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# Chapter 3

## Basic Switch Configuration

This chapter describes how to configure your Accelar switch as a layer 2 or layer 3 routing switch with routing protocols configured and enabled. After configuring system identification and security, you must configure the Accelar routing switch with respect to its layer 2 (bridging/switching) and layer 3 (routing) functionality.

This chapter discusses how to configure the Accelar routing switch in the following ways:

- Layer 2-only switch
- Layer 3 switch
  - A port-based virtual LAN (VLAN) and an isolated routing port using Routing Information Protocol (RIP)
  - A port-based virtual LAN (VLAN) and an isolated routing port using Open Shortest Path First (OSPF)

For information on more advanced configuration topics, including the following, refer to the software manuals for the Accelar routing switches:

- Protocol-based VLANs
- Route redistribution
- IEEE 802.1q tagging
- Proxy ARP
- DHCP relay
- IGMP snooping
- Multiple spanning tree groups
- Other advanced topics

The software manuals for the Accelar routing switches are as follows:

- *Reference for the Accelar Management Software*
- *Reference for the Accelar 1000 Series Command Line Interface*

The chapter is divided into the following sets of procedures:

- [Boot the Switch](#)
- [Log On to the System](#)
- [Set System Identification](#)
- [Set System Security](#)
- [Sample Configurations](#)
- Advanced Configurations

To perform these procedures, you must log on to the switch with Read-Write-All privileges.

## Boot the Switch

To turn the power on and boot the switch:

- 1. Turn on the routing switch:**
  - Accelar 1200/1250 chassis—use the switch located on the power supplies.
  - Accelar 1100/1150 chassis—use the switch on the rear of the chassis.
  - Accelar 1050/1051 switch—plug in the AC power cord.
- 2. The default boot order attempts to boot the switch from the PCMCIA (Accelar 1200/1250 chassis only), then from the flash memory, and then through the network. The automatic boot sequence starts, and the output on your console should look similar to that shown for an Accelar 1200 switch in [Figure 3-1](#).**

Accelar Monitor v1.x.x

CPU: 60Mhz PPC 403GCX Type 2 Rev 1 in Slot 4

DRAM: 16M

Chassis: 1200

Reason for Last Reset: WDT

Slot 2 is occupied

Slot 3 is occupied

Slot 6 is occupied

Slot 7 is occupied

Slot 8 is occupied

Press any key to stop autoboot

User Selected Boot Sources

Primary = pcmcia:1

Secondary = flash:1

Tertiary = net

Config = nvram

Booting from [pcmcia:1] pcmcia flash memory

Configuration from [nvram] ...

Unzipping file accl.x.x

Details /export/home2/projects/first/rell.x/rell.x.x/main/hw/accl.x.x.st  
on Thu

May 21 10:17:11 PDT 1998

from 0x768000b0 to 0x80010000 994554 to 5259022 bytes

Attaching network interface nicEvb0... done.

Null 0.0.0.0 inet address for interface nicEvb.

Attaching network interface lo0... done.

Accelar System Software Release 1.x.x

Copyright (c) 1996-1998 Bay Networks, Inc.

[0:00:00.600] INFO: Code=0x0 Task=rcStart: Accelar System Software  
Release 1.x.x

[0:00:00.633] INFO: Code=0x0 Task=rcStart: System log file flash:sys-  
log:0:19

\*\* Loading configuration from nvram \*\*

Initializing card in slot #2 ... OK

Initializing card in slot #3 ... OK

```
Initializing card in slot #6 ... OK
Initializing card in slot #7 ... OK
Initializing card in slot #8 ... OK
```

The system is ready.

```
*****
* Bay Networks, Inc.                *
* Copyright (c) 1996-1998          *
* All Rights Reserved              *
* Accelar 1200                    *
* Software Release 1.x.x          *
*****
```

Login:

**Figure 3-1. Sample Console Output During Automatic Boot Sequence**

## Log On to the System

The Accelar 1000 Series routing switches employ a scheme with five levels of security access for device management purposes. These levels are:

