

Single Point Setup

Overview

Since wireless networks are more important than ever, one affordable, easy, and secure way to improve the performance of these networks is by using Single Point Setup (SPS) on WAPs. SPS provides a unique centralized method to administer and control wireless services across multiple access points. Via one access point on the LAN you have a single view of the whole WLAN to replicate configuration, security, and management across all access points. SPS can be used to create a single group or cluster of wireless devices.

After the WAPs devices are clustered, you can view, deploy, configure, and secure the wireless network as a single entity. After a wireless cluster is created, SPS also facilitates channel planning across your wireless services to reduce radio interference and maximize bandwidth on the wireless network. When you first set up your WAP device, you can use the Setup Wizard to configure Single Point Setup or join an existing Single Point Setup. If you prefer not to use the Setup Wizard, you can use the web-based configuration utility.

Single Point Setup creates a dynamic, configuration-aware cluster, or group, of WAP devices in the same subnet of a network. A cluster supports only a group of configured WAPs devices that are the same. A single cluster does not support a mix of a WAP121 and a WAP321 device in the same group. SPS allows the management of more than one cluster in the same subnet or network; however, they are managed as single independent entities.

This smart tip introduces the concept of Single Point Setup. The document also describes how to configure Single Point Setup over one or multiple WAP devices.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration and an IP address, so the unit is accessible from the Cisco IOS Software GUI or the command line interface (CLI). If you work in a live network, ensure that you understand the potential impact of any command.

Components

- WAP121 Wireless-N Access Point with PoE, or
 - WAP321 Wireless-N Selectable-Band Access Point with PoE, or
 - WAP551 or WAP561
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Network Diagram

