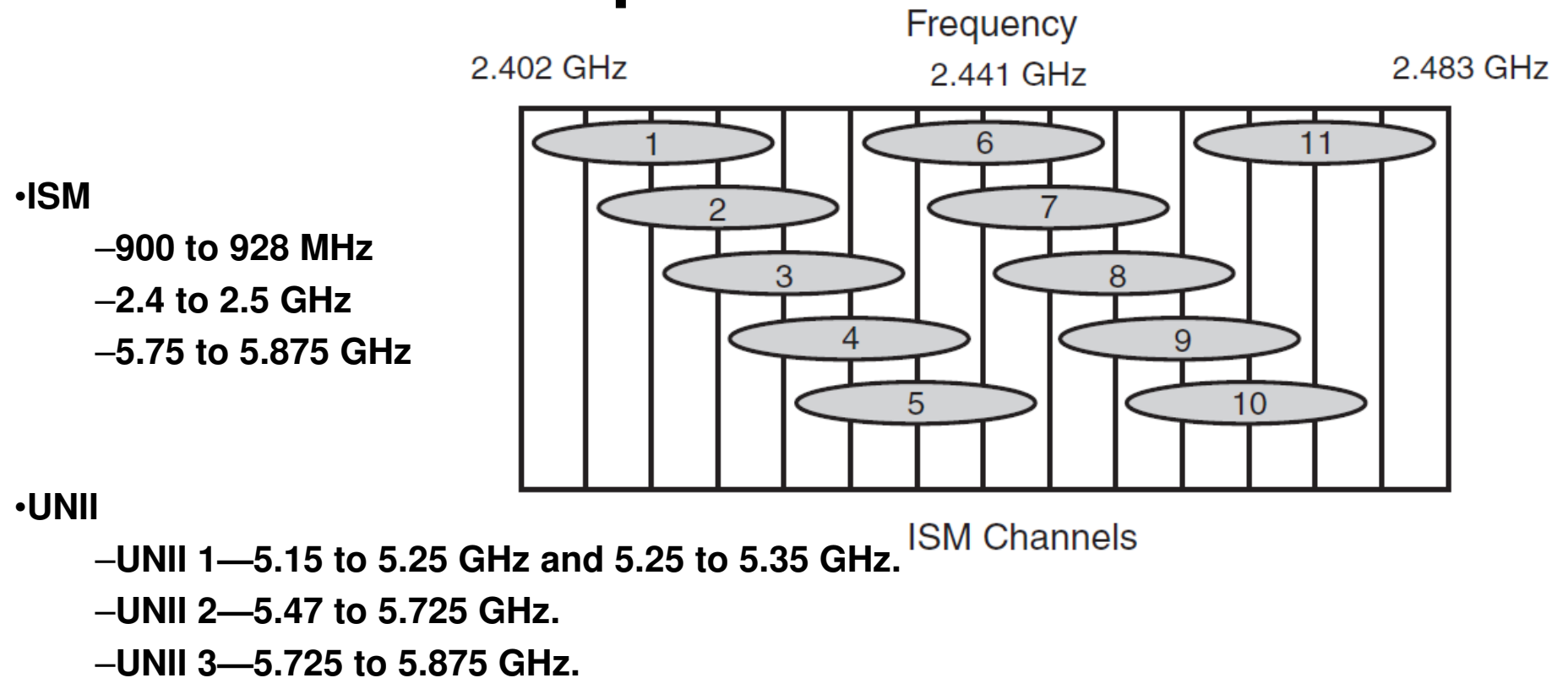


Chapter 4

ISM and UNII Frequencies



Chapter 4

Wireless LAN Standards

IEEE Protocol	Standard Release Date	Frequency	Typical Data Rate	Maximum Data Rate
Legacy	1997	ISM	1 Mbps	2 Mbps
802.11a	1999	UNII	25 Mbps	54 Mbps
802.11b	1999	ISM	6.5 Mbps	11 Mbps
802.11g	2003	ISM	25 Mbps	54 Mbps
802.11n	2007 (draft)	ISM or UNII	200 Mbps	540 Mbps

http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps10092/white_paper_c11-516389_ns767_Networking_Solutions_White_Paper.html

