XENA™

Test. Improve. Repeat.

Valkyrie3981 (v2.0)

A STEP-BY-STEP GUIDE

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VALKYRIE™

3918

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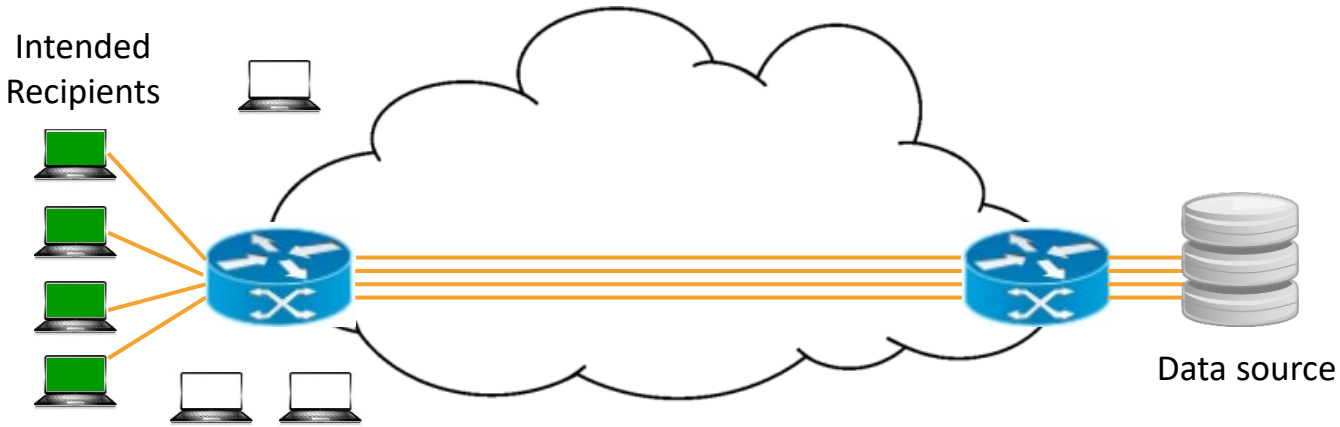
MULTICAST BACKGROUND

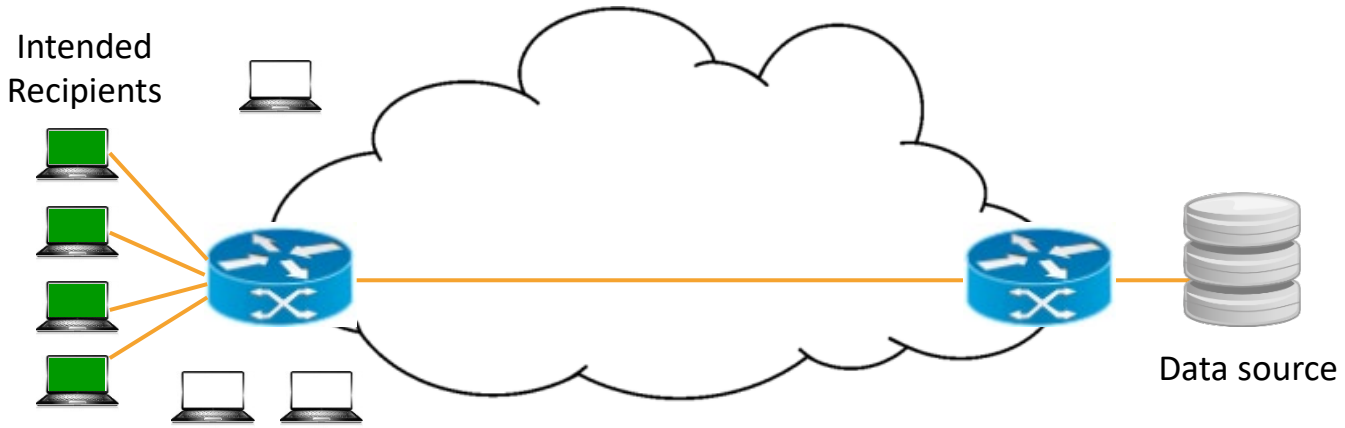
Multicasting data optimizes how is sent through a network

- Often data is sent from one point to another (Unicast)



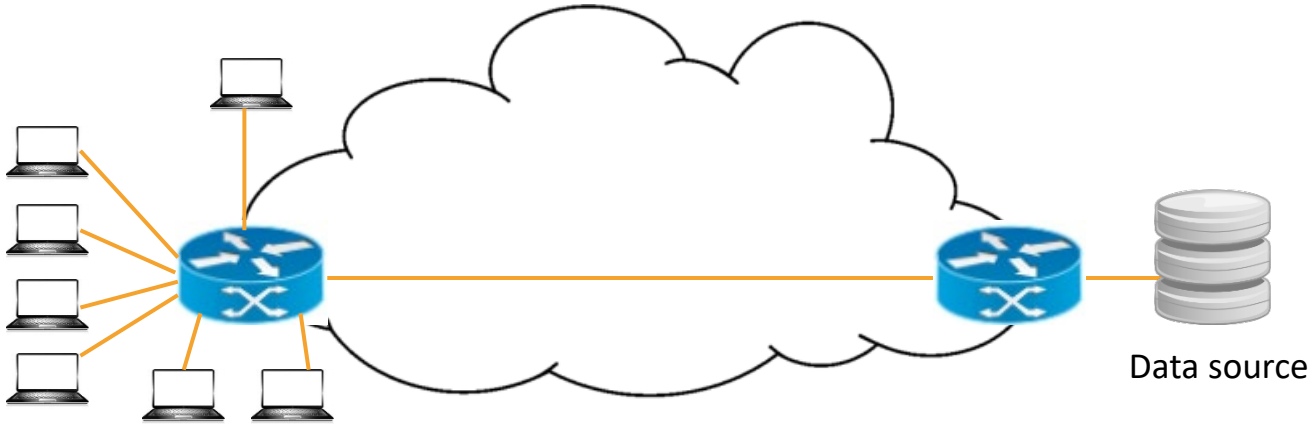
MULTICAST BACKGROUND

- If numerous end-users want to receive information from the same source at the same time, the bandwidth required to send the information through the network can be reduced.
  - This is achieved with IP Multicast:
    - Information is sent as one stream as far as possible before splitting it to the intended recipients.



MULTICAST BACKGROUND

- Broadcast is a third option for routing data through the network; in this case the information is sent to all users in a broadcast domain.

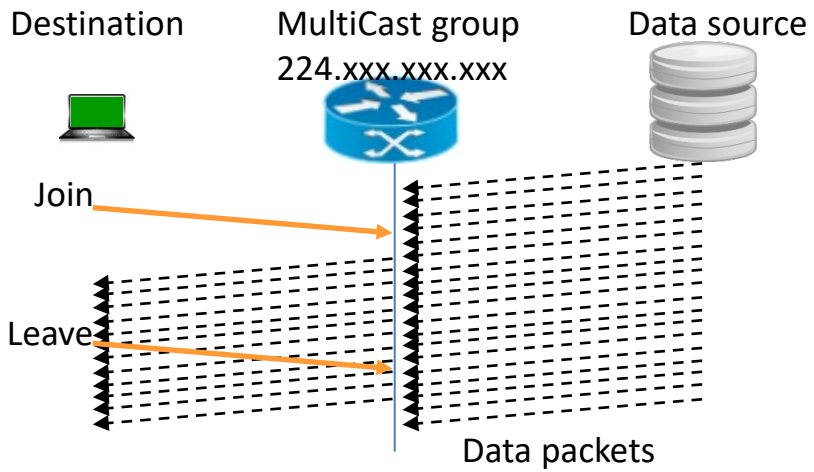


MULTICAST BACKGROUND

- With multicast, the recipients of the information can be limited to only those that are actually interested in receiving the information.
- Multicast is typically used for streaming application like:
  - Scheduled (not on-demand) IP Television
  - Video advertising
  - Multi-point video conferencing
  - Stock-quote applications
  - Simultaneous distribution of large files to a number of computers

MULTICAST BACKGROUND

- IP multicast enables real time communication between a source and a group of recipients (destinations) through an IP network
  - Recipient can dynamically enter an IP multicast group by sending a **Join** message, and drop out of the group again by sending a **Leave** message
  - Multicast address range (IPv4): 224.0.0.0 to 239.255.255.255



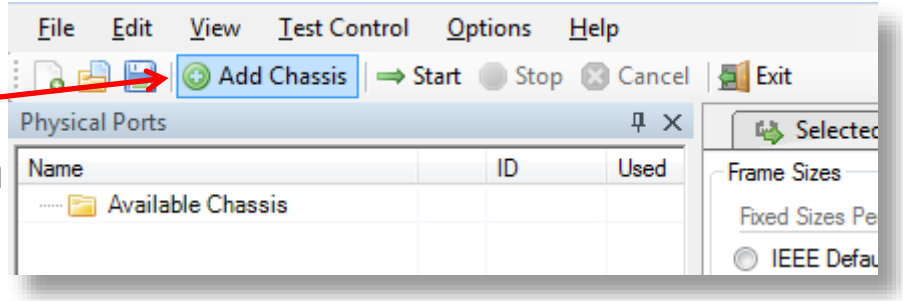
- The Join/Leave process is handled by
  - Internet Group Management Protocol (IGMP) for IPv4
  - Multicast Listener Discovery (MLD) protocol for IPv6

MULTICAST BACKGROUND

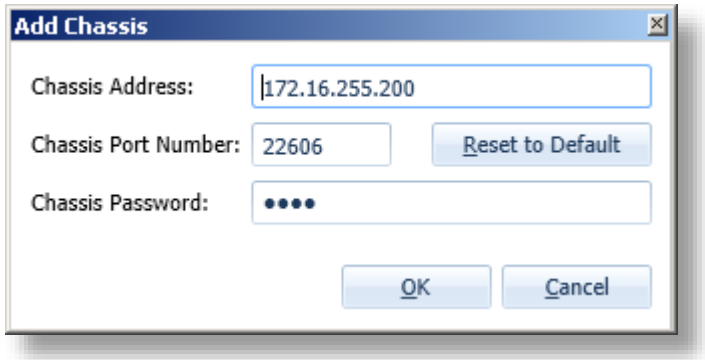
- To send data packets to an IP multicast group, the **source** use the multicast group address as destination IP address in data packets
  - Multicast group addresses are allocated dynamically.
  - There is no need for sources to register anywhere to send data packets to an IP multicast group, and sources don't have to join the group through IGMP/MLD
- Several sources can send data into an IP multicast group
  - IP multicast actually supports both point to multi-point and multi-point to multi-point communication.
  - IP multicast does not require that the multicast group source knows the recipients in the group
- IP network elements (e.g. switches, routers) transport data packets from the source to the IP multicast group recipients
  - IP network elements replicate data packets when required, but will use the IP network efficiently as a data packet is only sent once over a given link in the network, even if it will end up at numerous recipients

