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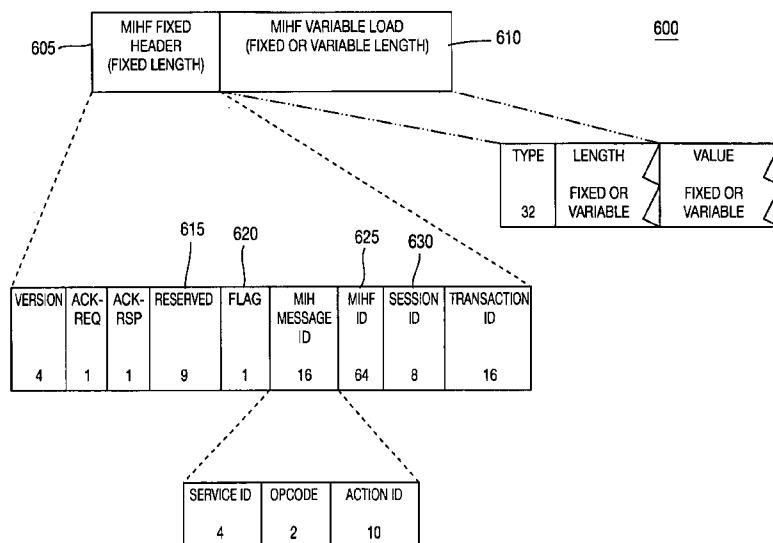
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- with international search report
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[Continued on next page]

(54) Title: EFFICIENT MEDIA INDEPENDENT HANDOVER PROTOCOL OPERATION ENHANCEMENTS



(57) Abstract: The present invention modifies existing media independent handover (MIH) function (MIHF) frame format as defined by the IEEE 802.21 standard. In one embodiment, the variable load of the MIHF frame is modified to eliminate the MIHF variable header by defining the MIHF identification (ID) field and the session ID field as fixed fields in the MIHF fixed header. Thus, the MIHF variable load is only made up of the MIHF payload. In another embodiment, a field such as an information element (IE), a header, or MIH service data such as a command or an event, is represented by a type field, a length field and a value field (TLV). The length of the value field is exactly 128 octets, and the length field only occupies one octet.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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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 H04Q

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 practical, 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	ANON: "Draft IEEE Standard for Local and Metropolitan Area Networks: Media Independent Handover Services;" IEEE P802.21/D01.00, 2005, pages 1-162, XP002459799	23, 24, 47, 48
Y	page 110 - page 139	1-4, 7, 8, 10-18, 20-22, 25-28, 31, 33-39, 42, 44-46

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 document 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)
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- *P* document published prior to the international filing date but later than the priority date claimed

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- *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

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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.
Y	AJAY RAJKUMAR, YOSHIHIRO OHBA: "Teleconference Meeting Minutes of the IEEE P802.21 Working Group; D00-05 Comment Resolution Ad Hoc" IEEEP802 MEDIA INDEPENDENT HANDOVER SERIES, February 2006 (2006-02), pages 1-6, XP002459798 Internet page 5	1-4, 7, 8, 10-18, 20-22, 25-28, 31, 33-39, 42, 44-46
A	US 2004/039830 A1 (ZHANG YANJI [CN] ET AL) 26 February 2004 (2004-02-26) paragraph [0001] - paragraph [0027] paragraph [0036]	1, 12, 25, 36
A	US 6 397 259 B1 (LINCKE SCOTT D [US] ET AL) 28 May 2002 (2002-05-28) column 2, line 47 - column 6, line 29 column 92, line 8 - column 93, line 13 column 107, line 17 - column 108, line 59 figure 7	1, 12, 25, 36
A	ANON: "Media Independent Handover - Discussion on IDs in primitives" IEEE 302.21 MEDIA INDEPENDENT HANDOVER SERVICES, March 2006 (2006-03), pages 1-11, XP002459800 the whole document	1, 12, 25, 36
A	WO 03/042981 A (MATSUSHITA ELECTRIC IND CO LTD [JP]) 22 May 2003 (2003-05-22) page 1, line 5 - page 2, line 20 page 11, line 24 - line 32 figures 6A, 6B	23, 24, 47, 48
P, X	ANON: "802.21 Frame Format Considerations" IEEE 802.21 MIHS, 15 June 2006 (2006-06-15), pages 1-20, XP002459801 Internet the whole document	1-48

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/013421

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 allsearchable 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: 1-22,25-46

Communicating media independent handover messages, where the variable load does not include a variable header;

2. claims: 23,24,47,48

Communicating media independent handover messages, where the length of the value field is exactly 128 octets, and the length field only occupies one octet.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2007/013421

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004039830	A1	26-02-2004	AT 372637 T 15-09-2007
			AU 2003290957 A1 11-03-2004
			CN 1593051 A 09-03-2005
			EP 1421765 A1 26-05-2004
			WO 2004019586 A1 04-03-2004
			KR 20050058371 A 16-06-2005
US 6397259	B1	28-05-2002	NONE
WO 03042981	A	22-05-2003	AU 2002343212 A1 26-05-2003
			BR 0206395 A 10-02-2004
			CA 2430923 A1 23-05-2003
			CN 1511313 A 07-07-2004
			DE 60212600 T2 05-07-2007
			EP 1374230 A1 02-01-2004
			ES 2268112 T3 16-03-2007
			MX PA03005133 A 02-04-2004
			TW 591606 B 11-06-2004
			US 2003093264 A1 15-05-2003
US 2007239463 A1 11-10-2007			