The example configurations below provide IP routing between two Routing Switches (Routing Switch A and Routing Switch B) using OSPF as the routing protocol. These two Routing Switches are within a single area OSPF domain.

Routing Switch A is configured to provide IP routing between port-based VLANs using only OSPF as the routing protocol. All protocols are switched within each VLAN. Routing Switch A is configured for route redistribution of its directly connected networks. (By default the Routing Switch will not advertise directly connected OSPF networks.) A redistribution filter is configured to deny one of the directly connected networks - 172.16.30.0 - from being redistributed into OSPF.

Routing Switch B is configured with OSPF and RIP as the routing protocols, thus serving as a gateway between the RIP and OSPF domains. This Routing Switch is also known as an Autonomous System Border Router (ASBR). The ASBR is also configured for route redistribution. This allows import of RIP routes into the OSPF domain and visa versa.

Routing Switch C, shown in the RIP domain of the topology below, is for reference only.

This configuration example applies to the following products:
- J4138A HP ProCurve Routing Switch 9308M
- J4139A HP ProCurve Routing Switch 9304M
- J4840A HP ProCurve Routing Switch 6308M-SX
WARNING:
The example configuration below was created from a factory default configuration on the Routing Switch. The first 3 commands in the sequence of CLI commands given below will first reset a routing switch back to factory default settings. We recommend saving your current configuration if necessary. Otherwise, skip the first 3 commands.

NOTES:
1. The interface port numbers (e.g. interface e 1/1) and the IP address (e.g. 10.10.10.1) may differ in your network, so adjust these values accordingly. The Routing Switch model (e.g. HP 9304M), type of module(s), and software version number below may not accurately reflect the device(s) you are configuring.
2. Some older versions of Routing Switch software do not include the version in the output of the show configuration command. For those versions, use the show version command to see the software version.
3. In the example below for Routing Switch A, the Routing Switch will switch non-IP traffic within each VLAN.
4. The router ospf command is used to enable OSPF on the Routing Switch. This command automatically activates OSPF and a software reload is not required.
5. The area 0.0.0.0 command is used to assign the Routing Switches to the single backbone area.
6. The ip ospf area 0.0.0.0 command is used to assign the individual interfaces to the OSPF area.
7. In the example below for Routing Switch A, as soon as redistribution is enabled for a given routing protocol, ALL routes for that given routing protocol are allowed (i.e., an implicit permit all). Therefore, the deny redistribute 1 all address 172.16.30.0/24 command is required in order to keep this directly connected network from being redistributed into OSPF.
8. In the example below for the ASBR, the permit redistribute commands are redistribution filters. Do not enable redistribution until you have configured the redistribution filters. Otherwise, you might accidentally overload the network with routes you did not intend to redistribute.
9. In the example below for the ASBR, the redistribution connected command is needed in order for Routing Switch A to learn (via OSPF) the directly connected network (e.g., the 192.168.10.0 network) on the ASBR. By default the Routing Switch will not advertise directly connected OSPF networks. By default the Routing Switch will advertise directly connected RIP networks.
10. In the example below for the ASBR, the redistribution rip command is needed in order for Routing Switch A to learn (via OSPF) the routes in the RIP domain.
11. The configuration examples below were created on software version 06.6.05.
CONFIGURATION COMMANDS: (created on software version 06.6.05)

Routing Switch A

HP9308> enable
HP9308# erase startup-config
HP9308# reload
HP9308> enable
HP9308# config t
HP9308(config)#hostname RouteSwitchA
RouteSwitchA(config)#router ospf
RouteSwitchA(config-ospf-router)#area 0.0.0.0
RouteSwitchA(config-ospf-router)#deny redistribute 1 all address 172.16.30.0/24
RouteSwitchA(config-ospf-router)#redistribution connected

RouteSwitchA(config-ospf-router)#vlan 10 by port
RouteSwitchA(config-vlan-10)#untagged e1/1 to 1/8
RouteSwitchA(config-vlan-10)#router-interface ve 10
RouteSwitchA(config-vlan-10)#int ve 10
RouteSwitchA(config-vif-10)#ip address 10.10.10.1/24
RouteSwitchA(config-vif-10)#ip ospf area 0.0.0.0

