Tech Tip
Alteon

Alteon HTTP Load Balancing

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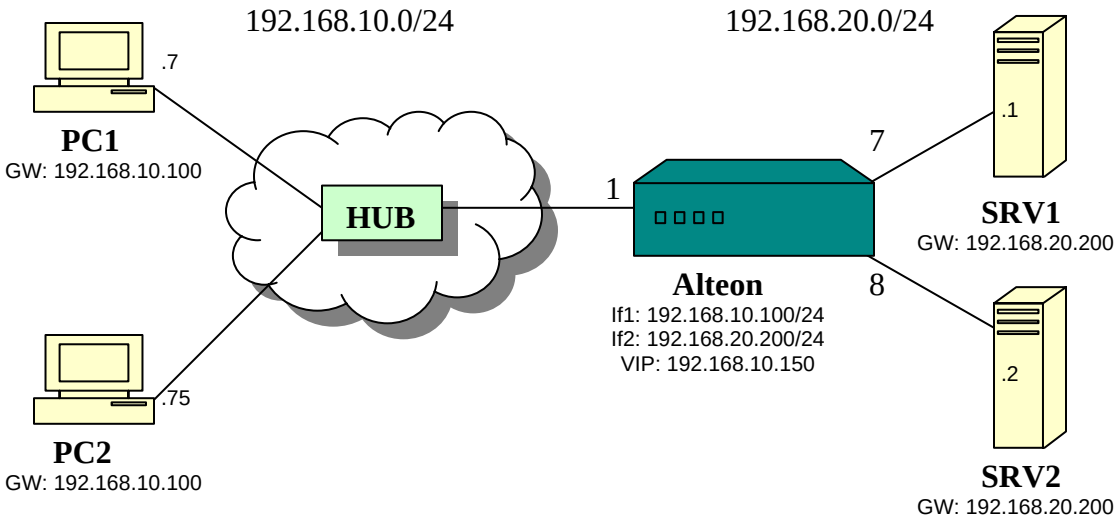
Overview

This document shows a sample configuration of the HTTP load balancing between multiple web servers using Alteon WebOS switch.

Alteon HTTP Load Balancing

Sample configuration

Setup



PC1 – Windows 2000 workstation, IP address 192.168.10.7/24;
PC2 – RedHat Linux 7.3 workstation, IP address 192.168.10.75/24;
SRV1 – Contivity Secure IP Services Gateway acting as a web server, management IP 192.168.20.1/24, private IP 192.168.20.10/24;
SRV2 – Contivity Secure IP Services Gateway acting as a web server, management IP 192.168.20.2/24, private IP 192.168.20.20;24;
Alteon – Alteon AD3, code version 10.0.30.7, interface 1 IP 192.168.10.100/24, interface 2 IP 192.168.20.200/24, Virtual IP 192.168.10.150, port 1 – client port, ports 7, 8 – server ports;
HUB – Ethernet HUB.

The goal of the configuration is to setup a basic web server load balancing, where Alteon switch distributes user connections between available web servers SRV1 and SRV2.

Note: When implementing load balancing identical content must be available at multiple servers.
Note: Contivity Secure IP Services Gateways were selected as HTTP servers an example only, and could be substituted with any available web server.

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Configuring PC1

Configure IP address (192.168.10.7/24) on PC1 with an Alteon interface 1 (192.168.10.100) as a default gateway:

```
C:\>ipconfig
Windows 2000 IP Configuration
Ethernet adapter Local Area Connection:

        Connection-specific DNS Suffix  . :
        IP Address. . . . . . . . . . . . : 192.168.10.7
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.10.100
```

Configuring PC2

The root privileges are required for the configuration:

```
$su
Password:
[root@linux user]#
```

Configure IP address on PC2 (192.168.10.75/24):

```
[root@linux user]# /sbin/ifconfig eth0 192.168.10.75 netmask
255.255.255.0
```

Enable the interface:

```
[root@localhost user]# /sbin/ifconfig eth0 up
```

Verify IP address has been set correctly and interface is up:

```
[root@localhost user]# /sbin/ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 00:0C:29:4D:F9:8C
          inet addr:192.168.10.75  Bcast:192.168.10.255
          Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:209 errors:0 dropped:0 overruns:0 frame:0
          TX packets:10 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:18588 (18.1 Kb)  TX bytes:420 (420.0 b)
          Interrupt:10 Base address:0x10e0
```

Configure a default gateway pointing to Alteon interface 1 (192.168.10.100):

```
[root@localhost user]# /sbin/route add 0.0.0.0 gw 192.168.10.100
```

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Verify the routing table:

```
[root@localhost user]# netstat -nr
Kernel IP routing table
Destination  Gateway        Genmask         Flags MSS Window  irtt Iface
0.0.0.0      192.168.10.100 255.255.255.255 UGH    40 0          0 eth0
192.168.10.0 0.0.0.0        255.255.255.0   U      40 0          0 eth0
127.0.0.0    0.0.0.0        255.0.0.0       U      40 0          0 lo
```

Configuring SRV1

Configure IP address for the management (192.168.20.1/24) and private (192.168.20.10/24) interfaces on Contivity acting as a web server.

Login to the Contivity (the default administrator username (admin) and password (setup) were used in this example):

```
Welcome to the Contivity Secure IP Services Gateway
Copyright (c) 1999-2004 Nortel Networks, Inc.
Version:                V05_00.058
Creation date:          Apr 19 2004, 20:54:20

Date:                   04/21/2004
Unit Serial Number:     18492

Please enter the administrator's user name: admin
Please enter the administrator's password:
```

The Main Menu appears.
Enter 1 menu choice to configure IP address for the interfaces:

```
Main Menu:  System is currently in NORMAL mode.

     1) Interfaces
     2) Administrator
     3) Default Private Route Menu
     4) Default Public Route Menu
     5) Create A User Control Tunnel(IPsec) Profile
     6) Restricted Management Mode       FALSE
     7) Allow HTTP Management            TRUE
     8) Firewall Options
     9) Shutdown
     B) System Boot Options
     P) Configure Serial Port
     C) Controlled Crash
     L) Command Line Interface
     R) Reset System to Factory Defaults
     E) Exit, Save and Invoke Changes

Please select a menu choice (1 - 9,B,P,C,L,R,E): 1
```

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The Interface menu appears.
Select 0 menu choice to configure IP address for the management and private interfaces:

```
- Interface Menu

   - Interface Menu

   0) Slot 0, Port 1, Private LAN
        Interface IP Address =
        Subnet Mask = 0.0.0.0
        Speed/Duplex = AutoNegotiate

   1) Slot 1, Port 1, Public LAN
        IP Address =
        Subnet Mask = 0.0.0.0
        Speed/Duplex = AutoNegotiate

   R) Return to the Main Menu

Please select a menu choice: 0
```