Chapter 4

WLANS

- **Service Set Identifier(SSID)**
- **WLAN Security**
 - WEP
 - WPA
 - WPA2
- **WPA2**
 - 802.1X
 - AES
- **Unauthorized Access**

Chapter 4

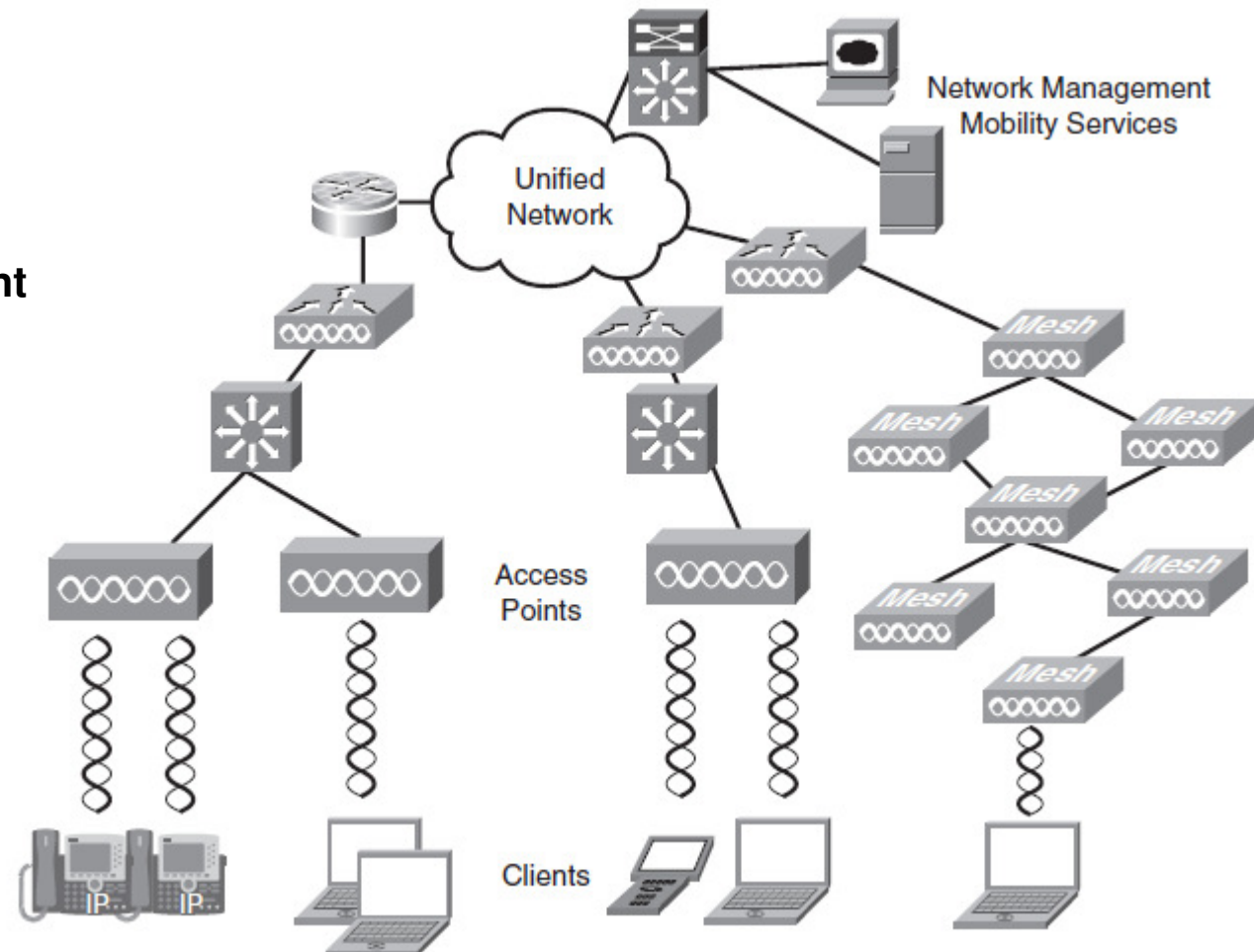
WLAN Security Design Approach

- Use of Lightweight Extensible Authentication Protocol (LEAP) to secure authentication
- Use of virtual private networks (VPN) with IP Security (IPsec) to secure traffic from the WLAN to the wired network
- IEEE 802.1X
- Dynamic WEP keys
- Controlling WLAN Access to Servers(DMZ)

