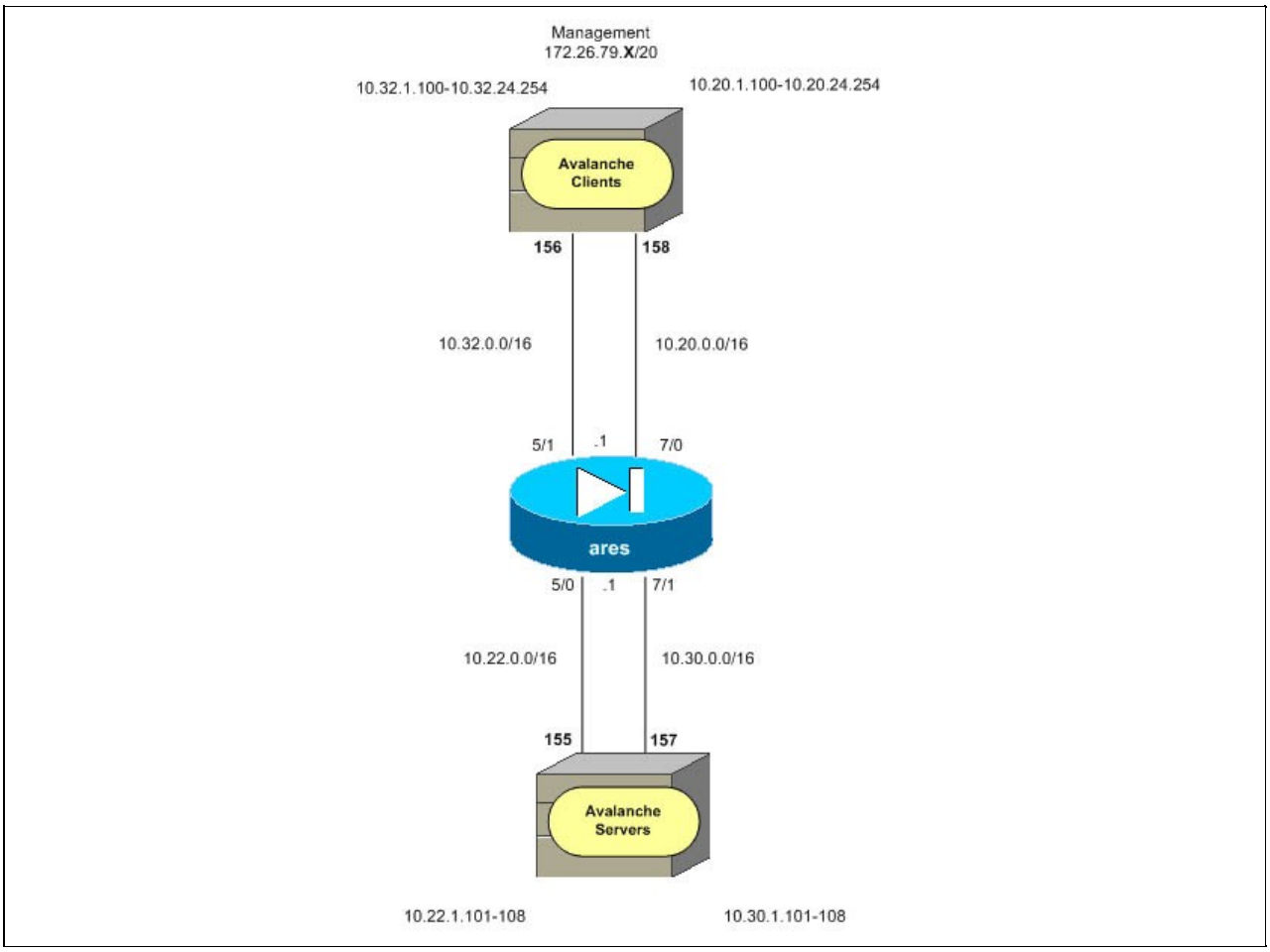
Test Details	
Goal of Test	The purpose of this test is to get the maximum throughput the ASA can process using HTTP traffic. This traffic model is more close to the real world traffic. In order to produce the TCP traffic the Spirent Avalanche 2900 was used (4, 2900's with 1 ten-gigabit interface each). When looking at the diagram the numbers 155, 156, 157, 158 are the individual 2900 chassis. To produce bi-directional traffic through the ASA one client port is placed on the outside pulling a 512K byte object from one server port on the inside, and one client port is placed on the inside pulling a 512K byte object form one server port on the outside. The Avalanche Tool is configured with 10672 clients and 16 servers. This comes down to 667 clients each pointing to one of the 16 servers. Each client walks an action list of 10 gets to the servers address. With HTTP 1.1 with persistence this results in 10 transactions per tcp connection. For each get the server responds with a 512K byte object. Below are screen shots of the test tool setup.
Data to Record	1. *show cpu* 2. *show conn count* 3. *show io-bridge* 4. Capture results from the test tool
Estimated Time Needed	60 minutes

