Report NO: 17I010005

FWS-7821

Intel® C236
1U Rackmount 8 LANs with 1 NIM Slot
Network appliance

Firewall Product
P5
Compatibility Test Report

Summary	☐ Pass ☐ Fail ☒ Pass with Deviation (Comment: 1. System can't support RAID installation with Ubuntu16.04, CRB has same compatibility issue. RAID installation works normal with Ubuntu16.10, CentOS7 and Windows10. 2. Adaptec AAR-1430SA SATA card and Digifusion ASM1061 STATIII card are not compatible with expansion slot, the CRB has same compatibility issue. 3. The throughput performance of LAN7/8 fiber SKU is lower than other LAN ports.

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
2017-03-20	KJ Wang	Louie Lee

Version Released Records

Date	Version	Change History	Note
01/27/2016	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	
Form Factor	1U Rackmount Network Platform	☒	☐	☐	
Processor	Intel® 7th Generation Core™ / Xeon Processors	☒	☐	☐	
Chipset	Intel® C236	☒	☐	☐	
System Memory	4 x 288-pin DDR4 2133MHz UDIMM up to 64GB	☒	☐	☐	
Graphics controller	Intel Integrated	☒	☐	☐	
Ethernet	Intel i210 controller for 8 Gigabit Ethernet (2 x onboard SFP by optional request)	☒	☐	☐	
Bypass	Optional 3 pairs	☒	☐	☐	
BIOS	AMI BIOS ROM	☒	☐	☐	
Serial ATA	5 x SATA 6Gb w/ RAID function (Max. 7 x SATA ports)	☒	☐	☐	
Serial Port	RJ45 Type x 1 (on front panel)	☒	☐	☐	
LCM	2x 16 characters, 4 keypad	☒	☐	☐	
Keyboard and Mouse	PS/2 Pin-header (Optional)	☒	☐	☐	
Universal Serial Bus	2 x USB 3.0 Type A on I/O side 2 x USB 3.0 for internal pin-header	☒	☐	☐	
Expansion Interface	2 x PCIe [x8] Golden Finger support NIM and riser	☒	☐	☐	
RTC	Internal RTC	☒	☐	☐	
TPM	Infineon	☒	☐	☐	TPM1.2
Watchdog Timer	1~255 step by software programmable	☒	☐	☐	
Storage	3.5” SATA HDD x 1 or 2.5” SATA HDD x 2 (Optional extra 2.5” HDD x 4 without NIM and Expansion lot are presented) 1 x CFast (Optional CF socket and mSATA slot)	☒	☐	☐	
GPIO	8bits, BIOS default 4 bits input, 4bits output.	☒	☐	☐	
Software Button	1 x GPIO Programmable push button	☒	☐	☐	
Power Requirement	1 x 24-pins ATX power connector compatible with 20 pin type PSU 2 x 4-pin DC power out connector for H.D.D	☒	☐	☐	
Front I/O panel	1 x Power LED 1 x Status LED 3 x Bypass LED 1 x HDD Active LED 2 x USB3.0 Ports 1 x NIM Slot 8 x RJ45 LAN ports with LEDs 1 x RJ45 Console 1 x LCM display and 4 keypad 1 x Software Programmable button	☒	☐	☐	

Rear I/O panel	1 x AC Power Input 1 x Power Switch 1 x Expansion slot	☒	☐	☐	

O.S. Support

Item	Specification	Result			Note
		Pass	Fail	N/A	
Microsoft Windows	Windows 10 64 bits	☒	☐	☐	
Linux	CentOS7 kernel:3.10.0-229.el7.x86_64	☒	☐	☐	Testing environment 1. Linux as first priority
	Ubuntu16.04 x86_64 kernel 4.4.0-21-generic	☒	☐	☐	

Platform Information

Item	Device Information	Note
Product of department	NSD	
System Model	FWS-7821	
PCB Model / Version	FWB-7821 A0.2	
BIOS / Version	FWS-7821 R1.3(K782CM13) (02/22/2017)	
Driver folder	\\nas3\SAP-BETA\Products\FWS-7821\20161005	
CPU Type	Intel® Core i® Processor i7-7700 (8M Cache, 3.6 GHz)	
Memory Type	ADATA DDR4 2133 16GB Hynix H5AN8G8NMFR x4	
SATA HDD	ADATA SATAIII SSD SX900 128GB	
USB DVD-ROM	ASUS SBW-06D2X-U	
VGA Monitor	Dell U2713HM	
HMDI Monitor	Dell U2713HM	
Compact Flash	Transcend CF220I 4GB	
CFast	Innodisk 3ME3 128GB	
mSATA	Innodisk 3ME3 32GB	
Daughter Board	PCIE x8 slot1 A0.1	
NIM Card	1G:NIM-C13B A1.0 (Intel 82580)	
	10G: NIM-S26C	
	40G: NIM-S26B	
Operating System	☒ CentOS7 kernel:3.10.0-229.el7.x86_64	
	☒ Ubuntu16.04 x86_64 kernel 4.4.0-21-generic	
	☒ Windows 10 Enterprise 64bit English version	
Power Supply	ATX Power Supply : ETASIS EFAP-S250 250W	
	FSP FSP250-50LC 250W	
Battery Model	N/A	
	Chipset Information	
Chip	Intel C236	
Super IO Chipset	ITE IT8728F	
Ethernet Chipset	Intel I211AT Gigabit Ethernet	

Summary Table of contents:

1. Mechanism Construction Test 7
1.1. Mechanism construction check 7
2. Basic Function Test 8
2.1. CPU Function Test 8
2.2. Memory Function Test 8
2.3. SATA / CF Function Test 9
2.4. Video Function Test 9
2.5 Console Function Test 10
2.6 Com Port Function Test 10
2.7 USB ports Function Test 10
2.8 LED / LCM / Button Function Test 11
2.9. Bypass Function Test 12
2.10. LAN Function Test 13
2.11. Digital IO Function Test 14
2.12. TPM1.2 Function Test 14
2.13. Jumper and connector Function Test 14
2.14. NIM Slot Function Test 15
4. Time Accuracy Test 18
4.1. System Clock & RTC Clock Test 18
5. Power Consumption Test 19
5.1. Power Consumption 19
5.2. PC Health Status 19
5.3. CMOS Battery Test 20
6. Hardware Compatibility Test 21
6.1. CPU Compatibility Test 21
6.2. Memory Compatibility Test 21
6.3. SATA Compatibility Test 22
6.4. Flash Card Compatibility Test 23
6.5. USB Compatibility Test 24
6.6. PCI-Express Compatibility Test: 25
6.7. NIM Card Compatibility Test 25
7. O.S Compatibility Test 27
7.1. Linux OS Compatibility Test 27
7.2. Windows OS Compatibility Test 29
8. BIOS Function Test 30
8.1. Flash BIOS 30
8.2. Advanced Test 30
8.3.Chipset Test 31
8.4. Boot Test 31
8.5. CMOS Backup / Clear CMOS Test 31
8.6. AAEON Tag Check Utility 32
8.7. Supervisor / User Password Test 32
8.8. Negative Test 32
9. Stability Test 33
9.1. LAN Endurance Test 33
9.2. Cold Boot Test 33
9.3. Memory Test 34
10. 1G LAN Performance Test 36
10.1 DUT and Test Equipment 36
10.2 RFC-2544 performance test (2 port) 37
10.3 RFC-2544 performance test (8 ports) 38
11. 10G LAN Performance Test 39
11.1 DUT and Test Equipment 39
11.2 RFC-2544 performance test (2 port) 40
11.3 RFC-2544 performance test (4 ports) 41
12. 40G LAN Performance Test 42
12.1 DUT and Test Equipment 42
12.2 RFC-2544 performance test (2 port) 43

1. Mechanism Construction Test

1.1. Mechanism construction check

Procedure:
Step1. Insert NIM, CF and expansion card.
Step2. Check the symbol of front and rear I/O

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	System case shouldn't interfere with assembly	☒	☐	☐	
2	NIM slot shouldn't interfere with assembly	☒	☐	☐	
3	CF slot shouldn't interfere with assembly	☒	☐	☐	
4	Expansion slot shouldn't interfere with assembly	☒	☐	☐	
5	I/O symbol should correct.	☒	☐	☐	

2. Basic Function Test

2.1. CPU Function Test

Configuration:

CPU: Intel Core i7-7700 Processor (3.60GHz / Cache: 8 MB / C/T:4/8)
Memory: Transcend DDR4 2400 16GB SEC K4A8G085WB x4

Procedure:

Step1. Connected CPU with product specification max supported.
Step2. Boot into BIOS manual and check CPU information is correct.
Step3. Confirm CPU max speed can meet CPU specification in OS environment.
<#watch –n 1 “cat /proc/cpuinfo | grep MHz”>
Step4. Install and execute benchmark AP “sysbench”, recode the benchmark.
<Reference: http://wiki.mikejung.biz/Benchmarking#Install_Sysbench_on_CentOS_7>
<# wget ftp://ftp.gnome.org/mirror/fedora/epel/6/x86_64/sysbench-0.4.12-5.el6.x86_64.rpm>
<#wget http://downloads.mysql.com/archives/mysql-5.1/MySQL-shared-compat-5.1.49-1.rhel5.x86_64.rpm>
<#rpm -iv MySQL-shared-compat-5.1.49-1.rhel5.x86_64.rpm>
<#yum install postgresql-libs.x86_64>
<#rpm -iv sysbench-0.4.12-5.el6.x86_64.rpm>
<1 thread #sysbench --test=cpu --cpu-max-prime=20000 run>
<8 threads #sysbench --test=cpu --cpu-max-prime=20000 --num-threads=8 run>