Figure 1

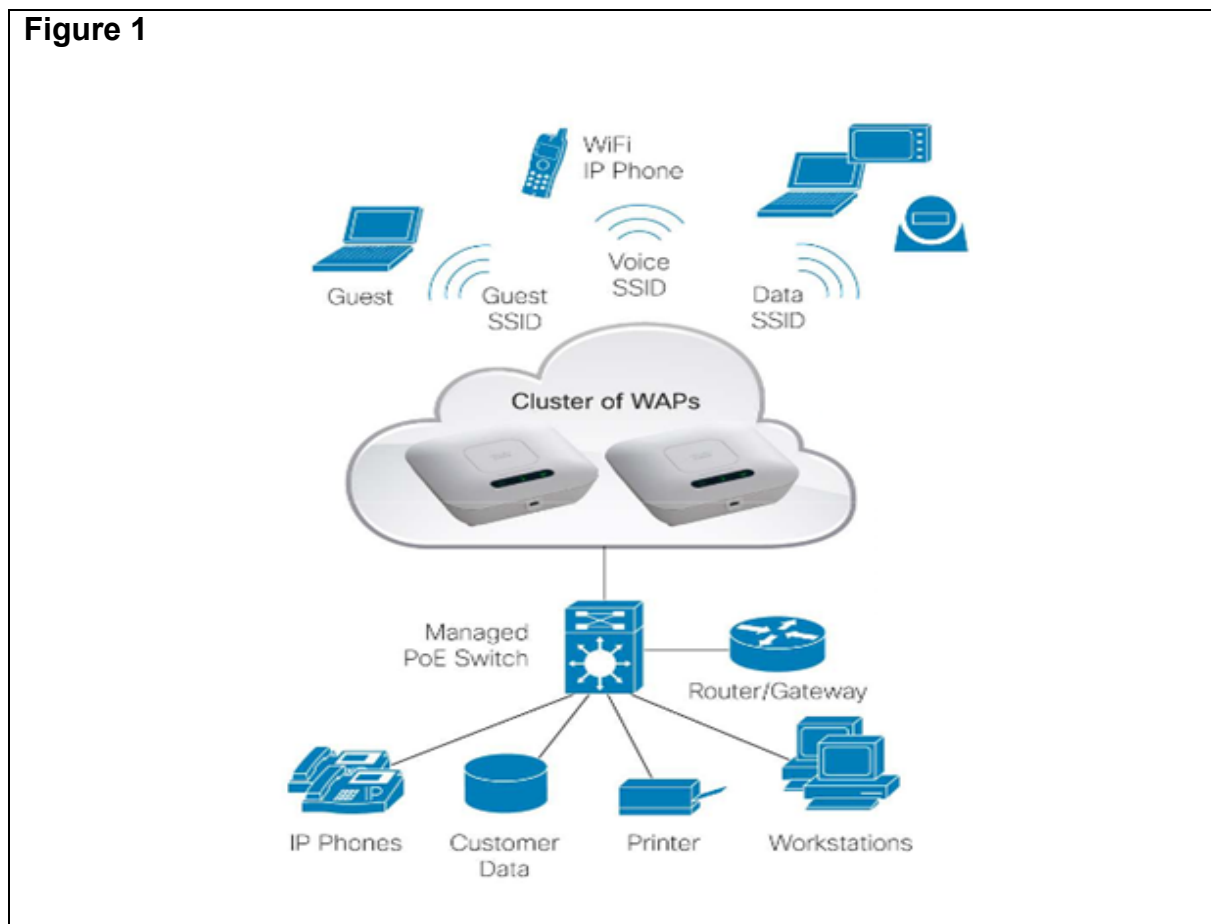


Figure 1 illustrates a sample implementation for Single Point Setup with two Cisco small business WAPs. A Cluster of WAPs is created.

Key Features

Single Point Setup Negotiation

When a WAP device is enabled and configured for Single Point Setup, it begins sending periodic advertisements every 10 seconds to announce its presence. If there are other WAP devices that match the criteria for the cluster, arbitration begins to determine which WAP device will distribute the master configuration to the rest of the members of the cluster.

Sessions

The Sessions page shows information on WLAN clients that are associated with the WAP devices in the Single Point Setup cluster. Each WLAN client is identified by its MAC address, along with the device location where it is currently connected.

Channel Management

The Channel Management page shows the current and planned channel assignments for WAP devices in a Single Point Setup cluster. When channel management is enabled, the WAP device automatically assigns radio channels used by WAP devices in a Single Point Setup cluster. Automatic channel assignment reduces mutual interference and maximizes Wi-Fi bandwidth to help maintain efficient communication over the wireless network.

The automatic channel assignment feature is disabled by default. The state of channel management (enabled or disabled) is propagated to the other devices in the Single Point Setup cluster.

Wireless Neighborhood

The Wireless Neighborhood page shows up to 20 devices within range of each wireless radio in the cluster. (For example, if a WAP device has two wireless radios, 40 devices would be displayed for that device.) The Wireless Neighborhood page also distinguishes between cluster members and nonmembers.

Pre-Configuration Guidelines

When you configure Single Point Setup on a device, settings from that device are propagated to other devices as they join the cluster. To form a cluster, make sure the following prerequisites or conditions are met:

1. Plan your Single Point Setup cluster. Be sure the two or more WAP devices you want to cluster are the same model. For example, Cisco WAP321 devices can only cluster with other Cisco WAP321 devices. It is strongly recommended to run the latest firmware version on all clustered WAP devices.

Note: Firmware upgrades are not propagated to all WAP devices in a cluster; you must upgrade each device independently.

2. Set up the WAP devices that will be clustered within the same layer 2 domain (VLAN) as well as IP subnet and verify that they are interconnected and accessible across the switched LAN network.

3. Enable Single Point Setup on all WAPs devices.
4. Verify that the WAP devices all reference the same Single Point Setup name.
5. When a more scalable network is needed you can create multiple clusters. For example: *ClusterFloor1*, *ClusterFloor2* or *ClusterBuildingA*, *ClusterBuildingB*.

Security Notes:

- The Cluster Name should be considered as a pre-shared key to prevent malicious APs from hijacking.
- We recommend using 802.1x port supplicant and connecting to smart/managed switch with 802.1x port-based security for AP switch ports. This will prevent the ability for someone to unplug a secure AP and connect a rogue AP to the wired network.
- All AP-to-AP communication is encrypted and is transported via HTTPS so sensitive data cannot be captured with a network sniffer.

Single Point Setup Wireless Service Limits

Cluster/Group Type	WAP devices	Number of Active Clients	Max number of Client (Active & Idle)
WAP121	4	40	64
WAP321	8	160	256
WAP551	16	480	1024
WAP561	16	960 (with dual radio)	2048 (with dual radio)

Step-by-step on how to configure the WAP device for Single Point Setup:

STEP 1. Select **Single Point Setup > Access Points** in the navigation panel.