Contents

- 1 Topology
- 2 Procedures
- 3 Configurations
- 4 Results
- 5 Screenshots

Topology



Procedures

DESCRIPTION

1. On the client side configure (Avalanche Clients):

a. 1500 SimUsers for the load on each avalanche 2900

b. 16 subnets, with 667 hosts (10.100 to 12.254) pointing to one server on the reflector and assign one to each port.

c. 10 GETs on the action profile

2. On the server side, configure:

a. One server per port

b. 512k Object size

3. Bidirectional traffic is used (Clients from the inside to the outside and vice-versa)
4. While traffic is at steady state take a screen shot of the live Client Stats.

Configurations

```
ares# sh run
: Saved
:
ASA Version 8.1(1)
!
hostname ares
enable password 8Ry2YjIyt7RRXU24 encrypted
passwd 2KFQnbNIdI.2KYOU encrypted
names
!
interface Management0/0
 shutdown
 no nameif
 no security-level
 no ip address
 management-only
!
interface Management0/1
 shutdown
 no nameif
 no security-level
 no ip address
 management-only
!
interface GigabitEthernet3/0
 shutdown
 no nameif
 no security-level
 no ip address
!
interface GigabitEthernet3/1
 shutdown
 no nameif
 no security-level
 no ip address
!
interface GigabitEthernet3/2
 shutdown
 no nameif
 no security-level
 no ip address
!
interface GigabitEthernet3/3
 shutdown
 no nameif
 no security-level
 no ip address
!
interface TenGigabitEthernet5/0
 nameif outside_gi_1

 security-level 0
 ip address 10.22.0.1 255.255.0.0
!
interface TenGigabitEthernet5/1
 nameif inside_gi_1
 security-level 100
 ip address 10.32.0.1 255.255.0.0
!
interface TenGigabitEthernet7/0
```

```
 nameif inside_gi_2

 security-level 100
 ip addresss 10.20.0.1 255.255.0.0
!
interface TenGigabitEthernet7/1
 nameif outside_gi_2
 security-level 0
 ip address 10.30.0.1 255.255.0.0
!
ftp mode passive
access-list in extended permit ip any any
access-list out extended permit ip any any
pager lines 24
logging enable
logging buffered warnings
mtu inside_gi 1500
mtu outside_gi 1500
no failover
icmp unreachable rate-limit 1 burst-size 1
icmp permit any echo inside_gi
icmp permit any echo-reply inside_gi
icmp permit any echo outside_gi
icmp permit any echo-reply outside_gi
asdm image disk0:/asdm-611.bin
no asdm history enable
arp timeout 14400
access-group out in interface inside_gi_1
access-group out in interface outside_gi_1
access-group out in interface inside_gi_2
access-group out in interface outside_gi_2

timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00 icmp 0:00:02
timeout sunrpc 0:10:00 h323 0:05:00 h225 1:00:00 mgcp 0:05:00 mgcp-pat 0:05:00
timeout sip 0:30:00 sip_media 0:02:00 sip-invite 0:03:00 sip-disconnect 0:02:00
timeout sip-provisional-media 0:02:00 uauth 0:05:00 absolute
dynamic-access-policy-record DfltAccessPolicy
no snmp-server location
no snmp-server contact
snmp-server enable traps snmp authentication linkup linkdown coldstart
telnet timeout 5
ssh timeout 5
console timeout 0
no threat-detection basic-threat
no threat-detection statistics access-list
!
class-map inspection_default
 match default-inspection-traffic
!
!
policy-map type inspect dns preset_dns_map
 parameters
  message-length maximum 512
policy-map global_policy
 class inspection_default
  inspect dns preset_dns_map
  inspect ftp
  inspect h323 h225
  inspect h323 ras
  inspect rsh
  inspect rtsp
  inspect esmtp
  inspect sqlnet
```

```
  inspect skinny
  inspect sunrpc
  inspect xdmcp
  inspect sip
  inspect netbios
  inspect tftp
!
prompt hostname context
Cryptochecksum:03cbf5e0557d3c2abac442316f5900b1
: end
```

