Nusoft Wireless LAN Solutions

AP Unified-Configuration

Scenario: You need to install tens to hundreds of access points to provide a wireless Internet access to hundreds of users in an enterprise.

In such a case, a conventional Fat AP would fail due to the followings:

a. During the installation of APs, tons of tedious configurations are mandatory and repeated for each AP one after another, such as management IP address, SSID, encryption, authentication, channel, etc.

b. The large amount of APs makes it hard to maintain from a long-term prospective.

c. The repetitive configurations easily lead to a connectivity issue, which is difficult to spot in a wireless roaming scenario.

With Nusoft APs and AP Controller (APC), now you may:

a. Configure as many APs as you have once for all by creating a pre-configured AP profile on the APC. Once they are connected to the LAN switch, they will automatically be assigned with your configuration profile.

b. Maintain all the AP profiles at an interval of ten seconds using the APC.

c. Reduce the risks of configuration errors due to the repetitiveness and gain an instant insight into the operation of each AP through the status table.

AP Load Balancing

Scenario: You need to provide a wireless Internet access to a number of participants in a business meeting.

In such a case, a conventional Fat AP would fail due to the following:

a. Technically speaking, mobile devices are designed to opt for the AP with the strongest signal, and thus all the devices in the same wireless coverage area are associated with the same AP. Accordingly, some participants may fail to associate with the AP while others may access the Internet at a low speed because of the AP limits, e.g., maximum number of connections, maximum number of clients, etc.

Though some third-party wireless solution offers AP load balancing capability, it still fails due to the following:

a. Their AP load balancing is achieved through limiting the number of associated clients, and thus AP associations are not evenly distributed among APs, which causes a bottleneck that slows down the connection speed.

With Nusoft APs and AP Controller (APC), now you may:

a. Automatically dis-associate any idle clients (associated but not active) and re-associate them with a neighboring AP that has a second signal strength in the wireless coverage area, ensuring the connectivity by load balancing clients across APs.

802.11r Fast Roaming

Scenario: You need to provide a roaming wireless network for VoIP users (VoIP is one of the most used services besides Web browsing and email) in a large enterprise or in the airport, or on a campus.

In such a case, a conventional Fat AP would fail due to the following:
   a. Although roaming between Fat APs can be done by using the same SSID, there is approximately 0.3-second latency during the AP handoff, which causes pause or disconnection.

With Nusoft APs and AP Controller, now you may:
   a. Perform a pre-authentication with the neighboring APs before the handoff occurs, which completes in 0.06 seconds without human perception (approximately 0.1 to 0.4 seconds) and achieves a seamless AP roaming.

Frequently Asked Questions

1. What are the types & differences of APs?

Fat AP : A standalone access point that is equipped with wireless capabilities (e.g., SSID, encryption, authentication, QoS, etc.) and yet no advanced features (e.g., auto radio power). It is ideal for a SOHO or a home scenario, where requires no coordination between APs.

Thin AP : A controller-based access point that delegates all functions to an AP controller (e.g., SSID, encryption, authentication, radio frequency, etc.) and provides centralized AP management as well as advanced features (e.g., AP load balancing, auto radio power, etc.). It is ideal for SMB, campus, hospital, hotel, airport, metro station, etc., where requires roaming or a centralized AP management. The performance of AP controller may decrease as the number of APs increases.

	Fat AP	Thin AP
Centralized AP Management	Not supported (standalone)	AP controller-based
Channel Management	Manual	Automatic
AP Load Balancing	Not supported	Supported
Seamless Roaming	Not supported	Supported
No. of Supported AP	Not supported	Less
Pricing	Low	High

2. **Why do you use the same SSID across different APs in a wireless network?**

Although APs can be assigned with a different SSID, it is suggested to use the same SSID for all APs due to the following advantages:

Simple AP Profile Configuration

The profile configuration can be simplified and done once for all by creating a pre-configured AP profile on the AP controller. However, the more SSIDs would require more times of configuration which increases the difficulty and complexity of the process.

No Need to Change Credentials

Only one set of credentials (SSID & password) is needed for associating with each AP in the wireless network.

Seamless Wireless Network Roaming

Using different SSID for each AP will cause dis-association and re-association due to the handoff with a different AP while roaming. Therefore, to roam among wireless coverage areas continuously, it is suggested to use the same SSID for each AP.

