



The page contains presentations and tutorials Philip has developed and/or presented over the last decade or so. They are all sorted in descending of year. The most recent presentations/tutorials should be considered to be the most up to date versions of the relevant content. Please feel free to reuse these for your own training activities - and do let Philip know about any suggestions for improvements or enhancements to the most recent materials. All feedback is most welcome.

Year	Event	Slideset
2025	BKNIX 2025	<a href="#">RouteViews Technical Update</a>
	ThaiNOG 7	<a href="#">Internet Routing Table Update</a>
2024	LINX 123	<a href="#">IXPs and developments in networking: A 30-year personal review</a>
	Peering Asia 6.0	<a href="#">The RouteViews Project: Update</a>
	NANOG 92	<a href="#">BGP Techniques for Network Operators</a>
		<a href="#">The RouteViews Project: Update</a>
	mnNOG6	<a href="#">The Internet Routing Table using RouteViews</a>
	SGNOG 11	<a href="#">The RouteViews Project: Update</a>
	btNOG 11	<a href="#">The Internet Routing Table using RouteViews</a>
	PhNOG 2024	<a href="#">Philippine Internet Routing Table Update: Using RouteViews</a>
	PacNOG33	<a href="#">Pacific Internet Routing Table Update: Using RouteViews</a>
	ThaiNOG 6	<a href="#">Thailand Internet Routing Table Update: Using RouteViews</a>
IETF 119/ISOC Policymaker Meeting	<a href="#">Overview of Routing &amp; Interconnection</a>	
2023	PacNOG 32	<a href="#">Global Routing Table Update</a>
	Peering Asia 5.0	<a href="#">RouteViews: BGP Global Monitoring Infrastructure and Services</a>
	SANOG 40	<a href="#">Global Routing Table Update</a>
	PhNOG 2023	<a href="#">RouteViews: Global BGP Collector for Operators and Research</a>
	NANOG 88	<a href="#">BGP Techniques for Network Operators Tutorial</a>
	SANOG 39	<a href="#">Global Routing Table Update</a>
2022	APNIC 54	<a href="#">Peering Toolbox</a>
	SANOG 38	<a href="#">Peering Toolbox</a>
		<a href="#">Global Routing Table Update</a>
	PhNOG 2022 Hybr1d	<a href="#">Peering Toolbox</a>
	ThaiNOG 4	<a href="#">RPKI Operations</a>
	BKNIX Peering Forum 2022	<a href="#">Peering Toolbox</a>
	TNC'22	<a href="#">Global R&amp;E Routing Report</a>
	ICTP	<a href="#">Network Operator Groups</a>
	AfNOG 2022	<a href="#">Keynote: Post Pandemic NOG Evolution</a>
ThaiNOG 4	<a href="#">RPKI Operations</a>	

Year	Event	Slideset
2021	mnNOG 3	<a href="#">Keynote: Mongolia's Internet Journey: from bits to Gigabits</a>
	btNOG 8	<a href="#">Keynote: The Events Defining Bhutan's Internet</a>
	APNIC Routing Security SIG Forum	<a href="#">Deploying RPKI and ROV at Cenpac</a>
	SANOG 37	<a href="#">Internet Routing Table Analysis Update</a>
	LKNOG 5	<a href="#">BGP Best Practices</a>
	vPhNOG2.0	<a href="#">R&amp;E Routing Table Update</a>
	AfNOG 2021	<a href="#">Global BCP for Routing Policy &amp; Security</a>
	SANOG 36	<a href="#">Internet Routing Table Analysis Update</a>
2020	LINX Seminar	<a href="#">Rebuilding a Pacific ISP During the Pandemic</a>
	PacNOG 26	<a href="#">Network Monitoring: The Foundation of Campus Security</a>
	APRICOT 2020	<a href="#">APRICOT 2020 RPKI Deployathon Report</a>
	SANOG 35	<a href="#">Internet Routing Table Analysis Update</a>
2019	PacNOG 25	<a href="#">RouteViews: The BGP Collector for Today's Network Operator &amp; Researcher</a>
		<a href="#">Campus Network Design &amp; Operations Introduction</a>
	LINX107	<a href="#">IXPs in Asia &amp; Pacific</a>
	mnNOG 1	<a href="#">RouteViews: The BGP Collector for Today's Network Operator &amp; Researcher</a>
	SANOG 34	<a href="#">Internet Routing Table Analysis Update</a>
	PhNOG 2019 Manila	<a href="#">RouteViews: The BGP Collector for Today's Network Operator &amp; Researcher</a>
	SGNOG7	<a href="#">RouteViews: The BGP Collector for Today's Network Operator &amp; Researcher</a>
	PacNOG 24	<a href="#">RouteViews: The BGP Collector for Today's Network Operator &amp; Researcher</a>
		<a href="#">Campus Network Design &amp; Operations Introduction</a>
	btNOG 6	<a href="#">RouteViews: The BGP Collector for Today's Network Operator &amp; Researcher</a>
	ThaiNOG 2	<a href="#">RouteViews Evolves: Modernizing the BGP Collector for Today's Researcher</a>
	SANOG33	<a href="#">Internet Routing Table Analysis Update</a>
<a href="#">Routing Security Tutorial</a>		
2018	PITA Telecoms Digital Strategy Forum	<a href="#">Modern Interconnects in the Internet Ecosystem</a>
	SANOG32	<a href="#">RouteViews: Enabling Research Through New and Innovative Infrastructure</a>
		<a href="#">Internet IPv4 Routing Table Analysis Update</a>
	btNOG5	<a href="#">Analysis of the Development of IXPs</a>
	BKNIX Peering Forum	<a href="#">Analysis of the Development of IXPs</a>