Results

```
19,554.443 Mbps incoming to the clients and 299.43Mbps outgoing from the clients.
A total of 19853.873 of HTTP Throughput were achieved.

Remember that half the clients were connected on the inside of the ASA, and half the clients on th

ares# sh cpu
CPU utilization for 5 seconds = *79%*; 1 minute: 62%; 5 minutes: 21%
ares# sh conn count
*1044 in use*, 1049 most used
ares# sh conn count
*1044 in use*, 1049 most used
ares# sh io-bridge
I/O Bridge-0 slot usage
  Slot 00: 0 pps, 0 bps
  Slot 01: Ignored
  Slot 02: Ignored
  Slot 03: 0 pps, 0 bps
  Slot 04: Ignored
  *Slot 05: 2264848 pps, 19678943960 bps*
  Slot 06: Ignored

I/O Bridge-1 slot usage
  *Slot 07: 2252144 pps, 19602570400 bps*
  Slot 08: Ignored

Load distribution - Packets-per-second (10 seconds)
  I/O Bridge 00:  50%\|************************\*
  I/O Bridge 01:  50%\|************************\*

Load distribution - Bits-per-second (10 seconds)
  I/O Bridge 00:  50%\|*************************\*
  I/O Bridge 01:  50%\|*************************\*

Legend:
  bps - bits per second
  pps - packets per second 
```

Screenshots

Test Tool Setup
Spirent Avalanche Network configuration
Client Network Tab

Client | Server | Content Files | Notes | Run | Results

Loads | Actions | Profiles | Network | Subnets | Ports | Associations

Miscellaneous Parameters

Enable Round Robin DNS	☐	Fairness Threshold	2147483647 bytes/sec/connection
IGMP Version	2	IP Fragment Reassembly Timer	30000 milliseconds

Proxy Parameters

Enable Persistence	☑	Maximum Transactions	100 per connection
Enable Proxy Header	☐	Maximum Connections	per client
Enable Proxy Client	☐	Proxy Server IP Address	
		Proxy Server Port No.	

TCP Parameters

IPV4 Maximum Segment Size	1380 bytes	Enable Congestion Control	☑
IPV6 Maximum Segment Size	1440 bytes	Override Internal Timeout Calculation	☐ with 2000 ms.
Receive Window	32768 bytes	Retries	2
Delayed Acks	☑	Inactivity Timer	0 ms.
Delayed Ack Timeout	200 ms.	Piggyback Get Requests	☐ (HTTP Only)
Delayed Ack Bytes	2920 bytes	Enable TCP Port Randomization	☐

