IEEE P802.11  
Wireless LANs

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| STA and AP | | | | |
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Abstract

This document proposes a modified nomenclature for STA and non-AP STA and suggests ways to implement it.

**Introduction**

802.11 defines the STA as the basic addressable unit for 802.11 communication, and derives from it the AP and the non-AP STA:

**station (STA):** A logical entity that is a singly addressable instance of a medium access control (MAC) and physical layer (PHY) interface to the wireless medium (WM).

**access point (AP):** An entity that contains one station (STA) and provides access to the distribution system services, via the wireless medium (WM) for associated STAs. An AP comprises a STA and a distribution system access function (DSAF).

**non-access-point (non-AP) station (STA):** A STA that is not contained within an access point (AP).

However, outside 802.11, there is typically reference only to AP and STA, where AP has the same meaning as in 802.11, but STA refers to non-AP STA.

**Proposal 1**

A possible way to simplify the 802.11 nomenclature might be to rename the generic 802.11 STA into GSTA (generic STA), then replace all occurrences of STA with GSTA, and then start a process of gradually changing all occurrences of non-AP GSTA and selected occurrences of GSTA, to STA (i.e. those occurrences of GSTA that are currently intended to refer to a non-AP STA).

This means that there will be a period of time during which the current non-AP STA is referred to as both non-AP GSTA and STA (in the new, narrow definition). During this time, volunteers can go section by section and migrate what is intended as the current non-AP STA to STA. When this process is done, there will be AP, STA and GSTA, where GSTA refers to the current generic station (STA) and STA refers to the current non-AP STA.

The use of GSTA over AU (as in proposal 2) has the advantage that "a STA" becomes "a GSTA", rather than "an AU". So the particle spelling does not have to be updated after the initial replace of STA to GSTA.

The above definitions would initially be modified as follows in this case:

**generic station (GSTA):** A logical entity that is a singly addressable instance of a medium access control (MAC) and physical layer (PHY) interface to the wireless medium (WM).

**access point (AP):** An entity that contains one generic station (GSTA) and provides access to the distribution system services, via the wireless medium (WM) for associated stations (STAs). An AP comprises a GSTA and a distribution system access function (DSAF).

**non-access-point (non-AP) generic station (GSTA):** A GSTA that is not contained within an access point (AP).

**station (STA):** A GSTA that is not contained within an access point (AP).

Then, over time, the definition for non-AP GSTA can be removed, as it will have been replaced with STA.

The editorial process would consist of the following steps, to be executed in the described order:

1. modify the definitions as shown above

these modifications introduce GSTA as the current (generic) STA, and both STA and non-AP GSTA as the current non-AP STA.

1. replace all occurrences of "STA" with "GSTA", except in the modified definitions from step 1

this replacement should catch all instances of STA and rename them to GSTA

1. replace all instances of "non-AP GSTA" with "STA"

this step enters the term STA in the new definition as a GSTA not contained within an AP

this step can be executed in one go, or section by section.

1. review and modify instances of GSTA that were intended as the new STA (e.g. the current non-AP STA)
2. delete all remaining instances of "non-access point (non-AP)"
3. delete all instances of "non-AP and"

this covers instances of "non-AP and non-PCP STA", of which there are quite a few

1. delete all instances of "non-AP"

this step cleans up remaining occurrences of "non-AP". However, prior to executing this step we may review each remaining instance of non-AP to see why it was not caught in any of the previous steps.

There are cases in which STA probably already meant non-AP STA. For example in the current definition of AP:

**access point (AP):** An entity that contains one station (STA) and provides access to the distribution system services, via the wireless medium (WM) for **associated STAs**. An AP comprises a STA and a distribution system access function (DSAF).

These cases will not be (more) broken when replaced with GSTA in step 1, but they would become more visible and probably will need be changed at some point. However, it will be better to catch as many of them beforehand, and exclude them from replacement in step 1.

