



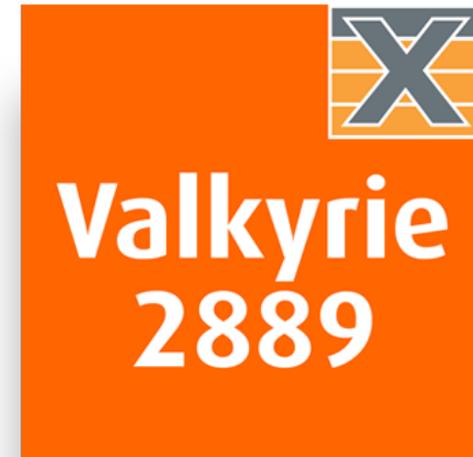
# Valkyrie2889

STEP-BY-STEP GUIDE



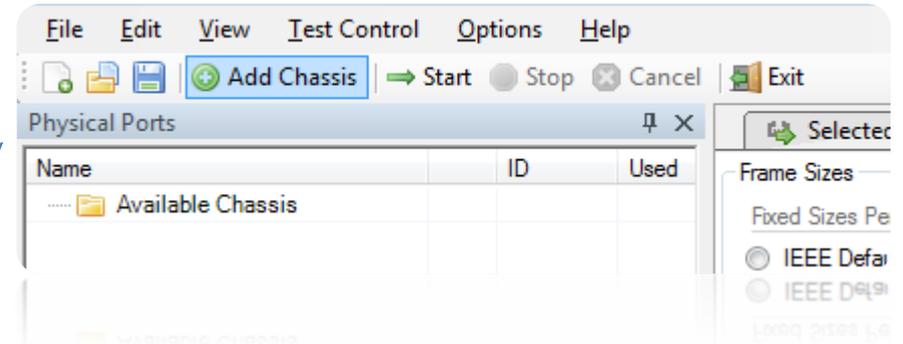


-  Add Chassis
-  Add/Configure Port/s
-  Protocol Segment Profiles
-  General Test Configuration
-  Test Types configuration
-  Reporting
-  CLI Option (RFC2889 Automated)

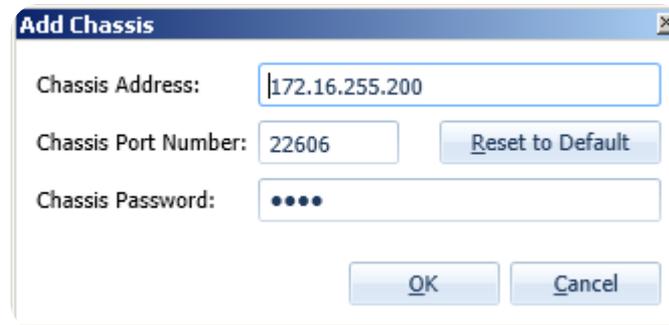


## Add chassis

Click on “Add Chassis” button.



Enter the IP of the Management port under “Chassis Address:”  
Use “xena” as default “Chassis Password”.



The 'Add Chassis' dialog box contains the following fields and buttons:

- Chassis Address: 172.16.255.200
- Chassis Port Number: 22606 (with a 'Reset to Default' button)
- Chassis Password: ••••
- Buttons: OK, Cancel

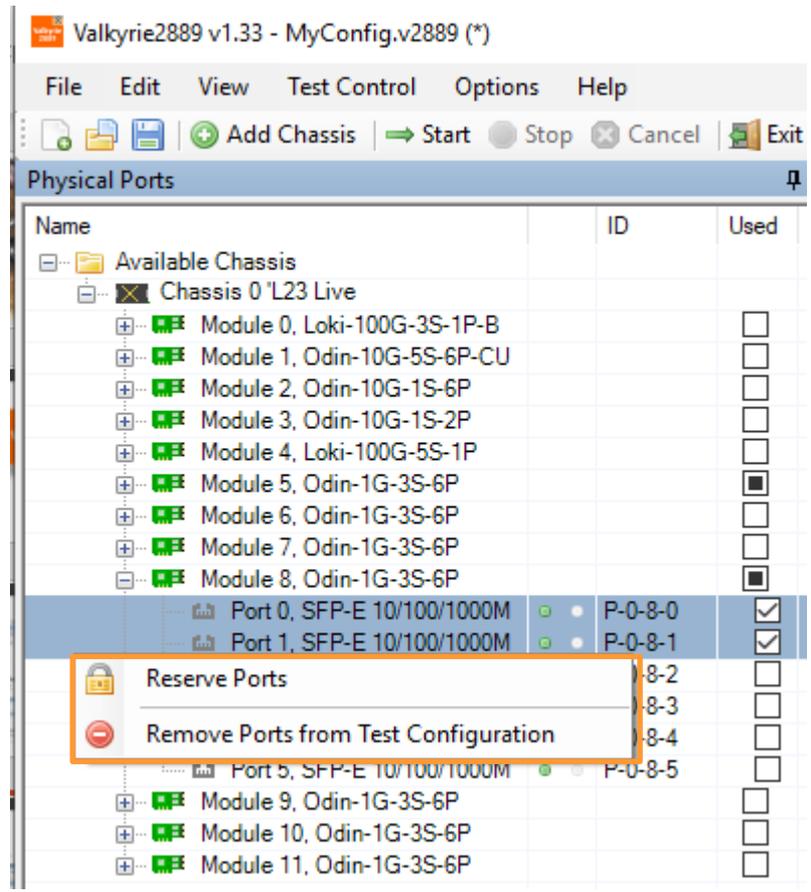


# ADD PORT(S)

## Add Port/s

1 Choose the Port/s you would like to work with:

2  On selected ports +  on “Reserve Ports”





# CONFIGURE PORT(S)

Choose the Port/s you would like to configure and:

**Selected Ports**

Select ports in the Physical Ports panel and drag them here to include them in the test.

Port Name	Port Speed	IP Address	Prefix	Gateway Address	Protocol Segment Profile
P-0-0-4 (SFP-100FX LR 1310 nm)	<fixed>	0.0.0.0	24	0.0.0.0	1: Ethernet
P-0-0-5 (SFP-100FX LR 1310 nm)	<fixed>	0.0.0.0	24	0.0.0.0	1: Ethernet

Select All Ports    Deselect All Ports      Selected Ports: 1

**Main Port Properties**   **Address Properties**

**Physical Port Properties**

Inter-Frame Gap: 20  
Speed Reduction: 0 ppm  
Enable PAUSE Mode:   
Latency Offset: 0 ns

**Port Rate Cap**

Rate Cap Type: Physical Port Rate  
Rate Cap Value: 1000.00 Mbit/s

**Peer Negotiation**

Enable Auto Negotiation:   
MDI/MDIX Mode: Auto

1, 2, 3, 4



## 1 Port Addressing

Column	Explanation
Port Name	The name (ID and type) of the port.
Port Speed	The physical port speed to use in the test. Normally this should be left at the default AUTO value, but certain DUTs require that the port speed is fixed to a specific rate.
IP Address	The IP address that you want to use for the port. (*)
Prefix	The decimal network prefix for the address. (*)
Gateway Address	The gateway address for the assigned IP address. This field may be left empty if the ports are located on the same IP subnet. (*)
Protocol Segment Profile	The protocol segment profile to use for this port. Profiles can be created, edited and deleted in the separate Protocol Segment Profiles panel.



## 2 Physical Port Properties

### Inter-Frame Gap

- Set to 20 -> 12B (Minimum allowed by Ethernet at 100% load)
- (12+8B Preamble equals 20B)
- can be set to 16B to achieve >100% load for port pressure testing
- \* Values range between 16B-20B

### Adjust PPM

Specifies an optional speed reduction on the transmit side of the port, expressed as a ppm value.

