Technical Tip

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NORTEL

Alteon Basic Firewall Load Balancing. Sample Configuration

Contents:

Introduction:

This document shows a sample basic firewall load balancing configuration using two WebOS switches.

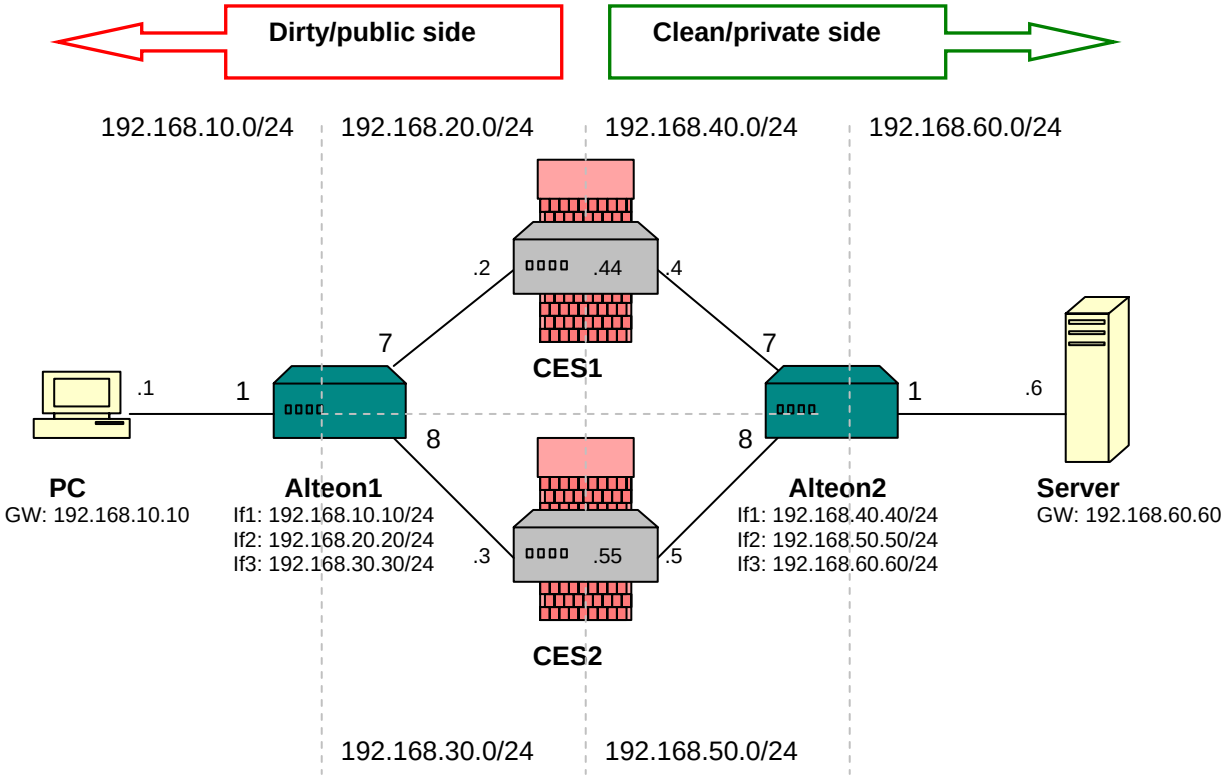
Associated Products:

The information in this document is intended to be used with the following product(s) with the indicated software or hardware revisions:

Product Name or Order Number	Revision Information	
	Potentially Affected	*Corrected*
Alteon WebOS switches: 180e, 180 Plus, 184, AD2, AD3, AD4	All	N/A

Sample Configuration

Setup



PC – Windows 2000 workstation, IP address 192.168.10.1/24;
Alteon1 – Alteon WebOS switch AD3, interface 1 192.168.10.10/24; interface 2 192.168.20.20/24; interface 3 192.168.30.30/24;
CES1 – Contivity Secure IP Services Gateway acting as a firewall only, management IP 192.168.40.44/24, private IP 192.168.40.4/24, public IP 192.168.20.2/24;
CES2 - Contivity Secure IP Services Gateway acting as a firewall only, management IP 192.168.50.55/24, private IP 192.168.50.5/24, public IP 192.168.30.3/24;
Alteon2 – Alteon WebOS switch AD3, interface 1 192.168.40.40/24; interface 2 192.168.50.50/24; interface 3 192.168.60.60/24;
Server – Windows 2000 workstation with FTP service enabled, IP address 192.168.60.6/24.

