

Warehouse Scale Datacenters: The case for a new approach to networking



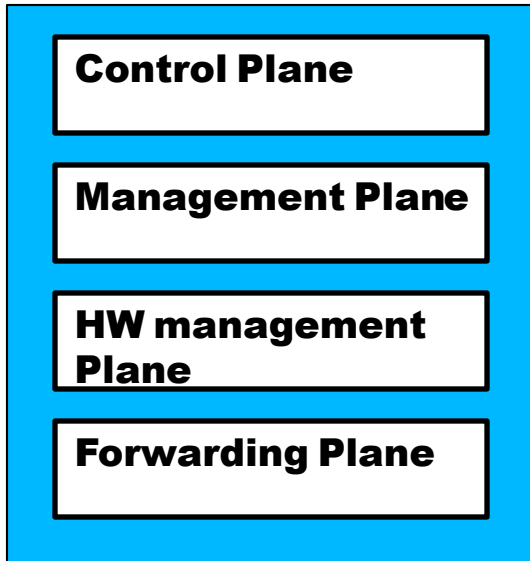
Igor Gashinsky
igor@yahoo-inc.com
Principal Architect
Yahoo!
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Some Terminology

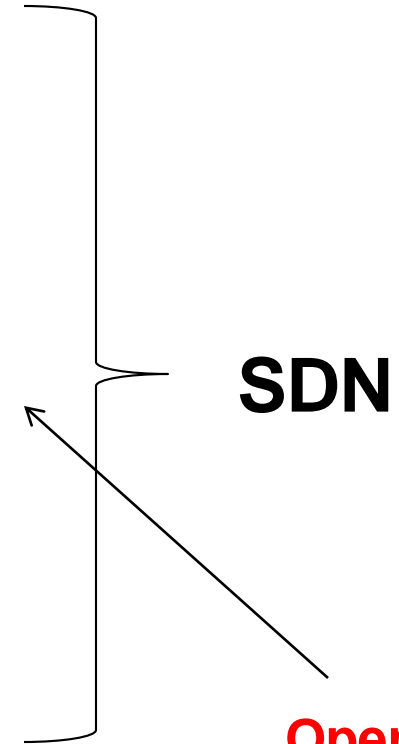
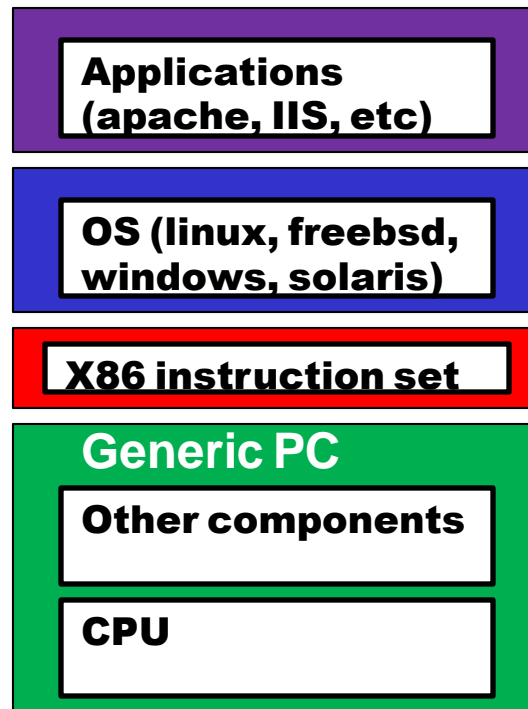


What is SDN and OpenFlow

Networking today



Servers today



What is a warehouse scale datacenter?

- **Large datacenters being built today can accommodate over 120,000 physical servers**
- **These servers may be 24+ cores**
 - **Dual-slot 6-core Westmere + HT**
 - **With decent virtualization, this can mean 20+ VM's per physical server**
 - **That is 2,400,000 VM's in a single datacenter!**
- **This is today...**
- **Massive amount of east-west bandwidth**
- **Massive amount of cross-talk**



Other attributes of warehouse datacenters?

- **In large-scale deployments, companies have very extensive Inventory Management System, and they already know:**
 - **Graph of the network elements**
 - **Where every server is in the datacenter**
 - **Which switch/port every server is plugged into**
 - **IP address of every server**
 - **MAC address of every server**



Topology Discovery



Topology discovery

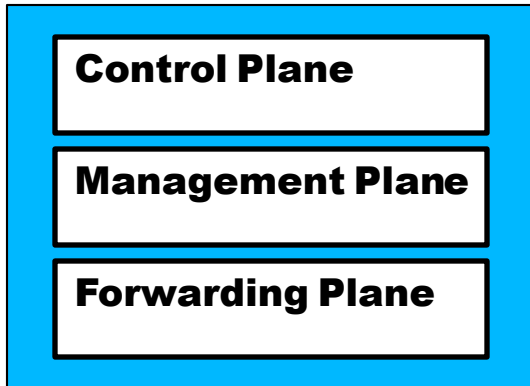
- **Today:**
 - **Routers spend 30%+ cpu cycles re-doing that topology discovery**
 - **Edge discovery**
 - **ARP/MAC bindings**
 - **Topology discovery**
 - **ISIS/OSPF/SPT/RSTP/TRILL/etc**
- **SDN:**
 - **We already have this info in a central DB!**
 - **So, let's just program it!**

Faster/cheaper/better

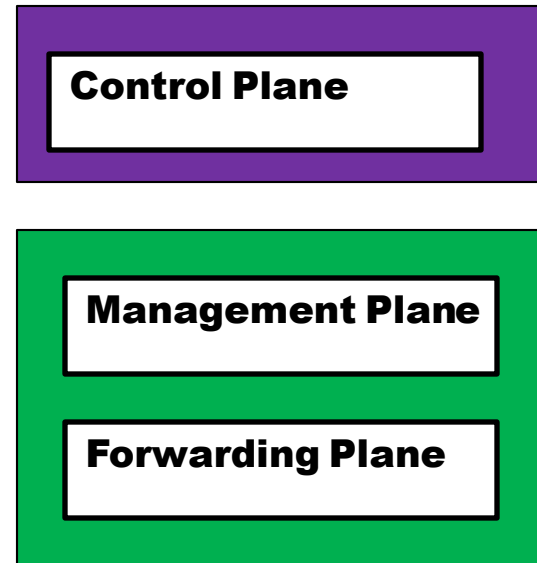


It's all about the \$\$\$\$\$

TODAY



SDN



Automation



Automation

- **Today:**
 - **Powerful configuration templating tools**
 - **Create config generators to translate those templates to every vendor/device/OS model syntax**
 - **Configuration deployment tools to push that out**
 - **They are absolutely archaic**
 - **Don't you just love expect?**
- **SDN:**
 - **General API**
 - **Easier to get stuff done..**



Faster Innovation



Feature Development today

Customer: “I need a new feature X please”

Vendor: “ But you are the only one asking for that, so, how much revenue will that bring in?”

Customer: “Give me that feature, or I won’t buy *any* more of your products!”

Vendor: “That’s nice, but not enough revenue behind that, we’ll get to it when we can (ie never)”

OR

Vendor: “Oh crap, they are actually serious and big enough, ok, you’ll get it in 18 months”

That’s a lot of conflict!



Feature Development with SDN

- **Separates Control features from forwarding (hardware) features**
- **Allows for network “plug-ins” into the controller**
 - **Now you can develop your own control features**
- **You can influence the whole system**



Questions?

igor@yahoo-inc.com