Server Network Tab

Client | Server | Content Files | Notes | Run | Results

Profiles | Transactions | Network | Subnets | Ports | Associations

TCP Parameters

IPV4 Maximum Segment Size	1380 bytes	Enable Congestion Control	☑
IPV6 Maximum Segment Size	1440 bytes	Override Internal Timeout Calculation	☐ with 2000 ms.
Receive Window	32768 bytes	Retries	2
Delayed Acks	☑	Inactivity Timer	0 ms.
Delayed Ack Timeout	200 ms.		
Delayed Ack Bytes	2920 bytes		

IP Parameters

Fragment Reassembly Timer 30000 milliseconds

Spirent Avalanche Client Configuration

Client Associations

Help

Client | Server | Content Files | Notes | Run | Results

Loads | Actions | Profiles | Network | Subnets | Ports | Associations

Load Profile Type: User Based Global Global Profile Name: Default

Enabled	Action	Profile	Weight (P...	Port	Subnet	Offset	Count	Number of Hosts	Inc	Start IP	End IP
☑	10_30_1_101	Default	100 (100)	172.26.79.158:8,0	10_20_0_0_A (IPv4)	0	0	667	1	10.20.1.100	10.20.3.254
☑	10_30_1_102	Default	100 (100)	172.26.79.158:8,1	10_20_0_0_B (IPv4)	0	0	667	1	10.20.4.100	10.20.6.254
☑	10_30_1_103	Default	100 (100)	172.26.79.158:8,2	10_20_0_0_C (IPv4)	0	0	667	1	10.20.7.100	10.20.9.254
☑	10_30_1_104	Default	100 (100)	172.26.79.158:8,3	10_20_0_0_D (IPv4)	0	0	667	1	10.20.10.100	10.20.12.254
☑	10_30_1_105	Default	100 (100)	172.26.79.158:8,4	10_20_0_0_E (IPv4)	0	0	667	1	10.20.13.100	10.20.15.254
☑	10_30_1_106	Default	100 (100)	172.26.79.158:8,5	10_20_0_0_F (IPv4)	0	0	667	1	10.20.16.100	10.20.18.254
☑	10_30_1_107	Default	100 (100)	172.26.79.158:8,6	10_20_0_0_G (IPv4)	0	0	667	1	10.20.19.100	10.20.21.254
☑	10_30_1_108	Default	100 (100)	172.26.79.158:8,7	10_20_0_0_H (IPv4)	0	0	667	1	10.20.22.100	10.20.24.254
☑	10_22_1_101	Default	100 (100)	172.26.79.156:8,0	10_32_0_0_A (IPv4)	0	0	667	1	10.32.1.100	10.32.3.254
☑	10_22_1_102	Default	100 (100)	172.26.79.156:8,1	10_32_0_0_B (IPv4)	0	0	667	1	10.32.4.100	10.32.6.254
☑	10_22_1_103	Default	100 (100)	172.26.79.156:8,2	10_32_0_0_C (IPv4)	0	0	667	1	10.32.7.100	10.32.9.254
☑	10_22_1_104	Default	100 (100)	172.26.79.156:8,3	10_32_0_0_D (IPv4)	0	0	667	1	10.32.10.100	10.32.12.254
☑	10_22_1_105	Default	100 (100)	172.26.79.156:8,4	10_32_0_0_E (IPv4)	0	0	667	1	10.32.13.100	10.32.15.254
☑	10_22_1_106	Default	100 (100)	172.26.79.156:8,5	10_32_0_0_F (IPv4)	0	0	667	1	10.32.16.100	10.32.18.254
☑	10_22_1_107	Default	100 (100)	172.26.79.156:8,6	10_32_0_0_G (IPv4)	0	0	667	1	10.32.19.100	10.32.21.254
☑	10_22_1_108	Default	100 (100)	172.26.79.156:8,7	10_32_0_0_H (IPv4)	0	0	667	1	10.32.22.100	10.32.24.254

Generate Flat Subnets | Add Asso. | Delete Asso.