The goal of the configuration is to setup a basic firewall load balancing.

Configuring PC

Configure IP address on PC with a default gateway pointing to Alteon1:

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

        Connection-specific DNS Suffix  . :
        IP Address. . . . . . . . . . . . : 192.168.10.1
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.10.10
```

Configuring CES1

1. Configure addresses for the management (192.168.40.44/24), private (192.168.40.4/24) and public (192.168.20.2/24) interfaces.

    a) 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:
```

    b) The **Main Menu** appears.
    c) Enter **1** menu choice to configure IP addresses 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
```

d) The **Interface Menu** appears.
e) Select **0** menu choice to configure IP addresses 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
```

f) Enter the **New IP Address** for the **Management** interface (192.168.40.44), private **Interface** (192.168.40.4), **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* = 192.168.40.44

        Old Interface IP Address =
        New Interface IP Address* = 192.168.40.4

        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>):
```

g) The interface is configured.
h) Review the settings and enter **1** to configure public IP address:

```
- Interface Menu

   0) Slot 0, Port 1, Private LAN
        Management IP Address = 192.168.40.44, ( Subnet Mask = 255.255.255.0 )
        Interface IP Address = 192.168.40.44
        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: 1
```

i) Enter the IP address for the public interface (192.168.20.2), enter mask for the interface (255.255.255.0), leave the speed to default by clicking Enter:

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


   *  Type 0.0.0.0 to delete.
   *  Just type <CR> to skip.
        Old IP Address =
        New IP Address* = 192.168.20.2

        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>):
```

j) The **Interface Menu** reappears, review the configuration and enter **R** (r) to return to the main menu:

```
- Interface Menu

   0) Slot 0, Port 1, Private LAN
        Management IP Address = 192.168.40.44, ( Subnet Mask = 255.255.255.0 )
        Interface IP Address = 192.168.40.4
        Subnet Mask = 255.255.255.0
        Speed/Duplex = AutoNegotiate

   1) Slot 1, Port 1, Public LAN
        IP Address = 192.168.20.2
        Subnet Mask = 255.255.255.0
        Speed/Duplex = AutoNegotiate

   R) Return to the Main Menu

Please select a menu choice: r
```

2. Once in the **Main Menu**, select option **L** (l) to enter CLI mode:

```
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): l
```

3. Enable privileged mode and provide the appropriate administrator password:

```
CES>enable
Password:
CES#
```

4. Enter configuration menu:

```
CES#configure terminal
Enter configuration commands, one per line.  End with Ctrl/z.
CES(config)#
```

5. Configure static route to 192.168.60.0/24 network via Alteon2 interface 2 IP 192.168.40.40:

```
CES(config)#ip route 192.168.60.0 255.255.255.0 192.168.40.40 ena
```

6. Configure static route to 192.168.10.0/24 network via Alteon1 interface 2 192.168.20.20:

```
CES(config)#ip route 192.168.10.0 255.255.255.0 192.168.20.20 ena
```

7. For Contivity to pass traffic between private and public sides, interface filters or Contivity Stateful Firewall should be enabled. Interface filters will be enabled in this example with permit all rule.
   a) Enter private interface configuration menu:

```
CES(config)#interface fastEthernet 0/1
CES(config-if)#
```

   b) Enable permit all filter on interface and exit private interface configuration menu:

```
CES(config-if)#filter "permit all"
CES(config-if)#exit
CES(config)#
```

   c) Enter public interface configuration menu, enable permit all filter on public interface and exit the public interface configuration menu:

```
CES(config)#interface fastEthernet 1/1
CES(config-if)#filter "permit all"
CES(config-if)#exit
CES(config)#
```

   d) Enable interface filters globally on CES:

```
CES(config)#firewall contivity
Restart CES for firewall changes to take effect !!
```

