

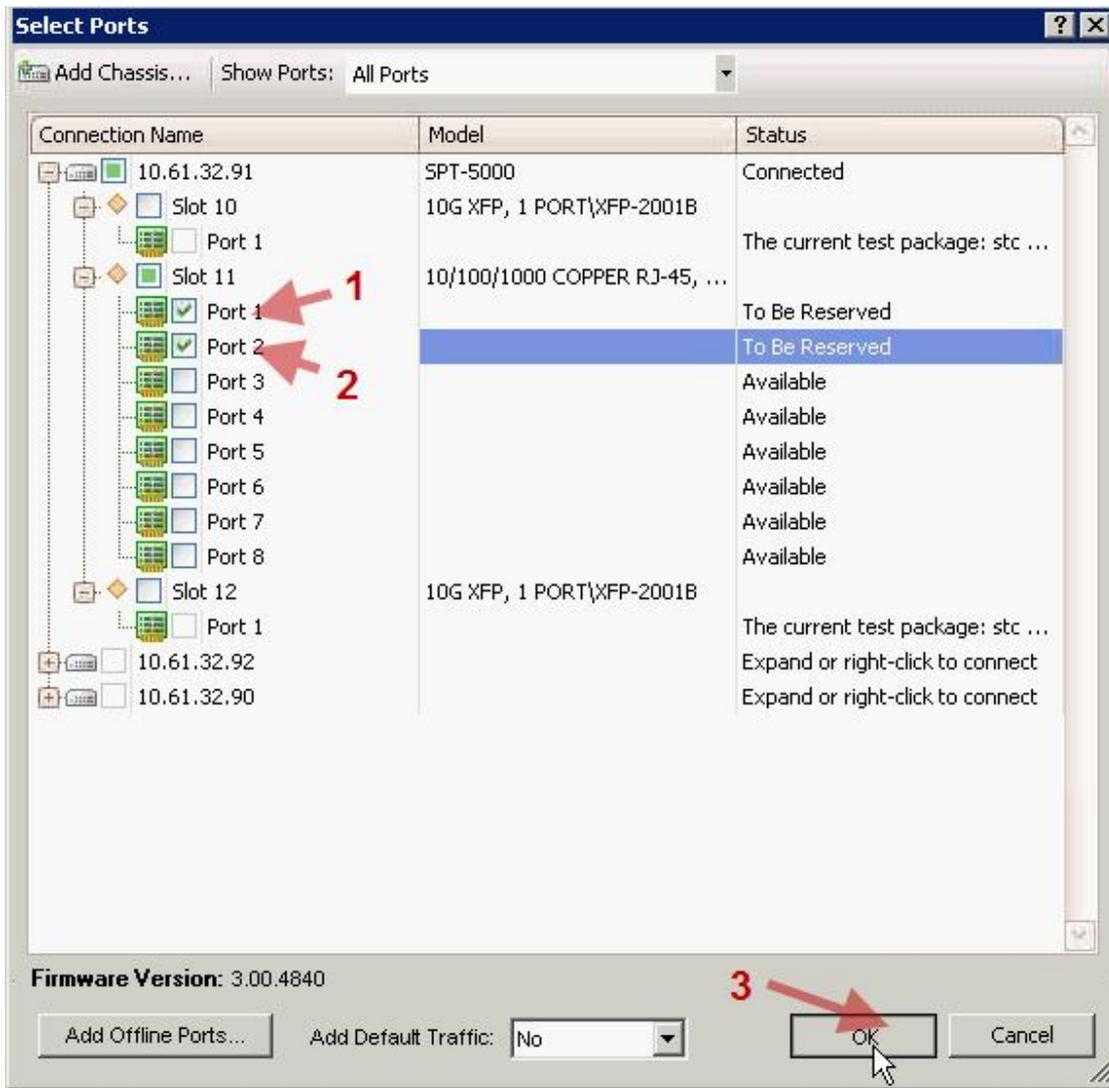
## Spirent TestCenter

### RFC2544 Latency test (manual)

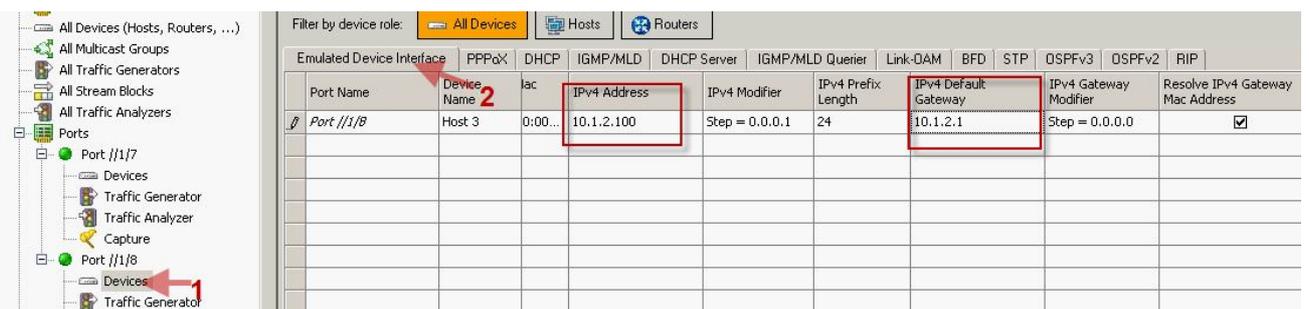
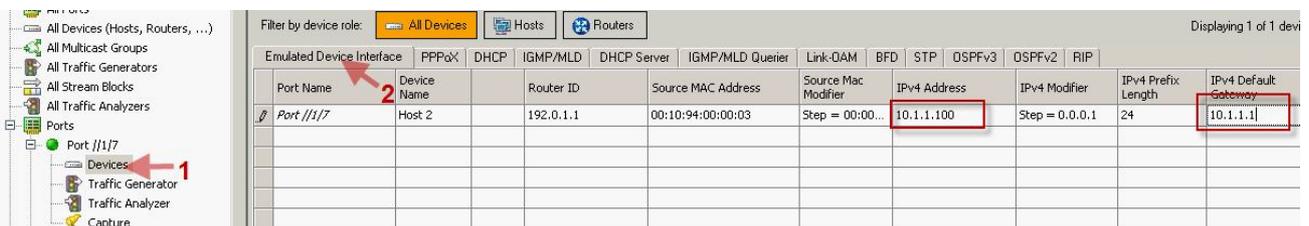