Client Action List

Client | Server | Content Files | Notes | Run | Results

Loads | Actions | Profiles | Network | Subnets | Ports | Associations

Select an Actions List to Edit: 10_22_1_101

Actions

```
1 get http://10.22.1.101
1 get http://10.22.1.101
1 get http://10.22.1.101
1 get http://10.22.1.101
1 get http://10.22.1.101
1 get http://10.22.1.101
1 get http://10.22.1.101
1 get http://10.22.1.101
1 get http://10.22.1.101
1 get http://10.22.1.101
```

Tear Off/Dock Resources

Spirent Avalanche Server Configuration

Server Association

Client | Server | Content Files | Notes | Run | Results

Profiles | Transactions | Network | Subnets | Ports | Associations

Profile	Port	Subnet	IPv4 Address Range
Default	172.26.79.155:8,0	10_22_0_0_A (IPv4)	10.22.1.101
Default	172.26.79.155:8,1	10_22_0_0_A (IPv4)	10.22.1.102
Default	172.26.79.155:8,2	10_22_0_0_A (IPv4)	10.22.1.103
Default	172.26.79.155:8,3	10_22_0_0_A (IPv4)	10.22.1.104
Default	172.26.79.155:8,4	10_22_0_0_A (IPv4)	10.22.1.105
Default	172.26.79.155:8,5	10_22_0_0_A (IPv4)	10.22.1.106
Default	172.26.79.155:8,6	10_22_0_0_A (IPv4)	10.22.1.107
Default	172.26.79.155:8,7	10_22_0_0_A (IPv4)	10.22.1.108
Default	172.26.79.157:8,0	10_30_0_0_A (IPv4)	10.30.1.101
Default	172.26.79.157:8,1	10_30_0_0_B (IPv4)	10.30.1.102
Default	172.26.79.157:8,2	10_30_0_0_C (IPv4)	10.30.1.103
Default	172.26.79.157:8,3	10_30_0_0_D (IPv4)	10.30.1.104
Default	172.26.79.157:8,4	10_30_0_0_E (IPv4)	10.30.1.105
Default	172.26.79.157:8,5	10_30_0_0_F (IPv4)	10.30.1.106
Default	172.26.79.157:8,6	10_30_0_0_G (IPv4)	10.30.1.107
Default	172.26.79.157:8,7	10_30_0_0_H (IPv4)	10.30.1.108

Server Transactions

Client | Server | Content Files | Notes | Run | Results

Profiles | Transactions | Network | Subnets | Ports | Associations

Select a Transaction Profile to Edit: Default

Response Properties

Timing	Fixed	Embedded String	Empty
Latency	0 ms.	String Position	Middle
Status Code	200	Body Size	Fixed
Status Phrase	OK	Size	512000 bytes
Body Content Type	Ascii	Fully Qualified Path	

Response Headers

MIME Type: text/html

Generate MD5 Header Every 1000 Response

Last Modified Header

Type: Fixed

Date: 1 Jan 1970

Time: 0 hrs. 0 min. 17 sec.

