

Spirent TestCenter

RFC 2544 back to back test case



编号 版本	修改时间	说明	
	05/4/2009	李辉	

1 连接 Spirent TestCenter 机箱并占用测试端口	
2 设置测试端口物理层属性	4
3 定义测试流量节点	5
4 启动所需的网络仿真	7
5 创建测试流量	
6对流量发送属性进行配置。	
7 对流量接收属性进行配置。	
8 定义测试进程	
9 对全局参数进行设置	
10运行测试,查看和分析测试结果	16
11 常见问题	

Back to Back test topology



拓扑示意图

1 连接 Spirent TestCenter 机箱并占用测试端口

1a连接机箱并占用测试端口



2 设置测试端口物理层属性

图例中设置测试端口1物理层属性(此项配置要据实际情况而定)。本例端口2以端口1的设置相同。



3 定义测试流量节点

3a. 分别在两个端口上创建 host

Spirent TestCenter	🕵 Add 🗙 Delete 📷 Edit Interface	
🕮 All Ports	Host Interface DHCP DHCPv6/PD DHCP Server	
All Traffic Generators	Port Name Host Name Host Count Encapsulation	
All Stream Blocks	Right Click	
Ports	Add Host	
🖻 🥥 PortConfig1 //1/1 (offline)	Add Multiple Hosts	
Hosts	Delete	
Traffic Analyzer	Cut Host Ctrl+X	
Capture	Copy Host Ctrl+C	
	Paste Host Ctrl+V	
an seconds	Duplicate	
	Edit Tatavénce	
	Ping	
	End	
	Fill Custom	



3b. 查看以创建的 Host

est Configuration		مىرى بورى										
🗄 🗁 Spirent TestCenter		Add 🗙 De	lete 🛛 诸 Ed	dit Interface								
All Ports	H	lost Interface	DHCP DH	ICPv6/PD	DHCP Server							
All Hosts		Port Name	Host Name	Host Count	Encapsulation	Source MAC Address	Source Mac Modifier	IPv4 Address	IPv4 Modifier	IPv4 Prefix Length	IPv4 Default Gateway	IPv4 G Modifie
All Stream Blocks		Port //11/3	Host 3	1	EthernetII/IPv4	00:10:94:00:00:01	Step = 00:00	1.1.1.100	Step = 0.0.0.1	24	1.1.1.1	Step =
All Trattic Analyzers Ports		Port //11/4	Host 4	1	EthernetII/IPv4	00:10:94:01:00:01	Step = 00:00	2.2.2.100	Step = 0.0.0.1	24	2.2.2.1	Step =
🖻 🥥 Port //11/3	-			-	-	-	-				-	-
Hosts		2	-	-								-
Traffic Generator				-		2						
E- 🥥 Port //11/4												
🐻 Traffic Generator												
Traffic Analyzer												
Capture												
Settings												

4 启动所需的网络仿真

4a 选择 wizard

	Vizards
Encapsulation	Rfc2889/Address Learning Rate Rfc2889/Address Caching Capacity Routing/MPLS/LDP VPLS Rfc3918 Test Package
	Routing/MPLS/Pseudowire Emulation (PWE)

