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**Datasheet for the decision
of 7 June 2022**

Case Number: T 1810/19 - 3.5.03

Application Number: 15196124.0

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Title of invention:

WLAN USER ROAMING

Applicant:

Huawei Technologies Co., Ltd.

Headword:

WLAN roaming/HUAWEI

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - (no)



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Case Number: T 1810/19 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 7 June 2022

Appellant: Huawei Technologies Co., Ltd.
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 8 February 2019
refusing European patent application No.
15196124.0 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman K. Peirs
Members: K. Schenkel
C. Heath

Summary of Facts and Submissions

I. This case concerns the appeal of the applicant against the decision of the examining division refusing the European patent application on the grounds of lack of inventive step having regard to **D1** (US 2009/034470 A1) (Article 56 EPC).

II. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of a main and only request as filed on 24 January 2019 and as refused by the examining division.

III. Oral proceedings were held before the board on 7 June 2022.

The appellant maintained the request mentioned in point II above.

At the end of the oral proceedings, the board's decision was announced.

IV. Claim 1 of the **main request** reads as follows:

"A wireless local area network, WLAN, user roaming method, comprising:

selecting, according to load balancing principle, by a first access controller, AC, a home access point, HAP, from an AP resource group, wherein the first AC is an AC to which a first AP associated before the roaming of a wireless terminal of a user belongs, and the AP resource group consists of APs that belong to a same gateway device as the first AP;

receiving, by a foreign access point, FAP, associated after layer 3 roaming of the wireless terminal, a first packet sent by the wireless terminal;

searching, by the FAP according to the first packet, a user table to obtain an encapsulation entry of a first roaming tunnel on which the first packet is to be forwarded, wherein a tunnel outer destination Internet Protocol, IP, address in the encapsulation entry of the first roaming tunnel is an IP address of the HAP, before the roaming of the wireless terminal, and a tunnel outer source IP address in the encapsulation entry of the first roaming tunnel is an IP address of the FAP;

encapsulating, by the FAP, the first packet according to the encapsulation entry of the first roaming tunnel; and

sending, by the FAP, the encapsulated first packet to the HAP by using the first roaming tunnel."

Reasons for the Decision

1. Technical background

The application refers to WLAN level 3 roaming, which is also called cross gateway roaming, in which the access points AP before and after roaming belong to different virtual local area networks (paragraph [0003] of the application as published).

2. Main request - inventive step (Article 56 EPC)

2.1 Claim 1 of the main request includes the following limiting features (board's labelling):

A wireless local area network, WLAN, user roaming method, comprising:

- (a) selecting, according to load balancing principle, by a first access controller, AC, a home access point, HAP, from an AP resource group, wherein the first AC is an AC to which a first AP associated before the roaming of a wireless terminal of a user belongs, and the AP resource group consists of APs that belong to a same gateway device as the first AP;
- (b) receiving, by a foreign access point, FAP, associated after layer 3 roaming of the wireless terminal, a first packet sent by the wireless terminal;
- (c) searching, by the FAP according to the first packet, a user table to obtain an encapsulation entry of a first roaming tunnel on which the first packet is to be forwarded, wherein a tunnel outer destination Internet Protocol, IP, address in the encapsulation entry of the first roaming tunnel is an IP address of the HAP, before the roaming of the wireless terminal, and a tunnel outer source IP address in the encapsulation entry of the first roaming tunnel is an IP address of the FAP;
- (d) encapsulating, by the FAP, the first packet according to the encapsulation entry of the first roaming tunnel; and
- (e) sending, by the FAP, the encapsulated first packet to the HAP by using the first roaming tunnel.

The wording "a first AP associated before the roaming of a wireless terminal of a user" in feature (a) is understood by the board as referring to the access point to which the terminal was associated before the roaming.

2.2 **D1** relates also to the roaming of a wireless client from a first subnet to a second subnet, i.e. layer 3 roaming (paragraphs [0002] and [0003]). The first subnet comprises a home wireless switch ("HAP") and the second subnet comprises a current wireless switch ("FAP") (paragraph [0003]). When the wireless client roams from the first to the second subnet and transmits a packet to the current wireless switch ("FAP") in the second subnet, the current wireless switch ("FAP") forwards the packet from the current wireless switch to the home wireless switch ("HAP") via a tunnel ("roaming tunnel") (*ibid.*).

In the exemplary embodiments, the concept of mobility domains is introduced which span several subnets and allow roaming of a client, such as a terminal, between the subnets within a mobility domain without changing its IP address (paragraphs [0077] and [0078], Fig. 2).

The layer 3 roaming protocol in one embodiment, which refers to Figs. 1 and 3, begins with the establishment of a mesh network connecting within a mobility domain each wireless switch with all other wireless switches by means of data tunnels (paragraph [0083]). After the tunnels have been established, a terminal entering a network is associated to a so-called current switch ("first AP associated before the roaming of a wireless terminal of a user") (paragraph [0086]).

