



**IBM @server BladeCenter Nortel
GbESM Creating VLANs Lab Guide**

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Preface

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Lab: GbESM Training Lab Guide

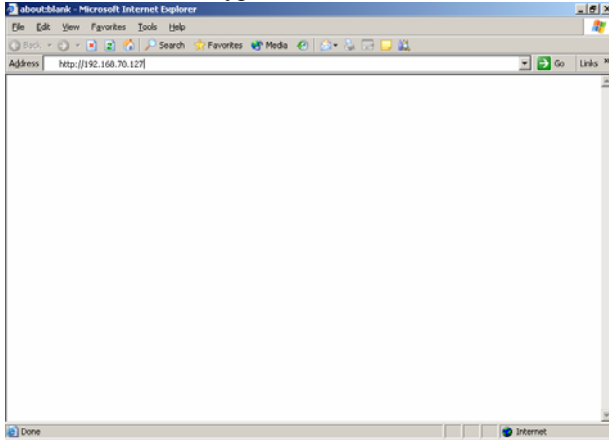
Time Required: 45 minutes

Scenario

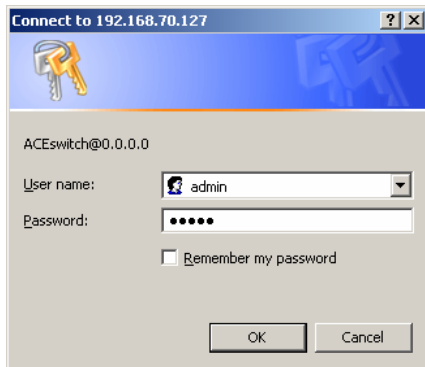
Introduction to the Browser Based Interface (BBI) and Command Line Interface (CLI)



Configure Basic Switch Options

- ___ 1. Open Internet Explorer.
- ___ 2. In the address area, type: **http://192.168.70.127**.



- ___ 3. Enter **admin** as the user name and **admin** as the password.



- ___ 4. Click **OK**.
- ___ 5. Click Configure. 
- ___ 6. In the left frame, Click the folder icon next to **Nortel Networks Layer 2-7 GbE Switch Module**
- ___ 7. Click the folder icon next to Switch.
- ___ 8. Click the "A" icon next to "General". 

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- ___ 9. In the right frame, scroll down to the Current Date field. Enter the current date.
- ___ 10. Enter the correct local time in the Current Time field.

Current Date	01/01/2070
Current Time	05:05:30

- ___ 11. In the Banner field enter a log on message, for example "**xSeries Education BladeCenter with Nortel Switches Training**".
- ___ 12. Scroll to the bottom of the right frame and Click **Submit**.
- ___ 13. Click the **Diff Flash** icon to display the pending changes.
- ___ 14. In the upper frame, or banner frame, click the **Apply** icon.
- ___ 15. Click the **Save** icon.
- ___ 16. Close the Internet Explorer Window.

Start a telnet session

- ___ 17. Start → Run, Type **cmd** and press **Enter**. This opens a Command Prompt window.
- ___ 18. Type **telnet 192.168.70.127**
- ___ 19. Enter **admin** as the password
- ___ 20. Note the banner that you entered.

```

c:\ Telnet 192.168.70.127
Hardware Revision: 0
PLD Firmware Version: 3.5
Temperature Sensor 1 (Warning): 39.5 C (Warn at 75.0 C/Recover at 70.0 C)
Temperature Sensor 2 (Shutdown): 40.0 C (Warn at 90.0 C/Recover at 80.0 C)
xSeries Education BladeCenter with Nortel Switches Training
[Main Menu]
Jan 1 5:05:11 NOTICE mgmt: admin login from host 192.168.70.100 info
- Information Menu
  stats - Statistics Menu
  cfg - Configuration Menu
  oper - Operations Command Menu
  boot - Boot Options Menu
  maint - Maintenance Menu
  diff - Show pending config changes [global command]
  apply - Apply pending config changes [global command]
  save - Save updated config to FLASH [global command]
  revert - Revert pending or applied changes [global command]
  exit - Exit [global command, always available]
>> Main#
    
```