8. CES should be restarted in other for the interface filters to be enabled.
   Exit the configuration mode and reboot CES:

```
CES(config)#exit
CES#reload
Reload: Scheduled Shutdown
Reload Explanation:
After Shutdown: RESTART
Disable New Logins: No
Disable Logins after Restart: No
Boot Mode: NORMAL
Config File: latest
Boot Drive: /ide0/

%Proceed with reload? (y/n)y

%Proceeding with reload…
```

Configuring CES2

1. Configure IP addresses for the management (192.168.50.55/24), private (192.168.50.5/24) and public (192.168.30.3/24) interfaces in the same manner they were configured for CES1:

```
- Interface Menu

   0) Slot 0, Port 1, Private LAN
        Management IP Address = 192.168.50.55, ( Subnet Mask = 255.255.255.0 )
        Interface IP Address = 192.168.50.5
        Subnet Mask = 255.255.255.0
        Speed/Duplex = AutoNegotiate

   1) Slot 1, Port 1, Public LAN
        IP Address = 192.168.30.3
        Subnet Mask = 255.255.255.0
        Speed/Duplex = AutoNegotiate

   R) Return to the Main Menu
```

2. Enter configuration mode and add private default route via Alteon2 interface 3 (192.168.50.50) and public default route via Alteon1 interface 3 (192.168.30.30):

```
CES(config)#ip route 192.168.10.0 255.255.255.0 192.168.30.30 ena
CES(config)#ip route 192.168.60.0 255.255.255.0 192.168.50.50 ena
```

Enable interface filters with “permit all” filter applied to all interfaces in the same manner it was done for CES1.

Configuring Alteon1 (dirty side)

Note: configuration has been started from factory default settings.

1. Login to the switch.

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

2. 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
```

Configuring Interfaces

1. Configure interface 1. Set mask (255.255.255.0), address (192.168.10.10) and enable interface:

```
>> Main# /cfg/ip/if 1/mask 255.255.255.0/addr 192.168.10.10/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: 192.168.10.10
Pending new broadcast address:  192.168.10.255
Current status: disabled
New status:     enabled
```

2. Configure interface 2. Set mask (255.255.255.0), address (192.168.20.20) and enable interface:

```
>> IP Interface 1# /cfg/ip/if 2/mask 255.255.255.0/addr 192.168.20.20/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: 192.168.20.20
Pending new broadcast address:  192.168.20.255
Current status: disabled
New status:     enabled
```

3. Configure interface 3. Set mask (255.255.255.0), address (192.168.30.30) and enable interface:

```
>> IP Interface 2# /cfg/ip/if 3/mask 255.255.255.0/addr 192.168.30.30/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: 192.168.30.30
Pending new broadcast address:  192.168.30.255
Current status: disabled
New status:     enabled
```

4. Apply the changes:

```
>> IP Interface 3# apply
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
```

Enabling IP forwarding

Enable IP forwarding between interfaces:

```
>> IP Interface 3# /cfg/ip/frwd/on
Current status: ON
New status:     ON
```

Configuring static routes

1. Define static routes to:
   192.168.40.0/24 network via CES1 public IP (192.168.20.2) using Alteon1 interface 2;
   192.168.50.0/24 network via CES2 public IP (192.168.30.3) using Alteon1 interface 3:

```
>> IPForwarding# /cfg/ip/route/add 192.168.40.0 255.255.255.0 192.168.20.2 2
>> IP Static Route# /cfg/ip/route/add 192.168.50.0 255.255.255.0 192.168.30.3 3
```

2. Apply the changes:

```
>> IP Static Route# apply
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
```

Enabling SLB globally

Enable SLB globally on Alteon1:

```
>> IP Static Route# /cfg/slb/on
Current status: OFF
New status:     ON
```

Configuring real servers

1. Configure and enable Alteon2 interfaces (interface 1 – 192.168.40.40 and interface 2 – 192.168.50.50) as real servers (real 1 and real 2):

```
>> Layer 4# /cfg/slb/real 1/rip 192.168.40.40/ena
Current real server IP address:     0.0.0.0
New pending real server IP address: 192.168.40.40

Warning: server did not respond to ping.
Current status: disabled
New status:     enabled

>> Real server 1 # /cfg/slb/real 2/rip 192.168.50.50/ena
Current real server IP address:     0.0.0.0
New pending real server IP address: 192.168.50.50