编号 版本	修改时间	说明
	01/08/2010	李辉

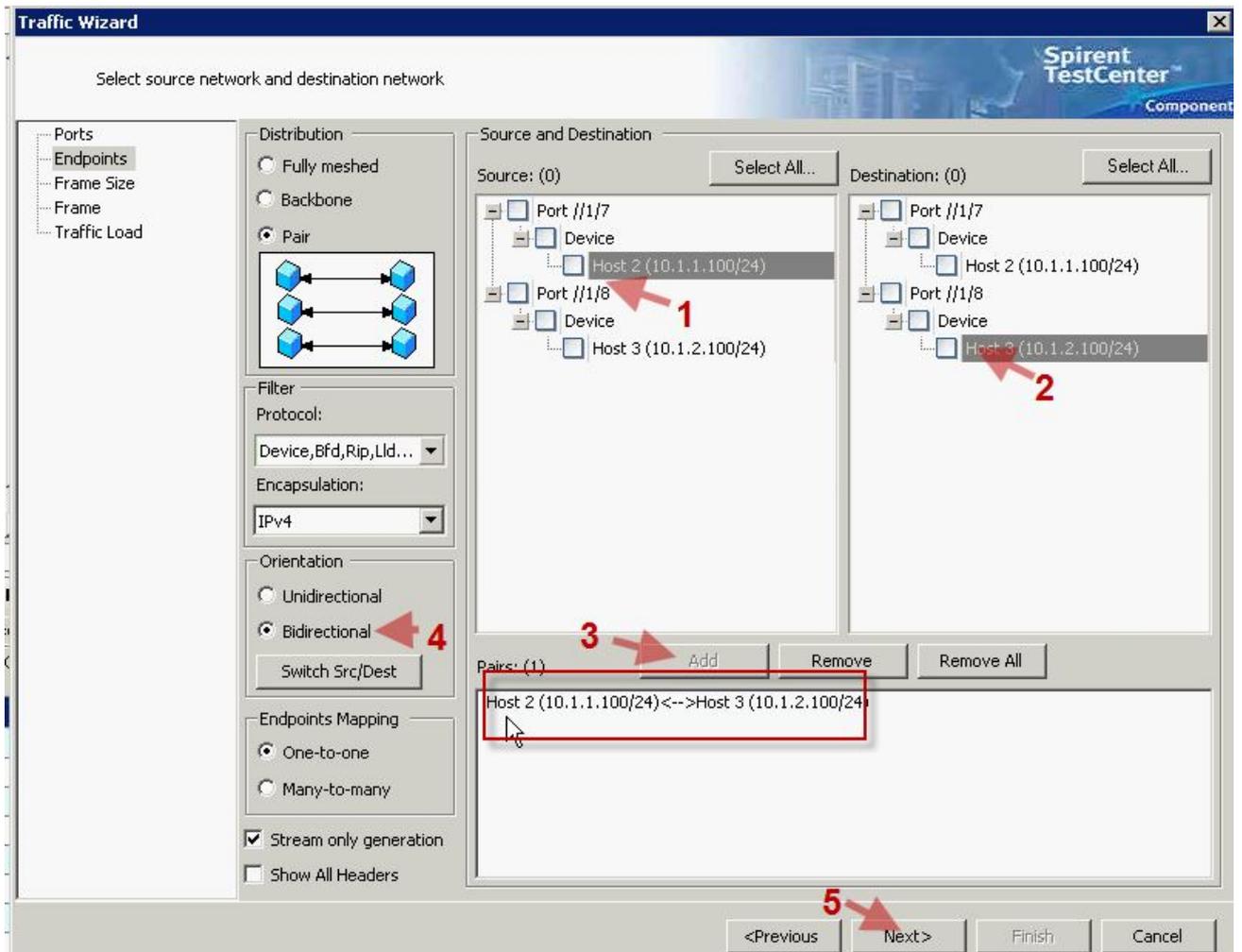
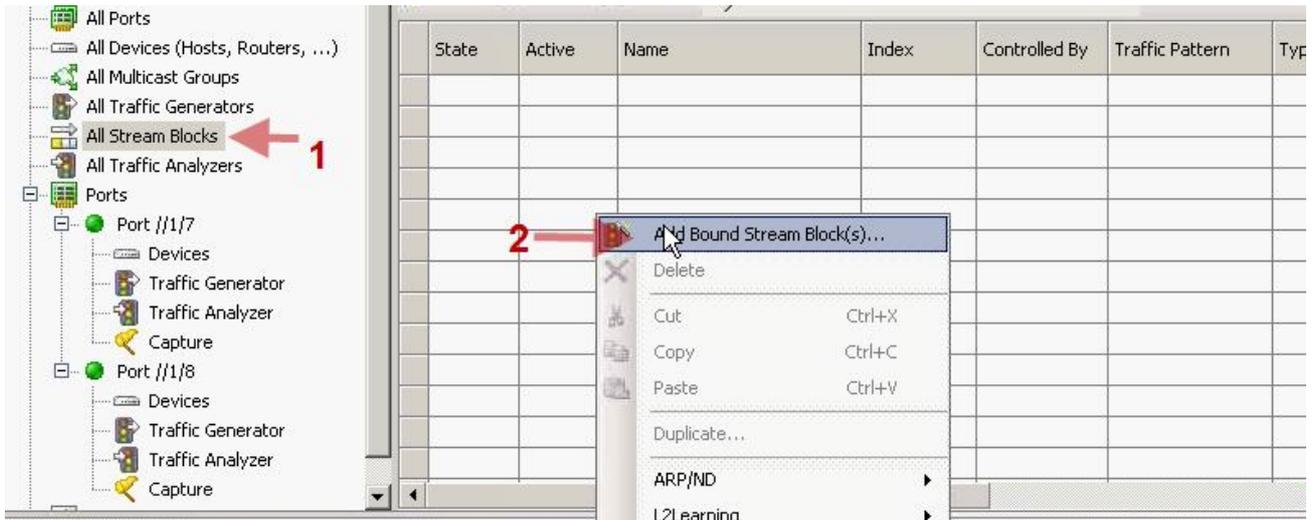
## 1 连接 Spirent TestCenter 机箱并占用测试端口



## 2 在端口下创建 Devices (Hosts)



### 3 创建 boundstream



## 4 Start ARP

### A. Start Hosts ARP

The screenshot shows the 'Test Configuration' window in Spirent TestCenter. The left sidebar shows a tree view with 'All Stream Blocks' highlighted by a red arrow labeled '1'. The main table lists emulated device interfaces for Host 2 and Host 3. A context menu is open over the 'Port //1/7' entry, with 'Start ARP/ND' selected. A red arrow labeled '2' points to this option. Below the table, the 'Streams > Detailed Stream Results' section is visible, showing a table with columns for Name/ID, Tx Port Name, Rx Port Names, Aggregated Rx Port Count, Tx Count (Frames), Rx Count (Frames), and Tx Rate (bps).