AP Load Balancing

Mobile devices are designed to opt for the AP with the strongest signal, and thus all the devices in the same wireless coverage are associated with the same AP. Consequently, heavy network traffic is generated and causes a bottleneck that slows down the connection speed. However, it is a quite different story if using a single SSID. With APs and AP controller, you can automatically dis-associate any idle clients (associated but not active) and re-associate them with a neighboring AP, ensuring the connectivity by load balancing clients across APs.

3. **Why do you need 8 SSIDs for a single AP?**
   Multiple SSIDs allow wireless users to be grouped by their identity (e.g., guests are permitted with Internet access only; no access to the LAN), or to be managed by their bandwidth usage (e.g., individual QoS).

4. **What are Nusoft Hardware-based & Software-based AP Controllers?**

   Software-based AP controller: Namely the LAC-100, which is operated on a PC and attached to your LAN switch, delivers a SSID-based wireless client management and authentication capability.

   Hardware-based AP controller: Namely an MHG / UTM A-Series product, which is attached to your LAN switch or is used to replace your existing firewall, delivers you an SPI protection and a wireless client management (e.g., QoS, access privilege, application blocking, etc.).

## 5. What are the differences between Nusoft & 3rd-Party AP Controllers?

Company / Model	Nusoft LAC-100	Nusoft MHG / UTM A-Series Product	Ubiquiti UniFi Controller	Aruba Mobility Controller
Deployment Mode	Non-inline	Non-inline / Inline / Gateway	Non-inline	Inline / Gateway
Forwarding Mode	Bridge	Tunnel / Bridge	Bridge	Tunnel / Bridge
AP Load Balancing	O	O	O	O
Seamless Roaming	O	O	O	O
AP Unified-Configuration	O	O	O	O
Authentication (RADIUS / LDAP / Captive Portal)	O	O	External Authentication Server & Captive Portal	O
AP over Google Maps	O	O	O	Only floor plan supported
Wi-Fi Billing	O	O	O	X
Wi-Fi Client Management	X	O	X	O
Scenario	No budget for a centralized AP management (small no. of APs)	A limited budget for a centralized AP & Wi-Fi client management (large no. of APs)	No budget for a centralized AP management (no limit on the no. of APs)	A sufficient budget for an advanced Wi-Fi client management (large no. of APs)
C / P Ratio	Free	High	Free	Medium

## 6. How & when to deploy an MHG / UTM A-Series AP controller?

Inline : The unit is deployed between your existing firewall and LAN without a change being made to the current infrastructure. It is best suited for a network where advanced security and management is needed for both the wired and wireless traffic.
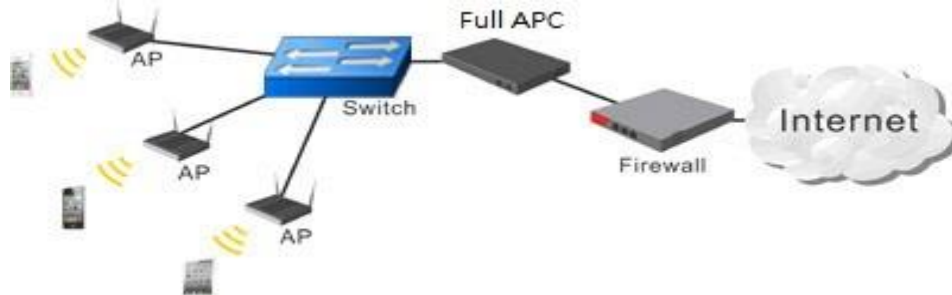
Non-inline : The unit is attached to your LAN switch without any network interference. It is best suited for a network where management is needed for wireless clients (applicable to Nusoft MHG / UTM A-Series).
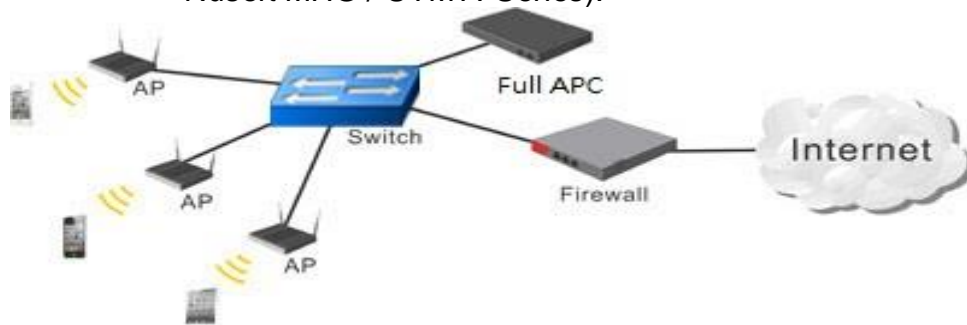
Gateway : The unit is deployed to replace your existing firewall. It is best suited for a network where outbound load balancing and advanced management are needed for both the wired and wireless traffic.
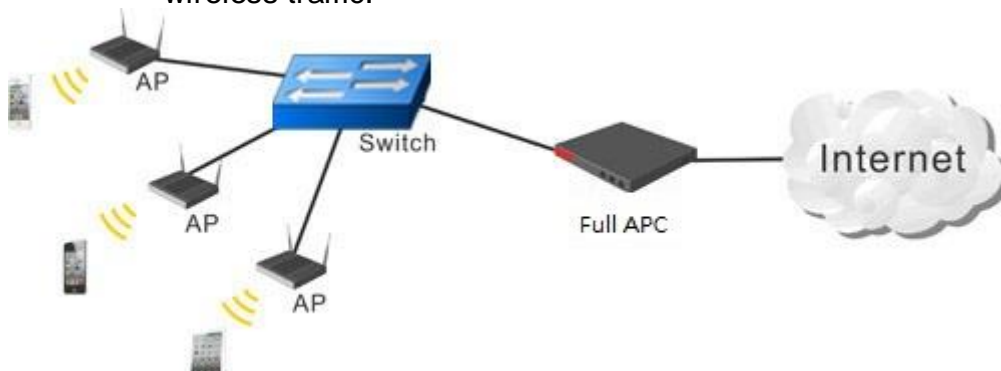
7. Why do AP and AP controller need to be from the same manufacturer?

