Tech Tip
Alteon

Alteon FTP Server Load Balancing

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Overview

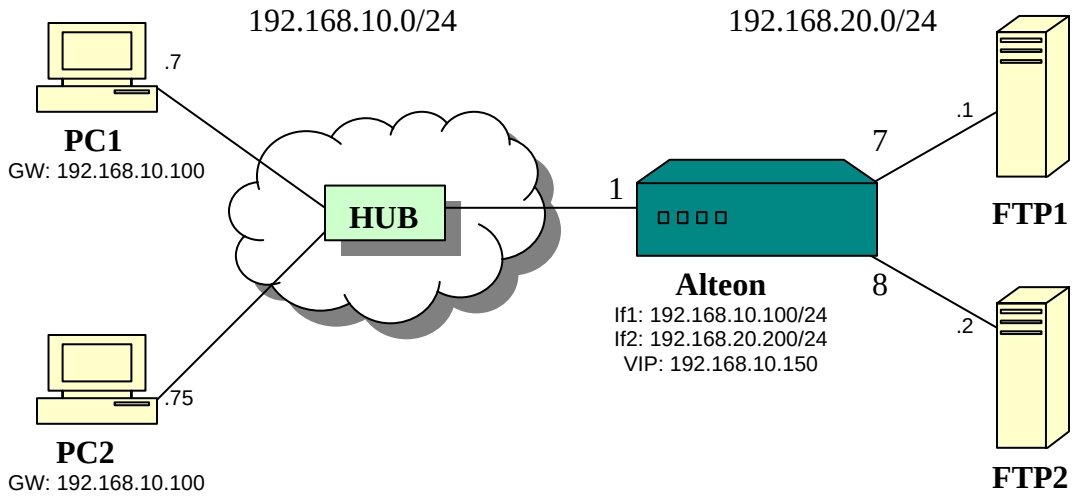
This document shows a basic FTP load balancing configuration using Alteon WebOS switch.

Sample configurations with Direct Access Mode (DAM) enabled and sample configuration with Proxy IP addresses enabled are shown.

Alteon FTP Server Load Balancing

Sample configuration using DAM

Setup



PC1 – Windows 2000 workstation, IP address 192.168.10.7/24;
PC2 – Windows 2000 workstation, IP address 192.168.10.75/24;
FTP1 – Windows 2000 workstation acting as an FTP server, IP address 192.168.20.1/24;
FTP2 – Windows 2000 workstation acting as an FTP server, IP address 192.168.20.2/24;
Alteon – Alteon AD3, code version 10.0.3.7, 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 FTP server load balancing using Direct Access Mode (DAM).

Note: When implementing load balancing identical content must be available at multiple servers.

Alteon FTP Server Load Balancing

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

Configure IP address (192.168.10.75/24) 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. . . . . . . . . . . . : 192.168.10.75
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.10.100
```

Configuring FTP1

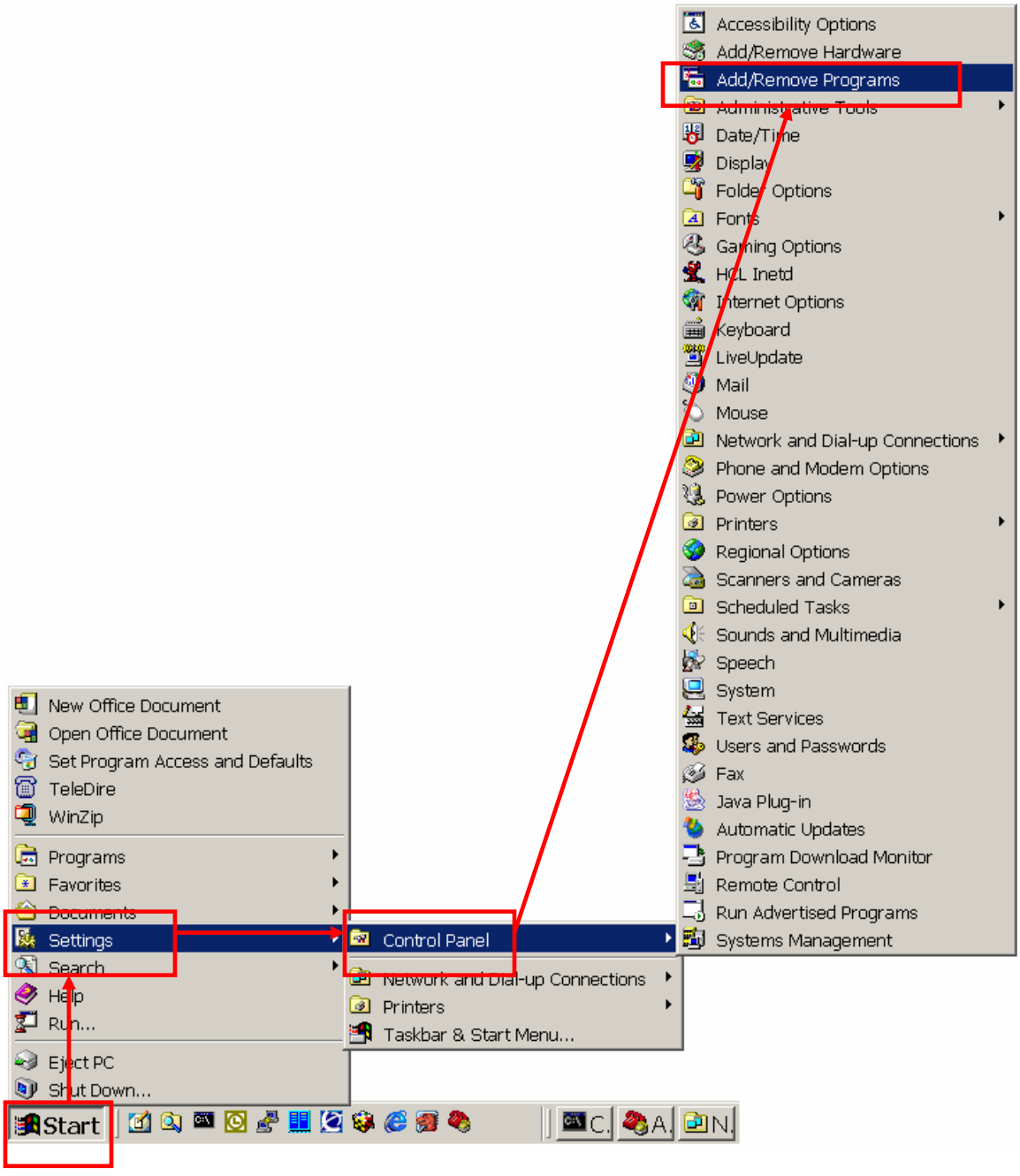
Configure IP address (192.168.20.1/24) with Alteon interface 2 (192.168.20.200) as a default gateway.

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

        Connection-specific DNS Suffix  . :
        IP Address. . . . . . . . . . . . : 192.168.20.1
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.20.200
```

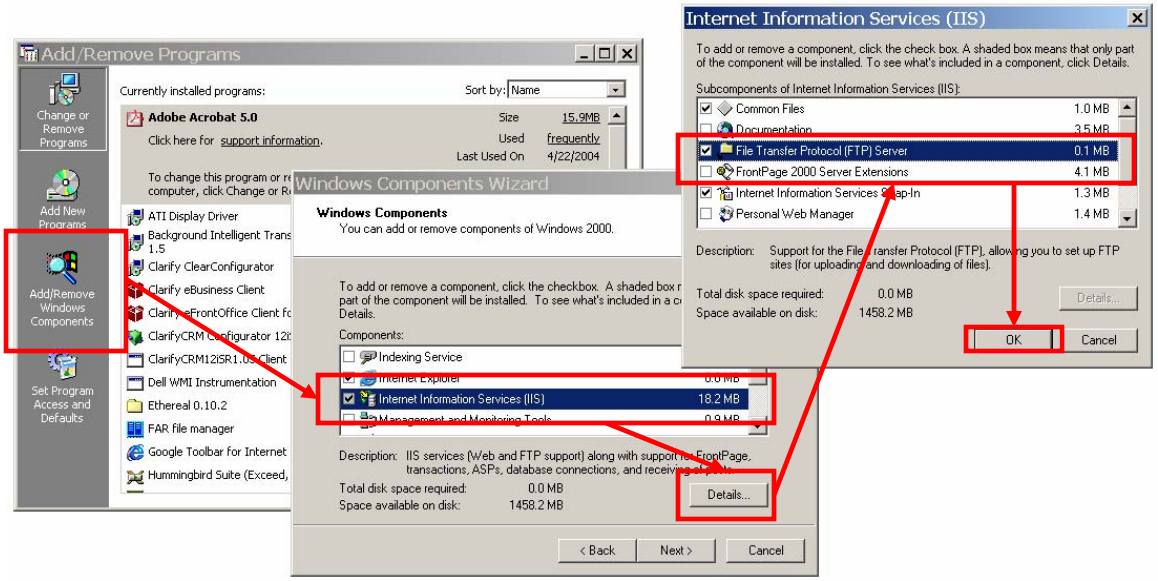
Alteon FTP Server Load Balancing

Enable FTP service on Windows machine.
Make sure FTP service is globally enabled on Windows machine.
Navigate **Start→Settings→Control Panel→Add Remove Programs**:

