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The workshop materials are based on the content of the extremely successful [Cisco ISP/IXP Workshop](#) programme which ran from 1997 until 2011, built by a cast of dozens of contributors from technical experts inside Cisco to highly experienced network engineers and operators across the Internet community. While the programme is sadly no longer active within Cisco, many industry friends and volunteers still use and develop the materials for use in workshops taking place in the Network Operations Group fora and other gatherings around the world.

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Most of the presentations below have been recorded during 2017 and 2019. If you'd like to see the presentations given live, then please look at [NSRC's Video Collection](#) for this content (and on many other topics as well).

If you have any suggestions for improvements, or any contributions you'd like to make to the materials, these would be most welcome, with full acknowledgements, of course.

## Presentations

Category	Presentation	Notes
Routing	<a href="#">Routing Introduction</a>	How routing works
	<a href="#">OSPF Introduction</a>	25 slide primer on OSPF
	<a href="#">OSPF for ISPs</a>	A lot more detail about OSPF
	<a href="#">OSPF in detail</a>	Out dated now
	<a href="#">IS-IS Introduction</a>	25 slide primer on IS-IS
	<a href="#">IS-IS for ISPs</a>	A lot more detail about IS-IS
	<a href="#">IS-IS in detail</a>	Out dated now
	<a href="#">Comparing IS-IS with OSPF</a>	Valuable comparison between the two protocols
	<a href="#">Migration from OSPF to IS-IS</a>	The simple steps to move from one to the other

Category	Presentation	Notes
BGP	<a href="#">BGP Introduction</a>	Introductory slideset
	<a href="#">Scaling BGP</a>	How to scale BGP for today's networks
	<a href="#">32bit AS Numbers</a>	What they are and how to deploy
	<a href="#">BGP Attributes</a>	Describing all the BGP attributes
	<a href="#">BGP Policy</a>	How to use attributes to implement policy
	<a href="#">BGP Best Current Practices</a>	Industry best current practices
	<a href="#">Transitioning to BGP</a>	How to move from static routed network to using BGP
	<a href="#">Multihoming: Introduction</a>	The whys and wherefores of multihoming
	<a href="#">Multihoming: Inbound TE</a>	Inbound Traffic Engineering Examples
	<a href="#">Multihoming: Outbound TE</a>	Outbound Traffic Engineering
	<a href="#">Multihoming: Deployment</a>	Deploying Multihoming for End-Sites
	<a href="#">BGP Communities</a>	More advanced BGP policy and traffic engineering
	<a href="#">BGP Case Studies</a>	Some multihoming case studies
	<a href="#">Troubleshooting BGP</a>	BGP Troubleshooting (old NOG tutorial)
IPv6	<a href="#">IPv6 Introduction</a>	Why we need to deploy IPv6
	<a href="#">The IPv6 Protocol</a>	All about the protocol and IPv6 standards
	<a href="#">IPv6 Address Planning</a>	How to do IPv6 addressing in a network
	<a href="#">IPv6 Address Planning Exercise</a>	Putting presentation into practice
	<a href="#">IPv6 Routing</a>	Introduction to IPv6 specific features in the common routing protocols
	<a href="#">Introduction to OSPFv3</a>	OSPF for IPv6
	<a href="#">ISIS for IPv6</a>	IPv6 support in IS-IS
	<a href="#">BGP for IPv6</a>	IPv6 support in BGP
	<a href="#">IPv6 Transition Planning</a>	A review of relevant transition mechanisms for today's Internet
	<a href="#">Securing IPv6 Transition Mechanisms</a>	And how to secure these mechanisms
	<a href="#">IPv6 Deployment Study</a>	The simple steps to deploying IPv6 on a network operator's backbone - technical version
	<a href="#">IPv6 Deployment Planning</a>	The simple steps to deploying IPv6 on a network operator's backbone - high level version
	<a href="#">IPv6 Security</a>	And introduction to security for IPv6
	<a href="#">IPv6 Device Hardening</a>	Device hardening, with a focus on IPv6
	<a href="#">IPv6 Routing Security</a>	Implementing routing security, specifically related to IPv6

Category	Presentation	Notes
Design	Internet Introduction	Introductory slideset
	Internet Evolution	The Internet from the 90s until today
	The Value of Peering	Why peering is fundamentally important for the Internet
	IXP Design	The why and how of design and building an IXP
	LINX History	The history of LINX from 1994 to 1997: my experience
	ISP Network Design	The key components for designing a service provider backbone network
	Transit and Peering Network Design	The key components for planning upstream transit and peering connectivity
	How to go about Peering (Private & at IXPs)	
	ISP Systems Design	
Security	Choosing Routers	How to choose a router
	Remotely Triggered Blackhole Filtering	Describing how RTBH filtering works
	BGP Origin Validation	RPKI and securing BGP announcements
	Unicast Reverse Path Forwarding	Implementing uRPF for BCP38

## Labs

Category	Lab Modules	Notes
IPv4	Workshop Setup	
	Introducing IS-IS or Introducing OSPF	
	Introducing iBGP	
	OSPF Areas	
	BGP Route Reflector	
	Cisco IOS Essentials	
	Policy Routing	
	IS-IS, iBGP & eBGP or OSPF, iBGP & eBGP	
	IS-IS, iBGP & eBGP from scratch	For IXP Workshop
	BGP Route Filtering	
	BGP Policy	
	BGP Best Practices	
	Simple IXP	
	Advanced IS-IS & iBGP or Advanced OSPF & iBGP	
	Multi-AS (IS-IS) & Advanced IXP or Multi-AS (OSPF) & Advanced IXP	
	Address Plan for single AS lab	
	Address Plan for 4 AS lab	

Category	Lab Modules	Notes
IPv6	Workshop Setup	
	Introducing IS-IS or Introducing OSPFv3	
	Introducing iBGP	
	OSPF Areas	
	BGP Route Reflectors	
	Migrating from OSPF to IS-IS	
	Migrating Dual Stack OSPF to IS-IS	
	IS-IS, iBGP & eBGP or OSPFv3, iBGP & eBGP	
	IS-IS, iBGP & eBGP from scratch	for IXP Workshop
	BGP Route Filtering	
	BGP Policy	
	IPv6 Access	
	Simple IXP	
	Advanced IS-IS & iBGP or Advanced OSPFv3 & iBGP	
	Multi-AS (IS-IS) & Advanced IXP or Multi-AS (OSPF) & Advanced IXP	
	Address Plan for single AS Labs	
	Address Plan for 4 AS Labs	

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