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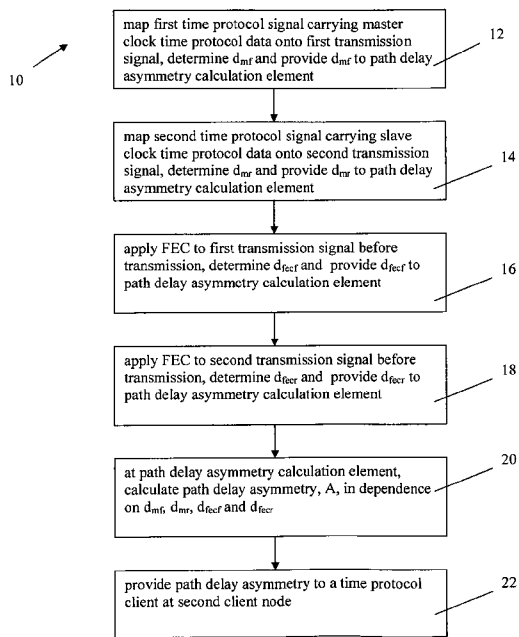
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(54) Title: METHOD OF PROVIDING A PATH DELAY ASYMMETRY FOR TIME SYNCHRONIZATION BETWEEN A MASTER AND A SLAVE CLOCK ACROSS A COMMUNICATION NETWORK

Fig. 1.



(57) Abstract: A method 10 of providing a path delay asymmetry for time synchronization between a master clock at a first client node and a slave clock at a second client node across a server communications network. The method comprises: mapping a first time protocol signal (TPS) carrying master clock time protocol data onto a first transmission signal, determining a forward mapping delay, d_{mf} , and providing d_{mf} to a path delay asymmetry calculation element 12; mapping a second TPS carrying slave clock time protocol data onto a second transmission signal, determining a reverse mapping delay, d_{mr} , and providing the d_{mr} to the path delay asymmetry calculation element 14; applying FEC to the first transmission signal, determining a forward FEC delay, d_{fecf} , and providing the d_{fecf} to the path delay asymmetry calculation element 16; applying FEC to the second transmission signal, determining a reverse FEC delay, d_{fecr} , and providing d_{fecr} to the path delay asymmetry calculation element 18; calculating a path delay asymmetry in dependence on d_{mf} , d_{mr} , d_{fecf} and d_{fecr} 20; and providing the path delay asymmetry to a time protocol client at the second client node 22.

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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

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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, 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,P	WO 2011/017867 A1 (ZTE CORP [CN]; SONG XIAOPENG [CN]; YUAN YAN [CN]; WANG LINFENG [CN]; S) 17 February 2011 (2011-02-17) abstract ----- -/--	1-12

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Date of the actual completion of the international search

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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	<p>ANONYMOUS ED - ANONYMOUS: "IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems; IEEE Std 1588-2008 (Revision of IEEE Std 1588-2002)", 24 July 2008 (2008-07-24), IEEE STANDARD; [IEEE STANDARD], IEEE, PISCATAWAY, NJ, USA, PAGE(S) 1 - 269, XP002588173, ISBN: 978-0-7381-5400-8</p> <p>3.1.46 transparent clock 6.5.4 End-to-end transparent clocks 6.5.5 Peer-to-peer transparent clocks 6.6 Synchronization overview 6.7 PTP communications overview 10. PTP for transparent clocks 11. Clock offset, path delay, residence time, and asymmetry corrections 14. TLV entity specifications Annex C Examples of residence and asymmetry corrections</p> <p>-----</p>	1-12
Y	<p>JUNFANG WANG FIBERHOME TECHNOLOGIES GROUP P R CHINA LIANG MEI FIBERHOME TECHNOLOGIES GROUP P R CHINA CHANGJUN HU CHINA ACADEMY OF: "1588v2 transmission by OSC over OTN", ITU-T DRAFTS ; STUDY PERIOD 2009-2012, INTERNATIONAL TELECOMMUNICATION UNION, GENEVA ; CH, vol. Study Group 15 ; 13, 11 October 2010 (2010-10-11), pages 1-3, XP017448560, [retrieved on 2010-10-11] the whole document</p> <p>-----</p>	1-12
A	<p>CHONGNING NA ET AL: "Synchronization Performance of the Precision Time Protocol", INFORMATION SCIENCES AND SYSTEMS, 2007. CISS '07. 41ST ANNUAL CONFERENCE ON, IEEE, PI, 1 October 2007 (2007-10-01), pages 25-32, XP031161274, ISBN: 978-1-4244-1063-7 the whole document</p> <p>-----</p> <p style="text-align: center;">-/--</p>	1-12

INTERNATIONAL SEARCH REPORT

International application No PCT/EP2011/056627

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>DAVARI A OREN BROADCOM L MARTINI CISCO S: "Transporting PTP messages (1588) over MPLS Networks; draft-davari-tictoc-1588overmpls-00.txt", TRANSPORTING PTP MESSAGES (1588) OVER MPLS NETWORKS; DRAFT-DAVARI-TICTOC-1588OVERMPLS-00.TXT, INTERNET ENGINEERING TASK FORCE, IETF; STANDARDWORKINGDRAFT, INTERNET SOCIETY (ISOC) 4, RUE DES FALAISES CH- 1205 GENEVA, SWITZERLAND, 23 September 2010 (2010-09-23), pages 1-13, XP015071277, [retrieved on 2010-09-23] the whole document</p> <p align="center">-----</p>	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2011/056627

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011017867	A1	17-02-2011 CN 101997669 A	30-03-2011
