	9.6 p128 Asse	rt Message Fo	rmat					
MUST	a specific s	source on the	shortest-pa Group-Address	routers forwath tree(SPT s field set to see S	bit is TRUE)				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-35.3	RFC 4601 s4.	9.6 p128 Asse	rt Message Fo	rmat					
MUST	messages and	a 1 bit value d 0 for Asser (S,G) Assert)	rt(S,G) messa	it is set to ages.	1 for Assert	c(*,G)			
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: pass	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					
PIM-SM-35.4	RFC 4601 s4.	9.6 p128 Asse	rt Message Fo	rmat					
MUST	the group ar	nd source(s)	under conter	routers forwa ntion on the s field set t	shared tree.				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested					
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive					
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested					





	Release	Release	Release	Release	Release	Release	Release	Release
	8.2.2	8.3	8.4	8.5	X.X.X	X.X.X	X.X.X	X.X.X
PIM-SM-35.5	RFC 4601 s4	.9.6 p128 Asse	rt Message Fo	rmat				
MAY	the IP sour	iggered Asser ce address of to zero other	the data pa					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-35.6	RFC 4601 s4	.9.6 p128 Asse	rt Message Fo	rmat				
MUST	IP source ac set to zero is set to M	iggered Assenddress of the otherwise. RIB.pref(RP(CSource-Address	e data packet The RPT-bit G)) and the M	that trigge is set to 1, Metric is set	ered the Asse the Metric- to MRIB.met	ert and is -Preference		
	untested	untested	untested	untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-35.7	RFC 4601 s4	.9.6 p128 Asse	rt Message Fo	rmat				
MUST	For data-triggered Asserts the Source-Address field MAY be set to the IP source address of the data packet that triggered the Assert and is set to zero otherwise. The RPT-bit is set to 1, the Metric-Preference is set to MRIB.pref(RP(G)) and the Metric is set to MRIB.metric(RP(G)).  (Note: for Source-Address field & Metric)							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				
PIM-SM-35.8	RFC 4601 s4	.9.6 p128 Asse	rt Message Fo	rmat				•
MUST	IP source ac set to zero is set to M	iggered Assenddress of the otherwise. RIB.pref(RP(0(*,G) Assert	e data packet The RPT-bit G)) and the M	that trigge is set to 1, Metric is set	ered the Asse the Metric-	ert and is -Preference		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested				
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive				
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested				





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-36.1	RFC 4601 s4.	.11 p130 Timer	· Values								
MUST	Hello Timer	(HT(I)). Per	riodic interv	al for Hello	messages.						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-36.2	RFC 4601 s4.11 p132 Timer Values										
MUST	1		, AT(S,G,I)). e assert stat			_					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-36.3	RFC 4601 s4.	.11 p133 Timer	· Values								
MUST	Upstream Join Timer (JT(*,*,RP), JT(*,G), JT(S,G)). This timer is used for period between Join/Prune messages. Default: 60 seconds										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-36.4	RFC 4601 s4.	.11 p133 Timer	· Values								
MUST	period when do so. Value	someone else : rand(1.1 ;	(*,*,RP), JT( e sends a J/F * t_periodic, is true, 0 ot	message so	we don't nee						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x		
PIM-SM-36.6	RFC 4601 s4.	.11 p133 Timer	· Values							
MUST	Upstream Join Timer $(JT(*,*,RP),\ JT(*,G),\ JT(S,G))$ . This timer is used for period between Join/Prune messages $(Here\ JT(S,G))$ is tested									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-36.7	RFC 4601 s4.11 p134 Timer Values									
MUST	(S,G) data p	packet during	g which (S,G)	ner is the Pe Join state essages. Defa Free BSD 10.3	will be mair	ntained	T	Γ		
	untested	untested	untested	untested						
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-41.1	draft-ietf-pim-	sm-bsr-12.txt s	1.2 p7 Protoco	l Overview						
MUST	BSMs are originated periodically to ensure consistency after failure restoration.									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-41.2	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine	)			
MUST	goes to E-BS E-BSR state included BSR	SR state and and originat R & the addre	after receiv tes a BSM thates of the bo	rent state is ving a non-pr at contains t	referred BSM The BSR prior	, it remains rity value o				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-41.3	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine		l			
MUST	In E-BSR state and after receiving a preferred BSM, it goes to the C-BSR state & forward BSM; store RP-Set; set Bootstrap timer to BS_Timeout.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.4	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine					
MUST		& forward BS	_	a preferred E -Set; set Boo	_						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.5	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine					
MUST	In P-BSR state and after receiving a non-preferred BSM, it remains in the P-BSR state & forward BSM										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.6	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine					
MUST	1	R state & for	_	a preferred E core RP-Set;							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x				
PIM-SM-41.7	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine		•				
MUST	in the C-BSI timer to BS (Note: A Boo current BSR provided tha	In C-BSR state and after receiving a preferred BSM, it remains in the C-BSR state & forward BSM; store RP-Set; set bootstrap timer to BS_Timeout (Note: A Bootstrap message is also preferred if it is from the current BSR with a lower weight than the previous BSM it sent, provided that if the router is a Candidate BSR the current BSR still has a weight higher or equal than the router itself.)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-41.8	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine						
MUST	In C-BSR state and after receiving a non-preferred BSM, it goes to the P-BSR state & forward BSM; set bootstrap timer to <bs_rand_override> (Note:A Bootstrap message is received from the elected BSR, but the BSR Priority field in the received message has changed, so that now the currently elected BSR has lower weight that the router itself.)</bs_rand_override>											
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-41.9	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine						
MUST	In C-BSR state when bootstrap timer expires, it goes to the P-BSR state & set bootstrap timer to BS_Rand_Override											
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								
PIM-SM-41.10	draft-ietf-pim-	sm-bsr-12.txt s	3.1.1 p11 Per-	Scope-Zone C	andidate-BSR	State Machine						
MUST		ate if the BS BS Timer to	_	res the BSR o	originates							
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested								
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive								
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested								



