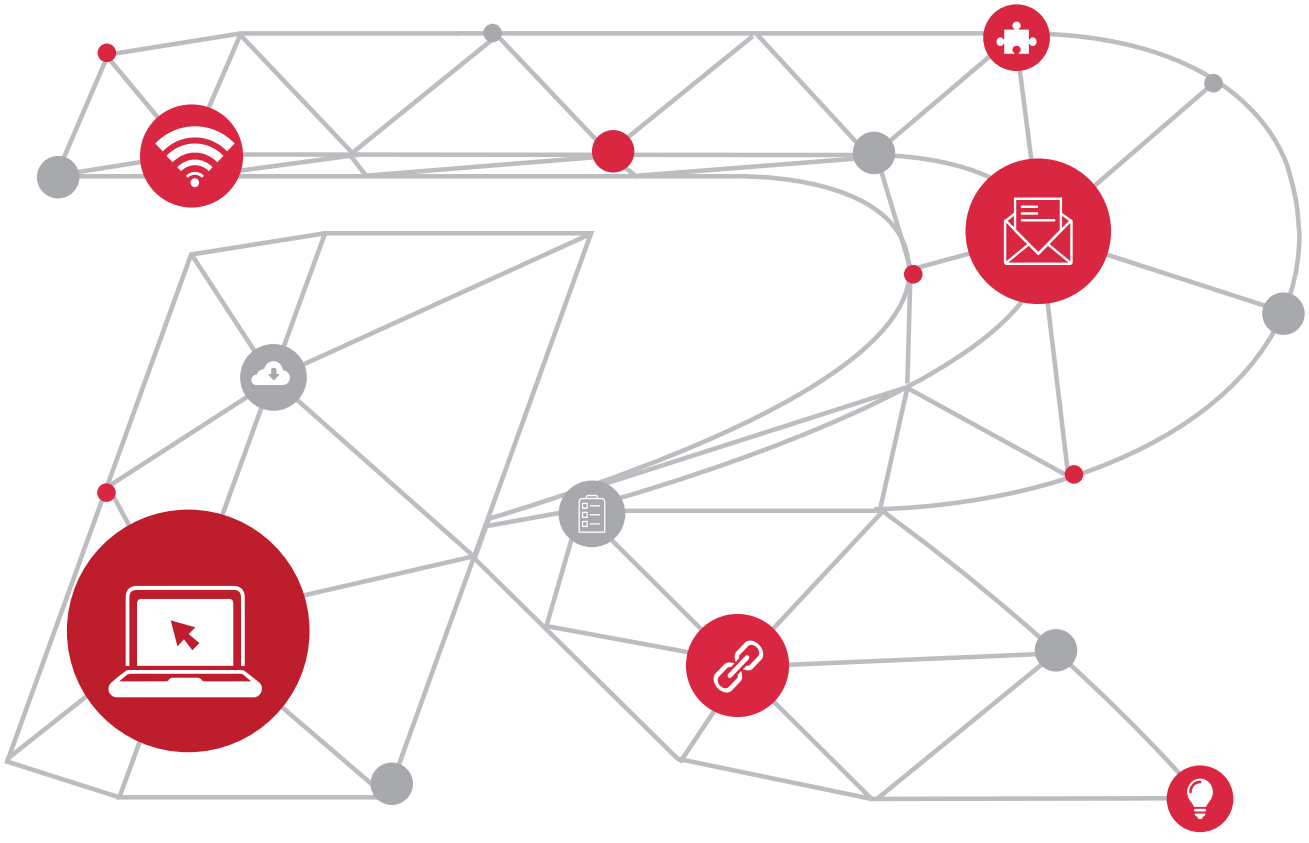
Ruijie Association Control

White Paper



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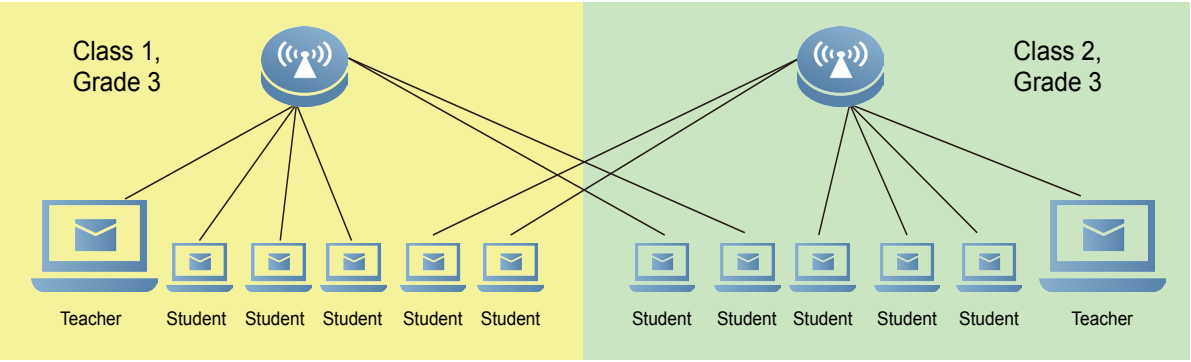
Introduction

This document describes the association control technology developed by Ruijie.