### Enable PAUSE mode

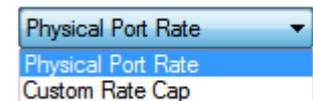
- This means enable **Flow Control on this port**

### Latency offset

- Used to automatically eliminate transceiver + cable latency.

## 3 Rate Cap Type:

Specifies whether to override the physical port speed with the custom speed specified below.



## 4 Enable/Disable Auto Negotiation.



# CONFIGURE PORT(S)

## 5 Public Address

Public IP Address:

1.1.1.1

Public IP Prefix:

24



Property	Explanation
Public IP Address:	<p>If a port is located behind a NAT firewall/router you may need to provide the public IP address offered by the NAT firewall/router. Valkyrie2889 will then perform an ARP request for the public IP address before starting the test, to avoid packet loss due to an initial ARP phase.</p> <p>The real (internal) IP address of the port must still be configured in the main port grid as this may be used to send Gratuitous ARP packets from the port to the router before starting the test.</p>
Public IP Prefix:	The network prefix value for the public IP address.

## Remote Loop Address

Remote Loop IP Address:

Remote Loop MAC Address:

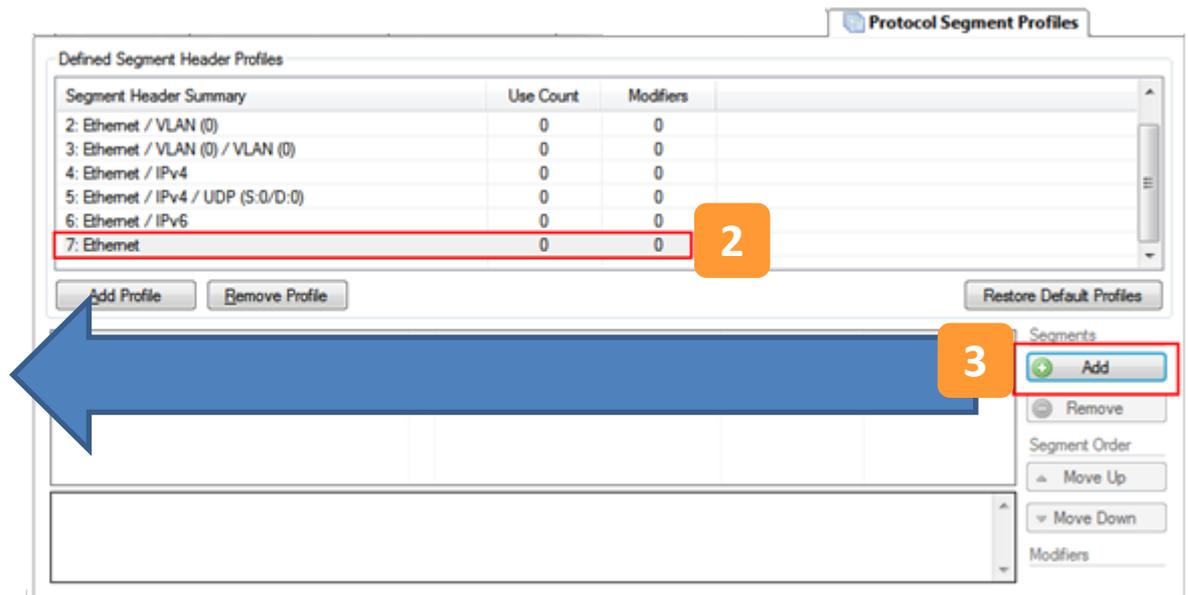
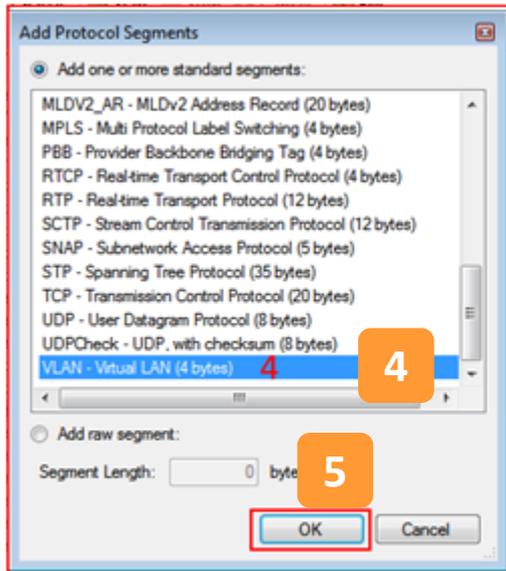
00 : 00 : 00 : 00 : 00 : 00

Remote Loop IP Address:	When a port with layer-3 protocol segments (IPv4/IPv6) has been configured as a looped port you must specify the IP address of the remote port so the Xena tester can perform an ARP request for the MAC address.
Remote Loop MAC Address:	When a port with pure layer-2 protocol segments (Ethernet + optional VLAN) has been configured as a looped port you must specify the MAC address of the remote loop port to avoid excessive flooding.



# PROTOCOL SEGMENT PROFILES

- 2) Select the new Profile.
- 3) Click “Add” to add additional headers.
- 4) Choose Segment.
- 5) Click “OK”.





## Protocol Segment Profiles

### Available Profiles List

The list-view at the top show all defined profiles.

### Managing Profiles

You can create and delete profiles to suit the needs of the current test scenario.

To create a new profile press the **Add Profile** button.

To delete a profile, select it in the listview and press the **Remove Profile** button.

### Default Profiles

When you create a new Valkyrie2889 configuration it will be populated with a number of default profiles. You can however freely modify or delete one or more of the default profiles.

### Profile Editor

You can edit each profile by selecting it in the top list-view and using the tree-view control below.



## Add and Remove Segment Headers

To add a new segment header press the **Add** button in the **Segments** section to the right.

- You can then select one or more of the built-in segment types to be included.
- To use a segment not currently supported by the Valkyrie2889, you can add a **raw segment** and specify the length in bytes.
- You can then edit the values in the resulting segment using the hex editor at the bottom.

## Editing Field Values

- The segment editor provides a tree-view similar to the one found in the Wireshark protocol analyzer.
- You can expand each segment branch to view or modify the various field values.
- Each field title is preceded with a small icon indicating the type of field value (decimal, hexadecimal, binary or IPv4/IPv6 address).



## MAC and IP Addresses

The address fields in the Ethernet and IP section headers will usually be overridden by the Valkyrie2889 when the test-streams are created:

**Source MAC (SMAC) address field** in the first Ethernet segment will be set to the MAC address of the source port.

**Destination MAC (DMAC) address field** in the first Ethernet segment will be set to the MAC address of the destination port.

If an IP segment has been defined and a gateway IP address is defined for a source port, Valkyrie2889 will attempt to resolve the MAC address of the gateway using ARP or NDP and will then use this MAC address as the DMAC.

The IP Source/Destination Address fields in the IP segment header will be set to the values configured on the ports.

This replacement will only occur if you leave the fields at their default (all-zeros) value. If you specify anything else this value will be used instead.