- Read-Only—allows the user to view the device settings but not make any changes to the device. Read-Only access is like the equivalent SNMP read-only community access.
- Layer 2 (read-write)—allows read-write access for all layer 2 (switching) functions for the switch.
- Layer 3 (layer 2 and 3 read-write)—allows read-write access for all layer 2 and layer 3 (routing) functions.
- Read-Write—allows the user to view and edit most device settings. The only device settings that cannot be changed with Read-Write access are the security and password settings. Like Read-Only access, Read-Write access functions in the same manner as its SNMP community access equivalent.
- Read-Write-All—allows all the privileges of Read-Write access and the ability to change the security settings. The security settings include the CLI and Web-based management user names and passwords and the SNMP community strings.

[Table 3-1](#) lists the default login names and passwords for the different access levels.

**Table 3-1. Default Login Names and Passwords**

| Access Level         | Description   | Default Login | Default Password |
|----------------------|---|---------------|------------------|
| Read-Only            | Allows viewing configuration and status information.  | ro            | ro               |
| Layer 2 (read-write) | Allows viewing and changing configuration and status information for layer 2 functions.             | l2            | l2               |
| Layer 3 (read-write) | Allows viewing and changing configuration and status information for layer 2 and layer 3 functions. | l3            | l3               |
| Read-Write           | Allows viewing and changing configuration and status information across the switch.                 | rw            | rw               |
| Read-Write-All       | Allows all the rights of Read-Write access <i>and</i> the ability to change passwords.              | rwa           | rwa              |

For example, if you want to log on with Read-Write access through the console port, log on as `rw` with password `rw` at the following prompt:

```
*****
* Bay Networks, Inc.          *
* Copyright (c) 1996-1998    *
* All Rights Reserved        *
* Accelar 1100               *
* Software Release 1.x.x     *
*****
```

```
Login: rw
Password: **
```

```
Accelar-1200#
```

To view a list of the available Help in the CLI, enter:

```
Accelar-1200# help
```

A list is displayed similar to that shown in [Figure 3-2](#).

Six forms of help are available in the system.

1. Typing "help" describes help features.
2. Typing "help commands" provides a list of commands you can enter from the current prompt.
3. Typing "help ttychars" provides a list of special terminal editing characters.
4. Typing "help <command>" or "<command> help" describes a specific command or provides a list of sub-commands you can enter from with-in <command>.
5. Typing "?" or "<command> ?" displays a path list of commands and parameters available from the current prompt or <command> forward.
6. Typing "?" or "help" as one of a commands parameters displays parameter help for the command.

**Figure 3-2. CLI Display of Available Help**

## Set System Identification

To set the system identification:

**1. Change the system name using the command:**

```
config sys set name <name>
```

where <name> is an ASCII string specifying the System name and box or root level prompt.

**2. Set the contact for the switch with the command:**

```
config sys set contact <contact>
```

where <contact> is an ASCII string specifying the contact.

**3. Define the location for the system with the command:**

```
config sys set location <location>
```

where <location> is an ASCII string specifying the system location.

---

## Set System Security

To set system security:

### 1. Change CLI users and passwords using the following commands:

- `config cli password ro <username>[<password>]`—changes the Read-Only login and/or password.
- `config cli password L2 <username>[<password>]`—changes the Layer 2 Read-Write login and/or password.
- `config cli password L3 <username>[<password>]`—changes the Layer 3 Read-Write login and/or password.
- `config cli password rw <username>[<password>]`—changes the Read-Write login and/or password.
- `config cli password rwa <username>[<password>]`—changes the Read-Write-All login and/or password.

where:

`username` is the login name.

`password` is the password associated with the login name.

### 2. Change SNMP community strings using the command:

```
config sys set snmp community <ro|rw|l2|l3|rwa> <commstr>
```

where:

`<ro|rw|l2|l3|rwa>` is the choice of community—`ro` is Read Only, `rw` is Read-Write, `l2` is Layer 2 Read-Write, `l3` is Layer 3 (and Layer 2) Read-Write, and `rwa` is Read-Write-All.

`<commstr>` is the input community string {string}.