Year	Event	Slideset
2017	APNIC44	IPv6 Transition Strategies
	LINX98	IXPs around Asia
		LINX 1994-1997
	SANOG30	Internet IPv4 Routing Table Analysis Update
		External BGP Route Propagation Behaviour without Policies
		IPv6 Deployment Planning
		IXP Design Best Practices
		RIPE Atlas Intro (on behalf of RIPE NCC)
	BhutanNOG 4	Internet Futures in Bhutan
	SANOG29	Internet IPv4 Routing Table Analysis Update
IPv6 Transition Strategies		
IPv6 Deployment Planning		
RIPE Atlas Intro (on behalf of RIPE NCC)		
2016	BTNOG 3	Internet IPv4 Routing Table Analysis Update
	APNIC 42	IPv6 Transition Strategies
		IXP Design Best Practices
	APRICOT 2016	BGP Techniques for Network Operators
		BGP Multihoming Techniques
		Troubleshooting BGP
		Virtualisation for Network Testing & Staff Training
	SANOG 27	BGP Techniques for Network Operators
		BGP Multihoming Techniques
		Virtualisation for Testing & Staff Training
Internet IPv4 Routing Table Analysis Update		
2015	APRICOT 2015	IPv6 Transition Strategies
		IPv6 Deployment Planning
	MENOG 15	Internet IPv4 Routing Table Analysis Update
	PacNOG 17	A Practical IPv6 Introduction
	SAFNOG 2	Migrating from OSPF to IS-IS
		Internet IPv4 Routing Table Analysis Update
	SANOG 25	BGP Techniques for Internet Service Providers
		BGP Multihoming Techniques
IPv6 Transition Strategies		
IPv6 Deployment Planning		
	Internet IPv4 Routing Table Analysis Update	

Year	Event	Slideset
2014	AfNOG 2014	<a href="#">Routing Table Update</a>
	APNIC 38	<a href="#">IPv6 Transition Strategies</a>
		<a href="#">IPv6 Deployment Planning</a>
	BDNOG 1	<a href="#">BGP Techniques for Internet Service Providers</a>
		<a href="#">BGP Multihoming Techniques</a>
		<a href="#">Internet Development: Experiences &amp; Lessons</a>
	BTNOG 1	<a href="#">Internet IPv4 Routing Table Analysis Update</a>
		<a href="#">Internet in Bhutan</a>
		<a href="#">DrukREN Technical Design</a>
	MENOG 14	<a href="#">Internet IPv4 Routing Table Analysis Update</a>
		<a href="#">IPv6 Transition Strategies</a>
	PacNOG 16	<a href="#">IPv6 Deployment Planning</a>
SAFNOG 1	<a href="#">Peering and IXPs</a>	
SANOG 23	<a href="#">BGP Best Current Practices</a>	
	<a href="#">BGP Techniques for Internet Service Providers</a>	
	<a href="#">IPv6 Essentials</a>	
	<a href="#">IPv6 Transition Planning</a>	
2013	AfNOG 2013	<a href="#">IPv6 Deployment Planning</a>
		<a href="#">NOG Update</a>
	APNIC 36	<a href="#">BGP Techniques for Internet Service Providers</a>
		<a href="#">BGP Multihoming Techniques</a>
		<a href="#">IPv6 Transition Strategies</a>
		<a href="#">IPv6 Deployment Planning</a>
	APRICOT 2013	<a href="#">IPv6 Introduction</a>
		<a href="#">IPv6 Transition Technologies</a>
		<a href="#">IPv6 Deployment Planning</a>
	CaribNOG 5	<a href="#">BGP Multihoming Techniques</a>
		<a href="#">Internet Routing Table Analysis Update</a>
		<a href="#">Peering, Transit and IXP Design</a>
MENOG 13	<a href="#">Internet Exchange Point Design</a>	
	<a href="#">BGP Multihoming Techniques</a>	
MyNOG 3	<a href="#">IPv6 Transition Strategies</a>	
	<a href="#">Migrating from OSPF to IS-IS</a>	
SANOG 22	<a href="#">Internet Routing Table Analysis Update</a>	