ADD CHASSIS

Click “Add Chassis” button



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



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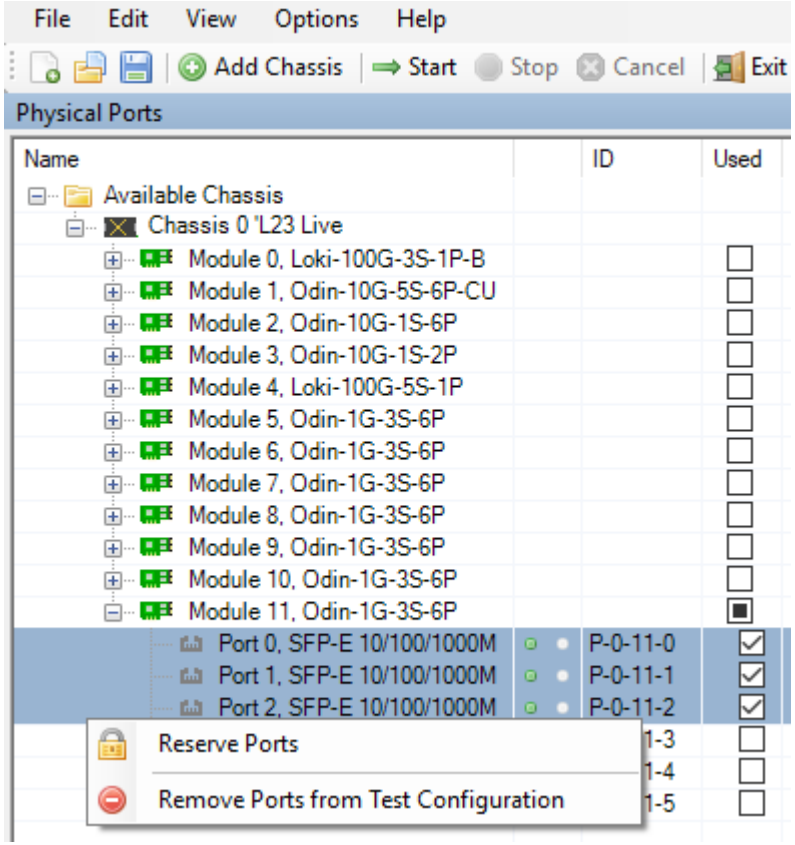
ADD PORT(S)

1. Choose the Port/s you would like to work with:
2. On selected ports + on “Reserve Ports”



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CONFIGURE PORT(S)

Choose the Port/s you want to configure :

Xena3918 v1.9 - <no name> (*)

File Edit View Options Help

Add Chassis | Start | Stop | Cancel | Exit

Selected Ports | Protocol Segment Profiles

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

Port Name	Port Role	Port Speed	IPv4 Address	Prefix	IPv4 Gateway	IPv6 Address	Prefix	IPv6 Gateway	UC Protocol Segment Profile
P-0-11-0 (SFP-E 10/100/1000M)	MC Source	AUTO	1.1.1.1	24	1.1.1.254	::	64	::	1: Ethernet / IPv4
P-0-11-1 (SFP-E 10/100/1000M)	MC Destination	AUTO	2.2.2.2	24	2.2.2.254	::	64	::	1: Ethernet / IPv4
P-0-11-2 (SFP-E 10/100/1000M)	UC Burden	AUTO	2.2.2.100	24	2.2.2.254	::	64	::	1: Ethernet / IPv4
P-0-11-3 (SFP-E 10/100/1000M)	UC Burden	AUTO	2.2.2.200	24	2.2.2.254	::	64	::	1: Ethernet / IPv4

Select All Ports | Deselect All Ports | Remove Port(s) | 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

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

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CONFIGURE PORT(S)

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.
Port Role	The role this port plays in the overall test configuration. See below for a description of the rules for port role assignment.
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.

Port Roles

The following rules apply when assigning roles to ports:

- There must be exactly one *Multicast Source* **(MC Source)** port. The MC Source port is the port that acts as the multicast server and transmits the multicast traffic to the multicast groups.
- There must be at least one *Multicast Destination* **(MC Destination)** port. The MC Destination ports act as the multicast clients and will receive the traffic sent to the multicast groups.
- If the selected tests require burdening traffic there must be at least two *Unicast Burdening* **(UC Burden)** ports. Burdening ports are used to emulate additional unicast traffic to burden the DUT.

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CONFIGURE PORT(S)

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

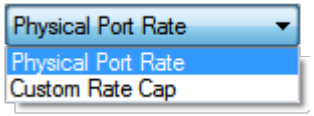
- This means enable **Flow Control on this port**

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**

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CONFIGURE PORT(S)

5 Public Address

Public IP Address: 1.1.1.1 Public IP Prefix: 24

Property	Explanation
Public IP Address:	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. Valkyrie2544 will then perform an ARP request for the public IP address before starting the test, in order to avoid packet loss due to an initial ARP phase. 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.
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.

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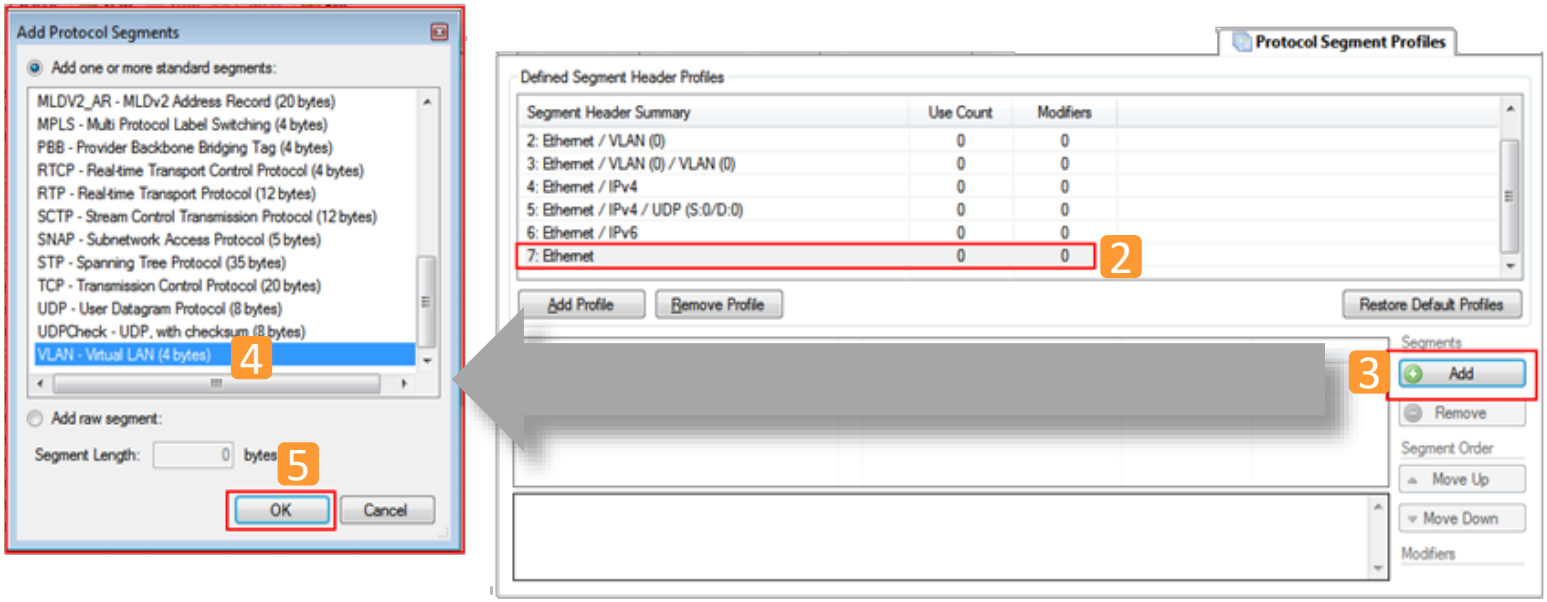
PROTOCOL SEGMENT PROFILES

2 Select the new Profile.

3 Click “Add” to add additional headers.

4 Choose Segment.

5 Click “OK”.



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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 match the need of the current test scenario.
- To create a new profile press the **Add Profile** button.
- To delete a profile select it in the list-view and click the **Remove Profile** button.

Default Profiles

- New Valkyrie2544 configurations will be populated with default profiles.
- You can freely modify or delete one or more of the default profiles.

Profile Editor

- To edit a profile, select it in the top list-view and use the tree-view control below.

PROTOCOL SEGMENT PROFILES

Add and Remove Segment Headers

- To add a new segment header click the **Add** button in the **Segments** section to the right.
- A dialog box will appear listing all built-in segment types - select one or more.
- To use a segment not currently supported, you can add a **raw segment** and specify the length in bytes.
- You can subsequently 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 Wireshark protocol analyzer.
- You can expand each segment branch to view and modify 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).

PROTOCOL SEGMENT PROFILES

MAC and IP Addresses

The address fields in the Ethernet and IP section headers will usually be overridden by the Valkyrie3918 when the test-streams are created:

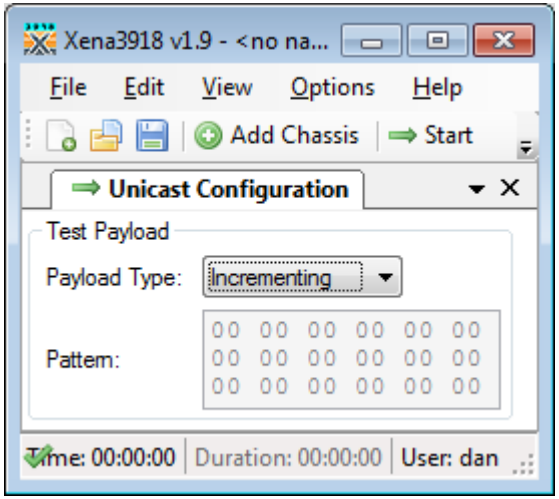
> **Source MAC (SMAC) address field** in the first Ethernet segment will be set to the MAC address of the source port.
>
> **Destination MAC (DMAC) address field** in the first Ethernet segment will be set to the MAC address of the destination port.

If an IP segment has been defined and a gateway IP address is defined for a source port, Valkyrie3918 will try 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.

UNICAST CONFIGURATION



Payload Type:

Pattern means you can set your own custom pattern:

Incrementing means "000102030405…FF00010203…" provides built-in data integrity check for payload.

PRBS provides Pseudo Random Bit Sequence of 2^31-1 pattern No data integrity with adding Payload checksum in port properties.

XENA NETWORKS

MULTICAST CONFIGURATION

Start Page | Selected Ports | Test Configuration | **Multicast Configuration** | Unicast Configuration

Multicast Protocol Profile and Version

Protocol Profile: 1: Ethernet / IPv4

IGMP/MLD Version: IGMPv2/MLDv1

Multicast Address Range

Start Address (IPv4): 225.0.0.0

Start Address (IPv6): FF11::1

Step Value: 1

Protocol Registration Handling

Join Refresh Interval: 10 secs

Join/Leave Rate: 1000 packets/sec

Use Source Address: ☐

Leave to AllRouters: ☐

Test Payload

Payload Type: Incrementing

Pattern:

```
00 00 00 00 00 00
00 00 00 00 00 00
00 00 00 00 00 00
```

Packet Rate

◉ Fraction: 10 percent

○ Packet/sec: 0 packets/sec

Resulting Rates

Port Speed Type

Fraction:

Packets/sec:

Bits/sec (L1)

Bits/sec (L2)

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MULTICAST CONFIGURATION

Protocol Profile: 1: Ethernet / IPv4

IGMP/MLD Version: IGMPv2/MLDv1

Protocol Profile:	Select the encapsulations used for the multicast traffic based on the Protocol Segments list.
IGMP/MLD Version:	Specifies the IGMP or MLD version to use. (Note that the IP version is selected in the Protocol Segments subpanel described below.)

Start Address (IPv4): 225.0.0.0

Start Address (IPv6): FF11::1

Step Value: 1

Multicast Start Address:	The start address to use when allocating a multicast group address sequence.
Step Value:	The step value used to increment the address when generating a multicast group address sequence.

