

### Interdomain Part (IDP)

Portion of the address used in routing between autonomous systems; assigned by ISO

### Domain-Specific Part (DSP)

Portion of the address relevant only within the local AS

### Authority and Format Identifier (AFI)

Identifies the authority which dictates the format of the address

### Initial Domain Identifier (IDI)

An organization belonging to the AFI

### High Order DSP (HODSP)

The area within the AS

### System ID

Unique router identifier; 48 bits for Cisco devices (often taken from a MAC address)

### NSAP Selector (SEL)

Identifies a network layer service; always 0x00 in a NET address

### Network Types

	Broadcast	Point-to-Point
<b>DIS Elected</b>	Yes	No
<b>Neighbor Discovery</b>	Yes	Yes
<b>Hello/Dead Timers</b>	10/30	10/30

### Troubleshooting

show ip route	show isis spf-log
show ip protocols	debug isis spf-events
show [clns isis] neighbor	debug isis adjacencies-packets
show [clns isis] interface	debug isis spf-statistics
show isis database	debug isis update-packets

### Attributes

<b>Type</b>	Link-State
<b>Algorithm</b>	Dijkstra
<b>Metric</b>	Default (10)
<b>AD</b>	115
<b>Standard</b>	ISO 10589
<b>Protocols</b>	IP, CLNS
<b>Transport</b>	Layer 2
<b>Authentication</b>	Plaintext, MD5

### Routing Levels

<b>Level 0</b>	Used to locate end systems
<b>Level 1</b>	Routing within an area
<b>Level 2</b>	Backbone between areas
<b>Level 3</b>	Inter-AS routing

### Terminology

#### Type-Length-Value (TLV)

Variable-length modular datasets

#### Link State PDU (LSP)

Carry TLVs encompassing link state information

#### Sequence Number Packet (SNP)

Used to request and advertise LSPs; can be complete (CSNP) or partial (PSNP)

#### Hello Packet

Establishes and maintains neighbor adjacencies

#### Designated Intermediate System

A pseudonode responsible for emulating point-to-point links across a multi-access segment

### Adjacency Requirements

- Interface MTUs must match
- Levels must match
- Areas must match (if level 1)
- System IDs must be unique
- Authentication must succeed

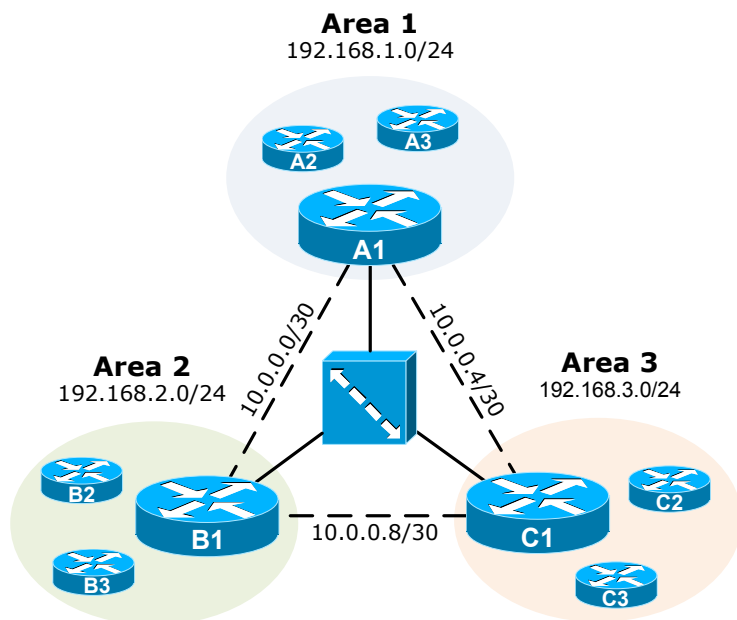
### DIS Election

- Highest-priority interface elected
- Highest SNPA (MAC/DLCI) breaks tie
- Highest system ID breaks SNPA tie
- Default interface priority is 64
- Current DIS may be preempted

## TLV Types

Name	Use	Name	Use	Name	Use
<b>1</b> Area Addresses	Hello, LSP	<b>6</b> IS Neighbors	Hello, L2 LSP	<b>128</b> IP Internal Reach.	LSP
<b>2</b> IS Neighbors	LSP	<b>8</b> Padding	Hello	<b>129</b> Protocols Supported	Hello, LSP
<b>3</b> ES Neighbors	L1 LSP	<b>9</b> LSP Entries	SNP	<b>131</b> IDRPI	SNP, L2 LSP
<b>5</b> Prefix Neighbors	L2 LSP	<b>10</b> Authentication	All	<b>132</b> IP Interface Address	Hello, LSP

## Configuration Example



## Router A2

```
interface FastEthernet0/0
description Area 1
ip address 192.168.1.2 255.255.255.0
ip router isis
isis circuit-type level-1
!
router isis
net 49.0001.0000.0000.00a2.00
```

## Router B2

```
interface FastEthernet0/0
description Area 2
ip address 192.168.2.2 255.255.255.0
ip router isis
isis circuit-type level-1
!
router isis
net 49.0002.0000.0000.00b2.00
```

## Router A1

```
interface FastEthernet0/0
description Area 1
ip address 192.168.1.1 255.255.255.0
ip router isis
isis circuit-type level-1
!
interface Serial1/0
no ip address
encapsulation frame-relay
!
interface Serial1/0.1 point-to-point
description To Area 2
ip address 10.0.0.1 255.255.255.252
ip router isis
isis circuit-type level-2-only
! MD5 authentication (keychain not shown)
isis authentication mode md5
isis authentication key-chain <keychain>
frame-relay interface-dlci 101
!
interface Serial1/0.2 point-to-point
description To Area 3
ip address 10.0.0.5 255.255.255.252
ip router isis
isis circuit-type level-2-only
frame-relay interface-dlci 102
!
router isis
net 49.0001.0000.0000.00a1.00
```

## Router B1

```
interface FastEthernet0/0
description Area 2
ip address 192.168.2.1 255.255.255.0
ip router isis
isis circuit-type level-1
!
interface Serial1/0
no ip address
encapsulation frame-relay
!
interface Serial1/0.1 point-to-point
description To Area 1
ip address 10.0.0.2 255.255.255.252
ip router isis
isis circuit-type level-2-only
! MD5 authentication (keychain not shown)
isis authentication mode md5
isis authentication key-chain <keychain>
frame-relay interface-dlci 101
!
interface Serial1/0.2 point-to-point
description To Area 3
ip address 10.0.0.9 255.255.255.252
ip router isis
isis circuit-type level-2-only
frame-relay interface-dlci 103
!
router isis
net 49.0002.0000.0000.00b1.00
```