4b 选择 Back-To-Back Frams test wizard

• Wizards	
Configuration Wizards Test Wizards Asymmetric Performance Test Package Rf:3918 Test Package Access Access Rf:2544 Back-To-Back Frames Frame Loss Latency Throughput Rf:2889 Rf:2889	SPIRENT RFC-2544 with VLAN Network Device Benchmark Test Package Rfc 2544: Benchmarking Methodology for Network Interconnect Devices Internet Request for Comments (RFC) document
E Traffic	Objective
	Characterizes the ability of the DUT to process back-to-back frames. This test simulates popular network activity such as requests for large amounts of data over an Ethernet network, that may use a relatively small MTU size and that can result in many fragments being transmitted. Methodology A binary search mechanism is used to determine the back-to-back result. For each iteration, frames are transmitted with a minimum interframe gap, for a specific duration (number of seconds or frame count). If frame loss occurs, then the duration is reduced by the defined backoff-value, otherwise the duration is increased. The test completes when the difference in duration is less than or equal to the defined resolution. The back-to-back value is the number of frames in the longest burst that the DUT will handle without the loss of any frames. Parameters Number of trials, trial duration, frame size, min/step/max load and latency type (Store && Forward, Bit Forwarding and LILO). Optional: Multiple MACs per stream, IPs, TCP/UDP port numbers, VLANs, QoS with DiffServ/ToS, acceptable loss. Output Back-to-back value and offered load. Counters include Tx/Rx statistics per port/per stream, lost frames, sequencing and min/average/max latency. Graph: back-to-back value vs. load for each frame size.
Reset -	Seck Next > Cancel

4c 选择测试端口

teps	Port Selection						
Select Wizard							
Select Ports	2	4		((
Configure Traffic	Select All	Name	Location	Model	Media	Status	
Fest Parameters 1	Clear Selection	Poit //1	//10.61.32.91	10/100/1000	EthernetCopper	Up	
Fest Options			1110.01.02.01		caloniocoppor	op	
	VIEW						
	Details						
	Contraction of the second						
	C List						
					-		
		-					
		-					
		•				111	
	J						
1.1		1	1			10 000000	1

4d 配置测试流量

测试流量有两种模型: Automatic 和 Manual。

Steps	Ti	affic Configuration Mode:	Automatic	C Manual		
Select Wizard	Configure Traffic	Distribution	Source:		Destination:	
Select Ports	🖃 😝 TrafficDescriptor 1	@ Pair			Port //11/3	
Configure Traffic	Endpoints		Port //11/4		Port //11/4	
Test Parameters	IP Header	C Backbone				
Test Options		C Fully meshed				

下面分别介绍两种测试流量的创建和调用。

A. Automatic 方式



注意,若要调用已经创建好的 host, Step5 要选择"Use existing endpoints"。

8	Tr	raffic Configuration Mode	: 💿 Automatic 🛛 🔍 Manual		
ct Wizard	Configure Traffic	Enable IPv4	2 🗆 Enable IPv6 🗖 E	nable VLAN 3	
ct Ports	E GrafficDescriptor 1	Port Configuration			
figure I rathc		This table assigns	s the starting addresses of the hosts	on each port	
t Parameters	PHeader				
(Uptions		Skip illegal and re	eserved IP addresses		
	n	Parameter	Start	Step	
		Port Mac Address	00:10:94:00:00:0:	00:00:01:00:00:00	
		IPv4 Address	4-1.1.1.100	1.1.1.0 🚽 🖊	5
		▶ IPv4 Gateway Ad	dress 1.1.1.1	1.1.1.0	
			6	7	
		Host Configuration	s the number of addresses and step	s within each port	
		Host Configuration	s the number of addresses and step	s within each port	
		Host Configuration This table assign: Host Count: 1 Parameter	s the number of addresses and step	s within each port	
		Host Configuration This table assign: Host Count: 1 Parameter Mac Address	s the number of addresses and step the	s within each port	F:FF
		Host Configuration This table assign: Host Count: Parameter Mac Address IPv4 Address	s the number of addresses and step 8 Step 00:00:00:00:00:01 0.0.0.1 24	s within each port ength Mask 00:00:FF:FF:FF 0.0.0.255	F:FF
	Add Remove	Host Configuration This table assigns Host Count: Parameter Mac Address IPv4 Address	s the number of addresses and step 8 Step 00:00:00:00:00:10 0.00.1 24	s within each port angth Mask 00:00:FF:FF:FF 0.0.0.255	F:FF
	Add Bemove	Host Configuration This table assigns Host Count: Parameter Mac Address IPv4 Address	the number of addresses and step 8 9 9 9 9 9 9 9 9	s within each port angth Mask 00:00:FF:FF:FF 0.0.0.255	F:FF
	Add Remove	Host Configuration This table assigns Host Count: Parameter Parameter Nac Address IPv4 Address	s the number of addresses and step 8 9 9 9 9 9 9 9 9	s within each port ength Mask 00:00:FF:FF:FF 0.0.0.255	F:FF
	Add Remove	Host Configuration This table assign: Host Count: Parameter Mac Address IPv4 Address	s the number of addresses and step 8 9 9 9 9 9 9 9 9	s within each port ength Mask 00:00:FF:FF:FF 0.0.0.255	F:FF
	Add Remove	Host Configuration This table assign: Host Count: Parameter Mac Address IPv4 Address	s the number of addresses and step 8 9 9 9 9 9 9 9 9	s within each port	F:FF
	Add Remove	Host Configuration This table assign: Host Count: Parameter Mac Address IPv4 Address	s the number of addresses and step	s within each port	F:FF
	Add Remove	Host Configuration This table assign: Host Count: Parameter Mac Address IPv4 Address	s the number of addresses and step	s within each port	F:FF
	Add Remove	Host Configuration This table assign: Host Count: Parameter Mac Address IPv4 Address	s the number of addresses and step 3 tep 9 Prefix Le 00:00:00:00:00:01 0.0.0.1 24	s within each port	F:FF