# GENERAL TEST CONFIGURATION



### Frame Sizes

#### Fixed Sizes Per Trial

- IETF Default 64,128,256,512,1024,1280,1518
- Custom Sizes
- Size Range Start size:  End size:  Step size:

#### Varying Sizes Per Trial

- Incrementing Min. size:  Max. size:
- Butterfly Sizes
- Random Sizes
- Mixed Sizes

### Overall Test Port Rate

- Fraction:  percent
- Frame-rate:  frames/sec
- Bit-rate (L1):  Mbit/s
- Bit-rate (L2):  Mbit/s

#### Resulting Rates (for average frame size)

Port Speed Type	1G Ports
Fraction:	100.000%
Frames/sec:	234.962 K
Bits/sec (L1)	1 G
Bits/sec (L2)	962.406 M

### Misc. Options

- Use Micro-TPLD if needed:
- Toggle Sync State:
- TID Alloc. Scope:
- Sync State Off Period:  seconds
- Latency Mode:
- Delay After Sync On:  seconds

### Port Scheduling

- Use Port Sync. Start:
- Port Stagger Steps:
- Resulting Delta:  microseconds

### Reset and Error Handling

- Stop on LOS:
- Delay After Reset:  seconds



## Frame Sizes Per Trial

### *IETF Default:*

The default setting is to use IETF standard frame sizes : 64, 128, 256, 512, 1024, 1280 and 1518 bytes.

The following options are also available:

### *Custom Sizes:*

Lets you specify a comma-separated list of values. This is useful if you only want to test using one or two packet sizes.

*Size Range:*  Size Range Start size:  End size:  Step size:

Lets you specify a range of packet sizes and the steps.

### *Incrementing Sizes:*

Lets you specify a Min and Max size – the sizes: Min,Min+1,Min+2,...,Max.

*Butterfly Sizes:*  Incrementing Min. size:  Max. size:

Lets you specify a Min and Max size – the sizes: Min,Max,Min+1,Max-1,Min+2,Max-2,...

*Random Sizes:*  Incrementing  Butterfly Sizes  Random Sizes  
Min. size:  Max. size:

Lets you specify a Min and Max size – The sizes will vary among Min – Max randomly.



## Frame Sizes Per Trial

### Mixed Sizes:

The Xena tester will use a more or less random mix of packet sizes when sending traffic.

Mixed Weights Configuration

This form enable you to configure the percentage weights for the 'Mixed Sizes' packet size mode. The sum of all weights must be 100.

Packet Sizes:	56	60	64	70	78	92	256	496	512	570	576	594	1438	1518	9216	16360
Weights:	0	0	0	0	57	3	5	1	2	5	1	4	4	18	0	0

Average Packet Size: 464.000 bytes  
Validation State: The sum of packet weights is 100%.

Buttons: Set Default, OK, Cancel

*\*Note that the use of this option will introduce a slight inaccuracy when calculating various results, as the packet sizes are not deterministic. A weighted average will be used.*



# GENERAL TEST CONFIGURATION

## Misc Options

Use Micro-TPLD if needed:

Toggle Sync State:

TID Alloc. Scope: Configuration Scope ▼

Sync State Off Period: 1 seconds

Latency Mode: Last-To-Last ▼

Use Micro-TPLD if needed:	When using regular TPLD 20B shall be used. *This means for ETH+IP+UDP(+TPLD)+FCS = 14+20+8(+20)+4 = 66 With Micro TPLD the TPLD size to 6B.
TID Alloc. Scope:	Determines how Valkyrie2889 allocates test payload identifier (TID) values.  <b>Configuration Scope:</b> Allocates a unique TID value for each stream created. This option ensures that only packets intended for a given port are taken into account. The downside is that for large configurations you may quickly run out of TID values due to hardware constraints.  <b>Rx Port Scope:</b> Allocate TIDs so all streams received on any given port have a unique TID. TID values are re-used between ports. This allow for larger configurations but the test is no longer able to detect if packets are mis-delivered by the DUT.  <b>Source Port ID:</b> Allocate TIDs so all streams from a given port is set equal to the port index in the configuration. This is a slight variation of the previous method.



## Misc Options

Use Micro-TPLD if needed:

TID Alloc. Scope:

Latency Mode:

Toggle Sync State:

Sync State Off Period:  seconds

Latency Mode:	Specifies the way the latency value is calculated.
Toggle Sync State:	<p>If checked the sync state for all selected ports will be toggled off and on at the start of each test trial. This ensures the DUTs MAC-tables are cleared at the start of each test.</p> <p>Note that the Address Caching Capacity and Address Learning Rate tests do not use this option as they use their own definition.</p>
Sync State Off Period:	The number of seconds to keep the port sync state off.

## Reset and Error Handling

Stop on LOS:  Delay After Reset:  seconds

Stop on LOS:	If enabled the Valkyrie2889 will abort the test if a port loses the sync state during test.
Delay After Reset:	The number of seconds to delay after resetting ports



## Overall Test Port Rate

1 Here you can specify the overall rate used by the tests, using one of the following methods:

- A fraction (percentage) of the physical port speed
- A frame-rate (Fps) value
- A bit-rate (Bps) value at either layer 1 or layer 2.

\*Bit-rate (Layer 2) =

Bit-rate (Layer 1) x framesize / ( framesize + inter-frame-gap )

1

Overall Test Port Rate

Fraction:  percent

Frame-rate:  frames/sec

Bit-rate (L1):  Mbit/s ▾

Bit-rate (L2):  Mbit/s ▾

2

Resulting Rates (for average frame size)

Port Speed Type	1G Ports
Fraction:	100.000%
Frames/sec:	234.962 K
Bits/sec (L1)	1 G
Bits/sec (L2)	962.406 M

2 Below the controls are the resulting percentages or rates for all selected port types.

Note that the Address Caching Capacity and Address Learning Rate tests do not use the overall test port rate as they utilize their own rate definition.

The Congestion Control and Forward Pressure tests also do not use the overall test port rate as these tests are always performed at port line speed.



## Port Scheduling

Use Port Sync. Start:

Port Stagger Steps:

Resulting Delta:  microseconds

Use Port Sync State:	When checked all ports are started as simultaneously as possible.
Port Stagger Steps:	When "Use Port Sync State" is checked the start of each selected ports will be delayed "Port Stagger Steps" * 64 microseconds relative to each other.
Resulting Delta:	The Port Stagger presented in microseconds.



## Test Types Configurations

Start Page | Selected Ports | General Test Configuration | Test Types Configuration | Protocol Segment Profiles | Reporting Options

Rate Tests

- Full Mesh
- Part.Mesh, 1:N
- Part.Mesh, N->N

- Congestion Control
- Forward Pressure
- Maximum Forwarding Rate
- Address Caching Capacity
- Address Learning Rate
- Errored Frames Filtering
- Broadcast Forwarding

### Available Tests

The following [RFC 2889](#) test types are currently available in the Valkyrie2889:

- Rate Tests ([RFC 2889 sections 5.1 - 5.4](#), see below for details)
- Congestion Control ([RFC 2889 section 5.5](#))
- Forward Pressure and Maximum Forwarding Rate ([RFC 2889 section 5.6](#))
- Address Caching Capacity ([RFC 2889 section 5.7](#))
- Address Learning Rate ([RFC 2889 section 5.8](#))
- Errored Frames Filtering ([RFC 2889 section 5.9](#), see below for details)
- Broadcast Forwarding and Latency ([RFC 2889 section 5.10](#))

### Configuring Tests

To inspect and optionally change the test options for each test, select the test in the treeview.

### Port Roles

For each test it is possible to assign roles to the ports selected for the test. Not all selected ports may be used in every test.

### Controlling Test Execution State

The checkbox to the left of the test name in the treeview determines whether the test is executed or not.

### Handling Rate Tests

The RFC 2889 defines several types of rate tests, but these are typically not possible to execute using the same test setup. Instead the Valkyrie2889 allow you to create and define the number of rate tests relevant for the actual DUT.

To create a new rate test press the **Add** button located at the bottom of the test treeview. You can configure both the topology and the direction for the rate test, and also set the port roles for the test.

To delete a rate test select the test and press the **Remove** button located at the bottom of the test treeview.

