CASE STUDY:
MIGRATION FROM OSPF TO ISIS IN WORLDLINK COMMUNICATIONS LTD.

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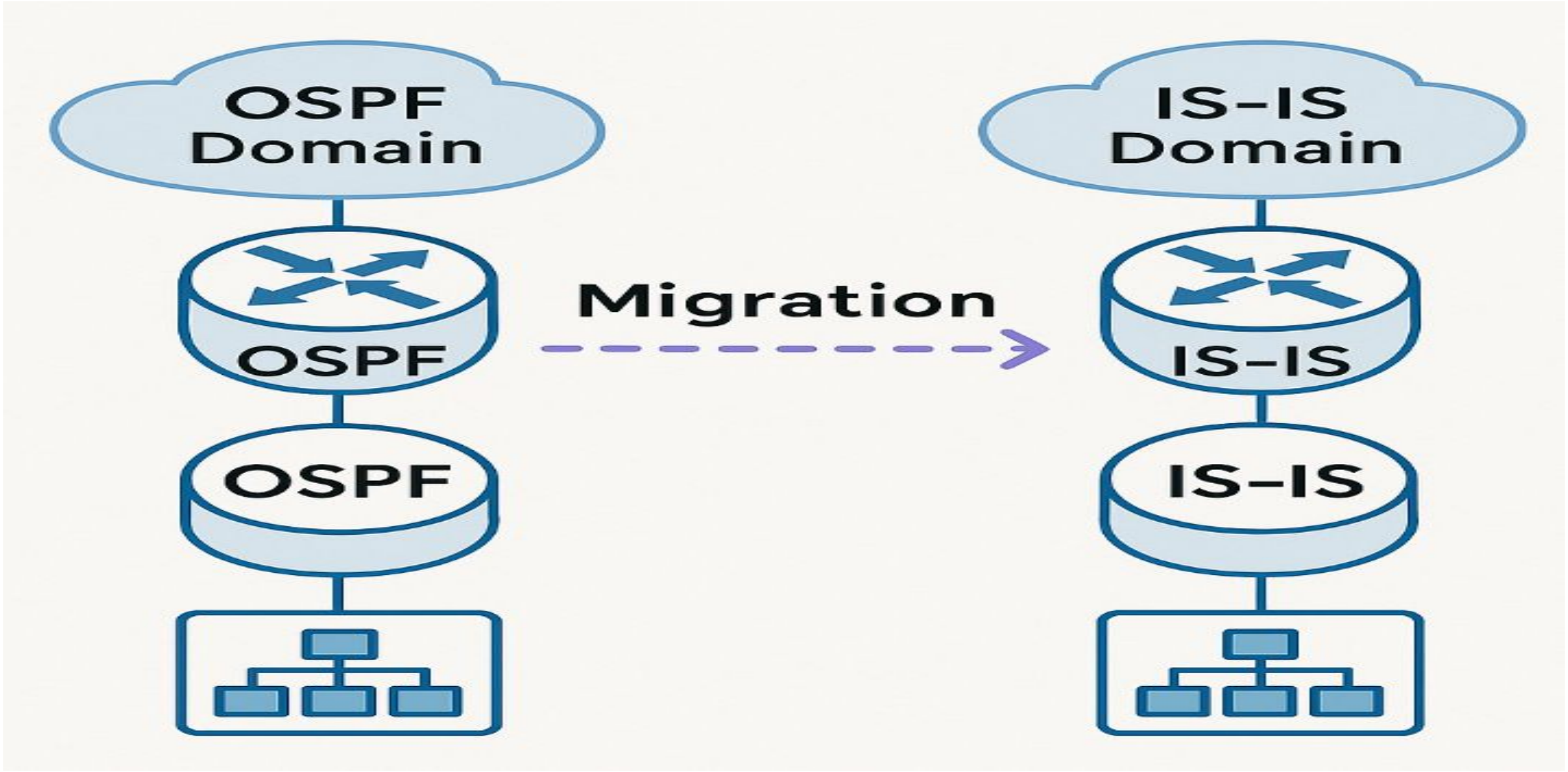

OSPF
Domain
OSPF
OSPF
Migration
IS-IS
Domain
IS-IS
IS-IS

CONTENT

- Introduction
- OSPF Network Topology
- ISIS Network Topology
- Migration challenges
- Migration Strategy & Process
- Configuration & Verification
- Conclusion

