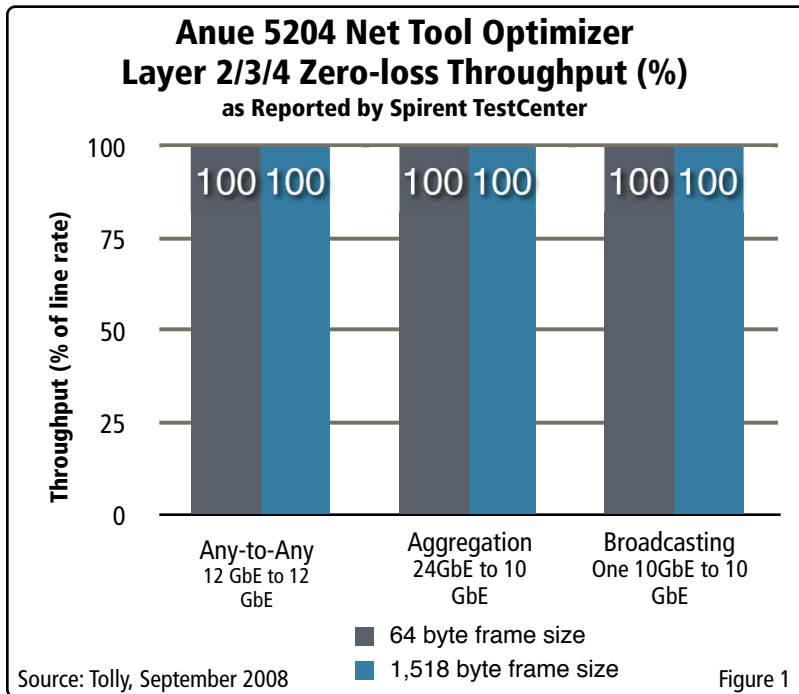


## Anue 5200 Net Tool Optimizer: Performance and Feature Evaluation of Tool and SPAN Port Aggregator



### Introduction

An ever-increasing number of specialized tools are used to monitor, secure, and troubleshoot applications. Deploying and managing these tools is a growing and costly challenge. This challenge includes: the vast number of network segments that need to be monitored; the numerous tools that need to be deployed; and the shortage of Switched Port Analyzer (SPAN) ports and taps for all the tools that need to analyze LAN traffic.

The Anue 5200 Net Tool Optimizer significantly streamlines the deployment and use of tools...

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### Test Highlights

- 1 Line rate performance up to 10 Gbps with zero dropped packets when aggregating, multicasting, and filtering
- 2 100% accuracy in broadcasting overlapping filtered traffic from one network port to multiple tool ports without the user having to identify overlaps and write complex filter rules
- 3 Zero-loss performance when aggregating and filtering (Layer 2, 3, and 4) traffic from up to 23 GbE network ports to a single GbE tool port
- 4 Broadcast traffic at line rate from one network port to 23 network tool ports
- 5 The easy-to-use GUI allows users to configure and forward filtered traffic to tools for diagnosis in a matter of minutes



by conveniently linking test and monitoring tools to any traffic on the network. This improves network visibility and maximizes return on investment for monitoring tools.

Anue Systems, Inc. commissioned The Tolly Group to evaluate the performance and features of the Anue 5204 28-port Layer 2/3/4 intelligent tool and SPAN port aggregator that supports Gigabit Ethernet (GbE) and 10GbE LAN connections.

The tests included throughput, filtering capabilities across a range of Layer 2, 3 and 4 criteria, traffic aggregation and broadcasting.

## Executive Summary

The Anue delivers 100% accuracy and line-rate performance when filtering, aggregating and broadcasting traffic from SPAN and tap ports to network tools.

The filter-by-criteria test proved the effectiveness of the Anue 5204's ability to filter specific data and direct the traffic of interest (e.g. by address, VLAN or protocol) to specialized tools for troubleshooting or analysis. This filtering capability is critical in maximizing the coverage, accuracy, and utilization of network tools by preventing tools from being overloaded with non-critical data. This is a common and undesirable occurrence in many data centers.

Tolly Group engineers found that the Anue 5204 offers zero-loss, line-rate throughput across the multiple frame sizes tested. Anue attributes the performance of the Anue 5204 to the company's proprietary Multi-Stream Switching (MSS) technology. This technology combines a broad range of connectivity options with powerful packet filtering capabilities, so each tool receives only the data it needs.