Test result:

No.	Test item			Result			Remark
				Pass	Fail	N/A	
1	System can boot properly			☒	☐	☐	
2	BIOS\CPU information is correct.			☒	☐	☐	
3	CPU speed should meet specification			☒	☐	☐	CPU 3.6GHZ,
4	Recode CPU Benchmark	Intel 3.6G	1 thread	20.6737s			
			8 threads	2.9206s			

2.2. Memory Function Test

Configuration:

CPU: Intel Core i7-7700 Processor (3.60GHz / Cache: 8 MB / C/T:4/8)
Memory: Transcend DDR4 2400 16GB SEC K4A8G085WB x4

Procedure:

Step1. Connected memory with product specification max supported.
Step2. Boot into BIOS manual and check memory information is correct.
Step3. Slot test.
Step4. Execute benchmark AP” sysbench”, recode the benchmark.
<Reference: http: http://ssorc.tw/4882>
<read # sysbench --test=memory --memory-block-size=8K --memory-total-size=1G --memory-oper=read run >
<write # sysbench --test=memory --memory-block-size=8K --memory-total-size=1G run >

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	

1	System should boot properly.		☒	☐	☐	64GB
2	BIOS\Memory information is correct.		☒	☐	☐	
3	Slot 1	System should boot up properly.	☒	☐	☐	
	Slot 2		☒	☐	☐	
	Slot 3		☒	☐	☐	
	Slot 4		☒	☐	☐	
	Slot 1 + 3		☒	☐	☐	
	Slot 2 + 4		☒	☐	☐	
	Slot 1+2+3+4		☒	☐	☐	
4.	Recode Memory Benchmark	read	Transferred:41157.73MB/s Total time:0.0249 s			
		write	Transferred:10137.51MB/s Total time:0.1010s			

2.3. SATA / CF Function Test

Configuration:

SATA: ADATA SATAIII SSD SX900 128GB
CF: Innodisk iCF9000 32GB
CFast: Innodisk 3ME3 32GB
mSATA: Innodisk 3ME3 32GB

Procedure:

Step1. Connect SATA HDD / SSD and CF.
Step2. Boot into BIOS manual and check SATA/CF information is correct.
Step3. Install Linux OS with SATA storage / CF.
Step4. Check SATA/CF read/write speed can meet the specification.
<update# yum update>
<install# yum install hdparm -y>
<check HDD# fdisk -l>
<Read command#: hdparm -tT /dev/sdaX>
<Write command#: #time dd if=/dev/zero of=/var/test bs=2k count=1000000>

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	SATA storage and CF information should correct during POST and OS.	☒	☐	☐	
2	SATA ports speed should meet specification. (SATAII max read speed > 150MB/s) (SATAIII max read speed> 300MB/s)	☒	☐	☐	SATA 1~7 port Read:440 MB/s Write:414 MB/s
3	CF R/W speed should meet specification.	☒	☐	☐	Read:84.87MB/s Write:42.9 MB/s
4	CFast R/W speed should meet specification.	☒	☐	☐	Read: 134 MB/s Write: 126 MB/s
5	mSATA R/W speed should meet specification	☒	☐	☐	Read:148 MB/s Write: 154 MB/s

2.4. Video Function Test

Procedure:

Step1. Connect VGA monitor.
Step2. Install Linux OS to DUT system.
Step3. After installation, boot to Linux OS for test X-windows mode and Text mode.

Test result:

No.	Test item		Result			Remark
			Pass	Fail	N/A	
1	Display shouldn't loss during OS installation.	VGA	☒	☐	☐	
		HDMI	☒	☐	☐	
2	Display shouldn't flicker during POST and OS.	VGA	☒	☐	☐	
		HDMI	☒	☐	☐	
3	VGA should display normal with x-window and text mode.		☒	☐	☐	800*600
4	HDMI should display normal with x-window and text mode.		☒	☐	☐	800*600

2.5 Console Function Test

Procedure:

Step1. Execute “Hyper-Terminal” in HOST PC.
Step2. Boot up DUT system and press ESC key of HOST keyboard to boot into BIOS manual.
Step3. To check HOST keyboard can control properly in BIOS manual.
Step4. DUT boot to DOS (USB flash) and check console redirection work properly.
Step5. Under Linux OS, install minicom AP and check console transmission.

Test Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Console should support BIOS display and control.	☒	☐	☐	Test with 9600/38400/115200
2	Console should support DOS display and command typing.	☒	☐	☐	Test with 9600/38400/115200
3	Under Linux OS, console should support minicom transmission.	☒	☐	☐	Test with 9600/38400/115200 ttyS0

2.6 Com Port Function Test

Procedure:

Step1. Execute “Hyper-Terminal” in Server PC.
Step2. Install “minicom” on DUT. <apt-get install mincom or yum install minicom>
Step3. To run “minicom” and set com port for test. (#minicom –s)(com1=ttyS0; com2=ttyS1….)
Step4. Connect “Null cable” between Server PC and DUT.
Step5. Transmit words between server and DUT.

Test Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Transmission words should not loss or error.	☒	☐	☐	COM2: ttyS1

2.7 USB ports Function Test

Procedure:

Step1. Connect USB keyboard and check it works properly under BIOS/DOS/Linux.

Step2. Connect USB DVD ROM, check system can boot from USB DVD ROM and USB DVD ROM can work properly under Linux OS.
Step3. Connect USB2.0/3.0 Flash, check system can boot from USB flash and USB flash can work properly under Linux OS.
Step4. Check USB2.0/3.0 flash read speed can meet the Flash specification.
<Read command#: hdparm -t /dev/sdaX>

Test Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Boot from USB DVD ROM and drive should work properly.	☒	☐	☐	USB1/2/3/4
2	USB 1.1 / 2.0 /3.0 devices (Flash, keyboard, mouse, DVD ROM) can work properly on USB 3.0 ports.	☒	☐	☐	USB1/2/3/4
3	USB2.0 R/W speed should meet specification.	☐	☐	☒	
4	USB3.0 R/W speed should meet specification.	☒	☐	☐	USB1/2/3/4 Read:102.11 MB/s

2.8 LED / LCM / Button Function Test

Procedure:
Step1. Check power LED when system power on.
Step2. Check HDD LED blinks when install OS to HDD/CF/mSATA/CFast.
Step3. Check Bypass LED when AAEON Test AP set Bypass status.
Step4. Check Test AP resume are correct which press LCM function button. (Up/Down/ESC/Enter)
Step5. Check Test AP resume is correct which press program reset button.
SDK: Button <1.#make clean 2# make 3# ./button>
Step6. Check status LED action same with Test AP setting.
Step7. To check Ethernet LED status can follow below methods.
A. Use LAN cable to connect 1GB switch between Server PC and DUT, transmit some packets between Server PC and DUT.
B. Use LAN cable to connect 100MB switch between Server PC and DUT, transmit some packets between Server PC and DUT.
C. Use LAN cable to connect 10MB switch between Server PC and DUT, transmit some packets between Server PC and DUT.

	Speed LED
40GB/s	Color Blue
10GB/s	Color Blue
1GB/s	Color Orange
100MB/s	Color Green
10MB/s	Color Blank

	Link/Act LED
Un-Linked	TBD
Linked	TBD
Transmit	Yellow Blink

Result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	Power LED should turn on when system power on.	☒	☐	☐	
2	HDD LED should blinks when install OS to HDD , CF , mSATA and CFast.	☒	☐	☐	
3	Bypass LED should turn on when SDK set bypass status.	☒	☐	☐	Onboardx3 ; NIMx2
4	Status LED color and action should same with SDK setting.	☒	☐	☐	SDK: LED
5	Reset value of SDK should show high when press the program reset button.	☒	☐	☐	Open: show high Press: show low
6	LCM value of SDK should show correct when press LCM function button.	☒	☐	☐	SDK: LCM ./lcm –getkey return ./lcm –lcmon ./lcm –lcmoff ./lcm –set String
7	10G connection LAN LED action as below: Speed LED: Green Link LED: Blue / Blinking	☐	☐	☒	
8	1000M connection LAN LED action as below: Speed LED: Orange Link LED: Yellow / Blinking	☒	☐	☐	
9	100M connection LAN LED action as below: Speed LED: Green Link LED: Yellow / Blinking	☒	☐	☐	
10	10M connection LAN LED action as below: Speed LED: blank Link LED: Yellow / Blinking	☒	☐	☐	

2.9. Bypass Function Test

Procedure:

Step1. Under Linux, execute AAEON SDK(LanByPass) to test Bypass function under power on and power off mode.

Step2. SDK set "power on" is "PassTru and "power off" is "ByPass, and remove the AC power cord. (G3 status)

Step3. BIOS set power on is “PassTru” and power off is “Bypass”, boot up system from G3 status..

Step4. SDK set "power on" is "PassTru" and "WDT-ByPass", execute watch Dog.