This first current switch ("first AP associated before the roaming of a wireless terminal of a user") initiates a process of selecting a home switch ("HAP") based on factors like for example the number of clients homed or associated to a switch or the data throughput which indicate the load (paragraph [0087]). In the specific embodiment referred to, client 4 selects

switch 12 in subnet A as home switch ("HAP") and roams then to switch 22 in subnet B which becomes its new current switch ("FAP") (paragraphs [0087], [0089] and [0090], Fig. 1). The selection process may also be carried out by the first current switch (before roaming) itself based on a load-balancing scheme (paragraph [0128]). In this case, the current switch adopts two functions, namely of selecting the home switch ("first AC") and being the access point associated to the client ("first AP associated before the roaming of a wireless terminal of a user"). The board notes that the term "access controller" is not strictly defined and may also be attributed to a switch in D1.

Regarding the expression that "the home access point (HAP) is selected from an access point resource group which consists of access points that belong to a same gateway device as the first access point", it could be considered that this is implicitly disclosed in D1 since selecting an access point as HAP which belongs to a different gateway device would be totally contrary to the basic idea of the method of D1 (see, for instance, paragraph [0076]). For the sake of argument, however, the board will regard this expression as a distinguishing feature (see point 2.3 below). **(feature a in part)**

The new current switch 22 ("FAP") determines the home switch of client 4 by searching (implicit) and consulting a wireless client database ("user table") and sends data packets received from client 4 over a tunnel to the home switch 12 ("HAP") (paragraphs [0090] and [0092]). The source and destination IP addresses of the tunnel correspond to the IP addresses of the home switch 12 ("HAP") and the new current switch 22 ("FAP")

respectively, since it appears to an external host that client 4 is still in subnet A (paragraph [0092]).

(feature b, c, d and e)

2.3 The method of claim 1 thus differs from the method of D1 in that

the home access point (HAP) is selected from an access point resource group which consists of access points that belong to a same gateway device as the first access point.

In the method of D1 this would mean that the HAP is selected among the switches of subnet A, it being noted that the switches or access points within one subnet share the same network and subnet number within the IP address and therefore belong to the same gateway device.

2.4 The technical effect of this difference is that the selected home access point has certainly the same network and subnet number within the IP address as the access point the client was first associated to before roaming.

2.5 An objective technical problem may therefore be seen in excluding cases in which the aim formulated in D1, namely to preserve the original IP-address also in cases of layer 3 roaming (paragraph [0076]), cannot be achieved.

2.6 It is apparent for a skilled person in the field of telecommunications that the above-mentioned problem can easily be solved by selecting the home access point among the group of access points having the same gateway device as the access point first associated.

The skilled person, starting out from D1 and applying common general knowledge, would have arrived at a method with all the features of claim 1 in order to solve the above-mentioned problem without having to exercise inventive skills.

- 2.7 The appellant argued that claim 1 included two features which were not disclosed by D1. Firstly, D1 did not disclose that the home access point was selected from an access point resource group consisting of access points that belong to the same gateway as the first access point, as already appreciated by the board in its preliminary opinion. Secondly, D1 did not disclose that the aforementioned selection was done by a first access controller, a difference which was acknowledged by the examining division in its decision. The second difference was said to increase the efficiency since the access controller had a central knowledge base and was in a better position for selecting the home access point.

The objective technical problem was thus rather to increase the efficiency with little data traffic in the process of seamless layer 3 roaming.

Further, D1 did not provide a hint to select a switch as HAP in the same VLAN and the skilled person would not consider only grouping access points that belong to the same gateway device as the first access point.

- 2.8 The board however notes that the term "access controller" is limited neither by claim 1 nor by the description in such a way that it would not encompass the wireless switch which determines the home access point in the method of D1 (cf. the home wireless switch selection algorithm of paragraph [0128] of D1). D1 does

furthermore not disclose an "access controller" different from the aforementioned wireless switch, which selects the home access point. The wireless switch therefore may be considered an access controller. The field of IP technology does also not provide a strict definition of the term "access controller" to the contrary.

The board therefore does not agree with the second alleged differentiating feature (that the home access point is selected by a first access controller).

The board furthermore disagrees with the problem formulated by the appellant. It is speculative that the method of claim 1 creates less traffic than that of D1. It has not been plausibly demonstrated that the method of claim 1 provides more efficiency.

As to the selection of the HAP, the example given in D1 already discloses selecting an access point (switch 12) belonging to the same subnet (subnet A) and therefore gateway device as the access point the client roams from. A hint in this respect is therefore not necessary. The only difference is that selecting access points outside the group served by the same gateway as HAP is explicitly ruled out which, as stated above, is not considered to be inventive.

- 2.9 The method of claim 1 is therefore considered to lack an inventive step having regard to **D1** combined with the skilled person's common general knowledge (Article 56 EPC).
3. Since there is no allowable claim request on file, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



B. Brückner

K. Peirs

Decision electronically authenticated