Port Name	Device Name	Mac	IPv4 Address	IPv4 Modifier	IPv4 Prefix Length	IPv4 Default Gateway	IPv4 Gateway Modifier	Resolve IPv4 Gateway Mac Address	IPv4 Gateway Mac
Port //1/7	Host 2	0:00...	10.1.1.100	Step = 0.0.0.1	24	10.1.1.1	Step = 0.0.0.0	<input checked="" type="checkbox"/>	00:00:01:00:00:01
Port //1/8	Host 3	0:00...	10.1.2.100	Step = 0.0.0.1	24	10.1.2.1	Step = 0.0.0.0	<input checked="" type="checkbox"/>	00:00:01:00:00:01

Filter by device role: All Devices Hosts Routers Displaying 2 of 2 devices

Port Name	Device Name	Mac	IPv4 Address	IPv4 Modifier	IPv4 Prefix Length	IPv4 Default Gateway	IPv4 Gateway Modifier	Resolve IPv4 Gateway Mac Address	IPv4 Gateway Mac
Port //1/7	Host 2	0:00...	10.1.1.100	Step = 0.0.0.1	24	10.1.1.1	Step = 0.0.0.0	<input checked="" type="checkbox"/>	00:19:55:E1:5E:C1
Port //1/8	Host 3	0:00...	10.1.2.100	Step = 0.0.0.1	24	10.1.2.1	Step = 0.0.0.0	<input checked="" type="checkbox"/>	00:19:55:E1:5E:C2

### B. Start Boundstream ARP

The screenshot shows the 'Test Configuration' window in Spirent TestCenter. The left sidebar shows a tree view with 'All Stream Blocks' highlighted by a red arrow labeled '1'. The main table lists stream configurations. A context menu is open over the 'Stream' entry, with 'Start ARP/ND' selected. A red arrow labeled '2' points to this option. Below the table, the 'Streams > Detailed Stream Results' section is visible, showing a table with columns for Name/ID, Tx Port Name, Rx Port Names, Aggregated Rx Port Count, Tx Count (Frames), Rx Count (Frames), and Tx Rate (bps).

State	Active	Name	Index	Controlled By	Source	Destination	Traffic Pattern	Type	Tx Port	Rx Port	Traffic Group
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Stream			Host 2 (10...	Host 3 (10.1...	Pair	Port	Port //1/7	Port //1/8	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Stream			Host 3 (10...	Host 2 (10.1...	Pair	Port	Port //1/8	Port //1/7	

## 5. 发流验证

The screenshot displays the Spirent TestCenter interface. The top section shows the 'Test Configuration' window with a tree view on the left and a table of configurations on the right. A red box highlights the 'State' column for 'StreamBlock 1-1' and 'StreamBlock 1-2', both of which are active. A red arrow points to the 'Add...' button in the toolbar.

State	Active	Name	Index	Controlled By	Source	Destination	Traffic Pattern	Type
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	StreamBlock 1-1	0	generator	Host 2 (10.1...	Host 3 (10.1...	Pair	Port
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	StreamBlock 1-2	0	generator	Host 3 (10.1...	Host 2 (10.1...	Pair	Port

The bottom section shows 'Results 1' with two tables: 'Port Traffic and Counters > Basic Traffic Results' and 'Streams > Detailed Stream Results'.