如测试流量需要带 VLAN,要选择 Step3 "Enable VLAN"。 如需要在一个 STC 端口下仿真多个 Hosts,增加 Step8 "Host Count"。 如只需要二层测试流量,可忽略 Step4、5、6、7。

	Traffic Configuration Mode: C Automatic C Manual
Select Wizard Select Ports Configure Traffic Test Parameters Test Options	Configure Traffic Configure Traffic Scriptor 1 Addressing IP Next Protocol IP next protocol variation UDP = 17 Add > IP's Next Protocol IP's Next Protocol (Remove << Remove
	Quality Of Service
	Edi
	Time to live: 10

B. Manual 方式

在采用 Manual 方式之前,必须手动的建立测试流量。

Test Configuration																
🖃 🗁 Spirent TestCenter	8	Add	🗙 Delete	📝 Edit 📗			_	10.00000 %								
All Ports		State	Active	Name	Index	Controlled By	Source	Destination	Traffic Pattern	Туре	T× Port	R× Port	Traffic Group	State	Load	Lo
	•	۲		StreamB	0	generator	Host 1 (1	Host 2 (2.2.2	Pair	Port	Port //11/3	Port //11/4		Ready		
All Traffic Analyzers		۲		StreamB	0	generator	Host 2 (2	Host 1 (1.1.1	Pair	Port	Port //11/4	Port //11/3		Ready		
Port //11/3 Insts Fort Market Generator																
Traffic Analyzer		_														+
±- ♥ Port //11/4	-							8								

在 Wizards 里选择 Manual 方式,调用手动建立的测试流量

🔆 Rfc2544 Back To Back Frames - Co	jure Traffic
Steps	Traffic Configuration Mode: C Automatic C Manual 1
Steps Select Wizard Select Ports Configure Traffic Test Parameters Test Options	Traffic Configuration Mode: Automatic Manual 1 Select All Image: Clear Selection Image: Clear Selection Image: Clear Selection 2 Image: Clear Selection Image: Clear Selection Image: Clear Selection 3
Reset •	Agack Next > Run Finish Cancel

4c. 配置测试参数

ens	Test Duration	Frame Size (bytes)
teps Select Wizard Select Ports Configure Traffic Test Parameters Fest Options	Number of trials: 1 1 1 Trial Duration (* Time (sec): 60 2 C* Bursts (frames): 1000 2 3	 Random Min: 128 Max: 256 Step: 128 Start: 128 End: 256 Step: 128 Custom (Comma delimited, e.g. 64, 128, 256, 512, 1024, 1280, 1518) 64, 128, 256, 512, 1024, 1280, 1518 MIX
	Duration Parameters Resolution (sec): 00001 Resolution (frames): 100 Acceptable frame loss (%): 0 (Note: Non-RFC compliant when Acceptable frame loss > 0)	Imix Traffic Load Load units: Percent [%] ▼ Random Min: 10 Max: 50 Step Start: 10 End: 50 Step: Start: 10 Custom Comma delimited (e.g. 10,20,30,)