Expires Header

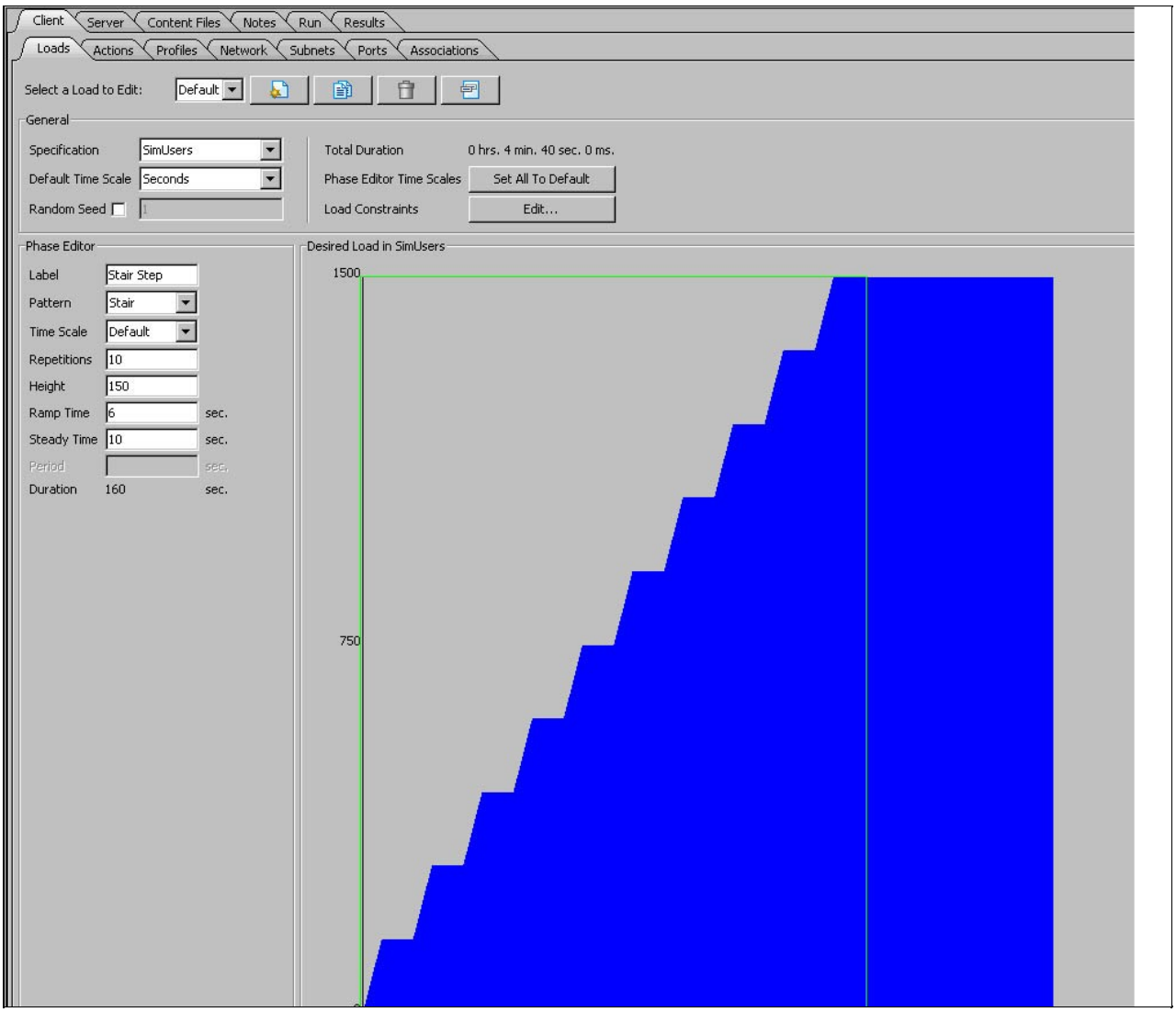
Type: Fixed

Date: 1 Jan 1970

Time: 0 hrs. 0 min. 17 sec.

Additional Headers

Avalanche Load Specifications


Client
Server
Content Files
Notes
Run
Results
Loads
Actions
Profiles
Network
Subnets
Ports
Associations
Select a Load to Edit:
Default
General
Specification
SimUsers
Default Time Scale
Seconds
Random Seed
Total Duration
0 hrs. 4 min. 40 sec. 0 ms.
Phase Editor Time Scales
Set All To Default
Load Constraints
Edit...
Phase Editor
Label
Stair Step
Pattern
Stair
Time Scale
Default
Repetitions
10
Height
150
Ramp Time
6
sec.
Steady Time
10
sec.
Period
sec.
Duration
160
sec.
Desired Load in SimUsers
1500
750