Network Design and Architecture Boot camp

Do you want to become an Architect?

The one and only boot camp in the market today - focusing on designing campus, service provider and data center architectures. During intensive 6-day workshop, we'll demonstrate and discuss topics related to designing scalable, highly available and secure networks. Workshop will be full of discussions in which we'll deep dive into protocol design and its practical applicability to design. We will also go through major new trends in protocols, designs and tools. During scenario discussions, instructors will detail real-life connections between theoretical protocol design and practical network services. This training helps to build a solid understanding of how to build and operate routing policies, security solutions, comparing and analyzing viable options for specific engagements. We'll also go over migration scenarios, as Greenfield networks are rarity today.

As boot camp is focused on practical design scenarios, it's focused on architects, designers and engineers that already have solid fundaments of networking and application knowledge on the level of current CCNA and CCNP certifications. Discussions and scenarios let students get a wide picture of the situation, understand all the possible approaches to solving the problem and then choose best solution. Boot camp is focused on delivering practical, useable knowledge and is built on top of knowledge not readily available in books or other training material.

One of the highlights of the boot camp is having three CCIE/CCDE instructors, experts in their domains. As it's built on workshop-style, students will have a lot of opportunities to discuss their own scenarios, or discuss projects, challenges and interesting cases from the instructor's vast experience. This boot camp is all about practical design skills, knowledge and experience. **This boot camp make excellent solid architects.**

Boot camp also helps to prepare for Design Cisco certifications, like CCDA, CCDP and CCDE.

Course schedule

Monday, hours 8am - 9pm

08:00am - 08:30am - Introduction

08:30am - 10:30am - Design Principles

10 design rules, what is important in a network design, is the latency important? Design process and methodology, the worst design enemy.

10:30am - 12:30pm - Sec Architectures

Security architecture and design principles based on the latest Cisco SAFE. This will cover different network areas (Edge, Campus, WAN, etc.) when security should be implemented and maps technologies/products (firewall, IPS, dot1x, VPN) to the respective places.

12:30pm - 01:30pm - Lunch

01:30pm - 04:30pm - ENT/SP - How SP Sec can protect enterprises?

Using NetFlow/sFlow/jFlow technologies for telemetry & attack visibility with BGP sinkholing, BGP blackholing and use of BGP FlowSpec for specific flow targeting. Also, real use cases of IP Anycast deployment to protect and scale out services and virtualization techniques to provide separation of traffic planes (VLANs, VRFs, overlay networks - GRE/IPv6oIPv4 and VXLAN).

04:30pm - 09:30pm - ENT – Store & Forward, TCAM scenarios

This scenario describes the security design process for a big retailer. It involves technologies like DMVPN, GETVPN, FlexVPN, 802.1x to secure WAN and campus.

Tuesday, hours 8am - 8pm

08:00am - 12:00pm - ENT – Store & Forward, TCAM scenarios

TCAM Bank scenario is about implementing security in the Data Center environments with focus on both physical and virtual devices. Technologies included are firewalling, intrusion prevention, traffic separation, virtualization, data security, etc.

12:00pm - 01:00pm - Lunch

01:00pm - 03:00pm - SP - Scenario Long Cable, Carrier Eth

Carrier Ethernet scenario, how to build a loop free L2 network using xSTP, Open Loop Protocols, L2VPN, MPLS, how to design large scale L2 topologies, solving design concerns, important step to DCI.

03:00pm - 08:00pm - Data Center

Data Center L2 and L3 topologies, how to choose the right topology? Where to place the L2/L3 border? Where to place a default gateway - on a switch, router or firewall? Data Center architectures evolution, a role of xSTP and why we should restrict failure domain. Why and how to replace xSTP? Leaf and spine topology, overlay architectures. Comparison of Fabric Path/Trill, VPLS, OTV, EVPN, STT/VXLAN/NVGRE. Comparison of ACI, NSX, Contrail and Nuage. What are the best practices to connect two, three or more Data Centers? What are DC Interconnect options? Real-life examples and scenarios.

