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Configuration Guide

Configuring DynamicRF in vWLAN

This configuration guide provides an in-depth look at DynamicRF in ADTRAN Bluesocket Virtual Wireless Local Area Network (vWLAN) products. Included in this guide are an overview of DynamicRF, configuration of DynamicRF for vWLAN products, and general troubleshooting information.

This guide consists of the following sections:

Overview of DynamicRF in vWLAN

DynamicRF, ADTRAN's Radio Resource Management (RRM) technology, is designed to maximize performance and adapt to interference in WLAN networks by automatically configuring optimal radio settings based on information an access point (AP) receives from the wireless environment.

DynamicRF functions in the WLAN network by learning about neighboring sources of interference, such as additional Bluesocket APs, third-party APs, ad-hoc networks, and channel interference. Once sources of interference are discovered, DynamicRF uses an algorithm to automatically configure optimal AP radio settings, such as channel settings and transmit power, to help prevent co-channel and adjacent-channel interference. The algorithm provides the optimal channel on which the AP should operate as well as determines if transmit power should be reduced on the AP radio.

To understand how DynamicRF functions, it is important to understand the following concepts:

- 2.4 GHz and 5 GHz radio operation
- Radio frequency (RF) planning and overlapping channels
- RF interference

For more information about these concepts, and in particular their function within a Bluesocket wireless deployment, you should read and understand the guide *Avoiding RF Interference with a Successful Bluesocket Wireless Deployment* before using DynamicRF. This guide is available online at https://supportforums.adtran.com.

The DynamicRF algorithm, various types of interference detected by DynamicRF, and the roles of DynamicRF in the AP configuration are discussed in the following sections.

Overview of DynamicRF Algorithm and Operation

The algorithm used by DynamicRF functions in two ways to optimize radio settings for connected APs: through dynamic channel and the dynamic power algorithm operations. The roles and operations of this algorithm are discussed in the following sections.

DynamicRF does not replace predictive network designs, RF planning, or onsite surveys. Engineering and design are required to determine network requirements, AP placement and installation, and other wireless network considerations. Best practice is to remove sources of network interference, such as printers, rogue APs, video cameras, etc.,through strong corporate network policies. DynamicRF is a tool that can operate within these policies and provide APs an ability to adapt to changes in the network. Refer to *DynamicRF Use Cases on page 11* *for more information regarding DynamicRF use case examples.*

DynamicRF Channel Algorithm

The dynamic channel algorithm operation used by DynamicRF employs RF planning concepts based around overlapping channels and channel interference from other APs to help select a channel plan for Bluesocket APs. When DynamicRF operation begins, APs evaluate their current AP adjacencies. An adjacency is detected by scanning the frequency band and listening for any other APs or ad-hoc networks that are being broadcast at a Received Signal Strength Indicator (RSSI) higher than the transmit power interface threshold set in the DynamicRF profile (refer to *Step 1: Configuring the DynamicRF Profile on page 7* for more information about DynamicRF profiles).

When all networks are detected, each AP calculates its channel utilization, which is a calculation of how much the channel is being used by other APs around it. Once this value is calculated, the information is sent back to vWLAN, and DynamicRF analyzes the data and selects the best channel for AP operation.

DynamicRF Channel Algorithm Operation Example

In a typical network setting, with multiple APs and ad-hoc networks, the DynamicRF channel algorithm is used to determine the best operation channels for APs within the wireless environment. *Figure 1* describes a wireless environment in which there are two company APs (orange), two third-party APs from another company (blue), and an ad-hoc network. In the illustration, the dotted lines represent the APs' effective range of coverage.

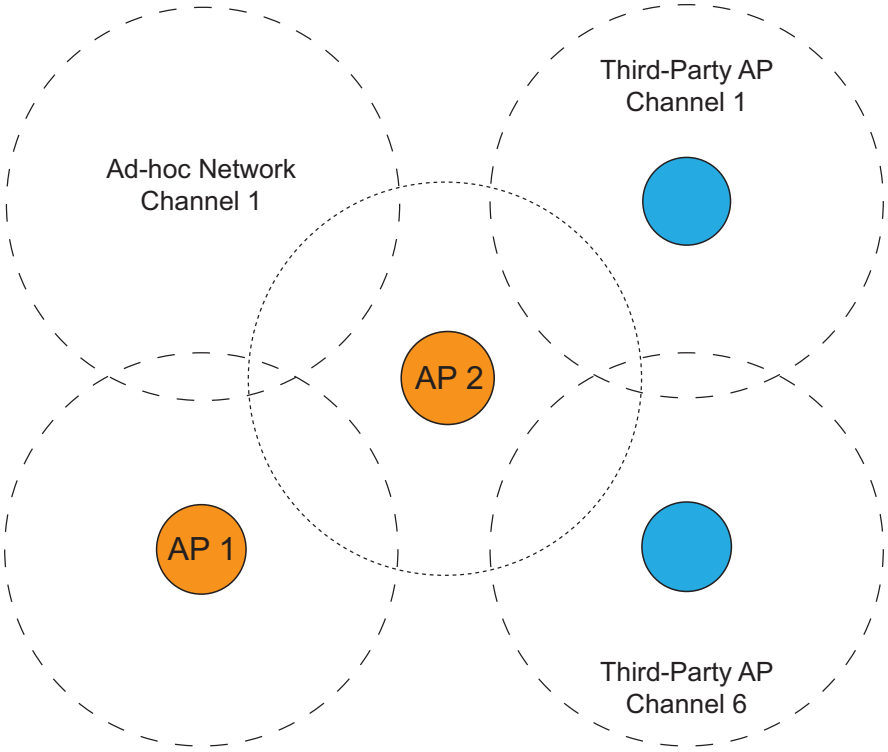


Figure 1. Wireless Environment with Company APs, Third-Party APs, and Ad-hoc Network

In this example, DynamicRF is enabled on both **AP 1** and **AP 2**. The adjacencies for **AP 1** include an ad-hoc network adjacency on channel 1, and the adjacencies for **AP 2** include adjacencies from third-party APs on channels 1 and 6. DynamicRF calculates the channel utilization for each AP based on these adjacencies, and then selects channel 11 for **AP 2** operations and channel 6 for **AP 1** operations. These selections allow the least amount of overlap possible while also conforming to normal channel planning concepts.