Test result:

No.	Test item	Power on	Power off	Result			Remark
				Pass	Fail	N/A	
1	PassTru / ByPass should work properly by SDK control.	Bypass	Bypass	☒	☐	☐	SDK: LanByPass onboard: 0,1,2 NIM: 3,4
		Bypass	PassTru	☒	☐	☐	
		PasTru	Bypass	☒	☐	☐	
		PassTru	PassTru	☒	☐	☐	

2	LAN should switch to ByPass mode when system AC loss.(G3 status)	PassTru	ByPass	☒	☐	☐	
3	Boot up from G3, LAN should switch to PassTru.	PassTru	ByPass	☒	☐	☐	
4	WDT ByPass should work properly.			☒	☐	☐	

2.10. LAN Function Test

Configuration:

1G switch: D-Link DGS-1210-16
100M switch D-Link DES-1008A
10M HUB SVEC FD916H
100 meters CAT6 cable

Procedure:

Step1. Each LAN port connect DHCP server. ; 10G & 40G LAN port connect to Host PC
Step2. Connect internet and ping Google (8.8.8.8) ; 10G & 40G ping Host PC.
Step3. Each LAN port connect host PXE PC and DUT BIOS enable PXE function.
Step4. BIOS select boot from LAN.
Step5. Test each LAN port WOL function properly which from OS shutdown and Dos power off.
Step6. Client PC to install and execute iperf and host PC execute iperf –s
Step7. Iperf test with 1G, 100M, 10M switch/Hub. ; 10G & 40G iperf test with Host PC.
<#yum install iperf>
<#iperf –c 192.168.3.58 –w 100M –t 60 –i 1>

Test result:

Test item	LAN 1~4 1G			LAN 5~8 1G			Note
	Pass	Fail	N/A	Pass	Fail	N/A	
Internet Browser (DHCP Server) Ping website(8.8.8.8) should work properly	☒	☐	☐	☒	☐	☐	
10G / 40G ping Host PC Ping Host PC should work properly	☐	☐	☒	☐	☐	☒	
LAN Boot (PXE) Boot from LAN should work properly	☒	☐	☐	☐	☐	☒	LAN1/LAN2
Wake On LAN WOL should work properly when resume from S5/Dos off	☒	☐	☐	☒	☐	☐	
40Gbps connection Iperf test result should not loss and max bandwidth must be in 20GB or more.	☐	☐	☒	☐	☐	☒	
10Gbps connection Iperf test result should not loss and max bandwidth must be in 9GB or more.	☐	☐	☒	☐	☐	☒	

1Gbps connection Iperf test result should not loss and max bandwidth must be in 900MB or more.	☒	☐	☐	☒	☐	☐	LAN7/8 RJ45 or Fiber
100Mbps connection Iperf test result should not loss and max bandwidth must be in 90MB or more.	☒	☐	☐	☒	☐	☐	
10Mbps connection Iperf test result should not loss and max bandwidth must be in 9MB or more.	☒	☐	☐	☒	☐	☐	

2.11. Digital IO Function Test

Procedure:

Step1. Use SDK to set DIO high/low output.
Step2. Use meter to measure DIO output value.

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	DIO ports should be controlled correct by SDK.	☒	☐	☐	

2.12. TPM1.2 Function Test

Procedure:

Step1. Enable BIOS\TPM device and status.
Step2. Download tpm-tool in Linux environment.
<Ubuntu# sudo apt-get install tpm-tool >
<CentOS # rpm –iv tpm-tools-1.3.8-6.el7.i686.rpm>
Step3. Type “sudo service tcsd start” and “tpm_version” to see the information of TPM module in used. Then, use “tpm_takeownership” to add password to TPM module.
Step4. Generate a text file, then use “tpm_sealdata –i file_name –o key_name” to encrypt the file.
Step5. Use “tpm_unsealdata –i key_name –o file_name_2” to decryption the key to previous file. Please use “diff file_name file_name_2” to see if there’s any difference between 2 files.

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	TPM version should show correct.	☒	☐	☐	1.2.4.40
2	Add ownership password should work normal.	☒	☐	☐	
3	Encryption and decryption file should work properly.	☒	☐	☐	

2.13. Jumper and connector Function Test

Configuration:

Procedure:
Step1. Connect power button cable to CN1, check if power on /off can work properly.
Step2. Connect PS/2 keyboard / mouse to CN12, check if keyboard / mouse can work properly
Step3. Connect PWB/Reset/HDD LED/PWR LED cable to FP1, check if each function can work properly
Step4. JP1 jumper set 2-3 close, check if system auto power on when insert AC power cord.
Step5. Use meter to measure the CFD voltage.
Step6. Connect IPMI module and open JP3, check if IPMI function can work properly.
Step7. Remove AC power cord and CMOS jumper set 2-3 close, check if CMOS all data will be cleaned.

Test result:

No.	Test item	Result			Remark
		Pass	Fail	N/A	
1	CN1 Power switch	☐	☐	☒	
2	CN31 PS/2 Keyboard, mouse.	☒	☐	☐	
3	FP1 1-2 Power Button / 5-6 PWR LED 3-4 Reset / 7-8 PWR LED	☒	☐	☐	
4	FP2 2-4 PS/2 keyboard lock	☐	☐	☒	
5	JP1 Auto power 1-2 disable 2-3 enable	☒	☐	☐	
6	CN27 CFD voltage 1-2 5V 2-3 3.3V	☒	☐	☐	
7	JP3 IPMI PWRBTN close with IPMI Open W/O IPMI	☐	☐	☒	
8	CN14 1-3 2-4 Normal 3-5 4-6 Clear CMOS	☒	☐	☐	

2.14. NIM Slot Function Test

2.14.1. 1G NIM card
Configuration:
1G switch: D-Link DGS-1210-16
100 meters CAT6 cable
NIM-C13B A1.0

Procedure:
Step1. Each LAN port connect DHCP server.
Step2. Connect internet and ping Google (8.8.8.8).
Step3. Each LAN port connect host PXE PC and DUT BIOS enable PXE function.
Step4. BIOS select boot from LAN.
Step5. Test each LAN port WOL function properly which from OS shutdown and Dos power off.
Step6. Client PC to install and execute iperf and host PC execute iperf –s (Windows OS)
Step7. Iperf test with Gigabit switch/Hub.
<#yum install iperf>
<#iperf –c 192.168.3.58 –w 100M –t 60 –i 1>

Test result:

Test item	LAN 1~4 1G			LAN 5~8 1G			Note
	Pass	Fail	N/A	Pass	Fail	N/A	

Internet Browser (DHCP Server) Ping website(8.8.8.8) should work properly	☒	☐	☐	☒	☐	☐	
LAN Boot (PXE) Boot from LAN should work properly	☐	☐	☒	☐	☐	☒	Not support
Wake On LAN WOL should work properly when resume from S5/Dos off	☐	☐	☒	☐	☐	☒	Not support
1Gbps connection Iperf test result should not loss and max bandwidth must be in 900MB or more.	☒	☐	☐	☒	☐	☐	Test max bandwidth: 942 MB/s

2.14.2. 10G NIM card
Configuration:
10G NIM card: NIM-S26C A1.0
10G HOST PC

Procedure:
Step1. Each LAN port connects to 10G HOST PC.
Step2. Ping HOST PC (192.168.100.xx).
Step3. Client PC to install and execute iperf3 and HOST PC execute iperf3 –s
Step4. Iperf test for 10G bandwidth.
<#iperf3 –c 192.168.100.10 –t 60 –i 1>

Test result:

Test item	LAN 1~2 10G			LAN 3~4 10G			Note
	Pass	Fail	N/A	Pass	Fail	N/A	
Ping HOST PC(192.168.100.xx) should work properly	☒	☐	☐	☒	☐	☐	
10Gbps connection Iperf test result should not loss and max bandwidth must be in 9GB or more.	☒	☐	☐	☒	☐	☐	

2.14.3. 40G NIM card
Configuration:
40G NIM card: NIM-S26B A0.1
40G HOST PC.

Procedure:
Step1. Each LAN port connects to 40G HOST PC.
Step2. Ping HOST PC (192.168.100.xx).
Step3. Client PC to install and execute iperf3 and HOST PC execute iperf3 –s
Step4. Iperf test for 40G bandwidth.
<#iperf3 –c 192.168.100.10 –t 60 –i 1>

Test result:

Test item	LAN 1 40G			LAN2 40G			Note
	Pass	Fail	N/A	Pass	Fail	N/A	

Ping HOST PC(192.168.100.xx) should work properly	☒	☐	☐	☒	☐	☐	
40Gbps connection Iperf test result should not loss and max bandwidth must be in 20GB or more.	☒	☐	☐	☒	☐	☐	

4. Time Accuracy Test

4.1. System Clock & RTC Clock Test

Procedure:

Step1. Check RTC time deviation after 24 hrs at power on status.
Step2. Check RTC time deviation after 24 hrs at power off status.
Step3. Press power button to check system with “beep” sound.
Step4. Run watchdog timer test with last version SDK.
<#chmod 777 superio>
<#./superio -w 10> to set time for 10sec, 60sec, 255sec

Test Result:
Under Room Temperature: 26 ºC

No.	Test item	Actual		Result			Remark
				Pass	Fail	N/A	
1	RTC Clock in Power On less 2 sec deviation	-1	Sec	☒	☐	☐	
2	RTC Clock in Power Off less 2 sec deviation	-1	Sec	☒	☐	☐	
3	System boot on in 60 sec	10	Sec	☒	☐	☐	
4	Watch dog time in 10+/-10% sec	10	Sec	☒	☐	☐	
5	Watch dog time in 60+/-10% sec	60	Sec	☒	☐	☐	
6	Watch dog time in 255+/-10% sec	254	sec	☒	☐	☐	