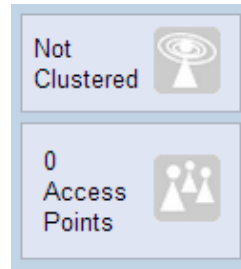
WAP 321

<ul style="list-style-type: none"> ▼ Single Point Setup <li style="background-color: #c6e0b4;">Access Points Sessions Channel Management Wireless Neighborhood 	<h4>Access Points</h4> <p>Single Point Setup allows WAP321-A-K9 access points to propagate settings.</p> <p>Single Point Setup: Disabled</p> <p>To enable clustering, complete the following fields and click "Enable Single Point Setup".</p> <p>Enter the location of this AP.</p> <p>Location: <input type="text" value="No Default"/> (Range: 1-64 Characters)</p> <p>Enter the name of the cluster for this AP to join.</p> <p>Cluster Name: <input type="text" value="ciscosb-cluster"/> (Range: 1-64 Characters)</p> <p>Clustering IP Version: <input type="radio"/> IPv6 <input checked="" type="radio"/> IPv4</p> <p style="text-align: center;"><input type="button" value="Enable Single Point Setup"/></p>
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WAP551

<ul style="list-style-type: none"> ▼ Single Point Setup <li style="background-color: #c6e0b4;">Access Points Sessions Channel Management Wireless Neighborhood 	<h4>Access Points</h4> <p>Single Point Setup allows WAP551-A-K9 access points to propagate settings.</p> <p>Single Point Setup: Disabled</p> <p>To enable clustering, complete the following fields and click "Enable Single Point Setup".</p> <p>Enter the location of this AP.</p> <p>Location: <input type="text" value="No Default"/> (Range: 1-64 Characters)</p> <p>Enter the name of the cluster for this AP to join.</p> <p>Cluster Name: <input type="text" value="ciscosb-cluster"/> (Range: 1-64 Characters)</p> <p>Clustering IP Version: <input type="radio"/> IPv6 <input checked="" type="radio"/> IPv4</p> <p style="text-align: center;"><input type="button" value="Enable Single Point Setup"/></p>
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Note: Single Point Setup is disabled by default on the WAP device. When disabled, the Enable Single Point Setup button is visible. If Single Point Setup is enabled, the Disable Single Point Setup button is visible. You can edit Single Point Setup options only when Single Point Setup is disabled.



Note: Icons on the right side of the page indicate whether Single Point Setup is enabled and, if it is, the number of WAP devices that are currently joined in the cluster.

STEP 2. With **Single Point Setup disabled**, configure the following information for each individual member of a Single Point Setup cluster. Enter the **Location**, **Cluster Name**, and **Clustering IP Version** (default is IPv4)

To enable clustering, complete the following fields and click "Enable Single Point Setup".

Enter the location of this AP.

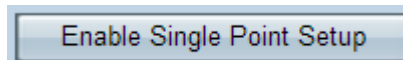
Location: (Range: 1-64 Characters)

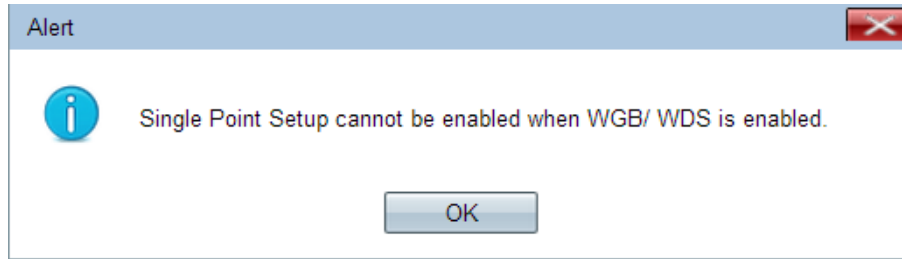
Enter the name of the cluster for this AP to join.

Cluster Name: (Range: 1-64 Characters)

Clustering IP Version: IPv6 IPv4

STEP 3. Click Enable Single Point Setup.





Note: At the moment to Enable Single Point Setup an alert can come up where remind you that if you have WGB/WDS enable you can't enable Single Point Setup.