DynamicRF Power Algorithm

The dynamic power algorithm operation used by DynamicRF operates similarly to the channel algorithm operation in that it detects Bluesocket AP adjacencies. However, when adjacency data is sent back to vWLAN, DynamicRF sets transmit power for an AP by considering only the adjacencies from APs in the same domain. If an adjacent AP is detected on the same channel, at a power level higher than the **Transmit Power Interference Threshold** specified in the DynamicRF profile, DynamicRF reduces one or both of

the APs' power. The channel is then scanned again by each AP, and the power reduction takes place again if the APs still detect each other at a high RSSI. The power algorithm always takes place after the channel algorithm has run and set channels for the AP (or it runs independently if it is run without the channel algorithm).

DynamicRF Power Algorithm Operation Example

In the following example, DynamicRF has already been used to properly set the appropriate channels for all working APs. *Figure 2* below illustrates two APs, **AP 1** and **AP 2**, that although not directly next to each other, can still hear each other on the same channel at a signal strength above the configured transmit power interference threshold setting of **-80 dBm**.

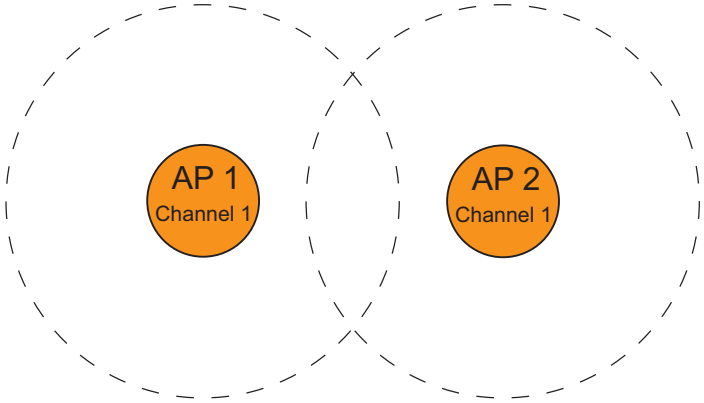


Figure 2. Two APs Using DynamicRF Power Algorithm

To address this interference, DynamicRF steps power down on one or both APs from **30 dBm** to **29 dBm**. Both APs once again listen and calculate the signal strength of the other's signal. If it is still above the threshold, power is reduced again and the steps are repeated until the APs cannot hear each other at a signal strength higher than the transmit power interface threshold value.

DynamicRF Operation on an AP's First Boot

DynamicRF is used from the first moment the AP begins operation. The following sections outline the order in which AP operations occur and their impact in DynamicRF operation. *Figure 3 on page 5* visually outlines this process.

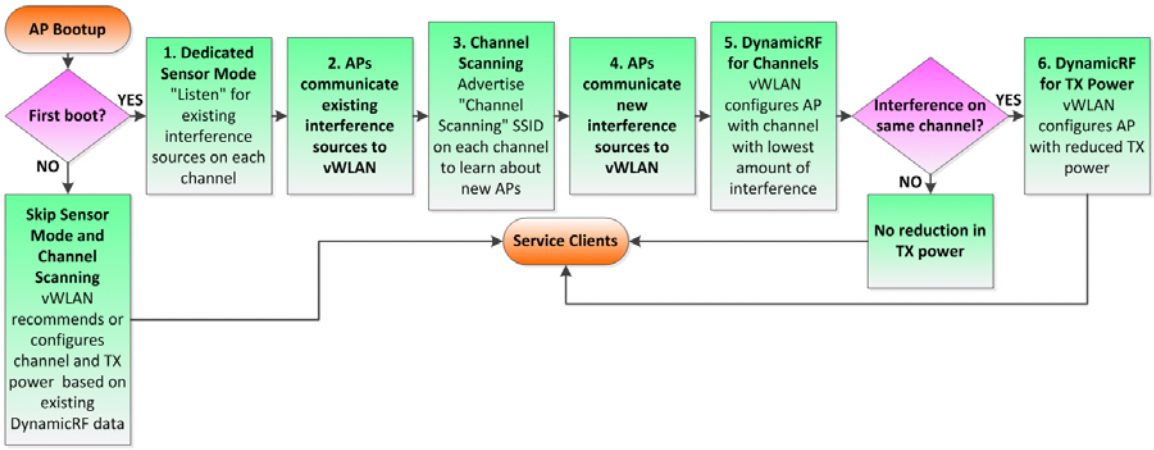


Figure 3. DynamicRF Order of Operation

> *The configuration of the DynamicRF mode setting for the AP radio can affect the DynamicRF operation as it is described below. If the DynamicRF mode is set to* ***Set Once and Hold*** *(default) or* ***Continuous****, DynamicRF operates as described. If DynamicRF mode is set to* ***Disabled****, all radio settings must be configured manually. In addition, if some specifics of AP configuration are set to* ***auto****, DynamicRF operation can be affected. Refer to* *Step 1: Configuring the DynamicRF Profile on page 7* *for more information about these settings.*

1. **Dedicated Sensor Mode**: When Bluesocket APs are added or moved into a domain for the first time, both the 2.4 GHz and 5 GHz radios of the AP enter dedicated sensor mode once their firmware upgrade is complete. They stay in this mode for one minute, in which the radios do not service clients but rather listen for sources of interference on each channel. Interference types detected during this time include neighboring Bluesocket APs, third-party APs, and ad-hoc networks on each channel.