Warning: server did not respond to ping.
Current status: disabled
New status:     enabled
```

2. Apply the changes:

```
>> Real server 2 # apply
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
```

Adding real servers to a group

1. Create a group for real servers and add the created real servers to the group:

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

2. Set metric hash:

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

3. Set health to ICMP:

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

Creating filters

1. Create a local access filter (filter 15 in this example) to allow PC access to its local network 192.168.10.0/24.

    a) Enter filter configuration menu:

```
>> Real server group 1# /cfg/slb/filt 15
------------------------------------------------------------
[Filter 15   Menu]
      adv     - Filter Advanced Menu
      name    - Set filter name
      smac    - Set source MAC address
      dmac    - Set destination MAC address
      sip     - Set source IP address
      smask   - Set source IP mask
      dip     - Set destination IP address
      dmask   - Set destination IP mask
      proto   - Set IP protocol
      sport   - Set source TCP/UDP port or range
      dport   - Set destination TCP/UDP port or range
      action  - Set action
      group   - Set real server group for redirection
      rport   - Set real server port for redirection
      nat     - Set which addresses are network address translated
      invert  - Enable/disable filter inversion
      ena     - Enable filter
      dis     - Disable filter
      del     - Delete filter
      cur     - Display current filter configuration
```

b) Set: source IP to any, destination IP to 192.168.10.0 network, destination mask to 255.255.255.0:

```
>> Filter 15  # sip any/dip 192.168.10.0/dmask 255.255.255.0
Current source address:     any
New pending source address: any
Current destination address:     any
New pending destination address: 192.168.10.0
Current destination mask:     0.0.0.0
New pending destination mask: 255.255.255.0
```

c) Set action to allow and enable the filter:

```
>> Filter 15  # action allow/ena
Current action: allow
Pending new action:     allow
Current status: disabled
New status:     enabled
```

2. Create a redirection filter (filter 20) to redirect any other traffic to firewalls.

a) Enter filter 20 configuration menu:

```
>> Filter 15 # /cfg/slb/filt 20
------------------------------------------------------------
[Filter 20   Menu]
      adv     - Filter Advanced Menu
      name    - Set filter name
      smac    - Set source MAC address
      dmac    - Set destination MAC address
      sip     - Set source IP address
      smask   - Set source IP mask
      dip     - Set destination IP address
      dmask   - Set destination IP mask
      proto   - Set IP protocol
      sport   - Set source TCP/UDP port or range
      dport   - Set destination TCP/UDP port or range
      action  - Set action
      group   - Set real server group for redirection
      rport   - Set real server port for redirection
      nat     - Set which addresses are network address translated
      invert  - Enable/disable filter inversion
      ena     - Enable filter
      dis     - Disable filter
      del     - Delete filter
      cur     - Display current filter configuration
```

b) Set: Source IP to any, Destination IP to any, set action to redirection and enable the filter:

```
>> Filter 20  # sip any/dip any/action redir/ena
Current source address:     any
New pending source address: any
Current destination address:     any
New pending destination address: any
Current action: allow
Pending new action:     redir
Current status: disabled
New status:     enabled
```

c) Enter advanced filter configuration mode and enable firewall load balancing hashing method:

```
>> Filter 20  # adv/fwlb ena
Current FWLB hash method: disabled
New FWLB hash method:     enabled
```

3. Apply the changes:

```
>> Filter 20  # apply
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
```

Applying filters to ports

1. Apply the created filters (filter 15 and filter 20) to the client's ingress port, in this configuration PC is connected to Alteon1 port 1, so both filters are applied to SLB port 1.
   Enter SLB port 1 configuration menu, add filter 15 and 20 and enable filtering on this port:

```
>> Filter 20  # /cfg/slb/port 1/add 15/add 20/filt ena
Filter 15 added to port 1.
Filter 20 added to port 1.
Current port 1 filtering: disabled
New port 1 filtering:     enabled
```

2. Apply the changes and save the configuration:

```
>> SLB port 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.
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.
```

Configuring Alteon2 (clean side)

Note: configuration has been started from factory default settings.

1. Login to the switch.

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

2. 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
```

