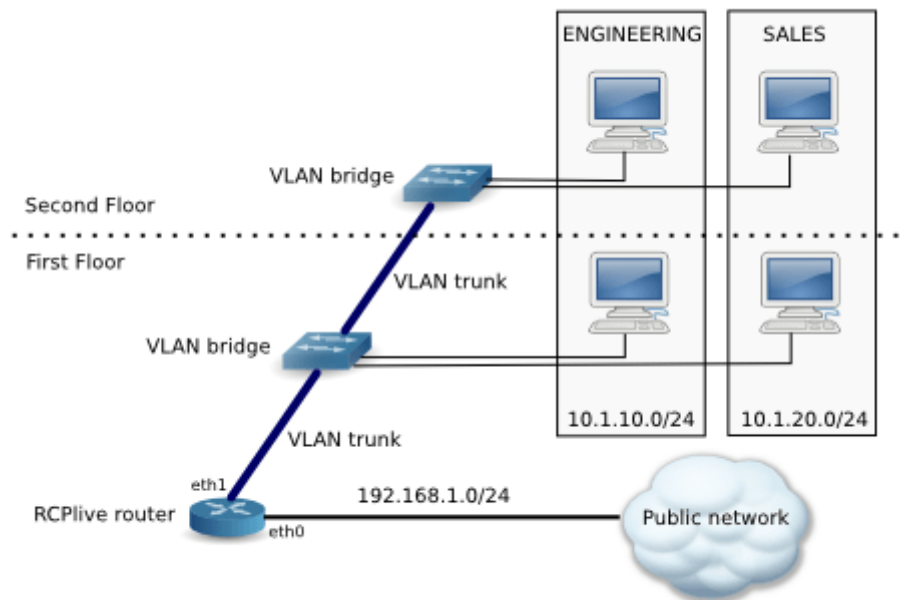


RCPlive: Inter-VLAN Routing

Ethernet networks can be partitioned into multiple distinct broadcast domains using VLANs. VLAN domains are mutually isolated. Whenever a hosts in one VLAN domain needs to communicate with a hosts in another VLAN domain, the traffic must be routed between the two domains. This is known as inter-VLAN routing.

This document provides a VLAN configuration example for a small network split into two separate VLAN domains: SALES and ENGINEERING. The backbone consists of two VLAN bridges connected by a VLAN trunk. I will use a Linux-based router, RCPlive, connected to the trunk to provide routing between the two VLAN domains and the outside world. On the router I will also enable a number of services such as DHCP and stateful firewall.



VLAN network

Introducing RCPlive

RCPlive is a free, open source router live CD based on [Debian 7](#) and [RCP100](#) routing suite. With an [ISO image](#) size of about 50MB, RCPlive is a flexible firewalling and routing platform. It is configured using a command line interface (CLI) syntax similar to the one found in commercial routers.

The software runs directly from a read-only CD or USB stick, and it provides persistence by saving the configuration into a file placed on an existing disk partition.

RCPlive supports layer 3 VLAN interfaces. These interfaces act as any other layer 3 interface and participate in routing. All normal routing features and services are available on VLAN interfaces.

Backbone configuration

On each backbone bridge, VLANs are defined on a port by port basis. Depending where is connected, a port can be either an access port or a trunk port.

Access ports are attached to end user workstations or servers, and they belong to one and only one VLAN. VLAN tagging takes place inside the bridge, as a result the traffic on the link is normal Ethernet non-VLAN traffic.

Traffic for multiple VLANs is multiplexed over trunk links. Trunk links are used to interconnect bridges and VLAN-aware routers.

The configuration consist of going through each bridge port and setting it up as an access port or a trunk port. I set ENGINEERING ports on VLAN ID 10, and SALES ports on VLAN ID 20. More likely, the configuration is entered using CLI, although some manufacturers also provide a web-based configurator.

Basic router configuration

RCPlive runs from a bootable CD or USB stick, as such there isn't any disk to partition and format. First boot on RCPlive media, persistence is configured by running *persist.sh* script. The process is simple and straightforward.

It is advisable to change the default passwords for administrator account and web-based configurator. Additional administrator accounts can also be created. From computer console I log in as user *rcp*, password *rpc*, then I go into configuration mode and change the passwords:

```
User: rcp
Password:
rcp>en
rcp#configure
rcp(config)#administrator rcp password a-secret-password
rcp(config)#service http password another-secret-password
```

Passwords are saved as a hash in the running or startup configuration:

```
rcp(config)#show running-config
...
service          http          encrypted          password
VWYBTYPF$00d01c8d3151b2a3eb18746903a8e7a7
administrator rcp encrypted password OGAVBTMH$x.hn.WDEufzIRIdHH.39b1
...
```

The next step is to configure the outside interface *eth0*, the default gateway address and name servers:

```
rcp(config)#interface ethernet eth0
rcp(config-if eth0)#ip address 192.168.1.1/24
```

```
rcp(config-if eth0)#no shutdown
rcp(config-if eth0)#exit
rcp(config)#ip default-gateway 192.168.1.15
rcp(config)#ip name-server 8.8.8.8
rcp(config)#ip name-server 8.8.4.4
```

In this moment we should be able to go on the Internet:

```
rcp(config)#ping google.com
PING google.com (74.125.228.33) 56(84) bytes of data.
64 bytes from iad23s06-in-f1.1e100.net (74.125.228.33): icmp_req=1
ttl=53 time=57.0 ms
64 bytes from iad23s06-in-f1.1e100.net (74.125.228.33): icmp_req=2
ttl=53 time=60.2 ms
64 bytes from iad23s06-in-f1.1e100.net (74.125.228.33): icmp_req=3
ttl=53 time=56.6 ms
64 bytes from iad23s06-in-f1.1e100.net (74.125.228.33): icmp_req=4
ttl=53 time=57.6 ms
64 bytes from iad23s06-in-f1.1e100.net (74.125.228.33): icmp_req=5
ttl=53 time=57.7 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 56.655/57.863/60.241/1.264 ms
rcp(config)#
```

Source : <http://l3net.wordpress.com/2013/11/11/rcplive-inter-vlan-routing/>