

Report NO: 161010018

# NIM-S26B

## INTEL Fortville XL710 PCI-Express 40G QSFP 2 Ports LAN Module

### Firewall NIM Card Bulletin Compatibility Test Report

Summary	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> Pass with Deviation (Comment: There are two of performance limitation: 1. Bandwidth is 22Gbps, lower than criteria(30Gbps), other functions are normal. 2. Endurance test passed with frame size=1518 / loading=22%, it's lower than criteria "frame size1518 / loading=31%"_)			
	Test Results Category			
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

Issue date

QE Manager

Test Engineer

2016-12-16

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**Version Released Records**

Date	Version	Change History	Note
10/28/2016	A0	1. First release	

**Note :**

For all test items in this report, 3 results have been defined and described as following:

- Pass:**            Functionality work perfectly
- Fail:**            Functionality failed and must be resolved in the next version
- N/A:**            Functionality Not Applicable or Not Available

This test report would be updated when re-test completed in product next change version.

## Specification Validation

### Main Specification

Item	Specification	Result			Note
		Pass	Fail	N/A	
Product Name	NIM-S26B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Form Factor	NIM-S26B: 40G Fiber LAN Module	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Main Chipset	1 x INTEL® XL710 Ethernet Controller	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Host Interface	PCI Express Gen3 [x8]	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LAN Port	NIM-S26B: QSFP 40GbE Connector x 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Indicator	NIM-S26B: 2 x LED for Active/Link	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### O.S. Support

Item	Specification	Result			Note
		Pass	Fail	N/A	
Microsoft Windows	Windows 7 64bit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LAN driver installation
	Windows10 64bit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Linux	Ubuntu16.04 x86_64 kernel 4.4.0-21-generic	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	CentOS7 kernel:3.10.0-229.el7.x86_64	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### Firewall system support

Item	Specification	Result			Note
		Pass	Fail	N/A	
Firewall system	FWS-7520	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	FWS-7821	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### Platform Information

Item	Device Information	Note
Product of department	NSD	
System Model	FWS-7821 A0.3	
BIOS / Version	FWS-7821 R0.3 (K782CM03)(11/08/2016)	
Driver folder	\\nas3\SAP-BETA\Products\NIM-S26C\20160627	
CPU Type	Intel® Core i® Processor i7-7700 (8M Cache, 3.6 GHz)	
Memory Type	Transcend DDR4 2400 16GB SEC K4A8G085WB x4	
SATA HDD	WD WD3200AAKX 320GB	
USB DVD-ROM	ASUS SBW-06D2X-U	
LCD Monitor	Dell U2713HM	
Daughter Board	N/A	
	N/A	
NIM Card	NIM-S26B A1.0	
Operating System	<input checked="" type="checkbox"/> CentOS7 kernel:3.10.0-229.el7.x86_64	
	<input checked="" type="checkbox"/> Ubuntu16.04 x86_64 kernel 4.4.0-21-generic	
	<input checked="" type="checkbox"/> Windows 10 Enterprise 64bit English version	
Power Supply	FSP FSP250-50LC 250W	
Battery Model	N/A	
	Chipset Information	
LAN chipset	INTEL® XL710 Ethernet Controller	

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# 1. Basic Function Test

## 1.1. LED / LCM / Button Function Test

Procedure:

Step1. To check Ethernet LED status can follow below methods.

- A. Use LAN cable to connect 40Gbps Host PC, transmit some packets between Host PC and DUT.
- B. Use LAN cable to connect 10Gbps Host PC, transmit some packets between Host PC and DUT.
- C. Use LAN cable to connect 1000Mbps switch between Server PC and DUT, transmit some packets between Server PC and DUT.
- D. Use LAN cable to connect 100Mbps switch between Server PC and DUT, transmit some packets between Server PC and DUT.
- E. Use LAN cable to connect 10Mbps switch between Server PC and DUT, transmit some packets between Server PC and DUT.

	Speed LED
40G bps	Color blue
10G bps	Color blue
1000Mbps	Color orange
100Mbps	Color green
10Mbps	Color blank

	Link/Act LED
Transmit	Yellow LED Blink

Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	40G connection LAN LED action as below: Speed LED: Blue Link LED: Yellow / Blinking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	10G connection LAN LED action as below: Speed LED: Blue Link LED: Yellow / Blinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	1G connection LAN LED action as below: Speed LED: Orange Link LED: Yellow / Blinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	100M connection LAN LED action as below: Speed LED: Blue Link LED: Green / Blinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	10M connection LAN LED action as below: Speed LED: Blue Link LED: Blank / Blinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 1.2. 40G Ethernet Function Test

Configuration:

HOST: FWS-7821 + NIM-S26B

Procedure:

Step1. Connect Host PC and to do ping test.

