



DEPARTMENT OF INFRASTRUCTURE AND ENERGY

Technical Aspects of Setting up, Operating and Administering Internet Exchange Points (IXPs)

DAY 1 “IP Resources and Routing Basics”

08:00 – 08:30 **Registration**

08:30 – 10:30 **Introduction to Internet Protocol (IP) and Number Resources** *Facilitator:*

- Introduction to IPv4 and IPv6
- Internet Number Resources

10:30 – 11:00 **Coffee Break**

11:00 – 13:00 **Introduction to Routing** *Facilitator:*

- Routing Basics

13:00 – 14:00 **Networking & Lunch**

14:00 – 16:00 **Introduction to Internal Gateway Protocols (IGPs)** *Facilitator:*

- Introduction to OSPF v2
- OSPF Deployment for ISPs

16:00 – 16:30 **Coffee break**

16:30 – 18:00 **OSPF Lab Exercises** *Facilitator:*

- Basic OSPF (Module 01a. IPv4 + OSPFv2)

DAY 2 “Introduction to BGP”

08:00 – 08:30

08:30 – 10:30 **Introduction to Exterior Gateway Protocol (EGPs)** *Facilitator:*

- Introduction to BGP

10:30 – 11:00 **Coffee Break**

	<i>Facilitator:</i>
	<i>BGP Hands-on Lab Exercise</i>
11:00 – 13:00	<ul style="list-style-type: none"> • iBGP Lab Exercise (Module 1c. IPv4+OSPFv2 + iBGP)
13:00 – 14:00	Networking & Lunch
14:00 – 16:00	<i>BGP Attributes and Scaling Techniques</i> <i>Facilitator:</i> <ul style="list-style-type: none"> • BGP Scaling Techniques • BGP Attributes
16:00 – 16:30	Coffee break
	<i>Facilitator:</i>
	<i>BGP Hands-on Lab Exercise</i>
16:30 – 18:00	<ul style="list-style-type: none"> • eBGP Lab Exercise (Module 6a. IPv4+OSPFv2 + iBGP + eBGP)

DAY 3 “BGP Policy Control and Multihoming”

08:00 – 08:30	Registration	
08:30 – 10:30	<i>BGP Policy and Best Practices</i> <i>Facilitator:</i> <ul style="list-style-type: none"> • Implementing BGP Policy Controls • BGP Best Practices for ISPs 	
10:30 – 11:00	Coffee Break	
	<i>Facilitator:</i>	
	<i>BGP Policy Control Hands-on Lab Exercise</i>	
11:00 – 13:00	<ul style="list-style-type: none"> • BGP Filtering Exercise (Module 7 IPv4 +OSPF+ iBGP + eBGP + Prefix-Lists and ASN Path) 	
13:00 – 14:00	Networking & Lunch	
14:00 – 16:00	<ul style="list-style-type: none"> • BGP Filtering Exercise • (Module 7 IPv4 +OSPF+ iBGP + eBGP + BGP Communities) 	<i>Facilitator:</i>
16:00 – 16:30	Coffee break	
	<i>Introduction to Multi-homing</i>	
16:30 – 18:00	<ul style="list-style-type: none"> • Simple Multi-homing • Advanced Multi-homing Techniques 	<i>Facilitator:</i>

DAY 4 “Introduction to Internet Exchange Points”

08:00 – 08:30

Registration

08:30 – 10:30

- Multi-homing Hands-on Lab Exercise *Facilitator:*
 - BGP Local Preference Exercise
(Module 8. IPv4 + OSPF+iBGP+eBGP+PrefixList+LocalPref)
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10:30 – 11:00

Coffee Break

11:00 – 13:00

- Multi-homing Hands-on Lab Exercise *Facilitator:*
- BGP Local Preference Exercise
(Module 8. IPv4 + OSPF+iBGP+eBGP+PrefixList+AS Path-Prepend)

Scalable Network Design

- ISP Network Design
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13:00 – 14:00

Networking & Lunch

14:00 – 16:00

Introduction to Internet Exchange Points (IXPs) *Facilitator:*

- Value of Peering
 - IXP Network Design
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16:00 – 16:30

Coffee break

16:30 – 18:00

IXP Hands-on Lab Exercise

- Advanced IXP Lab Exercise *Facilitator:*
(Module 16a OSPF+iBGP+eBGP+IXP+Transit)
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DAY 5 “IXP and Traffic Monitoring”

08:00 – 08:30

Registration

08:30 – 10:30

IXP Hands-on Lab Exercise

Facilitator:

- Advanced IXP Lab Exercise
(Module 16a
OSPF+iBGP+eBGP+IXP+Transit)
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10:30 – 11:00

Coffee Break

IXP Hands-on Lab Exercise

Facilitator:

11:00 – 13:00

- Advanced IXP Lab Exercise
(Module 16a
OSPF+iBGP+eBGP+IXP+Transit)
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13:00 – 14:00

Networking & Lunch

14:00 – 16:00

Network Monitoring & Value Added Services

Facilitator:

- Traffic Monitoring and Flow Analysis
 - Selecting an IXP
 - PeeringDB and Role of Peering Coordinator
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16:00 – 16:30

Coffee break

16:30 – 18:00

Way Forward and Certificate Ceremony
