

(12) 按照专利合作条约所公布的国际申请

(19) 世界知识产权组织
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2012 年 9 月 27 日 (27.09.2012)



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WO 2012/126424 A3

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- (25) 申请语言: 中文
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- (81) 指定国 (除另有指明, 要求每一种可提供的国家保护): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, 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, KM, 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, 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) 指定国 (除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, RU, TJ, TM), 欧洲 (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, ML, MR, NE, SN, TD, TG)。

本国际公布:

- 包括国际检索报告 (条约第 21 条(3))。
- 在修改权利要求的期限届满之前进行, 在收到该修改后将重新公布 (细则 48.2(h))。
- 根据申请人的请求, 在条约第 21 条(2)(a)所规定的期限届满之前进行。

(88) 国际检索报告公布日期: 2013 年 4 月 11 日

(54) Title: METHOD AND DEVICE FOR FORWARDING DATA PACKET

(54) 发明名称: 一种数据包的转发方法和设备

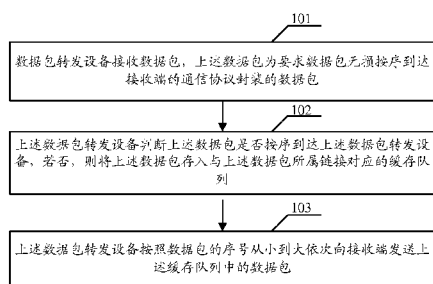


图 1 / Fig. 1

101 THE DATA PACKET FORWARDING DEVICE RECEIVES A DATA PACKET, WITH THE DATA PACKET BEING A DATA PACKET ENCAPSULATED BY A COMMUNICATION PROTOCOL WHICH REQUIRES UNDamaged AND ORDERED ARRIVAL OF DATA PACKETS AT THE RECEIVING END

102 THE DATA PACKET FORWARDING DEVICE JUDGES WHETHER OR NOT THE DATA PACKET ARRIVES AT THE DATA PACKET FORWARDING DEVICE IN ACCORDANCE WITH THE CORRECT ORDER; IF IT DOES NOT, THEN THE DATA PACKET WILL BE STORED IN A CACHE QUEUE CORRESPONDING TO THE LINK TO WHICH THE DATA PACKET BELONGS

103 THE DATA PACKET FORWARDING DEVICE SENDS THE DATA PACKETS IN THE CACHE QUEUE TO THE RECEIVING END ACCORDING TO THE SERIAL NUMBER OF THE DATA PACKET FROM SMALL TO BIG SUCCESSIVELY

(57) Abstract: Provided are a method and device for forwarding a data packet. The implementation of the method comprises: a data packet forwarding device receives a data packet, with the data packet being a data packet encapsulated by a communication protocol which requires undamaged and ordered arrival of data packets at the receiving end; the data packet forwarding device judges whether or not the data packet arrives at the data packet forwarding device in accordance with the correct order; if it does not, then the data packet will be stored in a cache queue corresponding to the link to which the data packet belongs; and the data packet forwarding device sends the data packets in the cache queue to the receiving end according to the serial number of the data packet from small to big successively. By way of adjusting the sequence of the data packets before the data packets are sent to the receiving end in the above method, the sending sequence of the data packets is closer to the original sequence thereof, which can lower the disordered sequence rate of the data packets and reduce the problem of bandwidth occupation by the repeated sending of the ACK request and the retransmission of the data packets by the receiving end, thus improving the throughput rate of the network.

(57) 摘要:

[见续页]

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本发明实施例提供一种数据包的转发方法和设备。其中方法的实现包括：数据包转发设备接收数据包，所述数据包为要求数据包无损按序到达接收端的通信协议封装的数据包；所述数据包转发设备判断所述数据包是否按序到达所述数据包转发设备，若否，则将所述数据包存入与所述数据包所属链接对应的缓存队列；所述数据包转发设备按照数据包的序号从小到大依次向接收端发送所述缓存队列中的数据包。以上方法通过在数据包发送至接收端之前，对数据包的顺序进行调整，使数据包的发送顺序更接近于数据包原有的顺序，可以降低数据包的乱序率，减少接收端重复发送 ACK 请求以及重传数据包占用带宽的问题，从而提升网络吞吐率。

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2012/075715

A. CLASSIFICATION OF SUBJECT MATTER

See the extra sheet

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)

IPC: 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)

CNABS, CNTXT, CNKI: data package, transmission, forward, sequence, serial, lossless, cache, queue