Configuring interfaces

1. Configure and enable interface 1 (192.168.40.40/24), interface 2 (192.168.50.50/24) and interface 3 (192.168.60.60/24):

```
>> Main# /cfg/ip/if 1/mask 255.255.255.0/addr 192.168.40.40/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: 192.168.40.40
Pending new broadcast address:  192.168.40.255
Current status: disabled
New status:     enabled

>> IP Interface 1# /cfg/ip/if 2/mask 255.255.255.0/addr 192.168.50.50/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: 192.168.50.50
Pending new broadcast address:  192.168.50.255
Current status: disabled
New status:     enabled

>> IP Interface 2# /cfg/ip/if 3/mask 255.255.255.0/addr 192.168.60.60/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: 192.168.60.60
Pending new broadcast address:  192.168.60.255
Current status: disabled
New status:     enabled
```

2. Apply the changes:

```
>> IP Interface 3# apply
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
```

Enabling IP forwarding
Enable IP forwarding between interfaces:

```
>> IP Interface 3# /cfg/ip/frwd/on
Current status: ON
New status:     ON
```

Creating static routes

1. Define static routes to:
   192.168.20.0/24 network via CES1 private IP (192.168.40.4) using Alteon2 interface 1;
   192.168.30.0/24 network via CES2 private IP (192.168.50.5) using Alteon2 interface 2:

```
>> IP Forwarding# /cfg/ip/route/add 192.168.20.0 255.255.255.0 192.168.40.4 1
>> IP Static Route# /cfg/ip/route/add 192.168.30.0 255.255.255.0 192.168.50.5 2
```

2. Apply the changes:

```
>> IP Static Route# apply
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
```

Enabling SLB globally
Enable SLB globally on Alteon2:

```
>> IP Static Route# /cfg/slb/on
Current status: OFF
New status:     ON
```

Configuring real servers
Configure and enable Alteon1 interface 2 (192.168.20.20) and interface 3 (192.168.30.30) as real servers 1 and 2:

```
>> Layer 4# /cfg/slb/real 1/rip 192.168.20.20/ena
Current real server IP address:     0.0.0.0
New pending real server IP address: 192.168.20.20

Warning: server did not respond to ping.
Current status: disabled
New status:     enabled
```

```
>> Real server 1 # /cfg/slb/real 2/rip 192.168.30.30/ena
Current real server IP address:     0.0.0.0
New pending real server IP address: 192.168.30.30

Warning: server did not respond to ping.
Current status: disabled
New status:     enabled
```

Adding real servers to a group

1. Create a real server group and add real server 1 and 2 to the group:

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

2. Set metric for the group to hash and set health to ICMP:

```
>> Real server group 1# metric hash/health icmp
Current metric:         leastconns
New pending metric:     hash
Current health check type:      tcp
New pending health check type:  icmp
```

3. Apply the changes:

```
>> Real server group 1# apply
------------------------------------------------------------------
Apply complete; don't forget to "save" updated configuration.
```

Creating filters

1. Create a local access filter (filter 15 in this example) to allow Server to have access to its local network 192.168.60.0/24:

```
>> Real server group 1# /cfg/slb/filt 15/sip any/dip 192.168.60.0/dmask
255.255.255.0/action allow/ena
Current source address:     any
New pending source address: any
Current destination address:     any
New pending destination address: 192.168.60.0
Current destination mask:     0.0.0.0
New pending destination mask: 255.255.255.0
Current action: allow
Pending new action:     allow
Current status: disabled
New status:     enabled
```

2. Create a filter (filter 20) to redirect all the other traffic to firewalls:

```
>> Filter 15  # /cfg/slb/filt 20/sip any/dip any/action redir/ena
Current source address:     any
New pending source address: any
Current destination address:     any
New pending destination address: any
Current action: allow
Pending new action:     redir
Current status: disabled
New status:     enabled
```

3. Enter advanced filter configuration mode and enable firewall hashing method:

```
>> Filter 20  # adv/fwlb ena
Current FWLB hash method: disabled
New FWLB hash method:     enabled
```