2. **Communicate Interference to vWLAN**: Once the APs have listened for interference during the dedicated sensor mode, they pass the list of learned interference sources and these source's signal strengths to vWLAN over the secure management and control channel. While the APs are in sensor mode, and not beaconing, neighboring active APs do not detect these APs. Once interference sources are communicated to vWLAN, if the AP is booting up for the first time in this domain, it begins channel scanning. If this is not the first boot of the AP, the AP does not begin channel scanning, but rather, DynamicRF configures or recommends radio channel and transmit power settings based on the information gathered and set in the DynamicRF profile.

3. **Channel Scanning Mode**: If this is the first boot for the AP in this domain, it enters **channel scanning mode** for three minutes (after the initial one minute in **dedicated sensor mode**). While in this mode, the 2.4 GHz and 5 GHz radios send a channel scanning beacon service set identifier (SSID) on each non-overlapping channel per radio. These channels are determined by the country in which the AP is operating; for example, in the United States, the channel scanning SSID is broadcast on channels 1 and 36 for the first minute (for the 2.4 GHz and 5 GHz radios respectively), 6 and 48 for the second minute, and 11 and 161 for the third minute. During this period, any new Bluesocket APs that boot up

concurrently learn about each other, and any existing active neighboring Bluesocket APs learn about the new APs when the new APs visit the channel on which the existing active APs are operating.

4. **Communicate Interference to vWLAN**: After the channel scanning mode, APs report any newly detected sources of interference to vWLAN over the secure management and control channel. Using this information, and information specified in the DynamicRF profile, DynamicRF configures or recommends radio channel and transmit power settings.

5. **DynamicRF for Channel Assignment**: Once the AP has been through the dedicated sensor and channel scanning modes, vWLAN runs a dynamic channel algorithm using the data it receives from the APs. This algorithm determines the number of neighboring interference sources on each channel and takes into account AP and ad-hoc network sources of interference and signal strength information. These settings can be configured as described in *Step 1: Configuring the DynamicRF Profile on page 7*. Once the algorithm has run, channels and transmit power settings are assigned to the AP. The AP is configured with the channel with the lowest amount of interference, neighboring APs, and ad-hoc networks. If these values result in a tie, signal strength information is used to make a channel assignment decision.

6. **DynamicRF for Transmit Power Settings**: After the radio channel has been configured, the DynamicRF power algorithm is used to determine if radio transmit power should be reduced. If there are sources of interference, such as neighboring Bluesocket APs in the same domain, on the same channel with an RSSI equal to or higher than the configured power threshold, transmit power is reduced.

Transmit power is reduced only if neighboring APs are Bluesocket APs in the same domain and on the same channel. Third-party APs do not impact transmit power.

The lower the power threshold is configured to be (refer to *Step 1: Configuring the DynamicRF Profile on page 7*), the more likely APs with interference or neighbors on the same channel and in the same domain will reduce power. APs without interference, or neighbors on the same channel, do not automatically result in reduced transmit power. vWLAN reduces transmit power only to mitigate interference, not to create a specific amount of cell overlap.

Hardware and Software Requirements and Limitations

This document describes DynamicRF configuration for vWLAN and APs running software versions 2.9 or later. DynamicRF is supported on all BSAPs, with the exception of the 1800 Series BSAPs.

This document assumes a familiarity with vWLAN and its configuration, as described in the *vWLAN Administrator's Guide*, available online at https://supportforums.adtran.com.

DynamicRF Configuration

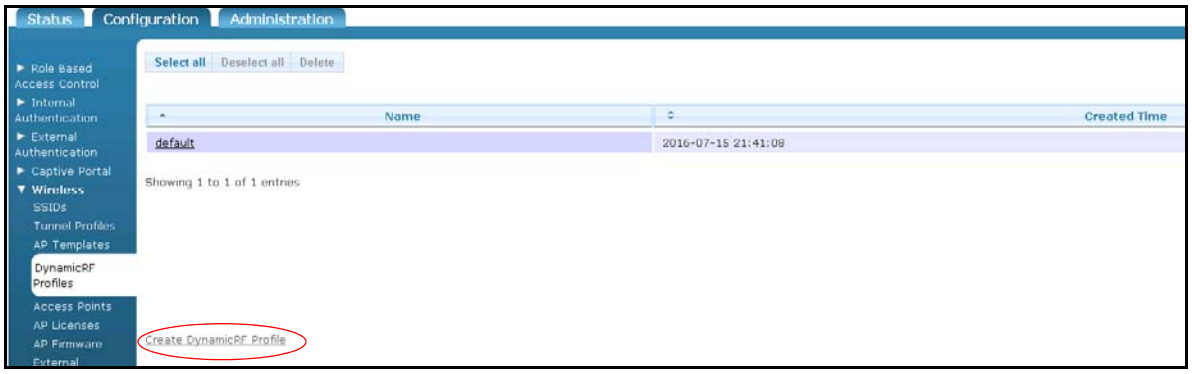
Configuring DynamicRF relies on two main configuration steps: configuring a DynamicRF profile, and applying the DynamicRF profile to the AP. The steps necessary to complete these tasks are described in the following sections.