VEN: data, package?, transmit+, serial, sequence, number, cache, queue

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 1764275 A (YANG, Guoyu), 26 April 2006 (26.04.2006), see description, pages 5-6	1, 5-8, 12-13
Y		2-4, 9-11
Y	CN 101123580 A (HUAWEI TECHNOLOGIES CO., LTD.), 13 February 2008 (13.02.2008), see description, pages 5-6, and figure 3	2-4, 9-11
A	CN 101247352 A (HUAWEI TECHNOLOGIES CO., LTD.), 20 August 2008 (20.08.2008), see the whole document	1-13
A	US 2006181734 A1 (NEC CORP.), 17 August 2006 (17.08.2006), see the whole document	1-13

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	“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
“A” document defining the general state of the art which is not considered to be of particular relevance	“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
“E” earlier application or patent but published on or after the international filing date	“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
“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)	“&” document member of the same patent family
“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	

Date of the actual completion of the international search
18 January 2013 (18.01.2013)

Date of mailing of the international search report
07 February 2013 (07.02.2013)

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2012/075715

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 1764275 A	26.04.2006	None	
CN 101123580 A	13.02.2008	None	
CN 101247352 A	20.08.2008	WO 2009115002 A1	24.09.2009
US 2006181734 A1	17.08.2006	JP 4415391 B2	17.02.2010
		EP 1694007 B1	05.01.2011
		EP 1694007 A2	23.08.2006
		DE 602006019337 E	17.02.2011
		JP 2006260543 A	28.09.2006
		US 7693166 B2	06.04.2010

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2012/075715

CONTINUATION OF SECOND SHEET: A. CLASSIFICATION OF SUBJECT MATTER

H04L 12/70 (2013.01) i

H04L 29/08 (2006.01) i

国际检索报告

国际申请号

PCT/CN2012/075715

A. 主题的分类

参见附加页

按照国际专利分类(IPC)或者同时按照国家分类和 IPC 两种分类

B. 检索领域

检索的最低限度文献(标明分类系统和分类号)

IPC: H04L, H04W

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用))

CNABS,CNTEXT,CNKI: 数据包, 传输, 传送, 转发, 顺序, 依序, 按序, 无损, 缓存, 队列

VEN: data, package?, transmit+, serial, sequence, number, cache, queue

C. 相关文件

类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
X	CN1764275A(杨国宇) 26.4 月 2006(26.04.2006) 参见说明书第 5-6 页	1, 5-8, 12-13
Y		2-4, 9-11
Y	CN101123580A(华为技术有限公司) 13.2 月 2008(13.02.2008) 参见说明书第 5-6 页, 附图 3	2-4, 9-11
A	CN101247352A(华为技术有限公司)20.8 月 2008(20.08.2008) 参见全文	1-13
A	US2006181734A1(NEC CORP) 17.8 月 2006(17.08.2006) 参见全文	1-13

☐ 其余文件在 C 栏的续页中列出。

☒ 见同族专利附件。

* 引用文件的具体类型:

“A” 认为不特别相关的表示了现有技术一般状态的文件

“E” 在国际申请日的当天或之后公布的在先申请或专利

“L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件(如具体说明的)

“O” 涉及口头公开、使用、展览或其他方式公开的文件

“P” 公布日先于国际申请日但迟于所要求的优先权日的文件

“T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了理解发明之理论或原理的在后文件

“X” 特别相关的文件, 单独考虑该文件, 认定要求保护的发明不是新颖的或不具有创造性

“Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时, 要求保护的发明不具有创造性

“&” 同族专利的文件

国际检索实际完成的日期

18.1 月 2013(18.01.2013)

国际检索报告邮寄日期

07.2 月 2013 (07.02.2013)

ISA/CN 的名称和邮寄地址:

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国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2012/075715

检索报告中引用的 专利文件	公布日期	同族专利	公布日期
CN1764275A	26.04.2006	无	
CN101123580A	13.02.2008	无	
CN101247352A	20.08.2008	WO2009115002A1	24.09.2009
US2006181734A1	17.08.2006	JP4415391B2	17.02.2010
		EP1694007B1	05.01.2011
		EP1694007A2	23.08.2006
		DE602006019337E	17.02.2011
		JP2006260543A	28.09.2006
		US7693166B2	06.04.2010

续：第 2 页 A.主题的分类

H04L 12/70(2013.01)i

H04L 29/08(2006.01)i