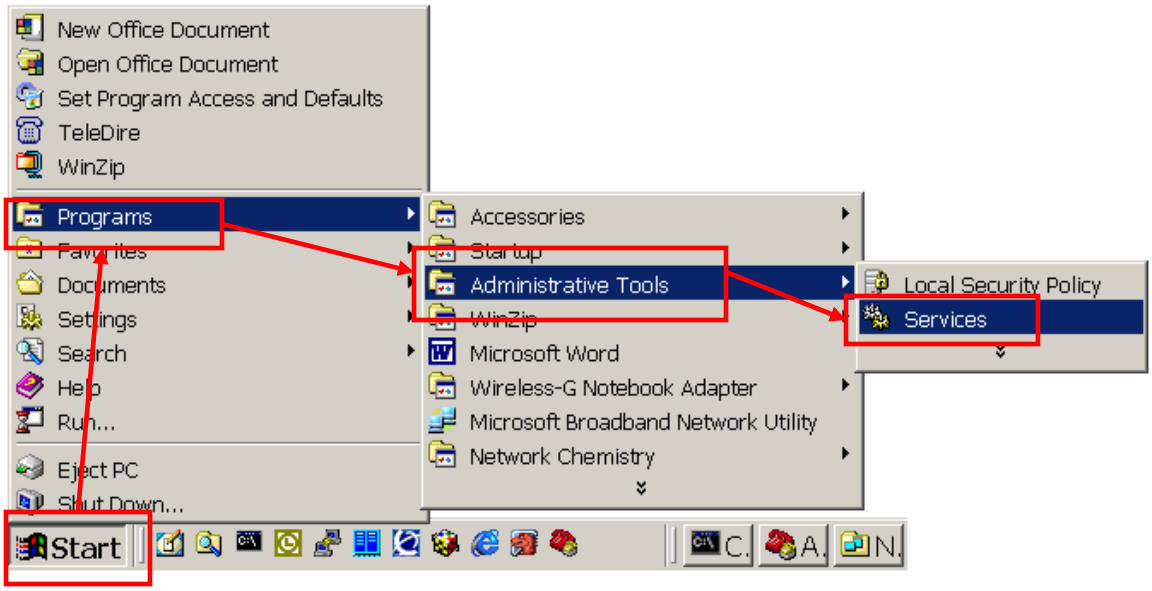


Alteon FTP Server Load Balancing

The **Add/Remove Programs** window appears.
Click on **Add/Remove Windows Components** in the panel on the left.
The **Windows Components Wizard** appears.
Select **Internet Information Services (IIS)**.
Click **Details**.
The **Internet Information Services (IIS)** window appears.
Make sure **File Transfer Protocol (FTP) Server** is enabled globally (checked).
Click **OK**.
If FTP service was not installed, install it.
Close Windows components and Add/Remove Programs windows.

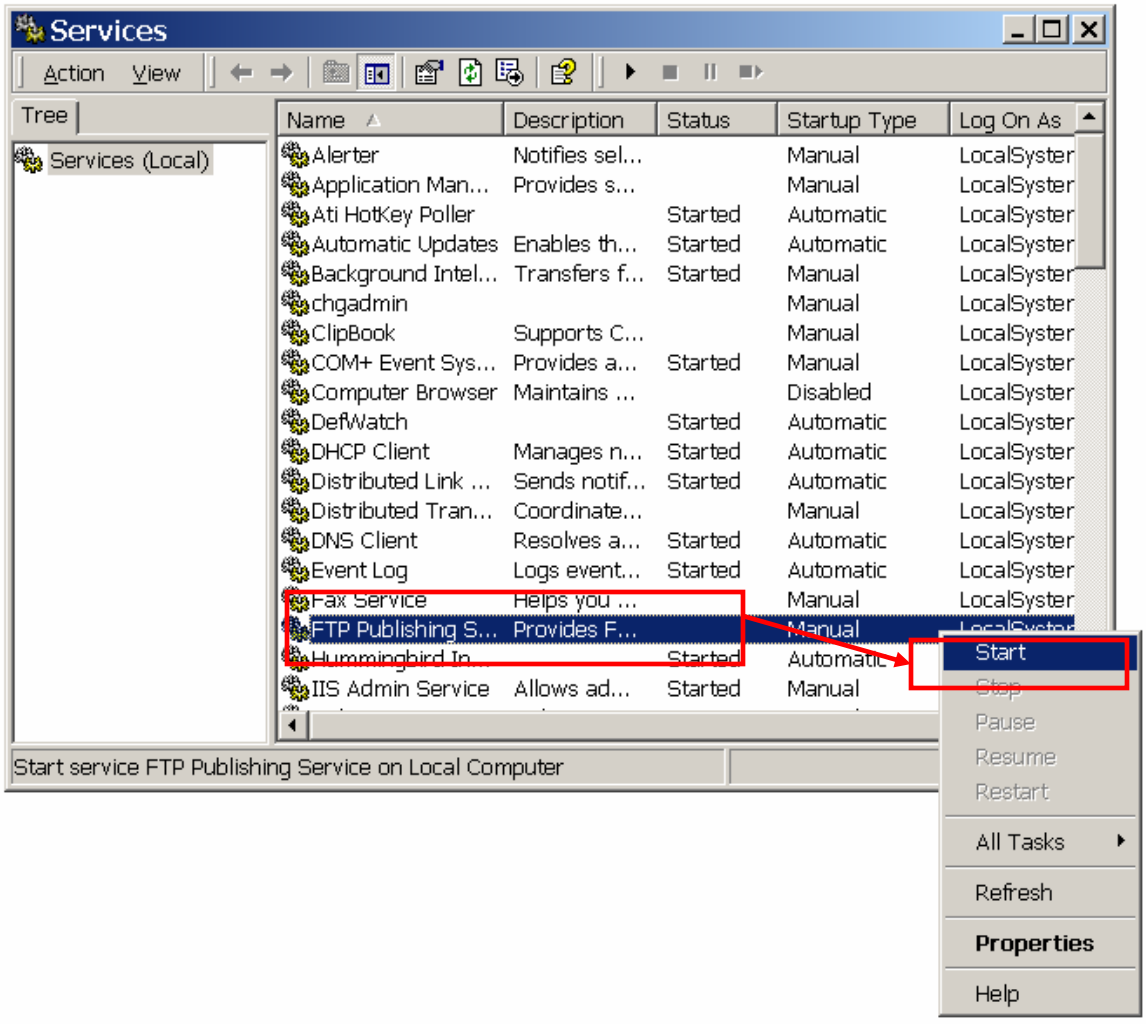


Start an FTP server.
Navigate **Start→Programs→Administrative Tools→Services**:

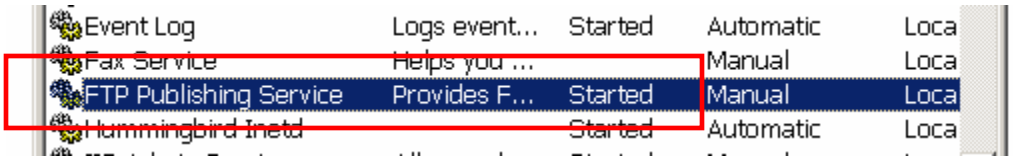


Alteon FTP Server Load Balancing

The **Services** screen appears.
Select the **FTP Publishing Service**.
Right click on FTP Publishing.
Select **Start** from the menu:



FTP service is started:



Alteon FTP Server Load Balancing

Configuring FTP2

In the same manner as for the FTP1 configure IP address (192.168.20.2/24) with an Alteon interface 2 address (192.168.20.200) as a default gateway:

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

        Connection-specific DNS Suffix  . :
        IP Address. . . . . . . . . . . . : 192.168.20.2
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.20.200
```

Enable FTP service in the same manner it was enabled for the FTP1 server.

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
```

Alteon FTP Server Load Balancing

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
```

Alteon FTP Server Load Balancing

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.
```

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.
```

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```
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
```

Enable real server 1:

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

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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.
```

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Creating a real servers group

Add real servers to a 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 issue 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 *Application Guide*.

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

Set 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
```

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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.
```

Configuring virtual IP

Configure the virtual IP for the clients to send request 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 to virtual interface to listen to requests on.

Note: FTP uses two connections; one for control (default TCP port 21) and one for data (default TCP port 20), both connections should be specified and assigned to the same real server.

Enable service for control FTP connection (port 21):

```
>> Virtual Server 1# service ftp
------------------------------------------------------------
[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
```

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```
      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 ftp Service# group 1
Current real server group:     1
New pending real server group: 1
```

Enable FTP parsing on the port. With FTP parsing Alteon looks deeper into the packets to determine the FTP mode of operation (active, passive) to correctly associate sessions:

```
>> Virtual Server 1 ftp Service# ftpp e
Current FTP SLB parsing: disabled
New FTP SLB parsing:     enabled
```

Enable virtual service for the data FTP connection (port 20):

```
>> Virtual Server 1 ftp Service# /cfg/slb/virt 1/service ftp-data
------------------------------------------------------------
[Virtual Server 1 ftp-data 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
```

Associate service with a group of real servers (group 1):

```
>> Virtual Server 1 ftp-data Service# group 1
Current real server group:     1
New pending real server group: 1
```

Enable FTP parsing on the FTP data port:

```
>> Virtual Server 1 ftp-data Service# ftpp e
Current FTP SLB parsing: disabled
New FTP SLB parsing:     enabled
```

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Enabling DAM

Enable Direct Access Mode (DAM):

```
>> Virtual Server 1 ftp-data Service# /cfg/slb/adv/direct e
Current Direct Access Mode: disabled
New Direct Access Mode:     enabled
```

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
```

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```
      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 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 SLB 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.
```

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

```
May 17 15:08:55 NOTICE  slb: real service 192.168.20.1:21 operational
May 17 15:08:55 NOTICE  slb: real server 192.168.20.1 operational
May 17 15:08:55 NOTICE  slb: Services are available for Virtual Server
1:192.168.10.150
May 17 15:08:55 NOTICE  slb: real service 192.168.20.2:21 operational
May 17 15:08:55 NOTICE  slb: real server 192.168.20.2 operational
```

Testing the configuration

Check the current SLB configuration:

```
>> Layer 4 Advanced# /cfg/slb/cur
Current Layer 4 settings:
  ON, direct enabled, 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:
      ftp: vport ftp, group 1
          virtual server:  1, 192.168.10.150,  enabled
      ftp-data: vport ftp-data, 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:
      ftp: vport ftp, group 1
          virtual server:  1, 192.168.10.150,  enabled
      ftp-data: vport ftp-data, group 1
          virtual server:  1, 192.168.10.150,  enabled

Current virtual servers settings:
  1: 192.168.10.150, enabled
    virtual ports:
```

Alteon FTP Server Load Balancing

```
      ftp: rport ftp, group 1, frags, ftpp
          real servers:
             1: 192.168.20.1,    weight 1,  enabled, backup none
             2: 192.168.20.2,    weight 1,  enabled, backup none
      ftp-data: rport ftp-data, group 1, frags, ftpp
          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
     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
```

Alteon FTP Server Load Balancing

```
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

Virtual server state:
  1: 192.168.10.150,  00:60:cf:46:53:6e
    virtual ports:
    ftp: rport ftp, 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
    ftp-data: rport ftp-data, group 1, backup none
        real servers:
          1: 192.168.20.1, backup none, 0 ms, up
          2: 192.168.20.2, backup none, 0 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
```

Alteon FTP Server Load Balancing

From PC2:

```
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
```

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
```

Start an FTP session from PC1 to FTP virtual server (192.168.10.150).
Enter the appropriate credentials (anonymous login was used in this example with ftp/ftp as user ID/password):

```
C:\>ftp 192.168.10.150
Connected to 192.168.10.150.
220 KRISTISE-1 Microsoft FTP Service (Version 5.0).
User (192.168.10.7:(none)): ftp
331 Anonymous access allowed, send identity (e-mail name) as password.
Password:
230 Anonymous user logged in.
ftp>
```

Check the session dump on Alteon:

```
>> Session Table Information# /info/slb/sess/dump
 7,5:  192.168.10.7 1098, 192.168.10.150 21 -> 4101 192.168.20.1 21  age
10  EU
```

FTP request from PC1 (192.168.10.7) to 192.168.10.150 has been forwarded to the FTP1 (192.168.20.1) real server.

Alteon FTP Server Load Balancing

Start an FTP session from PC2. Enter the appropriate credentials when prompted (anonymous logon was used in this example with ftp/ftp as a user ID/password):

```
C:\>ftp 192.168.10.150
Connected to 192.168.10.150.
220 KRISTISE-1 Microsoft FTP Service (Version 5.0).
User (192.168.10.75:(none)): ftp
331 Anonymous access allowed, send identity (e-mail name) as password.
Password:
230 Anonymous user logged in.
ftp>
```

Check the session dump:

```
>> Session Table Information# /info/slb/sess/dump
 2,9:  192.168.10.75 1152, 192.168.10.150 21 -> 4105 192.168.20.2 21
age 10  EU
 7,5:  192.168.10.7 1098, 192.168.10.150 21 -> 4101 192.168.20.1 21  age
10  EU
```

FTP request from PC2 (192.168.10.75) has been forwarded to the second real FTP server FTP2 as a round-robin algorithm has been configured as a metric to select the next available server for load balancing.

Issue a **dir** command from the PC1 while FTP'd into the FTP1:

```
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
10-31-03  05:34PM              1048576 100307 bin.180e
02-05-04  03:21PM               175008 cepsetup.exe
226 Transfer complete.
ftp: 173 bytes received in 0.00Seconds 173000.00Kbytes/sec.
ftp>
```

Check the sessions table:

```
>> Session Table Information# /info/slb/sess/dump
 2,9:  192.168.10.75 1152, 192.168.10.150 21 -> 4105 192.168.20.2 21
age 8  EU
 7,5:  192.168.10.7 1098, 192.168.10.150 21 -> 4101 192.168.20.1 21  age
10  EU
 7,6:  192.168.10.7 1099, 192.168.10.150 20 -> 4102 192.168.20.1 20  age
0, next 5
```

FTP data connection has been forwarded to the same server (192.168.20.1) as the FTP control connection.

Alteon FTP Server Load Balancing

Issue a **dir** command from PC2 while FTP'd into the FTP2:

```
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
10-31-03  05:34PM              1048576 100307 bin.180e
01-23-04  10:00AM              4658538 309978D00.pdf
226 Transfer complete.
ftp: 110 bytes received in 0.00Seconds 110000.00Kbytes/sec.
ftp>
```

Check the session table:

```
>> Session Table Information# /info/slb/sess/dump
 2,10:  192.168.10.75 1152, 192.168.10.150 21 -> 4105 192.168.20.1 21
age 10  EU
 2,11:  192.168.10.75 1153, 192.168.10.150 20 -> 4106 192.168.20.1 20
age 0
 7,5:  192.168.10.7 1098, 192.168.10.150 21 -> 4101 192.168.20.1 21  age
6  EU
```

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             2          6        3            10434
   2 192.168.20.2             0          7        2            19113
---- ----------------- -------- ---------- --------  ---------------
     192.168.10.150           2         13        5            29547
```

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.
```

Alteon FTP Server Load Balancing

Sample configuration using Proxy IP

Setup

This example is based on the Sample configuration using DAM.

The goal of the configuration is to setup a basic FTP server load balancing using Proxy IP addresses.

Configuring PC1, PC2, FTP1, FTP2

All devices (PC1, PC2, FTP1, FTP2) are configured exactly the same as in the previous example.

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
```

Alteon FTP Server Load Balancing

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
```

Alteon FTP Server Load Balancing

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.
```

Alteon FTP Server Load Balancing

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
```

Alteon FTP Server Load Balancing

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.
```

Alteon FTP Server Load Balancing

Creating real servers group

Add real servers to a 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 issue 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 *Application Guide*.