Port Name	ps	Generator Rate (Bps)	Generator Rate (bps)	Generator Sig Rate (fps)	Rx Sig Rate (fps)
Port //1/7	10,810,891	86,487,128	84,460	84,459	
Port //1/8	10,810,734	86,485,872	84,458	84,459	

Name/ID	Tx Port Name	Rx Port Names	Aggregated Rx Port Count	Tx Count (Frames)
StreamBloc...	Port //1/7	Port //1/8	1	8,993,96
StreamBloc...	Port //1/8	Port //1/7	1	9,037,01

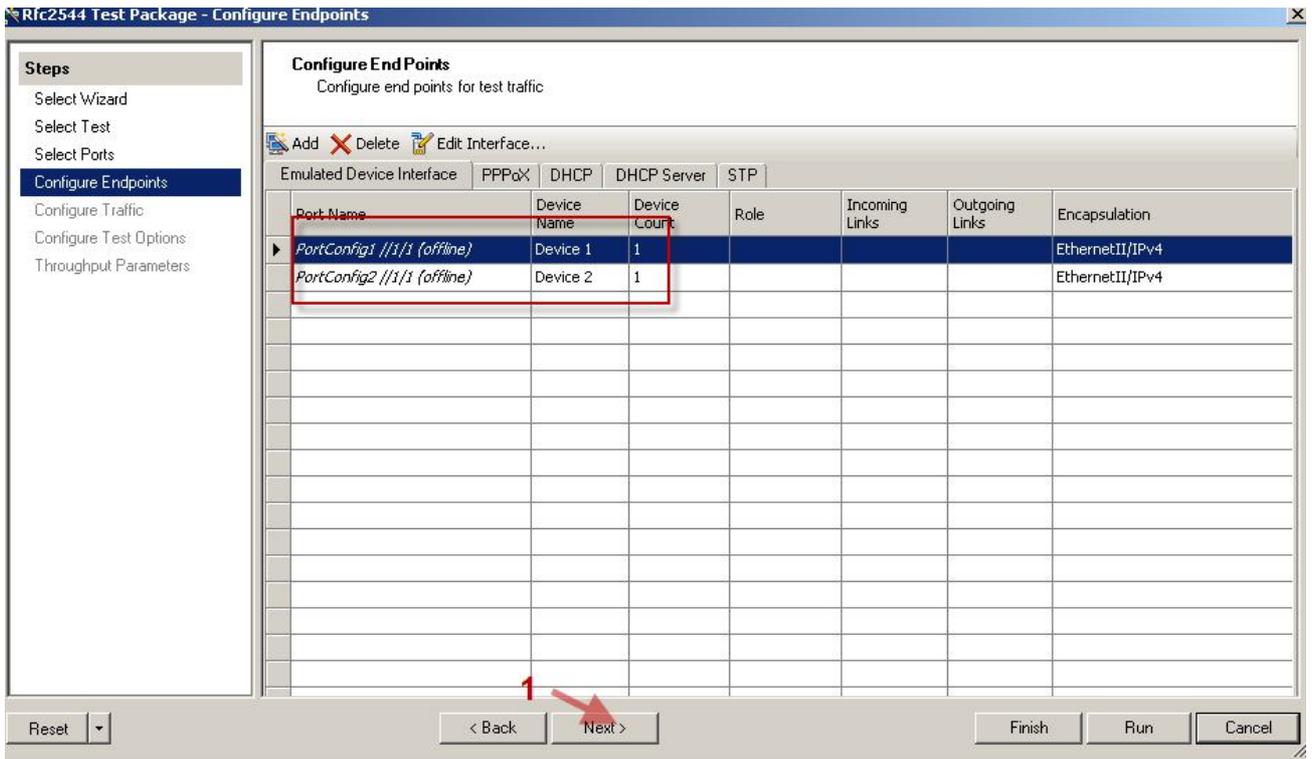
## 6 配置 RFC2544 wizard

### A. 选择 RFC2544 test package

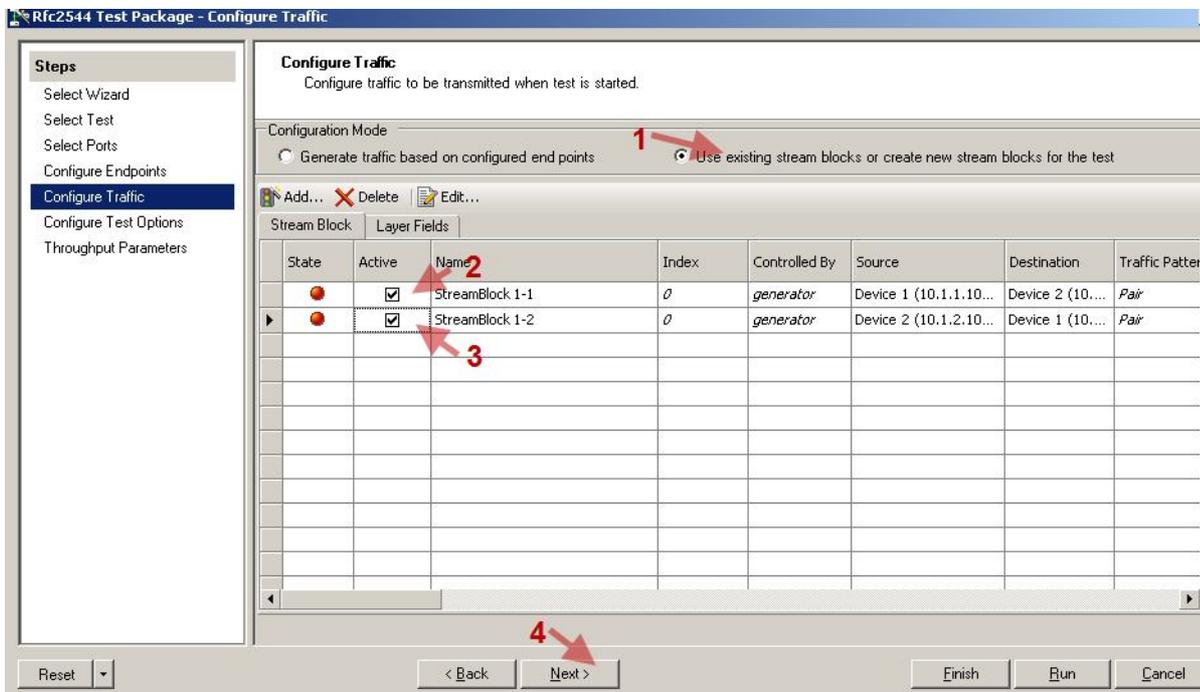
The screenshot shows the 'Wizards' menu in the Spirent TestCenter interface. A red arrow points to the 'Wizards...' option, which is highlighted with a red '1'. Another red arrow points to the 'Rfc2544 Test Package...' option, which is highlighted with a red '2'.

Wizards...
Wizards... 1
Triple Play/Video Quality Analyzer...
Triple Play/IPTV...
Rfc2544 Test Package... 2
Routing/MPLS/MPLS IP VPN...
Routing/MPLS/6PE/6VPE...