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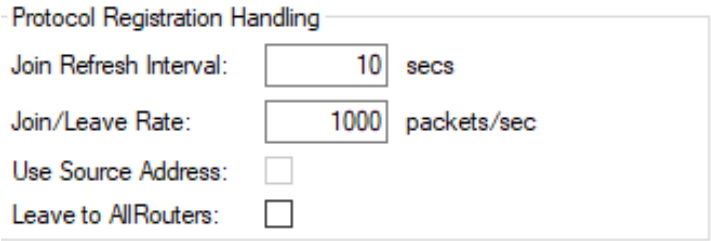
MULTICAST CONFIGURATION



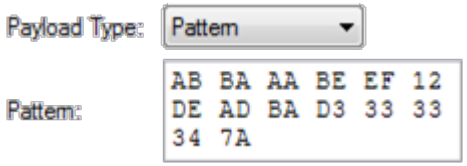
Join Refresh Interval:	The interval in seconds that the join requests will be retransmitted. This is useful for longer-running tests where the router may otherwise timeout the individual learning requests.
Join/Leave Rate:	The maximum rate that the IGMP Join or Leave packets are sent. This is used to spread out the request transmission to prevent the DUT from being overwhelmed and drop requests.
Use Source Address:	If selected, the multicast address will be added as a source address to the IGMPv3/MLDv2 Group Record in the Join/Leave requests. If not selected the Group Records will not contain any source addresses. See RFC 3376, section 4.2.9 for details.
Leave to AllRouters	If selected, Leave Group messages are sent to the all-routers multicast group (224.0.0.2) If not selected Leave Group messages are sent to the multicast group address

XENA NETWORKS

MULTICAST CONFIGURATION

Payload Type:

Pattern mean you can set your own custom pattern:



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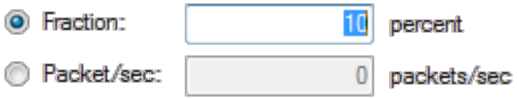
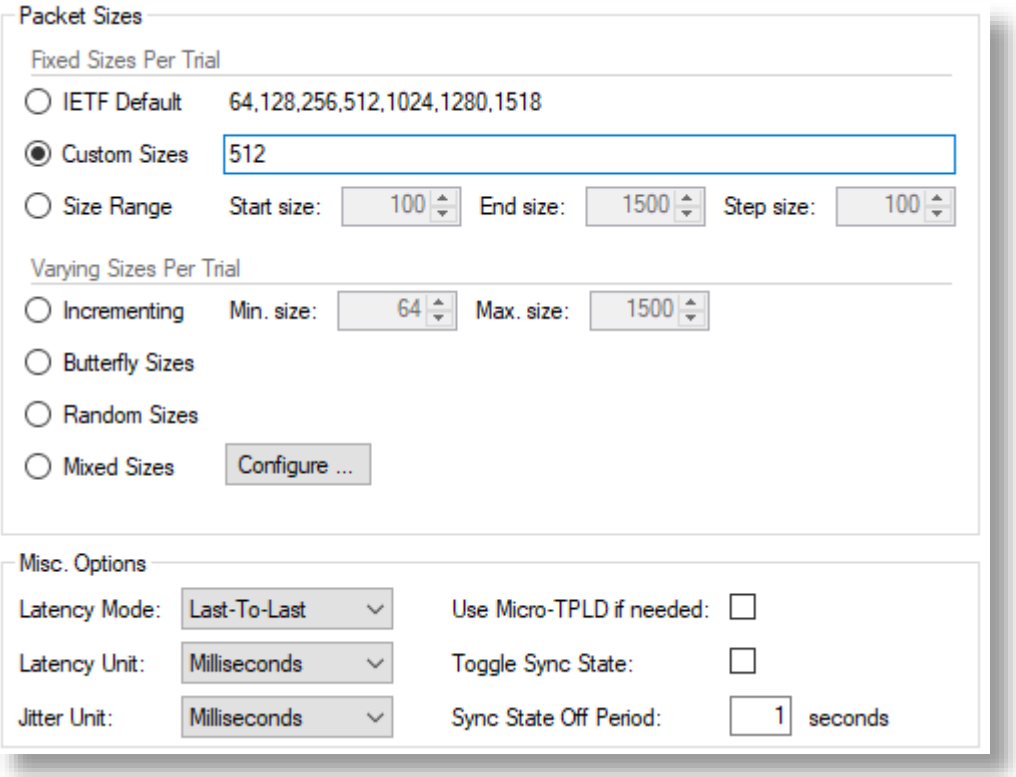
No data integrity with adding Payload checksum in port properties



Fraction:	Lets you specify the overall rate used for the multicast stream as a percentage of the physical port rate.
Packet/sec:	Lets you specify the overall rate used for the multicast stream as a packets per second value.

GENERAL TEST CONFIGURATION



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GENERAL TEST CONFIGURATION

Frame Sizes Per Trial

1 *IETF Default:*

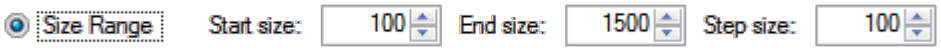
The default setting is to use the IETF standard frame sizes : 64, 128, 256, 512, 1024, 1280 and 1518 bytes.

The following options are also available:

Custom Sizes:

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

Size Range:



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

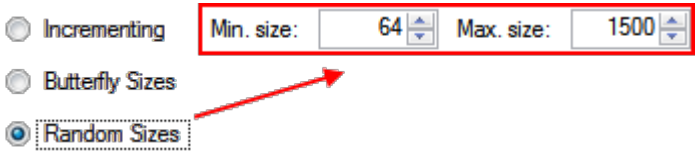
Incrementing Sizes:

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

Butterfly Sizes:

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

Random Sizes:



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

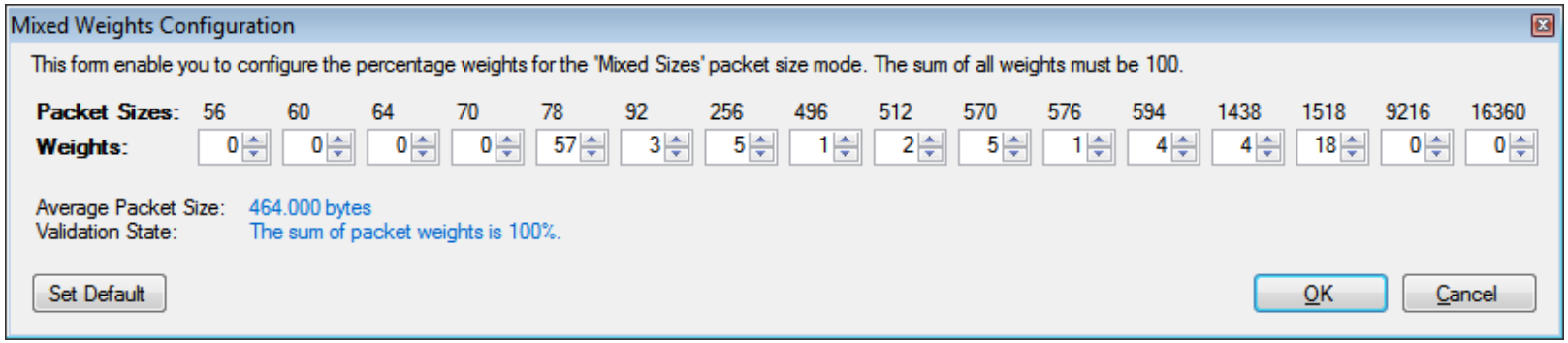
XENA NETWORKS

GENERAL TEST CONFIGURATION

Frame Sizes Per Trial

Mixed Sizes:

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



**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

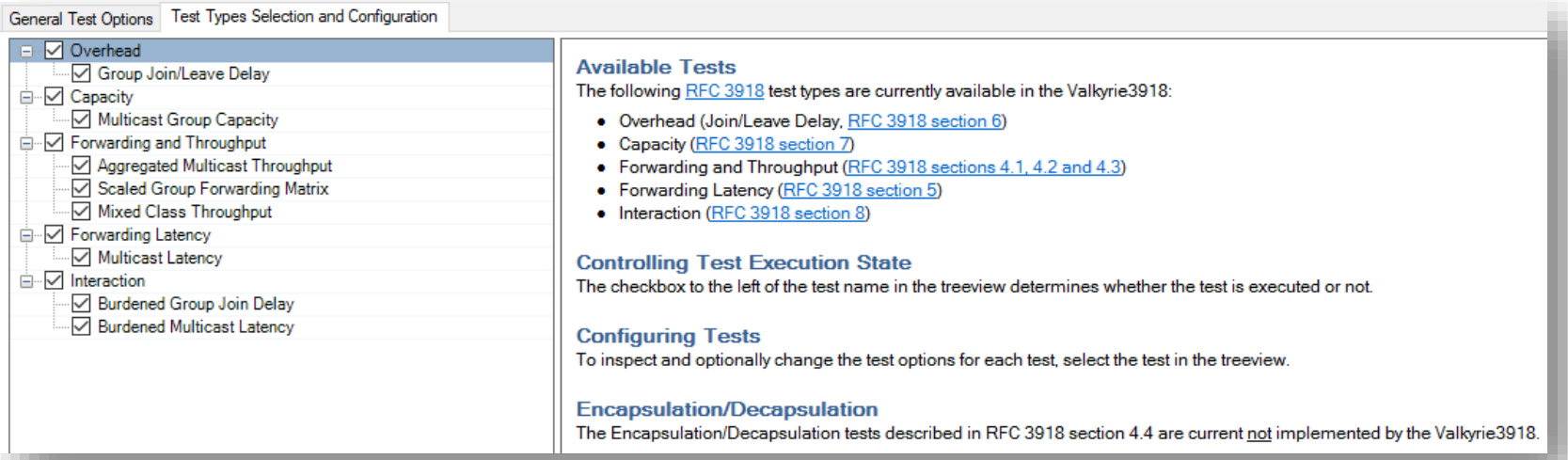
Latency Mode:	Define the mode used to measure latency.
Latency Unit:	Define the unit used to report latency measurements.
Jitter Unit:	Define the unit used to report jitter measurements.
Use Micro TPLD if Needed:	When using regular TPLD 20B shall be used. *This means for ETH+IP+UDP(+TPLD)+FCS = 14+20+8(+20)+4 = 66 With Micro TPLD the TPLD size to 6B.
Toggle Sync State:	If selected, toggles the port sync off and on states between each trial.
Sync State Off Period:	The time the link will be off when “Toggle Sync State” is selected.