Enter the New IP Address for the Management interface (192.168.20.1), private Interface (192.168.20.10), New Subnet Mask (255.255.255.0), leave the speed to default by clicking enter at the speed/duplex menu:

```
0) Slot 0, Port 1, Private LAN
        Interface IP Address =
        Subnet Mask = 0.0.0.0
        Speed/Duplex = AutoNegotiate

   *  Type 0.0.0.0 to delete.
   *  Just type <CR> to skip.
        Old Management IP Address =
        New Management IP Address* = 192.168.20.1

        Old Interface IP Address =
        New Interface IP Address* = 192.168.20.10

        Old Subnet Mask = 0.0.0.0
        New Subnet Mask = 255.255.255.0

        Old Speed/Duplex = AutoNegotiate
        1)    AutoNegotiate (Default)
        2)    100Mbs-FullDuplex
        3)    100Mbs-HalfDuplex
        4)    10Mbs-FullDuplex
        5)    10Mbs-HalfDuplex
        <CR>) Leave unchanged
        Please select a menu choice (1-5, <CR>):
```

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The interface is configured.
Review the settings and enter R(r) to return to the main menu:

```
- Interface Menu

   0) Slot 0, Port 1, Private LAN
        Management IP Address = 192.168.20.1, ( Subnet Mask =
255.255.255.0 )
        Interface IP Address = 192.168.20.10
        Subnet Mask = 255.255.255.0
        Speed/Duplex = AutoNegotiate

   1) Slot 1, Port 1, Public LAN
        IP Address =
        Subnet Mask = 0.0.0.0
        Speed/Duplex = AutoNegotiate

   R) Return to the Main Menu

Please select a menu choice: R
```

Configure the default private route to point to Alteon interface 2 (192.168.20.200).
Select option 3 from the Main menu:

```
Main Menu:  System is currently in NORMAL mode.

     1) Interfaces
     2) Administrator
     3) Default Private Route Menu
     4) Default Public Route Menu
     5) Create A User Control Tunnel(IPsec) Profile
     6) Restricted Management Mode       FALSE
     7) Allow HTTP Management            TRUE
     8) Firewall Options
     9) Shutdown
     B) System Boot Options
     P) Configure Serial Port
     C) Controlled Crash
     L) Command Line Interface
     R) Reset System to Factory Defaults
     E) Exit, Save and Invoke Changes
Please select a menu choice (1 - 9,B,P,C,L,R,E): 3
```

The Default Private Route Menu appears.
Enter option A (a) to add a new route:

```
- Default Private Route Menu

     A) Add New Gateway
     R) Return to the Main Menu

Please select a menu choice(A, R): a
```

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Enter a new default gateway (192.168.20.200) and a non-zero metric, 1 in this example:

```
   *  Just type <CR> to skip.
Please enter the new gateway address (x.x.x.x): 192.168.20.200

Please enter the cost (Numeric, greater than zero): 1
```

Review the settings and enter R (r) option to return to the Main menu:

```
- Default Private Route Menu

     0) Gateway IP Address* = 192.168.20.200
        Cost = 1
     A) Add New Gateway
     R) Return to the Main Menu

Please select a menu choice(0, A, R): r
```

On the Main menu enter E (e) to apply and save the interface configuration:

```
Main Menu:  System is currently in NORMAL mode.

     1) Interfaces
     2) Administrator
     3) Default Private Route Menu
     4) Default Public Route Menu
     5) Create A User Control Tunnel(IPsec) Profile
     6) Restricted Management Mode       FALSE
     7) Allow HTTP Management            TRUE
     8) Firewall Options
     9) Shutdown
     B) System Boot Options
     P) Configure Serial Port
     C) Controlled Crash
     L) Command Line Interface
     R) Reset System to Factory Defaults
     E) Exit, Save and Invoke Changes

Please select a menu choice (1 - 9,B,P,C,L,R,E): e
```

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Configuring SRV2

In the same manner as for the SRV1 configure IP address for the management (192.168.20.2) and private interfaces (192.168.20.20/24):

```
- Interface Menu

   0) Slot 0, Port 1, Private LAN
        Management IP Address = 192.168.20.2, ( Subnet Mask =
255.255.255.0 )
        Interface IP Address = 192.168.20.20
        Subnet Mask = 255.255.255.0
        Speed/Duplex = AutoNegotiate

   1) Slot 1, Port 1, Public LAN
        IP Address =
        Subnet Mask = 0.0.0.0
        Speed/Duplex = AutoNegotiate

   R) Return to the Main Menu
```

In the same manner as for SRV1 configure the default private route to Alteon interface 2 (192.168.20.200):

```
- Default Private Route Menu

     0) Gateway IP Address* = 192.168.20.200
        Cost = 1
     A) Add New Gateway
     R) Return to the Main Menu
```

Configuring Alteon

Note, this sample configuration is started from factory default settings.
Login to the switch.

```
Enter password:
System Information at 11:05:11 Wed Apr 21, 2004
Alteon AD3
sysName:
sysLocation:
. . .
```

Select **n** to not run the setup script:

```
The switch is booted with factory default configuration.
  To ease the configuration of the switch, a "Set Up" facility which
  will prompt you with those configuration items that are essential
  to the operation of the switch is provided.
Would you like to run "Set Up" to configure the switch? [y/n] n
```

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Configuring interfaces

Configure Interface 1.
Enter interface 1 configuration menu:

```
>> Main# /cfg/ip/if 1
------------------------------------------------------------
[IP Interface 1 Menu]
      addr    - Set IP address
      mask    - Set subnet mask
      broad   - Set broadcast address
      vlan    - Set VLAN number
      relay   - Enable/disable BOOTP relay
      ena     - Enable IP interface
      dis     - Disable IP interface
      del     - Delete IP interface
      cur     - Display current interface configuration
```

Set mask (255.255.255.0), address (192.168.10.100) and enable the interface.