Host: #ping 192.168.100.client IP -s 65500 -c 1000.

Client: #ping 192.168.100.host IP -s 65500 -c 1000

Step2. Install iperf and execute.

HOST: #iperf -s (Linux Ubuntu16.04)

Client: # iperf -c 192.168.100.xx -t 120 -i 1

Test result:

Test item		Result			Note
		Pass	Fail	N/A	
Ping test. Ping loss should < 2 times.	LAN1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	LAN2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
40Gbps connection. Iperf test result should not loss and max bandwidth must be in 30Gbps or more.	LAN1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pass with deviation: Bandwidth is 22Gbps, lower than criteria(30Gbps), other functions are normal.
	LAN2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 2. O.S Compatibility Test

### 2.1. Linux OS Compatibility Test

Procedure:

Step1. Install Linux x86 or x64 OS from USB DVD ROM.

Step2. Enter command "lspci" to check if devices were detected.

Step3. Install LAN driver to system.

(1) Checked whether the command "Insmod drivename" can function normally, or not.

(2) Checked whether the command "rmmmod drivename" can successful uninstall the driver, or not

Step 4.3 ifconfig Ethernet

(1) Execute command "ifconfig ethx down" close Ethernet.

(2) Execute command "ifconfig ethx up" start Ethernet.

Step 4.6 Jumbo Frame

Setting #ifconfig LAN mtu 9000

Check #ifconfig LAN (mtu will change from 1500 to 9000)

Step 5 Ping Google or Host PC.

#ping 8.8.8.8 or #ping 192.168.xx.xx .

Test result:

#### 2.1.1 Ubuntu16.04 x86\_64 kernel 4.4.0-21-generic

Test Item	Result			Note	
	Pass	Fail	N/A		
System should not any error during installation process.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
lspci to check LAN devices.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
System should not error during LAN driver installation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
"Insmod drivename" should install driver normally.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
"rmmmod drivename" should uninstall driver normally.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Ifconfig	Ethernet interface should be closed when execute command ""sudo nmcli networking off"	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ubuntu16.04 is not support ifdown ethx ; ifup ethx command
	Ethernet interface should be started when execute command ""sudo nmcli networking on"	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Jumbo	Jumbo function should work properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ping test	Ping should work normal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

#### 2.1.2 CentOS7 kernel: 3.10.0-229.11.1e17.x86\_64

Test Item	Result			Note	
	Pass	Fail	N/A		
System should not any error during install process.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
lspci to check LAN devices.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
System should not error during LAN driver installation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
"Insmod drivename" should install driver normally.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
"rmmmod drivename" should uninstall driver normally.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Ifconfig	Ethernet interface should be closed when execute command ""ifconfig ethx down"	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CentOS support ifup/ifdown



	Ethernet interface should be started when execute command ""ifconfig ethx up"	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Jumbo	Jumbo function should work properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ping test	Ping should work normal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## 2.2. Windows OS Compatibility Test

Procedure:

- Step1. Install Windows OS from USB DVD ROM.
- Step2. Install all required driver to system.
- Step3. Connect internet, check each LAN port function.
- Step4. ACPI S5 and reset function test.
- Step5. ACPI S3 and S4 function test if support graphics driver.

Test result:

### 2.2.1 Windows 10 Enterprise 64bit English version

Test Item	Result			Note	
	Pass	Fail	N/A		
System should not any error during install process.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
All required driver should be installed.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Ping the HOST PC should work properly.	40G NIM module: port 1~2 <NIM-S26B>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Shutdown	System should be shutdown when click "shutdown" icon	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reboot	System should be reset when click "Reset" icon.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S3	System should be sleep when click "Sleep" icon and resume function should work properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S4	System should be sleep when click "Sleep" icon and resume function should work properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### 3. Stability Test

#### 3.1. LAN Endurance Test

Configuration:

CPU: Intel® Core i® Processor i7-7700 (8M Cache, 3.6 GHz)

RAM: Transcend DDR4 2400 16GB x4

Storage: WD WD3200AAKX 320GB

Graphics card: Onboard graphics

OS: CentOS7 Kernel 3.10.0.el7.x86\_64

NIM module: NIM-S26B A1.0

Procedure:

Step1. Use SmartBits to test LAN endurance.