5. Power Consumption Test

Configuration	
CPU	Intel® Xeon® Processor E3-1225 v5 (8M Cache, 3.30 GHz)
Memory	Innodisk DDR4 2400 16GB M4U0-AGS1KCSJ-26 SEC K4A8G085WB x4
Storage	ADATA SSD SX900 128GB
O.S	CentOS7 kernel:3.10.0-229.el7.x86_64

5.1. Power Consumption

Test Equipment				
Equipment	Programmable AC Source			
Manufacturer	Chroma			
Model name	61604			
Test Environment				
ATX Power Model	FSP FSP250-50LC 250W			
Power Supply		**P**		**Note**
Full Loading Mode Test AP: Stress Test	+100VAC 60Hz	77	W	# stress –c 4 (CPU total cores)
Win. Idle mode: Measure the current value when system in windows mode and without running any program	+100VAC 60Hz	32	W	
S5 mode: Measure the current value when system in S5 mode of windows and without running any	+100VAC 60Hz	2.7	W	

5.2. PC Health Status

Procedure:

Step1. Use meter to measure each voltage of H/W monitor supported.
Step2. Use thermometer to measure each Temp of H/W monitor supported.
Step3. Use Tachometer to measure each FAN speed of H/W monitor supported.

Test Result:

H/W monitor	Result			BIOS		Actual		Note
	Pass	Fail	N/A					
(+) Vcore Actual and monitor must be ±5%	☒	☐	☐	1.04	V	1.04	V	
(+) VMEM Actual and monitor must be ±5%	☒	☐	☐	1.212	V	1.2	V	
(+) 12V Actual and monitor must be ±5%	☒	☐	☐	12.08	V	12.11	V	
(+) 5V Actual and monitor must be ±5%	☒	☐	☐	4.98	V	5.08	V	
(+) 5VDual Actual and monitor must be ±5%	☒	☐	☐	5.01	V	5.00	V	
VBAT Actual and monitor must be ±5%	☒	☐	☐	3.02	V	3.09	V	
CPU Fan1 Speed	☒	☐	☐	16875	Rp	16000	rpm	

Actual and monitor must be ±10%					m			
CPU Fan2 Speed Actual and monitor must be ±10%	☒	☐	☐	16875	rpm	16000	rpm	
Chassis FAN Speed Actual and monitor must be ±10%	☒	☐	☐	16875	rpm	16000	rpm	
CPU Temp Actual and monitor must be ±15℃	☒	☐	☐	60	℃	57	℃	
System Temp Actual and monitor must be ±5℃	☒	☐	☐	38	℃	36	℃	

5.3. CMOS Battery Test

Procedure:

Step1. DUT AC loss, use meter to measure voltage of CMOS battery

Step2. Use ammeter to measure current of CMOS battery.

Test Result:

(Calculate result=225mA/measured current / 365days/24hours)

Check item	Measured Voltage		Measured Current		Calculate Result		Result			Note
							Pass	Fail	N/A	
Battery leakage 1. Voltage should be >3V. 2. Calculated result should be > 5 years.	3.11	V	3.4	uA	7.5	years	☒	☐	☐	

6. Hardware Compatibility Test

6.1. CPU Compatibility Test

Procedure:

Step1. Check CPU information and frequency should show correct value during POST screen and O.S.
<Linux CPU info # dmidecode -t processor|grep "Version:">

Step2. CPU supported must meet specification.

Test Result:

Test item	Result			Note
	Pass	Fail	N/A	
Below CPU information and frequency should show correct value				
Intel® Xeon® Processor E3-1225 v5 (8M Cache, 3.30 GHz)	☒	☐	☐	
Intel® Core™ i7-6700K Processor (8M Cache, up to 4.20 GHz)	☒	☐	☐	
Intel® Core™ i7-6700 Processor (8M Cache, up to 4.00 GHz)	☒	☐	☐	
Intel® Core™ i5-6500TE Processor (6M Cache, up to 3.30 GHz)	☒	☐	☐	
Intel® Pentium® Processor G4400 (3M Cache, 3.30 GHz)	☒	☐	☐	
Intel Core i7-7700 Processor (3.60GHz / Cache: 8 MB / C/T:4/8	☒	☐	☐	
Intel Core i7-7500 Processor (3.40GHz / Cache: 6 MB / C/T:4/	☒	☐	☐	
Intel Core i7-7700T Processor (2.9GHz / Cache: 8MB / C/T:4/8)	☒	☐	☐	
Intel Core i7-7500T Processor (2.4GHz / Cache: 6 MB / C/T:4/	☒	☐	☐	

6.2. Memory Compatibility Test

Procedure:

Step1. Boot up function test

Step2. Check Memory frequency should show correct value during POST screen and O.S.
<Linux Memory info # dmidecode -t memory|grep "Size:">

Step3. Memory supported must meet specification.

Test Result:

Test item	AAEON P/N	Result			Note
		Pass	Fail	N/A	
a. Boot up normal. b. Below Memory Information and frequency should show correct value.					
U-DIMM					
ADATA DDR4 2133 16GB Hynix H5AN8G8NMFR	N/A	☒	☐	☐	
ADATA DDR4 2133 16GB SEC K4A8G085WB	N/A	☒	☐	☐	
Transcend DDR4 2400 16GB SEC K4A8G085WB	N/A	☒	☐	☐	
Transcend DDR4 2133 16GB SEC K4A8G085WB	N/A	☒	☐	☐	

Transcend DDR4 2133 8GB SEC K4A4G085WD	N/A	☒	☐	☐	
Transcend DDR4 2133 4GB SEC K4A4G085WD	N/A	☒	☐	☐	Single side.
Innodisk DDR4 2400 16GB M4U0-AGS1KCSJ-26 SEC K4A8G085WB	N/A	☒	☐	☐	
Innodisk DDR4 2133 16GB M4U0-AGS1KCRG-26 SEC K4A8G085WB	N/A	☒	☐	☐	
Innodisk DDR4 2133 8GB M4U0-8GSSKCRG-26 SEC K4A4G085WD	N/A	☒	☐	☐	
Innodisk DDR4 2133 4GB M4U0-4GSSJCRG-26 SEC K4A4G085WD	N/A	☒	☐	☐	Single side.
ECC					
Innodisk DDR4 2133 8GB M4C0-8GSSMCRG-26 SEC K4A4G085WE	N/A	☒	☐	☐	

6.3. SATA Compatibility Test

6.3.1 SATA IDE / AHCI Mode

Procedure:

Step1. BIOS select IDE mode, check SATA devices information/ size should show correct value in BIOS setup.

Step2. BIOS select AHCI mode, check SATA devices information/ size should show correct value in BIOS setup.

Step3. Boot into OS, check SATA devices information/size should show correct value.

OS: CentOS7 kernel:3.10.0-229.el7.x86_64

Test Result:

Test item			Result			Note
			Pass	Fail	N/A	
a. Below SATA devices information and size should show correct value with AHCI mode.						
SATAII	Toshiba MK1676GSX 2.5” 160GB		☒	☐	☐	
SATAII	WD WD250OBPVT 2.5” 250GB		☒	☐	☐	
SATAIII	WD WD3200LPVX 2.5” 320GB		☒	☐	☐	
SATAIII	Seagate ST500DM002 3.5” 500GB		☒	☐	☐	
SATAIII	TOSHIBA HDS721010DLE630 3.5” 1TB		☒	☐	☐	
SATAIII	WD WD20EZRX 3.5” 2TB		☒	☐	☐	
SATAIII	Seagate ST3000DM001 3.5” 3TB		☒	☐	☐	
SSD	ADATA SSD SX900 128GB		☒	☐	☐	
SSD	Transcend TS32GSSD370 2.5”.32GB.SATA III SSD MLC.	968C032G2D	☒	☐	☐	
SSD	Transcend.TS64GSSD370 2.5”.64GB. SATA III.SSD.MLC	968C64G003	☒	☐	☐	
SSD	Transcend.TS128GSSD370 2.5” SATA3 SSD.128GB.MLC.	968C128G0W	☒	☐	☐	
SSD	2.5" .16GB 3MG2-P 15nm.SATA III MLC SSD.Innodisk MLC .0℃ ~ +70℃.DGS25-16GD81BC3SC-26	AP-SS968C016G3K	☒	☐	☐	

SSD	(TF)2.5".32GB 3MG2-P 15nm.SATA SSD MLC.0~70°C.HIGH IOPS.innodisk.DGS25-32GD81 BC3DC-26	AP-SS968C032G1P	☒	☐	☐	
SSD	(TF)2.5".64GB.SATA MLC SSD .3MG2-P 15nm.0~70°C.HIGH IOPS.innodisk.DGS25-64GD81 BC3QC-26	968C064G39	☒	☐	☐	
SSD	2.5' MLC SSD 128GB 3MG2-P 15nm.SATA 0℃~+70℃.InnoDisk.DGS25-A2 8D81BC3QC-26	AP-SS968C128G1P	☒	☐	☐	
SSD	2.5".256GB.SATA MLC SSD 3MG2-P 15nm.0~70°C.HIGH IOPS.innodisk.DGS25-B56D81B C3QC-26	AP-SS968C256G16	☒	☐	☐	

6.3.2 SATA RAID Mode

Procedure:

Step1. BIOS select RAID mode and press Ctrl +I during POST screen for RAID setting.