> *Prior to vWLAN version 3.1.0, the default mode for DynamicRF was **Set Once and Hold**, such that channels and power would not change after the first boot. As of vWLAN 3.1.0, new APs will default to Client-aware AP/Sensor mode and the DynamicRF profile will default to **Continuous mode**. These settings will allow new APs to run Dynamic RF out of the box and adapt to channel and power changes in the environment without manual intervention.*
>
> *While the new default mode allows dynamic changes, ADTRAN still recommends that an on-site technical administrator evaluate the changes for special situations and adjust the settings, if needed.*

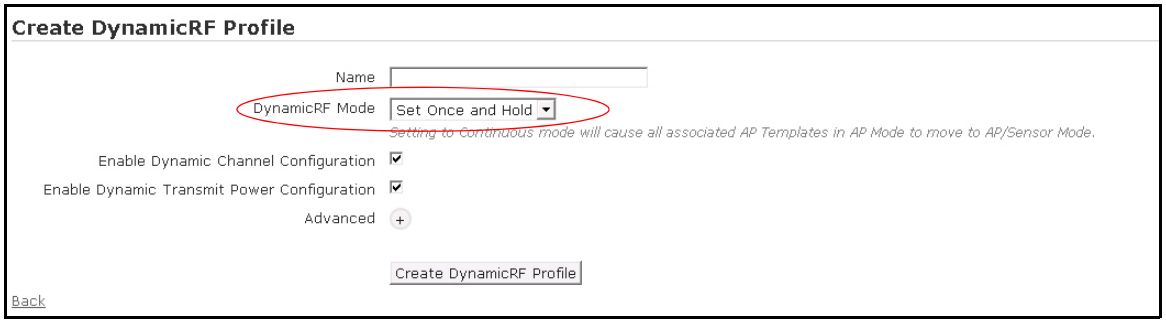
Step 1: Configuring the DynamicRF Profile

There are various settings that can be configured for the DynamicRF profile. These settings include specifying the profile name and DynamicRF mode, enabling channel and power configuration, and specifying power thresholds. Each configurable DynamicRF profile setting is described in the following section. To configure various settings for the DynamicRF profile, follow these steps:

1. In the vWLAN GUI, navigate to the **Configuration** tab, and select **Wireless** > **DynamicRF Profiles**.



2. A **Default** DynamicRF profile already exists. This profile uses all default values for DynamicRF settings. To create a new DynamicRF profile, select **Create DynamicRF Profile**. To edit an existing profile, select the profile name from the list.
3. In the **Create DynamicRF Profile** menu, specify the name of the profile in the **Name** field. Specify the DynamicRF type by selecting either **Set Once and Hold** or **Continuous** from the **DynamicRF Mode** drop-down menu. Refer to *DynamicRF Use Cases on page 11* for additional information about when to use each of these settings.



Set Once and Hold: This setting indicates that vWLAN only configures the RF power and channel settings for APs to achieve optimal RF performance a single time. After the initial configuration is set by DynamicRF, future changes to the channel and power settings must be made manually, or a background scan can be scheduled or run manually. In this mode, neighboring APs do not automatically respond to changes in the wireless environment.

> NOTE
>
> *It is possible to run DynamicRF in the background even when the DynamicRF mode is **Set Once and Hold**. This allows you to receive suggested radio setting changes that you can choose to manually accept later (refer to Creating DynamicRF Background Scans in vWLAN on page 14).*

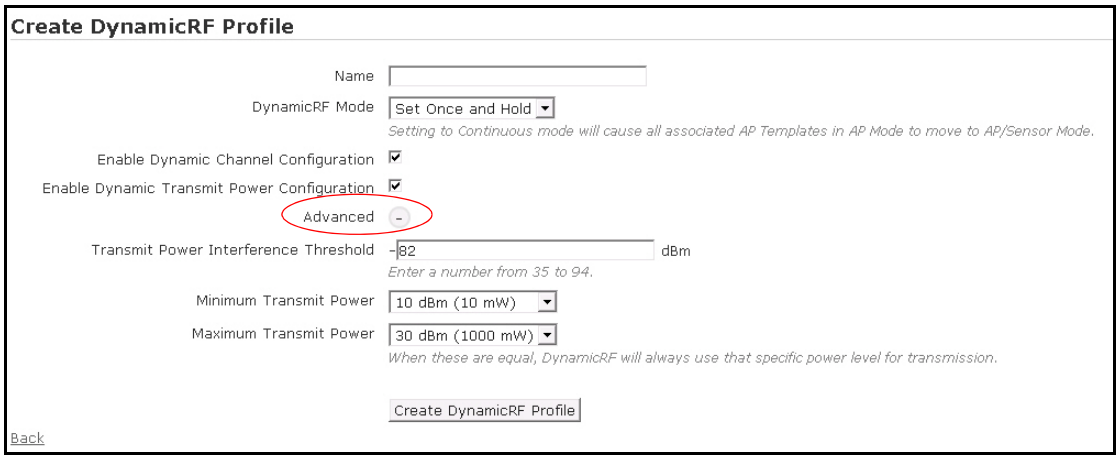
Continuous: This setting indicates that vWLAN continuously evaluates the RF environment and modifies the AP's RF power and channel settings as needed to achieve optimal RF performance. In this mode, if the environment changes, the APs automatically increase or decrease power levels or change radio channels to account for the environmental changes. In general, you should not use continuous DynamicRF for real time traffic (such as voice) or in high-throughput environments

As of vWLAN 3.1.0, **Client-Aware AP/Sensor** mode was added as a selection under Radio Settings in the AP template, allowing the AP to background scan for better channels. When a better channel is found, the AP will queue up a change, but will not implement it until all clients are idle. This practice eliminates issues with clients not following channel changes during data transmission.

