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

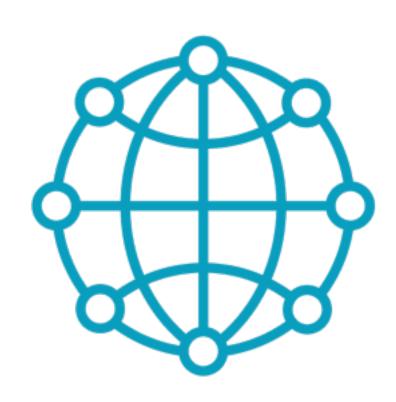
Static routing - administratively defining a path for a packet to follow

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.dynamicrouting.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

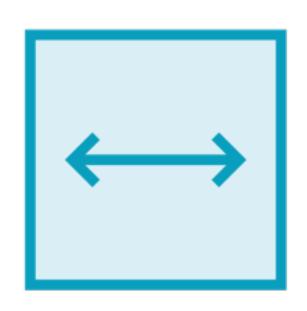


Used to partition a layer 2 segment into separate logical LANs, thus IP networks

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

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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