Year	Event	Slideset
2012	APRICOT 2012	BGP Multihoming Techniques
		Migrating from OSPF to IS-IS
	AfNOG 2012	BGP Multihoming Techniques
	APNIC 34	IPv6 Address Planning
		ISP & IXP Design
	MENOG 10	BGP Multihoming Techniques
		Migrating from OSPF to IS-IS
	MENOG 11	IPv6 Address Planning
		ISP & IXP Design
Peering, Transit & IXPs		
MyNOG 2	BGP Multihoming Techniques	
	IPv6 Address Planning	
	Internet Routing Table Analysis Update	
NZNOG 2012	Migrating from OSPF to IS-IS	
PacNOG 12	Peering, Transit and IXP Design	
SANOG 20	Internet Routing Table Analysis Update	
2011	APRICOT 2011	BGP Techniques for Internet Service Providers
		IPv6 Addressing & Routing Protocols
	AfNOG 2011	Routing Table Update
		BGP Techniques for Internet Service Providers
		BGP Multihoming
		Troubleshooting BGP
	PacNOG 9	Towards an IPv6-only network
PacNOG 10	IPv6 Deployment Planning	
SANOG 17	Internet Routing Table Analysis Update	
SANOG 18	Internet Routing Table Analysis Update	
2010	AfNOG 2010	NOG Updates
	APAN 29	The Next Three Years
	APRICOT 2010	BGP Techniques for Internet Service Providers
	NANOG 50	BGP Techniques for Internet Service Providers
	NZNOG 2010	The Next Three Years: IPv6, IPv4 runout and 4-byte ASNs
	PacNOG 7	Introduction to Cloud Computing
	PacNOG 8	IPv6 and 4-byte ASN update
	RIPE NCC Regional Meeting Moscow	Network Operations Groups around the World
	SANOG 15	Internet Routing Table Analysis Update
	SANOG 16	Network Operations Groups around the World
Internet Routing Table Analysis Update		
		Troubleshooting BGP

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2009	AfNOG 2009	<a href="#">Routing Table Update</a>
		<a href="#">NOG Updates</a>
	APRICOT 2009	<a href="#">BGP Techniques for Internet Service Providers</a>
		<a href="#">BGP Multihoming Techniques</a>
	Australian Computer Society ACS2009	<a href="#">The Next Three Years</a>
	MENO 5	<a href="#">IPv6 Deployment Study</a>
		<a href="#">32-bit ASNs</a>
		<a href="#">The Next Three Years: IPv4 runout and the motivation for IPv6</a>
		<a href="#">Internet Routing Table Analysis Update</a>
		<a href="#">IPv6 Technical &amp; Service Considerations</a>
	RIPE 58	<a href="#">2008-06: Use of Final /8 (v2)</a>
		<a href="#">2008-07:Ensuring efficient use of IPv4 resources (v2)</a>
	SANOG 13	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>
	SANOG 14	<a href="#">32-bit ASNs</a>
<a href="#">BGP Multihoming Techniques</a>		
<a href="#">Troubleshooting BGP</a>		
<a href="#">Network Operations Groups</a>		