### 3. Enable or Disable Web access using the commands:

- `config web-server disable` to turn off Web access
- `config web-server enable` to turn on Web access

#### 4. Change Web passwords using the command:

```
config web-server set password <ro|rw|rwa> <username> <password>
```

where:

<ro|rw|rwa> is the access level (Read-Only, Read-Write, Read-Write-All).

<username> is the user's login name.

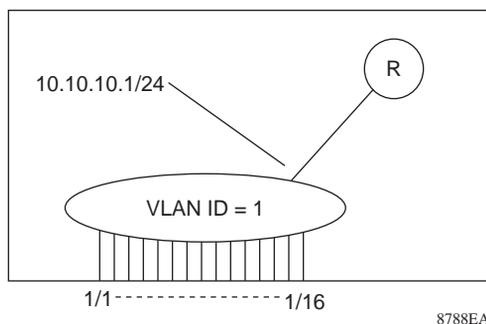
<password> is the password associated with the login name.

## Sample Configurations

This section describes how to configure the Accelar 1000 Series switches as layer 2 only devices, layer 3 port-based VLAN and an isolated routing port using RIP, and layer 3 port-based VLAN and an isolated routing port using OSPF.

### Layer 2 Only Switch Configuration

This section describes the steps to configure an Accelar switch as a managed layer 2 switch. In this configuration, all ports in the routing switch belong to a single VLAN for bridging purposes. An IP address and a gateway address (default route) are assigned for remote management. When the configuration is finished, the logical view will be as shown in [Figure 3-3](#).



**Figure 3-3. Logical Depiction of Layer 2 Only Configuration**

Configuring the Accelar switch as a layer 2 switch consists of the following steps:

- Confirm that all ports are in the default VLAN.
- Assign an IP address to the default VLAN.
- Specify a default gateway address or default route.
- Test connectivity.

To configure the Accelar switch as a layer 2 switch:

**1. Confirm that all ports are in the default VLAN using the command:**

```
show vlan info
```

The display will show the VlanId (1) and list the port members.

**2. To assign an IP address to the default VLAN, enter:**

```
config vlan 1 ip create <ippaddr/mask>
```

where:

1 is the VLAN ID of the default VLAN.

<ippaddr/mask> is the IP address/subnet mask you are assigning it (for example, 10.10.10.1/24).

**3. Specify a default gateway address/default route.**

When configuring IP on most layer 2 switches, you need to specify the IP address of the device and the IP address of the default gateway. Because the Accelar switch is a routing switch, adding a default route is equivalent to specifying a default gateway in a layer 2 only switch.

Use the following command to specify the default route:

```
config ip static-route create <ipaddr/mask> next-hop <value>  
cost <value>
```

```
config ip static-route create 0.0.0.0/0 next-hop 10.0.0.1 cost 1  
config ip static-route create default next-hop 10.0.0.1 cost 1
```

where:

0.0.0.0 is the default route.

**4. Disable routing with the command:**

```
config ip forwarding disable
```



**Note:** By default, the Spanning Tree Protocol is enabled on the switch. To disable spanning tree, use the following command:

```
config stg 1 group-stp disable
```

---

**5. To save the configuration, enter:**

```
save
```

Your Accelar 1000 Series routing switch now has an IP address and can be used as a layer 2 switch.

## Layer 3 Configuration

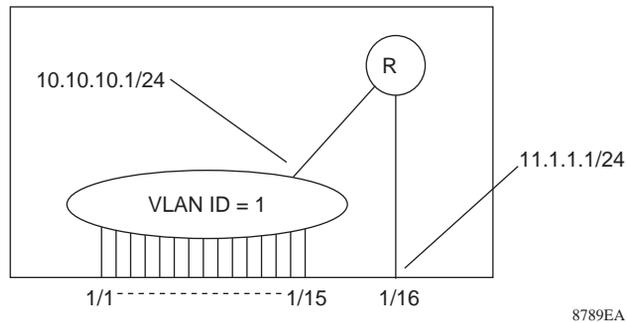
The following section discusses configuring an Accelar switch as a layer 3 device with two methods: port-based VLAN and isolated routing port using RIP or OSPF.