The easy-to-use system aggregates network data from any SPAN port or tap in the data center to a convenient, centralized tool farm. The Anue 5204 allows multiple tools to share access to any network data and load balances tools with packet filtering so each tool gets the data it needs.

## Results

### Throughput

Tolly Group engineers measured the throughput of the Anue under various common scenarios. Tolly Group engineers verified that the Anue delivers line-rate performance with zero dropped packets.

### Filter Criteria and Overlapping Filters

Tolly Group engineers tested and validated the ability of the Anue to filter packets of data based on specific criteria such as: IP address, VLAN, IP protocol, TCP port and VLAN or TCP destination port.

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**Anue 5200 Net Tool Optimizer**

**Performance & Feature Evaluation**



*Tested  
September  
2008*

Only traffic matching the user-defined filter criteria was passed to the corresponding tool port(s) with 100% accuracy and zero dropped packets.

During the overlapping rules test, traffic from one network port was broadcast to multiple tool ports. The tools' filter rules overlapped so that portions of the same filtered traffic needed to be directed to multiple tool ports.

Tolly Group engineers validated the accuracy of each filter distributing 100% of the filtered data to its specified tool ports. The GUI eliminated the burden for the user to identify potential overlaps and write complex filter rules.

### Aggregation

Tolly Group engineers tested and validated the ability of the Anue to aggregate data by load balancing or filtering traffic from 24 GbE network ports to a single tool port.

100% of the packet traffic from all network ports connected to the Anue filter, which matched the user-



### Anue 5204 Layer 2/3/4 Data Filtering

Filter	Network port configuration	Tool port configuration	Expected filtered packets	Actual filtered packets	Filtered packets received (%)
IP address	One GbE	One 10GbE/Two GbE	8,928,402	8,928,402	100
VLAN	One GbE	One 10GbE/Two GbE	8,928,402	8,928,402	100
IP protocol	One GbE	One 10GbE/Two GbE	8,928,402	8,928,402	100
TCP destination	One GbE	One 10GbE/Two GbE	8,928,402	8,928,402	100
VLAN + TCP destination	One GbE	One 10GbE/Two GbE	8,928,402	8,928,402	100
Overlapping rules	One 10GbE	One 10GbE/Two GbE	8,928,470	8,928,470	100

Source: Tolly, September 2008

Figure 2

defined filter criteria, was passed to the tool port. In the case of tool port overload, that is, where the total incoming traffic exceeded the port capacity of the output tool, the user was notified with a visual alert from the Anue GUI, along with statistics showing the number of packets dropped by the Anue tool port.

### Broadcast

Tolly Group engineers tested and validated the capability of the Anue to broadcast data by receiving traffic from a single SPAN or tap port and simultaneously direct only the filtered traffic of interest to a number of specialized tool ports for

analysis, recording or troubleshooting. Tolly Group engineers proved that all traffic from a single network port was accurately filtered and directed to up to 24 tool ports.

### Anue 5204 Layer 2/3/4 Data Aggregation

Network port (source)	Tool port (target)	Packets transmitted (Network ports)	Packets filtered	Total packets received (Tool ports)	Aggregation accuracy (%)
Two GbE	One 10GbE/Two GbE	80,000,000	40,000,000	40,000,000	100
Eight GbE	One 10GbE/Two GbE	400,000,000	200,000,000	200,000,000	100
10 GbE	One 10GbE/Two GbE	300,000,000	150,000,000	150,000,000	100
23 GbE (see note)	One 10GbE/Two GbE	920,000,000	328,572,365	328,572,365	100

Note: The test with 23 network ports was deliberately configured to overload the single tool port and force the Anue GUI to display a "tool port overload" alert.

Source: Tolly, September 2008

Figure 3



### Ease of Use

The Anue GUI provides tools which simplify the daily functions of a network operator. The user interface provides features that drastically reduce the amount of time it takes to set up, identify a network problem, apply complex filters, aggregate traffic and then broadcast a filtered stream of data to one or more tools for data analysis.

## Test Setup & Methodology

The test bed consisted of a Spirent TestCenter (with 24 GbE ports), an Anue 5204 Net Tool Optimizer and a Spirent AX/4000 10GbE analyzer.

