Enterprise Network Design

Industrial Insights

Alok Chilka
Software Engineer
CSD ® | MTA | Dynamics 365 CRM

https://www.linkedin.com/in/calok64/

Key Highlights of today's talk

1) Introduction
2) SDN Terminology
3) SDN Use Cases
4) OpenFlow
5) NFV, VNF
6) Network Design Best Practices
7) Must have tools

Enterprise Network Design | *Industrial Insights*

Software Defined Networking (SDN)

Simplified approach of controlling / programming network using software applications.

There are both paid and open source tools available. Toughest task is to decide which tool to select based on the requirements.
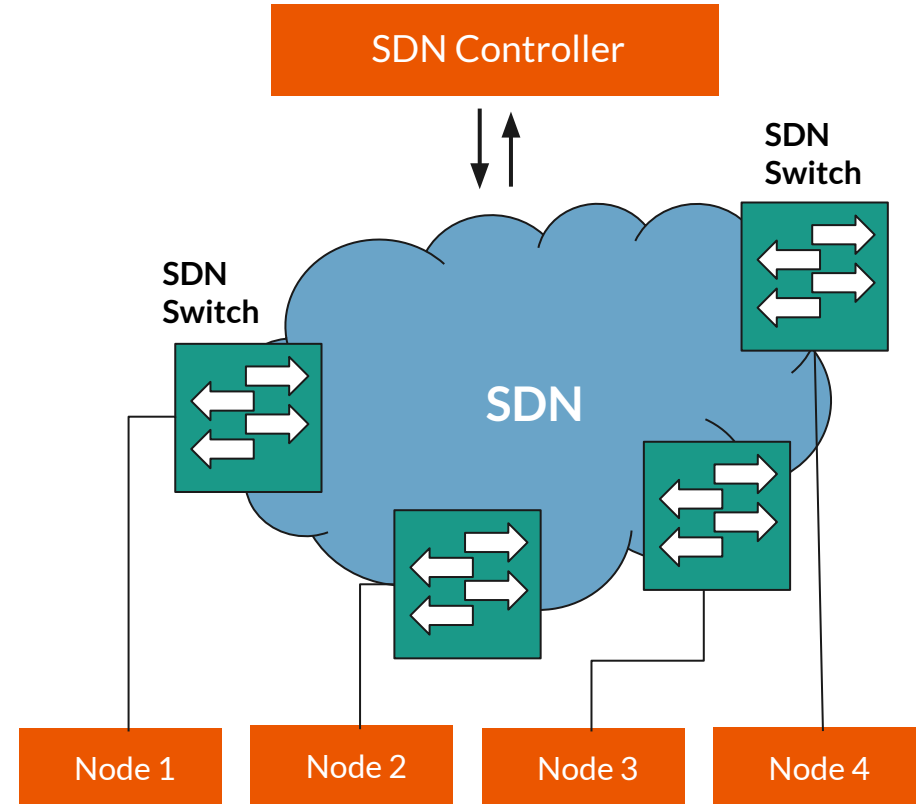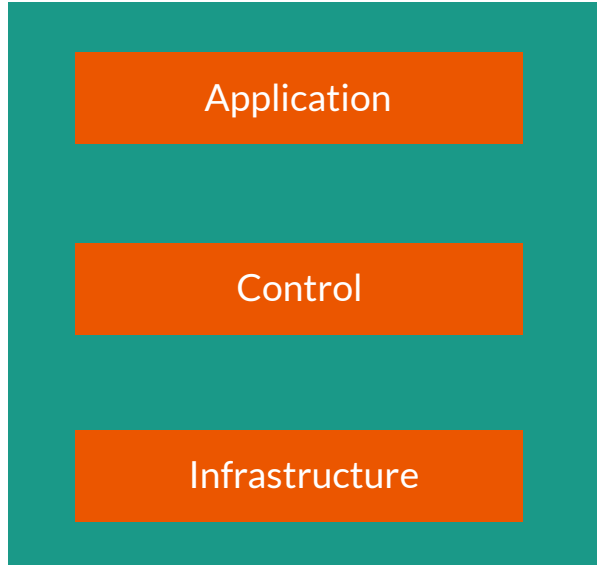
Some proprietary vendors :

HP
VMWare
Cisco
Juniper ….

Some open source vendors :

OpenDaylight by Linux Foundation
OpenContrail by Juniper
Faucet by Reannz-WAND Network Research Group …

Enterprise Network Design | *Industrial Insights*

Software Defined Networking (SDN)

Application

Control

Infrastructure

SDN Controller

SDN Switch

SDN Switch

SDN

Node 1

Node 2

Node 3

Node 4

Enterprise Network Design | *Industrial Insights*

Example SDN Use case(s)

Migration of VM(s) from one DC to another.

Handling network traffic over WAN

Vendor specific network configuration management.