GENERAL TEST CONFIGURATION

Test Types

Valkyrie3918 supports the following subtests:

- Group Join/Leave Delay
- Multicast Group Capacity
- Aggregated Multicast Throughput
- Scaled Group Forwarding Matrix
- Mixed Class Throughput
- Multicast Latency
- Burdened Group Join Delay
- Burdened Multicast Latency



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GENERAL TEST CONFIGURATION

Test Types Configurations – Group Join/Leave Delay

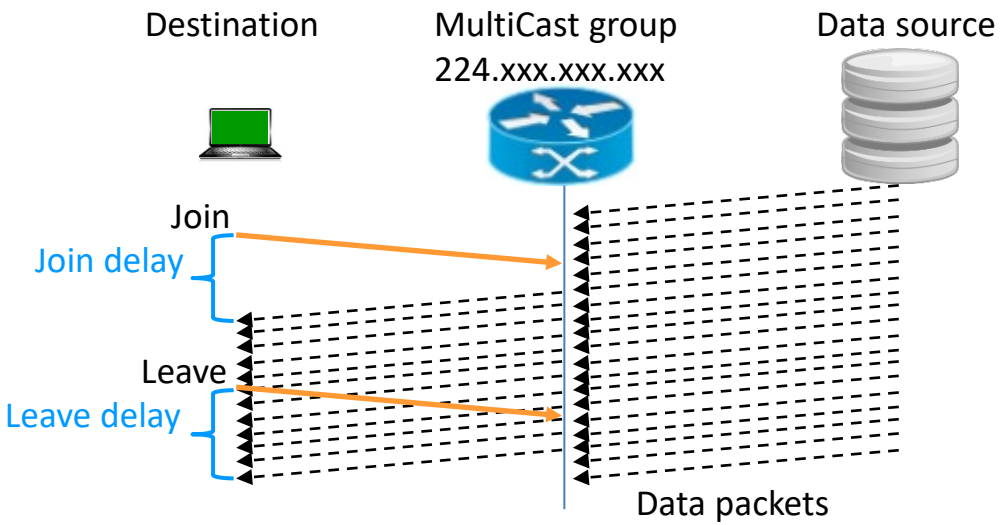
RFC 3918 Group Join Delay Objective: To determine the time duration it takes a DUT/SUT to start forwarding multicast frames from the time a successful IGMP group membership report has been issued to the DUT/SUT

RFC 3918 Group Leave Delay Objective: To determine the time duration it takes a DUT/SUT to cease forwarding multicast frames after a corresponding IGMP Leave Group message has been successfully offered to the DUT/SUT

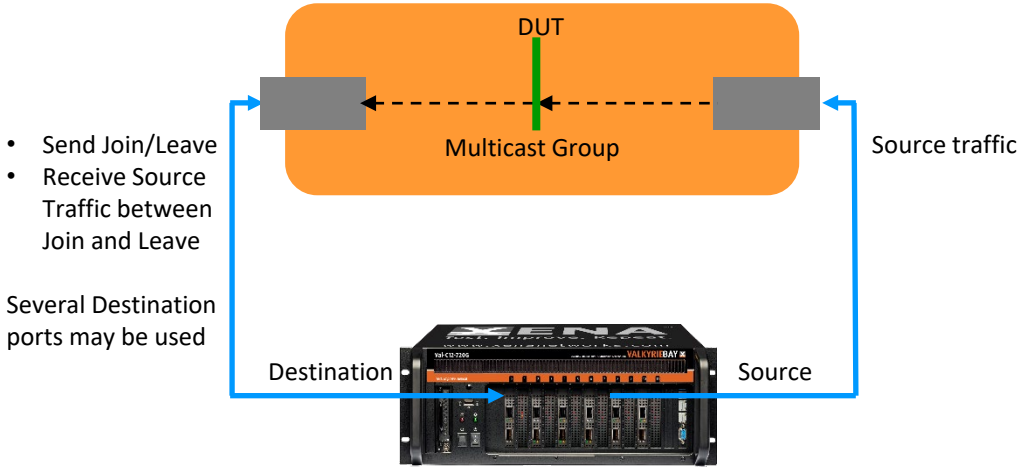
Group Join Delay and Group Leave Delay are covered in the same Valkyrie3918 subtest

GENERAL TEST CONFIGURATION

Test Types Configurations – Group Join/Leave Delay



Test setup:



- Send Join/Leave
- Receive Source Traffic between Join and Leave

Several Destination ports may be used

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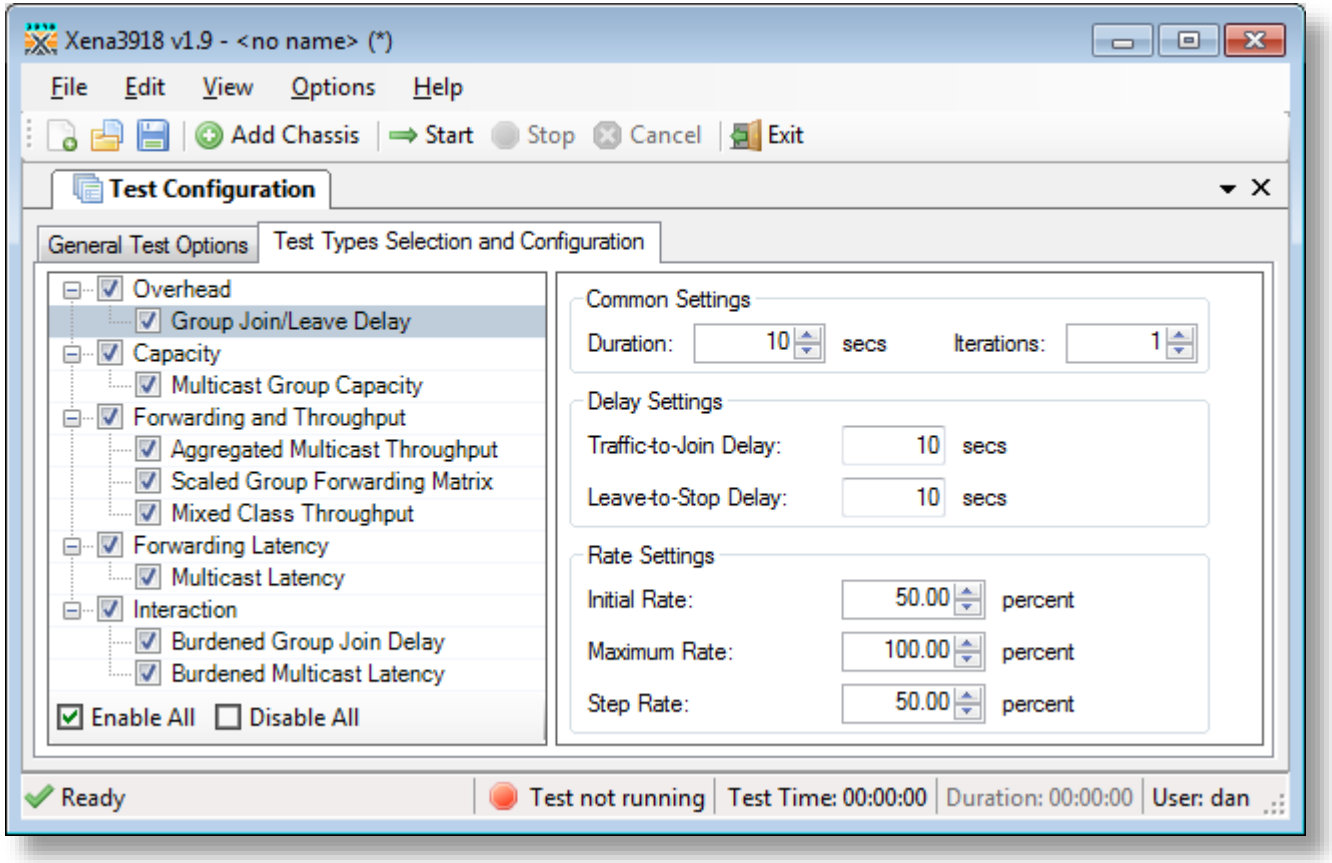
GENERAL TEST CONFIGURATION

Test Types Configurations – Group Join/Leave Delay



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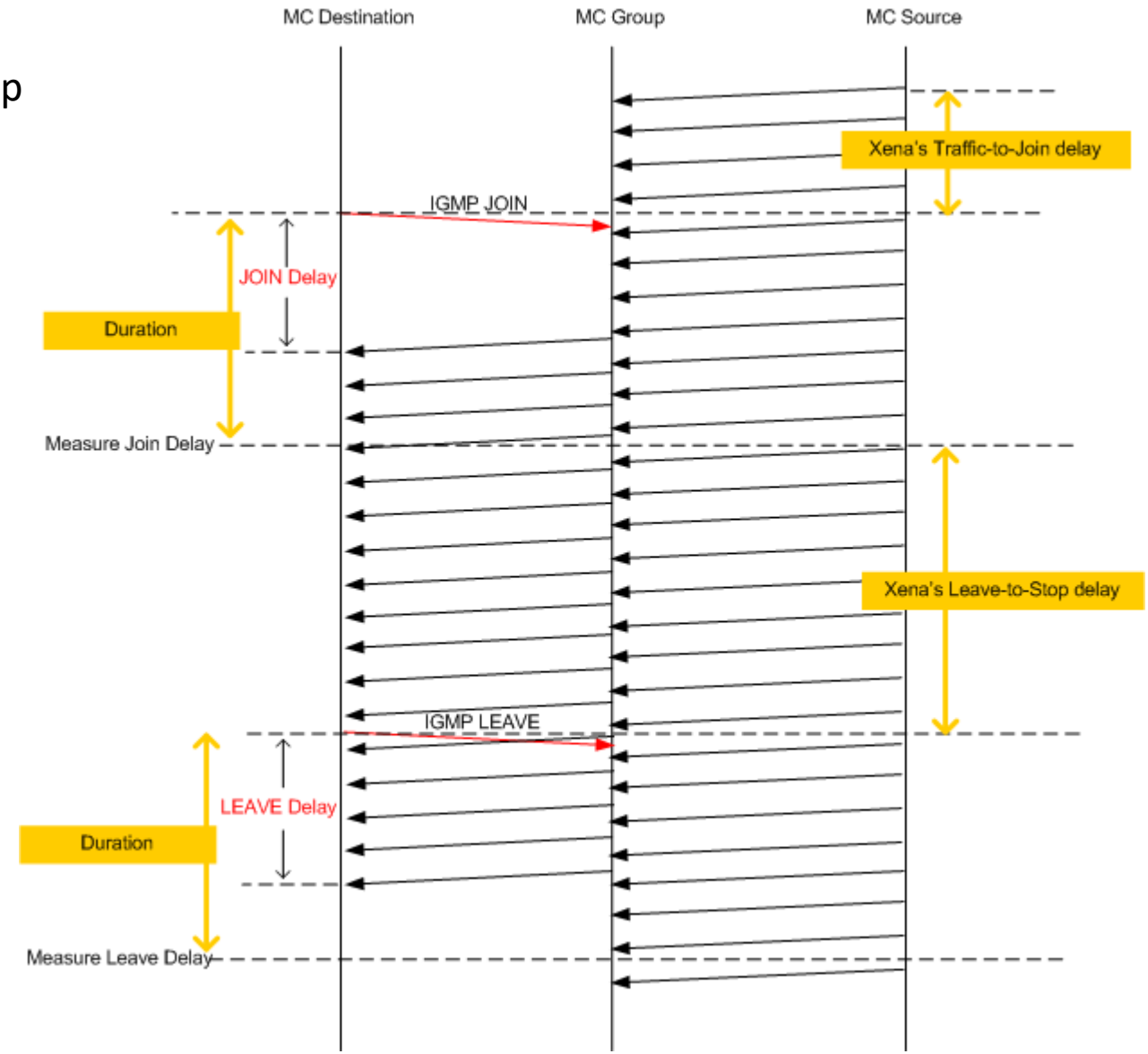
GENERAL TEST CONFIGURATION