Step2. Test with RAID 0 / 1 / 5 /10 respectively, check RAID function is work properly.

Test Result:

Test item	HDD	Criteria	Result			Note
			Pass	Fail	N/A	
RAID-0 (HDDx2) Striping/Span Test	WD WD5000LPVX 2.5" 500GB	Installation should without error.	☒	☐	☐	CentOS7 / Ubuntu16.10
		RAID0 size should be (disk1+disk2)	☒	☐	☐	
		Read performance should > AHCI mode 50%	☒	☐	☐	AHCI read performance is 105.4MB/s. RAID0 read performance is 180.63MB/s
RAID-1 (HDDx2) Mirror Test	WDC WD20EZRX-00DC0B0 2TB	Installation should without error.	☒	☐	☐	CentOS7 / Ubuntu16.10
		Reject one of RAID HDD, system should still work normal.	☒	☐	☐	
		Reconnect HDD, system resync function should work properly.	☒	☐	☐	

6.4. Flash Card Compatibility Test

Procedure:

Step1. Connect Flash card and boot into BIOS, check Flash card information is correct.

Step2. Boot into OS.

Step3. Test Flash read / write function.

OS: CentOS7 kernel:3.10.0-229.el7.x86_64

Test Result

Test Item	AAEON P/N	Result			Note
		Pass	Fail	N/A	

a. CF information and size should show correct value. b. R/W function should work properly.					
Innodisk iCF9000 64GB	N/A	☒	☐	☐	
Innodisk iCF9000 32GB	N/A	☒	☐	☐	
Innodisk iCF4000 16GB	N/A	☒	☐	☐	
Innodisk iCF8000 4GB standard	N/A	☒	☐	☐	
Transcend CF220I 4GB	N/A	☒	☐	☐	
Transcend TS4GCF266 4GB	N/A	☒	☐	☐	
Transcend Ultra 4GB industrial	N/A	☒	☐	☐	
a. CFast information and size should show correct value. b. R/W function should work properly.					
Innodisk.DECFA-04GD07AC2DT-26 4G.SLC	968C004G0P	☒	☐	☐	
InnoDisk.DECFA-08GD07RC2SC-26 8GB.MLC.3ME.	AP-SS968C00 8G10	☒	☐	☐	
Innodisk.3ME.DECFA-16GD07RC2DC-26 16GB.MLC.	968C016G4C	☒	☐	☐	
Innodisck.DECFA-32GD07RC2DC-26 SATA3.MLC.32GB	968C032G2B	☒	☐	☐	
Innodisck.DECFA-64GD07RC2DC-26 SATA3.MLC.64GB.CFAST.	AP-SS968C06 4G2T	☒	☐	☐	
Innodisck.DECFA-A28D07RC2DC-26 SATA3.MLC.128GB	AP-SS968C12 8G19	☒	☐	☐	
a. mSATA information and size should show correct value. b. R/W function should work properly.					
Transcend.TS16GMSA370 Full-size mSATA.16GB.MLC.	AP-SS968C016 G2Z	☒	☐	☐	
Transcend.TS32GMSA370 Full-size mSATA.32GB.MLC.	968C032G32	☒	☐	☐	
Transcend.TS64GMSA370 (TF)Full-size.64GB.mSATA.MLC	968C064G2K	☒	☐	☐	
Innodisk full size mSATA.8GB 3ME3	CTOS	☒	☐	☐	
Innodisk full size mSATA.16GB 3ME3	CTOS	☒	☐	☐	
Innodisk full size mSATA.32GB 3ME3	CTOS	☒	☐	☐	
Innodisk full size mSATA.64GB 3ME3	CTOS	☒	☐	☐	
Innodisk full size mSATA.128GB 3ME3	CTOS	☒	☐	☐	

6.5. USB Compatibility Test

Procedure:

Step1. Insert USB device to USB2.0 / 3.0 ports.

Step2. Test each USB device function.

OS: CentOS7 kernel:3.10.0-229.el7.x86_64

Test Result

Test Item		Result			Note
		Pass	Fail	N/A	
USB devices function should work properly.					
keyboard	Logitech K200	☒	☐	☐	
Mouse	Logitech M-U0003	☒	☐	☐	
DVD ROM	ASUS SBW-06D2X-U	☒	☐	☐	
HUB	Mini 4ports HUB High speed USB2.0	☒	☐	☐	
HDD	Transcend TS500GSJ25D3 USB3.0 500GB	☒	☐	☐	
USB2.0	Sandisk cruzer 8GB	☒	☐	☐	

Flash	Transcend16GB	☒	☐	☐	
USB3.0 Flash	Kingston Ultimate G2 16GB	☒	☐	☐	
	Transcend 32GB	☒	☐	☐	
	PNY 128GB	☒	☐	☐	

6.6. PCI-Express Compatibility Test:

Procedure:

Step1. Connect PCI-e device and boot into OS.

Step2. Test PCI-e card basic function.

OS: CentOS7 kernel:3.10.0-229.el7.x86_64

Test result:

PCI-Express Bear card Test		**Result**			**Note**
		Pass	**Fail**	**N/A**	
Test result should show Pass as below item					
Test with PCI-e 8X		☒	☐	☐	Test with GEN3 bear card
Test with PCI-e 4X		☒	☐	☐	X4 / Gen2
PCI-Express x1 card		**Result**			**Note**
		Pass	**Fail**	**N/A**	
Function should work properly as below item					
Intel Gigabit CT Desktop Adapter	8x slot	☒	☐	☐	
Realtek RTL8111E Gigabit LAN card	8x slot	☒	☐	☐	
Uptech UTB242 USB3.0 4ports	8x slot	☒	☐	☐	
Digifusion STATIII card ASM1061	8x slot	☐	☐	☒	Not compatible. CRB same issue.
Moxa Multi serial ports Moxa CP-118EL-A	8x slot	☒	☐	☐	lspci detection only, no driver support kernel 3.10.0
Graphics card SFPX84 A8.2	8x slot	☒	☐	☐	
PCI-Express x4 card		**Result**			**Note**
		Pass	**Fail**	**N/A**	
Function should work properly as below item	(Slot1 /2)				
Intel Gigabit ET2 Quad Port Svr Adapter	8x slot	☒	☐	☐	
Intel Pro/1000 PF Dual Port	8x slot	☒	☐	☐	
AAR-1430SA Adaptec SATA card	8x slot	☐	☐	☒	Not compatible. CRB same issue.
PLEXTOR PX-AG128M6e 128GB	8x slot	☒	☐	☐	Read: 760MBps.
PCI-Express x8 card		**Result**			**Note**
		Pass	**Fail**	**N/A**	
Function should work properly as below item	(Slot1 /2)				
ASUS Radeon R7 250 8x Graphics card	8x slot	☒	☐	☐	

6.7. NIM Card Compatibility Test

Procedure:

Step1. Connect NIM device and boot into Linux OS.

Step2. Test NIM card basic LAN function.

Test result:

NIM card information and test item		Result			Note
		Pass	Fail	N/A	
NIM-C13B	Visit Web-side should work properly	☒	☐	☐	
	ByPass should work properly	☒	☐	☐	
NIM-C13D	Visit Web-side should work properly	☒	☐	☐	
	ByPass should work properly	☐	☐	☒	
NIM-S13B	Visit Web-side should work properly	☒	☐	☐	
	ByPass should work properly	☐	☐	☒	
NIM-S13D	Visit Web-side should work properly	☒	☐	☐	
	ByPass should work properly	☐	☐	☒	
NIM-S13E	Visit Web-side should work properly	☒	☐	☐	
	ByPass should work properly	☐	☐	☒	
NIM-S26C 10G	Ping server should work properly	☒	☐	☐	
	ByPass should work properly	☐	☐	☒	
NIM-S26B 40G	Ping server should work properly	☒	☐	☐	
	ByPass should work properly	☐	☐	☒	

7. O.S Compatibility Test

7.1. Linux OS Compatibility Test

Procedure:

Step1. Install Linux x86 & x64 serial from USB DVD ROM.
Step2. Enter lspci command detect H/W.
Step3. Enter dmesg or dmesg|mort, review dmesg log to find out the error and warning key words.
Step4. Install all required driver to system.
Step5. Execute the following command to test driver and verify
Step 5.1 Driver install
(1) Checked whether the command "Insmod drivername" can function normally, or not.
(2) Checked whether the command "rmmod drivername" can successful uninstall the driver, or not
Step 5.2 Force speed
(1) Execute command “ethtool –s ethx autoneg off speed 1000” ,link cable to confirm speed light is orange
(2) Execute command “ethtool –s ethx autoneg off speed 100” ,link cable to confirm speed light is green
(3) Execute command “ethtool –s ethx autoneg off speed 10” ,link cable to confirm speed light is blank
Step 5.3 ifconfig Ethernet
(1) Execute command “ifdown ethx” close ethernet interface
(2) Execute command “ifup ethx” start ethernet interface
Step 5.4 Jumbo Frame
Setting #ifconfig LAN mtu 9000
Check #ifconfig LAN (mtu will change from 1500 to 9000)
Step 6 Enter ping Google command (ping 8.8.8.8), test network function is whether normal
Step 7 Execute command “init 0” or “shutdown –h” to shutdown system.
Step 8 Execute command “init 6” or “reboot” to reset system.
Step 9 Execute command “systemctl suspend –i” to suspend system.