Note that in the following commands, each Accelar port number has two components: a slot number and a position number. The slot number identifies the chassis slot containing the I/O module that the port is on. The position number identifies the position of the port on the I/O module. In the Accelar 1200/1250 switch, chassis slots are numbered from the top slot down, beginning with 1 for the top slot. In the Accelar 1100/1150 switch, slot 1 is the left I/O module, slot 2 is the right I/O module, and slot 3 represents the fixed chassis. In the Accelar 1050/1051 switch, slot 1 indicates the Gigabit port, and slot 3 identifies 10/100 Mb/s ports. Ports are numbered from left to right beginning with 1 for the far left port.

### RIP-Based Layer 3 Configuration

This section discusses how to configure the switch as a layer 3 device (routing) with a single port-based VLAN and an isolated routing port. The RIP routing protocol will be used for dynamic exchange of routing information.

This configuration begins with a switch that has one slot with 16 ports in the default VLAN. When the configuration is finished, this switch will be running the RIP routing protocol with a logical configuration as shown in [Figure 3-4](#).



**Figure 3-4. Logical Configuration of Switch with RIP Enabled**

To configure the switch as a layer 3 device (routing) single port-based VLAN and an isolated routing port:

**1. Add IP addressing information to VLAN 1.**

- Create an IP address on VLANs using the command:  
`config vlan <vid> ip create <ipaddr/mask>`

where:

<vid> is a unique VLAN identifier (numbered 1 to 127).

<ipaddr/mask> is the IP address and mask {a.b.c.d/x | a.b.c.d/x.x.x.x}.

- Enter the following command exactly:

```
config vlan 1 ip create 10.1.1.1/24
```

**2. Remove port 1/16 from VLAN 1.**

Removing the port will create an isolated port.

- Remove ports from a VLAN using the command:

```
config vlan <vid> remove <ports>
```

where:

<vid> is a unique VLAN Identifier (numbered from 1 to 127).

<ports> is one or more physical interfaces in the form {<slot/port> | <slot/port>, <slot/port> | <slot/port>-<slot/port>}.

- Enter the following command exactly:

```
config vlan 1 remove 1/16
```

**3. Add IP addressing information to port 1/16.**

- Create an IP address on an isolated port using the command:

```
config ethernet <port> ip create <address/mask>
```

where:

<ports> is one or more physical interfaces in the form {<slot/port>|<slot/port>,<slot/port> |<slot/port>-<slot/port>}.

<ipaddr/mask> is the IP address and mask {a.b.c.d/x |a.b.c.d/x.x.x.x}.

- Enter the following command exactly:

```
config ethernet 1/16 ip create 11.1.1.1/24
```

**4. Enable RIP routing globally using the command:**

```
config ip rip enable
```

**5. Configure RIP parameters for each interface.**

- To enable or disable the RIP protocol on a VLAN interface, use the following command:

```
config vlan <vid> ip rip <enable|disable>
```

- To enable or disable the RIP protocol on an Ethernet interface, use the following command:

```
config ethernet <ports> ip rip <enable|disable>
```

- Enter the following command exactly for VLAN 1:

```
config vlan 1 ip rip enable
```

- Enter the following command exactly for Ethernet 1/16:

```
config ethernet 1/16 ip rip enable
```

Note that, when RIP is enabled on an interface, the default parameters will both supply and listen for RIP information. You modify these parameters within either the `config vlan` or `config ethernet` context with the following commands:

— `ip rip supply <enable|disable>`—configures whether or not the switch will supply route information via RIP out this interface.

— `ip rip listen <enable|disable>`—configures whether or not the switch will listen for route information via RIP on this interface.

- `ip rip default-supply <enable|disable>`—configures whether or not the switch will supply the default route via RIP out this interface. A default route will be added to the RIP update only if it exists in the routing table.
- `ip rip default-listen <enable|disable>`—configures whether or not the switch will listen for the default route via RIP on this interface.

These commands in combination have the results shown in [Table 3-2](#).