Test Types Configurations – Group Join/Leave Delay

Flow per test step



XENA NETWORKS

GENERAL TEST CONFIGURATION

Test Types Configurations – Group Join/Leave Delay

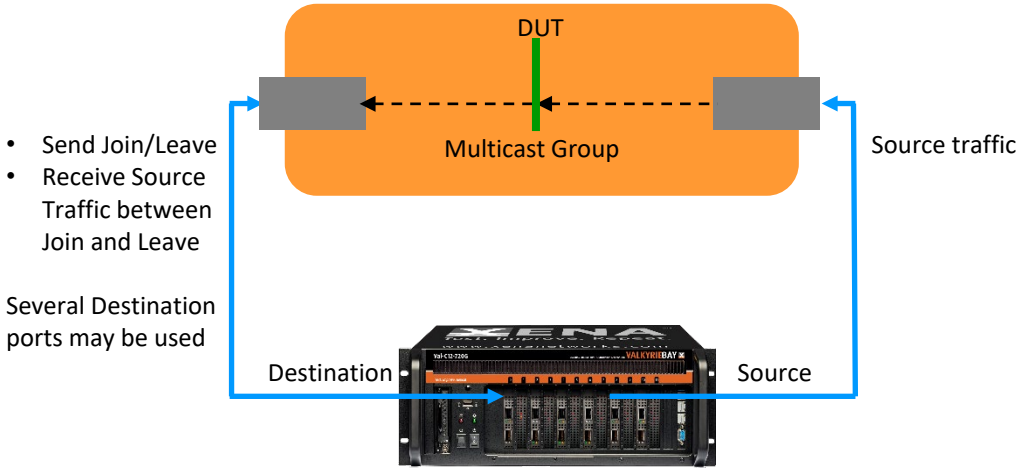
Duration:	The duration in seconds of the time used in each trial for the actual measurement. This does not include the test setup and teardown phases so the total duration of a test will be longer.
Iterations:	The number of times a test is repeated using the same set of variable parameters (packet size, rate, etc.)
Traffic-to-Join Delay:	The number of seconds to wait between starting the multicast traffic on the server and sending the Join requests from the clients. This delay ensures that we can accurately check that traffic is not received by clients before they Join the multicast groups.
Leave-to-Stop Delay:	The number of seconds to wait between sending the Leave requests from the clients and stopping the multicast traffic on the server. This delay ensures that we can accurately check that the Leave requests from clients are actually honored by the server before stopping the traffic.
Initial Rate:	If present this option denotes the initial rate in percent of the overall rate configured in the Multicast Stream panel.
Maximum Rate:	If present this option denotes the maximum rate in percent of the overall rate configured in the Multicast Stream panel.
Minimum Rate:	If present this option denotes the minimum rate in percent of the overall rate configured in the Multicast Stream panel.
Step Rate:	if present this option is used to increment the rate percentage when iterating from a starting to a maximum rate.

GENERAL TEST CONFIGURATION

Test Types Configurations – Multicast Group Capacity

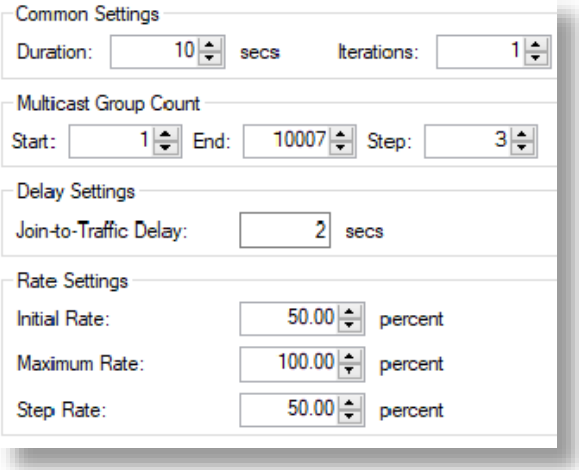
RFC 3918 Objective: To determine the maximum number of multicast groups a DUT/ can support while maintaining the ability to forward multicast frames to all multicast groups registered to that DUT/SUT

Test setup:



GENERAL TEST CONFIGURATION

Test Types Configurations – Multicast Group Capacity



Flow per test step:

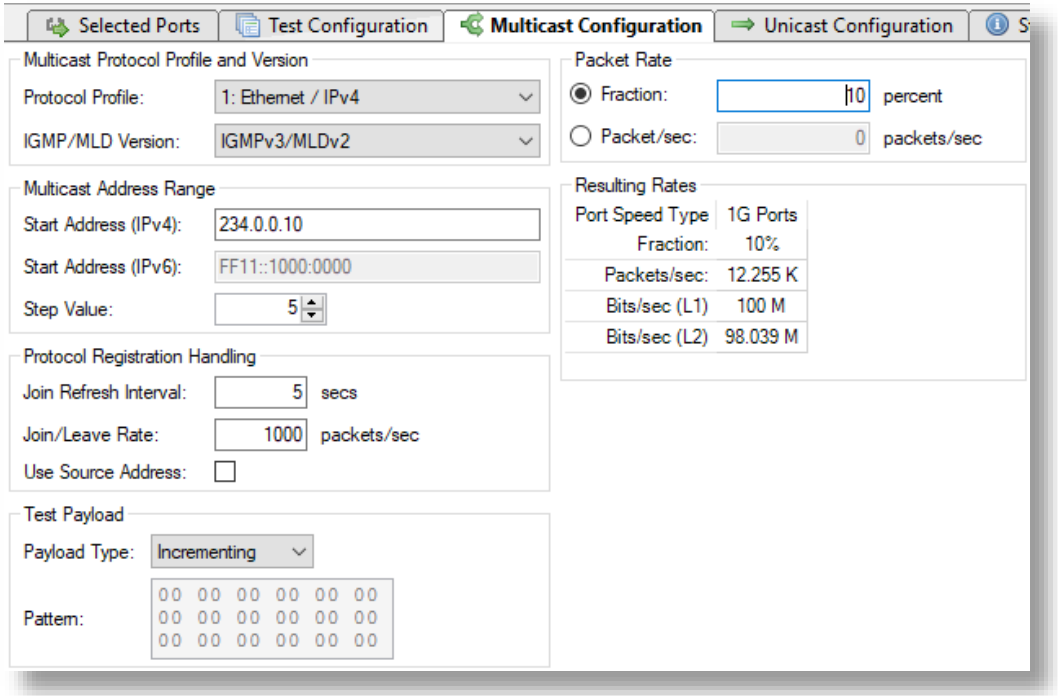
- Initialization
- Send Join from destination port(s)
- Wait “Join-to-Traffic” delay
- Start traffic on Multicast source port
- Check that all packets sent are received by the destination port(s)
    - If No: Test is over; result is Multicast Group Count from previous test step
    - If Yes increase Multicast Group Count with step size for next test step
- Stop traffic on Multicast source port
- Send Leave from destination port(s)

XENA NETWORKS

GENERAL TEST CONFIGURATION

Test Types Configurations – Multicast Group Capacity

Configuration of Multicast Groups:



- Multicast addresses range: 224.0.0.0 to 239.255.255.255

XENA NETWORKS

GENERAL TEST CONFIGURATION

Test Types Configurations – Multicast Group Capacity

Duration:	The duration in seconds of the time used in each trial for the actual measurement. This does not include the test setup and teardown phases so the total duration of a test will be longer.
Iterations:	The number of times a test is repeated using the same set of variable parameters (packet size, rate, etc.)
Multicast Group Count:	If present this option allows you to define a multicast group count sweep with a start, end and step value.
Join-to-Traffic Delay:	The delay between the sent Joins and the start of the traffic. It is meant to give the DUT time to process the joins before burdening it with traffic.
Initial Rate:	If present this option denotes the initial rate in percent of the overall rate configured in the Multicast Stream panel.
Maximum Rate:	If present this option denotes the maximum rate in percent of the overall rate configured in the Multicast Stream panel.
Step Rate:	if present this option is used to increment the rate percentage when iterating from a starting to a maximum rate.

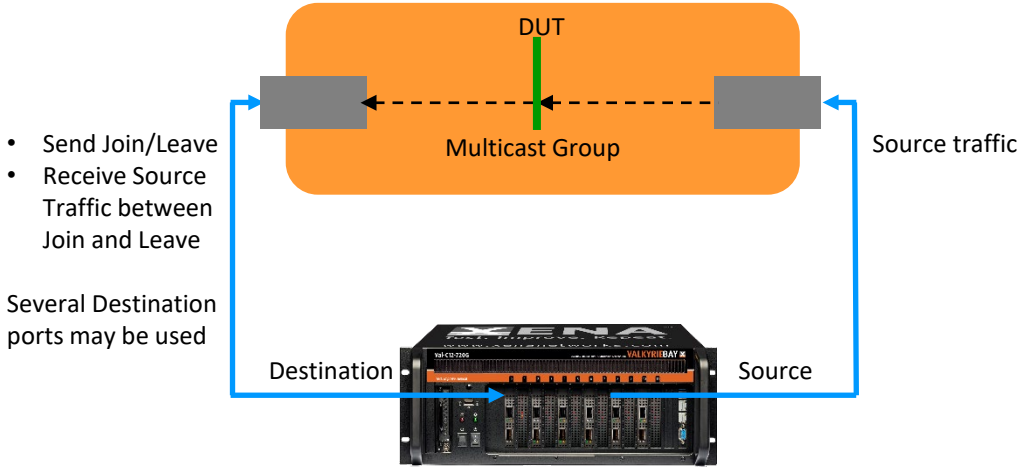
XENA™ NETWORKS

GENERAL TEST CONFIGURATION

Test Types Configurations – Aggregated Multicast Throughput

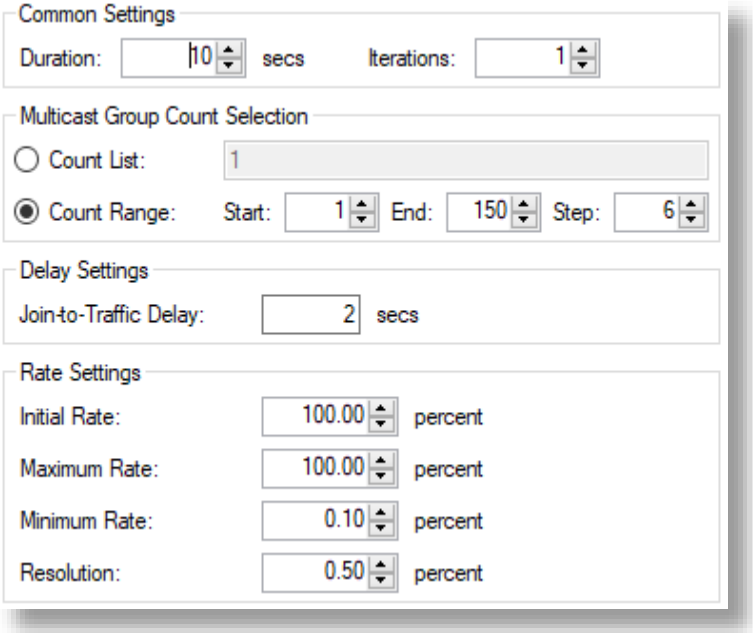
RFC 3918 Objective: To determine the maximum rate at which none of the offered frames to be forwarded through N destination interfaces of the same multicast groups are dropped

Test setup:



GENERAL TEST CONFIGURATION

Test Types Configurations – Aggregated Multicast Throughput



Flow per test step:

- Initialization
- Send Join from destination port(s)
- Wait “Join-to-Traffic” delay
- Start traffic on Multicast source port
- After Duration send Leave from destination port(s)
- Check that all packets sent are received by the destination port(s)
    - If Yes: Go to next Multicast Group Count
    - If No: Iterate to find a traffic rate without packet loss
        - After that: Go to next Multicast Group Count