- ___ 21. Type **/cfg**. This takes you to the configuration menu

```

c:\ Telnet 192.168.70.127
cfg - Configuration Menu
oper - Operations Command Menu
boot - Boot Options Menu
maint - Maintenance Menu
diff - Show pending config changes [global command]
apply - Apply pending config changes [global command]
save - Save updated config to FLASH [global command]
revert - Revert pending or applied changes [global command]
exit - Exit [global command, always available]
>> Main# /cfg
-----
[Configuration Menu]
  sys - System-wide Parameter Menu
  port - Port Menu
  pmirr - Port Mirroring Menu
  l2 - Layer 2 Menu
  l3 - Layer 3 Menu
  slb - Server Load Balancing (Layer 4-7) Menu
  setup - Step by step configuration set up
  dump - Dump current configuration to script file
  ptcfg - Backup current configuration to tftp server
  gtcfg - Restore current configuration from tftp server
>> Configuration#
    
```

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- ___ 22. Type **sys**. This takes you to the, system-wide parameter submenu.
- ___ 23. Type **user** to enter the User Access Control Menu
- ___ 24. Type **opw** to set the operator password.
- ___ 25. First, you must enter the current administrator password. Type **admin**, press **Enter**.
- ___ 26. Type **PASSWORD** and press Enter to set the Operator password.
- ___ 27. Re-type the new password and press **Enter**.
- ___ 28. Type **/** and press **Enter** to return to the Main menu.
- ___ 29. Type **Apply** to apply the change you just made.
- ___ 30. Type **Save** to save the configuration.
- ___ 31. Confirm saving to Flash by typing **y** and pressing **Enter**.

This completes this section of the lab.

Layer 2 and Layer 3 configuration

VLAN Configuration (Layer 2)

Configure a VLAN for the Server Ports (INT1-INT14)

1. Type **/cfg** and press **Enter**. This takes you to the Configuration Menu.

```

c:\ Telnet 192.168.70.127
cfg      - Configuration Menu
oper     - Operations Command Menu
boot     - Boot Options Menu
maint    - Maintenance Menu
diff     - Show pending config changes [global command]
apply    - Apply pending config changes [global command]
save     - Save updated config to FLASH [global command]
revert   - Revert pending or applied changes [global command]
exit     - Exit [global command, always available]

>> Main# /cfg
-----
[Configuration Menu]
sys      - System-wide Parameter Menu
port     - Port Menu
pmirr    - Port Mirroring Menu
12       - Layer 2 Menu
13       - Layer 3 Menu
slb      - Server Load Balancing (Layer 4-7) Menu
setup    - Step by step configuration set up
dump     - Dump current configuration to script file
ptcfg    - Backup current configuration to tftp server
gtcfg    - Restore current configuration from tftp server

>> Configuration# _
    
```

2. Type **12** and press **Enter**. This takes you to the Level 2 Menu.
3. Type **vlan** and press **Enter**. This takes you to the VLAN Menu.

```

c:\ Telnet 192.168.70.127
>> Main# /cfg
-----
[Configuration Menu]
sys      - System-wide Parameter Menu
port     - Port Menu
pmirr    - Port Mirroring Menu
12       - Layer 2 Menu
13       - Layer 3 Menu
slb      - Server Load Balancing (Layer 4-7) Menu
setup    - Step by step configuration set up
dump     - Dump current configuration to script file
ptcfg    - Backup current configuration to tftp server
gtcfg    - Restore current configuration from tftp server

>> Configuration# 12
-----
[Layer 2 Menu]
stg      - Spanning Tree Menu
trunk    - Trunk Group Menu
vlan     - VLAN Menu
cur      - Display current layer 2 parameters

>> Layer 2# vlan
Enter VLAN number: (1-4095)
    
```

4. Enter a VLAN number. “25” was used to create this document.
5. Type **ena** and press **Enter**. This sets the new status of VLAN 25 to “enabled.”
6. **Type add int1** and press **Enter**. This adds Internal Port 1 to VLAN 25. Internal Port 1 is associated with blade server bay one.
7. We have to confirm this change by pressing **y** and then **Enter**.