a. **Different Way of Communication**
The Control and Provisioning of Wireless Access Point (CAPWAP) protocol is used for the communication between AP and APC, yet it may not be adapted to each AP in the market. Therefore, to ensure the proper operation, it is suggested to use the products from the same manufacturer.

b. **Different Way of Operation**
Unlike third-party AP using complex VLAN configuration, Nusoft AP saves the hassle by transmitting the datagrams within a tunnel.

c. **Different Way of Encapsulation**
Even some third-party APs transmit the datagrams within a tunnel, the encapsulation method they use could still vary with one another. Accordingly, it is the best to use Nusoft APC along with Nusoft APs.

8. How & when to deploy a Nusoft AP?

AP Mode: This mode is the most common approach used for establishing a wireless LAN. It converts Ethernet signals into radio signals, enabling mobile devices to access the Internet through the wired network, which is ideal for SMB, campus, hotel, hospital, SOHO, home, and other indoor sites.

Repeater Mode: This mode eliminates dead spots and enhances weak signals by extending your current Wi-Fi coverage, efficaciously alleviating the signal issues caused by obstacles or walls (including structural and interior ones). It is widely adopted in an indoor scenario where the signal of wireless router or AP is impeded.

WDS Mode: This mode is subcategorized into "Root AP" and "Station" modes. It connects LANs at two (or more) physically separated locations, enabling wireless devices to communicate with each other, which is ideal for outdoor-to-indoor and building-to-building scenarios.

WDS Root AP Mode: Once enabled, the AP serves as a root node to connect a leaf node (i.e., LAN) in a point-to-point (P2P) fashion or multiple leaf nodes in a point-to-multipoint (P2MP) fashion.

WDS Station Mode: Once enabled, the AP serves as a leaf node to connect a root node (i.e., an AP operated in "WDS Root AP" mode) in a point-to-point (P2P) fashion.

WISP Client Router Mode: This mode shares a subscribed (from your ISP) or free Wi-Fi signal with LAN users, saving the hassles of wiring. It is ideal for a rural area that lacks of fixed-line telecommunications infrastructure or a region that is covered by a public Wi-Fi hotspot.

9. How to provide wireless users with an access to a NAS server in the company headquarter via Microsoft Networks?

As the popularity of wireless networks increased over the years, more and more employees access the company's NAS server (i.e., file server) via their mobile device.

To access through a Fat / Thin AP, you need to:

a. Establish a VPN connection between the branch and the headquarter office.

b. Set up a WINS server for allowing users on the different subnets to access Microsoft Networks (due to NetBIOS broadcast not being supported as well as Microsoft Networks not being accessible from a different subnet).

To access through a Nusoft AP and a hardware-based AP controller, you simply need to:

Access the NAS server via Microsoft Networks by using your mobile device.