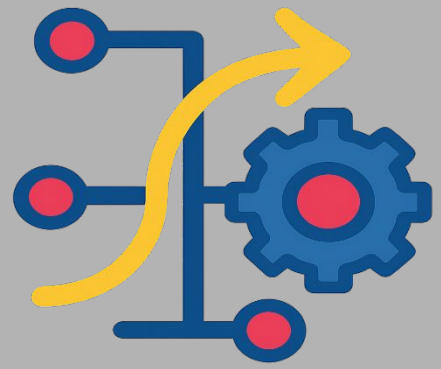
Introduction

Objective

Focus on Migration of OSPF to IS-IS

Security

Scalability

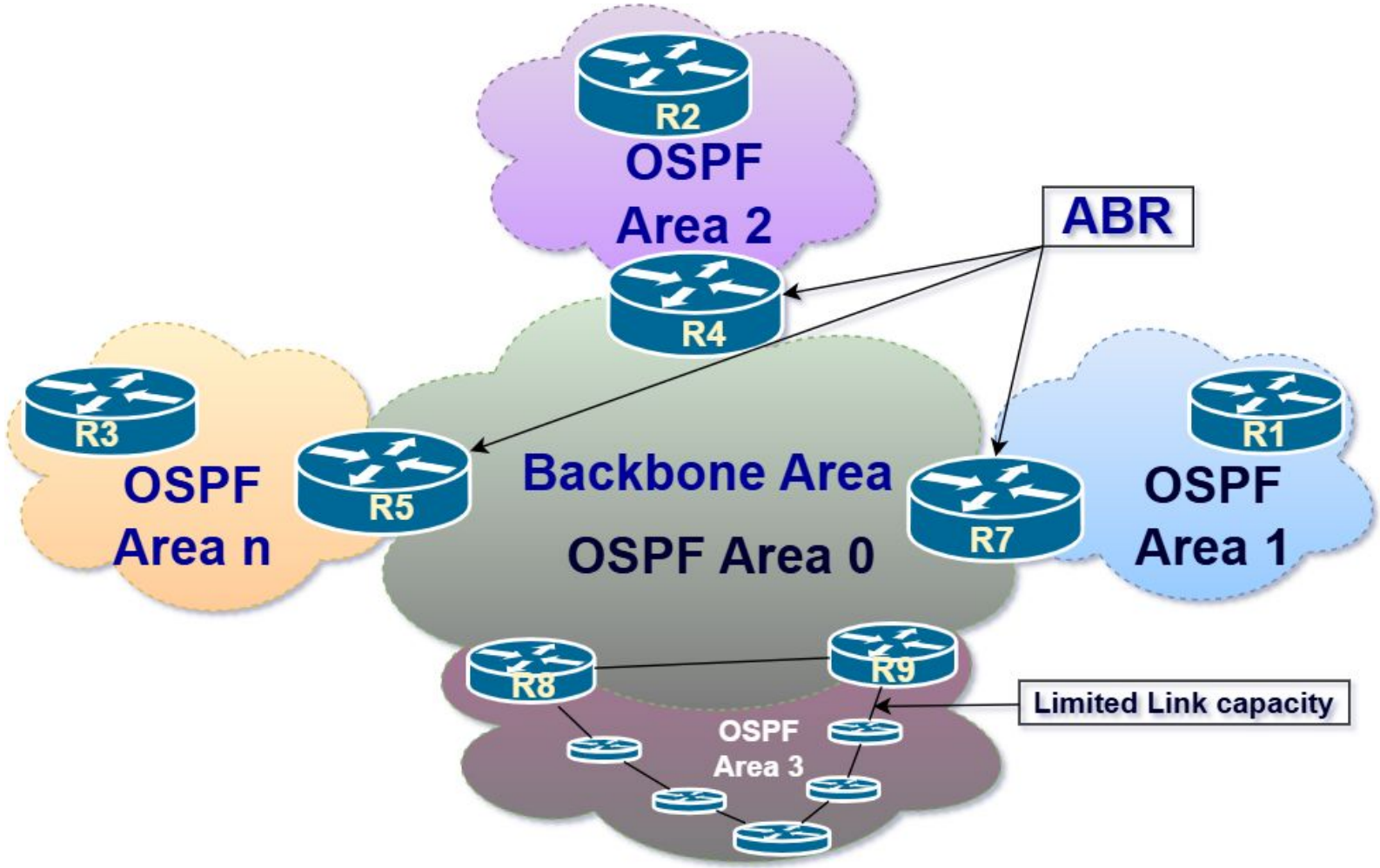


Traffic Engineering

Dual Stack Support

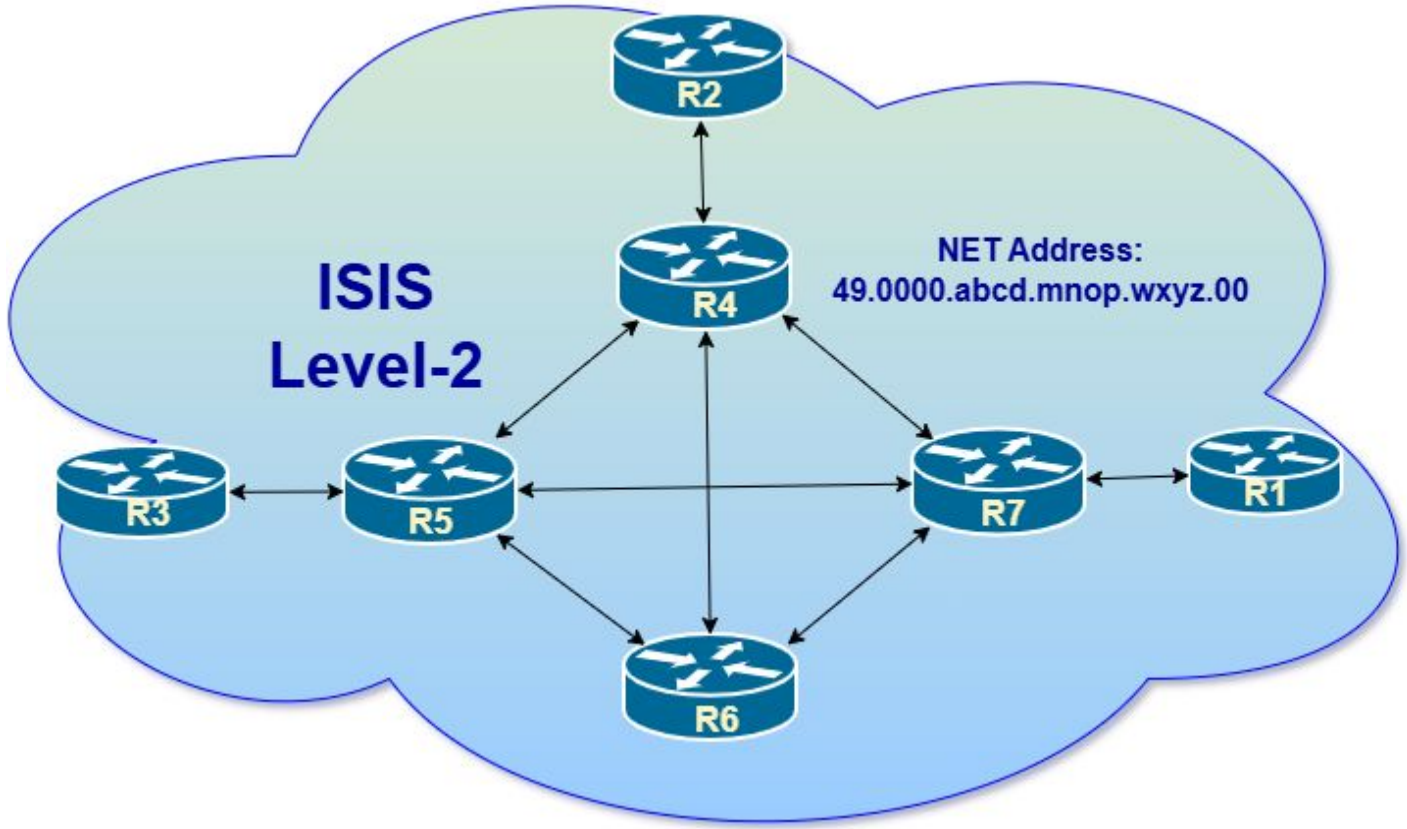
OPSF Network Topology

- Multiple OSPF Area
- Backbone Area 0
- Non-Backbone Area
- Lack of flexibility
- scale-up IP/MPLS
- Traffic Engineering



IS-IS Network Topology

- Hierarchy: L1 & L2
- Faster Convergence
- Encapsulate in Layer 2
- Dual Stack Support
- Large-Scale Support



Migration Challenges

- **More familiar with OSPF than ISIS**
- **NET address: 49.0000.abcd.mnop.wxyz.00**

AFI: 49 (commonly use)
Area:
System ID:
Loopback IP -192.168.101.1->192.168.101.001
NSEL: 00

- **MTU of links:**

Migration Challenges (cont.)

- **Metric – Wide Metric to support higher cost**

Metric For	Narrow Metric	Wide Metric	Default
Link	6-bit or 63	24-bit Or $2^{24} - 1$	10
Path	10-bit or 1023	32-bit Or $2^{32} - 1$	

- **Security (Authentication) configuration**

IIH- Authentication

CSN/PSN/LSP - Authentication

Migration Challenges (cont.)