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```

Telnet 192.168.70.127
>> Layer 2# vlan
Enter VLAN number: <1-4095> 25
VLAN number 25 with name "VLAN 25" created.
-----
[VLAN 25 Menu]
name      - Set VLAN name
stg       - Assign VLAN to a Spanning Tree Group
add       - Add port to VLAN
rem       - Remove port from VLAN
def       - Define VLAN as list of ports
jumbo     - Enable/disable Jumbo Frame support
ena       - Enable VLAN
dis       - Disable VLAN
del       - Delete VLAN
cur       - Display current VLAN configuration

>> VLAN 25# ena
Current status: disabled
New status:    enabled

>> VLAN 25# add int1
Port INT1 is an UNTAGGED port and its current PVID is 1.
Confirm changing PVID from 1 to 25 [y/n]: y
    
```

8. Type **add int2** and press **Enter**. This adds Internal Port 2 to VLAN 25. Internal Port 2 is associated with blade server bay one.

9. We have to confirm this change by pressing **y** and then **Enter**.

```

Telnet 192.168.70.127
rem       - Remove port from VLAN
def       - Define VLAN as list of ports
jumbo     - Enable/disable Jumbo Frame support
ena       - Enable VLAN
dis       - Disable VLAN
del       - Delete VLAN
cur       - Display current VLAN configuration

>> VLAN 25# ena
Current status: disabled
New status:    enabled

>> VLAN 25# add int1
Port INT1 is an UNTAGGED port and its current PVID is 1.
Confirm changing PVID from 1 to 25 [y/n]: y
Current ports for VLAN 25:    empty
Pending new ports for VLAN 25: INT1

>> VLAN 25# add int2
Port INT2 is an UNTAGGED port and its current PVID is 1.
Confirm changing PVID from 1 to 25 [y/n]: y
Current ports for VLAN 25:    empty
Pending new ports for VLAN 25: INT1 INT2

>> VLAN 25#
    
```

10. We can add more than one port at a time. To do this, we use a different command. Type **def int3 int4 int5** and press **Enter**. The **def** command defines a list of ports that are to be added to the VLAN.

11. Press **y** and **Enter** to accept the change for each newly added port.

12. Create and configure a VLAN for the Client Ports (EXT1-EXT4) using the **def** command. Type **/cfg/12/vlan 30/ena/def ext1 ext2 ext3 ext4**

```

Telnet 192.168.70.127
jumbo     - Enable/disable Jumbo Frame support
ena       - Enable VLAN
dis       - Disable VLAN
del       - Delete VLAN
cur       - Display current VLAN configuration

>> VLAN 25# ena
Current status: disabled
New status:    enabled

>> VLAN 25# add int1
Port INT1 is an UNTAGGED port and its current PVID is 1.
Confirm changing PVID from 1 to 25 [y/n]: y
Current ports for VLAN 25:    empty
Pending new ports for VLAN 25: INT1

>> VLAN 25# add int2
Port INT2 is an UNTAGGED port and its current PVID is 1.
Confirm changing PVID from 1 to 25 [y/n]: y
Current ports for VLAN 25:    empty
Pending new ports for VLAN 25: INT1 INT2

>> VLAN 25# def int3 int4 int5
Port INT3 is an UNTAGGED port and its current PVID is 1.
Confirm changing PVID from 1 to 25 [y/n]: y
    
