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H04W 76/02 (2009.01) *H04L* 12/813 (2013.01)

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DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR,
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MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,
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SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
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[Continued on next page]

(54) Title: EFFICIENT POLICY ENFORCEMENT USING NETWORK TOKENS FOR SERVICES C-PLANE APPROACH

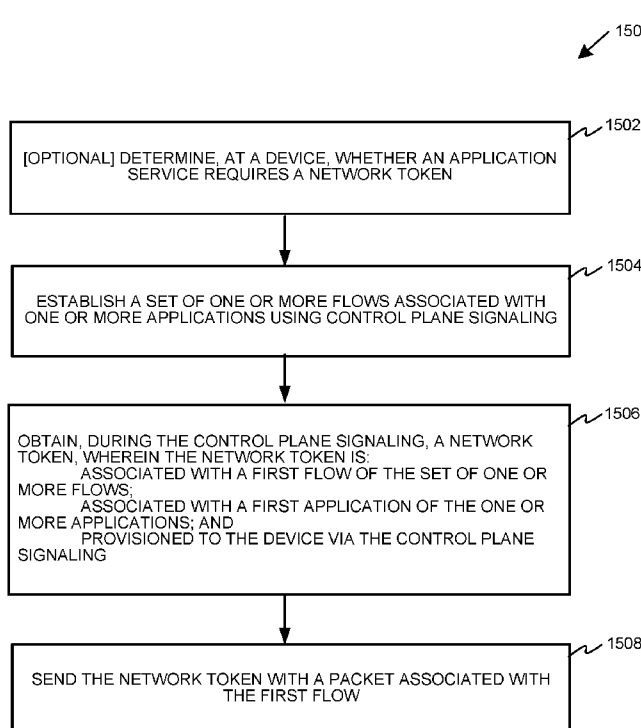


FIG. 15

(57) Abstract: A device establishes flows associated with one or more applications using control plane signaling. A gateway device obtains a request for a network token during the control plane signaling. The gateway device derives the network token and sends it to the device and/or an access node during the control plane signaling. The device and/or access node obtain the network token, where the network token is associated with a first flow of the one or more flows, a first application of the one or more applications, and provisioned to the device or access node via the control plane signaling. The network token may be included in a packet sent in the user plane from the device. The network token may be verified at the access node and/or the gateway device using a cryptographic function and sent to its destination based on the results of the verification.





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Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2016/018104

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04L29/06 H04L12/14 H04W4/24 H04W28/12 H04W76/02
H04L12/851 H04L12/721 H04L12/819 H04L12/859 H04L12/813

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04L H04W

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	W0 2014/207550 A2 (ORANGE [FR]) 31 December 2014 (2014-12-31)	1-39
A	abstract; figure 1 paragraph [0025] - paragraph [0029] paragraph [0038] - paragraph [0058] paragraph [0064] - paragraph [0086] paragraph [0116] - paragraph [0124] -----	40-46
X	EP 1 332 627 A2 (ERICSSON TELEFON AB L M [SE]) 6 August 2003 (2003-08-06)	1-39
A	abstract; figures 18,26-27 paragraph [0056] - paragraph [0064] paragraph [0076] - paragraph [0090] paragraph [0095] - paragraph [0105] ----- -/-	40-46



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

11 January 2017

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2013/010567 A1 (ERICSSON TELEFON AB L M [SE]; STALLARD PAUL [GB]; LUDWIG REINER [DE]) 24 January 2013 (2013-01-24)	40-46
A	abstract page 3, line 20 - page 5, line 2 page 6, line 14 - page 14, line 9; figure 2	1-39
A	----- EP 2 670 174 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 4 December 2013 (2013-12-04) abstract; figure 5 paragraph [0028] - paragraph [0057] paragraph [0063] - paragraph [0075] -----	40-46
A	US 2014/308918 A1 (LEE JI CHEOL [KR] ET AL) 16 October 2014 (2014-10-16) abstract paragraph [0083] - paragraph [0120] paragraph [0125] - paragraph [0128] paragraph [0155] -----	40-46

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2016/018104

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-39

Methods, device, gateway device and access node for obtaining a network token during connection setup.

2. claims: 40-46

Method and access node for verifying a network token.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2016/018104

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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