- Configuring 100's of Router with its link and metric(cost)
- Running OSPF and IS-IS in parallel
- Preferring ISIS from OSPF
- Restrict IGP routes over iBGP
- Flood control: Flood group Area
- Monitoring and Troubleshooting

Migration Strategy & Process

1. Documenting

- Testing: ISIS configuration & topology in lab.
- Documentation: Routers, Links, Metric, Link MTU

2. Implementing

- ISIS Configuration: Adding ISIS configuration
- Dual Stack Operation: OSPF & ISIS
- Preferring ISIS: Switching IGP preference from OSPF to ISIS

3. Monitoring

- Observation: ISIS Routing operation
- Fixing issues: ISIS to OSPF and vice versa
- Final observation

4. Removing

- Remove OSPF from Routers

Configuration – Juniper (Junos)

- **Minimum Configuration**

```
set interfaces lo0 unit 0 family iso address 49.0001.1921.6810.1001.00    // lb -192.168.101.1->192.168.101.001
set interfaces ae100 unit 0 family iso

set protocols isis interface ae100.0 point-to-point
set protocols isis interface lo0.0 passive
set protocols isis level 2 wide-metrics-only
set protocols isis level 1 disable
```

- **Link metric configuration – Optional**

```
set protocols isis topologies ipv6-unicast
set protocols isis interface ae100.0 level 2 metric 100
set protocols isis interface ae100.0 level 2 ipv6-unicast-metric 200
```

- **Authentication – Optional**

```
set security authentication-key-chains key-chain AUTH-KEY key 1 secret YOUR-AUTH-KEY
set security authentication-key-chains key-chain AUTH-KEY key 1 start-time "2025-01-01.00:00:00 +0545"
set security authentication-key-chains key-chain AUTH-KEY key 1 algorithm md5
set protocols isis level 2 authentication-key-chain AUTH-KEY
```

- **LDP-IGP Sync – Optional**

```
set protocols isis interface ae100 ldp-synchronization
```

Configuration – Cisco (IOS XR)

Minimum Configuration

```
router isis IGP-ISIS net 49.0001.1921.6810.1255.00        // lb -192.168.101.255->192.168.101.255
router isis IGP-ISIS interface Bundle-Ether100 point-to-point
router isis IGP-ISIS interface Loopback0 passive
router isis IGP-ISIS address-family ipv4 unicast metric-style wide
router isis IGP-ISIS address-family ipv6 unicast metric-style wide
router isis IGP-ISIS is-type level-2-only
```

Link metric configuration – Optional

```
router isis IGP-ISIS interface Bundle-Ether100 address-family ipv4 unicast metric 100
router isis IGP-ISIS interface Bundle-Ether100 address-family ipv6 unicast metric 200
```

Authentication – Optional

```
key chain AUTH-KEY key 1 accept-lifetime 00:00:00 january 01 2025 infinite
key chain AUTH-KEY key 1 key-string password YOUR-AUTH-KEY
key chain AUTH-KEY key 1 send-lifetime 00:00:00 january 01 2025 infinite
key chain AUTH-KEY key 1 cryptographic-algorithm HMAC-MD5

router isis IGP-ISIS lsp-password keychain AUTH-KEY level 2
router isis IGP-ISIS interface Bundle-Ether4 hello-password keychain AUTH-KEY
```

LDP-IGP Sync - optional

```
router isis IGP-ISIS mpls ldp sync
```

Preferring: ISIS over OSPF

Cisco (IOS XR)

router ospf *v4-OSPF* distance 150

router ospfv3 *v6-OSPF* distance 150

Juniper (Junos)

set protocols ospf preference 150

set protocols ospf3 preference 150

Preference (AD) values:

Protocol	Cisco	Juniper
ISIS	115	18
OSPF	110	10

Verification: ISIS Operation

Cisco (IOS XR)

show isis interface brief
show isis hostname   // Router with ID
show isis database   // Link State Database
show isis adjacency // Adjacency
show route isis

Juniper (Junos)

show isis interface
show isis hostname
show isis adjacency
show isis database
show route protocol isis

- IBGP Session
- Customer prefix reachability
- External Interface IP & next-hop

Removing: OSPF

- **Cisco (IOS XR)**
  - **no router ospf *v4-OSPF***
  - **no router ospfv3 *v6-OSPF***
- **Juniper (Junos)**
  - **delete protocols ospf**
  - **delete protocols ospf3**

Conclusion

- Flexible to scale-up Network
- Ease Traffic Engineering – IP/MPLS
- Single Level-2 for full visibility of network


Q&A

Thank you !