```


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 ____ 13. What does the `/cfg/l2/vlan 30/ena/def ext1 ext2 ext3 ext4` command do?

This Command	Performs this action
/	
Cfg	
l2	
vlan 30	
Ena	
Def	
ext1 ext2 ext3 ext4	

____ 14. Verify by viewing the typing `/info/l2/vlan` command. This takes you to the Information Menu, Level 2 Menu and shows the VLANs that have been created.

Note:	VLAN 4095 is configured by default. This is the Management Module VLAN and ports can not be added to or removed from it.
--------------	--

This completes this section of the lab.

IP Interface Configuration (Layer 3)

- ___ 1. Configure an IP interface for each VLAN, and associate each interface with the appropriate VLAN. Refer to **Appendix A** for the IP address assignments for your GbESM.
- ___ 2. Enable and configure the proper configuration settings for subnet mask, broadcast, address, and associated VLAN for this interface by typing the following series of commands:
- ___ 3. Type **/cfg** This takes you to the Main Menu and then to the Configuration Menu.
- ___ 4. Type **13** This takes you to the Layer 3 Menu.
- ___ 5. Type **ip** This takes you to the IP Menu.
- ___ 6. Type **if 25** This takes you to the Interface 25 Menu.

Note:	We used the number 25 here because it was the same as the VLAN that was going to be associated with this interface. You could use another number, but matching it to the VLAN simplifies the configuration.
--------------	---

- ___ 7. Configure the IP Address for the interface by typing **addr 9.1.1.1**
- ___ 8. Configure the subnet mask by typing mask **255.255.255.0**
- ___ 9. Set the VLAN for this interface by typing **vlan 25**

Note:	We used the number 25 here because it is the number of the VLAN that we created for this interface.
--------------	---

- ___ 10. Enable this interface by typing **ena**

Note:	Please be sure to associate the external VLAN with the external Interface, and the Internal VLAN with the Internal Interface. Refer to Appendix A for further details.
--------------	--

- ___ 11. Ensure that IP forwarding is enabled by typing the following command: **/cfg/13/ip/frwd on**

Note:	Best practice is to have the instance number for the interface be equal to the VLAN number where possible. Interfaces can only be numbered up to 128
--------------	--

- ___ 12. Create an internal interface for the external ports by typing the following series of commands: **/cfg/13/ip/if 30 then proceed to step 17**. If you prefer, you can enter each command individually as follows:
- ___ 13. **/cfg** This takes you to the Main Menu and then to the Configuration Menu.
- ___ 14. **13** This takes you to the Layer 3 Menu.
- ___ 15. **ip** This takes you to the IP Menu.
- ___ 16. **if 30** This takes you to the Interface 25 Menu.

Note:	We used the number 30 here because it was the same as the VLAN that was going to be associated with this interface. You could use another number, but matching it to the VLAN simplifies the configuration.
--------------	---

- ___ 17. Enable this interface by typing **ena**
- ___ 18. Ensure that both interfaces are enabled by using the following command: **/info/13/ip**

Note:	Interface 128 is also enabled and configured – this is done by the Management Module and Interface 128 is attached to the management VLAN (4095).
--------------	---

Verify functionality of the internal interface by pinging a server.

- ____ 19. From the management workstation, ping 9.1.1.10 (This is the IP Address of one the Blade Servers in your chassis. If this ping is successful, please proceed to the Configure Trunking (Advanced Layer 2) section.

This completes this section of the lab.

Configure Trunking (Advanced Layer 2)

- Configure External Ports 1-2 as a trunk.
- Create a trunk group using and assign ports EXT1 and EXT2 to the group.
- Ensure that the group is enabled.

1. Type `/cfg/12/trunk 1` This takes you to the Configuration Menu, Level 2 Menu, Trunk
2. Type `add ext1` This adds external port 1 to trunk 1
3. Type `add ext2` This adds external port 2 to trunk 1
4. Type `ena` This enables Trunk 1
5. Ensure that both trunk ports are members of the appropriate VLAN by typing `/info/port`

Alias	Port	Tag	RMON	PVID	NAME	VLAN(s)
INT1	1	n	d	25	INT1	25
INT2	2	n	d	25	INT2	25
INT3	3	n	d	1	INT3	1
INT4	4	n	d	1	INT4	1
INT5	5	n	d	1	INT5	1
INT6	6	n	d	1	INT6	1
INT7	7	n	d	1	INT7	1
INT8	8	n	d	1	INT8	1
INT9	9	n	d	1	INT9	1
INT10	10	n	d	1	INT10	1
INT11	11	n	d	1	INT11	1
INT12	12	n	d	1	INT12	1
INT13	13	n	d	1	INT13	1
INT14	14	n	d	1	INT14	1
MGT1	15	n	d	4095	MGT1	4095
MGT2	16	n	d	4095	MGT2	4095
EXT1	17	n	d	30	EXT1	30
EXT2	18	n	d	30	EXT2	30
EXT3	19	n	d	30	EXT3	30
EXT4	20	n	d	30	EXT4	30

6. Physically connect the cables to the gateway if this is not already done.
7. Verify that the trunk is up and functioning by checking using the following commands:
8. Type `/info/12/trunk`, This shows the trunking information.
9. Type `/info/link` This shows the link information.
10. Type `/info/13/ip`. This shows the IP information.
11. Type `exit` to close the session.

Verifying the trunking information:

1. Ping the external IP address of the VLAN 30 (10.10.1.1) using the following command. `ping 10.10.1.1 -t`