Step2. Test Group: <LAN1-LAN2 bi-directional> ;

Step3. To set Frame size=1518 / loading=22% / time=43200sec

<For 40G and 10G, the Frame size and loading need refer to throughput value>

Remark: Max ports: 40G x2

Test Result:

Test item	Result			Note
	Pass	Fail	N/A	
NIM Module LAN1~2 Endurance Test <Test result should not frame loss.>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pass with deviation: Endurance test passed with frame size=1518 / loading=22%, it's lower than criteria 31%, performance limitation.

## 4. LAN Performance Test

### 4.1 DUT and Test Equipments

#### 4.1.1. DUT Specification

##### Hardware:

- Model name: FWS-7821 (FWB-7821 A0.2)
- M/B: FWB-7821 A0.2
- CPU: Intel® Core i® Processor i7-7700 (8M Cache, 3.6 GHz)
- RAM: Transcend DDR4 2400 16GB SEC K4A8G085WB x4
- HDD: WD WD3200AAKX 320GB
- NIM module: NIM-S26B A1.0

##### Software:

- BIOS: FWS-7821 R0.3 (K782CM03)(11/08/2016)
- Operating System: CentOS7 kernel:3.10.0-229.11.1e17.x86\_64
- NIM LAN driver: i40e-1.5.16.tar.gz

#### 4.1.2. Test Equipments Specification

##### SPIRENT Test Center

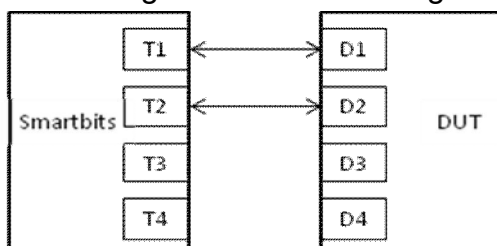
- Chassis: SPIRENT CTL-N4U E16100679
- Chassis Version: E1
- Module: SPIRENT FX2 2-port 40/10GBE QSFP+
- Test Software: SPIRENT Test Center Application 4.64

## 4.2 RFC-2544 performance test (2 port)

### 4.2.1. Throughput test (2 port)

#### Test Description:

- In DUT System, set routing function enabled.  
<# echo 1 > /proc/sys/net/ipv4/ip\_forward>
- Test Configuration as below Figure.



- Smartflow\Test Group to add port1<->port2 with Bi-directional,
- The tester set loading traffic from 1% to 100% and the traffic step is 50%.
- Interaction Constants Duration Time Set to 60 Sec.
- Test all LAN ports performance.

#### Test Result:

Test Group: <LAN1-LAN2 bi-directional>

Speed: 40G_Full	Frame Size(bytes)						
LAN ports	64	128	256	512	1024	1280	1518
1-2	1.56	2.68	5.5	10.70	21.95	26.87	31.79

Total Trials	Number of Passed Trials	Frame Size (bytes)	Intended Load (%)	Offered Load (%)	Throughput (%)	Aggregated Throughput (fps)	Aggregated Theoretical Max (fps)	Aggregated Throughput (Mbps)
1	1	64	1.563	1.563	1.563	1860119.067	119047619.048	1250
1	1	128	2.688	2.688	2.688	1815878.4	67567567.568	2150
1	1	256	5.5	5.5	5.5	1992753.633	36231884.058	4400
1	1	512	10.703	10.703	10.703	2011865.633	18796992.481	8562.5
1	1	1024	21.953	21.953	21.953	2102789.767	9578544.061	17562.5
1	1	1280	26.875	26.875	26.875	2067307.7	7692307.692	21500
1	1	1518	31.797	31.797	31.797	2067417.133	6501950.585	25437.5

## 5. Compatibility with Firewall Products Test

### 5.1 Compatibility with Firewall products

Procedure:

- Step1. Refer to product specification what products supported for the NIM card.
- Step2. Install Linux x86 or x64 OS from USB DVD ROM.
- Step3. Enter command "lspci" to check if devices were detected.
- Step4. Install LAN driver to system.
- Step5. Ping Google or ping Host PC.  
#ping 8.8.8.8 or #ping 192.168.xx.xx .

Test result:

#### 5.1.1 FWS-7821

Test Item	Result			Note
	Pass	Fail	N/A	
System should not any error during installation process. OS:CentOS7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
lspci to check LAN devices.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
System should not error during LAN driver installation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ping test Ping should work normal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

#### 5.1.2 FWS-7520

Test Item	Result			Note
	Pass	Fail	N/A	
System should not any error during installation process. OS: CentOS7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
lspci to check LAN devices.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
System should not error during LAN driver installation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ping test Ping should work normal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	