In the e-bag application, each school has multiple classrooms, and each classroom is equipped with one or several wireless access points (APs). As we know, radio signals are propagated in the air. When some students in one classroom connect one AP in the neighboring classroom, the inner access to this AP will be influenced. Therefore, to avoid mutual interference, the school expects that the terminals in one classroom to associate only with the inside APs.

Figure 1



Association control is a method used to control the association behaviors of wireless STAs. With the technology after STAs are grouped, one of them is defined as the primary STA and others as secondary STAs; the secondary STAs must follow the primary STA to associate with the same wireless network.

Basic concepts are introduced as follows:

* **Association control domain: An association control domain is a wireless network that consists of one or a group of APs. In one association control domain, an AP can successfully associate barely with one STA group at a time.**

* **Terminal package: A terminal package refers to a group of STAs, including one primary STA and multiple secondary STAs. The secondary STAs cannot stand alone in association. That is, the secondary STAs must associate with the AP the primary associates.**

Technical Principle

The coverage area of a wireless network is divided into several association control domains, each with one or more APs. Then STAs are grouped and strictly managed into different control domains. The typical application is the school e-bag scenario described in the previous chapter.

To avoid across-class interference, each classroom is defined as an association control domain, and the e-bag used by the students and teachers are associated with a wireless AP in the classroom. Currently, this function is available in the fit AP architecture and the fat AP architecture. These two architectures have the same requirements for association application.

*** Each association control domain is a WLAN subnet, and a VLAN is allocated to each WLAN. The purpose is to restrict broadcast or multicast packets within the local control domain, so as to ensure smooth service application.**

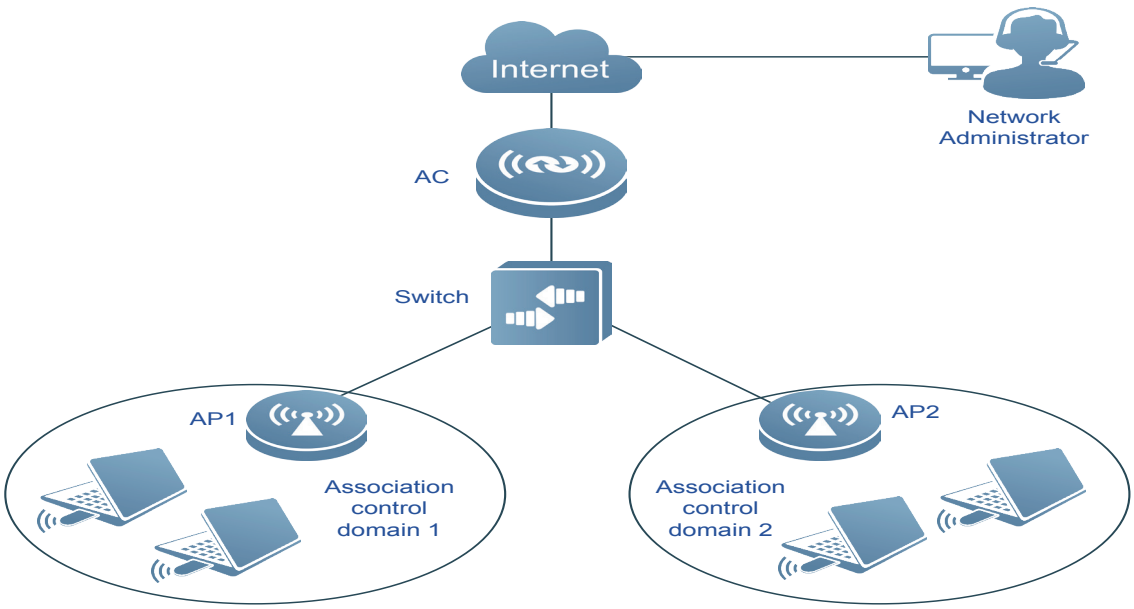
*** All WLAN subnets use different SSIDs. For example, the name of an association control domain can be used as the SSID of a WLAN subnet. The purpose is to enable the primary STA and secondary STAs to associate with an AP in the specified association control domain by using the SSID.**

The following describes how to apply the association control technology to the two networking architectures.