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

Set 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
```

Alteon FTP Server Load Balancing

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.
```

Configuring Proxy IP addresses

Configure Proxy IP address on the client port.

NOTE: Even though we need only client port to have Proxy IP enabled, Proxy IP addresses should be assigned to all ports of the switch if VMA (Virtual Matrix Architecture) is enabled. It is not recommended to disable VMA on the switch as it will degredate switch performance and limit switch functionality.
Care must be taken to provision IP addresses for all ports on the switch.

An AD3 is used in this example; therefore all 8 ports should be configured with routable IP addresses.
In this example 192.168.20.210-217 addresses have been selected as a Proxy IP addresses for the switch.

Configure Proxy IP (PIP) for the port 1:

```
>> Real server group 1# /cfg/slb/port 1/pip 192.168.20.210
Current proxy IP address:     0.0.0.0
New pending proxy IP address: 192.168.20.210
```

Enable Proxy IP on the client port (port 1 in this example):

```
>> SLB port 1# proxy e
Current using proxy IP address: disabled
New using proxy IP address:     enabled
```

Configure the rest of the ports with the PIPs.
Note: There is no need to enable proxy IPs on the ports that are not enabled for the client processing.

```
>> SLB port 1# /cfg/slb/port 2/pip 192.168.20.211
Current proxy IP address:     0.0.0.0
New pending proxy IP address: 192.168.20.211

>> SLB port 2# /cfg/slb/port 3/pip 192.168.20.212
Current proxy IP address:     0.0.0.0
New pending proxy IP address: 192.168.20.212

>> SLB port 3# /cfg/slb/port 4/pip 192.168.20.213
Current proxy IP address:     0.0.0.0
New pending proxy IP address: 192.168.20.213

>> SLB port 4# /cfg/slb/port 5/pip 192.168.20.214
Current proxy IP address:     0.0.0.0
```

Alteon FTP Server Load Balancing

```
New pending proxy IP address: 192.168.20.214

>> SLB port 5# /cfg/slb/port 6/pip 192.168.20.215
Current proxy IP address:     0.0.0.0
New pending proxy IP address: 192.168.20.215

>> SLB port 6# /cfg/slb/port 7/pip 192.168.20.216
Current proxy IP address:     0.0.0.0
New pending proxy IP address: 192.168.20.216

>> SLB port 7# /cfg/slb/port 8/pip 192.168.20.217
Current proxy IP address:     0.0.0.0
New pending proxy IP address: 192.168.20.217
```

Apply and save the changes:

```
>> SLB port 8# 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.
```

Configuring virtual IP

Configure the virtual IP for the clients to send request 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
```

Alteon FTP Server Load Balancing

Assign a protocol to virtual interface to listen to requests on.

Note: FTP uses two connections; one for control (default TCP port 21) and one for data (default TCP port 20), both connections should be specified and assigned to the same real server.

Enable service for control FTP connection (port 21):

```
>> Virtual Server 1# service ftp
------------------------------------------------------------
[Virtual Server 1 ftp 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 ftp Service# group 1
Current real server group:     1
New pending real server group: 1
```

Enable FTP parsing on the port:

```
>> Virtual Server 1 ftp Service# ftpp e
Current FTP SLB parsing: disabled
New FTP SLB parsing:     enabled
```

Enable virtual service for the data FTP connection (port 20):

```
>> Virtual Server 1 ftp Service# /cfg/slb/virt 1/service ftp-data
------------------------------------------------------------
[Virtual Server 1 ftp-data 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
```

Alteon FTP Server Load Balancing

Associate service with a group of real servers (group 1):

```
>> Virtual Server 1 ftp-data Service# group 1
Current real server group:     1
New pending real server group: 1
```

Enable FTP parsing on the FTP data port:

```
>> Virtual Server 1 ftp-data Service# ftpp e
Current FTP SLB parsing: disabled
New FTP SLB parsing:     enabled
```

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.
```

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
```

Enabling Client/Server processing

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
```

Alteon FTP Server Load Balancing

```
      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
```

Note: When implementing Proxy IP, server port processing could be disabled on ports.

In this example we've chosen to enable server processing on ports.
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 SLB globally

Enable server load balancing (SLB) globally:

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

Alteon FTP Server Load Balancing

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
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:

```
>> Layer 4 Advanced# /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:
      ftp: vport ftp, group 1
          virtual server:  1, 192.168.10.150,  enabled
      ftp-data: vport ftp-data, 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
```

Alteon FTP Server Load Balancing

```
    cookie assignment server: disabled
    exclusionary string matching: disabled
    real ports:
      ftp: vport ftp, group 1
          virtual server:  1, 192.168.10.150,  enabled
      ftp-data: vport ftp-data, group 1
          virtual server:  1, 192.168.10.150,  enabled

Current virtual servers settings:
  1: 192.168.10.150, enabled
    virtual ports:
      ftp: rport ftp, group 1, frags, ftpp
          real servers:
             1: 192.168.20.1,    weight 1,  enabled, backup none
             2: 192.168.20.2,    weight 1,  enabled, backup none
      ftp-data: rport ftp-data, group 1, frags, ftpp
          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  enabled, 192.168.20.210
     filt disabled, filters: empty
  2: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 192.168.20.211
     filt disabled, filters: empty
  3: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 192.168.20.212
     filt disabled, filters: empty
  4: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 192.168.20.213
     filt disabled, filters: empty
  5: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 192.168.20.214
     filt disabled, filters: empty
  6: client disabled, server disabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 192.168.20.215
     filt disabled, filters: empty
  7: client disabled, server  enabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 192.168.20.216
     filt disabled, filters: empty
  8: client disabled, server  enabled, rts disabled
     hotstan disabled, intersw disabled, idslb disabled
     proxy disabled, 192.168.20.217
     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
```

Alteon FTP Server Load Balancing

```
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

Virtual server state:
  1: 192.168.10.150,  00:60:cf:46:53:6e
    virtual ports:
    ftp: rport ftp, 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
    ftp-data: rport ftp-data, group 1, backup none
        real servers:
          1: 192.168.20.1, backup none, 0 ms, up
          2: 192.168.20.2, backup none, 0 ms, up

Redirect filter state:

Port state:
  1: 192.168.20.210, proxy, client
  2: 192.168.20.211
  3: 192.168.20.212
  4: 192.168.20.213
  5: 192.168.20.214
  6: 192.168.20.215
  7: 192.168.20.216, server
  8: 192.168.20.217, server
  9: 0.0.0.0
```

Alteon FTP Server Load Balancing

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:

```
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
```

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
```

Alteon FTP Server Load Balancing

Start an FTP session from PC1 to FTP virtual server (192.168.10.150).
Enter the appropriate credentials (anonymous login was used in this example with ftp/ftp as user ID/password):

```
C:\>ftp 192.168.10.150
Connected to 192.168.10.150.
220 KRISTISE-1 Microsoft FTP Service (Version 5.0).
User (192.168.10.7:(none)): ftp
331 Anonymous access allowed, send identity (e-mail name) as password.
Password:
230 Anonymous user logged in.
ftp>
```

Check the session dump:

```
>> Session Table Information# /info/slb/sess/dump
  7,5:  192.168.10.7 1126, 192.168.10.150 21 ->
      192.168.20.216 4101 192.168.20.1 21  age 8  EU
```

FTP request from PC1 (192.168.10.7) to virtual IP (192.168.10.150) has been forwarded to the FTP1 (192.168.20.1) real server and client's source addresses has been substituted with one of the configured proxy IPs. The proxy IP of port 7 (192.168.20.216) has been used in this case as port 7 has been selected by the VMA to process the session.

Start an FTP session from PC2. Enter the appropriate credentials when prompted (anonymous logon was used in this example with ftp/ftp as a user ID/password):

```
C:\>ftp 192.168.10.150
Connected to 192.168.10.150.
220 KRISTISE-1 Microsoft FTP Service (Version 5.0).
User (192.168.10.75:(none)): ftp
331 Anonymous access allowed, send identity (e-mail name) as password.
Password:
230 Anonymous user logged in.
ftp>
```

Check the session dump:

```
>> Session Table Information# /info/slb/sess/dump
 2,6:  192.168.10.75 1165, 192.168.10.150 21 ->
      192.168.20.211 4102 192.168.20.2 21  age 10  EU
 7,5:  192.168.10.7 1126, 192.168.10.150 21 ->
      192.168.20.216 4101 192.168.20.1 21  age 8  EU
```

FTP request from PC2 (192.168.10.75) has been forwarded to the second real FTP server FTP2 as a round-robin algorithm has been configured as a metric to select the next available server for load balancing. Note VMA has selected port 2 for processing the session and therefore proxy IP address of port 2 has been used to substitute the client's source IP.

Alteon FTP Server Load Balancing

Issue a **dir** command from the PC1 while FTP'd into the FTP1:

```
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
10-31-03  05:34PM              1048576 100307 bin.180e
02-05-04  03:21PM               175008 cepsetup.exe
226 Transfer complete.
ftp: 173 bytes received in 0.00Seconds 173000.00Kbytes/sec.
ftp>
```

Check the sessions table:

```
>> Session Table Information# /info/slb/sess/dump
  2,6:  192.168.10.75 1165, 192.168.10.150 21 ->
      192.168.20.211 4102 192.168.20.2 21  age 8  EU
 7,5:  192.168.10.7 1126, 192.168.10.150 21 ->
      192.168.20.216 4101 192.168.20.1 21  age 10  EU
 7,6:  192.168.10.7 1127, 192.168.10.150 20 ->
      192.168.20.216 4102 192.168.20.1 20  age 0, next 5
```

Issue a **dir** command from PC2 while FTP'd into the FTP2:

```
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
10-31-03  05:34PM              1048576 100307_bin.180e
01-23-04  10:00AM              4658538 309978D00.pdf
226 Transfer complete.
ftp: 110 bytes received in 0.00Seconds 110000.00Kbytes/sec.
ftp>
```

Check the session table:

```
>> Session Table Information# /info/slb/sess/dump
  2,6:  192.168.10.75 1165, 192.168.10.150 21 ->
      192.168.20.211 4102 192.168.20.2 21  age 10  EU
 2,7:  192.168.10.75 1166, 192.168.10.150 20 ->
      192.168.20.211 4103 192.168.20.2 20  age 0
 7,5:  192.168.10.7 1126, 192.168.10.150 21 ->
      192.168.20.216 4101 192.168.20.1 21  age 8  EU
```

Alteon FTP Server Load Balancing

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             2          6        3            10434
   2  192.168.20.2             0          7        2            19113
----  ----------------- -------- ---------- --------  ---------------
      192.168.10.150           2         13        5            29547
```

To clear SLB statistics:

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

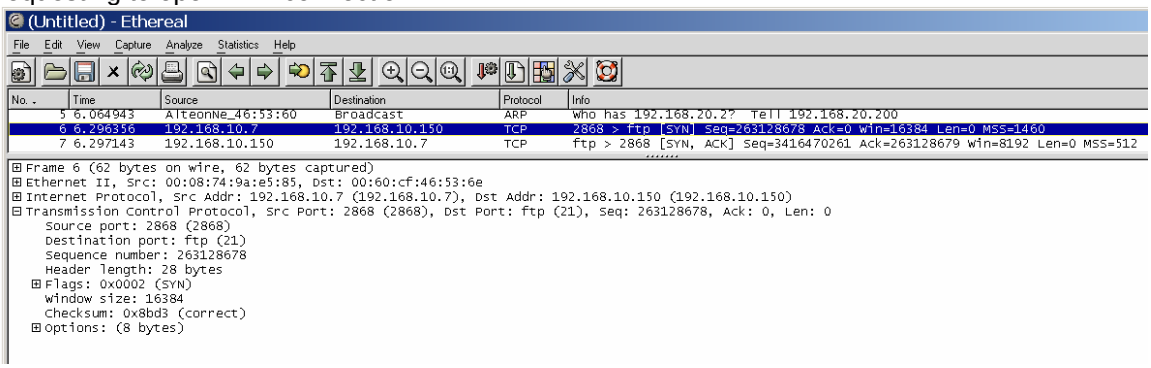
To clear session statistics:

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

Alteon FTP Server Load Balancing

Appendix A. FTP with DAM. Sample sniffer traces.

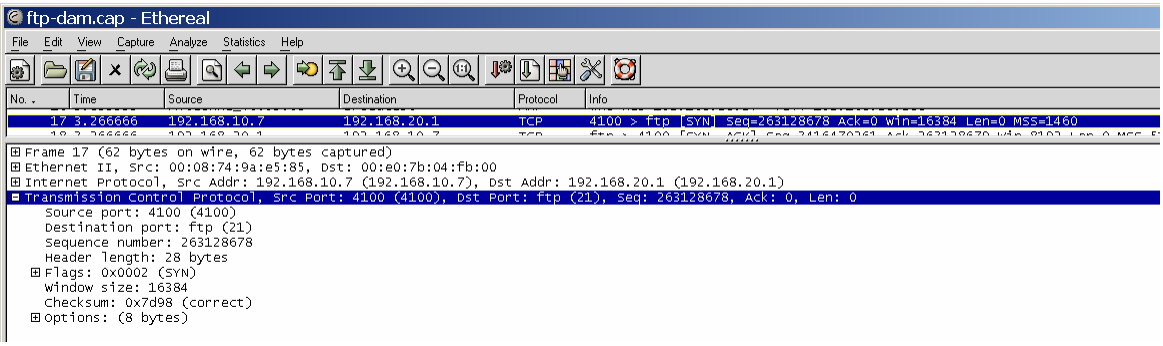
Client starts and FTP session.
Client (192.168.10.7) sends a SYN from the port 2868 to the virtual IP (192.168.10.150) port 21 requesting to open FTP connection:



Alteon receives SYN to its virtual IP (192.168.10.150), checks whether client processing has been enabled on the port the SYN was received on. With client processing being enabled Alteon checks whether real servers are available. With real servers being available, Alteon processes the request and decides on which real server to forward the request to:

```
7,5:  192.168.10.7 2868, 192.168.10.150 21 -> 4100 192.168.20.2 21  age
10  EU
```

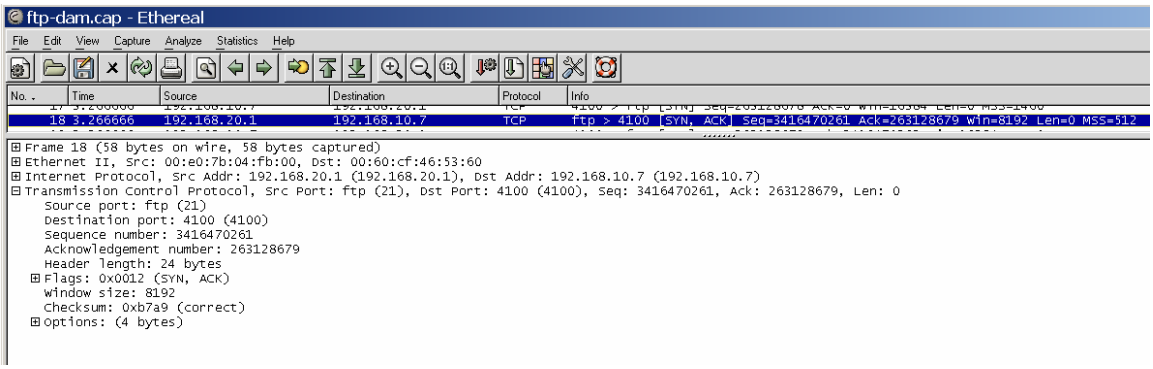
Alteon substitutes the destination address from virtual IP (192.168.10.150) to the real server IP (192.168.20.2), changes client source port from 2868 to 4100 and forwards the SYN to the real server:



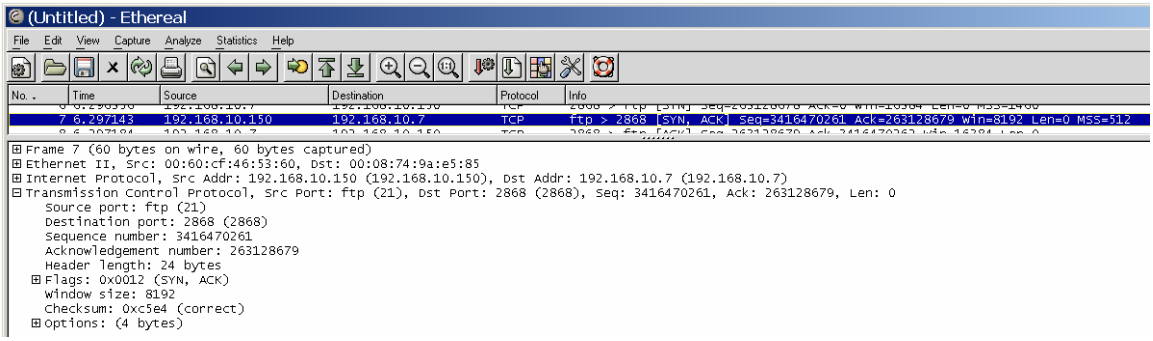
Alteon FTP Server Load Balancing

Real server receives the SYN and responds with SYN ACK.

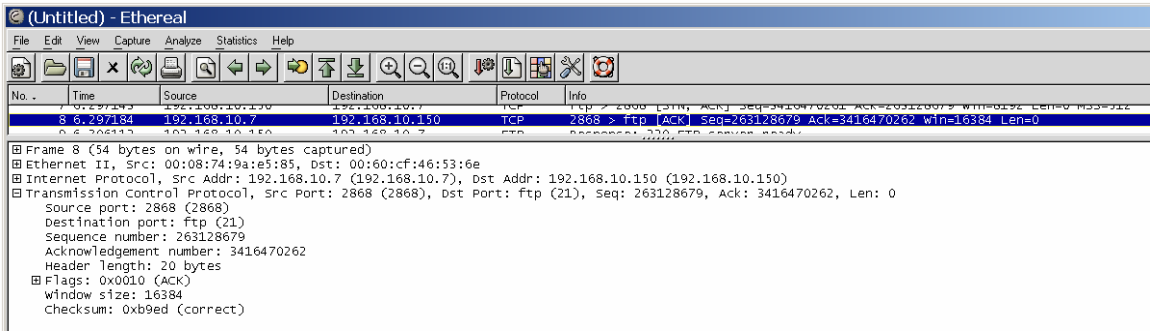
Note: From the real server point of view an FTP SYN request has been initiated by the client from port 4100.



Alteon receives the SYN ACK, looks up its sessions table, substitutes real server IP (192.168.20.2) with Alteon's virtual IP (192.168.10.150), changes destination port (4100) to clients port (2868) and forwards the SYN ACK to the client:

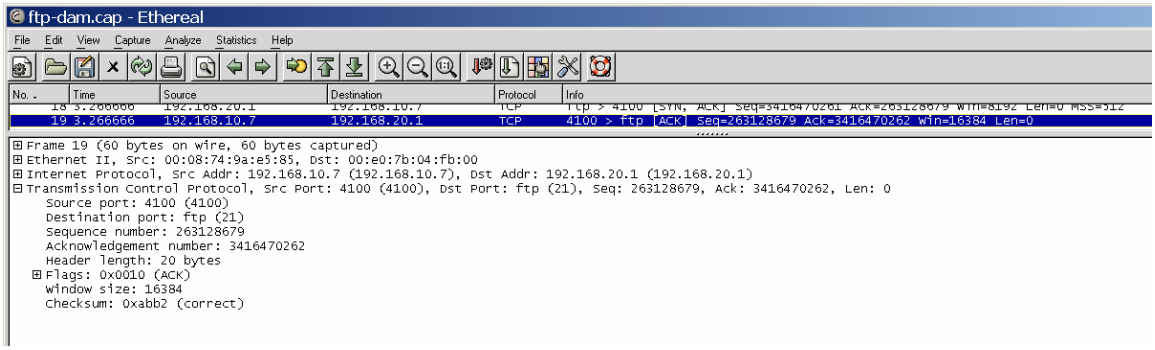


Client receives the SYN ACK and responds to virtual server with ACK:

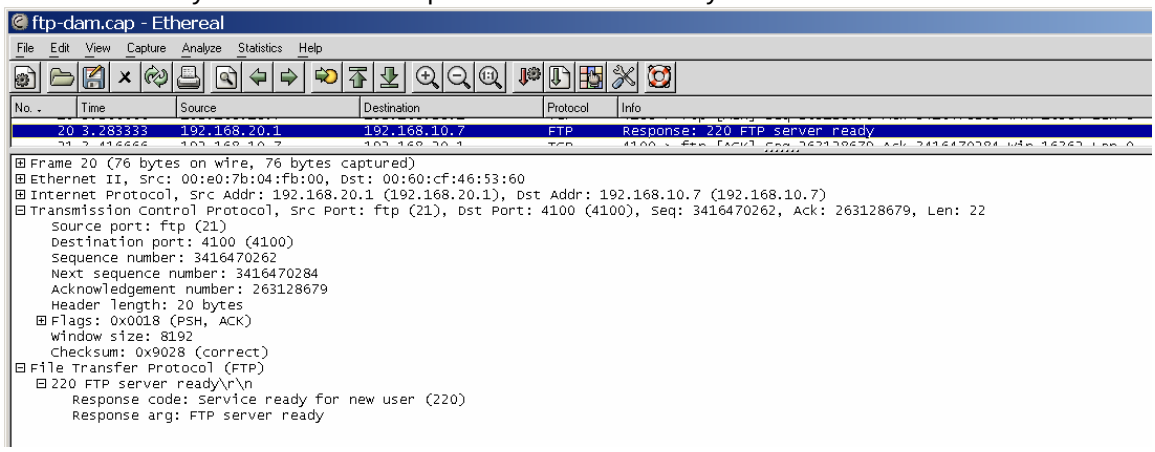


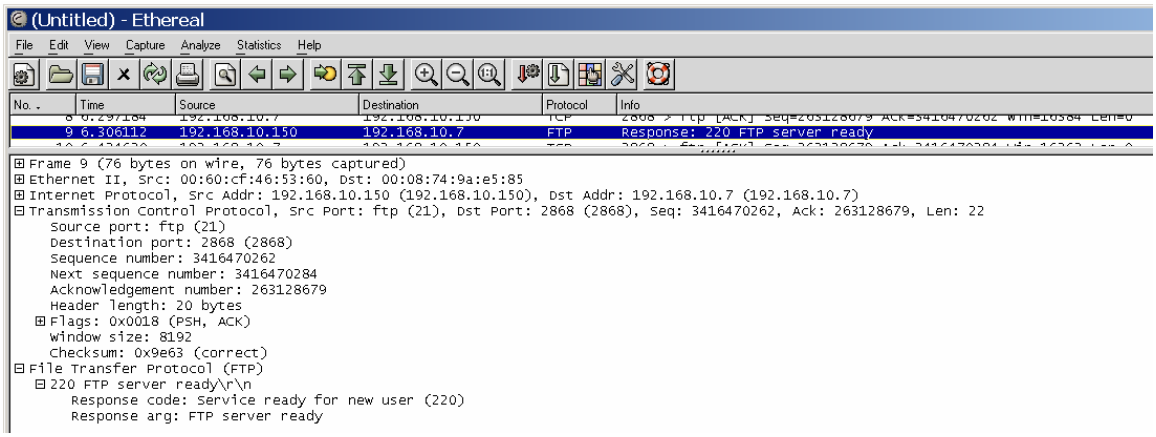
Alteon FTP Server Load Balancing

Alteon receives the ACK, checks its session table, substitutes the destination virtual IP (192.168.10.150) with a real server IP (192.168.20.2), changes ports from 2868 to 4100 and forwards the ACK to the real server:



Thus a three way handshake is complete and server is ready for a new user.



