



**Course No:** (TWI-JUN -ISIS)

**Length:** 3 days

## About this Course

This course covers not only the most common details, but also goes into the corner-case deployments of the IS-IS routing protocol. Every module is accompanied with a hands-on lab to reinforce the concepts learned during the presentation. Each student that participates will receive a copy of "The Complete IS-IS Routing Protocol" co-authored by Hannes Gredler and Walter Goralski which is without question the single best reference to the IS-IS protocol.

## Prerequisites

A student following the IS-IS Protocol in-Depth should be familiar with operational and configuration modes in the Juniper Networks JUNOS operating system.

## Course Contents

Day One

### Introduction, historical background and IS-IS basics

- The historical background to the IS-IS protocol
- IS-IS terminology
- The difference between Areas and Levels
- IS-IS addressing
- The IS-IS packet types
- Hands on Lab

### Neighbor Discovery, Handshaking and Fragmentation with IS-IS

- Hello PDU encoding, LAN Hellos & Point-to-Point Hellos
- MTU Check
- Handshaking on Broadcast and P2P media
- Sub-net Checking
- Convergence and Neighbor Liveliness Detection
- Graceful Restart
- Hands on Lab

### Designated Routers and Pseudonodes

- Scalability issues on broadcast multi-access networks with multiple nodes
- Timer Jittering – how and why
- Pseudonode representation in the Link State Database (LSDB)
- DIS Election procedures and Redundancy
- Suppression of Pseudonodes on Point-to-Point LANS
- Hands on Lab

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## Day Two

### **Generation and Flooding of LSP's**

- Distributed Databases, Local Computation model
- LSP revision control
- The structure of LSP's
- The Overload function applications
- IS-IS flooding operation
- Pruning the flooding topology with Mesh-Groups
- Hands on Lab

### **Database Synchronization**

- LSDB Synchronization overview
- LSDB synchronized procedures on LAN Circuits
- LSDB synchronized procedures on P2P Circuits
- Hands on Lab

### **SPF and Route Calculation**

- The three steps required for Route Calculation
- How the SPF Algorithm works
- Pseudonode processing
- SPF variations
- Route Resolution
- Prefix Insertion
- Hands on Lab



Day Three

### **TLV's, Sub-TLV and IP Reachability Information**

- Protocol Extensibility
- TLV format and encoding
- Examination of the most common TLV's used in LSP's
- Why also SubTLV's?
- TLV Checking
- Old style versus new style and metrics
- Route leaking effects on TLV's
- Hands on Lab

### **IS-IS Network Design**

- The difference between Topology and Reachability Information
- The reasons for Router Stress
- Design recommendations for scalable IS-IS networks
- Hands on Lab
- Troubleshooting IS-IS
- Troubleshooting methodology
- Tools available for troubleshooting
- Case studies of common issues
- Hands on Lab

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