Therefore, excluded from replacing "STA" with "GSTA" in step 1 are:

associated STA

non associated STA

nonassociated STA

authenticated STA

nonauthenticated STA

TDLS STA

TDLS initiator STA

TDLS responder STA

S1G relay STA

relay STA

PSMP STA

[Check instances of associated STA where the STA is the AP associated to a non-AP STA]

802.11 is also not entirely consistent in its use of STA as being a generic 802.11 device. For example, in some cases an AP and a non-AP STA are introduced, and the section subsequently appears to refer to the non-AP STA as the STA. But STA can refer to both the AP and the non-AP STA that were introduced, so which is it? Presumably in most cases the non-AP STA, but the use of STA is incorrect in this case. Examples:

2210.47 (in 11.3.5.11 Service characteristic indication during association)

**A non-AP STA** may indicate to **the AP** its service characteristic information during association by including the Service Characteristic field in the AID Request element in the (Re)Association Request frame. The AP may assign a particular AID **to the STA** taking into account the received service characteristic information **from the STA**.

2290.28 (in 11.10.19 Multicast diagnostic reporting)

**An AP** may send a Multicast Diagnostic request consisting of one or more Multicast Diagnostic requests in a Radio Measurement Request frame **to a non-AP STA** that has indicated support of the multicast diagnostic capability or to a multicast group address if all associated non-AP STAs support the multicast diagnostic capability. If **the STA** accepts the request it shall count the number of received MSDUs with the specified group address and **the STA** shall record the maximum observed PHY data rate of the frames that contained these MSDUs during the requested Measurement Duration.

Such occurrences of STA probably would need to be fixed regardless of whether the above edits are made.

**Proposal 2 (deprecated)**

A possible way to simplify the 802.11 nomenclature might be to rename the generic 802.11 STA into something like AU (addressable unit) and then replace all occurrences of non-AP STA with STA. The above definitions would become as follows in this case:

**addressable unit (AU):** A logical entity that is a singly addressable instance of a medium access control (MAC) and physical layer (PHY) interface to the wireless medium (WM).

**access point (AP):** An entity that contains one addressable unit (AU) and provides access to the distribution system services, via the wireless medium (WM) for associated stations (STAs). An AP comprises an AU and a distribution system access function (DSAF).

**station (STA):** An AU that is not contained within an access point (AP).

[May need a fourth term to denote things like IBSS STA, mesh STA, etc.]

[Maybe delete the term AU and refer to AP and STA]

The editorial process would consist of the following steps, to be executed in the described order:

1. replace all instances of "STA" without prefix "non-AP" with "AU"

this should exclude from replacement:

non-AP STA

non-AP CMMG STA

non-access point (non-AP) QoS stations (STAs)

note: occurrences of "a STA" should be changed to "an AU"

further exclusions are listed below

the intent in this replacement is to catch all generic instances of STA and rename them to AU

1. replace all instances of "non-AP STA" with "STA"

this step enters the term STA in the new definition (as an AU not contained within an AP)

1. delete all instances of "non-access point (non-AP)"

this covers the definitions section

1. delete all instances of "non-AP and"

this covers instances of "non-AP and non-PCP STA", of which there are quite a few

1. delete all instances of "non-AP"

this step cleans up remaining occurrences of "non-AP". However, prior to executing this step we may review each remaining instance of non-AP to see why it was not caught in any of the previous steps.

There are cases in which STA probably already meant non-AP STA. For example in the current definition of AP:

**access point (AP):** An entity that contains one station (STA) and provides access to the distribution system services, via the wireless medium (WM) for **associated STAs**. An AP comprises a STA and a distribution system access function (DSAF).

These cases will not be (more) broken when replaced with AU in step 1, but they would become more visible and probably will need be changed at some point. However, it will be better to catch as many of them beforehand, and exclude them from replacement in step 1.

Therefore, excluded from replacing "STA" with "AU" in step 1 are:

associated STA

non associated STA

nonassociated STA

authenticated STA

nonauthenticated STA

TDLS STA

TDLS initiator STA

TDLS responder STA

S1G relay STA

relay STA

PSMP STA

[Check instances of associated STA where the STA is the AP associated to a non-AP STA]

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