Applying filters to ports

1. In this configuration server on the clean side is connected to port 1, so created filters should be assigned to port 1.
   Enter SLB port 1 configuration mode, add the create filter 15 and 20 to the port and enable filtering on this interface:

```
>> Filter 20 Advanced# /cfg/slb/port 1/add 15/add 20/filt ena
Filter 15 added to port 1.
Filter 20 added to port 1.
Current port 1 filtering: disabled
New port 1 filtering:     enabled
```

2. Apply and save the changes:

```
>> SLB port 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.
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.
```

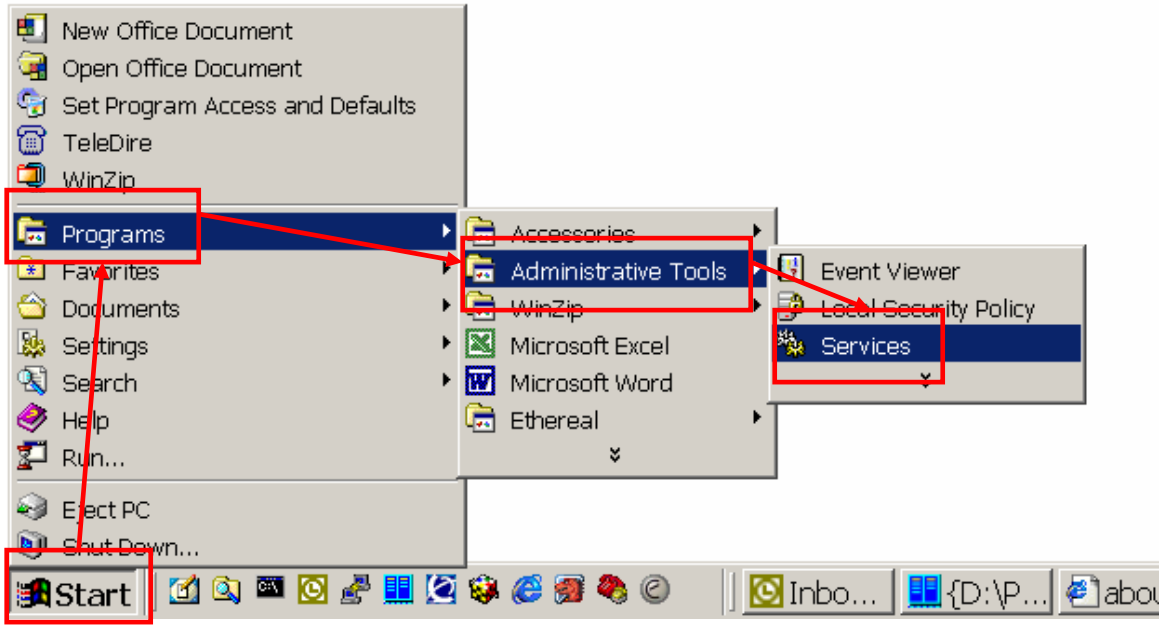
Configuring Server

1. Configure IP address on Server with a default gateway pointing to Alteon2 interface 3 (192.168.60.60):

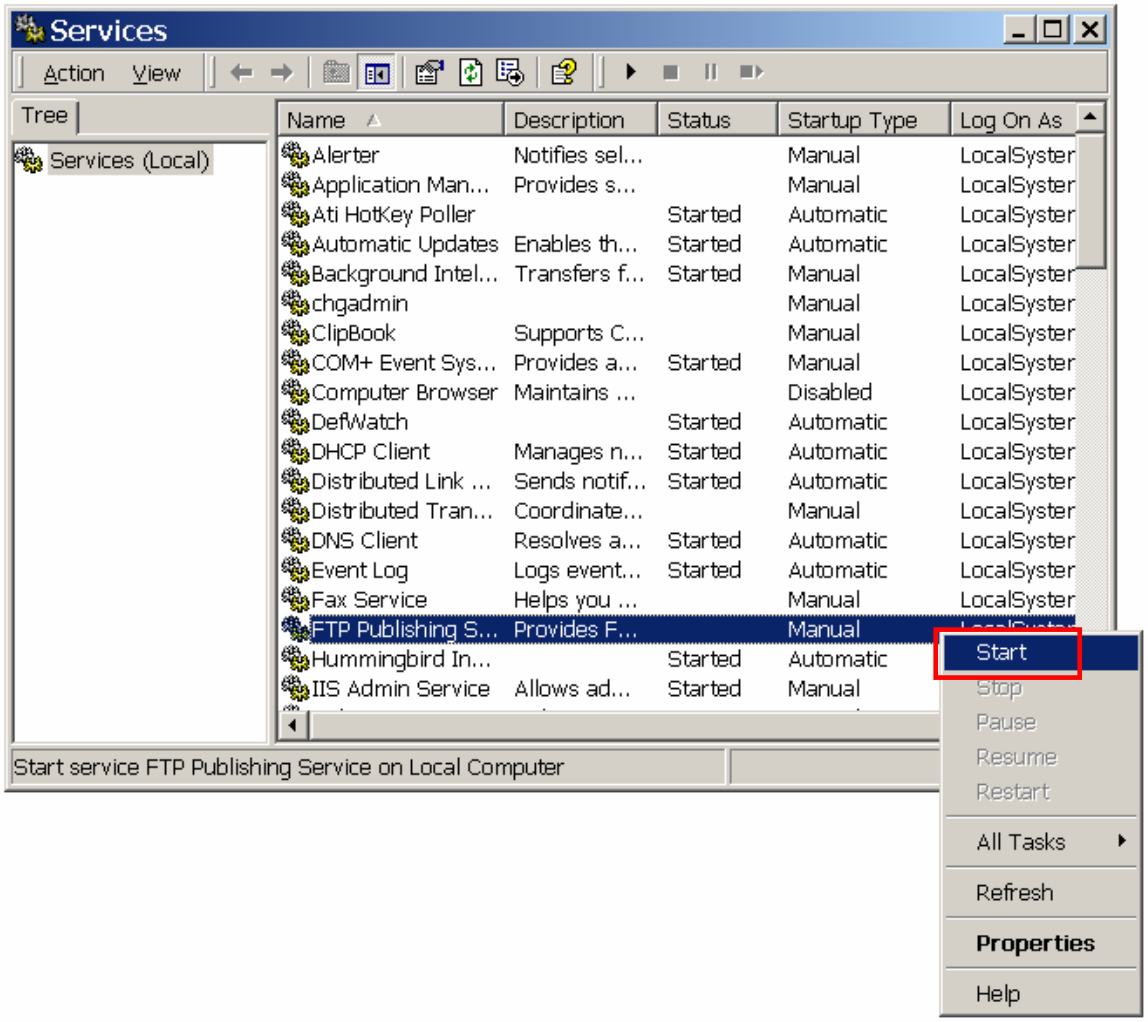
```
C:\>ipconfig
Windows 2000 IP Configuration