Dynamic network scalability (for ex. VPN provisioning)

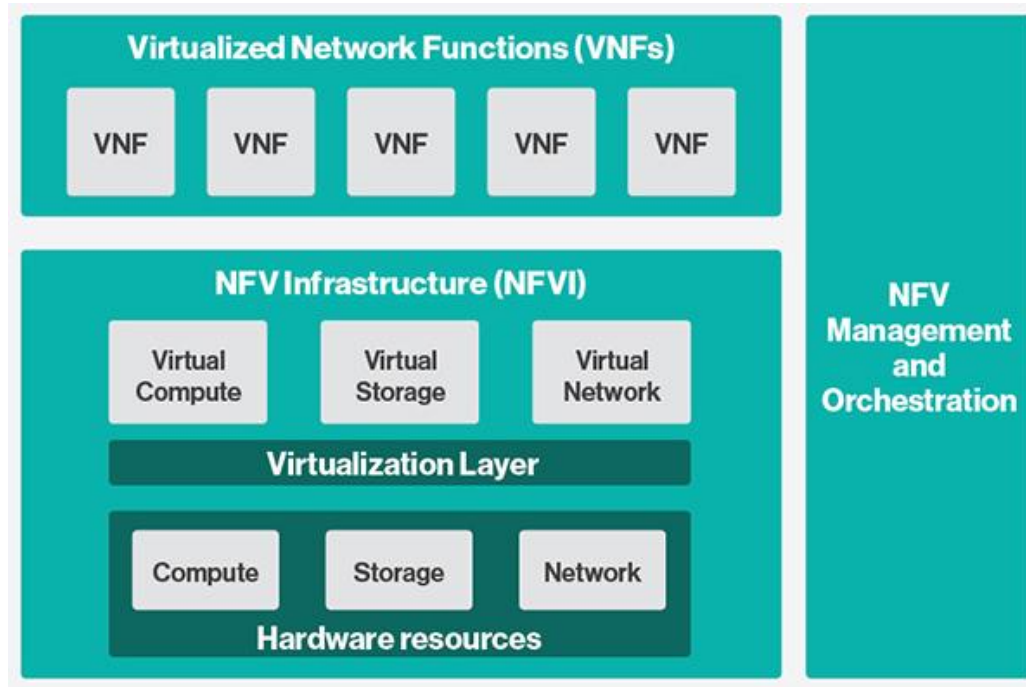**Enterprise Network Design |** *Industrial Insights*

OpenFlow

Protocol that allows to control the forwarding plane. I.e. telling network switches where to send the packets

Different Switch - Different Software

Enterprise Network Design | *Industrial Insights*

NFV (Network Function Virtualization) vs VNF (Virtualized Network Function)

Enterprise Network Design | *Industrial Insights*

Network Design Best Practices

➔ Detailed Diagram

➔ Correct Equipments

➔ Make long term plan.

➔ Security at each step

➔ DR

➔ Proper Cabling

➔ Standardize to save money

➔ Redundancy, Resiliency and High Availability

➔ Monitoring and Management, Out-of-Band Access

➔ Cooling, Power Management

➔ Plenty of research for the plan

Enterprise Network Design | *Industrial Insights*

Must have tools

➔   Dia - for diagrams
➔   Node Red - https://github.com/node-red/node-red (for event driven applications)
➔   Ansible, Chef - IT Automation / Configuration Management
➔   Netmiko , NAPALM - python based network automation
➔   Wireshark , Nagios, Zabbix, OpenNMS, Splunk - Monitoring & Analyzing
➔   GNS3, Cisco Packet Tracer - Network Simulation
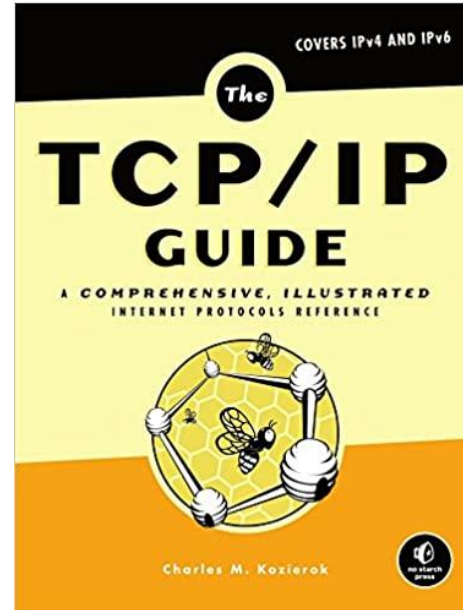➔   Mininet, ns3, OpenNet - SDN Simulators / Emulators

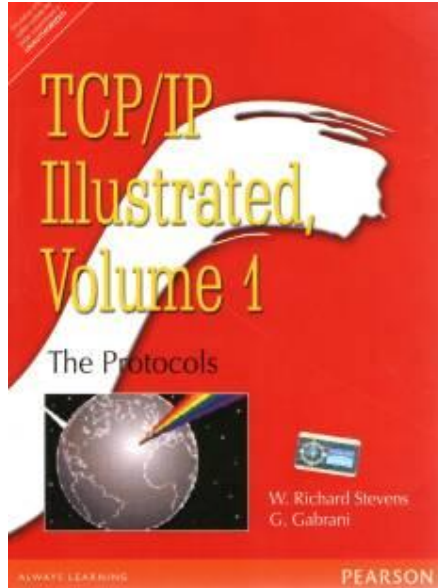**Enterprise Network Design |** *Industrial Insights*

References & Glossary

https://www.liveaction.com/docs/glossary/glossary-of-network-terms/

https://networksimulationtools.com/sdn-projects/

https://github.com/sdnds-tw/awesome-sdn

http://flowgrammable.org/sdn/openflow/

https://www.sdxcentral.com/resources/glossary/

https://www.lanner-america.com/blog/5-examples-nfv-use-cases/#Network_Virtualization_NFV_and_VNF

https://opennetworking.org/wp-content/uploads/2014/10/TR-538_Use_Cases_for_Carrier_Grade_SDN.pdf

Enterprise Network Design | *Industrial Insights*

References & Glossary (continued)

Must have books for strengthening the knowledge of protocols

Enterprise Network Design | *Industrial Insights*

Thank You

Happy Learning