**Table 3-2. VLAN RIP Supply and Listen Parameter Setting Results**

| RIP Supply | RIP Default Supply | RIP Listen | RIP Default Listen | Results  |
|------------|--------------------|------------|--------------------|--|
| Disabled   | Disabled           |            |                    | Switch sends no RIP updates.   |
| Enabled    | Disabled           |            |                    | Switch sends RIP updates except the default.   |
| Disabled   | Enabled            |            |                    | Switch supplies the default only (if the default route exists in the routing table). |
| Enabled    | Enabled            |            |                    | Switch sends RIP updates including the default (if it exists).                       |
|            |                    | Disabled   | Disabled           | Switch does not listen to any RIP updates.   |
|            |                    | Enabled    | Disabled           | Switch listens for RIP updates except the default.                                   |
|            |                    | Disabled   | Enabled            | Switch listens for the default only.   |
|            |                    | Enabled    | Enabled            | Switch listens for RIP updates, including the default (if it exists).                |

In summary, use the following commands to configure one VLAN and one isolated routing port using RIP:

- `config vlan 1 ip create 10.1.1.1/24`
- `config vlan 1 remove 1/16`
- `config ethernet 1/16 ip create 11.1.1.1/24`
- `config ip rip enable`
- `config vlan 1 ip rip enable`
- `config ethernet 1/16 rip enable`

## OSPF-Based Layer 3 Configuration

The Open Shortest Path First (OSPF) routing protocol implements a link-state protocol.

The basic required parameters are area and a unique router ID. If the router you are configuring is the only router running OSPF or if the router is isolated, use the default values:

- The default configured area is 0.0.0.0.
- The default router ID is configured at the factory based on the serial number of the chassis.

If the Accelar switch is being introduced into an existing environment, configure the following parameters:

- `unique routerid`—The default router ID will work unless there is a predefined numbering convention for router IDs.
- `area` that the router will attach to—In a simple environment, it is usually 0.0.0.0.

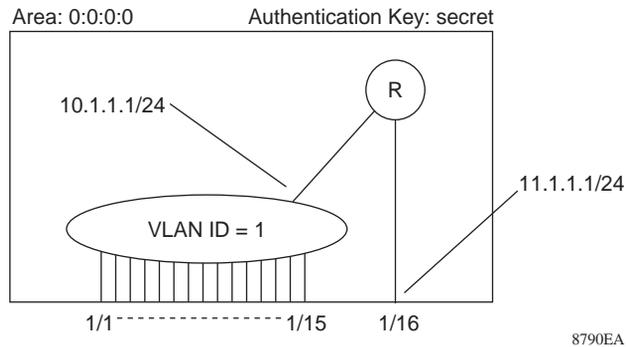


**Note:** For more advanced OSPF configurations, refer to *Reference for the Accelar Management Software* and *Reference for the Accelar 1000 Series Command Line Interface*.

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- `authentication-type`—Authentication type is either none or simple. If simple authentication is used in your network, authentication keys are required for each interface.
- `authentication-key`—This key must be configured on each OSPF interface. The authentication key must match other OSPF routers on the same subnet.

This configuration will begin with a switch that has one slot with 16 ports in the default VLAN. When the configuration is finished, this switch will be running the OSPF routing protocol with a logical configuration as shown in [Figure 3-5](#).



**Figure 3-5. Logical Configuration of Switch with OSPF Enabled**

To create this configuration:

**1. Add IP addressing information to VLAN 1.**

- Create an IP address on a VLAN using the command:

```
config vlan <vid> ip create <ipaddr/mask>
```

where:

<vid> is a unique VLAN Identifier (numbered from 1 to 127).

<ipaddr/mask> is the IP address and mask {a.b.c.d/x | a.b.c.d/x.x.x.x}.

- Enter the following command exactly:

```
config vlan 1 ip create 10.1.1.1/24
```

**2. Remove port 1/16 from VLAN 1.**

This action creates an isolated port.

- Remove ports from a VLAN using the command:

```
config vlan <vid> remove <ports>
```

where:

<vid> is a unique VLAN Identifier (numbered from 1 to 127).