Chapter 4

Cisco Unified Wireless Network

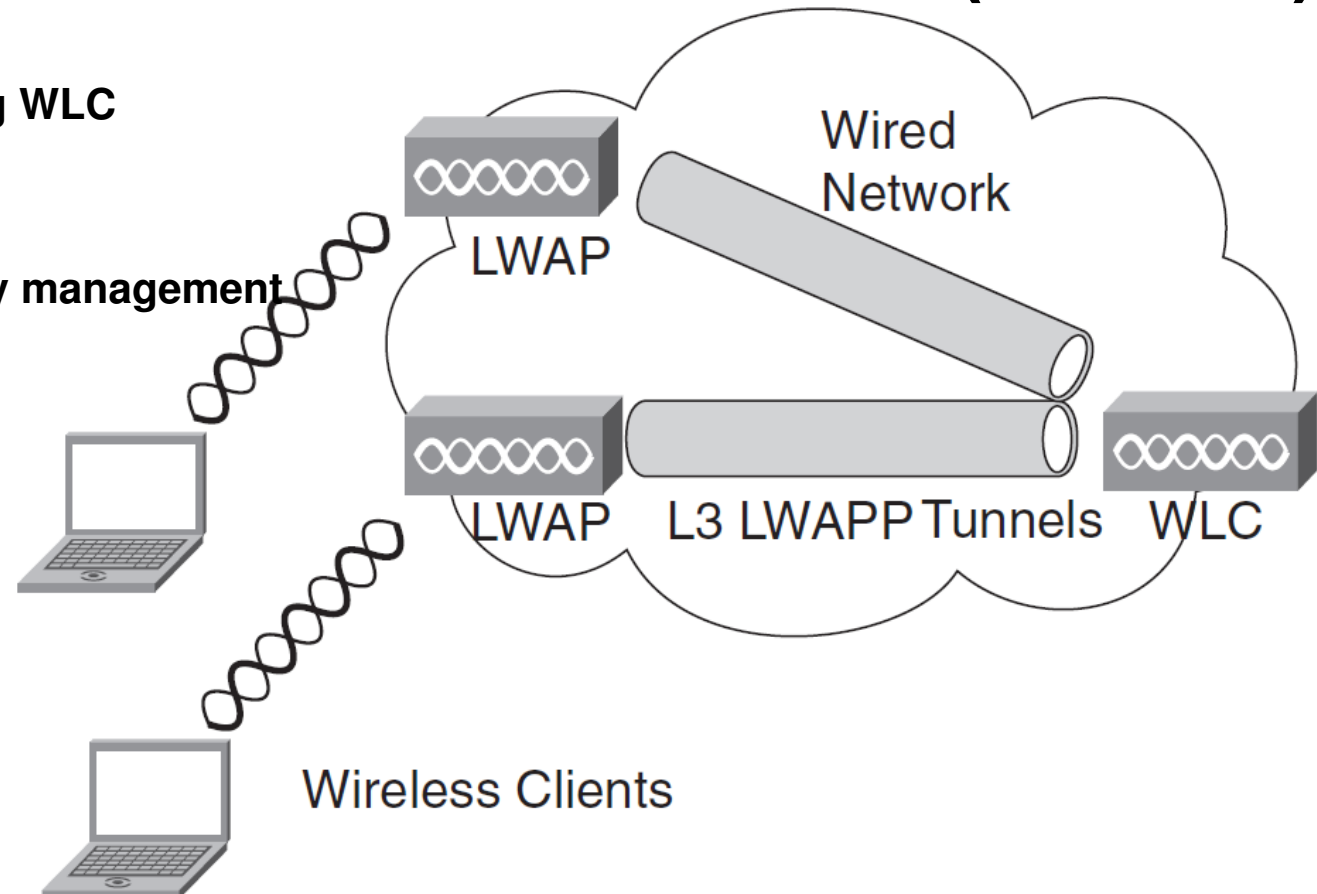
- Client devices
- Access points
- Network unification
- Network management
- Mobility services



Chapter 4

Lightweight Access Point Protocol (LWAPP)