### FRROUTING RFC Compliance Test Report PIM Results



	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-41.11	draft-ietf-pim-	sm-bsr-12.txt s	3.1.2 p13 Per-	Scope-Zone St	tate Machine fo	or Non-Candida	ate-BSR Route	ers			
MUST	If the included BSR is not preferred over, and not equal to, the currently active BSR If the Bootstrap Timer has expired and the receiving router is not a C-BSR, the Bootstrap message is then forwarded (Note: Per-Scope-Zone State-machine for Non-Candidate-BSR Routers)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:							
	pass	pass	pass	pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.12	draft-ietf-pim-	sm-bsr-12.txt s	3.1.2 p13 Per-	Scope-Zone St	tate Machine fo	or Non-Candida	ate-BSR Route	ers			
MUST	RP-Set provi	ided by that	BSR. Only bo	c current BSF ootsrap messa n the current	ges from tha	at BSR or					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.13	NEGATIVE di	aft-ietf-pim-sm	-bsr-12.txt s3.	1.2 p13 Per-Sc	ope-Zone Stat	e Machine for I	Non-Candidate	-BSR Routers			
MUST	RP-Set provi	ided by that	BSR. Only bo	e current BSF ootsrap messa n the current	ges from tha	at BSR or					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.14	draft-ietf-pim-	sm-bsr-12.txt s	3.2 p19 Sendir	ng Candidate-F	RP-Advertisem	ent Messages					
MUST		periodically the unicast		C-RP-Adv to t Formed)	he BSR						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release	Release	Release	Release	Release	Release	Release	Release		
	8.2.2	8.3	8.4	8.5	X.X.X	X.X.X	X.X.X	X.X.X		
PIM-SM-41.15	draft-ietf-pim-	sm-bsr-12.txt s	3.2 p19 Sendir	ng Candidate-F	RP-Advertisem	nt Message				
MUST	Every C-RP periodically unicasts a C-RP-Adv to the BSR (Note: Here the periodic test is performed)									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-41.16	draft-ietf-pim-	sm-bsr-12.txt s	3.2 p19 Sendir	ng Candidate-F	RP-Advertisem	ent Messages				
SHOULD	C-RPs should	d by default	send C-RP-Ad	lv messages w	iththe Prior	ity field se	t to 192.			
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3						
	untested	untested	untested	untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-41.17	draft-ietf-pim-	sm-bsr-12.txt s	3.2 p19 Sendir	ng Candidate-F	RP-Advertisem	ent Messages				
MUST	Zone bit MUS zone; otherw		the C-RP-Adv			_				
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						
PIM-SM-41.18	draft-ietf-pim-	sm-bsr-12.txt s	3.3 p21 Creati	ng the RP-Set	at the BSR					
MUST	from the C-I than BS_Per: for some Boo	RP-Set, subjection and SHOUI otstrap messa	ect to the co LD be larger ages getting	1	t it MUST be	e larger	Ī	ı		
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested						
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive						
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested						