RouteSwitchA(config-vif-20)#vlan 20 by port
RouteSwitchA(config-vlan-20)#untagged e2/1 to 2/24
RouteSwitchA(config-vlan-20)#router-interface ve 20
RouteSwitchA(config-vlan-20)#int ve 20
RouteSwitchA(config-vif-20)#ip address 10.10.20.1/24

RouteSwitchA(config-vif-30)#vlan 30 by port
RouteSwitchA(config-vlan-30)#untagged e3/1 to 3/24
RouteSwitchA(config-vlan-30)#router-interface ve 30
RouteSwitchA(config-vlan-30)#int ve 30
RouteSwitchA(config-vif-30)#ip address 172.16.30.1/24
RouteSwitchA(config-vif-30)#end
RouteSwitchA#wr mem
RouteSwitchA#reload
CONFIGURATION COMMANDS: (created on software version 06.6.05)

Routing Switch B (ASBR)

HP6308> enable
HP6308# erase startup-config
HP6308# reload
HP6308> enable
HP6308# config t
HP6308(config)#hostname RouteSwitchB
RouteSwitchB(config)#router ospf
RouteSwitchB(config-ospf-router)#area 0.0.0.0
RouteSwitchB(config-ospf-router)#redistribution connected
RouteSwitchB(config-ospf-router)#redistribution rip

RouteSwitchB(config-rip-router)#redistribute 1 ospf
RouteSwitchB(config-rip-router)#redistribute

RouteSwitchB(config-rip-router)#int e1
RouteSwitchB(config-if-e1000-1)#ip add 10.10.10.2/24
RouteSwitchB(config-if-e1000-1)#ip ospf area 0.0.0.0

RouteSwitchB(config-if-e1000-1)#int e8
RouteSwitchB(config-if-e1000-8)#ip add 192.168.10.1/24
RouteSwitchB(config-if-e1000-8)#ip rip v1-only
RouteSwitchB(config-if-e1000-8)#wr mem
RouteSwitchB(config-if-e1000-8)#end
RouteSwitchB#reload
RESULTING CONFIGURATION:

Routing Switch A

RouteSwitchA#sh config
Startup configuration:
!
ver 06.6.0ST43
module 1 8-port-gig-management-module
module 2 24-port-copper-module
module 3 24-port-copper-module
!
global-protocol-vlan
!
! vlan 10 by port
  untagged ethe 1/1 to 1/8
  router-interface ve 10
!
! vlan 20 by port
  untagged ethe 2/1 to 2/24
  router-interface ve 20
!
! vlan 30 by port
  untagged ethe 3/1 to 3/24
  router-interface ve 30
!
hostname RouteSwitchA
!
interface ve 10
  ip address 10.10.10.1 255.255.255.0
  ip ospf area 0.0.0.0
!
interface ve 20
  ip address 10.10.20.1 255.255.255.0
!
interface ve 30
  ip address 172.16.30.1 255.255.255.0
!
!
router ospf
  area 0.0.0.0
deny redistribute 1 all address 172.16.30.0 255.255.255.0
  redistribution connected
!
end
RESULTING CONFIGURATION:

Routing Switch B (ASBR)

RouteSwitchB#sh config
Startup configuration:
!
ver 06.6.05T43
!
!
!
!
hostname RouteSwitchB
!
interface e 1
  ip address 10.10.10.2 255.255.255.0
  ip ospf area 0.0.0.0
!
interface e 8
  ip address 192.168.10.1 255.255.255.0
  ip rip v1-only
!
!
router ospf
  area 0.0.0.0
  redistribution connected
  redistribution rip
!
router rip
  permit redistribute 1 ospf
  redistribution
!
end
VERIFICATION COMMANDS:

1. The following CLI commands can be used to display OSPF information:
   - `show ip ospf config`
   - `show ip ospf interface`
   - `show ip ospf routes`
   - `show ip ospf neighbor`
   - `show ip ospf database link-state`
   - `show ip ospf database external-link-state`