Mapping of RFC 2889 rate tests to topology settings:

- **Fully meshed:** Topology: Mesh, Direction: Bidirectional
- **One-to-many:** Topology: Blocks, Direction: East-to-West. Place one port in the East group, and all other ports in the West group.
- **Many-to-one:** Topology: Blocks, Direction: West-to-East, otherwise as for the One-to-many test.
- **Partially meshed multiple devices:** Topology: Blocks, Direction: Bidirectional.
- **Partially meshed unidirectional traffic:** Topology: Blocks, Direction: East-to-West. Place first half of the test ports in the East group and the other half in the West group.

### Errored Frames Filtering

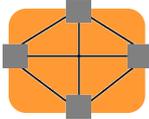
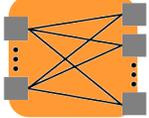
The following tests are current not implemented by the Valkyrie2889:

- Dribble Bit Errors
- Alignment Errors

+ Add | - Remove |

## Test Types Configurations – Rate Tests

RFC 2889 Objective: To determine the throughput, frame loss and forwarding rates of DUT/SUTs for 3 configurations:

- Full Mesh 
- Partial Mesh 1:N 
- Partial Mesh N ->N 

Throughput: Highest data rate that can pass through the DUT/SUT without frame loss  
Forwarding Rate: Highest data rate that can pass through the DUT/SUT – frame loss may be experienced

Flood count: Any frame originating from the DUT/SUT MUST not be counted as a received frame.  
Frames originating from the DUT/SUT MAY be counted as flooded frames or not counted at all.



## Test Types Configurations – Rate Tests

**Test Types Configuration**

**Rate Tests**

- Full Mesh
- Part.Mesh, 1:N
- Part.Mesh, N->N
- Congestion Control
- Forward Pressure
- Maximum Forwarding Rate
- Address Caching Capacity
- Address Learning Rate
- Errored Frames Filtering
- Broadcast Forwarding

**Common Options**

Test Label: Full Mesh

Duration: **1** 30 seconds

Iterations: 1

**Traffic Setup**

Topology: Mesh

Direction: **2** Bidirectional

**Throughput Test Options**

Enable Throughput Test **3**

Initial Rate: 100.00 percent

Minimum Rate: 0.10 percent

Maximum Rate: 100.00 percent

Resolution Rate: 0.50 percent

**Forwarding Test Options**

Enable Forwarding Test

Start Rate: 50.00 percent

End Rate: **4** 100.00 percent

Step Rate: 50.00 percent

Port Name	Used?
P-0-11-0 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>
P-0-11-1 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>

**5**

Select All Ports  Unselect All Ports

Ready | Test not running | Test Time: 00:00:00 | Duration: 00:00:00 | User: dan

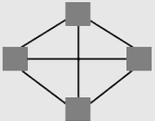
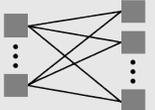
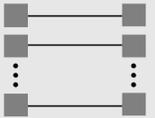


## Test Types Configurations – Rate Tests

### 1 Common Options

Test Label:	A text label for this rate test. Use this to assign a short description of the purpose of the test.
Duration:	The duration of each test trial in seconds.
Iterations:	The number of times to repeat -each test trial with the same set of test parameters.

### 2 Traffic Setup

Topology:	<ul style="list-style-type: none"> <li>•The topology of the test traffic: Mesh: All testports send traffic to all other testports. The Direction option is ignored as Mesh traffic is always bidirectional.</li> <li>•Blocks: Each testport is placed in either the East or the West block. Every port in the transmitting block sends traffic to every port in the other block. The Direction option determines if only one block or both will be transmitting.</li> <li>•Pairs: Each testport is placed in either the East or the West block. Then the ports are paired together two and two. Traffic is only flowing between paired ports. The Direction option determines which ports will be transmitting.</li> </ul>	  
Direction:	Determines the direction of the test traffic.	



## Test Types Configurations – Rate Tests

### 3 Throughput Options

Enable Throughput Test:	If checked the Throughput test will be executed. This is an iterative test that will find the largest throughput rate with zero loss for the DUT.
Initial Rate:	The starting rate to use. This is specified as a percentage of the overall port rate defined in the general test options panel.
Maximum Rate:	The maximum rate to use. This is specified as a percentage of the overall port rate.
Minimum Rate:	The minimum rate to use. This is specified as a percentage of the overall port rate. If the iteration reaches this value the test is stopped and the result will be FAILED.
Resolution Rate:	The trial stops when the difference between the current and the last successful trial is less than the Resolution.

### 4 Forwarding Options

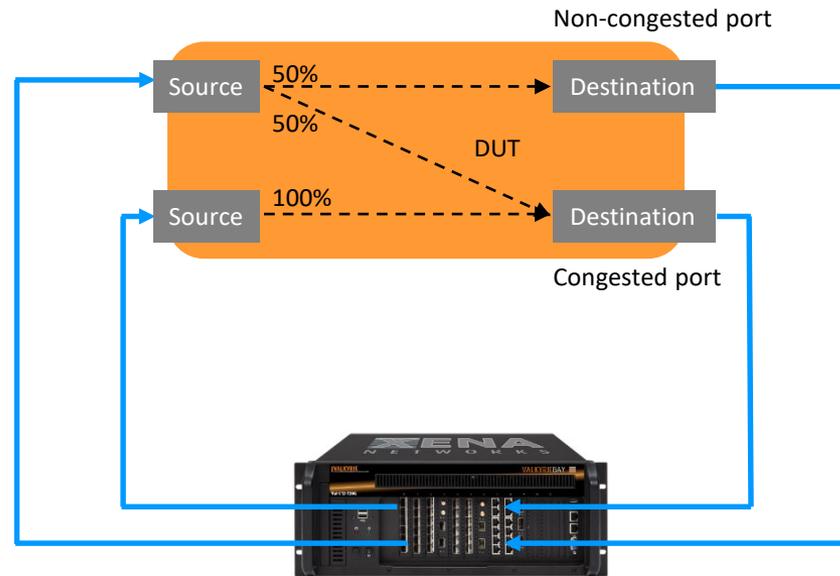
Enable Forwarding Test:	If checked the Forwarding test will be executed. This is a rate sweep test that will measure the forwarding rate and the loss for the DUT at various transmit rates.
Start Rate:	The starting rate percentage used in the test.
End Rate:	The ending rate percentage used in the test.
Step Rate:	The rate step increment.

5 Used?	If checked the port will be used in this test.
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## Test Types Configurations – Congestion Control

RFC 2889 Objective: To determine how a DUT handles congestion. Does the device implement congestion control and does congestion on one port affect an uncongested port

Test setup:





## Test Types Configurations – Congestion Control

Port Name	Used?	Port Role
P-0-8-0 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Source
P-0-8-1 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Source
P-0-8-2 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Destination
P-0-8-3 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Destination

← Non-congested port  
← Congested port

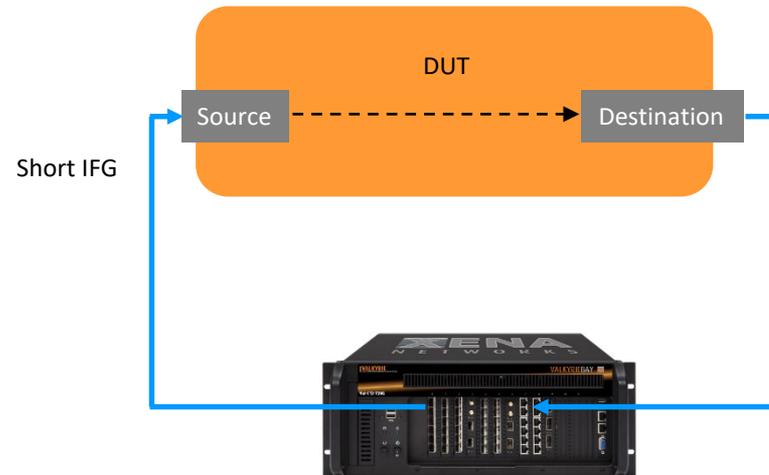
Duration:	The duration of each test trial in seconds.
Iterations:	The number of times to repeat -each test trial with the same set of test parameters.