	Release	Release	Release	Release	Release	Release	Release	Release			
	8.2.2	8.3	8.4	8.5	X.X.X	x.x.x	x.x.x	x.x.x			
PIM-SM-41.19	draft-ietf-pim-	draft-ietf-pim-sm-bsr-12.txt s3.3 p21 Creating the RP-Set at the BSR									
SHOULD	from the C-H than BS_Per: for some Boo	For each RP-address, the "RP-Holdtime" field is set to the Holdtime from the C-RP-Set, subject to the constraint that it MUST be larger than BS_Period and SHOULD be larger than 2.5 times BS_Period to allow for some Bootstrap messages getting lost.  (Note: Here we test the SHOULD part									
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.20	draft-ietf-pim-	sm-bsr-12.txt s	3.3 p21 Creati	ng the RP-Set	at the BSR						
MUST	There MUST h		minimum of E	BS_Min_Interv	al between e	each					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.21	draft-ietf-pim-	sm-bsr-12.txt s	3.4 p23 Forwa	rding Bootstrap	Messages						
MUST	One is that bit is set,	_	message is r	not forwarded	l if its No-F	Forward					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.22	draft-ietf-pim-	sm-bsr-12.txt s	3.4 p23 Forwa	rding Bootstrap	o Messages						
MUST	multicast-ca		ace which ha	ed, it is for as PIM neighb ived).		_					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-41.23	draft-ietf-pim-	sm-bsr-12.txt s	3.5 p24 Bootst	rap Messages	to New and R	ebooting Route	ers				
MAY	one router on the LAN sends a stored copy of the Bootstrap message for each admin scope zone to the new or rebooting routerThis message SHOULD be sent as a No-Forward Bootstrap message For backwards compatibility, this message MAY instead or in addition be sent as a Unicast Bootstrap message,  (Note: Here ANVL checks that whether the Bootstrap MSG send by DUT has Multicast or Unicast destination. If the destination is Multicast then it should be No-Forward Bootstrap message)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.24		raft-ietf-pim-sm M Packet Form		5 p24 Bootstra	Messages to	New and Reb	ooting Routers	RFC4601			
	Hello messagnew GenID is sends a stor to the new on	ge is receive s received fi red copy of t or rebooting ASE-1> Ser	ed from a new rom an exista the Bootstrap router. nding PIM Hel	o learn the F w neighbor, coing neighbor, o message for llo MSG with llo MSG with	or a Hello me one router each admin	essage with a on the LAN scope zone					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.26	draft-ietf-pim-	sm-bsr-12.txt s	4 p25 Messag	e Formats							
MUST	Usually, Bootstrap messages are multicast with TTL 1 to the ALL-PIM-ROUTERS group, (Note: Here DUT originates the Bootstrap Message)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.27	draft-ietf-pim-	sm-bsr-12.txt s	4 p25 Messag	e Formats							
MUST	ALL-PIM-ROUT	otstrap messa TERS group, DUT forwards		cicast with T	TL 1 to the						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release 8.2.2	Release 8.3	Release 8.4	Release 8.5	Release x.x.x	Release x.x.x	Release x.x.x	Release x.x.x			
PIM-SM-41.28	draft-ietf-pim-	sm-bsr-12.txt s	4 p25 Messag	e Formats							
MUST	Usually, Bootstrap messages are multicast with TTL 1 to the ALL-PIM-ROUTERS group, (Note: here we check IP TTL value)										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.29	draft-ietf-pim-	sm-bsr-12.txt s	4 p25 Messag	e Formats							
MUST	ALL-PIM-ROUT in section : PIM neighbor	TERS group, h 3.5.2) Bootst	out in some o	cicast with T circumstances s are unicast or forwarded Free BSD 10.3	described to a specif	fic	Ι				
	untested	untested	untested	untested							
	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:	Ubuntu 18.04:							
	pass Free BSD 12.0	pass Free BSD 12.0	pass Free BSD 12.0	Free BSD 12.0							
	untested	untested	untested	untested							
PIM-SM-41.30	draft-ietf-pim-	sm-bsr-12.txt s	4.1 p28 Bootst	rap Message F	ormat	•	•				
MAY	The length (in bits) of the mask to use in the hash function. For IPv4 we recommend a value of 30.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-41.31	draft-ietf-pim-	sm-bsr-12.txt s	4.2 p32 Candi	date-RP-Adver	tisement Mess	age Format					
MUST	C-RPs MUST 1	NOT send C-RI	P-Adv message	es with a Pre	fix Count of	`0'.					
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive	Ubuntu 18.04: inconclusive							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							





	Release	Release	Release	Release	Release	Release	Release	Release			
	8.2.2	8.3	8.4	8.5	X.X.X	X.X.X	X.X.X	X.X.X			
PIM-SM-42.1	draft-ietf-pim-	sm-bsr-12.txt s	3.6 p25 Receiv	ing and Using	the RP-Set						
MUST	If a mapping is not already part of the RP-Set, it is added to the RP-Set and the associated Group-to-RP mapping Expiry Timer (GET) is initialized to the holdtime from the Bootstrap message. Its priority is set to the Priority from the Bootstrap message.										
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-42.2	draft-ietf-pim-	sm-bsr-12.txt s	3.6 p25 Receiv	ing and Using	the RP-Set						
MUST	Priority fro	g is already om the Bootst dtime from th	rap message	and its asso	_						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-42.3	draft-ietf-pim-	sm-bsr-12.txt s	3.6 p25 Receiv	ing and Using	the RP-Set						
MUST	If a mapping is not already part of the RP-Set, it is added to the RP-Set and the associated Group-to-RP mapping Expiry Timer (GET) is initialized to the holdtime from the Bootstrap message. Its priority is set to the Priority from the Bootstrap message.  (Note: This test is for rp-priority)										
	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3	Free BSD 10.3							
	untested	untested	untested	untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							
PIM-SM-42.4	draft-ietf-pim-	sm-bsr-12.txt s	3.6 p25 Receiv	ing and Using	the RP-Set						
MUST	Priority fro	g is already om the Bootst dtime from th test is for	trap message ne Bootstrap	and its asso	_						
	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested	Free BSD 10.3 untested							
	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass	Ubuntu 18.04: pass							
	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested	Free BSD 12.0 untested							