Output from some of these `show` commands for these example configurations follow below. Refer to Chapter 6 of the Advanced Configuration and Management Guide and Chapter 20 of the Command Line Interface Reference for the HP ProCurve Routing Switches 9304M, 9308M, and 6308M-SX for detailed descriptions of each command's output.

```
RouteSwitchA#sh ip ospf config
Router OSPF: Enabled
Redistribution: Enabled
Default OSPF Metric: 10
OSPF Redistribution Metric: Type2
OSPF External LSA Limit: 2000
OSPF Database Overflow Interval: 0
RFC 1583 Compatibility: Enabled

Router id: 10.10.10.1
Interface State Change Trap: Enabled
Virtual Interface State Change Trap: Enabled
Neighbor State Change Trap: Enabled
Virtual Neighbor State Change Trap: Enabled
Interface Configuration Error Trap: Enabled
Virtual Interface Configuration Error Trap: Enabled
Interface Authentication Failure Trap: Enabled
Virtual Interface Authentication Failure Trap: Enabled
Interface Receive Bad Packet Trap: Enabled
Virtual Interface Receive Bad Packet Trap: Enabled
Interface Retransmit Packet Trap: Enabled
Virtual Interface Retransmit Packet Trap: Enabled
Originate LSA Trap: Enabled
Originate MaxAge LSA Trap: Enabled
Link State Database Overflow Trap: Enabled
Link State Database Approaching Overflow Trap: Enabled

OSPF Area currently defined:
Area-ID     Area-Type     Cost
0.0.0.0     normal        0

OSPF Interfaces currently defined:
Ethernet Interface: v10
ip ospf md5-authentication-key-activation-wait-time 300
ip ospf area 0.0.0.0

deny redistribute 1all address 172.16.30.0 255.255.255.0
```

```
RouteSwitchB#sh ip ospf config
Router OSPF: Enabled
Redistribution: Enabled
Default OSPF Metric: 10
OSPF Redistribution Metric: Type2
OSPF External LSA Limit: 2000
```

OSPF Database Overflow Interval: 0

RFC 1583 Compatibility: Enabled

Router id: 10.10.10.2

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface State Change Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Virtual Interface State Change Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Neighbor State Change Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Virtual Neighbor State Change Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Interface Configuration Error Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Virtual Interface Configuration Error Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Interface Authentication Failure Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Interface Receive Bad Packet Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Virtual Interface Receive Bad Packet Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Interface Retransmit Packet Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Virtual Interface Retransmit Packet Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Originate LSA Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Originate MaxAge LSA Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Link State Database Overflow Trap:</td>
<td>Enabled</td>
</tr>
<tr>
<td>Link State Database Approaching Overflow Trap:</td>
<td>Enabled</td>
</tr>
</tbody>
</table>

OSPF Area currently defined:

<table>
<thead>
<tr>
<th>Area-ID</th>
<th>Area-Type</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0.0.0</td>
<td>normal</td>
<td>0</td>
</tr>
</tbody>
</table>

OSPF Interfaces currently defined:

Ethernet Interface: 1

ip ospf md5-authentication-key-activation-wait-time 300

ip ospf area 0.0.0.0

---

RouteSwitchA#sh ip ospf int

ethernet v10,OSPF enabled

- IP Address 10.10.10.1, Area 0.0.0.0
- OSPF state BD, Pri 1, Cost 1, Options 2, Type broadcast
- Timers (sec): Transit 1, Retrans 5, Hello 10, Dead 40
- DR: Router ID 10.10.10.2, Interface Address 10.10.10.2
- BDR: Router ID 10.10.10.1, Interface Address 10.10.10.1
- Neighbor Count = 1, Adjacent Neighbor Count = 1
- Neighbor: 10.10.10.2 (DR)
- Authentication-Key: None
- MD5 Authentication: Key None, Key-Id None, Key-Activation-Wait-Time 300

RouteSwitchB#sh ip ospf int

ethernet 1,OSPF enabled

- IP Address 10.10.10.2, Area 0.0.0.0
- OSPF state DR, Pri 1, Cost 1, Options 2, Type broadcast
- Timers (sec): Transit 1, Retrans 5, Hello 10, Dead 40
- DR: Router ID 10.10.10.2, Interface Address 10.10.10.2
- BDR: Router ID 10.10.10.1, Interface Address 10.10.10.1
- Neighbor Count = 1, Adjacent Neighbor Count = 1
- Neighbor: 10.10.10.1 (BDR)
- Authentication-Key: None
- MD5 Authentication: Key None, Key-Id None, Key-Activation-Wait-Time 300

