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r/sysadmin • 11 yr. ago
ScottRaymond

ELI5: What the hell is a Layer 3 switch?

I'll be honest, this term always struck me as kind of a non sequitur. If it operates at Layer 3 and performs routing, it is no longer a switch, it's a router. I'm guessing this is purely a marketing trick to sell either really expensive switches or really cheap routers, but maybe there is something here I'm missing.

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chuckbales • 11y ago • Edited 11y ago

Most L3 switches today are really multi-layer switches, in that they can work on layers above layer-3 - but the term layer-3 switches seems to just stick around. It's still a switch, but it supports routing. If you want to call an L3 switch a router, then you need to call a router something else to differentiate the two- just because they can both route doesn't make them equal/equivalent. They still excel at different things and should be used accordingly for different scenarios.

Switches - Good for port density, acting as a core for the network for pushing a lot of traffic through it quickly between networks. Good for routing between VLANs, EIGRP/OSPF, or basic BGP. Most don't support NAT.

Routers - Good for **full** routing, like full BGP tables, policy-based routing. Will handle more than just copper/fiber, runs your voice network (SIP trunks, PRIs, POTS lines, etc.). Supports NAT, typically you'll get larger buffers for queuing than on a switch

⊖   ⬆ 33 ⬇   •••

ScottRaymond OP • 11y ago

Makes sense. Right now we have an ASA that handles our LAN<>WAN traffic as well as some VLAN<>VLAN traffic internally (like users interacting with servers that are on a more secure network than they are).

It sounds like I might be better served getting a Layer 3 switch to perform the VLAN<>VLAN routing with ACLs to prevent unauthorized access to servers they shouldn't be talking to. That would probably take a significant workload off of my ASA so that it isn't impacting LAN<>WAN performance when somebody is sending a lot of traffic between VLANs locally.

⬆ 7 ⬇   •••

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Joe_testing • 11y ago

Simple answer: It's a Switch with a router inside that can switch packets in hardware based on L3 information.

⌐ ⌂ **15** ⌄ **...**

spunkyenigma • 11y ago

This. L3 switches don't use the central CPU for next hop determination. All the routing is done at the hardware layer with custom ASICs and shared trinary ram.

⌂ **7** ⌄ **...**

⊕ 1 more reply

r5a • 11y ago

Layer 2 Switch - I build a table of MAC addresses, you tell me which MAC you want and I switch your traffic accordingly. I am better than a hub because I has a table.

Layer 3 Switch - I know where things go and can priortize yo shit. Fuck what you think know, I tell you what you know. Because I can now operate at switch speed, Layer 2 switches are obsolete for all but the cheapest of businesses.

Source: http://www.reddit.com/user/EnragedMoose

⌐ ⌂ **22** ⌄ **...**

spyingwind • 11y ago

> I am better than a hub because I has a table.

I like this phrase.

⌂ **10** ⌄ **...**

⊕ 2 more replies

SomeEndUser • 11y ago

Benefit of a Layer 3 Switch is local VLAN routing. Less work for the router to handle.

⌂ **4** ⌄ **...**

⊕ 4 more replies

A layer 3 switch handles the routing of packets between VLANs/L3 ports itself without having to offload it to a separate device. Without this functionality, you have to have an external device handle the routing for you (like a firewall or separate router). Cisco calls this "router on a stick." Keep in mind that while you can do this, you're limited to the connection speed between the router and switch for all VLANs. If you've got 20 VLANs on one switch, you will only have 1Gb or 10Gb or whatever port you attached to the layer 3 device.

With a layer 3 switch, all of your inter-vlan routing is done in an array of ASICs, and with good switches, is done at line rate for all ports. That means if I've got 48x 1Gb ports, that switch will be capable of routing at least 48Gb per second. From a cost perspective, that alone makes a layer 3 switch worth it. Try and find a router that can do 48Gbps and tell me what it costs. That may seem like a little overkill for your basic business, but when you stick that switch in a datacenter serving dozens or hundreds of servers that have thousands of connections to them, it makes a lot of sense.

Keep in mind that while a layer 3 switch technically performs routing, a full fledged router can do sooo much more feature-wise.

That, my friend, is what they're for.

⇧ 4 ⇩   …

Hikithemori • 11y ago

[A bunch of sysadmins trying to explain networking.](#)

⇧ 3 ⇩   …

WetSunshine • 11y ago

It's a switch with a routing engine :)

⇧ 2 ⇩   …

r/networking • 11 yr. ago

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I need a lesson in Layer 3 routing

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I can't even recall how I discovered where L3 and R3 were

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