Test result:

7.1.1 CentOS7 kernel:3.10.0-229.el7.x86_64

Test Item		Result			Note
		Pass	Fail	N/A	
System should not any error during install process.		☒	☐	☐	leagacy
lspci to check H/W device.		☒	☐	☐	
Record log file which was error or warring key words.		☒	☐	☐	
System should not error during LAN driver installation.		☒	☐	☐	igb-5.3.3.5.tar.gz
Force speed	LAN connection speed should show 1000Mb when execute command “ ethtool –s ethx autoneg off speed 1000”	☒	☐	☐	
	LAN connection speed should show 100Mb when execute command “ ethtool –s ethx autoneg off speed 100”	☒	☐	☐	
	LAN connection speed should show 10Mb when execute command “ ethtool –s ethx autoneg off speed 10”	☒	☐	☐	

Ifconfig	Ethernet interface should be closed when execute command ““ifdown ethx”	☒	☐	☐	
	Ethernet interface should be started when execute command ““ifup ethx”	☒	☐	☐	
Jumbo	Jumbo function should work properly	☒	☐	☐	
Connected internet and ping the website should work properly. (Google: 8.8.8.8)	Onboard port1~8	☒	☐	☐	
	1G NIM module: port 1~8 <NIM-C13B>	☒	☐	☐	
Ping the HOST PC should work properly.	10G NIM module: port 1~4 <NIM-S26C>	☒	☐	☐	
Ping the HOST PC should work properly.	40G NIM module: port 1~2 <NIM-S26B>	☒	☐	☐	
Shutdown	System should be shutdown when execute command "init 0"	☒	☐	☐	
Reboot	System should be reset when execute command "init 6"	☒	☐	☐	
Suspend	Suspend and resume function should work normal	☐	☐	☒	BIOS not support ACPI S3/S4

7.1.2 Ubuntu16.04 x86_64 kernel 4.4.0-21-generic

Test Item		Result			Note
		Pass	Fail	N/A	
System should not any error during install process.		☒	☐	☐	UEFI
Ispci to check H/W device.		☒	☐	☐	
Record log file which was error or warring key words.		☒	☐	☐	
System should not error during LAN driver installation.		☒	☐	☐	igb-5.3.3.5.tar.gz
Force speed	LAN connection speed should show 1000Mb when execute command “ ethtool –s ethx autoneg off speed 1000”	☒	☐	☐	
	LAN connection speed should show 100Mb when execute command “ ethtool –s ethx autoneg off speed 100”	☒	☐	☐	
	LAN connection speed should show 10Mb when execute command “ ethtool –s ethx autoneg off speed 10”	☒	☐	☐	
Ifconfig	Ethernet interface should be closed when execute command ““sudo nmcli networking off”	☒	☐	☐	Ubuntu16.04 is not support ifdown ethx ; ifup ethx command
	Ethernet interface should be started when execute command ““sudo nmcli networking on”	☒	☐	☐	
Jumbo	Jumbo function should work properly	☒	☐	☐	
Connected internet and ping the website should work properly. (Google: 8.8.8.8)	Onboard port1~8	☒	☐	☐	
	1G NIM module: port 1~8 <NIM-C13B>	☒	☐	☐	
Ping the HOST PC should work properly.	10G NIM module: port 1~4 <NIM-S26C>	☒	☐	☐	
Ping the HOST PC should work properly.	40G NIM module: port 1~2 <NIM-S26B>	☒	☐	☐	

Shutdown	System should be shutdown when execute command "init 0"	☒	☐	☐	
Reboot	System should be reset when execute command "init 6"	☒	☐	☐	
Suspend	Suspend and resume function should work normal	☐	☐	☒	Not suspend S3/S4

7.2. 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. Insert USB flash disk, check each USB port function and performance.
Step5. Connect VGA / HDMI monitor and check display function.
Step6. Connect null cable between DUT and Host, and execute hyper terminal to test Console / com port transmission function. (Baud rate: 115200 bps)
Step5. ACPI S5 and reset function test.
Step6. ACPI S3 and S4 function test if support graphics driver.

Test result:

7.2.1 Windows 10 Enterprise 64bit English version

Test Item		Result			Note
		Pass	Fail	N/A	
System should not any error during install process.		☒	☐	☐	UEFI mode
All required driver should be installed.		☒	☐	☐	
Connected internet and ping the website should work properly. (Google: 8.8.8.8)	Onboard port1~8	☒	☐	☐	
	NIM module: port 1~8 <NIM-C13B>	☒	☐	☐	
Ping the HOST PC should work properly.	10G NIM module: port 1~4 <NIM-S26C>	☒	☐	☐	
Ping the HOST PC should work properly.	40G NIM module: port 1~2 <NIM-S26B>	☒	☐	☐	
USB ports should work properly and speed should meet specification.		☒	☐	☐	USB3.0 X4
Monitor should display normal and should detect monitor EDID.	VGA	☒	☐	☐	
	HDMI	☒	☐	☐	
Transmission should work properly. Baud rate: 115200bps	Console (COM0)	☒	☐	☐	
	COM1	☒	☐	☐	
Shutdown	System should be shutdown when click “shutdown” icon	☒	☐	☐	
Reboot	System should be reset when click "Reset" icon.	☒	☐	☐	
S3	System should be sleep when click "Sleep" icon and resume function should work properly.	☐	☐	☒	
S4	System should be sleep when click "Sleep" icon and resume function should work properly.	☐	☐	☒	

8. BIOS Function Test

Procedure:

Step1. Flash BIOS process will complete and run correctly
Step2. Press Keyboard " DEL" Key into BIOS.
Step3. To ensure the BIOS setting can be controlled correctly.
Step4. Please add or del test item from your test BIOS Version.

Test Result:

8.1. Flash BIOS

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
*Execute Go.bat for flash BIOS	☒	☐	☐	
*Press keyboard Del into BIOS setup	☒	☐	☐	

8.2. Advanced Test

Test Item (Following item should work properly)			Result			Note
			Pass	Fail	N/A	
CPU Configuration	CPU info.		☒	☐	☐	
	Hyper-threading		☒	☐	☐	
	Active processor cores		☒	☐	☐	
	Intel SpeedStep		☒	☐	☐	
Trusted Computing	security device support		☒	☐	☐	Enable Disable
	TPM status		☒	☐	☐	Enable Disable
	Clear TPM		☒	☐	☐	
SATA Configuration	SATA info.		☒	☐	☐	
	SATA controller		☒	☐	☐	
	AHCI Mode		☒	☐	☐	
	Hot plug		☒	☐	☐	
	Intel RST Premium (RAID)		☒	☐	☐	Support SATA1~5 , port6/7 not support.
SIO configuration	Serial Port 1		☒	☐	☐	
	Serial Port 2		☒	☐	☐	
	Parallel Port		☒	☐	☐	
HW Monitor	Temp / voltage Value		☒	☐	☐	
SmartFAN	FAN1	Full	☒	☐	☐	
		Manual	☒	☐	☐	255/127/10/0: <set 0=2667 rpm>
		auto	☒	☐	☐	Source: CPU Temp / System Temp
	FAN2	Full	☒	☐	☐	
		Manual	☒	☐	☐	255/127/10/0: <set 0=2667 rpm>
		auto	☒	☐	☐	Source: CPU Temp / System Temp
	FAN3	Full	☒	☐	☐	
		Manual	☒	☐	☐	255/127/0: <set 0=2667 rpm>
		auto	☒	☐	☐	Source: CPU Temp / System Temp
DIO			☒	☐	☐	0~7
Power manager	Power Mode	AT	☒	☐	☐	
		ATX	☒	☐	☐	
	AC power loss	Power on	☒	☐	☐	
		Power off	☒	☐	☐	
		Last state	☒	☐	☐	

	RTC wake system from S5	Fixed Time	☒	☐	☐	
		Dynamic Time	☒	☐	☐	
LAN Bypass Config	Status LED		☒	☐	☐	LED off/RED on/RED Blink/RED Fast Blink/Green on/Green Blink/Green Fast blink
	LAN kit1	Power on	☒	☐	☐	PassTru / Bypass
		Power off	☒	☐	☐	PassTru / Bypass
	LAN kit2	Power on	☒	☐	☐	PassTru / Bypass
		Power off	☒	☐	☐	PassTru / Bypass
	LAN kit3	Power on	☒	☐	☐	PassTru / Bypass
		Power off	☒	☐	☐	PassTru / Bypass
	LAN kit4	Power on	☒	☐	☐	PassTru / Bypass
		Power off	☒	☐	☐	PassTru / Bypass
	LAN kit5	Power on	☒	☐	☐	PassTru / Bypass
		Power off	☒	☐	☐	PassTru / Bypass
	WDT	System Reset	☒	☐	☐	
		Force Bypass	☒	☐	☐	
Serial port console redirection	Enable / disable		☒	☐	☐	
	Baud rate: 9600/38400/115200		☒	☐	☐	

8.3.Chipset Test

Test Item (Following item should work properly)			Result			Note
			Pass	Fail	N/A	
System Agent (SA) Configuration PCH Config.	Memory Configuration		☒	☐	☐	
	Graphics Configuration	Primary Display	☒	☐	☐	Auto/IGFX/PEG
		IGFX boot display	☒	☐	☐	VBIOS / VGA / HDMI
		Secondary IGFX boot display	☒	☐	☐	Disable/ HDMI / VGA