Used?	If checked the port will be used in this test.
Port Role	Two source ports and two destination ports must be defined. Second destination port will be the congested port.

## Test Types Configurations – Forward Pressure

RFC 2889 Objective: The Forward Pressure test overloads a DUT/SUT port and measures the output for forward pressure.

Test setup:





## Test Types Configurations – Forward Pressure

The screenshot shows the 'Test Types Configuration' window with the following settings:

- Test Type:** Forward Pressure (selected)
- Common Options:**
  - Duration: 30 seconds
  - Iterations: 1
- Test Options:**
  - Interframe Gap Delta: 1 bytes
  - Accept. Rx Util. Delta: 0.001 percent
- Port Configuration Table:**

Port Name	Used?	Port Role
P-0-11-0 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Source
P-0-11-1 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Destination
P-0-11-2 (SFP-E 10/100/1000M)	<input type="checkbox"/>	Source

### Inter-frame Gap Delta

The difference between the default Inter-frame Gap (IFG) value of 20 bytes and the reduced value used on the source port.

### Accept Rx Util.Delta

The acceptable receive rate utilization delta, i.e. the value with which the receive rate is allowed to exceed 100.0%.

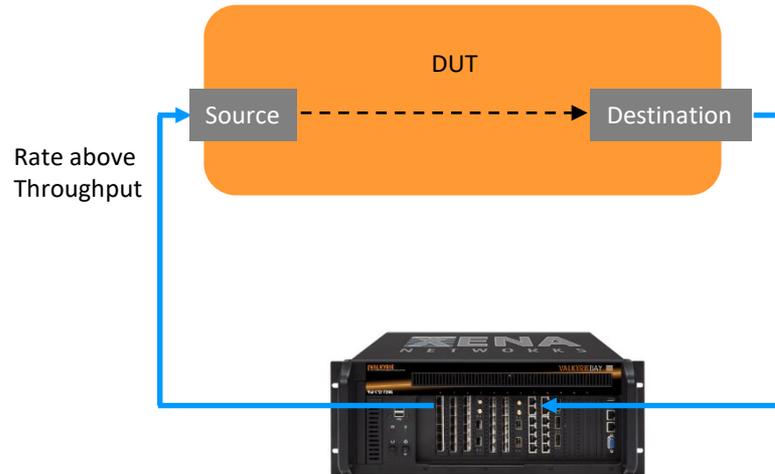
Duration:	The duration of each test trial in seconds.
Iterations:	The number of times to repeat -each test trial with the same set of test parameters.

Used?	If checked the port will be used in this test.
Port Role	Used to define source and destination ports

## Test Types Configurations – Maximum Forwarding Rate

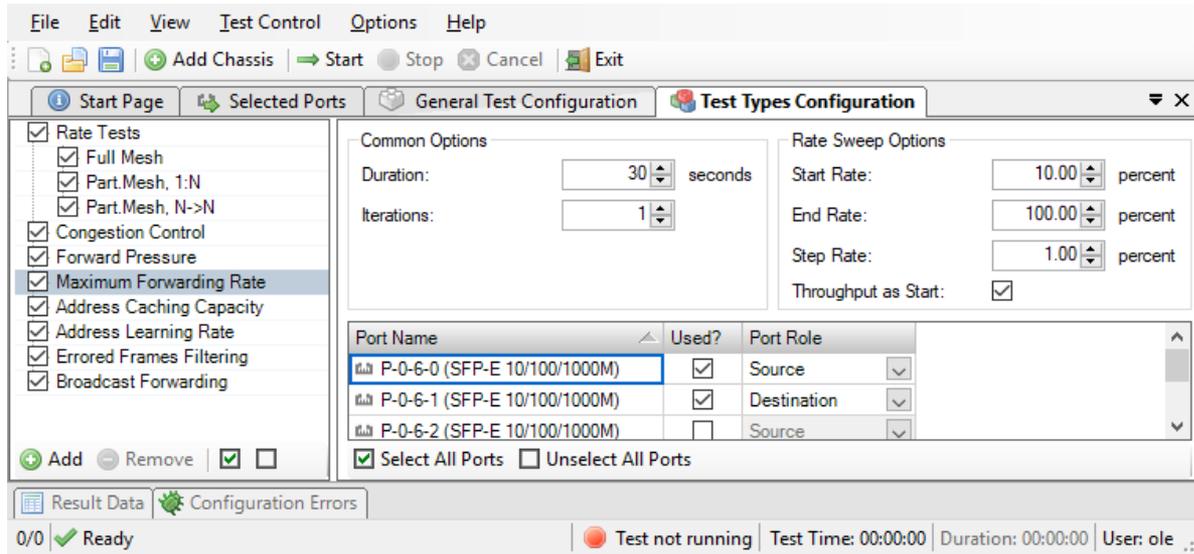
RFC 2889 Objective: Measure the peak value of the Forwarding Rate when the Offered Load is varied between the throughput and the Maximum Offered Load

Test setup:





## Test Types Configurations – Maximum Forwarding Rate

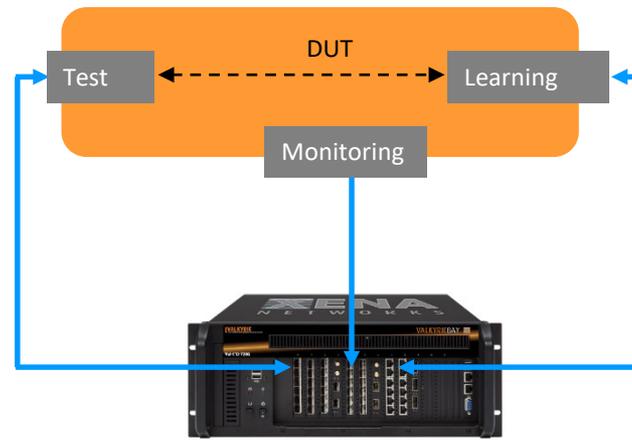


Duration:	The duration of each test trial in seconds.
Iterations:	The number of times to repeat -each test trial with the same set of test parameters.
Start Rate:	The starting rate percentage used in the test.
End Rate:	The ending rate percentage used in the test.
Step Rate:	The rate step increment.
Used?	If checked the port will be used in this test.
Port Role	Used to define source and destination ports

## Test Types Configurations – Address Caching Capacity

RFC 2889 Objective: To determine the address caching capacity of a LAN switching device

Test setup:



Procedure:

- Send traffic with a range of MAC addresses as source addresses from tester to learning port – DUT caches as many MAC addresses as possible
- Send traffic with same range of MAC addresses as destination MAC addresses from tester to test port
- Traffic with non-cached MAC addresses are broadcasted and reach the Monitoring port
- If all MAC addresses are cached, no traffic will reach Monitoring port
  - Test repeats until no traffic is detected on Monitoring port

## Test Types Configurations – Address Caching Capacity

The screenshot shows the 'Test Types Configuration' window with the 'Address Caching Capacity' option selected in the left-hand menu. The main configuration area is divided into several sections:

- Common Options:** Iterations: 1
- MAC Address Settings:** Test Port Address Mode: Use Port Native MAC; Learn Port DMAC Mode: Use Test Port MAC; Learning Base Address: 02 F4 BC; Initial Count: 4096 addresses; Minimum Count: 100 addresses; Maximum Count: 65535 addresses; Resolution Count: 100 addresses
- Learning Rate Settings:** Learning Rate: 1000 Fps
- DUT Address Learning Reset:** Toggle Sync States: checked; Sync State Off Period: 1 seconds; Switch Test Port Roles: unchecked; DUT Aging Time: 300 seconds

At the bottom, there is a table of port configurations:

Port Name	Used?	Port Role
P-0-11-0 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Test Port
P-0-11-1 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Learning Port
P-0-11-2 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Monitoring Port

Below the table are checkboxes for 'Select All Ports' (checked) and 'Unselect All Ports' (unchecked). The status bar at the bottom indicates 'Ready', 'Test not running', 'Test Time: 00:00:00', 'Duration: 00:00:00', and 'User: dan'.