### Throughput

12 GbE ports on the Anue were enabled as GbE network ports and 12 GbE ports were enabled as tool ports. Engineers used the Anue GUI to connect 12 network ports to 12 tool ports with Pass All filters (1:1 mapping). The Spirent TestCenter was used to generate line rate traffic on 12 ports connected to 12 Anue

5204 network ports. 64-byte and 1,518-byte frames were tested.

The test ran using bursts of 300 million packets. The Spirent TestCenter was used to confirm all traffic was passed from Anue network ports to tool ports. Engineers also verified no traffic was sent upstream from the network port.

Permutations: test 1a included 12 GbE network ports and 12 GbE tool ports. Test 1b included 24 GbE network ports and three 10GbE tool ports. Test 1c included one 10GbE network port and 10 GbE tool ports.

### Filter-by-Criteria and Overlapping Filters

The filter-by-criteria testbed was comprised of an Anue with 24 GbE ports and four 10GbE ports. The Anue was connected to a 24-port Spirent TestCenter and a single 10GbE port on the Spirent Adtech AX/4000.

The filter-by-criteria test was conducted with the following setup: one GbE port on Anue was enabled as a GbE network port and one

10GbE port was enabled as a 10GbE tool port. An additional GbE port on the Anue was enabled as GbE tool port to be used later for testing the overlapping rules. The Anue GUI was used to connect the network port to the first tool port with a pass-by-criteria filter. The filter rule was set for a specific target IP source address. Once the stream with the source IP address was filtered, the Anue passed the filtered stream to the tool port.

Spirent TestCenter was used to generate traffic to the Anue network port. The outgoing traffic contained two stream blocks. One stream consisted of the target IP source address defined in the Pass-by-Criteria filter at 10% load and the other stream(s) consisted of a different IP source address at 75% bandwidth load.

Only traffic with the target source IP address was passed from the Anue network port to the tool port. This was verified by the Spirent gear.

For the overlapping rules permutation, a stream from one network port matched criteria going

**Anue 5204 Layer 2/3/4 Data Broadcast**

Network port (source)	Tool port (target)	Packets transmitted	Packets filtered	Packets received (Tool ports)	Accuracy (%)
One GbE	Two GbE	40,000,000	20,000,000	20,000,000x2	100
One GbE	23 GbE	40,000,000	20,000,000	20,000,000x23	100
One 10GbE	24 GbE	563,304,618	80,472,090	80,472,090x24	100

Source: Tolly, September 2008

Figure 4



through two filters destined for two tool ports (e.g., Generate a single VLAN ID "10" stream carrying HTTP traffic and send to two pass-by-criteria filters, one filter looking for VLAN ID "10" packets and another looking only for HTTP traffic; in this case the incoming stream will be passed through both filters toward their respective tool ports).

## Aggregation

The test bed consisted of an Anue with 24 GbE ports and four 10GbE ports available. The 24 port Spirent TestCenter and Spirent Adtech AX/4000 were connected to provide traffic generation and analysis for the Anue.

The aggregation test procedure initially was run with the following configuration: Two GbE ports on Anue were enabled as GbE network ports, and one GbE port on the Anue was enabled as a tool port. The GUI was used to connect the two network ports to the same tool port with a Pass by Criteria filter. The

Filter Criteria was set for a specific VLAN ID of "10".

The Spirent TestCenter was used to generate two streams, VLAN ID: "10" and "11", toward the first Anue network port. For the second Anue network port, the Spirent TestCenter sent two VLAN streams with VLAN ID: "10" and "12". Each stream was set to 10% of the bandwidth.

To verify all VLAN ID "10" traffic from both network ports and only traffic with VLAN ID "10" was passed from the Anue network ports to the tool port, engineers examined the Spirent results.

Permutations: Test 3a included two Anue GbE ports configured as the network ports, and one GbE port on the Anue was enabled as a tool port. Test 3b included eight Anue GbE ports as the network ports and one Anue 10GbE port set as the tool port. Test 3c included 10 GbE ports configured as network ports and one GbE port set as the tool port. Test 3d included 23 GbE ports as the network ports and one GbE port as the tool port. Test scenario 3d created an overload of the Anue tool port.

## Broadcast

The test bed consisted of an Anue with 24 GbE ports and four 10GbE ports. The 24-port Spirent TestCenter and Spirent Adtech AX/4000 were connected to provided traffic generation and analysis.