### C. 调用之前配置的 boundstream 进行 throughput 测试



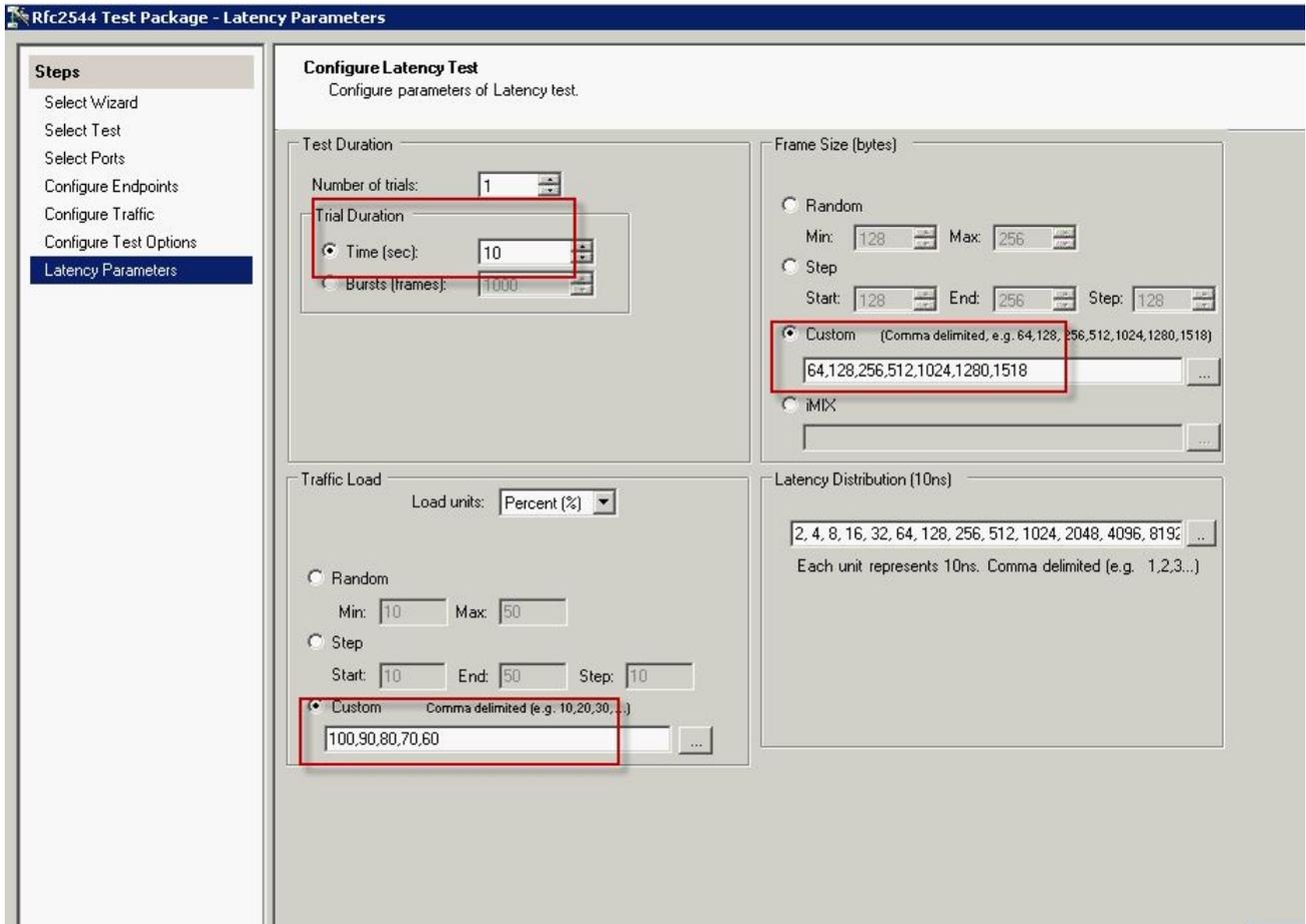
### D. 配置测试参数

The screenshot shows a configuration window with the following sections and settings:

- Scheduling:**
  - Start traffic delay (second): 2
  - Stagger start (64 microseconds): 0
  - Delay after transmission (second): 15
- Latency Type:**
  - LIFO
  - LIFO (Store and forward)
  - FIFO (Bit forwarding)
- Learning:**
  - Enable Learning
  - Mode: L3 Learning
  - Delay before learning (sec): 2
  - Rate (frame/sec): 1000
  - Retry count: 5
  - Cyclic address resolution
- Frequency:**
  - Learn once
  - Learn every trial
  - Learn every frame size
  - Learn every iteration
- Traffic Verification:**
  - Enable Verification
  - Verification Frequency Mode: Verify every iteration
  - Tx Frame Rate: 1000
  - Tx Frame Count: 100
  - Abort test if traffic verification fails
- Results:**
  - Save detailed stream results with every iteration
  - Measure Jitter

At the bottom, there are buttons for "< Back", "Next >", "Finish", and "Run". A red arrow with the number "1" points to the "Next >" button.

Enable Learning – 若测试三层性能则选择 L3 Learning；若测试二层性能侧选择 L2 Learning。  
Latency Type – 选择 LIFO（存储转发）。测试吞吐量的同时可以测试 Latency。  
Measure Jitter – 使能该功能后，测试结果有 Jitter（抖动）。