Ethernet adapter Local Area Connection:

        Connection-specific DNS Suffix  . :
        IP Address. . . . . . . . . . . . : 192.168.60.6
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.60.60
```

2. Enable FTP service on PC1.

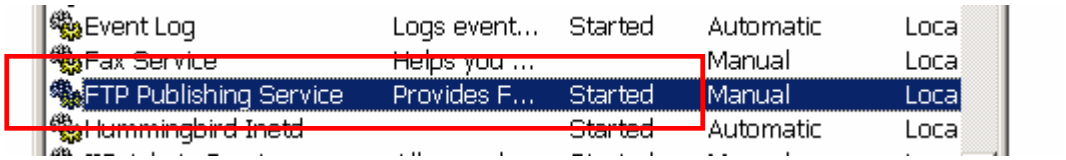
   a) Navigate **Start→Programs→Administrative tools→Services**:



b) The **Services** window appears. Scroll down to the **FTP** and right click on it.
c) A menu appears. Select **Start**:



3. FTP service is started:



Testing the configuration

1. Initiate an FTP session from PC (192.168.10.75) to Server (192.168.60.6), provide appropriate credentials:

```
C:\>ftp 192.168.60.6
Connected to 192.168.60.6.
220 KRISTISE-1 Microsoft FTP Service (Version 5.0).
User (192.168.60.6:(none)): ftp
331 Anonymous access allowed, send identity (e-mail name) as password.
Password:
230 Anonymous user logged in.
ftp>
```