8.4. Boot Test

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
Quiet Boot	☒	☐	☐	
Launch Intel PXE OpROM	☒	☐	☐	Support LAN1 /2
Boot From Hard Disk	☒	☐	☐	
Boot From USB HDD	☒	☐	☐	
Boot From USB CD-ROM	☒	☐	☐	
Boot from LAN	☒	☐	☐	
Disable	☒	☐	☐	

8.5. CMOS Backup / Clear CMOS Test

Test Item	Result	Note

(Following item should work properly)	Pass	Fail	N/A	
Clear CMOS Test by Jumper	☒	☐	☐	Clear All data and password
Clear CMOS Test by remove CMOS battery	☒	☐	☐	Clear All data and password

8.6. AAEON Tag Check Utility

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
Check AAEON BIOS OK	☒	☐	☐	AONCHECK.EXE

8.7. Supervisor / User Password Test

Test Item (Following item should work properly)	Result			Note
	Pass	Fail	N/A	
Administrator Password	☒	☐	☐	
User Password	☒	☐	☐	

8.8. Negative Test

8.8.1 USB Keyboard Negative Test

Methods	Result			Note
	Pass	Fail	N/A	
1. Boot into BIOS setup manual. 2. Press NumLock or ScrLk and press arrow key. 3. confirm arrow key function are normally	☒	☐	☐	

8.8.2 UEFI Mode Negative Test

Methods	Result			Note
	Pass	Fail	N/A	
1. Install Windows with UEFI mode. 2. Clear CMOS. 3. Confirm BIOS\Boot device was not loss “Windows boot manager” and should boot into Windows properly.	☒	☐	☐	

9. Stability Test

9.1. LAN Endurance Test

Configuration:

CPU: Intel® Core i® Processor i7-7700 (8M Cache, 3.6 GHz)
RAM: Transcend DDR4 2400 16GB SEC K4A8G085WB x4
Storage: Innodisk 3MG2-P 64GB
Graphics card: Onboard graphics
OS: CentOS5.6 Kernel 2.6.18-238.el5PAE
LAN: Intel I211AT
NIM module: NIM-C13B A1.0 (82580)

Procedure:

Step1. Use SmartBits to test LAN endurance.
Step2. Test Group: <LAN1-LAN2 bi-directional> ; <LAN3-LAN4 bi-directional>
<LAN5-LAN6 bi-directional>; <LAN7-LAN8 bi-directional>
Step3. To set Frame size=1518 / loading=100 / time=43200sec
Step4. Repeat step1~3 for NIM slot endurance test.

Test Result:

Test item	Result			Note
	Pass	Fail	N/A	
Onboard LAN1~8 Endurance Test <Test result should not frame loss.>	☒	☐	☐	
NIM Module LAN1~8 Endurance Test <Test result should not frame loss.>	☒	☐	☐	

Throughput Detail Report

Summary Report Stray Frames Report Port Errors Report Packet Rate Report

Name	Time	FrameSize	ILoad	TxFrames	RxFrames	LostFrames	Lost (%)	Throughput	Tx fps	Tx L2 bps	Rx fps	Rx L3 bps	Rx L2 bps
Total	11/18/16 06:59:24	1518	100.00000	32769829960	32769829960	0	0.00000	100.00000	650195	7999999758	650195	7802340467	7999999758
A Group	11/18/16 06:59:24	1518	100.00000	32769829960	32769829960	0	0.00000	100.00000	650195	7999999758	650195	7802340467	7999999758
A 1-1->1-2	11/18/16 06:59:24	1518	100.00000	4096228745	4096228745	0	0.00000	N/A	81274	999999970	81274	975292558	999999970
A 1-2->1-1	11/18/16 06:59:24	1518	100.00000	4096228745	4096228745	0	0.00000	N/A	81274	999999970	81274	975292558	999999970
A 1-3->1-4	11/18/16 06:59:24	1518	100.00000	4096228745	4096228745	0	0.00000	N/A	81274	999999970	81274	975292558	999999970
A 1-4->1-3	11/18/16 06:59:24	1518	100.00000	4096228745	4096228745	0	0.00000	N/A	81274	999999970	81274	975292558	999999970
A 2-1->2-2	11/18/16 06:59:24	1518	100.00000	4096228745	4096228745	0	0.00000	N/A	81274	999999970	81274	975292558	999999970
A 2-2->2-1	11/18/16 06:59:24	1518	100.00000	4096228745	4096228745	0	0.00000	N/A	81274	999999970	81274	975292558	999999970
A 2-3->2-4	11/18/16 06:59:24	1518	100.00000	4096228745	4096228745	0	0.00000	N/A	81274	999999970	81274	975292558	999999970
A 2-4->2-3	11/18/16 06:59:24	1518	100.00000	4096228745	4096228745	0	0.00000	N/A	81274	999999970	81274	975292558	999999970

9.2. Cold Boot Test

9.2.1 ACPI G3 Cold Boot Test

Configuration:

CPU: Intel Core i7-7700 Processor (3.60GHz / Cache: 8 MB / C/T:4/8)
RAM: Transcend DDR4 2400 16GB SEC K4A8G085WB x4
Storage: Transcend USB3.0 Flash 8GB
Graphics: Onboard Graphics
OS: DOS

Procedure:
Step1. Set BIOS\restore AC loss for always on.
Step2. Set power on with 60 second and power off with 20 second.
Step3. Run the on/off test over 1000 cycles to test system boot up stability at room temp.
Step4. Set H/W auto power on.
Step5. Set power on with 60 second and power off with 5 second.
Step6. Run the on/off test over 20 cycles to test system AC power restored in short time

Test Result:

Test item	Result			Note
	Pass	Fail	N/A	
G3(AC loss) cold boot over 1000 cycles Setting: Power on- 60sec ; Power off-- 20sec. <loss rate: 0 /1000 times>	☒	☐	☐	☐Jumper set auto power button ☒BIOS select " power on"
G3(AC loss) cold boot over 20 cycles Setting: Power on- 60sec ; Power off- 5sec. <loss rate: 0 /20 times>	☒	☐	☐	☒Jumper set auto power button

9.2.2 Power Button Cold Boot Test
Configuration:
CPU: Intel Core i7-7700 Processor (3.60GHz / Cache: 8 MB / C/T:4/8)
RAM: Transcend DDR4 2400 16GB SEC K4A8G085WB x4
Storage: Transcend USB3.0 Flash 8GB
Graphics: Onboard Graphics
OS: DOS

Procedure:
Step1. Set auto power on jumper for disable.
Step2. Set each ON/OFF cycle with 180 second.
Step3. Run the power button on/off test over 500 cycles to test system boot up stability at room temp.

Test Result:

Test item	Result			Note
	Pass	Fail	N/A	
Power button boot over 500 cycles <loss rate: 0 /500 times>	☒	☐	☐	

9.3. Memory Test
Configuration:
OS: DOS
Tool: Memtest86+ V5.01 above
Memory information: Transcend DDR4 2400 16GB SEC K4A8G085WB x 4
(SPEC max support size).

Test item	Result			Note
	Pass	Fail	N/A	
Memory Test for 3 loops. < Memtest result should not error or	☒	☐	☐	

hang..>				

Remark: If system support UEFI mode only, the test tool is [Memtest86 Version 5.0 Experimental UEFI Beta]

10. 1G LAN Performance Test

10.1 DUT and Test Equipment

10.1.1. DUT Specification

Hardware:

- Model name: FWS-7821 (FWB-7821 A0.2) (RJx6 + Fiber x2)
- CPU: Intel® Core i® Processor i7-7700 (8M Cache, 3.6 GHz)
- RAM: Transcend DDR4 2400 16GB SEC K4A8G085WB x4
- HDD: Innodisk 3MG2-P 64GB
- NIM module: NIM-C13B A1.0 (82580)

Software:

- BIOS: FWS-7821 R0.3 (K782CM03)(11/08/2016)
- Operating System: CentOS5.6 Kernel 2.6.18-238.el5PAE
- NIM LAN driver: igb5.2.5 Intel Gigabit Ethernet Network Driver

10.1.2. Test Equipment Specification

SPIRENT Smartbits

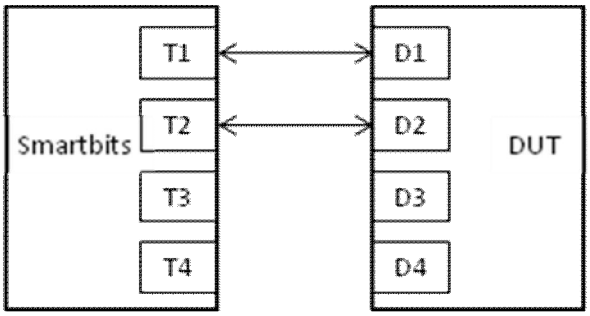
- Chassis: SPIRENT Smartbits 600B
- Chassis Version: 2.80.003 (Cur) 2.50.000
- Chassis Serial #: 06014047
- Library: 6.00-29
- API: 5.50.42.01
- File: 0550042
- Module: 2 * LAN-3324A SmartMetrics XD 4-Port 10/100/1000Base-T Gigabit Ethernet
- Test Software: SmartFlow5.50.42.1

10.2 RFC-2544 performance test (2 port)

10.2.1. Throughput test (2 port)

Test Description:

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

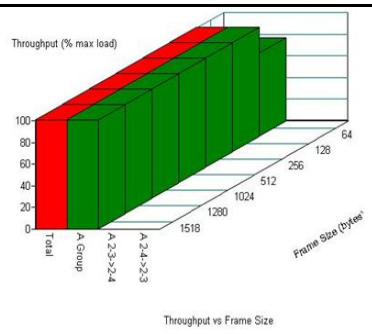


3. Smartflow\Test Group to add port1<->port2 with Bi-directional,
4. The tester set loading traffic from 1% to 100% and the traffic step is 50%.
5. Interaction Constants Duration Time Set to 60 Sec.
6. Test all LAN ports performance.

