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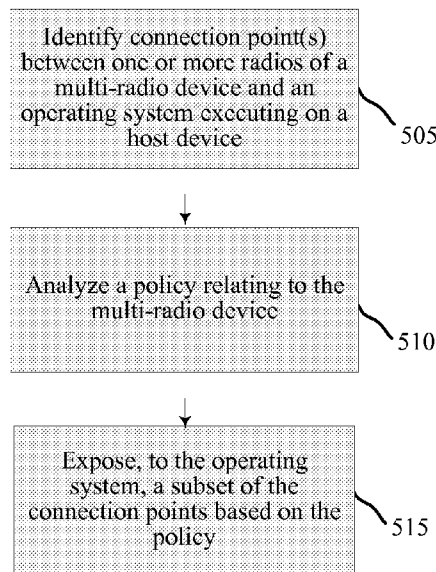
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: CONFIGURABLE HOST INTERFACE USING MULTI-RADIO DEVICE AND ARCHITECTURE FOR WLAN OFF-LOAD

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(57) Abstract: A method, an apparatus, and a computer program product for wireless communication are provided. A multi-radio device controls wireless communications by identifying one or more connection points between radio(s) of the multi-radio device and an operating system executing on a host device, analyzing a policy relating to the multi-radio device, and exposing, to the operating system, a subset of the connection points based on the policy. A modem manages a connection to an applications processor (AP) by virtualizing physical communication interfaces at the modem, providing a single Internet protocol (IP) interface representing the virtualized physical communication interfaces to a high level operating system (HLOS) at the AP, detecting a physical communication interface connected to the modem, and determining whether to expose the detected physical communication interface to the HLOS as a standalone virtualized physical communication interface, or hide the detected physical communication interface as part of an existing virtualized physical communication interface.

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GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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

**Published:**

— *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))*

**Declarations under Rule 4.17:**

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

**(88) Date of publication of the international search report:**

6 March 2014

INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2013/049396

A. CLASSIFICATION OF SUBJECT MATTER  
INV. H04W88/06  
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)  
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, 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	WO 2012/061771 A1 (QUALCOMM INC [US]; MEYLAN ARNAUD [US]; SUNDARARAJAN JAY KUMAR [US]; GI) 10 May 2012 (2012-05-10)	1-6, 9-18, 21-30, 33-42, 60,61, 63,75-77
A	abstract paragraph [0033] - paragraph [0037] figure 2 paragraph [0041] paragraph [0046] - paragraph [0048] paragraph [0053] paragraph [0096] figure 10  -----  -/--	8,20,32, 44-59, 62,64-74

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
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "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  14 January 2014	Date of mailing of the international search report  23/01/2014
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Larcinese, Concetta
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2013/049396

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 2011/022506 A1 (QUALCOMM INC [US]; WIETFELDT RICHARD DOMINIC [US]; ZHANG DONG-AN [US];) 24 February 2011 (2011-02-24)</p> <p>abstract figure 2 paragraph [0015] paragraph [0024] - paragraph [0026]</p> <p>-----</p>	<p>1,2,7, 13,14, 19,25, 26,31, 37,38,43</p>
A	<p>US 2009/303932 A1 (TSIRTSIS GEORGIOS [GB] ET AL) 10 December 2009 (2009-12-10) abstract paragraph [0037] - paragraph [0042]</p> <p>-----</p>	44-59
A	<p>US 2012/124229 A1 (SAHU DEBESH KUMAR [IN] ET AL) 17 May 2012 (2012-05-17) abstract paragraph [0060]</p> <p>-----</p>	44-59

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2013/049396

## 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: 1-43

Method, mobile device, apparatus and computer program code for controlling wireless communication

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2. claims: 44-59

Method, apparatuses and computer program code for managing connections between a modem and an application processor

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3. claims: 60-77

Method, user equipment and computer program code for managing a connection to a wireless LAN

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/049396

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