---

RouteSwitchA#sh ip ospf routes

<table>
<thead>
<tr>
<th>Index</th>
<th>Destination</th>
<th>Mask</th>
<th>Path_Cost</th>
<th>Type2_Cost</th>
<th>Path_Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.10.10.0</td>
<td>255.255.255.0</td>
<td>1</td>
<td>0</td>
<td>Intra</td>
</tr>
<tr>
<td></td>
<td>Adv_Router</td>
<td>Link_State</td>
<td>Dest_Type</td>
<td>State</td>
<td>Tag</td>
</tr>
<tr>
<td>10.10.10.1</td>
<td>10.10.10.2</td>
<td>Network</td>
<td>Valid</td>
<td>00000000</td>
<td>4000</td>
</tr>
<tr>
<td>Paths Out_Port</td>
<td>Next_Hop</td>
<td>Type</td>
<td>Arp_Index</td>
<td>State</td>
<td></td>
</tr>
</tbody>
</table>

RouteSwitchB#sh ip ospf routes

<table>
<thead>
<tr>
<th>Index</th>
<th>Destination</th>
<th>Mask</th>
<th>Path_Cost</th>
<th>Type2_Cost</th>
<th>Path_Type</th>
</tr>
</thead>
</table>

©Copyright Hewlett-Packard Company, 2000. All rights reserved.
RouteSwitchB#sh ip ospf routes

<table>
<thead>
<tr>
<th>Index</th>
<th>Destination</th>
<th>Mask</th>
<th>Path_Cost</th>
<th>Type2_Cost</th>
<th>Path_Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.10.10.0</td>
<td>255.255.255.0</td>
<td>1</td>
<td>0</td>
<td>Intra</td>
</tr>
<tr>
<td>2</td>
<td>10.10.20.0</td>
<td>255.255.255.0</td>
<td>1</td>
<td>10</td>
<td>Type2_Ext</td>
</tr>
</tbody>
</table>

RouteSwitchC#sh ip route

Total number of IP routes: 3

<table>
<thead>
<tr>
<th>Destination</th>
<th>NetMask</th>
<th>Gateway</th>
<th>Port</th>
<th>Cost</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0.0.0</td>
<td>255.0.0.0</td>
<td>192.168.10.1</td>
<td>1/1</td>
<td>2</td>
<td>R</td>
</tr>
<tr>
<td>192.168.10.0</td>
<td>255.255.255.0</td>
<td>1/1</td>
<td>1</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>192.168.20.0</td>
<td>255.255.255.0</td>
<td>2/1</td>
<td>1</td>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>

RouteSwitchB#sh ip ospf routes

<table>
<thead>
<tr>
<th>Index</th>
<th>Destination</th>
<th>Mask</th>
<th>Path_Cost</th>
<th>Type2_Cost</th>
<th>Path_Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.10.10.0</td>
<td>255.255.255.0</td>
<td>1</td>
<td>0</td>
<td>Intra</td>
</tr>
<tr>
<td>2</td>
<td>10.10.20.0</td>
<td>255.255.255.0</td>
<td>1</td>
<td>10</td>
<td>Type2_Ext</td>
</tr>
</tbody>
</table>

RouteSwitchC#sh ip route

Total number of IP routes: 4

<table>
<thead>
<tr>
<th>Destination</th>
<th>NetMask</th>
<th>Gateway</th>
<th>Port</th>
<th>Cost</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.10.10.0</td>
<td>255.255.255.0</td>
<td>10.10.10.1</td>
<td>1</td>
<td>10</td>
<td>O</td>
</tr>
<tr>
<td>10.10.20.0</td>
<td>255.255.255.0</td>
<td>8</td>
<td>1</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>192.168.10.0</td>
<td>255.255.255.0</td>
<td>192.168.10.2</td>
<td>8</td>
<td>2</td>
<td>R</td>
</tr>
</tbody>
</table>

RouteSwitchA#sh ip route

Total number of IP routes: 5

<table>
<thead>
<tr>
<th>Destination</th>
<th>NetMask</th>
<th>Gateway</th>
<th>Port</th>
<th>Cost</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.10.10.0</td>
<td>255.255.255.0</td>
<td>0.0.0.0</td>
<td>1</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>10.10.20.0</td>
<td>255.255.255.0</td>
<td>0.0.0.0</td>
<td>20</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>10.10.10.1</td>
<td>255.255.255.0</td>
<td>30</td>
<td>1</td>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>

2. The `show ip route` command can be used on Routing Switch C to verify OSPF routes are being redistributed into the RIP domain. The route tables for Routing Switches A and B are also shown for completeness.