> NOTE
>
> *ADTRAN recommends always using Client-Aware AP/Sensor mode with a **Continuous** DynamicRF profile.*

> *If you are editing a previously created DynamicRF profile, and set it to **Continuous**, any associated AP templates will place the APs in AP/Sensor mode. This could cause a disruption to wireless communication. In addition, any change in channel or radio settings on the AP will cause clients to lose connectivity to that AP. Note that when an AP changes channels, a Channel Switch Announcement (CSA) is sent to clients to notify them of the channel change.*

4. Enable **Enable Dynamic Channel Configuration** by selecting the check box. This option is enabled by default, and specifies that DynamicRF will automatically assign the AP radio to the channel with the least amount of interference.
5. Enable **Enable Dynamic Transmit Power Configuration** by selecting the check box. This option is enabled by default, and specifies that DynamicRF will automatically change transmit power settings of the AP radio based on learned signal strength of other APs.
6. Optionally select the **Advanced** tab to configure transmit power settings for the DynamicRF profile.



Specify the **Transmit Power Interference Threshold** by entering a value in the appropriate field. By default, the threshold is set to **-82 dBm**. Valid range is **-35** to **-94 dBm**. This setting specifies that neighboring APs on the same channel with an RSSI of this setting or stronger will reduce transmit power. The stronger the threshold number, the more likely APs with neighbors on the same channel will reduce power.

Select the **Minimum Transmit Power** from the drop-down menu. By default, the minimum transmit power is set to **10 dBm (10 mW)**. Valid range is **1 dBm (1.3 mW)** to **30 dBm (1000 mW)**. This setting specifies that the transmit power will never be lower than the specified value.

Select the **Maximum Transmit Power** from the drop-down menu. By default, the maximum transmit power is set to **30 dBm (1000 mW)**. Valid range is **1 dBm (1.3 mW)** to **30 dBm (1000 mW)**. This setting specifies that the transmit power will never be higher than the specified value.

> *When the minimum and maximum transmit power values are equal, DynamicRF always uses that specific power level for transmission. In addition, certain APs can only operate to a maximum power under 30 dBm (these parameters are visible in the AP details power configuration options). Setting the power level above this maximum results in the AP still functioning at the value below 30 dBm. For example, if an AP is configured for 30 dBm, and the AP is not capable of 30 dBm, it will be configured for the maximum value of which it is capable. If the maximum value is configured to a value above that of which the AP is capable, the value automatically becomes the maximum value of which the AP is capable.*

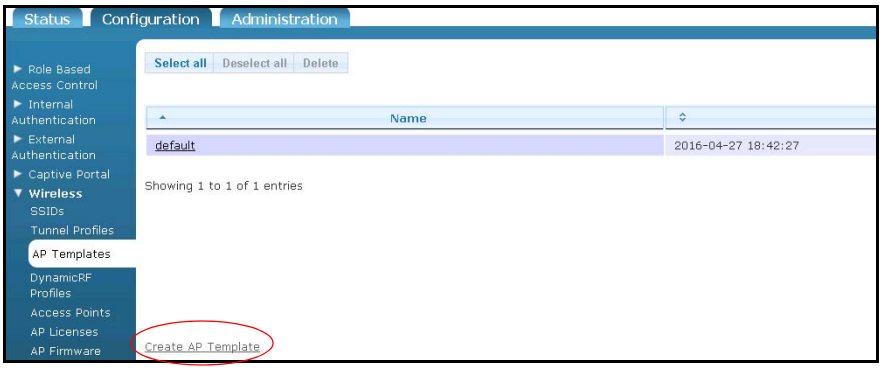
7. Select **Create DynamicRF Profile** to create the profile.

> *Often it is desired to limit 2.4GHz power levels lower than 5GHz power levels due to the 2.4GHz frequencies traveling much farther distances. ADTRAN recommends creating separate profiles for 2.4GHz and 5GHz operation and apply them to the AP template accordingly.*

Step 2: Applying the DynamicRF Profile to an AP

To apply the DynamicRF profile to an AP radio, access the AP template used by the AP and apply the profile following these steps:

1. In the vWLAN GUI, navigate to the **Configuration** tab, and select **Wireless** > **AP Templates**.



2. Select the AP template from this list if you are editing a template, or select **Create AP Template** from the bottom of the menu if you are creating a new template.
3. To add the DynamicRF profile to the template, in the **Create AP Template** or **Edit AP Template** menu, navigate to the **Per Radio Setting** menu. Select the **DynamicRF Profile** from the drop-down menu. The default profile appears in this list, as well as any other profiles you have created. Make selections for both the 2.4 GHz and 5 GHz radios.

4. To apply the DynamicRF profile to the AP template, select **Update AP Template** from the bottom of the **Edit AP Template** menu. All APs that use this template will be updated with the new DynamicRF profile.

> NOTE
> *If the DynamicRF profile is set to **Continuous** mode, all APs that use this template will change from AP mode to AP/Sensor mode. This could cause an interruption in wireless connection.*

> NOTE
> *As of vWLAN 3.1.0, the ability to exclude channels from Dynamic RF was added to the AP Template menu. Refer to the Bluesocket vWLAN Administrator's Guide, available online at https://supportforums.adtran.com for more information on how to configure channels to be excluded.*

DynamicRF Use Cases

The following section provides more detailed information about DynamicRF use cases, such as when the AP DynamicRF mode is set to one of the following:

- **Continuous Mode** (most responsive to changes in the RF environment)
- **Set Once and Hold** (most stable, relies on DynamicRF settings at first boot)
- **AP/Sensor Mode** (able to service clients while performing off-channel background scans; BSAP 1900 and 2000 Series only)

Details of each DynamicRF mode, as well as considerations for their use, are described in the following sections.