XENA NETWORKS

GENERAL TEST CONFIGURATION

Test Types Configurations – Aggregated Multicast Throughput

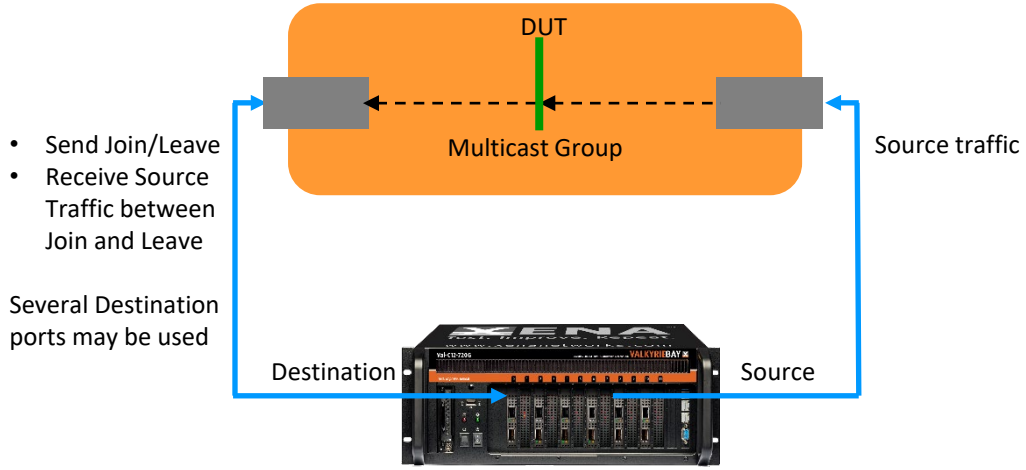
Duration:	The duration in seconds of the time used in each trial for the actual measurement. This does not include the test setup and teardown phases so the total duration of a test will be longer.
Iterations:	The number of times a test is repeated using the same set of variable parameters (packet size, rate, etc.)
Count List:	The test will run for each group count listed (e.g. 1,10,100)
Count Range:	The test will run for *Start* # of groups and increment till *End* by increments of *Step*.
Join-to-Traffic Delay:	The delay between the sent Joins and the start of the traffic. It is meant to give the DUT time to process the joins before burdening it with traffic.
Initial Rate:	If present this option denotes the initial rate in percent of the overall rate configured in the Multicast Stream panel.
Maximum Rate:	If present this option denotes the maximum rate in percent of the overall rate configured in the Multicast Stream panel.
Minimum Rate:	If present this option denotes the minimum rate in percent of the overall rate configured in the Multicast Stream panel.
Resolution:	If present this option denotes a minimum difference between rates which will be used to stop the iteration.

GENERAL TEST CONFIGURATION

Test Types Configurations – Scaled Group Forwarding Matrix

RFC 3918 Objective: To determine Forwarding Rate as a function of tested multicast groups for a fixed number of tested DUT/SUT ports

Test setup:

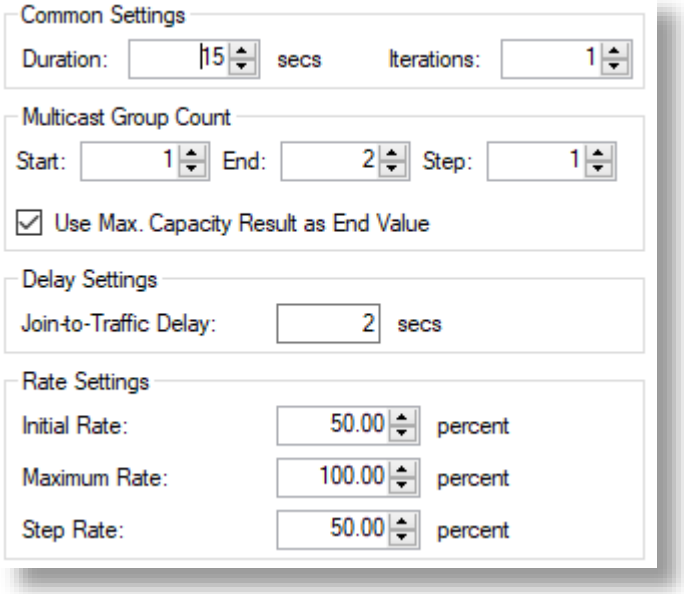


GENERAL TEST CONFIGURATION

Test Types Configurations – Scaled Group Forwarding Matrix

Flow per test step:

- Initialization
- Send Join from destination port(s)
- Wait “Join-to-Traffic” delay
- Start traffic on Multicast source port and count
  sent and received traffic on involved ports
- After “Duration” stop traffic on Multicast source port
- Send Leave from destination port(s)



After test step: Go to next Multicast Group Count

Then repeat test with next higher rate setting

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GENERAL TEST CONFIGURATION

Test Types Configurations – Scaled Group Forwarding Matrix

Duration:	The duration in seconds of the time used in each trial for the actual measurement. This does not include the test setup and teardown phases so the total duration of a test will be longer.
Iterations:	The number of times a test is repeated using the same set of variable parameters (packet size, rate, etc.)
Multicast Group Count Selection:	If present this option allow you to specify a series of multicast group counts which can be used if multiple iterations have been configured.
Use Max. Capacity Result as End Value	Enable in order to have the test use the “Max Capacity” result – This value will be achieved after running the Max Group Capacity test.
Join-to-Traffic Delay:	The delay between the sent Joins and the start of the traffic. It is meant to give the DUT time to process the joins before burdening it with traffic.
Initial Rate:	If present this option denotes the initial rate in percent of the overall rate configured in the Multicast Stream panel.
Maximum Rate:	If present this option denotes the maximum rate in percent of the overall rate configured in the Multicast Stream panel.
Step Rate:	if present this option is used to increment the rate percentage when iterating from a starting to a maximum rate.

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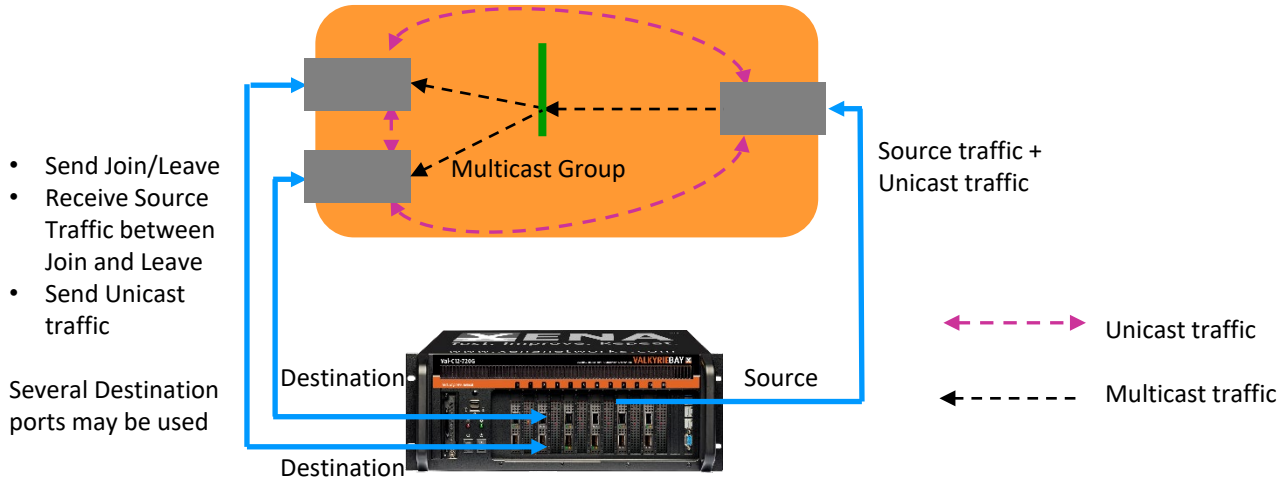
GENERAL TEST CONFIGURATION

Test Types Configurations – Mixed Class Throughput

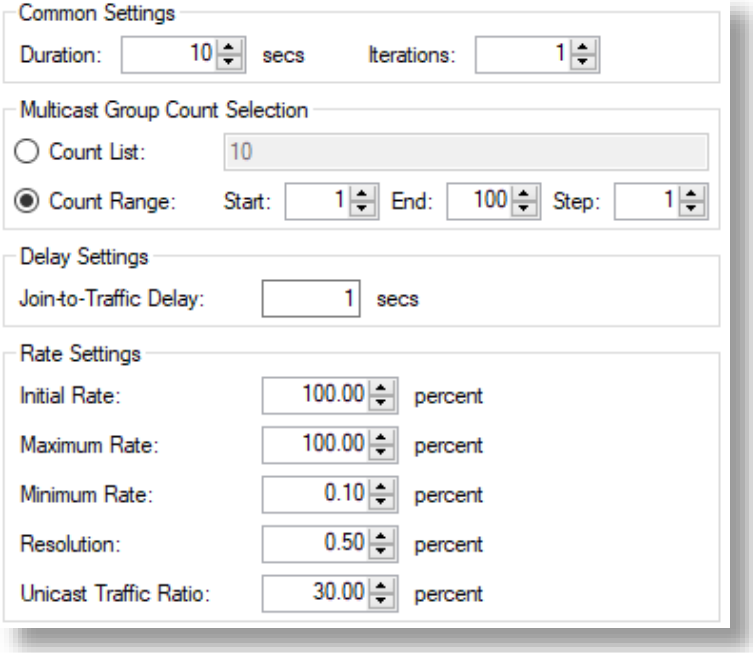
RFC 3918 Objective: To determine the throughput of a DUT/SUT when both unicast class frames and multicast class frames are offered simultaneously to a fixed number of interfaces

Test setup:



GENERAL TEST CONFIGURATION

Test Types Configurations – Mixed Class Throughput



Flow per test step:

- Initialization
- Briefly start and stop traffic on all ports
- Send Join from destination port(s)
- Wait “Join-to-Traffic” delay
- Start traffic on Multicast source port and Unicast traffic on all source and destination ports.
  Count sent and received traffic on involved ports
- After “Duration” stop traffic on all ports
- Send Leave from destination port(s)
- Check that all Multicast packets sent are received by the destination port(s)
  - If Yes: Go to next Multicast Group Count
  - If No: Iterate to find a traffic rate without packet loss
    - After that: Go to next Multicast Group Count

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GENERAL TEST CONFIGURATION

Test Types Configurations – Mixed Class Throughput

Duration:	The number of seconds used in each trial for the actual measurement. Does not include the test setup and teardown phases so the total duration of a test will be longer.
Iterations:	The number of times a test is repeated using the same set of variable parameters (packet size, rate, etc.)
Count List:	The test will run for each group count listed (e.g. 1,10,100)
Count Range:	The test will run for *Start* # of groups and increment till *End* by increments of *Step*.
Join-to-Traffic Delay:	The delay between the sent Joins and the start of the traffic. It is meant to give the DUT time to process the joins before burdening it with traffic.
Initial Rate:	The initial rate in percent of the overall rate configured in the Multicast Stream panel.
Maximum Rate:	The maximum rate in percent of the overall rate configured in the Multicast Stream panel.
Minimum Rate:	The minimum rate in percent of the overall rate configured in the Multicast Stream panel.
Resolution:	Denotes a minimum difference between rates that will be used to stop the iteration.
Unicast Traffic Ratio:	If present this option denotes the percentage of the overall rate configured in the Multicast Stream panel to be used for unicast traffic. Note that the unicast rate will be <u>added</u> to the configured multicast rate. So if the multicast rate has been set to e.g. 10% and the UC traffic ratio is set to 50% the total rate for the port will be 10% + (50% of 10%) = 15%.