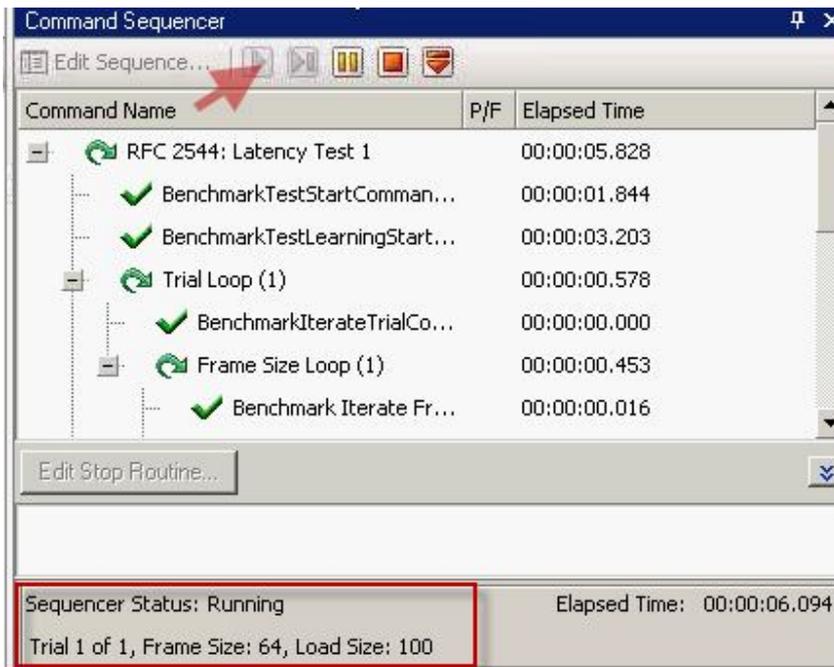


Trail Duration: 每轮测试的时间。

Traffic Load: 在 100%，90%，80%，70%，60%负载下的 Latency。

Frame size: 分别测试以上七个字节长度的 Latency。

## 7 运行 Latency 测试



## 8 通过 result reporter 查看测试结果

Frame Size and Load (%)

Min Jitter Avg Jitter Max Jitter

Frame Size (bytes)	Load (%)	Loss (%)	Min Jitter (uSec)	Avg Jitter (uSec)	Max Jitter (uSec)
64	60	0	0	0.3	1.04
64	70	0	0	0.17	0.88
64	80	0	0	0.09	3.06
64	90	0	0	0.08	0.69
64	100	0	0	0	3.23
128	60	0	0	0.34	1.22
128	70	0	0	0.2	1.15
128	80	0	0	0.2	2.93
128	90	0	0	0.15	0.78
128	100	0	0	0	3.24
256	60	0	0	0.31	1.76
256	70	0	0	0.2	1.09
256	80	0	0	0.37	2.69
256	90	0	0	0.17	1.12
256	100	0	0	0	0.67
512	60	0	0	0.36	1.65
512	70	0	0	0.3	1.67
512	80	0	0	0.48	2.17
512	90	0	0	0.28	1.44
512	100	0	0	0	0.68
1,024	60	0	0	0.27	2.21
1,024	70	0	0	0.54	2.21
1,024	80	0	0	0.68	2.14
1,024	90	0	0	0.13	2.11
1,024	100	0	0	0	0.87
1,280	60	0	0	0.59	2.49
1,280	70	0	0	0.64	2.38
1,280	80	0	0	0.73	2.51
1,280	90	0	0	0.42	2.42
1,280	100	0	0	0.42	2.42

Frame Size and Load (%)

Min Latency Avg Latency Max Latency

Frame Size (bytes)	Load (%)	Min Latency (uSec)	Avg Latency (uSec)	Max Latency (uSec)	Latency Type
64	60	6.34	6.8	7.55	LIFO
64	70	6.26	6.88	7.66	LIFO
64	80	6.35	6.94	9.87	LIFO
64	90	6.41	7.04	7.58	LIFO
64	100	6.76	63.89	121.74	LIFO
128	60	6.49	7.13	7.82	LIFO
128	70	6.49	7.09	7.79	LIFO
128	80	6.49	7.21	10.67	LIFO
128	90	6.6	7.25	7.94	LIFO
128	100	6.82	64.04	122.12	LIFO
256	60	6.84	7.51	9.73	LIFO
256	70	6.86	7.48	8.26	LIFO
256	80	6.85	7.53	10.29	LIFO
256	90	6.87	7.62	8.33	LIFO
256	100	7.44	63.75	119.63	LIFO
512	60	7.23	8.1	9.1	LIFO
512	70	7.24	8.13	9.16	LIFO
512	80	7.22	8.15	9.93	LIFO
512	90	7.25	8.22	9.09	LIFO
512	100	7.42	64.94	120.48	LIFO
1,024	60	8.01	9	10.89	LIFO
1,024	70	8	9.07	10.38	LIFO
1,024	80	8.01	9.06	10.38	LIFO
1,024	90	8.01	8.97	10.39	LIFO
1,024	100	8.63	65.77	121.62	LIFO
1,280	60	8.39	9.57	11.02	LIFO
1,280	70	8.39	9.5	11.01	LIFO
1,280	80	8.39	9.54	11.04	LIFO
1,280	90	8.39	9.58	11.05	LIFO