Wednesday, hours 8am - 8pm

08:00am - 12:00pm - Data Center

How to build active/active Data Centers? Do we really need a/a DC? What are the challenges of building a/a DC? How to steer egress and ingress traffic? HSRP localization and ingress optimization. Scenarios around designing multiple Data Centers and migration procedures. Security of North-South and East-West. How to avoid or deal with an asymmetric routing? How virtualization changes DC architecture, security, scalability, performance, and availability? Data Center design including networking and security services like firewalls, IPS, AV, load-balancer, NAT, DNS, SSL offload.

12:00pm - 01:00pm - Lunch

01:00pm - 08:00pm - SP - Internet adjacency inc.

We're going to go through BGP best practices design overview, including Confederations and Route Reflectors for scalability (and trends, like software virtualization for BGP RR deployments), options to speed up convergence (with BFD, next-hop tracking and optimization, BGP PIC and hierarchical FIBs), provide multipathing (BGP AddPath and ECMP load-balancing) and BGP traffic engineering at AS and inter-AS scale (with use of BGP attributes like AS_PATH, LOCALPREF, MED, but also with prefix aggregation and splitting).

Thursday, hours 8am - 8 pm

08:00am - 10:00am - SP - Internet adjacency inc.

MPLS/VPLS usage for typical scenarios, including migrations from pure IP to MPLS, mergers of different MPLS clouds, providing different logical topologies like hub & spoke (RD/RT imports/exports), and separation of customer services in own network for the sake of security.

10:00am - 12:00pm - SP - SR, MPLS-TE, Path Diversity in BGP

MPLS-TE recommendations and best practices for SPs and Enterprises. BGP path diversity options for typical ISP and DC/Enterprise deployments. New trends in virtualization and service chaining - Segment Routing (SR) and Network Service Headers (NSH).

12:00pm - 01:00pm - Lunch

01:00pm - 06:00pm - ENT - Scenario VPN, WAN, IWAN, QoS LAN/WAN

More about specific VPN designs for global WAN. Traffic separation and engineering together with proper QoS is the key factor here.

06:00pm - 08:00pm - ENT - Compliance scenarios

For those students that are struggling with being compliant with industry standards like PCI, SOX or HIPAA - we're going to describe basic requirements and approach to proper security design in such environments.

Friday, hours 8am - 8 pm

08:00am - 12:00pm - ENT, Design Enterprise IPv6, DNS, DHCP, IPAM, services

How to design or redesign Enterprise network keeping IPv6 in mind - dual stack, translate, tunnel? We'll cover major transition technologies like 6rd and coexistence like NAT64. Also, how to scale out and provide HA for typical services - name resolution, address assignment and tracking.

12:00pm - 01:00pm - Lunch

01:00pm - 03:00pm - ENT/SP - Network monitoring, management

Automation and orchestration tools of trade to build or rebuild today's converged solutions, with specific attention given to Ansible, Chef and Puppet.

03:00pm - 05:00pm - ENT/SP - BULB scenario, EIGRP, OSPF

A scenario for a large enterprise company where students find design traps with EIGRP topology. This scenario is related to a convergence, performance and scalability of EIGRP and OSPF. How to migrate between protocols? How to plan large migration?

05:00pm - 07:00pm - ENT/SP - Fast Convergence, Pj, 2h

What is Fast Convergence? A role and optimization of a failure detection, control-plane, data-plane. How to speed up convergence and the traffic switchover? How big IGP areas can we build

without a severe impact? Techniques like IP LFA, Remote IP LFA, BGP PIC. What are micro-loops? Tips and tricks.

07:00pm - 08:00pm - ENT - Mcast

A multicast scenario based on the stock market company case. Students will design a multicast distribution and decide which protocols to use. PIM SM, SSM, mVPN, L2VPN may also be involved.

Saturday, hours 8am - 12pm

08:00am - 12:00pm - Judgment Day

A final challenge scenario for an hour self-pace work. After that an instructor led solution guide part. Mix of Enterprise and SP technologies.