

# Internet Protocol - Routing Packets with Linux

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# Course Overview



**Network Topologies and the OSI Model**

**Internet Protocol -  
Addressing and Subnetting Fundamentals**

**Internet Protocol -  
ARP and DNS Fundamentals**

**Internet Protocol - Routing Packets**

**Routing Packets with Linux**

**Investigating TCP Internals**

**Troubleshooting Network Issues**

# Module Overview

**Static routing between networks**

**Dynamic routing between networks**

**Routing between VLANs**

# Learning Objective

**Route IP statically and dynamically**

<http://lartc.org/howto/lartc.dynamic-routing.html>  
<https://debian-handbook.info/browse/stable/sect.dynamic-routing.html>



# Static Routing

**Static routing - administratively defining a path for a packet to follow**

**Commands on the router or computer defining the next hop address to send traffic and interface**

**Tell the router what to do with traffic destined for the specified network**

<http://lartc.org/howto/lartc.dynamic-routing.html>  
<https://debian-handbook.info/browse/stable/sect.dynamic-routing.html>

# Dynamic Routing



**Dynamic routing** - programmatically defining a path for traffic to follow

**Routing protocol** - programs/ algorithms running on the router that learn the paths and choose an “optimal” path

**Quagga (Zebra)**

# VLAN



**Used to partition a layer 2 segment into separate logical LANs, thus IP networks**

**Requires a router to move data between**

**Tagged VLAN - 802.1q**

# Routing Between VLANs



**Tagged frame is passed to an interface and the same VLAN**

**The frame is de-encapsulated as an IP packet and the routing decision is made as any other IP packet**



# Demo

- Configure a static route for a host
- Configure a static route to a network
- Configure a default route
- Configure VLAN tagging

# Module Overview

**Static routing between networks**

**Dynamic routing between networks**

**Routing between VLANs**

# What's Next!

## Investigating TCP Internals

# References

- **Internetworking with TCP/IP Vol. 1** by Douglas Comer - <http://amzn.to/29X7dyT>
- <http://lartc.org/>
- <https://debian-handbook.info/browse/stable/sect.dynamic-routing.html>