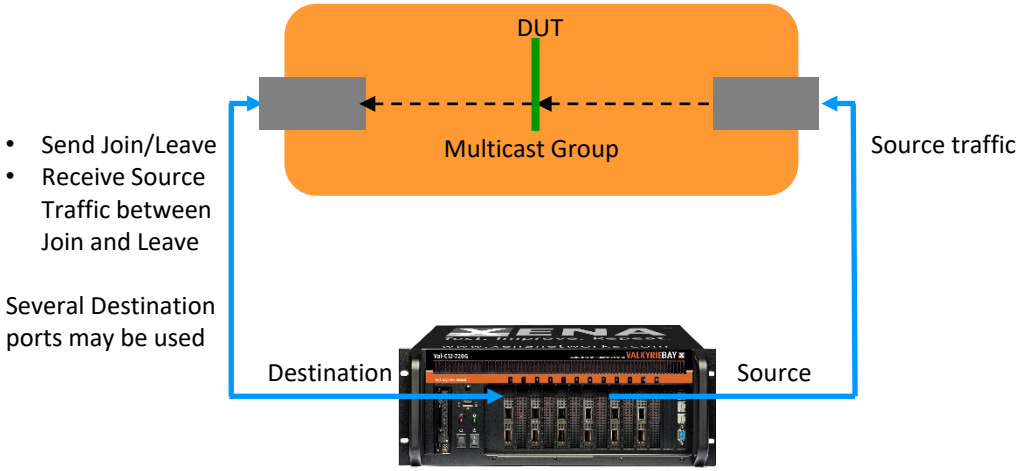
XENA™ NETWORKS

GENERAL TEST CONFIGURATION

Test Types Configurations – Multicast Latency

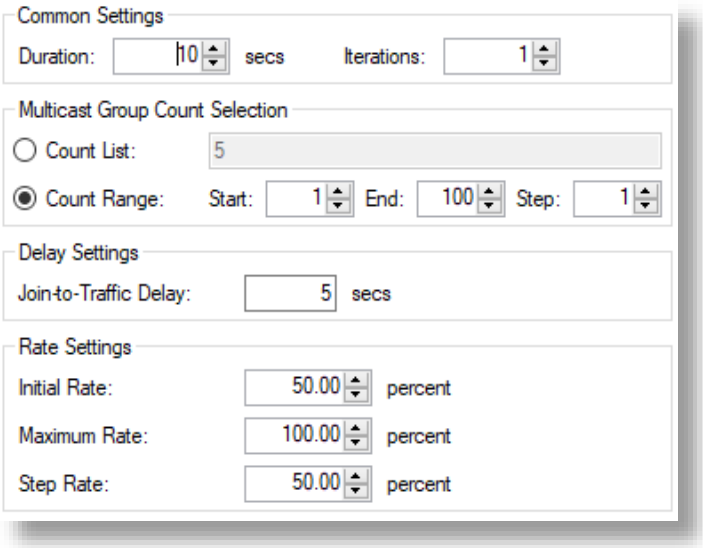
RFC 3918 Objective: To produce a set of multicast latency measurements from a single, multicast ingress interface of a DUT/SUT through multiple, egress multicast interfaces of that same DUT/SUT as provided for by the metric "Multicast Latency" in RFC 2432

Test setup:



GENERAL TEST CONFIGURATION

Test Types Configurations – Multicast Latency



Flow per test step:

- After initialization :
- Join is sent from Destination port(s)
- After “Join-to-Traffic Delay” traffic is sent from the source port
- Measure time from traffic start on source port to traffic is received on destination port
- After “Duration” source port stops sending traffic
- Send Leave message from Destination port(s)

Next step will be next higher rate setting

When all rate settings have been tested for a Multicast Group Count, tests will be repeated for the next Multicast Group Count

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GENERAL TEST CONFIGURATION

Test Types Configurations – Multicast Latency

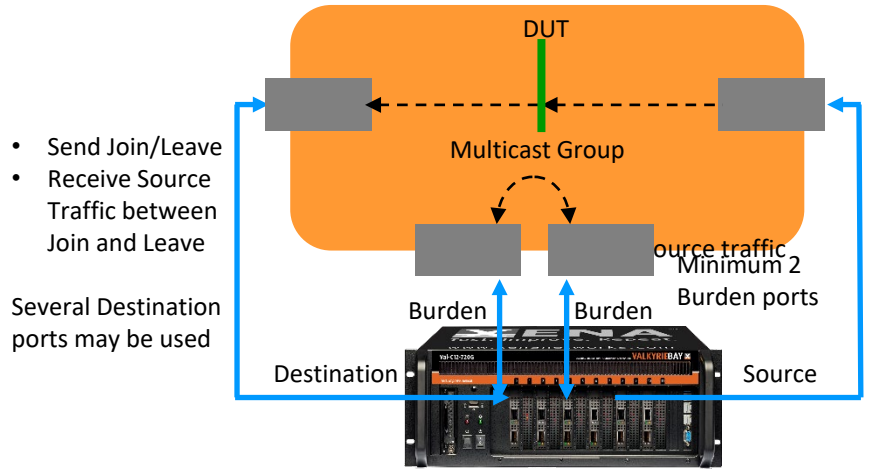
Duration:	The duration in seconds of the time used in each trial for the actual measurement. This does not include the test setup and teardown phases so the total duration of a test will be longer.
Iterations:	The number of times a test is repeated using the same set of variable parameters (packet size, rate, etc.)
Count List:	The test will run for each group count listed (e.g. 1,10,100)
Count Range:	The test will run for *Start* # of groups and increment till *End* by increments of *Step*.
Join-to-Traffic Delay:	The delay between the sent Joins and the start of the traffic. It is meant to give the DUT time to process the joins before burdening it with traffic.
Initial Rate:	If present this option denotes the initial rate in percent of the overall rate configured in the Multicast Stream panel.
Maximum Rate:	If present this option denotes the maximum rate in percent of the overall rate configured in the Multicast Stream panel.
Step Rate:	if present this option is used to increment the rate percentage when iterating from a starting to a maximum rate.

GENERAL TEST CONFIGURATION

Test Types Configurations – Burdened Group Join Delay

RFC 3918 Objective: To determine the time duration it takes a DUT/SUT to start forwarding multicast frames from the time a successful IGMP Group Membership Report has been issued to the DUT/SUT while forwarding meshed unicast traffic.

Test setup:



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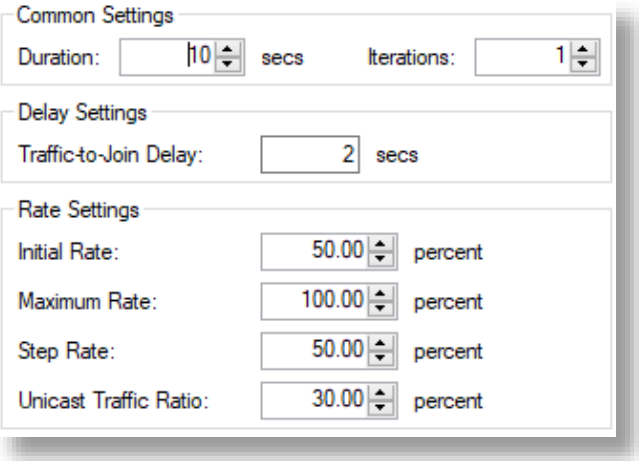
GENERAL TEST CONFIGURATION

Test Types Configurations – Burdened Group Join Delay



Flow per test step:

- After initialization :
- Traffic is sent between Burden ports
- Traffic is sent from the source port
- After “Traffic-to-Join Delay” Join is sent from Destination port(s)
- After “Duration” source port stops sending traffic and Join Delay is measured
- Send Leave message from Destination port(s)

Next test step will be next higher rate setting

GENERAL TEST CONFIGURATION

Test Types Configurations – Burdened Group Join Delay

Duration:	The duration in seconds of the time used in each trial for the actual measurement. This does not include the test setup and teardown phases so the total duration of a test will be longer.
Iterations:	The number of times a test is repeated using the same set of variable parameters (packet size, rate, etc.)
Traffic-to-Join Delay:	The number of seconds to wait between starting the multicast traffic on the server and sending the Join requests from the clients. This delay ensures that we can accurately check that traffic is not received by clients before they Join the multicast groups.
Initial Rate:	If present this option denotes the initial rate in percent of the overall rate configured in the Multicast Stream panel.
Maximum Rate:	If present this option denotes the maximum rate in percent of the overall rate configured in the Multicast Stream panel.
Step Rate:	if present this option is used to increment the rate percentage when iterating from a starting to a maximum rate.
Unicast Traffic Ratio:	If present this option denotes the percentage of the overall rate configured in the Multicast Stream panel to be used for unicast traffic. Note that the unicast rate will be <u>added</u> to the configured multicast rate. So if the multicast rate has been set to e.g. 10% and the UC traffic ratio is set to 50% the total rate for the port will be 10% + (50% of 10%) = 15%.

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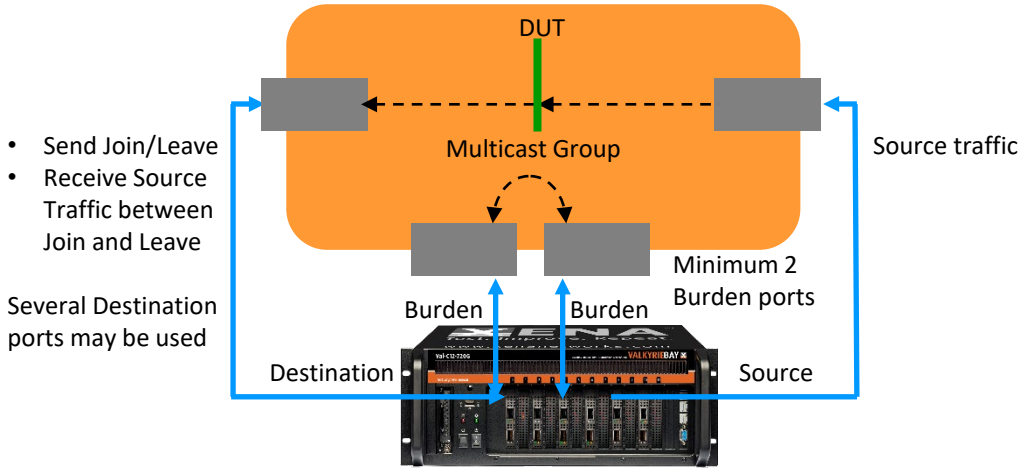
GENERAL TEST CONFIGURATION

Test Types Configurations – Burdened Multicast Latency

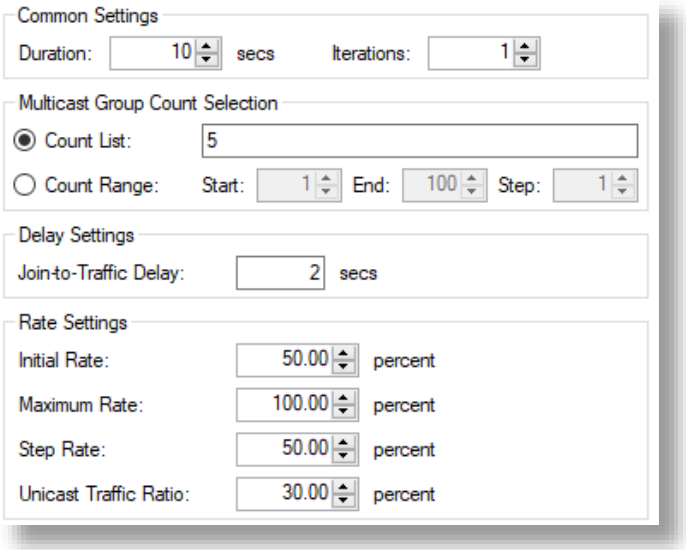
RFC 3918 Objective: To produce a set of multicast latency measurements from a single multicast ingress interface of a DUT/SUT through multiple egress multicast interfaces of that same DUT/SUT as provided for by the metric "Multicast Latency" in RFC 2432 while forwarding meshed unicast traffic

Test setup:



GENERAL TEST CONFIGURATION

Test Types Configurations – Burdened Multicast Latency



Flow per test step:

- After initialization :
- Traffic is sent between Burden ports
- Join is sent from Destination port(s)
- After “Join-to-Traffic Delay” traffic is sent from the source port
- Measure time from traffic start on source port to traffic is received on destination port
- After “Duration” source port stops sending traffic
- Send Leave message from Destination port(s)

Next step will be next higher rate setting

When all rate settings have been tested for a Multicast Group Count, tests will be repeated for the next Multicast Group Count

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GENERAL TEST CONFIGURATION

Test Types Configurations – Burdened Multicast Latency

Duration:	The duration in seconds of the time used in each trial for the actual measurement. This does not include the test setup and teardown phases so the total duration of a test will be longer.
Iterations:	The number of times a test is repeated using the same set of variable parameters (packet size, rate, etc.)
Count List:	The test will run for each group count listed (e.g. 1,10,100)
Count Range:	The test will run for *Start* # of groups and increment till *End* by increments of *Step*.
Join-to-Traffic Delay:	The delay between the sent Joins and the start of the traffic. It is meant to give the DUT time to process the joins before burdening it with traffic.
Initial Rate:	If present this option denotes the initial rate in percent of the overall rate configured in the Multicast Stream panel.
Maximum Rate:	If present this option denotes the maximum rate in percent of the overall rate configured in the Multicast Stream panel.
Step Rate:	if present this option is used to increment the rate percentage when iterating from a starting to a maximum rate.
Unicast Traffic Ratio:	If present this option denotes the percentage of the overall rate configured in the Multicast Stream panel to be used for unicast traffic. Note that the unicast rate will be <u>added</u> to the configured multicast rate. So if the multicast rate has been set to e.g. 10% and the UC traffic ratio is set to 50% the total rate for the port will be 10% + (50% of 10%) = 15%.

