With each advance in wireless technology, access points are increasing in their number of radios as well as in their processing power and memory. In 2001 the Cisco® Aironet® 350 Series Access Points had one 2.4-GHz radio and processor requiring only 6 watts of power. These early Power over Ethernet (PoE) access points could fully function using the earlier 802.3af (15.4W) powering systems developed in 2000 to 2003.

Newer PoE standards have since emerged, with 802.3at providing up to 30 watts at the Power Sourcing Equipment (PSE). Many of Cisco’s previous access points, such as the Aironet 1850 and 3700 Series, worked best with the higher power sources enabled by 802.3at and PoE+ but would operate with reduced functionality if powered by the older 802.3af 15.4W powering systems.

With the introduction of dual-band (XOR) radios, along with more advanced features, it simply is not feasible to run these higher-performance access points on the older legacy 802.3af (15.4W) powering systems. Customers who have such older systems should upgrade to 802.3at (30W) PoE equipment or systems that support Cisco Universal PoE (Cisco UPOE® or UPOE+) for best performance or use a different power source, such as a midspan injector or local power supply. Note the following:

If the Aironet 2800 and 3800 Series access points are powered from an 802.3af power source, the LED will cycle though the colors and the radios will be disabled.
Performance requires power, as the 2800 and 3800 Series have much more advanced features, such as:

- Dedicated microprocessor and memory for each radio band
- Dual-core processor to manage access point and ethernet functionality
- Additional XOR radio and antenna switching circuitry, pushing the transceiver count to 12 radios
- Cisco CleanAir® silicon for complete spectrum analysis and interference detection
- Cisco ClientLink (legacy 802.11a/g/n and 803211ac Wave 1 beamforming), improving older client connectivity and performance; the IEEE specification is limited to beamforming only on 802.11ac Wave 2 clients
- Additional (auxiliary) Ethernet port, USB, and advanced radio functions, such as 160 MHz and dual XOR
- Support for smart antenna functionality (Wireless Security Module [WSM] monitor mode and enhanced location)
- 802.3bz (NBASE-T) Multigigabit Ethernet support (Aironet 3800 Series)
- Future hardware expandability using modular technology (Aironet 3800 Series)

The PoE powering standards have evolved as follows:

- Cisco pre-standard PoE: Original implementation, 6 to 7 watts (2000 to 2001)*
- Cisco pre-standard PoE: Upgraded to negotiate up to 10 to 15 watts via Cisco Discovery Protocol (2001 to 2003)
- IEEE 802.3af PoE mechanism that supplies power up to 15.4W (July 2003)*
- IEEE 802.3at PoE+ mechanism that supplies up to 30W (2009)*
- Cisco UPOE and UPOE+: Universal PoE that supplies up to 60W (2014)*

*Note: The * indicates that these are approximate dates and PoE is defined as the maximum power required at the source.

Cisco Aironet 2800 and 3800 Series access points easily function with 802.3at powering systems, and for advanced features such as module support (3800 Series), Cisco UPOE and UPOE+ can be used.

<table>
<thead>
<tr>
<th>Description</th>
<th>AP Functionality</th>
<th>PoE Budget @ PSE (Watts)</th>
<th>802.3af or PWRINJ5</th>
<th>802.3at PoE+ PWRINJ6</th>
<th>802.3bt uPOE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2800</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PoE 802.3at</td>
<td>2800 – Out of the box (8.2.x.x)</td>
<td>All features enabled*</td>
<td>26W</td>
<td>x</td>
<td>v</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>AP Functionality</th>
<th>PoE Budget @ PSE (Watts)</th>
<th>802.3af or PWRINJ5</th>
<th>802.3at PoE+ PWRINJ6</th>
<th>802.3bt uPOE AIR-PWR50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3800</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PoE 802.3at</td>
<td>3800 – Out of the box (8.2.x.x)</td>
<td>All features enabled* Except module support</td>
<td>30W</td>
<td>x</td>
<td>v</td>
</tr>
<tr>
<td>PoE 802.3bt (uPoE)</td>
<td>3800 – Out of the box (8.2.x.x)</td>
<td>All features enabled* Including module support</td>
<td>52W</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

*USB support not available at FCS may increase power up to 3W
If an 802.3at or better power source is not available, the Cisco midspan injectors listed in Figure 3 may be used.

Figure 3. Low-cost 802.3at Gigabit Ethernet injectors for Aironet 2800 and 3800 Series (if Multigigabit is not required)

### 30 Watt Gigabit Ethernet injector – Cisco AIR-PWRINJ6

<table>
<thead>
<tr>
<th>No. of ports</th>
<th>Weight</th>
<th>Dimensions</th>
<th>No. of ports</th>
<th>Weight</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.6 lbs (2.5 kg)</td>
<td>53 mm (W) x 32.5 mm (H) x 140 mm (L)</td>
<td>1</td>
<td>5.6 lbs (2.5 kg)</td>
<td>53 mm (W) x 32.5 mm (H) x 140 mm (L)</td>
</tr>
</tbody>
</table>

**Data rates**: 10/100/1000 Mbps

**Input power requirements**
- AC Input voltage: 100 to 240Vac
- AC Input current: 1.5A

**Dimensions**
- 53 mm (W) x 32.5 mm (H) x 140 mm (L)
- 2.09 in. x 1.28 in. x 5.5 in

**Power over ethernet output**: 55Vdc

**Pin assignment and polarity**: 4/5 (+), 7/8 (-)

**Electromagnetic emission and immunity**
- FCC Part 15, Class B
- IEC/EN 55022 Class B (Emissions)
- EN 55024 (Immunity)

**Regulatory Compliance**
- UL 60950-1
- IEC/EN 60950-1
- FCC Part 15, Class B
- EN 55022 Class B (Emissions)
- EN 55024 (Immunity)
- CE

**Note**: The Cisco Aironet 2800 Series does not support a local power supply; however, the 3800 Series does have a new high-wattage supply that can be used in applications where a PoE source is unavailable.

If Multigigabit Ethernet is required, an additional midspan injector capable of 802.3bz (known as Multigigabit Ethernet or N-BASE-T) will be available in the future (Figure 4).

Figure 4. Planned midspan injector

### 30 Watt Multigigabit PoE+ Injector

Cisco MA-INJ-5-xx up to 10Gbps

**Local power supply – Cisco PID = AIR-PWR-50**

<table>
<thead>
<tr>
<th>Input:</th>
<th>100–240V – 1.5A</th>
<th>50–60Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output:</td>
<td>48V = 1.05A</td>
<td>LPS</td>
</tr>
</tbody>
</table>

**Input power requirements**
- AC Input voltage: 100-240Vac
- AC Input current: 0.67A
- AC Frequency: 50-60Hz

**Warranty**: 1-year

**Reliability**: MTBF: 100,000 hrs. @25°C

**Operating ambient temperature**: -4°F to 122°F (-20°C to 50°C)

**Operating humidity**: Maximum 90%, Non-condensing

**AC/DC Adapter**
- Input: 100-240V 1.5A 50-60Hz
- Output: 48V 1.05A LPS

**Note**: The following midspan devices are not compatible with the Cisco Aironet 2800 and 3800 Series:
- Local power supplies: AIR-PWR-A, AIR-PWR-B, and AIR-PWR-C

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