Note: If address is specified before the mask, a broadcast address must be entered using **broad** command.

```
>> IP Interface 1# mask 255.255.255.0/addr 192.168.10.100/ena
Current subnet mask:     0.0.0.0
New pending subnet mask: 255.255.255.0
Current IP address:     0.0.0.0
New pending IP address: 192.168.10.100
Pending new broadcast address:  192.168.10.255
Current status: disabled
New status:     enabled
```

Enter interface 2 configuration menu:

```
>> IP Interface 1# /cfg/ip/if 2
------------------------------------------------------------
[IP Interface 2 Menu]
      addr    - Set IP address
      mask    - Set subnet mask
      broad   - Set broadcast address
      vlan    - Set VLAN number
      relay   - Enable/disable BOOTP relay
      ena     - Enable IP interface
      dis     - Disable IP interface
      del     - Delete IP interface
      cur     - Display current interface configuration
```

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Set the mask (255.255.255.0) and address (192.168.20.200) for the interface.
Enable the interface:

```
>> IP Interface 2# mask 255.255.255.0/addr 192.168.20.200/ena
Current subnet mask:     0.0.0.0
New pending subnet mask: 255.255.255.0
Current IP address:     0.0.0.0
New pending IP address: 192.168.20.200
Pending new broadcast address:  192.168.20.255
Current status: disabled
New status:     enabled
```

Disable spanning tree protocol:

```
>> Main# cfg/stp 1/off
Current Spanning Tree 1 setting: ON
New Spanning Tree 1 setting:     OFF
```

Apply and save the changes:

```
>> IP Interface 2# apply/save
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
Request will first copy the FLASH "active" config to "backup",
 then overlay FLASH "active" with new config.
Confirm saving to FLASH [y/n]: y
New config successfully saved to FLASH.
Switch is currently set to use factory default config block on next
boot.
Do you want to change that to the active config block? [y/n] y
Next boot will use active config block.
```

Verify connectivity to web servers by pinging SRV1 and SRV2:

```
>> IP Interface 2# ping 192.168.20.1
[host 192.168.20.1, max tries 5, delay 1000 msec]
192.168.20.1: #1 ok, RTT 0 msec.
192.168.20.1: #2 ok, RTT 1 msec.
192.168.20.1: #3 ok, RTT 1 msec.
192.168.20.1: #4 ok, RTT 1 msec.
192.168.20.1: #5 ok, RTT 1 msec.
Ping finished.

>> IP Interface 2# ping 192.168.20.2
[host 192.168.20.2, max tries 5, delay 1000 msec]
192.168.20.2: #1 ok, RTT 1 msec.
192.168.20.2: #2 ok, RTT 1 msec.
192.168.20.2: #3 ok, RTT 1 msec.
192.168.20.2: #4 ok, RTT 1 msec.
192.168.20.2: #5 ok, RTT 1 msec.
Ping finished.
```

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Verify connectivity to clients by pinging PC1 and PC2:

```
>> IP Interface 2# ping 192.168.10.7
[host 192.168.10.7, max tries 5, delay 1000 msec]
192.168.10.7: #1 ok, RTT 1 msec.
192.168.10.7: #2 ok, RTT 0 msec.
192.168.10.7: #3 ok, RTT 1 msec.
192.168.10.7: #4 ok, RTT 1 msec.
192.168.10.7: #5 ok, RTT 1 msec.
Ping finished.

>> IP Interface 2# ping 192.168.10.75
[host 192.168.10.75, max tries 5, delay 1000 msec]
192.168.10.75: #1 ok, RTT 2 msec.
192.168.10.75: #2 ok, RTT 1 msec.
192.168.10.75: #3 ok, RTT 1 msec.
192.168.10.75: #4 ok, RTT 1 msec.
192.168.10.75: #5 ok, RTT 1 msec.
Ping finished.
```

Configuring real servers

Configure real servers on Alteon.
Enter real server configuration menu for the real server 1:

```
>> Main# /cfg/slb/real 1
------------------------------------------------------------
[Real server 1  Menu]
      layer7  - Layer 7 Command Menu
      rip     - Set IP addr of real server
      name    - Set server name
      weight  - Set server weight
      maxcon  - Set maximum number of connections
      tmout   - Set minutes inactive connection remains open
      backup  - Set backup real server
      inter   - Set interval between health checks
      retry   - Set number of failed attempts to declare server DOWN
      restr   - Set number of successful attempts to declare server UP
      addport - Add real port to server
      remport - Remove real port from server
      remote  - Enable/disable remote site operation
      proxy   - Enable/disable client proxy operation
      submac  - Enable/disable source MAC address substitution
      ena     - Enable real server
      dis     - Disable real server
      del     - Delete real server
      cur     - Display current real server configuration
```

Set real IP (192.168.20.1) for the real server SRV1:

```
>> Real server 1 # rip 192.168.20.1
Current real server IP address:     0.0.0.0
New pending real server IP address: 192.168.20.1
```

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Enable real server 1:

```
>> Real server 1 # ena
Current status: disabled
New status:     enabled
```

Enter configuration menu for the real server 2:

```
>> Real server 1 # ../real 2
------------------------------------------------------------
[Real server 2  Menu]
      layer7  - Layer 7 Command Menu
      rip     - Set IP addr of real server
      name    - Set server name
      weight  - Set server weight
      maxcon  - Set maximum number of connections
      tmout   - Set minutes inactive connection remains open
      backup  - Set backup real server
      inter   - Set interval between health checks
      retry   - Set number of failed attempts to declare server DOWN
      restr   - Set number of successful attempts to declare server UP
      addport - Add real port to server
      remport - Remove real port from server
      remote  - Enable/disable remote site operation
      proxy   - Enable/disable client proxy operation
      submac  - Enable/disable source MAC address substitution
      ena     - Enable real server
      dis     - Disable real server
      del     - Delete real server
      cur     - Display current real server configuration
```

Set the real IP address (192.168.20.2) for the real server SRV2:

```
>> Real server 2 # rip 192.168.20.2
Current real server IP address:     0.0.0.0
New pending real server IP address: 192.168.20.2
```

Enable the real server:

```
>> Real server 2 # ena
Current status: disabled
New status:     enabled
```

Apply and save the changes:

```
>> Real server 2 # apply/save
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
Request will first copy the FLASH "active" config to "backup",
 then overlay FLASH "active" with new config.
Confirm saving to FLASH [y/n]: y
New config successfully saved to FLASH.
```

Add real servers to a group.