Iterations:

The number of times to repeat  
-each test trial with the same set of test parameters.



## Test Types Configurations – Address Caching Capacity

Learning Base Address:	The first 3 bytes of the MAC addresses used for the learning test. It is necessary to use a different base address than the default Xena base address (04.F4.BC) when running a test using multiple addresses to avoid conflicts with other unused ports on the Xena tester.
Initial Count:	The starting address count to use.
Maximum Count:	The maximum address count to use.
Minimum Count:	The minimum address count to use. If the trial reaches this value the test is stopped and the result will be FAILED.
Resolution Count:	The trial stops when the difference between the current and the last successful trial is less than the Resolution.

Learning Rate:	The learning rate in frames/second to use.
----------------	--

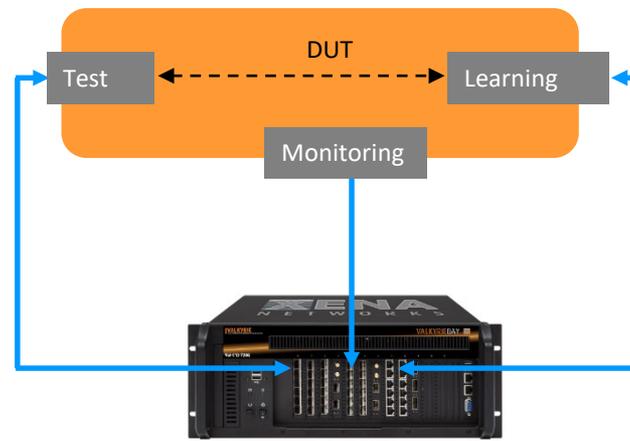
Toggle Sync States:	If checked the sync state of the test ports will be toggled off and on between test trials. Enabling this may help clearing the MAC learning tables in the DUT and speed up the test.
Sync State Off Period:	The amount of seconds the port sync states will be off.
Switch Test Port Roles:	If checked the port with the Test and Learning roles will be swapped between test trials. Enabling this may help clearing the MAC learning tables in the DUT and speed up the test.
DUT Aging Time:	If none of the two options above are checked the test will wait for the specified seconds between trials to ensure that the MAC table in the DUT has been cleared.

Used?	If checked the port will be used in this test.
Port Role	Used to define Test port, Learning port and Monitoring port

## Test Types Configurations – Address Learning Rate

RFC 2889 Objective: To determine the rate of address learning of a LAN switching device

Test setup:



Procedure:

- Send traffic with a range of MAC addresses as source addresses from tester to learning port – DUT caches as many MAC addresses as possible
- Send traffic with same range of MAC addresses as destination MAC addresses from tester to test port
- Traffic with non-cached MAC addresses are broadcasted and reach the Monitoring port
- If all MAC addresses are cached, no traffic will reach Monitoring port
  - Test repeats until no traffic is detected on Monitoring port

## Test Types Configurations – Address Learning Rate

The screenshot shows the 'Test Types Configuration' window with the 'Address Learning Rate' test type selected. The 'Common Options' section has 'Iterations' set to 1. The 'MAC Address Settings' section has 'Test Port Address Mode' and 'Learn Port DMAC Mode' both set to 'Use Port Native MAC'. The 'Learning Base Address' is '02 F4 BC'. The 'Start Count' is 13107, 'End Count' is 65535, and 'Step Count' is 13107. The 'Learning Rate Settings' section has 'Base Learning Rate' at 1000 Fps, 'Initial Rate' at 100.00 percent, 'Minimum Rate' at 0.10 percent, 'Maximum Rate' at 100.00 percent, and 'Resolution Rate' at 0.60 percent. The 'DUT Address Learning Reset' section has 'Toggle Sync States' checked, 'Sync State Off Period' at 1 seconds, 'Switch Test Port Roles' unchecked, and 'DUT Aging Time' at 300 seconds. The 'Port Name' table is as follows:

Port Name	Used?	Port Role
P-0-11-0 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Test Port
P-0-11-1 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Learning Port
P-0-11-2 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Monitoring Port

At the bottom, there are checkboxes for 'Select All Ports' (checked) and 'Unselect All Ports' (unchecked). The status bar shows 'Ready', 'Test not running', 'Test Time: 00:00:00', 'Duration: 00:00:00', and 'User: dan'.

Iterations:

The number of times to repeat  
-each test trial with the same set of test parameters.



## Test Types Configurations – Address Learning Rate

Learning Base Address:	<p>The first 3 bytes of the MAC addresses used for the learning test.</p> <p>It is necessary to use a different base address than the default Xena base address (04.F4.BC) when running a test using multiple addresses to avoid conflicts with other unused ports on the Xena tester.</p>
Initial Count:	The starting address count to use.
Maximum Count:	The maximum address count to use.
Minimum Count:	<p>The minimum address count to use.</p> <p>If the trial reaches this value the test is stopped and the result will be FAILED.</p>
Resolution Count:	The trial stops when the difference between the current and the last successful trial is less than the Resolution.
Only Use Max. Capacity:	<p>If checked the test will ignore the start, end and step options and only run the test at the max. capacity.</p> <p>This option is only used if an Address Caching Capacity test has previously been run as part of the same test and a capacity test result has been found for the frame size in question.</p> <p>Otherwise the test will default to use the start, end and step options.</p>
Set End = Max. Capacity	<p>If checked the test will ignore the end count option value and use the max. capacity value instead.</p> <p>This option is only used if an Address Caching Capacity test has previously been run as part of the same test and a capacity test result has been found for the frame size in question.</p> <p>Otherwise the test will default to use the end option value.</p>



## Test Types Configurations – Address Learning Rate

Toggle Sync States:	If checked the sync state of the test ports will be toggled off and on between test trials. Enabling this may help clearing the MAC learning tables in the DUT and speed up the test.
Sync State Off Period:	The amount of seconds the port sync states will be off.
Switch Test Port Roles:	If checked the port with the Test and Learning roles will be swapped between test trials. Enabling this may help clearing the MAC learning tables in the DUT and speed up the test.
DUT Aging Time:	If neither of the two options above are checked the test will wait for the specified seconds between trials to ensure that the MAC table in the DUT has been cleared.