2. Check session table on Alteon1, FTP session was sent to CES1, note the redirected traffic to Alteon2 interface 1 (192.168.40.40):

```
>> Session Table Information# /info/slb/sess/dump
 2,1:  192.168.10.1 1035, 192.168.60.6 21 -> 192.168.40.40 21  age 10  E
```

3. Check session table on Alteon2. The returned traffic has been redirected back through the same firewall (CES1) as Alteon1 interface 2 (192.168.20.20) was used for redirection:

```
>> Session Table Information# /info/slb/sess/dump
 3,1:  192.168.60.6 21, 192.168.10.1 1036 -> 192.168.20.20 1036  age 10  E
```

4. While FTP'd, disconnect the cable between CES1 and Alteon1.

5. Issue a **`dir`** command in the FTP session.

6. Check the session table on both Alteon1 switch. Session has been balanced to CES2. Note the redirected traffic to 192.168.50.50 (Alteon2 interface 2):

```
>> Session Table Information# /info/slb/sess/dump
 1,2:  192.168.10.1 2339, 192.168.60.65 21 -> 192.168.50.50 21  age 10  E
```

7. Check the session table on Alteon2. Traffic back to the client PC has been redirected through the same CES2:

```
>> Session Table Information# /info/slb/sess/dump
 6,2:  192.168.60.65 21, 192.168.10.1 2339 -> 192.168.30.30 2339  age 10  E
```

Appendix A. Alteon1 (dirty side) configuration file

```
script start "Alteon AD3" 4  /**** DO NOT EDIT THIS LINE!
/* Configuration dump taken 16:52:10 Tue May 25, 2004
/* Version 10.0.30.7,  Base MAC address 00:60:cf:46:52:80
/c/sys
        idle 60
/c/ip/if 1
        ena
        addr 192.168.10.10
/c/ip/if 2
        ena
        addr 192.168.20.20
/c/ip/if 3
        ena
        addr 192.168.30.30
/c/ip/route
        add 192.168.40.0 255.255.255.0 192.168.20.2 2
        add 192.168.50.0 255.255.255.0 192.168.30.3 3
/c/slb
        on
/c/slb/real 1
        ena
        rip 192.168.40.40
/c/slb/real 2
        ena
        rip 192.168.50.50
/c/slb/group 1
        metric hash
        health icmp
        add 1
        add 2
/c/slb/filt 15
        ena
        action allow
        dip 192.168.10.0
        dmask 255.255.255.0
/c/slb/filt 20
        ena
        action redir
/c/slb/filt 20/adv
        fwlb ena
/c/slb/port 1
        filt ena
        add 15
        add 20
/
script end  /**** DO NOT EDIT THIS LINE!
```

Appendix B. Alteon2 (clean side) configuration file

```
script start "Alteon AD3" 4  /**** DO NOT EDIT THIS LINE!
/* Configuration dump taken 16:50:34 Tue May 25, 2004
/* Version 10.0.30.7,  Base MAC address 00:60:cf:46:53:60
/c/sys
        idle 60
/c/ip/if 1
        ena
        addr 192.168.40.40
/c/ip/if 2
        ena
        addr 192.168.50.50
/c/ip/if 3
        ena
        addr 192.168.60.60
/c/ip/route
        add 192.168.20.0 255.255.255.0 192.168.40.4 1
        add 192.168.30.0 255.255.255.0 192.168.50.5 2
/c/slb
        on
/c/slb/real 1
        ena
        rip 192.168.20.20
/c/slb/real 2
        ena
        rip 192.168.30.30
/c/slb/group 1
        metric hash
        health icmp
        add 1
        add 2
/c/slb/filt 15
        ena
        action allow
        dip 192.168.60.0
        dmask 255.255.255.0
/c/slb/filt 20
        ena
        action redir
/c/slb/filt 20/adv
        fwlb ena
/c/slb/port 1
        filt ena
        add 15
        add 20
/
script end  /**** DO NOT EDIT THIS LINE!
```

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If after following this guide you are still having problems, please ensure you have carried out the steps exactly as in this document. If problems still persist, please contact Nortel Networks Technical Support (contact information is available online at: http://www.nortel.com/cgi-bin/comments/comments.cgi?key=techsupport_cu).

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