

cisco aironet series 2800 3800 access point deployment guide

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Introduction

In today's fast-paced, connectivity driven workplaces, a robust Wi-Fi infrastructure is not just an add-on—it's a core business enabler. Cisco's Aironet series has long been a trusted name in enterprise wireless, and the 2800 and 3800 access point families continue to deliver reliable, high throughput performance across a wide range of environments. Whether you're expanding an existing campus, deploying a new branch office, or modernizing a legacy network, a well planned deployment is essential for achieving seamless coverage, optimal capacity, and secure connectivity.

This comprehensive guide walks you through every step of a **cisco aironet series 2800 3800 access point deployment**. From initial planning and site survey to configuration, performance tuning, and ongoing maintenance, we'll provide the knowledge you need to execute a successful rollout that meets both technical requirements and business goals.

1. Overview of Cisco Aironet 2800 & 3800 Series

1.1 Key Features

- Dual band support (2.4 /GHz & 5 /GHz) with 802.11ac Wave 2 capabilities.
- High density client handling—up to 200+ concurrent clients per AP.
- Integrated WPA2/WPA3 security and support for 802.1X authentication.
- Advanced band steering and bandwidth management for efficient spectrum use.
- Seamless mesh networking for flexible deployment in challenging RF environments.
- Low power operation and power over Ethernet (PoE) compatibility.

1.2 Target Use Cases

- Large enterprise campuses with high client densities.
- Branch offices requiring reliable, secure connectivity.
- Educational institutions with dynamic classroom setups.
- Healthcare facilities demanding low latency and robust security.

1.3 Comparison to Other Cisco AP Series

The 2800 and 3800 series strike a balance between cost and performance. Compared to the 1800 series, they offer higher throughput and better RF performance, while being more affordable than the 3800 plus or 5000 series. They're ideal for organizations that need enterprise grade features without the premium price tag of the latest Wi-Fi 6 hardware.

2. Planning the Deployment

2.1 Define Objectives and Success Metrics

Before you even pick up a screwdriver, clarify what you want to achieve:

- Coverage: 95% of the area with minimum 20 /dBm signal strength.
- Capacity: Support 500 concurrent clients with 10 /Mbps per user baseline.
- Reliability: 99.9% uptime, minimal handoff delays.
- Security: Zero unauthorized access incidents.
- Scalability: Easy to add 20% more APs in the next 2 /years.

2.2 Budget and Resource Allocation

Map out the total cost of ownership (TCO): AP hardware, PoE switches, controllers, labor, and future upgrades. Don't forget indirect costs such as training, monitoring tools, and contingency funds for unexpected RF challenges.

2.3 Stakeholder Engagement

Engage network architects, IT operations, security teams, and end user representatives early. Their input ensures that the deployment aligns with organizational policies and user expectations.

3. Site Survey and RF Planning

3.1 Types of Site Surveys

- Passive Survey: Uses existing traffic to map signal strength.
- Active Survey: Deploys test devices to generate traffic and collect real time data.
- RF Modeling: Employs simulation tools to predict coverage and identify interference.

3.2 Conducting the Survey

1. Identify critical zones: conference rooms, open offices, reception areas.
2. Map obstructions: walls, metal cabinets, HVAC units.
3. Record ambient RF sources: microwave ovens, Wi Fi routers, Bluetooth devices.
4. Generate a heat map and adjust AP placement accordingly.

3.3 Choosing AP Placement

For the 2800 and 3800 series, a common strategy is to place APs on ceilings or high on walls to maximize line of sight coverage. Use the following guidelines:

- Maintain a minimum of 1 /m separation between APs on the same band to avoid co channel interference.
- Place APs 2.5–3.5 /m above the floor for optimal coverage in open spaces.
- Use directional antennas for long range coverage or to mitigate interference.

4. Hardware Requirements

4.1 Access Points

- Choose the 2800 for moderate density environments or the 3800 for high density, mission critical sites.
- Verify firmware compatibility with your controller version.

4.2 Controllers and Switches

- Use a Cisco WLC 3000 or WLC 5000 controller for centralized management.
- Ensure switches support PoE+ (802.3at) to power APs efficiently.
- Plan for redundant controllers and power supplies to avoid single points of failure.

4.3 Network Infrastructure

Plan for VLAN segmentation, QoS policies, and proper routing to segregate traffic between guest, staff, and management networks.

5. Installation Steps

5.1 Physical Mounting

Mount the AP on the ceiling or wall following the manufacturer's instructions. Use the appropriate mounting kit and ensure the device is securely fastened.

5.2 Powering the AP

Connect the AP to a PoE+ port on your switch. Verify power delivery and check the LED status for normal operation.

5.3 Network Connectivity

Use an Ethernet cable to connect the AP to the controller or to a layer 3 switch that forwards traffic to the controller.

5.4 Initial Configuration

1. Access the AP's web interface via its default IP.
2. Set a strong admin password.
3. Assign the AP to the correct controller using the "AP Group" settings.
4. Configure basic wireless settings: SSID, security type, and radio parameters.

6. Configuration Basics

6.1 Wireless Profiles

Create separate profiles for each SSID (e.g., **Corporate**, **Guest**, **VoIP**) and apply them to AP groups.

6.2 Security Settings

- Enable WPA2 Enterprise with 802.1X authentication.
- Consider WPA3 Enterprise if your clients support it.
- Implement MAC filtering only as a supplemental measure, not a primary security layer.

6.3 Band Steering and Load Balancing

Enable band steering to guide dual band clients to the less congested 5 GHz band. Configure load balancing across APs to prevent hotspots.

6.4 QoS and Traffic Management

Define QoS policies to prioritize voice, video, and mission critical traffic. Use **802.11e** WMM for client side QoS.

7. Advanced Configuration

7.1 Mesh Networking

For sites with difficult RF environments, configure the APs in mesh mode:

- Set a dedicated mesh VLAN.
- Enable mesh backhaul on the 5 /GHz band.
- Use mesh aware radios for improved throughput.

7.2 RF Optimization

1. Adjust transmit power per AP to reduce co channel interference.
2. Use channel planning tools to assign non overlapping channels.
3. Deploy dynamic frequency selection (DFS) to avoid radar interference.

7.3 Client Steering and Roaming

Configure **roaming aggressiveness** to ensure smooth handoffs between APs. Use **Fast BSS Transition (802.11r)** for reduced latency.

8. Security Best Practices

8.1 Physical Security

Secure AP mounting points and restrict access to the network infrastructure.

8.2 Network Segmentation

Segment guest traffic from internal networks using VLANs and firewall rules.

8.3 Regular Firmware Updates

Schedule periodic firmware upgrades to patch vulnerabilities and improve performance.

8.4 Monitoring and Alerts

Set up SNMP traps and Syslog alerts for abnormal activity such as rogue AP detection or unusual authentication failures.

9. Performance Optimization

9.1 Throughput Testing

Use tools like **iperf** or **NetSpot** to measure actual throughput and compare it against theoretical limits.

9.2 Client Density Management

Implement **client load balancing** and **bandwidth throttling** to maintain quality of service under heavy load.

9.3 Interference Mitigation

- Identify and mitigate sources of RF interference.
- Use dynamic channel assignment to avoid congested channels.
- Apply beamforming settings where supported.

10. Troubleshooting

10.1 Common Issues

- Weak Signal: Re-evaluate AP placement or adjust transmit power.
- Intermittent Connectivity: Check for interference, firmware mismatches, or PoE power drops.

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