4f. 配置测试选项

Rfc2544 Back To Back Frames -	Test Options		×
Rfc2544 Back To Back Frames Steps Select Wizard Select Ports Configure Traffic Test Parameters Test Options 1	Scheduling Statt traffic delay (second): 2 2 C Latency Type Stagger start (64 microseconds): 0 - 0 C LLO C LLO C - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - 3 - - - 3 - - 3 - - - - - 3 -		
	Measure Jitter 4		
Reset -	Kext>	lun — Finish Ca	ancel



5 创建测试流量

测试流量在 STEP4 已经创建。

6 对流量发送属性进行配置。

本例不用更改。

7 对流量接收属性进行配置。

本例不用更改。

8 定义测试进程

本例不用更改。

9 对全局参数进行设置

本例不用更改。

10 运行测试,查看和分析测试结果

10a 点击 Apply 将配置下发。

State Active Name Index Controlled By Source Destination Traffic Pattern Type Image: StreamB 0 generator Host 1 (1 Host 2 (2 Pair Port Image: StreamB 0 generator Host 1 (1.1 Pair Port Image: StreamB 0 generator Host 2 (2 Host 1 (1.1 Pair Port	Command Name RFC 2544: Back To Back Frame BenchmarkTestStartComma	Type Port	Traffic Pattern	Destination		0			Delete	MUUIII		- C Solreor Lesri enrer
Image: StreamB 0 generator Host 1 (1 Host 2 (2.2.2 Pair Port Image: StreamB 0 generator Host 2 (2.2.2 Pair Port BenchmarkTestStartCommand 1	t BenchmarkTestStartComma	Port			Source	Controlled By	Index	Name	Active	State		All Ports
StreamB 0 generator Host 2 (2 Host 1 (1.1.1 Pair Port	ν μ	A DECEMBER OF	. Pair	Host 2 (2.2.2	Host 1 (1	generator	0	StreamB			•	All Traffic Generators
Trial Loop (0)	BenchmarkTestLearningSta	Port	. Pair	Host 1 (1.1.1	Host 2 (2	generator	0	StreamB				
Edit Stop Routine	Edit Stop Routine											→3 Traffic Analyzer √ Capture B ● Port //11/4 5ettings
Image: Constraint of the second se	Edit Stop Routine											For the second sec

Status 为绿色,表示测试流状态 OK。

10b 开始执行测试



10c 观察测试执行

🚵 Apply 🐻 🚓 🛱 🛱 🗱 🖏 🐔 📲 Technologies... 📗 Sequencer 🔊 Reporter 🛛 Wizards... + 🗋 Summary...

									×	Command Sequencer 4
	Add >	🕻 Delete	📝 Edit			-	10.00000 %			🛅 Edit Sequence 🚺 🚺 🔲 🚍
9	State	Active	Name	Index	Controlled By	Source	Destination	Traffic Pattern	Type	Command Name P/F Elapsed Time
			StreamB	0	generator	Host 1 (1	Host 2 (2.2.2	Pair	Rort	Error Carl RFC 2544: Back To Back Frames Test 1 00:02:36.262
			StreamP	0	generator	Host 2 (2	Host 1 (1.1.1	Pair	Port	 Weight BenchmarkTestStartCommand 1 00:00:06.503
			Streamb		generator	11050 2 (2	1105c 1 (1.1.1	<i>r a</i>	PUIL	
	0	-	- 3				<u> </u>		-	🚽 🔁 Trial Loop (1) 00:02:22.915
0 3			1							- V BenchmarkIterateTrialCommand 1 00:00:00.357
				-						🚽 🚵 Frame Size Loop (1) 00:02:22.527
										Edit Stop Routine
-				2						
-		12	-	-		-				
11 5	-	-		-			÷		-	Sequencer Status: Running Elapsed Time: 10:02:37.2
•		1 .		1	1	1	1	1	•	Trial 1 of 1, Frame Size: 64, Load Size: 100

