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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. While the programme is sadly no longer active within Cisco, many industry friends and volunteers still use and develop the materials for use in workshops taking place in the Network Operations Group fora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.

If you like the materials, and want to make derivative works, Philip is happy for you to do that. Just please acknowledge Philip, Cisco, and the [Network Startup Resource Center](#), without whom this collection of training materials would simply not be available.

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="#">Internet Introduction</a>        | Introductory slideset                                |
|          | <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       |
| 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="#">Simple Multihoming</a>           | Some simple multihoming examples                     |
|          | <a href="#">Advanced Multihoming</a>         | Follow on, more detailed look at traffic engineering |
|          | <a href="#">BGP Communities</a>              | More advanced BGP policy and traffic engineering     |

| Category | Presentation                                           | Notes                                                                                    |
|----------|--------------------------------------------------------|------------------------------------------------------------------------------------------|
| 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                              |
| Design   | <a href="#">The Value of Peering</a>                   | Why peering is fundamentally important for the Internet                                  |
|          | <a href="#">ISP Network Design</a>                     |                                                                                          |
|          | <a href="#">ISP Systems Design</a>                     |                                                                                          |
|          | <a href="#">IXP Design</a>                             | The why and how of design and building an IXP                                            |
|          | <a href="#">LINX History</a>                           | My experiences with the early history of LINX                                            |
|          | <a href="#">Choosing Routers</a>                       | How to choose a router                                                                   |
| Security | <a href="#">Remotely Triggered Blackhole Filtering</a> | Describing how RTBH filtering works                                                      |
|          | <a href="#">BGP Origin Validation</a>                  | RPKI and securing BGP announcements                                                      |

## Labs

| Category | Lab Modules                                                                               | Notes            |
|----------|-------------------------------------------------------------------------------------------|------------------|
| IPv4     | <a href="#">Workshop Setup</a>                                                            |                  |
|          | <a href="#">Introducing IS-IS or Introducing OSPF</a>                                     |                  |
|          | <a href="#">Introducing iBGP</a>                                                          |                  |
|          | <a href="#">OSPF Areas</a>                                                                |                  |
|          | <a href="#">BGP Route Reflector</a>                                                       |                  |
|          | <a href="#">Cisco IOS Essentials</a>                                                      |                  |
|          | <a href="#">Policy Routing</a>                                                            |                  |
|          | <a href="#">IS-IS, iBGP &amp; eBGP or OSPF, iBGP &amp; eBGP</a>                           |                  |
|          | <a href="#">IS-IS, iBGP &amp; eBGP from scratch</a>                                       | For IXP Workshop |
|          | <a href="#">BGP Route Filtering</a>                                                       |                  |
|          | <a href="#">BGP Policy</a>                                                                |                  |
|          | <a href="#">BGP Best Practices</a>                                                        |                  |
|          | <a href="#">Simple IXP</a>                                                                |                  |
|          | <a href="#">Advanced IS-IS &amp; iBGP or Advanced OSPF &amp; iBGP</a>                     |                  |
|          | <a href="#">Multi-AS (IS-IS) &amp; Advanced IXP or Multi-AS (OSPF) &amp; Advanced IXP</a> |                  |
|          | <a href="#">Address Plan for single AS lab</a>                                            |                  |
|          | <a href="#">Address Plan for 4 AS lab</a>                                                 |                  |
| IPv6     | <a href="#">Workshop Setup</a>                                                            |                  |
|          | <a href="#">Introducing IS-IS or Introducing OSPFv3</a>                                   |                  |
|          | <a href="#">Introducing iBGP</a>                                                          |                  |
|          | <a href="#">OSPF Areas</a>                                                                |                  |
|          | <a href="#">BGP Route Reflectors</a>                                                      |                  |
|          | <a href="#">Migrating from OSPF to IS-IS</a>                                              |                  |
|          | <a href="#">Migrating Dual Stack OSPF to IS-IS</a>                                        |                  |
|          | <a href="#">IS-IS, iBGP &amp; eBGP or OSPFv3, iBGP &amp; eBGP</a>                         |                  |
|          | <a href="#">IS-IS, iBGP &amp; eBGP from scratch</a>                                       | for IXP Workshop |
|          | <a href="#">BGP Route Filtering</a>                                                       |                  |
|          | <a href="#">BGP Policy</a>                                                                |                  |
|          | <a href="#">IPv6 Access</a>                                                               |                  |
|          | <a href="#">Simple IXP</a>                                                                |                  |
|          | <a href="#">Advanced IS-IS &amp; iBGP or Advanced OSPFv3 &amp; iBGP</a>                   |                  |
|          | <a href="#">Multi-AS (IS-IS) &amp; Advanced IXP or Multi-AS (OSPF) &amp; Advanced IXP</a> |                  |
|          | <a href="#">Address Plan for single AS Labs</a>                                           |                  |
|          | <a href="#">Address Plan for 4 AS Labs</a>                                                |                  |

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