Base Learning Rate:	The learning rate in frames/second to use.
---------------------	--

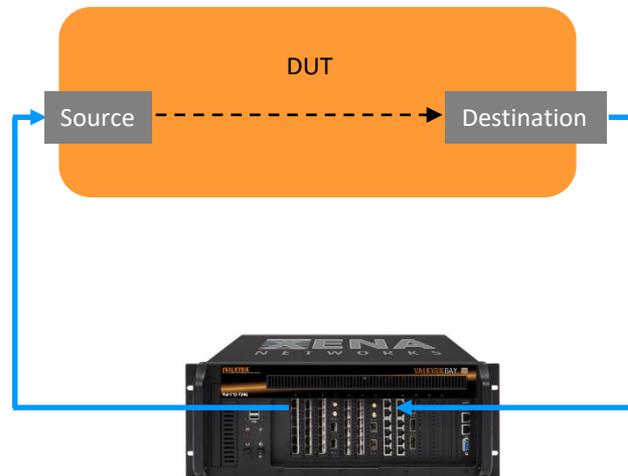
Used?	If checked the port will be used in this test.
Port Role	Used to define Test port, Learning port and Monitoring port

## Test Types Configurations – Errored Frames Filtering

RFC 2889 Objective: Determine the behavior of the DUT under error or abnormal frame conditions. The results of the test indicate if the DUT/SUT filters the errors or simply propagates the errored frames along to the destination.

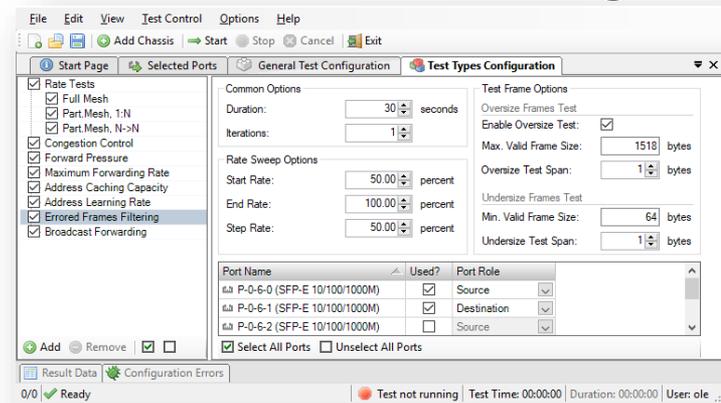
Test setup:

- 1 stream: Oversize frames (optional)
  - 1 stream: Undersize frames
  - 1 stream: Minimum size frames;  
approx. 2 FCS errors/second
- Streams share test step traffic rate equally



## Test Types Configurations – Errored Frames Filtering

Duration:	The duration of each test trial in seconds.
Iterations:	The number of times to repeat -each test trial with the same set of test parameters.
Start Rate:	The starting rate percentage used in the test.
End Rate:	The ending rate percentage used in the test.
Step Rate:	The rate step increment.



Enable Oversize Test:	If checked the oversize frames test will be performed. You can disable this if your DUT generally supports very large frame sizes and you don't want to bother testing this.
Max. Valid Frame Size:	The maximum valid frame size you believe your DUT should support.
Oversize Test Span:	The number of oversize frame sizes to use in the test. The frame sizes used will be in the range [max. valid size + 1, max. valid size + span].
Min. Valid Frame Size:	The minimum valid frame size you believe your DUT should support. This value should typically be 64.
Undersize Test Span:	The number of undersize frame sizes to use in the test. The frame sizes used will be in the range [min. valid size - 1, min. valid size - span].

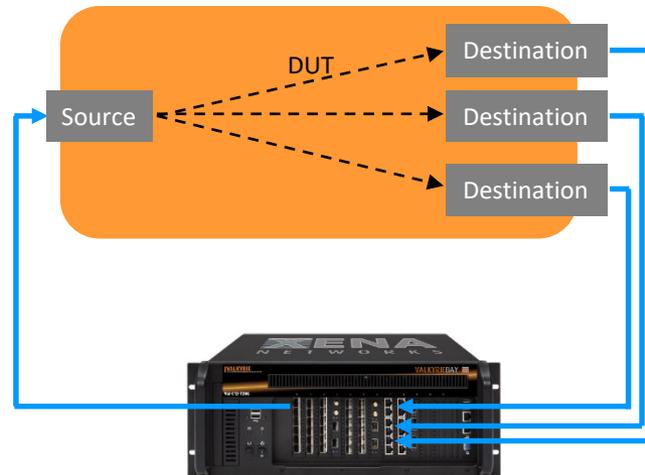
Used?	If checked the port will be used in this test.
Port Role	Used to place the port in either the "East" or the "West" block. Only available when Topology is either "Blocks" and "Pairs"
Port Peer	Used to pair the port with another port. Only available when Topology is "Pairs"

## Test Types Configurations – Broadcast Forwarding

RFC 2889 Objective: Determine the throughput and latency of the DUT when forwarding broadcast traffic. The ability to forward broadcast frames will depend upon a specific function built into the device for that purpose. It is therefore necessary to determine the ability of DUT/SUT to handle broadcast frames, since there may be many different ways of implementing such a function.

Test setup:

1 stream sends broadcast frames  
(destination MAC address =  
FF FF FF FF FF FF)



Several destination ports  
may be used for this test



## Test Types Configurations – Broadcast Forwarding

File Edit View Test Control Options Help

Add Chassis Start Stop Cancel Exit

### Test Types Configuration

- Rate Tests
  - Full Mesh
  - Part.Mesh, 1:N
  - Part.Mesh, N->N
- Congestion Control
- Forward Pressure
- Maximum Forwarding Rate
- Address Caching Capacity
- Address Learning Rate
- Errored Frames Filtering
- Broadcast Forwarding

Add Remove

**Common Options**

Duration:  seconds

Iterations:

**Throughput Test Options**

Initial Rate:  percent

Minimum Rate:  percent

Maximum Rate:  percent

Resolution Rate:  percent

Port Name	Used?	Port Role
P-0-11-0 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Source
P-0-11-1 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Destination
P-0-11-2 (SFP-E 10/100/1000M)	<input checked="" type="checkbox"/>	Destination

Select All Ports  Unselect All Ports

Ready | Test not running | Test Time: 00:00:00 | Duration: 00:00:00 | User: dan



## Test Types Configurations – Broadcast Forwarding

Duration:	The duration of each test trial in seconds.
Iterations:	The number of times to repeat -each test trial with the same set of test parameters.

Initial Rate:	The starting rate to use. This is specified as a percentage of the overall port rate defined in the general test options panel.
Maximum Rate:	The maximum rate to use. This is specified as a percentage of the overall port rate.
Minimum Rate:	The minimum rate to use. This is specified as a percentage of the overall port rate. If the iteration reaches this value the test is stopped and the result will be FAILED.
Resolution Rate:	The trial stops when the difference between the current and the last successful trial is less than the Resolution.

Used?	If checked the port will be used in this test.
Port Role	Used to place the port in either the "East" or the "West" block. Only available when Topology is either "Blocks" and "Pairs"
Port Peer	Used to pair the port with another port. Only available when Topology is "Pairs"



1

**Report Identification**

Customer Name:

Customer Service ID:

Customer Access ID:

Comments:

2

**Report Generation Options**

**Report Naming**

Report Filename Prefix:

Append Timestamp to Filename:

**Report Content**

Packets/Frames Terminology:

Include Detailed Port Information in Report:

Include Charts in Report:

Throughput Unit for Charts:

3

**Report Formats**

Generate PDF Report

Generate XML Report

Also Log Intermediate Results



## 1 *Report Identification:*

This section contains a number of options that can help identify the test context.

### **Customer Name:**

Customer Name:

The name of the customer for which the test is performed.

### **Customer Service/Access Id:**

These two options allow you to provide details about the network circuits you are testing.

Customer Service ID:

Customer Access ID:

### **Comments:**

Lets you to provide any multi-line comments for the test configuration.

Comments:



## 2 Report generation Options:

### Report Naming

#### **Report Filename Prefix:**

Specifies the prefix for the report filename.

#### **Append Timestamp to Filename:**

If checked a <YYYYMMDD-HHMMSS> timestamp is added to the filename prefix.