Note: The WAP device begins searching for other WAP devices in the subnet that are configured with the same cluster name and IP version. A potential cluster member sends advertisements every 10 seconds to announce its presence. While searching for other cluster members, the status indicates that the configuration is being applied. Refresh the page to see the new configuration.

If one or more WAP devices are already configured with the same cluster settings, the WAP device joins the cluster and information on each member shows in a table.

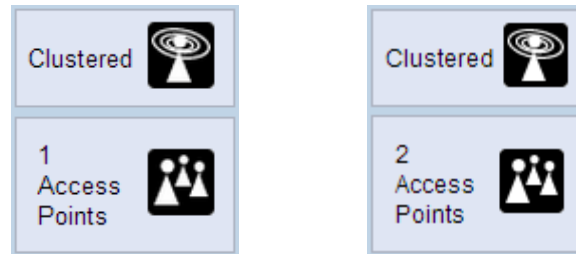
STEP 4. Repeat these steps on additional WAP devices that you want to join the Single Point Setup.

Verify Single Point Setup

When Single Point Setup is enabled, the WAP device automatically forms a cluster with other WAP devices with the same configuration. On the Access Points page, the WAP devices detected are listed in a table and the following information is shown:

WAP321	WAP561															
<p>Single Point Setup allows WAP321-A-K9 access points to propagate settings.</p> <p>Single Point Setup: Enabled</p> <p>Access Points detected in Cluster: Location1_Cluster</p> <table border="1"> <thead> <tr> <th>Location</th> <th>MAC Address</th> <th>IP Address</th> </tr> </thead> <tbody> <tr> <td>Location1</td> <td>CC:EF:48:87:49:A0</td> <td>192.168.1.245</td> </tr> </tbody> </table> <p>To change your clustering options, click "Disable Single Point Setup".</p> <p>Enter the location of this AP.</p> <p>Location: <input type="text" value="Location1"/> (Range: 1-64 Characters)</p> <p>Enter the name of the cluster for this AP to join.</p> <p>Cluster Name: <input type="text" value="Location1_Cluster"/> (Range: 1-64 Characters)</p> <p>Clustering IP Version: <input type="radio"/> IPv6 <input checked="" type="radio"/> IPv4</p> <p><input type="button" value="Disable Single Point Setup"/></p>	Location	MAC Address	IP Address	Location1	CC:EF:48:87:49:A0	192.168.1.245	<p>Single Point Setup allows WAP561-A-K9 access points to propagate settings.</p> <p>Single Point Setup: Enabled</p> <p>Access Points detected in Cluster: ClusterBuildingA</p> <table border="1"> <thead> <tr> <th>Location</th> <th>MAC Address</th> <th>IP Address</th> </tr> </thead> <tbody> <tr> <td>BuildingA</td> <td>68:86:A7:FE:7C:60</td> <td>192.168.1.250</td> </tr> <tr> <td>BuildingA</td> <td>68:86:A7:FE:8A:00</td> <td>192.168.1.245</td> </tr> </tbody> </table> <p>To change your clustering options, click "Disable Single Point Setup".</p> <p>Enter the location of this AP.</p> <p>Location: <input type="text" value="BuildingA"/> (Range: 1-64 Characters)</p> <p>Enter the name of the cluster for this AP to join.</p> <p>Cluster Name: <input type="text" value="ClusterBuildingA"/> (Range: 1-64 Characters)</p> <p>Clustering IP Version: <input type="radio"/> IPv6 <input checked="" type="radio"/> IPv4</p> <p><input type="button" value="Disable Single Point Setup"/></p>	Location	MAC Address	IP Address	BuildingA	68:86:A7:FE:7C:60	192.168.1.250	BuildingA	68:86:A7:FE:8A:00	192.168.1.245
Location	MAC Address	IP Address														
Location1	CC:EF:48:87:49:A0	192.168.1.245														
Location	MAC Address	IP Address														
BuildingA	68:86:A7:FE:7C:60	192.168.1.250														
BuildingA	68:86:A7:FE:8A:00	192.168.1.245														

- **Location:** Description of where the access point is physically located.
- **MAC Address:** Media Access Control (MAC) address of the access point.
- **IP Address:** The IP address for the access point.



Note: the Single Point Setup status and the number of WAP devices are shown graphically on the right side of the page.