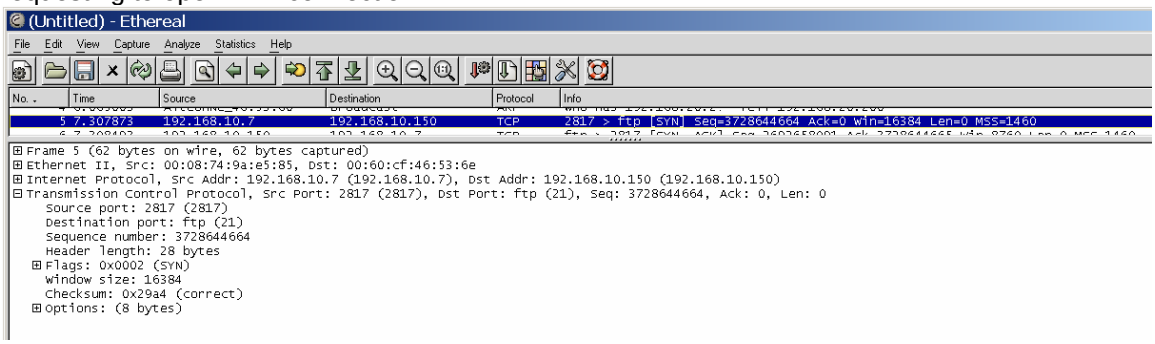


NOTE: From the client's point of view, it opened an FTP connection to the FTP server at 192.168.10.150 and it has no knowledge of the real servers behind the Alteon.
From the real server point of view, the session has been opened by the real client (192.168.10.7) from port 4100.

Alteon FTP Server Load Balancing

Appendix B. FTP with Proxy IP. Sample sniffer traces.

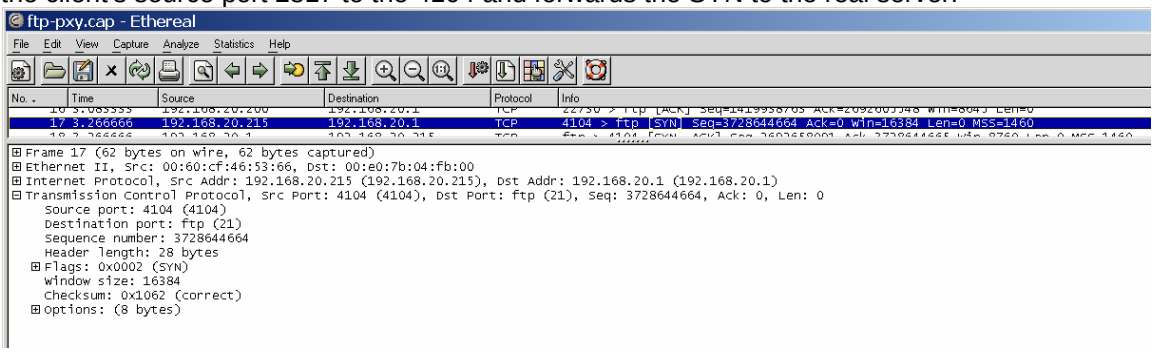
Client starts and FTP session.
Client (192.168.10.7) sends a SYN from the port 2817 to the virtual IP (192.168.10.150) port 21 requesting to open FTP connection:



Alteon receives SYN to its virtual IP (192.168.10.150), checks whether client processing has been enabled on the port the SYN was received on. With client processing being enabled Alteon checks whether real servers are available. With real servers being available, Alteon processes the request and decides on which real server to forward the request to:

```
6,3:  192.168.10.7 2817, 192.168.10.150 21 ->
      192.168.20.215 4104 192.168.20.2 21 age 10  EU
```

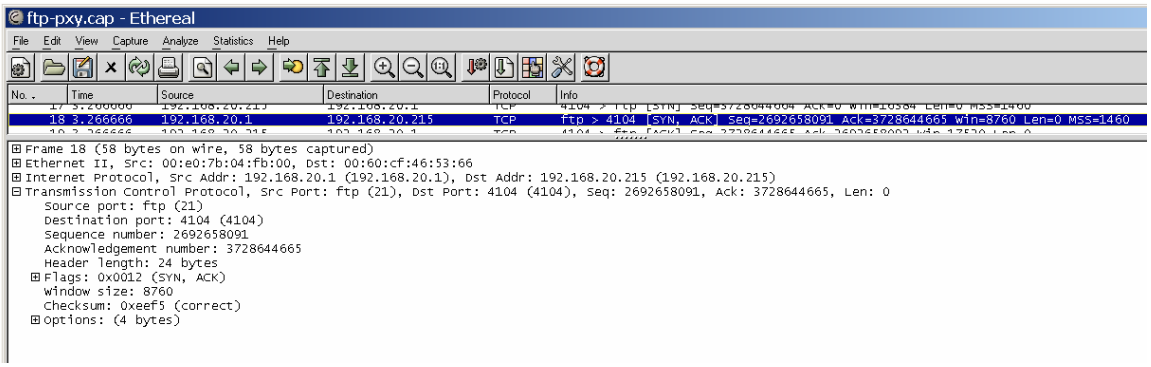
Alteon substitutes the client source IP (192.168.10.7) with the proxy IP assigned to the port that was selected by VMA for session processing, 192.168.20.215 in this example. Alteon changes the client's source port 2817 to the 4104 and forwards the SYN to the real server:



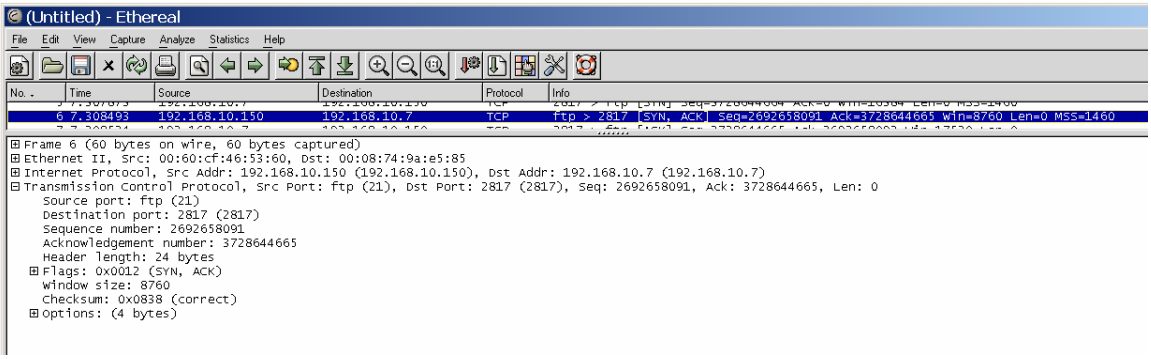
Alteon FTP Server Load Balancing

Real server receives the SYN and responds with SYN ACK.

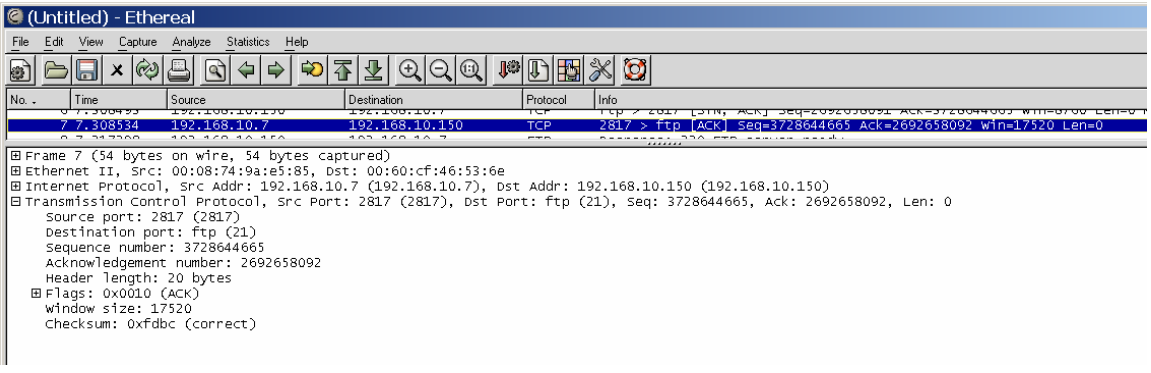
Note: From the real server point of view an FTP SYN request has been initiated by the Alteon itself (192.168.20.215), real server has no knowledge of the real client therefore the reply will be forwarded back to the switch.