### Report Content

**Packets/Frames Terminology:** lets you choose if the units of data are referred to as "packets" or "frames".

**Include Detailed Port Information in Report:** If checked the report will also contain detailed results for each port. If unchecked only the totals will be reported.

**Include Charts in Report:** If checked the report will include bar charts showing the test results. This is only applicable for PDF type reports.

**Throughput Unit for Charts:** Use this to select whether to use frames/second or bits/second as the unit for throughput charts.



3

## *Report Formats:*

Select which type(s) of reports will be generated.

The generated report files will be given a file extension that matches the selected type i.e. ".pdf" for PDF files and so forth.

### **\*XML Report Specification**

You can find the [specification for the XML Report here](#).

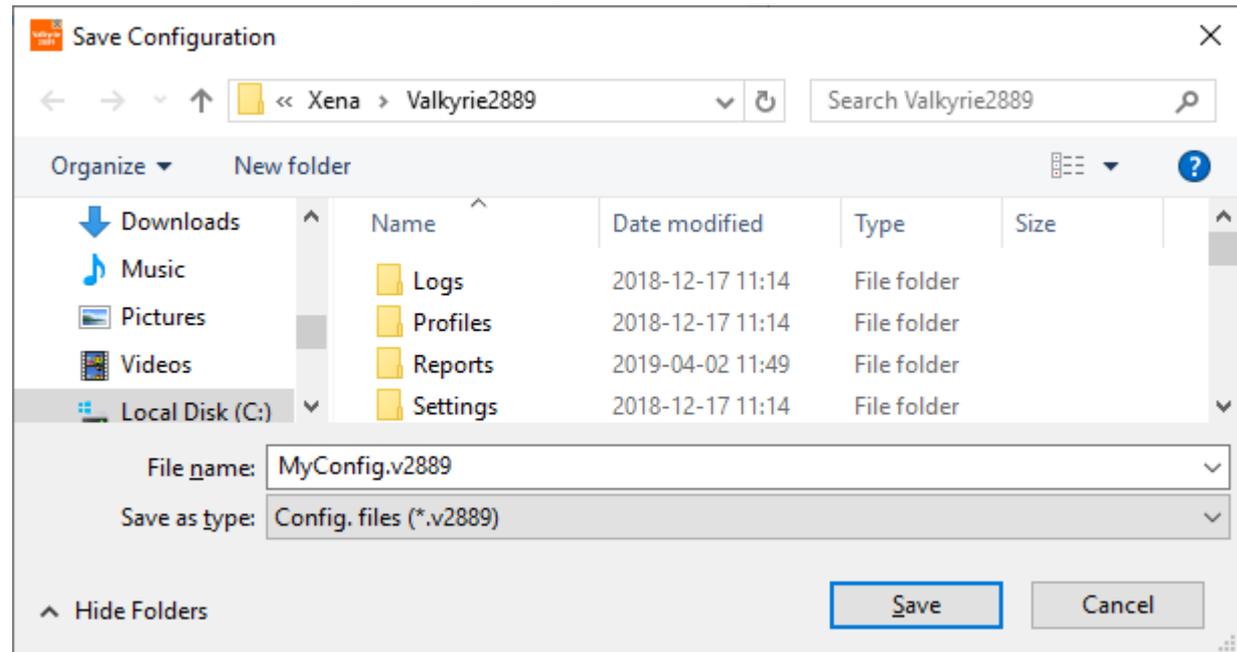
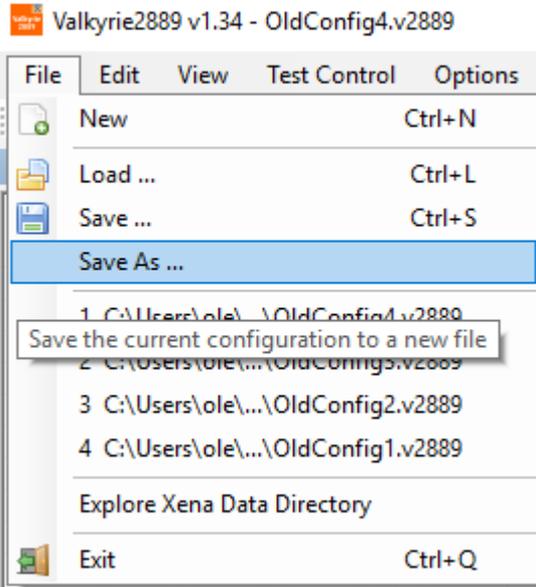
### **Also Log Intermediate Results**

Results from intermediate test steps are logged in a .csv file, which can be found in folder: \Documents\Xena\Valkyrie2889\Reports\ResultLog



## Xena RFC2889 CLI Option

Save the configuration with an appropriate name.





Use Valkyrie2889.Exe to parse and run your configuration:

\* This one command can be executed from a script via one line of code.

e.g. TCL : **EXEC** "C:/.../Valkyrie2889.exe -ec MyTestConfig.x2889"

```
C:\WINDOWS\system32\cmd.exe
C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>Valkyrie2889 -ec MyConfig.v2889
C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>INFO: Loading test configuration MyConfig.v2889
INFO: Activating chassis: 192.168.1.170
INFO: Logon to 192.168.1.170:22606 successful
INFO: All chassis connected and read
INFO: Starting subtest 'Throughput: Full Mesh'
INFO: Reserving ports
INFO: Resetting used ports
INFO: Port post-reset delay
INFO: Configuring ports
INFO: InitTrial: 512 byte packets, iteration 1
INFO: Setting up streams
INFO: Toggling port sync state
INFO: Sending MAC learning packets
INFO: Traffic on source port(s) started
INFO: Traffic on source port(s) stopped
INFO: Ending subtest 'Throughput: Full Mesh'
INFO: Starting subtest 'Forwarding: Full Mesh'
INFO: Reserving ports
INFO: Resetting used ports
INFO: Port post-reset delay
INFO: Configuring ports
INFO: InitTrial: 512 byte packets, iteration 1
INFO: Toggling port sync state
INFO: Sending MAC learning packets
INFO: Setting up streams
INFO: Traffic on source port(s) started
INFO: Traffic on source port(s) stopped
INFO: InitTrial: 512 byte packets, iteration 1
INFO: Toggling port sync state
INFO: Sending MAC learning packets
INFO: Setting up streams
INFO: Traffic on source port(s) started
INFO: Traffic on source port(s) stopped
INFO: Ending subtest 'Forwarding: Full Mesh'
INFO: All tests completed
INFO: PDF report written to [C:\Users\ole\Documents\Xena\Valkyrie2889\Reports\valkyrie2889-Report-20190304-114830.pdf]
INFO: Test execution completed
C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>
```



## Xena RFC2889 CLI Option

Use “—help” to learn about other parameters options:

```
C:\WINDOWS\system32\cmd.exe
C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>Valkyrie2889 -help
C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>
Valkyrie2889 version 1.33
Copyright © Xena Networks 2018
Valid options:

-c, --config          Load a test configuration file with the specified path.
-e, --execute         Execute the specified test configuration file (requires
-c <file>).
-g, --gennewcfg       Generate an empty configuration file to the path
specified and exit.
-u, --user            Set the username used when logging on to Xena testers
(default: valkeryrun).
-r, --reportpath      Set the directory where reports are saved.
-o, --company         Set the company name used in reports.
-l, --logo            Set the path to the report logo file.
-f, --clogfile        Full path to logfile (including filename) receiving
console output
--help               Display this help screen.

C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>
```



Visit our website:

[www.xenanetworks.com](http://www.xenanetworks.com)

Contact us:

[support@xenanetworks.com](mailto:support@xenanetworks.com)