2. Physically disconnect the Ethernet Cable from Port 1 of the GbESM and the ping should continue since Port 2 is still active.
3. Reconnect the cable to Port 1 and remove the cable from Port 2 of the GbESM. The ping test maybe interrupted while the trunked ports re-sync.

Once you have verified that both ports 1 and 2 respond to the same IP address we have successfully:

- Created a VLAN for the Internal Ports
- Created a VLAN for the External Ports
- Assigned IP Addresses for the VLANs
- Enabled Trunking for Ports 1 and 2.

This completes this section of the lab.

Optional GbESM Training Lab Guide

Time Required: 10 minutes

Scenario

Deny all traffic other than legitimate VIP Services and Management Connectivity

NOTE: Some of these functions are inherent to the switch, and are otherwise either unnecessary or configurable via alternate “out-of-the-box” services, however this lab is intended to serve as hands-on training to familiarize the student with the basics of Access List Filtering.

Filtering

___ 1. Create allow filters for each VIP service by entering the following sequence of commands:

Type this command:	The command does:		
<code>/cfg</code>	Takes you to the main menu and then the Configuration Menu		
<code>slb</code>	Takes you to the Server Load Balancing (Layer 4-7) Menu		
<code>filt 10</code>	Takes you to the Filter 10 Menu		
<code>dip 9.1.1.10</code>	Enters the IP Address of the Destination Server. <table border="1" style="margin-left: 20px;"> <tr> <td>Note:</td> <td>This needs to be the IP Address of one of the Blade Servers in the Chassis.</td> </tr> </table>	Note:	This needs to be the IP Address of one of the Blade Servers in the Chassis.
Note:	This needs to be the IP Address of one of the Blade Servers in the Chassis.		
<code>dmask 255.255.255.25</code>	Enters the Subnet Mask of the Destination Server.		
<code>proto tcp</code>	Enters the protocol to be filtered.		
<code>action allow</code>	Sets the action that the filter will have.		
<code>dport 80</code>	Sets the Destination Port that the filter will affect. Here http traffic will be affected.		
<code>Ena</code>	Enables the filter.		
This series of commands could be entered as a single command by typing: <code>/cfg/slbfilt 10/dip 9.1.1.10/dmask 255.255.255.0/action allow/proto tcp/dport 23/ena</code>			

___ 2. Type apply

___ 3. Type save and confirm the changes by typing y.

___ 4. Create allow filter for telnet access by typing the following command:

`/cfg/slbfilt 20/dip 9.1.1.10/dmask 255.255.255.0/action allow/proto tcp/dport 23/ena`

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 If any part of the previous command is not clear, please contact your instructor for clarification.

We created filter 20, could another number be used here? _____

___ 5. Create an allow filter for gateway health checks (for interface 9.1.1.10 and z.z.z.z using PING for health checks) by entering the following command (see your instructor for ip address z.z.z.z):

Type this command:	The command does:		
/cfg	Takes you to the main menu and then the Configuration Menu		
slb	Takes you to the Server Load Balancing (Layer 4-7) Menu		
filt 30	Takes you to the Filter 30 Menu		
dip 9.1.1.10	Enters the IP Address of the Destination Server. <table border="1" style="width: 100%;"> <tr> <td style="width: 10%;">Note:</td> <td>This needs to be the IP Address of one of the Blade Servers in the Chassis.</td> </tr> </table>	Note:	This needs to be the IP Address of one of the Blade Servers in the Chassis.
Note:	This needs to be the IP Address of one of the Blade Servers in the Chassis.		
dmask 255.255.255.25	Enters the Subnet Mask of the Destination Server.		
sip	Enters the source IP Address.		
smask	Enters the subnet mask of the Source Server.		
proto	Sets the protocol that the filter will affect. Here icmp traffic will be affected.		
Ena	Enables the filter.		
This series of commands could be entered as a single command by typing: /cfg/slbfilt 30/dip 9.1.1.10/dmask 255.255.255.255/sip z.z.z.z/smask 255.255.255.255/proto icmp/ena			

___ 6. Create a “deny all” filter for the remainder of traffic by entering the following command:

/cfg/slbfilt 40/ena/action deny

If any part of the previous command is not clear, please contact your instructor for clarification.

___ 7. Assign the filters to the client ports by entering the following series of commands:

___ 8. Type **/cfg/sbl/port ext1/add 10**

___ 9. Type **add 20**

___ 10. Type **add 30**

___ 11. Type **add 40**

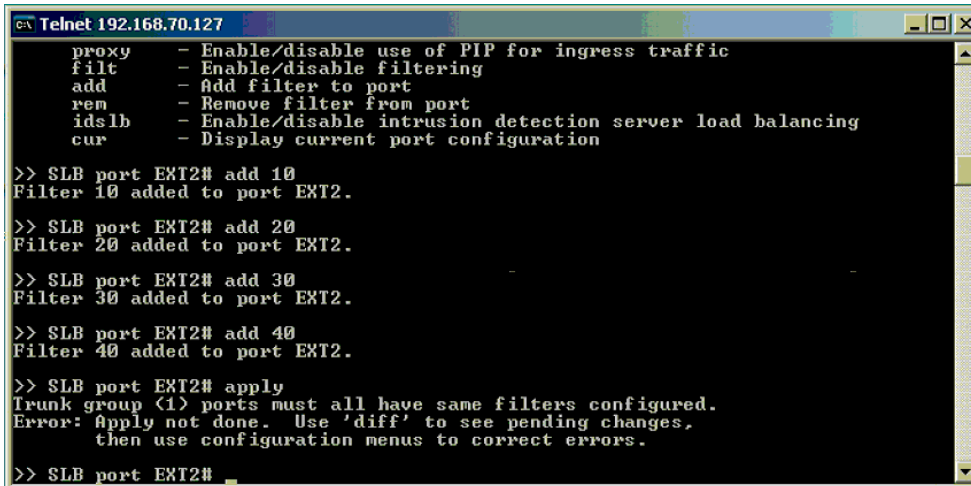
___ 12. Type **fil** and type **e** to enable these filters on the external port 1.

___ 13. Since external ports 1 and 2 are part of the same trunking group, port 2 must be configured exactly as port 1 by entering the following commands:

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- ___ 14. Type `/cfg/sbl/port ext2/add 10`
- ___ 15. Type `add 20`
- ___ 16. Type `add 30`
- ___ 17. Type `add 40`
- ___ 18. Type `apply` to apply the changes.

The interface indicates that the Apply was not done. The configuration of external port 1 is not the same as external port 2.