Year	Event	Slideset
2008	AfNOG 2008	<a href="#">NOG Updates</a>
	AfriNIC 9	<a href="#">How Cisco is preparing for IPv6</a>
	APRICOT 2008	<a href="#">Troubleshooting BGP</a>
		<a href="#">BGP Aggregation &amp; Deaggregation Report</a>
	Cisco AU ISP Roadshow	<a href="#">Internet Status</a>
	JANOG 22	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>
		<a href="#">Network Operations Groups</a>
	MENOG 3	<a href="#">BGP Techniques for Internet Service Providers</a>
		<a href="#">IPv6 Addressing &amp; Routing Protocols</a>
	MENOG 4	<a href="#">IS-IS Tutorial</a>
		<a href="#">Network Operations Groups Update</a>
	NANOG 42	<a href="#">Introduction to IPv6</a>
		<a href="#">Troubleshooting BGP</a>
	NANOG 44	<a href="#">BGP Techniques for Internet Service Providers</a>
		<a href="#">IPv6 Addressing &amp; Routing Protocols</a>
	Netnod IPv6 Conference	<a href="#">IPv6 @ NANOG, APRICOT and other places</a>
		<a href="#">IPv6 Address &amp; Routing Protocols</a>
	NZNOG 2008	<a href="#">32-bit ASNs</a>
		<a href="#">BGP Techniques for Internet Service Providers</a>
		<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>
OECD ITC 2008	<a href="#">The State of the Internet Routing Infrastructure</a>	
PacNOG 4	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>	
	<a href="#">Network Operations Groups</a>	
PhNOG 3	<a href="#">IPv6 @ NANOG, APRICOT and other places</a>	
RIPE 56	<a href="#">Network Operations Groups</a>	
RIPE 57	<a href="#">Proposal 2008-06: Use of Final /8</a>	
	<a href="#">Proposal 2008-07: Ensuring efficient use of historical IPv4 resources</a>	
SANOG 11	<a href="#">32-bit ASNs</a>	
	<a href="#">BGP Techniques for Internet Service Providers</a>	
	<a href="#">Improving the Internet Infrastructure</a>	
	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>	
SANOG 12	<a href="#">BGP Multihoming Techniques</a>	
	<a href="#">Troubleshooting BGP</a>	
	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>	

Year	Event	Slideset
2007	AfNOG 2007	<a href="#">Internet Routing &amp; Deaggregation Report</a>
		<a href="#">32-bit ASNs</a>
		<a href="#">Advanced Routing Workshop</a>
		<a href="#">BGP Multihoming Techniques</a>
	AfriNIC 7	<a href="#">32-bit ASNs</a>
		<a href="#">IPv6 at Cisco</a>
	APRICOT 2007	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>
		<a href="#">BGP Techniques for Internet Service Providers</a>
	ARIN 20	<a href="#">IPv6 Addressing &amp; Routing Protocols</a>
	MENOG 1	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a> <a href="#">BGP Multihoming Techniques</a>
	MENOG 2	<a href="#">32-bit ASNs</a>
		<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>
		<a href="#">IPv6 Routing Protocols: What has changed?</a>
		<a href="#">IPv6 Addressing &amp; Routing Protocols</a>
	NANOG 39	<a href="#">BGP Techniques for Internet Service Providers</a>
		<a href="#">BGP Deaggregation Report</a> <a href="#">Troubleshooting BGP</a>
	NANOG 40	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>
	NANOG 41	<a href="#">BGP Multihoming Techniques</a>
	PacNOG 3	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>
	PhNOG 1	<a href="#">BGP Multihoming Techniques</a>
PhNOG 2	<a href="#">Improving the Internet Infrastructure</a>	
	<a href="#">BGP Route Aggregation Best Practices</a>	
SANOG 9	<a href="#">BGP Techniques for Internet Service Providers</a>	
	<a href="#">BGP Multihoming Techniques</a>	
	<a href="#">BGP Route Aggregation Best Practices</a>	
	<a href="#">Internet Routing Table Analysis Update</a>	
SANOG 10	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>	
	<a href="#">BGP Multihoming Techniques</a>	
UKNOF 8	<a href="#">BGP Best Practices</a>	
	<a href="#">BGP Aggregation &amp; The Deaggregation Report</a>	

Year	Event	Slideset
2006	AfNOG 2006	BGP Multihoming Techniques
	AfrINIC 5	Aggregation Recommendations
		IPv6: A Global Perspective
		BGP Techniques for Internet Service Providers
	APNIC 22	BGP Tutorial
		BGP Multihoming Techniques
		Troubleshooting BGP
	APRICOT 2006	Deploying BGP
		BGP Multihoming Techniques
	NANOG 36	Troubleshooting BGP
		BGP Techniques for Internet Service Providers
	NANOG 37	BGP Techniques for Internet Service Providers
	NANOG 38	BGP Multihoming Techniques
	NZNOC 2006	Deploying BGP
		BGP Multihoming Techniques
Troubleshooting BGP		
QUESTnet 2006	BGP Techniques for Providers	
RIPE 52	BGP Flap Damping: Deprecating RIPE-229	
RIPE 53	Route Aggregation Recommendations	
RIPE NCC Regional Meeting Bahrain	BGP Best Practices	
SANOG 7	NGP Multihoming & Internet Exchange Points	
	Internet Routing Table Analysis Update	
SANOG 8	Scaling IGPs in ISP Networks	
	BGP Multihoming Techniques	
	Internet Routing Table Analysis Update	
2005	APNIC 20	BGP Flap Damping: Where to now?
	APRICOT 2005	Deploying BGP
		Troubleshooting BGP
	NANOG 33	Troubleshooting BGP
	NANOG 34	BGP Techniques for Internet Service Providers
	NANOG 35	BGP Multihoming Techniques
	RIPE 50	Aggregation (?)
		BGP Flap Damping
	RIPE 51	BGP Flap Damping: Where to now?
SANOG 5	Internet Routing Table Analysis Update	
	IPv6 Tutorial	
SANOG 6	Aggregation (?)	