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Creating a real servers group

Create a group 1 on the Alteon and enter group configuration mode:

```
>> Main # /cfg/slb/group 1
------------------------------------------------------------
[Real server group 1 Menu]
      metric  - Set metric used to select next server in group
      content - Set health check content
      health  - Set health check type
      backup  - Set backup real server or group
      name    - Set real server group name
      realthr - Set real server failure threshold
      viphlth - Enable/disable VIP health checking in DSR mode
      add     - Add real server
      rem     - Remove real server
      del     - Delete real server group
      cur     - Display current group configuration
```

Add real server 1 to a group:

```
>> Real server group 1# add 1
Real server 1 added to real server group 1
```

Add real server 2 to a group:

```
>> Real server group 1# add 2
Real server 2 added to real server group 1.
```

Set the round robin metric for the group. **Note**: Setting metric to round robin forces Alteon to distribute connections to the real servers in turn, first connection to the first server, second to the second, third to the third, etc. In this sample configuration only two real servers are used, so the third connection would be issued to the first server again, and so forth. For more information on selecting a metric, please consult the *Server Load Balancing* chapter of the *Application Guide*.

```
>> Real server group 1# metric round
Current metric:         leastconns
New pending metric:     roundrobin
```

Set the health check type to TCP, this will send health checks to TCP port, insuring TCP port is operational and accepts connections from a client. TCP health check is a default setting.

```
>> Real server group 1# health tcp
Current health check type:      tcp
New pending health check type:  tcp
```

Apply and save the changes:

```
>> Real server group 1# apply/save
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
Request will first copy the FLASH "active" config to "backup",
 then overlay FLASH "active" with new config.
Confirm saving to FLASH [y/n]: y
New config successfully saved to FLASH.
```

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Configuring virtual IP

Configure the virtual IP for the clients to send requests for the service to.
Enter virtual interface 1 configuration mode:

```
>> Real server group 1# /cfg/slb/virt 1
------------------------------------------------------------
[Virtual Server 1 Menu]
      service - Virtual Service Menu
      vip     - Set IP addr of virtual server
      dname   - Set domain name of virtual server
      layr3   - Enable/disable layer 3 only balancing
      ena     - Enable virtual server
      dis     - Disable virtual server
      del     - Delete virtual server
      cur     - Display current virtual configuration
```

Set the virtual IP address (192.168.10.150) for the virtual interface:

```
>> Virtual Server 1# vip 192.168.10.150
Current virtual server IP address:     0.0.0.0
New pending virtual server IP address: 192.168.10.150
```

Enable the virtual interface:

```
>> Virtual Server 1# ena
Current status: disabled
New status:     enabled
```

Assign a protocol (http in this example) to the created virtual interface to listen for requests on:

```
>> Virtual Server 1# service http
------------------------------------------------------------
[Virtual Server 1 http Service Menu]
      group   - Set real server group number
      rport   - Set real port
      hname   - Set hostname
      httpslb - Set HTTP SLB processing
      pbind   - Set persistent binding type
      rcount  - Set multi response count
      dbind   - Enable/disable delayed binding
      udp     - Enable/disable UDP balancing
      frag    - Enable/disable remapping UDP server fragments
      nonat   - Enable/disable only substituting MAC addresses
      dnsslb  - Enable/disable DNS query load balancing
      ftpp    - Enable/disable FTP SLB parsing for virtual server
      del     - Delete virtual service
      cur     - Display current virtual service configuration
```

Set the real server group (group 1) to be associated with the service on virtual interface:

```
>> Virtual Server 1 http Service# group 1
Current real server group:     1
New pending real server group: 1
```

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Apply and save the changes:

```
>> Virtual Server 1 http Service# apply/save
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
Request will first copy the FLASH "active" config to "backup",
 then overlay FLASH "active" with new config.
Confirm saving to FLASH [y/n]: y
New config successfully saved to FLASH.
```

Enabling Client/Server processing

Enable Client port processing.
Enter the SLB port 1 configuration menu:

```
>> Main # /cfg/slb/port 1
------------------------------------------------------------
[SLB port 1 Menu]
      client  - Enable/disable client processing
      server  - Enable/disable server processing
      rts     - Enable/disable RTS processing
      hotstan - Enable/disable hot-standby processing
      intersw - Enable/disable inter-switch processing
      proxy   - Enable/disable use of PIP for ingress traffic
      pip     - Set Proxy IP address for port
      filt    - Enable/disable filtering
      add     - Add filter to port
      rem     - Remove filter from port
      idslb   - Enable/disable intrusion detection server load balancing
      cur     - Display current port configuration
```

Enable Client processing on port:

```
>> SLB port 1# client e
Current client processing: disabled
New client processing:     enabled
```

Enter SLB port 7 configuration menu:

```
>> SLB port 1# /cfg/slb/port 7
------------------------------------------------------------
[SLB port 7 Menu]
      client  - Enable/disable client processing
      server  - Enable/disable server processing
      rts     - Enable/disable RTS processing
      hotstan - Enable/disable hot-standby processing
      intersw - Enable/disable inter-switch processing
      proxy   - Enable/disable use of PIP for ingress traffic
      pip     - Set Proxy IP address for port
      filt    - Enable/disable filtering
      add     - Add filter to port
      rem     - Remove filter from port
      idslb   - Enable/disable intrusion detection server load balancing
      cur     - Display current port configuration
```

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Enable Server processing on the port:

```
>> SLB port 7# server e
Current server processing: disabled
New server processing:     enabled
```

Enter port 8 configuration menu:

```
>> SLB port 7# /cfg/slb/port 8
------------------------------------------------------------
[SLB port 8 Menu]
      client  - Enable/disable client processing
      server  - Enable/disable server processing
      rts     - Enable/disable RTS processing
      hotstan - Enable/disable hot-standby processing
      intersw - Enable/disable inter-switch processing
      proxy   - Enable/disable use of PIP for ingress traffic
      pip     - Set Proxy IP address for port
      filt    - Enable/disable filtering
      add     - Add filter to port
      rem     - Remove filter from port
      idslb   - Enable/disable intrusion detection server load balancing
      cur     - Display current port configuration
```

Enable Server processing on the port:

```
>> SLB port 8# server e
Current server processing: disabled
New server processing:     enabled
```

Enabling Server Load Balancing globally

Enable server load balancing (SLB) globally:

```
>> Spanning Tree Group 1# /cfg/slb/on
Current status: OFF
New status:     ON
```

Apply and save the changes:

```
>> Layer 4# apply/save
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
Request will first copy the FLASH "active" config to "backup",
 then overlay FLASH "active" with new config.
Confirm saving to FLASH [y/n]:y
New config successfully saved to FLASH.
```

Once the changes have been applied informational messages appear stating the status of the virtual server and real servers.
Make sure status is operational:

```
Apr 21 12:57:14 NOTICE  slb: real service 192.168.20.1:80 operational
Apr 21 12:57:14 NOTICE  slb: real server 192.168.20.1 operational
Apr 21 12:57:14 NOTICE  slb: Services are available for Virtual Server
1:192.168.10.150
```