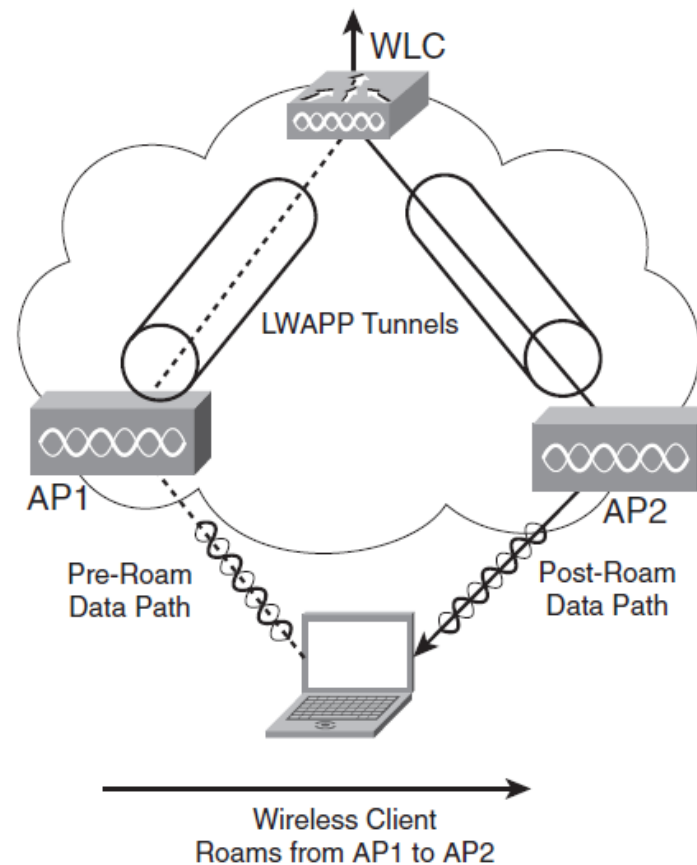
- Protocol mellem AP og WLC
- MAC Management
- Resource Reservation
- Authentication and key management
- L2/L3 LWAPP
- H-REAP