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2004	APRICOT 2004	<a href="#">BGP Tutorial</a>
		<a href="#">BGP Multihoming</a>
	NANOG 31	<a href="#">BGP Techniques for Internet Service Providers</a>
	NANOG 32	<a href="#">BGP Multihoming Techniques</a>
	NZNOG 2004	<a href="#">Troubleshooting BGP</a>
	RIPE NCC Regional Meeting Moscow	<a href="#">ripencc-moscow-routing.pdf</a>
	SANOG 3	<a href="#">BGP enhancements for IPv6</a>
		<a href="#">IPv6 Multicast</a>
<a href="#">BGP Multihoming Techniques</a>		
<a href="#">Internet Routing Table Analysis Update</a>		
SANOG 4	<a href="#">Internet Routing Table Analysis Update</a>	
2003	AfNOG 2003	<a href="#">Troubleshooting BGP</a>
	APNIC 16	<a href="#">BGP Multihoming</a>
		<a href="#">Catching Worms at APNIC 16</a>
	APRICOT 2003	<a href="#">Routing Table Update</a>
		<a href="#">BGP Tutorial</a>
		<a href="#">BGP Deployment Technqies</a>
		<a href="#">BGP Multihoming</a>
		<a href="#">BGP Troubleshooting</a>
	NANOG 27	<a href="#">BGP for Internet Service Providers</a>
	NANOG 28	<a href="#">BGP Multihoming Techniques</a>
	NANOG 29	<a href="#">BGP Troubleshooting</a>
	RIPE 44	<a href="#">Internet Routing Table Analysis Update</a>
	RIPE 45	<a href="#">Day in the Life of a BGP Update in Cisco IOS</a>
	RIPE NCC Regional Meeting Dubai	<a href="#">Introduction to Routing</a>
	SANOG 1	<a href="#">BGP for Internet Service Providers</a>
<a href="#">BGP Multihoming Techniques</a>		
SANOG 2	<a href="#">ISP Essentials</a>	
	<a href="#">BGP Multihoming Techniques</a>	
2002	AfNOG 2002	<a href="#">BGP for Internet Service Providers</a>
	APNIC 14	<a href="#">BGP Multihoming</a>
	APRICOT 2002	<a href="#">Routing Table Update</a>
	IEPG @ IETF54	<a href="#">Routing Table Update</a>
	KIOW 2002	<a href="#">BGP for Internet Service Providers</a>
	NANOG 25	<a href="#">IXes in the AP Region</a>
		<a href="#">BGP for Internet Service Providers</a>
	NANOG 26	<a href="#">Troubleshooting BGP</a>
	RIPE 41	<a href="#">Internet Routing Table Analysis Update</a>
	RIPE 42	<a href="#">Internet Routing Table Analysis Update</a>

Year	Event	Slideset
2001	APNIC 12	<a href="#">Internet Routing Analysis</a>
	APRICOT 2001	<a href="#">Promoting Routability</a>
		<a href="#">BGP Multihoming</a>
	ARIN 7	<a href="#">Internet Routing Table Analysis Update</a>
	AUUG 2001	<a href="#">Router Security</a>
	NANOG 22	<a href="#">BGP Tutorial</a>
	NANOG 23	<a href="#">BGP Multihoming Techniques</a>
	RIPE 38	<a href="#">Internet Routing Table Analysis Update</a>
RIPE 39	<a href="#">Revisions to RIPE 210: Coordinated Route Flap Damping Parameters</a>	
RIPE 40	<a href="#">BGP for Internet Service Providers</a>	
2000	IEPG@IETF49	<a href="#">Internet Routing Table Analysis Update</a>
	ISPCON 2K	<a href="#">Promoting Routability</a>
		<a href="#">BGP Multihoming</a>
	RIPE 37	<a href="#">Internet Routing Table Analysis Update</a>
<a href="#">BGP Flap Damping</a>		
1999	APRICOT 99	<a href="#">Promoting Routability</a>
1998	APRICOT 98	<a href="#">Promoting Routability</a>

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