DynamicRF Continuous Mode

In DynamicRF, **Continuous** mode is most responsive to changes in the RF environment. It is most frequently used in a dynamic environment where automatic changes to power or channel settings are important.

The following considerations are important when deciding to use DynamicRF **Continuous** mode:

- There can be client disruption with power and channel changes. DynamicRF **Continuous** mode should not be used where service disruptions are critical issues. In addition, this mode may impact real time applications.
- For continuous adaptation to changes in the RF environment through automatic channel and power setting changes, the AP radio mode should be set to **AP/Sensor Client Aware** or **AP/Sensor Mode** when using DynamicRF **Continuous** mode. If the DynamicRF mode is set to **Set Once and Hold**

with an AP radio in **AP/Sensor Client Aware Mode** or **AP/Sensor Mode**, channel and transmit power setting suggestions are provided, but not automatically made.

- If another AP goes online on the same channel as an existing AP, the existing AP might change channels or reduce transmit power to help prevent interference based on the DynamicRF settings. Additionally, if an AP goes down, neighboring Bluesocket APs in the same domain might increase transmit power to compensate for the nonfunctional AP.

DynamicRF Set Once and Hold Mode

In DynamicRF, **Set Once and Hold** mode allows the APs to pick the best power and channel settings DynamicRF finds at the AP's first boot for a starting point before manually adjusting power settings or channels as needed or in tandem with an on-site survey.

The following considerations are important when deciding to use DynamicRF **Set Once and Hold** mode:

- In **Set Once and Hold** mode, DynamicRF can suggest transmit power changes based on changes in the environment (after an on-demand or scheduled scan is completed and the AP radio is set to **AP/Sensor Mode**). While DynamicRF is in **Set Once and Hold** mode, the system administrator can look and determine what channel and power settings should be accepted.
- When DynamicRF is in **Set Once and Hold** mode, and the AP radio mode is set to **AP** mode, the BSAP 1900 and 2000 Series APs are able to service clients on the current channel. These APs also report any adjacencies or sources of interference if the source is operating on the same channel as the AP.
- DynamicRF **Set Once and Hold** mode is typically paired with an on-demand or scheduled background scan (refer to *DynamicRF Background Scans* below). Given that the wireless environment can change quickly, vWLAN will create a task to schedule a scan when DynamicRF is operating in this mode.

DynamicRF AP/Sensor Mode

When the AP radio is set to **AP/Sensor Mode**, the BSAP 1900 and 2000 Series APs can service clients on the current channel while non-intrusively performing off-channel background scanning on other channels for sources of interference and wireless intrusion detection. Off-channel background scanning is performed every **10** seconds with a dwell time of **190** milliseconds.

Off-channel background scanning can cause a negligible loss of throughput performance (<10 percent).

Understanding AP/Sensor (Dual) AP Radio Mode

AP/Sensor Mode, commonly referred to as dual mode, is a radio mode that allows APs to service clients normally on one channel, while being aware of adjacencies and RF changes on other channels. While generic **AP** radio mode can only detect adjacencies from other APs on the same channel on which it is currently operating, the **AP/Sensor Mode** can listen to other channels for adjacencies by performing off-channel scanning. Off-channel scanning is achieved by allowing the AP to switch to a different channel than the one it is servicing once every **10** seconds. When it is ready to switch, it buffers client traffic and dwells on a different channel for **190** milliseconds to check for adjacencies before resuming client service.

While this switch can negligibly impact throughput performance (<10 percent), it also allows DynamicRF to make decisions based on adjacencies on other channels.

When an AP radio set to **AP/Sensor Mode** is paired with DynamicRF in **Continuous** mode, DynamicRF can determine if there is a better channel on which the AP should operate based on channel utilization data received from off-channel scanning.

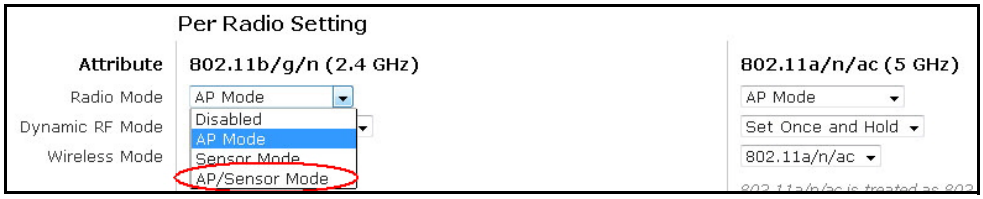
If a better channel is found, a channel change notification is sent to the clients and the AP moves to the other channel. Although this can cause a slight service disruption, the overall performance gain received from operating on the best channel can outweigh this risk.

> NOTE
>
> *The **Continuous** DynamicRF mode should not be used for critical and real time applications, such as voice and video traffic that cannot easily handle latency.*

When an AP radio set to **AP/Sensor Mode** is paired with DynamicRF in **Set Once and Hold** mode, the system administrator can receive DynamicRF suggestions from each channel and then decide whether to push those suggested changes to the APs at their convenience, or based on a schedule.

AP radio modes are determined by the **Radio Mode** specified in the AP's template. To set the radio mode to **AP/Sensor Mode**, access the vWLAN GUI and navigate to the **Configuration** tab, select **Wireless** > **AP Templates**, and select the proper template from the list.