```

Telnet 192.168.70.127
proxy - Enable/disable use of PIP for ingress traffic
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

>> SLB port EXT2# add 10
Filter 10 added to port EXT2.

>> SLB port EXT2# add 20
Filter 20 added to port EXT2.

>> SLB port EXT2# add 30
Filter 30 added to port EXT2.

>> SLB port EXT2# add 40
Filter 40 added to port EXT2.

>> SLB port EXT2# apply
Trunk group (1) ports must all have same filters configured.
Error: apply not done. Use 'diff' to see pending changes,
      then use configuration menus to correct errors.

>> SLB port EXT2#
    
```

- ___ 19. Use the diff command to see the pending changes. Type `diff`.
- ___ 20. Notice that the filter for external port 1 is enabled (filt ena) and the filter for external port 2 is disabled (filt dis).
- ___ 21. Enable filtering on external port 2 by typing `filt` and `e` to enable the filters.

Notes:	The filter numbers (10, 20...) are arbitrary but filters are applied in sequence. It is good practice to leave space between the numbers you use to make it easier to add additional filters later on. Once a filter is matched the specified action is taken and no further filters are checked for the current packet.
---------------	--

This lab is complete.

Answers to questions

From page 9.

This command	Performs this action
/	Returns to the Main Menu
cfg	Takes you to the Configuration Menu
l2	Takes you to the Level 2 Menu
vlan 30	Creates a VLAN named "VLAN 30"
ena	Enables the VLAN that you just created.
def	Defines a list of ports that will be added to the VLAN
ext1 ext2 ext3 ext4	Adds External Ports 1 through 4 to the VLAN.

From page 14.

We created filter 20, could another number be used here? _____ YES _____