• Fit AP Architecture

Figure 2 shows the association control topology in the fit AP architecture.

Figure 2 Fit AP Architecture



Operating principle

*** According to the configuration pre-defined for the association control domain and terminal package, AC delivers primary STA information to all the associated APs which generate a whitelist of the primary STA.**

*** To apply the association control function, the primary STA needs to associate with an SSID corresponding to the specified control domain. After the association succeeds, the AC delivers secondary STA information to all the associated APs according to the primary STA configuration in the terminal package, which generate a whitelist of secondary STAs. This allows the secondary STAs to associate with the control domain.**

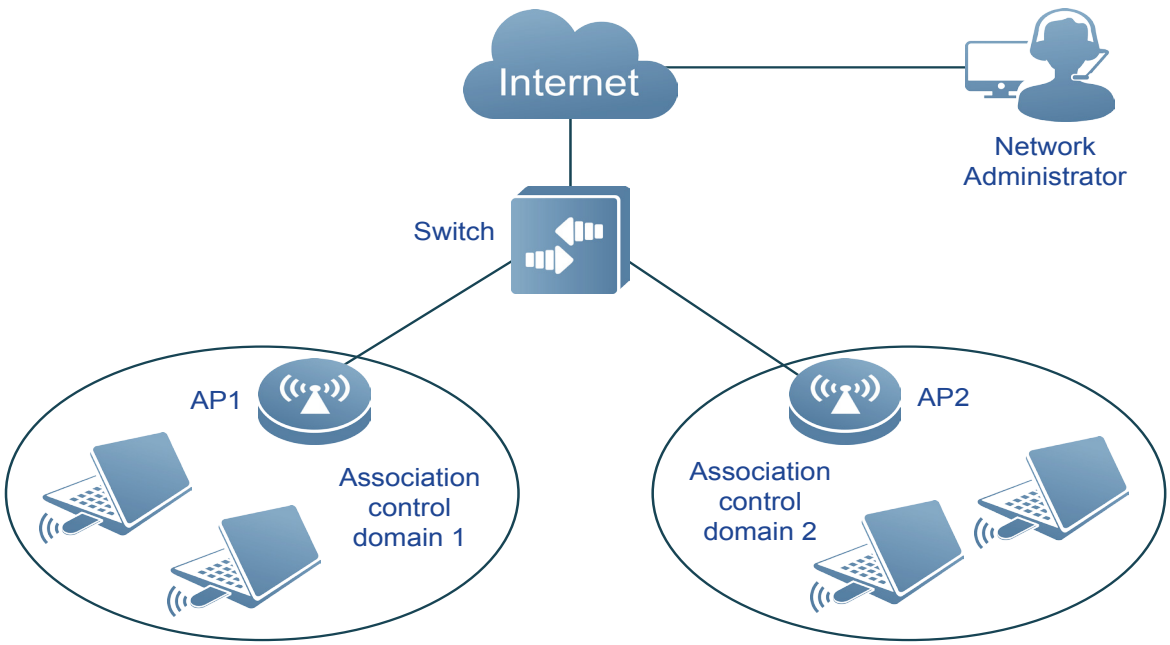
*** When the primary STA is unassociated, all the intra-domain secondary STAs are also unassociated and removed from the whitelist on the AP in the association control domain.**

The foregoing process can be summarized as follows: The secondary STAs follow the primary STA. Wherever the primary STA associate, the secondary STAs pursue the same association. This is because that the whitelist for the corresponding to the secondary STAs is available only on the AP in the association control domain. This ensures that the STAs cannot be associated with unauthorized APs.

• Fat AP Architecture

Figure 3 shows association control topology in fat AP architecture.

Figure 3 Fat AP Architecture



Operating principle

*** According to the configuration pre-defined for the association control domain and terminal package, an AP adds information about all the primary STAs to the whitelist.**

*** To apply the association control function, the primary STA needs to associate with an SSID corresponding to the specified control domain. After the association succeeds, the AP generates a whitelist of secondary STAs according to the primary STA configuration in the terminal package. This allows the secondary STAs to associate with the control domain.**

*** When the primary STA is unassociated, all the corresponding secondary STAs are also unassociated and removed from the whitelist on the fat AP.**

The foregoing process can be summarized as follows: The secondary STAs follow the primary STA. Wherever the primary STA associate, the student STAs pursue the same association. The attempt to connect other non-associated APs will fail. This prevents some naughty students make informal connection.

Conclusion

Ruijie association control technology can meet customers' requirements in special application scenarios and improve user experience.

Ruijie Networks Co.,Ltd

For further information,please visit our website **http://www.ruijienetworks.com**