Chapter 4

Roaming and Mobility Groups

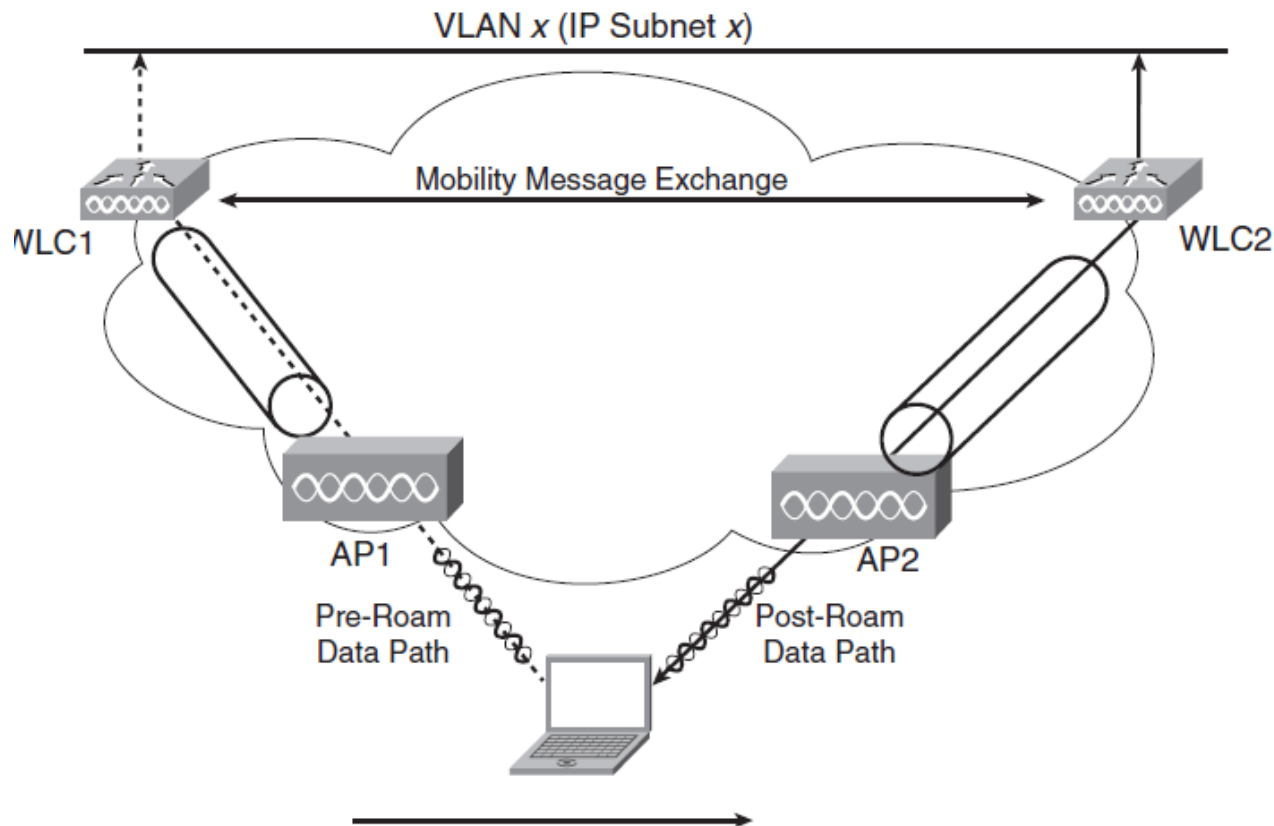
Intracontroller Roaming



Chapter 4

Roaming and Mobility Groups

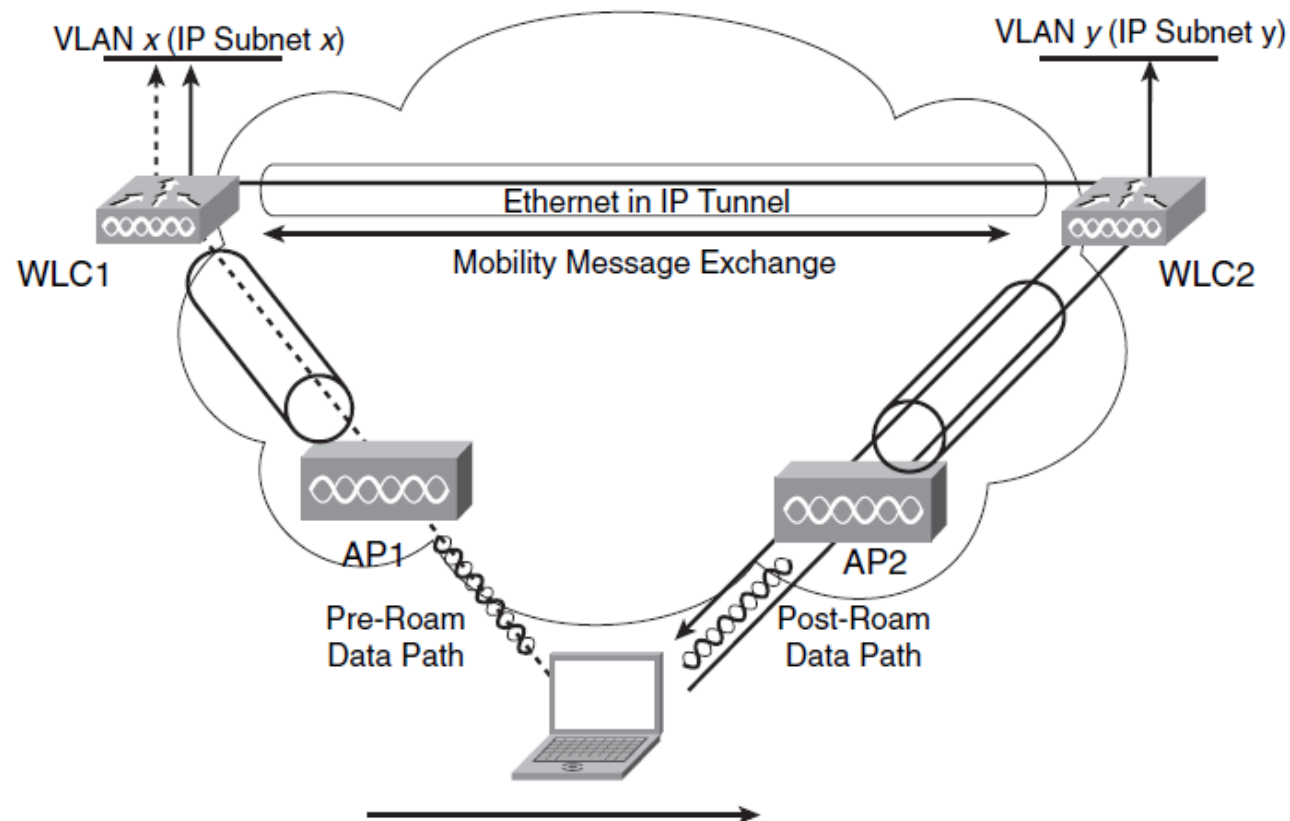
Layer 2 Intercontroller Roaming



Chapter 4

Roaming and Mobility Groups

Layer 3 Intercontroller Roaming



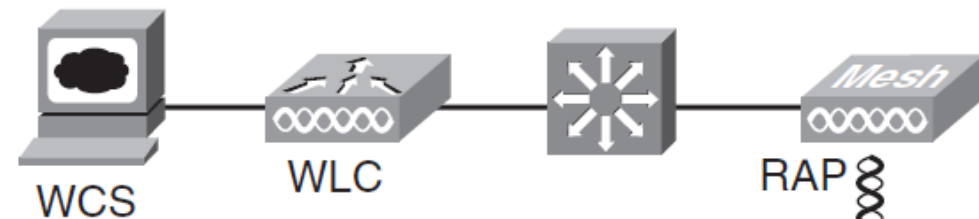
Chapter 4

RF Site Survey

1. **Define customer requirements**
2. **Identify coverage areas and user density**