Alteon receives the SYN ACK, looks up its session table, substitutes destination proxy IP (192.168.20.215) with client's IP (192.168.10.7), substitutes real server IP (192.168.20.2) with Alteon's virtual IP (192.168.10.150), changes destination port (4104) to clients port (2817) and forwards the SYN ACK to the client:

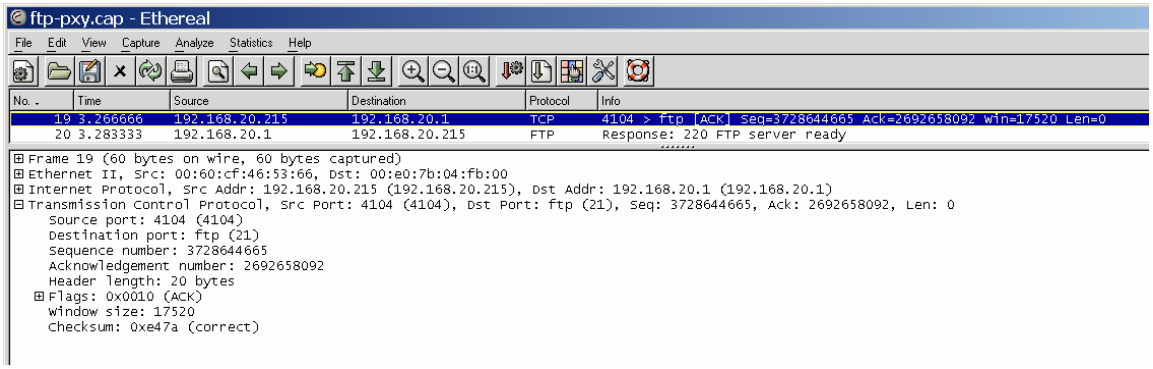


Client receives the SYN ACK and responds to virtual server with ACK:



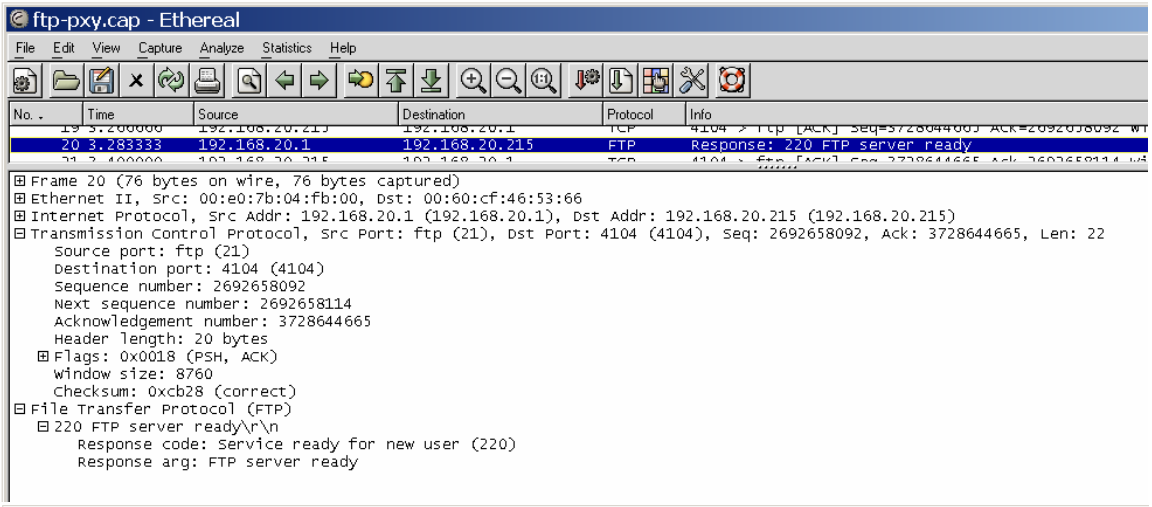
Alteon FTP Server Load Balancing

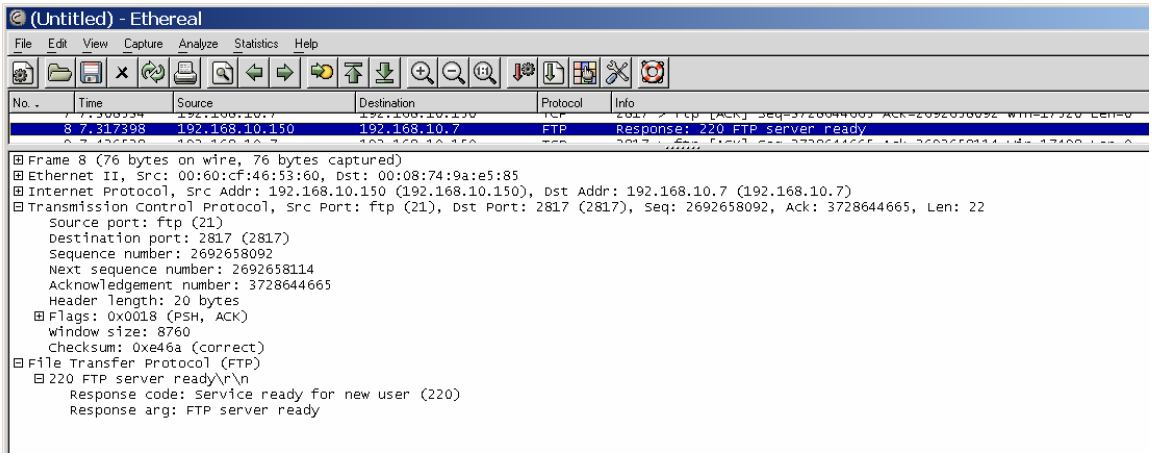
Alteon receives the ACK, checks its session table, substitutes the destination virtual IP (192.168.10.150) with a real server IP (192.168.20.2), substitutes the source IP (192.168.10.7) with proxy IP (192.168.20.215), changes ports from 2817 to 4104 and forwards the ACK to the real server:



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Thus a three way handshake is complete and server is ready for a new user.





NOTE: From the client point of view, it opened an FTP connection to the FTP server at 192.168.10.150.
From the real server point of view, FTP connection has been opened from a client at 192.168.20.215.
Both client and real server have no knowledge of each other.

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Appendix C. Alteon configuration dump with DAM

```
script start "Alteon AD3" 4  /**** DO NOT EDIT THIS LINE!
/* Configuration dump taken  9:33:41 Mon Apr 26, 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/adv
        direct ena
/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 ftp
        group 1
        ftpp ena
/c/slb/virt 1/service ftp-data
        group 1
        ftpp ena
/
script end  /**** DO NOT EDIT THIS LINE!
```

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Appendix D. Alteon configuration dump with Proxy IP

```
script start "Alteon AD3" 4  /**** DO NOT EDIT THIS LINE!
/* Configuration dump taken 11:45:47 Mon Apr 26, 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
        proxy ena
        pip 192.168.20.210
/c/slb/port 2
        pip 192.168.20.211
/c/slb/port 3
        pip 192.168.20.212
/c/slb/port 4
        pip 192.168.20.213
/c/slb/port 5
        pip 192.168.20.214
/c/slb/port 6
        pip 192.168.20.215
/c/slb/port 7
        server ena
        pip 192.168.20.216
/c/slb/port 8
        server ena
        pip 192.168.20.217
/c/slb/virt 1
        ena
        vip 192.168.10.150
/c/slb/virt 1/service ftp
        group 1
        ftpp ena
/c/slb/virt 1/service ftp-data
        group 1
        ftpp ena
/
script end  /**** DO NOT EDIT THIS LINE!
```

Tech Tip
Alteon

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