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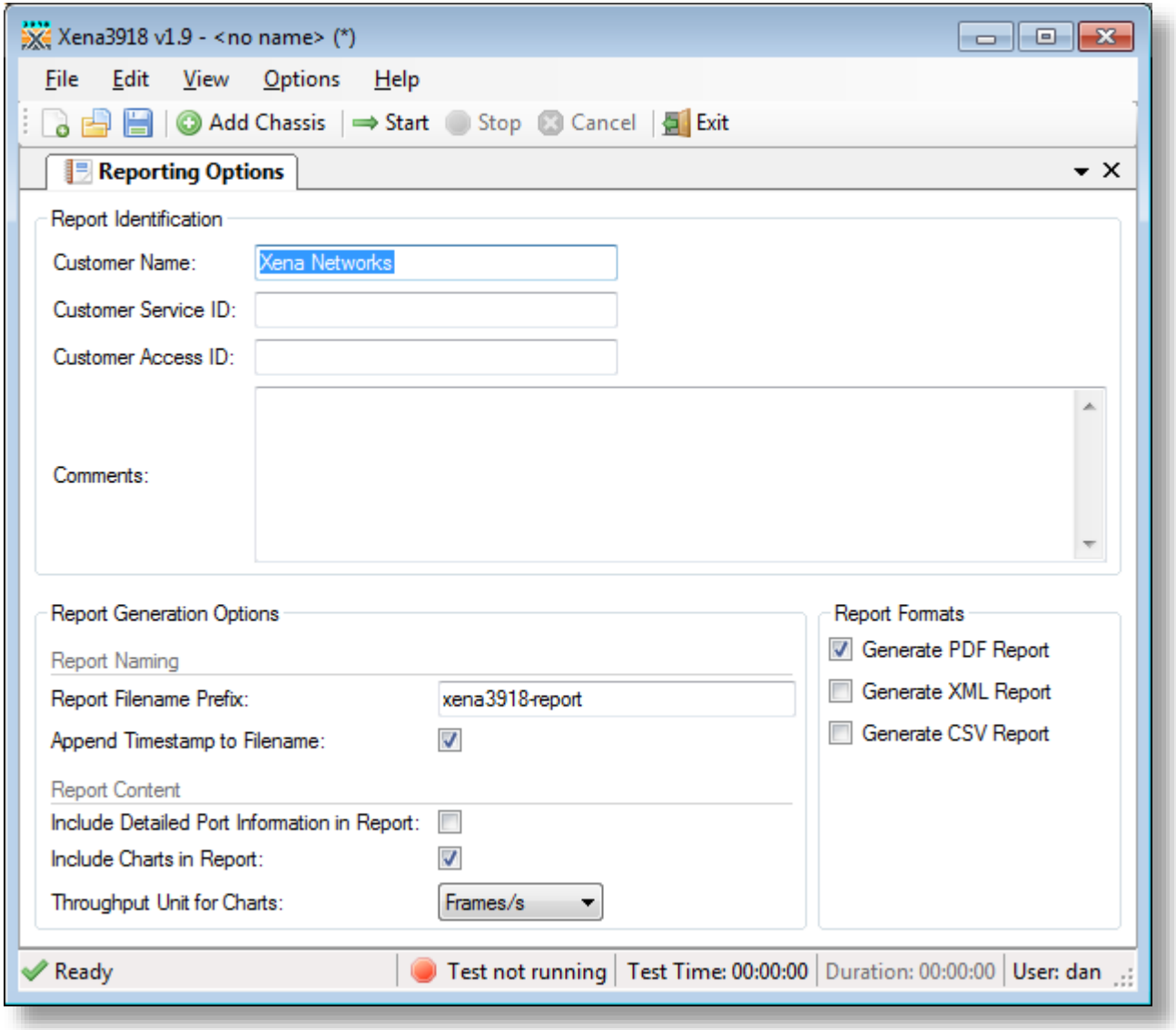
REPORTING



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REPORTING

1 *Report Identification:*

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

Customer Name:

Customer Name: Xena Networks

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:

XENA NETWORKS

REPORTING

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.

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REPORTING

3 *Report Formats:*

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

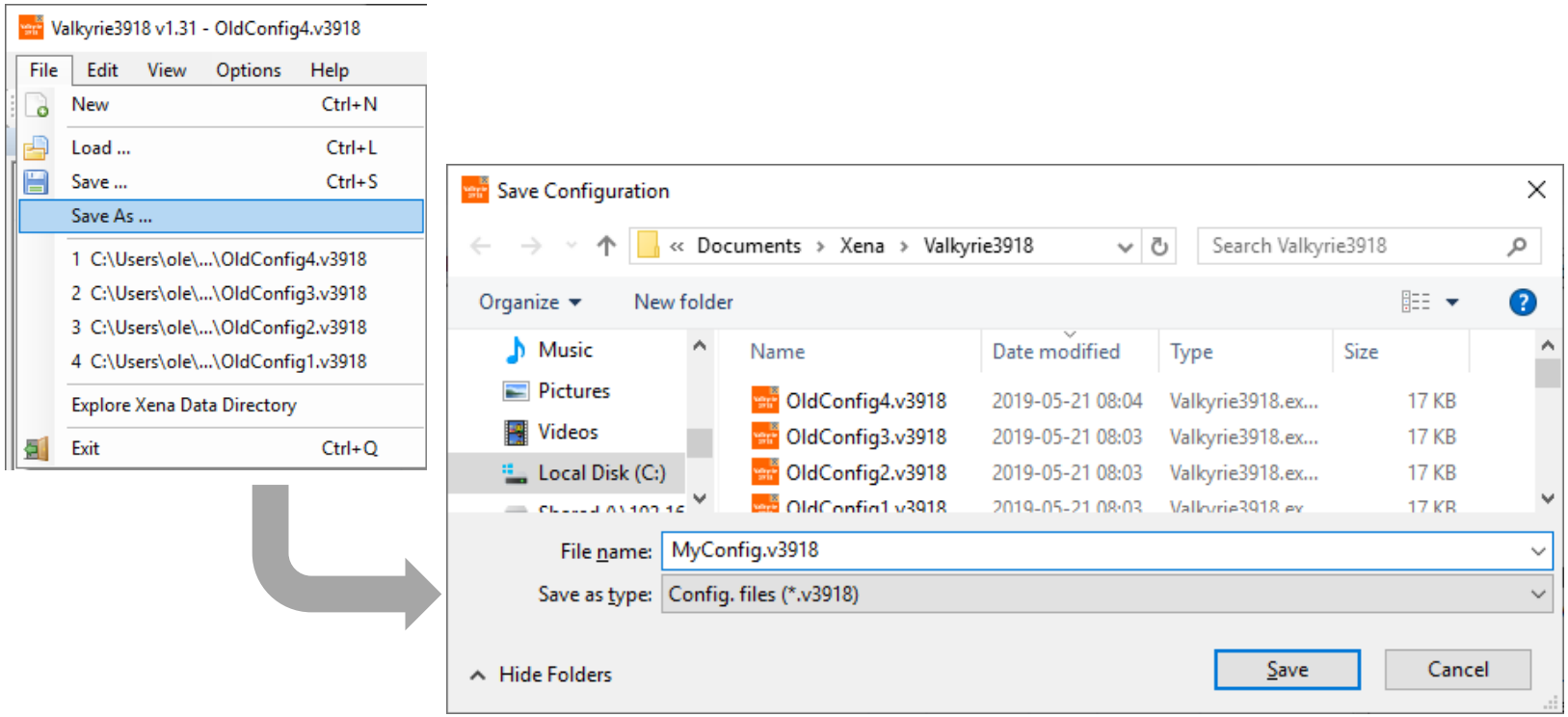
The generated report files will be given a file extension that matches the selected type i.e. ".pdf" for PDF files and so forth.

***XML Report Specification**
You can find the specification for the XML Report here.

REPORTING

CLI Option

Save the configuration with an appropriate name.



REPORTING

RFC3918 CLI Option

2 Use the Valkyrie3918.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:/.../Valkyrie3918.exe –ec MyConfig.x3918"

C:\WINDOWS\system32\cmd.exe

```
C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>Valkyrie3918.exe -ec MyConfig.v3918

C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>INFO: Loading test configuration MyConfig.v3918
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 'Group Join/Leave Delay'
INFO: Reserving ports
INFO: Resetting used ports
INFO: Port post-reset delay
INFO: Configuring ports
INFO: Configuring ports
INFO: ARP-resolving gateway addresses
INFO: InitTrial: 1000 byte packets, iteration 1
INFO: Setting up multicast streams
INFO: Traffic on source port(s) started
INFO: Sending IGMP Join on destination ports
INFO: Measuring Join Delay
INFO: Sending IGMP Leave on destination ports
INFO: Triggering Leave Capture
INFO: Measuring Leave Delay
INFO: Traffic on source port(s) stopped
INFO: Ending subtest 'Group Join/Leave Delay'
INFO: All tests completed
INFO: PDF report written to [C:\Users\ole\Documents\Xena\Valkyrie3918\Reports\Valkyrie3918-Report-20190304-101141.pdf]
INFO: Test execution completed

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

XENA NETWORKS

REPORTING

Xena RFC3918 CLI Option

3 Use "—help" to learn about other parameters options:

```
Vælg C:\WINDOWS\system32\cmd.exe
C:\Program Files (x86)\Xena Networks\L2-3\L23Tools>Valkyrie3918.exe -help

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

Valkyrie3918 version 1.31
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>
```

-c, --config	Load a test configuration file with the specified path.
-e, --execute	Execute the specified test configuration file (requires -c <file>). If this option is used the program will not show the GUI but will run in command line mode.
-u, --user	Set the username used when logging on to Xena testers (default: xenarun).
-r, --reportpath	Set the path where reports are saved.
-o, --company	Set the company name used in reports.
-l, --logo	Set the path to the report logo file.
-h, --help	Display this help screen.

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Want more?

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BOOK A GUIDED SW TOUR

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support@xenanetworks.com

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