The broadcast test procedure initially was run with the following configuration: one GbE port on Anue was enabled as a GbE network port, and two GbE ports on the Anue were configured as the tool ports. The GUI was used to connect the network port to both tool ports, using a Pass-by-Criteria filter. The Pass-by-Criteria filter was configured for filtering TCP destination port "FTP-21".

The Spirent TestCenter was used to generate two stream blocks with TCP destination port: "FTP-21" and "HTTP-80", respectively, toward the Anue network port. Each stream was set to 10% of the bandwidth load.

Permutations: Test 4a included one Anue GbE port configured as the network port and two Anue GbE ports as the tool ports. Test 4b included one GbE port as the network port and 23 GbE ports as the tool ports. Test 4c included one Anue 10GbE port as the network port and 24 Anue GbE ports set as the tool ports.

## Contact Anue...

Anue Systems, Inc.

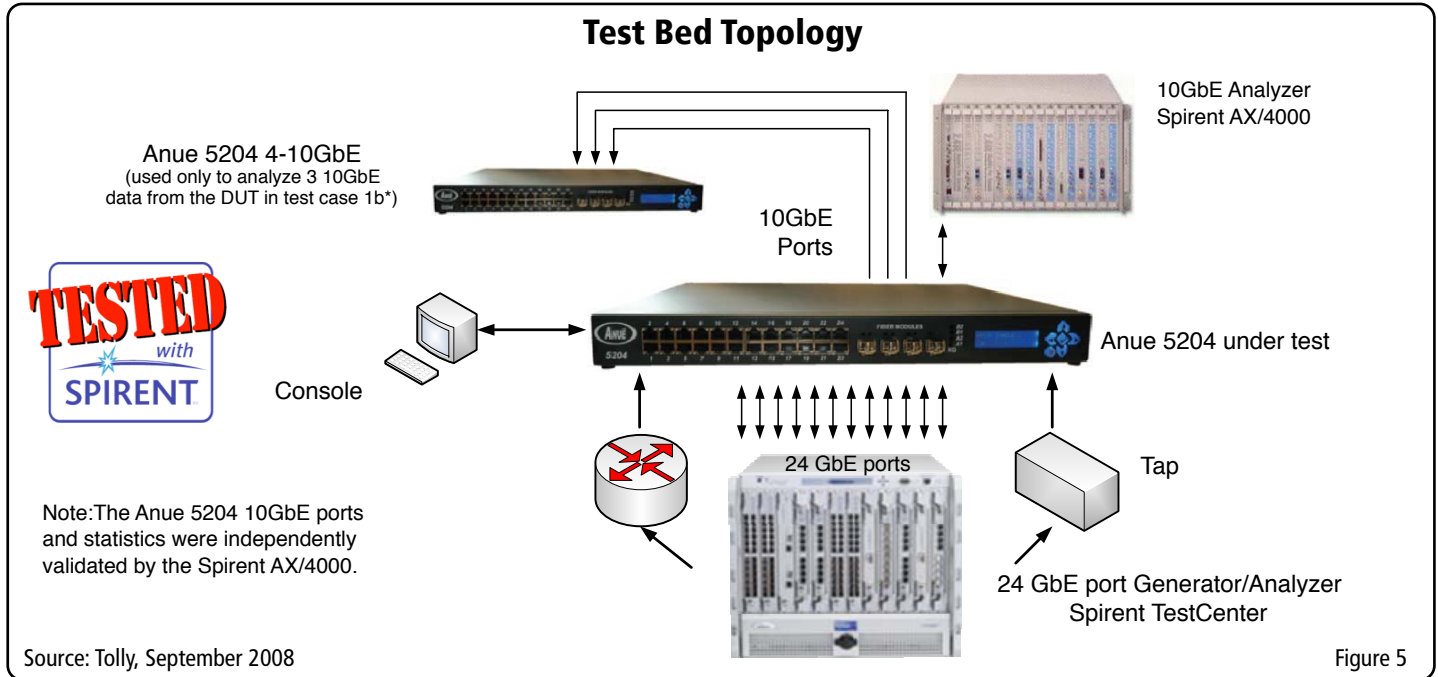
Ph: +1 512 527-0453  
Fax: +1 512 692-2634  
1- 877 ANUE BOX  
[sales@anuesystems.com](mailto:sales@anuesystems.com)

<http://www.anuesystems.com>

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