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```
Apr 21 12:57:15 NOTICE  slb: real service 192.168.20.2:80 operational
Apr 21 12:57:15 NOTICE  slb: real server 192.168.20.2 operational
```

Testing the configuration

Check the current SLB configuration:

```
>> Main# /cfg/slb/cur
Current Layer 4 settings:
  ON, direct disabled, matrix enabled, grace disabled, submac disabled
  fastage 0, slowage 0, tpcp disabled, aphttp disabled, minter 10
  imask 255.255.255.255, pmask 255.255.255.255
  mnet 0.0.0.0, mmask 255.255.255.255, idslb g1
  pgarp disabled, dsfail disabled

Current health scripts settings:
SYN attack detection check interval: 2 seconds
SYN attack detection alarm threshold: 1000 new half-open sessions/second

LDAP version 2

Current real servers settings:
  1: 192.168.20.1, enabled, name , weight 1, timeout 10 mins, maxcon
200000
    backup none, inter 2, retry 4, restr 8
    remote disabled, proxy enabled, submac disabled
    cookie assignment server: disabled
    exclusionary string matching: disabled
    real ports:
      http: vport http, group 1
          virtual server:  1, 192.168.10.150,  enabled
  2: 192.168.20.2, enabled, name , weight 1, timeout 10 mins, maxcon
200000
    backup none, inter 2, retry 4, restr 8
    remote disabled, proxy enabled, submac disabled
    cookie assignment server: disabled
    exclusionary string matching: disabled
    real ports:
      http: vport http, group 1
          virtual server:  1, 192.168.10.150,  enabled

Current virtual servers settings:
  1: 192.168.10.150, enabled
    virtual ports:
      http: rport http, group 1, frags
          real servers:
             1: 192.168.20.1,    weight 1,  enabled, backup none
             2: 192.168.20.2,    weight 1,  enabled, backup none

Current filters:

Current port settings:
  1: client  enabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty
  2: client disabled, server disabled, rts disabled
```

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```
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty
  3: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty
  4: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty
  5: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty
  6: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty
  7: client disabled, server  enabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty
  8: client disabled, server  enabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty
  9: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 0.0.0.0
     filt disabled, filters: empty

Current Global SLB settings:
  OFF, dns enabled, ttl 60, local disabled, one disabled, alway disabled
  http enabled, usern disabled, mincon 1024, inter 1, weight 1, geo
enabled
  norem disabled, encrypt enabled

Current remote site settings:

Current Lookup settings:
  lookups disabled, host lookups disabled, dname none

Current internet network preference settings:

Current sync settings:
  filt enabled, ports enabled, prios enabled, pips disabled
  state disabled, update 30

Current peer switch settings:
```

Check the SLB status:

```
>> Main # /info/slb/dump
Real server state:
  1: 192.168.20.1, 00:e0:7b:04:fb:00, vlan 1, port 7, health 4, up
  2: 192.168.20.2, 00:e0:7b:05:46:40, vlan 1, port 8, health 4, up
```

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```
Virtual server state:
  1: 192.168.10.150,  00:60:cf:46:53:6e
    virtual ports:
    http: rport http, group 1, backup none
        real servers:
          1: 192.168.20.1, backup none, 2 ms, up
          2: 192.168.20.2, backup none, 2 ms, up

Redirect filter state:

Port state:
  1: 0.0.0.0, client
  2: 0.0.0.0
  3: 0.0.0.0
  4: 0.0.0.0
  5: 0.0.0.0
  6: 0.0.0.0
  7: 0.0.0.0, server
  8: 0.0.0.0, server
  9: 0.0.0.0
```

Check connectivity from clients PC1 and PC2 to VIP (192.168.10.150) using ping:

From PC1:

```
C:\>ping 192.168.10.150
Pinging 192.168.10.150 with 32 bytes of data:
Reply from 192.168.10.150: bytes=32 time=10ms TTL=255
Reply from 192.168.10.150: bytes=32 time<10ms TTL=255
Reply from 192.168.10.150: bytes=32 time<10ms TTL=255
Reply from 192.168.10.150: bytes=32 time<10ms TTL=255

Ping statistics for 192.168.10.150:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  10ms, Average =  2ms
```

From PC2:

```
[root@localhost user]# ping 192.168.10.150
PING 192.168.10.150 (192.168.10.150) from 192.168.10.75 : 56(84) bytes
of data.
64 bytes from 192.168.10.150: icmp_seq=1 ttl=255 time=1.47 ms
64 bytes from 192.168.10.150: icmp_seq=2 ttl=255 time=0.618 ms

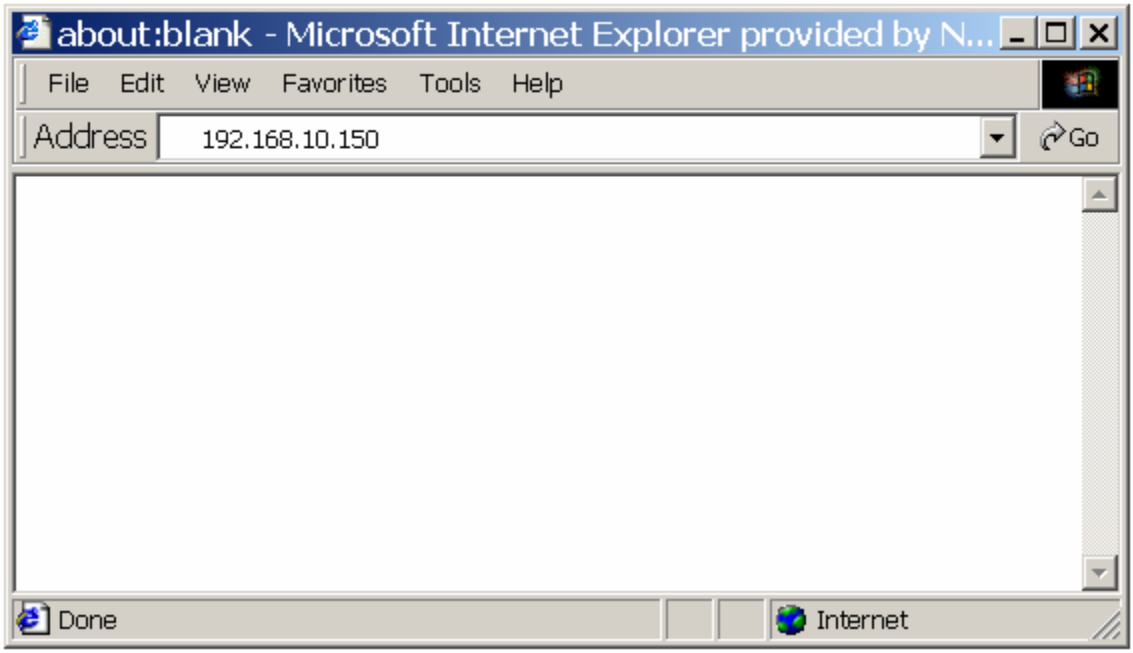
--- 192.168.10.150 ping statistics ---
2 packets transmitted, 2 received, 0% loss, time 1011ms
rtt min/avg/max/mdev = 0.618/1.048/1.478/0.430 ms
```

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Check the virtual server statistics:

```
>> Main # /stats/slb/virt 1
------------------------------------------------------------------------
Virtual server 1 stats:
                                Current      Total      Highest
Real  IP address               Sessions    Sessions     Sessions    Octets
----  -------------------- -------- ---------- --------  ---------------
   1  192.168.20.1                0          0         0            0
   2  192.168.20.2                0          0         0            0
----  -------------------- -------- ---------- --------  ---------------
      192.168.10.150              0          0         0            0
```

From PC1 launch a web browser (Internet Explorer in this example).
Enter the IP address of the virtual web server (192.168.10.150) into the address field and hit Enter:



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The Contivity Welcome page appears:



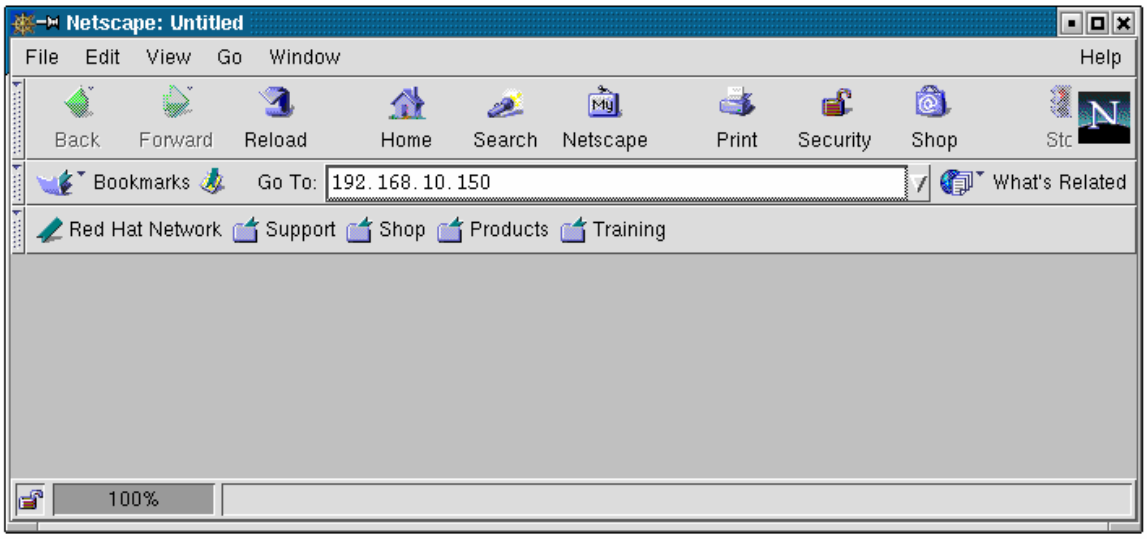
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Check the session dump on Alteon:

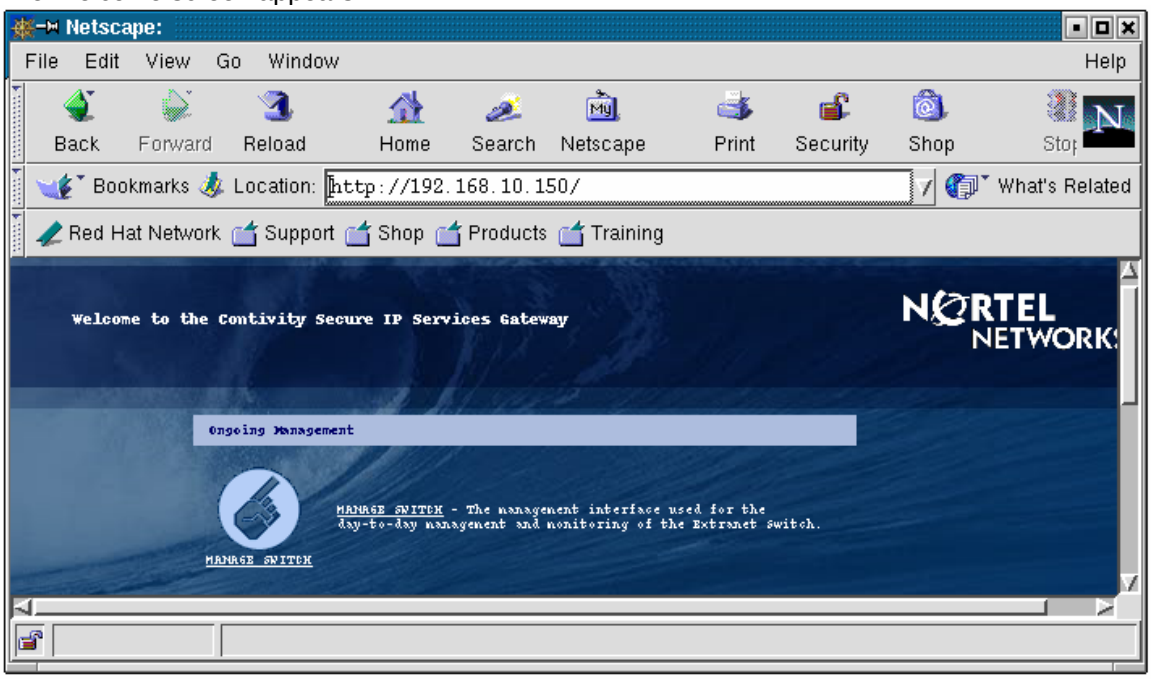
```
>> Main # /info/slb/sess/dump
 6,4:  192.168.10.7 3232 -> 192.168.20.1 80  age 10  E
```

Client's request has been forwarded to SRV1 (192.168.20.1).

From PC2 launch web browser (Netscape Navigator in this example).
Enter the IP address of the virtual server (192.168.10.150) into the address field and hit Enter:



The Welcome screen appears:



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Check the sessions dump:

```
>> Session Table Information# /info/slb/sess/dump
 2,3:  192.168.10.75 1040 -> 192.168.20.2 80  age 10
```

Session has been forwarded to SRV2 (192.168.20.2).

Sessions have been distributed between different web servers in the group.

Check the statistics for the virtual server:

```
>> Session Table Information# /stats/slb/virt 1
-------------------------------------------------------------------
Virtual server 1 stats:
                     Current     Total  Highest
Real  IP address     Sessions  Sessions Sessions           Octets
----  ------------- -------- ---------- --------  ---------------
   1  192.168.20.1         0          1        1            46645
   2  192.168.20.2         0          1        1            46305
----  ------------- -------- ---------- --------  ---------------
      192.168.10.150       0          2        2            92950
```

To clear SLB statistics:

```
>> Main # /stats/slb/clear
Confirm clearing all SLB statistics [y/n]: y
```

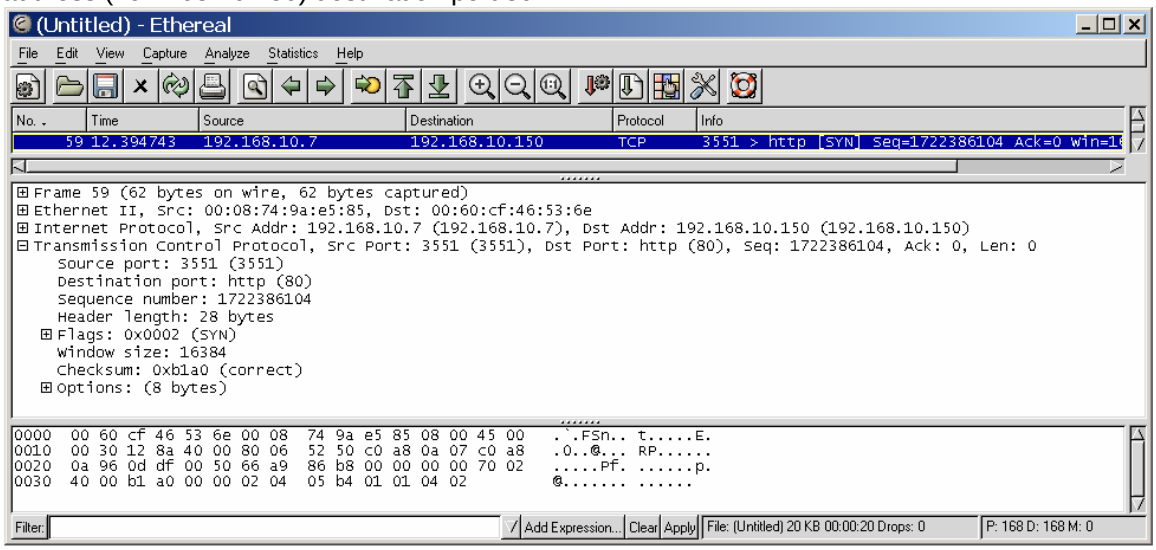
To clear session statistics:

```
>> Main # /oper/slb/clear
Session table cleared.
```

Appendix A. Sample sniffer traces.

Sample sniffer traces are based on the sample configuration described in this document.

Client initiates an HTTP session to the web server.
Client (192.168.10.7) sends a TCP SYN from the source port 3551 to the virtual server IP address (192.168.10.150) destination port 80:

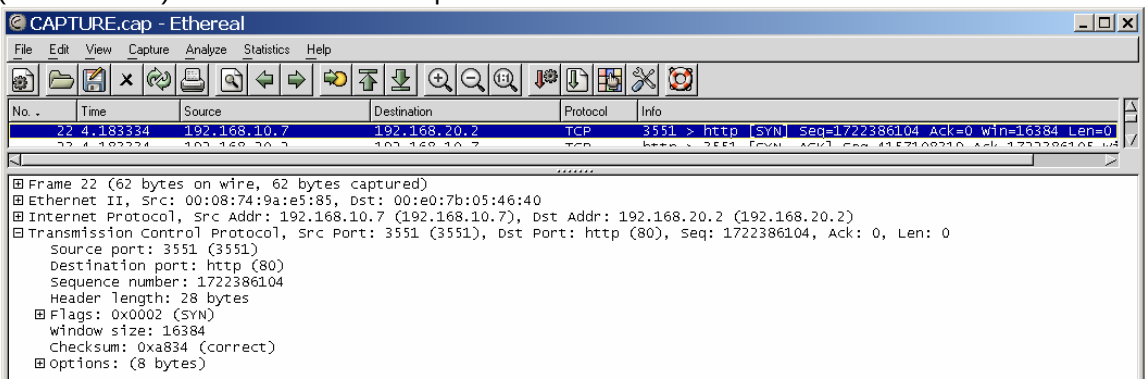


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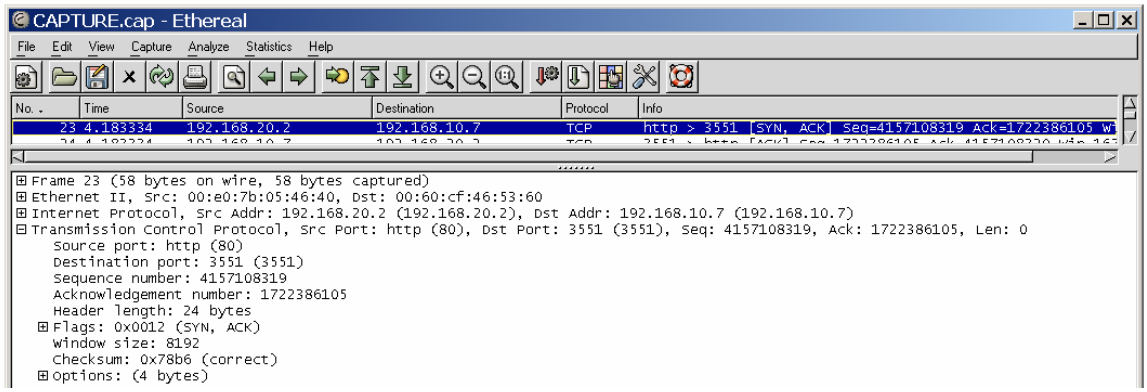
Alteon receives the SYN request, checks whether the Client processing has been enabled on the port the packet has been received on. If Client processing has been enabled Alteon checks whether real servers are available to forward the packet to and based on the configured metric decides which real server to forward the request to:

```
6,3:  192.168.10.7 3551 -> 192.168.20.2 80  age 10  E
```

Once the real server has been selected Alteon substitutes the destination virtual IP (192.168.10.150) in the packet received from the client with a real server IP address (192.168.20.2) and forwards SYN request to the selected server:

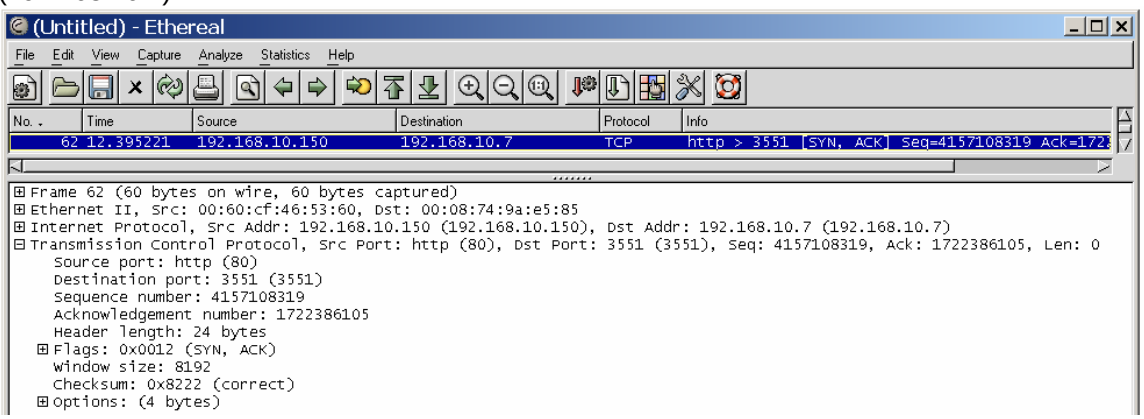


Real server receives the SYN request and responds to the Client's request with a SYN Acknowledgment:

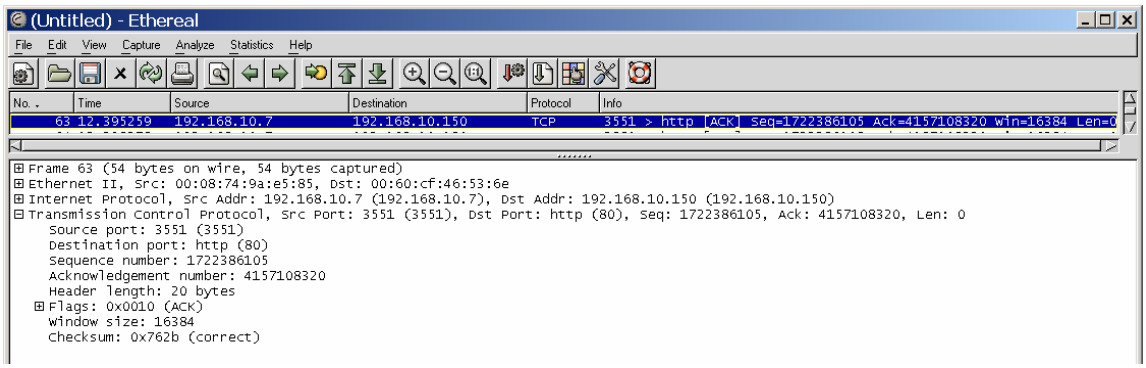


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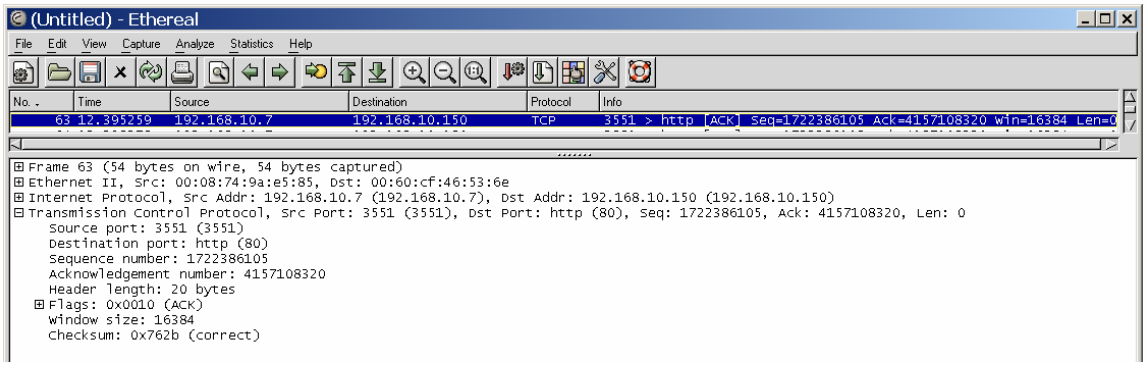
Alteon receives the SYN Acknowledgment from the real server to the Client, checks whether Server processing has been enabled on the port the packet has been received on. With Server processing being enabled on the port, Alteon substitutes the real server source address (192.168.20.2) with a virtual address (192.168.10.150) and forwards reply to the Client (192.168.10.7):



Client receives the SYN Acknowledgment and replies with its Acknowledgment:



Alteon substitutes the destination address (192.168.10.150) with a real server address (192.168.20.2) and forwards the Acknowledgement to the real server:



Thus a three way TCP handshake is complete.
From the Client's point of view it has established the connection with the virtual server 192.168.10.150 and has no knowledge about real servers behind the Alteon.

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Appendix B. Alteon configuration dump

An Alteon configuration dump used in the sample configuration:

```
script start "Alteon AD3" 4  /**** DO NOT EDIT THIS LINE!
/* Configuration dump taken 15:20:50 Wed Apr 21, 2004
/* Version 10.0.30.7,  Base MAC address 00:60:cf:46:53:60
/c/sys
        idle 60
        tnet ena
/c/stp 1/off
/c/ip/if 1
        ena
        addr 192.168.10.100
/c/ip/if 2
        ena
        addr 192.168.20.200
/c/slb
        on
/c/slb/real 1
        ena
        rip 192.168.20.1
/c/slb/real 2
        ena
        rip 192.168.20.2
/c/slb/group 1
        metric roundrobin
        add 1
        add 2
/c/slb/port 1
        client ena
/c/slb/port 7
        server ena
/c/slb/port 8
        server ena
/c/slb/virt 1
        ena
        vip 192.168.10.150
/c/slb/virt 1/service http
        group 1
/
script end  /**** DO NOT EDIT THIS LINE!
```

Tech Tip
Alteon

Alteon HTTP Load Balancing

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Author: Kristina Senkova

Special Credits: Robert Haynes and Ken Kalinowski