In the template menu, navigate to the **Per Radio Setting** section, and use the **Radio Mode** drop-down menu select **AP/Sensor Mode** for either the 2.4 GHz radio, the 5 GHz radio, or both.



Once the changes are complete, select **Edit AP Template** at the bottom of the menu. These changes will impact all APs configured to use this template.

AP/Sensor Client Aware Mode

The **AP/Sensor Client Aware Mode** was added in vWLAN 3.1.0. This mode functions the same as **AP/Sensor Mode** except that channel changes only occur when no clients are actively transmitting. When a channel change is needed, the change is queued and pushed out when either no clients are connected or when all connected clients are idle. ADTRAN recommends using **AP/Sensor Client Aware Mode** with a Continuous DynamicRF profile.

> NOTE
>
> *The **AP/Sensor Client Aware Mode** carries the same performance degradation as **AP/Sensor Mode**.*

DynamicRF Background Scans

DynamicRF suggestions can be determined by a background scan. This non-service impacting scan looks for improved channel and power settings, and also provides the ability to accept or clear any DynamicRF suggestions. These scans, as well as the ability to apply the suggested changes, can be scheduled. Refer to *Creating DynamicRF Background Scans in vWLAN on page 14* for more information.

Creating DynamicRF Background Scans in vWLAN

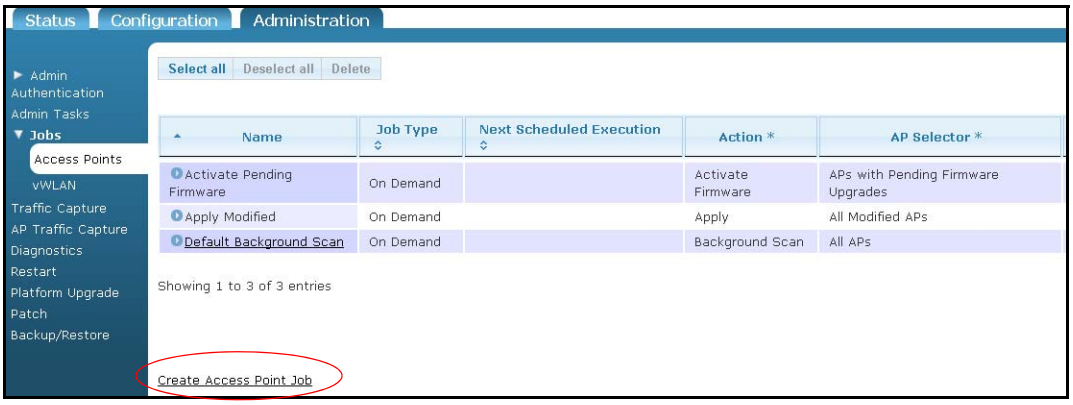
DynamicRF-suggested radio settings can be determined using background scans in vWLAN. These scans allow configured APs to keep servicing clients while simultaneously scanning the wireless environment for suggested changes in radio settings. There are several methods to create background scans for DynamicRF, the suggestions from which can be manually or automatically accepted. The sections below outline the steps to create these scans and accept the suggested changes.

> NOTE
>
> *Off-channel background scans do not impact wireless service as they can allocate minimal airtime to perform off-channel scans, but they can result in a negligible throughput performance decrease (<10 percent).*

Using AP Jobs to Create a Background DynamicRF Scan

To create a DynamicRF scan that runs in the background using an AP job, follow these steps:

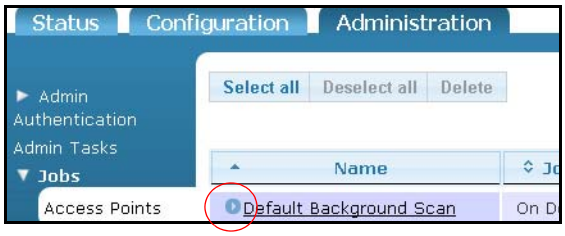
1. In the vWLAN GUI, navigate to the **Administration** tab, and select **Jobs** > **Access Points**. From this menu, select **Create Access Point Job** to begin configuring a DynamicRF background scan.



2. In the **Create Access Point Job** menu, specify the parameters of the job by entering the job name in the appropriate field, selecting **Background Scan** from the **Action** drop-down menu, specifying the duration of the scan, and specifying which APs will perform the scan. You can optionally choose to automatically apply any radio channel and power suggestions when the scan is complete by selecting the **Automatically Apply Channel and Transmit Power Suggestions During Scan** check box. If you do not want to automatically apply these suggestions, for example to avoid wireless service interruption, you can retrieve the suggestions and apply them manually later as described in *Manually Applying DynamicRF Suggestions on page 16*. In addition, you can choose to optionally schedule the scan by selecting the **Scheduled** check box. Once selected, you can specify the frequency, start time, and start

date of the scan. Once you have specified the parameters of the scan, select **Create Access Point Job** to create the job.

3. To run the job, select the play arrow in front of the job in the **Jobs** > **Access Points** menu.



4. If you selected to automatically apply the suggested channel and power changes once the scan is complete, you need not take any further action to implement the DynamicRF suggestions. If you chose to manually apply the suggested changes, refer to *Manually Applying DynamicRF Suggestions on page 16*.

Running a Background Scan from the Status Tab

In addition to creating an AP job to run a DynamicRF background scan, you can also run a background scan from the **Status** tab in the vWLAN GUI. Using this method to run a background scan utilizes dual mode on the selected APs, which allows the APs to service channels while performing off-channel scanning of other channels for adjacent APs.