3. **Determine preliminary AP locations**
4. **Perform the actual survey**
5. **Document the findings**

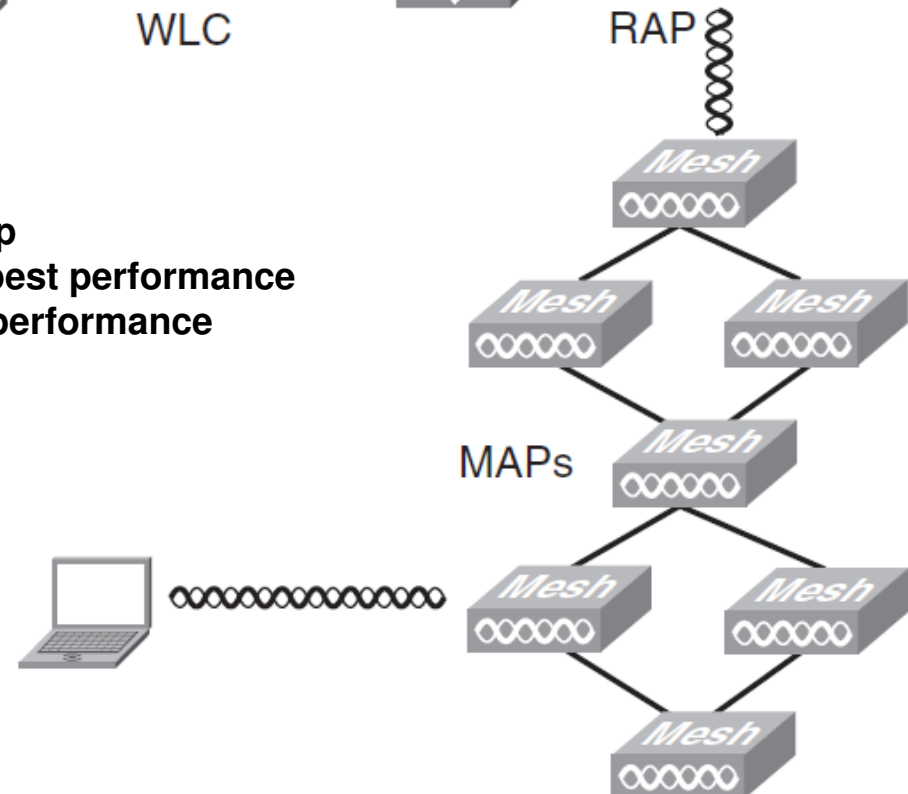
Chapter 4

Wireless Mesh for Outdoor Wireless



•Mesh Design Recommendations

- There is a 2- to 3-ms typical latency per hop
- Four or fewer hops are recommended for best performance
- 20 MAP nodes are recommended for best performance





Chapter 4



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