<ports> is one or more physical interfaces in the form {<slot/port> | <slot/port>,<slot/port> | <slot/port>-<slot/port>}.

- Enter the following command exactly:

```
config vlan 1 remove 1/16
```

### 3. Add IP addressing information to port 1/16.

- Create an IP address on an isolated port using the command:

```
config ethernet <port> ip create <address/mask>
```

where:

<ports> is one or more physical interfaces in the form {<slot/port>|<slot/port>,<slot/port> |<slot/port>-<slot/port>}.

<ipaddr/mask> is the IP address and mask {a.b.c.d/x |a.b.c.d/x.x.x.x}.

- Enter the following command exactly:

```
config ethernet 1/16 ip create 11.1.1.1/24
```

### 4. Configure global OSPF parameters.

For this configuration, use the default configured area 0.0.0.0. Change the router ID to match our predetermined numbering scheme and use simple passwords for authentication.

- Use the following commands:

```
config ip ospf router-id <ipaddr>
```

where:

<ipaddr> is any IP address dotted-decimal value used as a unique identifier for this router.

```
config ip ospf router-id 1.1.1.1
```

```
config ip ospf area <area> authentication-type
```

```
<auth-type>
```

where:

<area> is the value of an OSPF area in dotted-decimal notation.

- Enter the following command exactly:

```
config ip ospf area 0.0.0.0 authentication-type simple
```

### 5. Configure per-interface OSPF parameters.

You now need to configure authentication keys for each OSPF interface.

- Use the following commands:

```
config vlan <vid> ip ospf authentication-key <string>
```

```
config ethernet <ports> ip ospf authentication-key <string>
```

where:

<vid> is a unique VLAN Identifier (numbered from 1 to 127).

<ports> is one or more physical interfaces in the form {<slot/port>|<slot/port>,<slot/port> |<slot/port>-<slot/port>}.

<string> is the simple password in eight characters.

- Enter the following command exactly:

```
config vlan 1 ip ospf authentication-key secret
```

- Enter the following command exactly:

```
config ethernet 1/16 ip ospf authentication-key secret
```

## 6. Enable OSPF on each interface.

- Enable OSPF on each of the configured interfaces using the following commands:

```
config vlan <vid> ip ospf area <area> enable
```

```
config ethernet <ports> ip ospf area <area> enable
```

where:

<vid> is a unique VLAN Identifier (numbered from 1 to 127).

<ports> is one or more physical interfaces in the form {<slot/port>|<slot/port>,<slot/port> |<slot/port>-<slot/port>}.

<area> is the value of an OSPF area in dotted-decimal notation.

- Enter the following command exactly:

```
config vlan 1 ip ospf area 0.0.0.0 enable
```

- Enter the following command exactly:

```
config ethernet 1/16 ip ospf area 0.0.0.0 enable
```

## 7. Enable OSPF globally.

```
config ip ospf admin-state enable
```

In summary, use the following commands to configure one VLAN and one isolated routing port for using the OSPF routing protocol:

```
config vlan 1 ip create 10.1.1.1/24
```

```
config vlan 1 remove 1/16
```

```
config ethernet 1/16 ip create 11.1.1.1/24
```

```
config ip ospf router-id 1.1.1.1
config ip ospf area 0.0.0.0 authentication-type simple
config vlan 1 ip ospf authentication-key secret
config ethernet 1/16 ip ospf authentication-key secret
config vlan 1 ip ospf enable
config ethernet 1/16 ip ospf enable
config ip ospf admin-state enable
```

## Advanced Configurations

More detailed information about configuring the switch is found in *Reference for the Accelar Management Software* (using Device Manager and VLAN Manager) and *Reference for the Accelar 1000 Series Command Line Interface* (using the CLI). These documents are on the *Accelar 1000 Series Software Documentation* CD included with this guide and can be viewed using the Adobe Acrobat software.

Advanced configuration options include:

- Access lists
- Protocol-based VLANs
- RMON
- Routing protocol configuration
- Route redistribution
- IEEE 802.1q tagging
- Proxy ARP
- DHCP relay
- IGMP snooping
- Multiple spanning tree groups
- Other advanced topics