10d 观察测试结果 测试结果默认保存目录,如下图示

2544-BTBF-2009-05-04_13	-52-0	15									
Edit View Favorites	Tools	Help									
Back 🔹 🕥 🖌 🏂 Search 🌮 Folders 🔛 🗧											
ress 🛅 C:\Documents and S	ettings	hii\My Documents\TestCenter\Results\Untitled-2009-05-04_13-52-04\2544-BTBF-2009-0	5-04_13-52-05								
		Name A	Size	Туре	Date Modified						
File and Folder Tasks	*	2544-BTBF-Summary-2009-05-04_13-52-05	5,984 KB	Data Base File	2009-5-4 14:00						
Maka a naw faldar		2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-0.4688-Secs	5,072 KB	Data Base File	2009-5-4 14:00						
Make a new rolder		2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-0.937536-Secs	5,072 KB	Data Base File	2009-5-4 13:59						
Publish this folder to the		2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-1.87501-Secs	5,072 KB	Data Base File	2009-5-4 13:58						
		🔊 2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-3.75002-Secs	5,072 KB	Data Base File	2009-5-4 13:58						
Share this folder		2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-7.50003-Secs	5,072 KB	Data Base File	2009-5-4 13:57						
		2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-15-Secs	5,072 KB	Data Base File	2009-5-4 13:56						
Other Places	\$	2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-30-Secs	5,072 KB	Data Base File	2009-5-4 13:55						
		2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-60-Secs	5,072 KB	Data Base File	2009-5-4 13:54						
Contitled-2009-05-04_13-5	52·	2544-BTBF-Trial-1-Frame-64-Load-100.000000-Iter-1-Duration-0.234432-Secs	320 KB	Data Base File	2009-5-4 14:00						
My Documents											
😡 My Computer											
🧕 My Network Places											
Details	*										
2544-BTBF-2009-05-04_1 Folder	3-										
Date Modified: 2009年5月4日 13:59	,										

测试结果必须使用 STC Report Result 打开。

🧽 Spirent TestCenter Results Reporter									_ 8 ×
<u>File Tools Report Help</u>									
<u>6</u> 5 4 8 8 1 8 8 8	Help								
E- 🔄 Results	Template								
E- 2544-BTBF-Summary-2009-05-05_04-28-57.db	Template: Rfc2544BackToBackStats						-		
Gring RFc2544 Back to Back Test Result Summary View Second Strength Result Summary View	Title Test Summary Advanced Test	Summary Tria	Summary LiMIX	Distribution	ns Theoretical M	axl			
The second part of the second permitted summary					-			- 91	
							217	=/篇	
1	2		100						
-									
	Ba	ick-to-Back	Burst Dura	tion per	Frame size				_
	25								
	25								
	5 20 -	-							
	LI 15								
		_							
	≓ ¹⁰								
	5								
	0								
		A (3	50	\$	102×	1300	570		
				Frame Siz	e				
			📕 Tria	I Duration					
	*Duration is measur	d in SECONDS							
	Frame Size(bytes)	Back-to-Back	Back-to-Back	Intended	Average Frame	Average	Average	Average	
	64	31 989 334	10 748416	100	2 976 190	56 1 81 771	56 1 81 027	744	
	128	31,837,298	18.84768	100	1,689,189	43,529,896	43,529,551	345	
	256	15,876,696	17.527872	100	905,797	22,090,893	22,090,708	185	
	512	10,600,874	22.558656	100	469,924	13,184,220	13,184,136	84	
	1,024	6,291,726	26.27424	100	239,463	/,898,708	6 470 662	46	
	1,280	4,476,454	27.539652	100	162,507	5,488,632	5.488.603	29	
		.,,			,	-,,	-,,		
۲ ۲									English (United States)

11 常见问题