To run a background scan on selected APs from the **Status** tab, follow these steps:

1. In the vWLAN GUI, navigate to the **Status** tab and select **Access Points**. Select from the list the APs on which you wish to run a background scan. Once you have selected the APs, select **Run Background Scan** from the top of the menu.

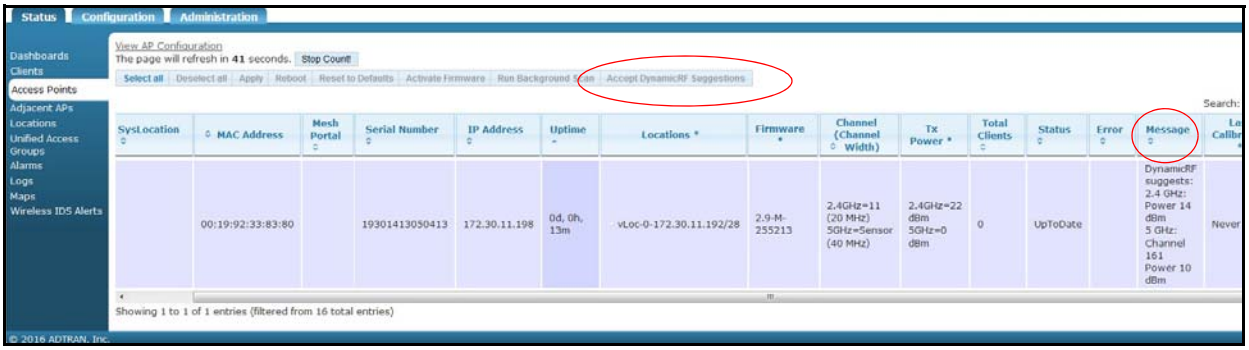
*Using this option runs a **Default Background Scan** (found in the **Administration** tab, **Jobs** > **Access Points**). By default, the scan does not automatically apply DynamicRF settings to the APs. In addition, if the AP selected from **Status** > **Access Points** belongs to an AP template whose DynamicRF Profile set to **Disabled**, the background scan will not run on the selected AP as noted in the **Message Column**.*

2. Apply the suggested changes as described in *Manually Applying DynamicRF Suggestions*.

Manually Applying DynamicRF Suggestions

To manually apply DynamicRF suggestions to your APs, at your convenience, follow these steps:

1. In the vWLAN GUI, navigate to the **Status** tab and select **Access Points**. Any suggested changes for DynamicRF are listed in the **Messages** column of the menu.
2. Select from the list the APs to which you want to apply the suggestions and then select **Accept DynamicRF Suggestions** at the top of the menu to apply the radio and power suggestions to the selected APs.



3. Alternatively, you can create an AP job to accept DynamicRF suggestions. When creating a job (as described in *Using AP Jobs to Create a Background DynamicRF Scan on page 14*), select **Accept DynamicRF Suggestions** from the **Action** drop-down menu.

Running DynamicRF on a Heavily Scaled vWLAN System (750+ APs)

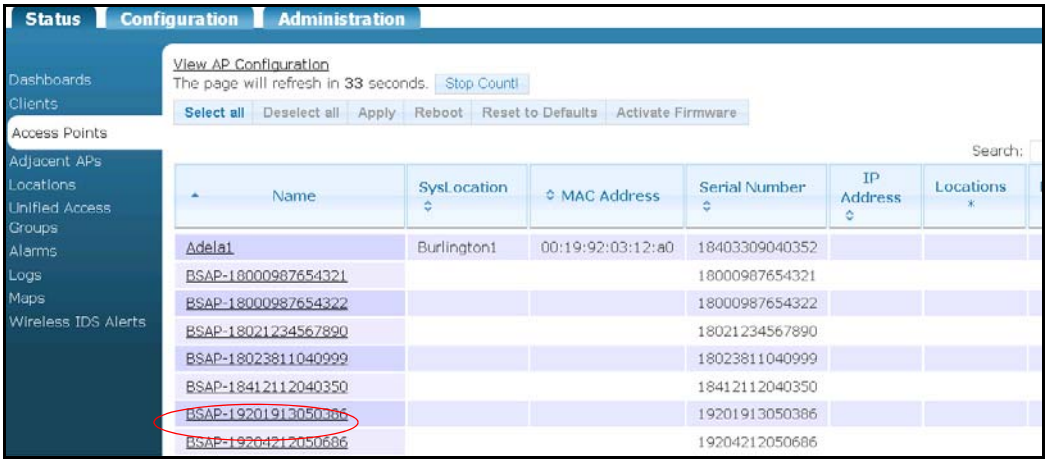
When operating DynamicRF on a large vWLAN system with over 750 APs, it is recommended to use caution with any DynamicRF settings and background scans as to not overload the system. A general recommendation is to utilize **Continuous** DynamicRF mode with **AP/Sensor Client Aware Mode**.

If an administrator desires to run a background scan, it is recommended to execute it on smaller batches of APs for an extended period of time (e.g. 100APs for 3 hours) to balance the load of the DynamicRF process and ensure the best results. Generally, these APs should be logically grouped, as in a specific building or location.

Viewing DynamicRF Statistics

You can view the major causes of interference detected by DynamicRF, including both the number of co-channel and adjacent channel sources of interference, by viewing detailed statistics for each AP. To view DynamicRF statistics on the AP, follow these steps:

1. In the vWLAN GUI, navigate to the **Status** tab, and select **Access Points**. Each configured AP is listed in the menu. Select the AP you want to view from the list.



2. The selected AP details are displayed including the AP configuration, radio interfaces, associated SSIDs, and DynamicRF statistics. From this detailed menu, you can view the adjacent APs, any co-channel APs, and DynamicRF statistics.