Test Result:

Test Group: <LAN1-LAN2 bi-directional>

Speed: 1000_Full	Frame Size(bytes)						
LAN ports	64	128	256	512	1024	1280	1518
1-2	76.79	100	100	100	100	100	100
3-4	76.02	100	100	100	100	100	100
5-6	76.79	100	100	100	100	100	100
7-8	76.02	100	100	100	100	100	100
NIM 1-2	100	100	100	100	100	100	100
NIM 3-4	100	100	100	100	100	100	100
NIM 5-6	100	100	100	100	100	100	100
NIM 7-8	100	100	100	100	100	100	100



Throughput vs Frame Size

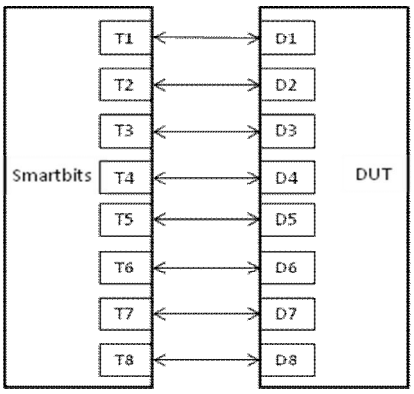
Name/Framesize	64	128	256	512	1024	1280	1518
Total	76.0234375	100	100	100	100	100	100
A Group	76.0234375	100	100	100	100	100	100
A 2-3->2-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 2-4->2-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

10.3 RFC-2544 performance test (8 ports)

10.3.1. Throughput test

Test Description:

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

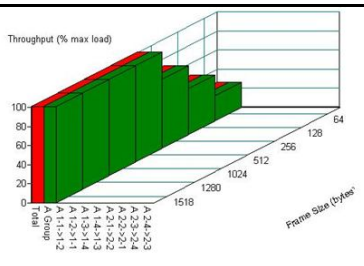


3. Smartflow\Test Group to add port1<->port2 with Bi-directional, port3<->port4 with Bi-directional, port5<->port6 with Bi-directional, port7<->port8 with Bi-directional.
4. The tester set loading traffic from 1% to 100% and the traffic step is 50%.
5. Interaction Constants Duration Time Set to 60 Sec.
6. Test all LAN ports performance.

Test Result:

Test Group: <LAN1-LAN2 bi-directional> ; <LAN3-LAN4 bi-directional>
<LAN5-LAN6 bi-directional> ; <LAN7-LAN8 bi-directional>

Speed: 1000_Full	Frame Size(bytes)						
LAN ports	64	128	256	512	1024	1280	1518
1 ~8	25.75	47.40	72.16	100	100	100	100
NIM 1~8	47.40	76.02	100	100	100	100	100



Throughput vs Frame Size

Name/Framesize	64	128	256	512	1024	1280	1518
Total	25.75	47.40625	72.15625	100	100	100	100
A Group	25.75	47.40625	72.15625	100	100	100	100
A 1-1->1-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 1-2->1-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 1-3->1-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 1-4->1-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 2-1->2-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 2-2->2-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 2-3->2-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A 2-4->2-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

11. 10G LAN Performance Test

11.1 DUT and Test Equipment

11.1.1. DUT Specification

Hardware:

- Model name: FWS-7821 (FWB-7821 A0.2) (RJx6 + Fiber x2)
- 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-S26C A0.1

Software:

- BIOS: FWS-7821 R0.3 (K782CM03)(11/08/2016)
- Operating System: CentOS7 Kernel 3.10.0.el7.x86_64
- NIM LAN driver: i40e 1.5.16 Intel 40-10 Gigabit Ethernet Connection Network Driver.

11.1.2. Test Equipment Specification

SPIRENT Smartbits

- Chassis: SPIRENT CTL-N4U E16100679
- Chassis Version: E1
- Module: SPIRENT FX2 2-port 40/10GBE QSFP+

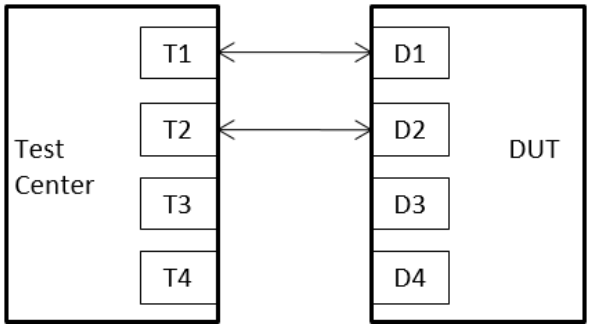
  Test Software: SPIRENT Test Center Application 4.64

11.2 RFC-2544 performance test (2 port)

11.2.1. Throughput test (2 port)

Test Description:

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



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

Test Result:

Test Group: <LAN1-LAN2 bi-directional>

Test Group: <LAN3-LAN4 bi-directional>

Speed: 10Gb_Full	Frame Size(bytes)						
LAN ports	64	128	256	512	1024	1280	1518
NIM 1-2	6.625	13.516	24.766	46.563	93.672	100	100
NIM 3-4	6.625	8.875	21.25	44.453	78.203	100	100

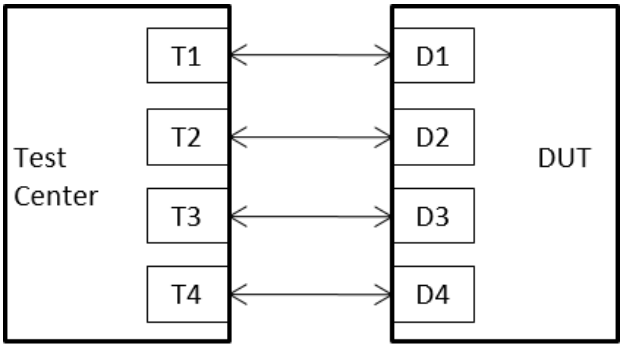
11.3 RFC-2544 performance test (4 ports)

11.3.1. Throughput test

Test Description:

1 In DUT System, set routing function enabled.
<# echo 1 > /proc/sys/net/ipv4/ip_forward>

2 Test Configuration as below Figure.



3 Smartflow\Test Group to add port1<->port2 with Bi-directional, port3<->port4 with Bi-directional.

4 The tester set loading traffic from 1% to 100% and the traffic step is 50%.

5 Interaction Constants Duration Time Set to 60 Sec.

6 Test all LAN ports performance.

Test Result:

Test Group: <LAN1-LAN2 bi-directional> ; <LAN3-LAN4 bi-directional>

Speed: 10Gb_Full	Frame Size(bytes)						
LAN ports	64	128	256	512	1024	1280	1518
NIM 1~4	5.5	8.875	14.922	31.094	54.297	75.391	89.453

12. 40G LAN Performance Test

12.1 DUT and Test Equipment

12.1.1. DUT Specification

Hardware:

- Model name: FWS-7821 (FWB-7821 A0.2) (RJx6 + Fiber x2)
- 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 A0.1

Software:

- BIOS: FWS-7821 R0.3 (K782CM03)(11/08/2016)
- Operating System: CentOS7 Kernel 3.10.0.el7.x86_64
- NIM LAN driver: i40e 1.5.16 Intel 40-10 Gigabit Ethernet Connection Network Driver.

12.1.2. Test Equipment Specification

SPIRENT Smartbits

- Chassis: SPIRENT CTL-N4U E16100679
- Chassis Version: E1
- Module: SPIRENT FX2 2-port 40/10GBE QSFP+

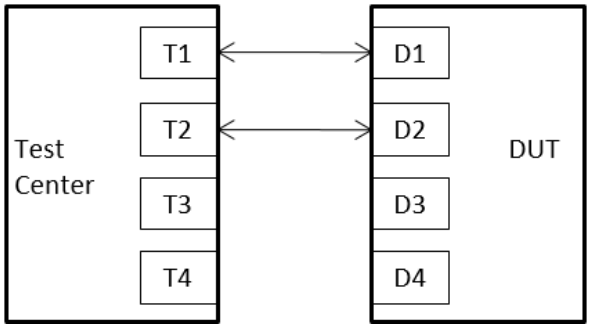
  Test Software: SPIRENT Test Center Application 4.64

12.2 RFC-2544 performance test (2 port)

12.2.1. Throughput test (2 port)

Test Description:

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



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

Test Result:

Test Group: <LAN1-LAN2 bi-directional>

Speed: 40Gb_Full	Frame Size(bytes)						
LAN ports	64	128	256	512	1024	1280	1518
NIM 1-2	1	2.688	5.5	10.703	20.547	20.547	31.797