

(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
国际局

(43) 国际公布日
2024 年 7 月 11 日 (11.07.2024)



(10) 国际公布号
WO 2024/146397 A1

(51) 国际专利分类号:
G06F 3/06 (2006.01) G06F 11/14 (2006.01)

国北京市朝阳区望京东园四区 9 号楼 - 阿里中心, 望京 A 座, Beijing 100102 (CN)。

(21) 国际申请号: PCT/CN2023/141198

(74) 代理人: 广州铸智知识产权代理有限公司 (GUANGZHOU ZHUZHI INTELLECTUAL PROPERTY LIMITED); 中国广东省广州市天河区林和西路 161 号中泰国际广场 B 座 2305 室, Guangdong 510620 (CN)。

(22) 国际申请日: 2023 年 12 月 22 日 (22.12.2023)

(25) 申请语言: 中文

(26) 公布语言: 中文

(30) 优先权:
202310006110.8 2023 年 1 月 4 日 (04.01.2023) CN

(71) 申请人: 杭州阿里云计算技术服务有限公司 (HANGZHOU ALICLOUD FEITIAN INFORMATION TECHNOLOGY CO., LTD.) [CN/CN]; 中国浙江省杭州市余杭区五常街道文一西路 969 号 3 幢 5 层 553 室, Zhejiang 311121 (CN)。

(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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW。

(72) 发明人: 徐达维 (XU, Dawei); 中国北京市朝阳区望京东园四区 9 号楼 - 阿里中心, 望京 A 座, Beijing 100102 (CN)。李金涛 (LI, Jintao); 中国北京市朝阳区望京东园四区 9 号楼 - 阿里中心, 望京 A 座, Beijing 100102 (CN)。杨航 (YANG, Hang); 中

(84) 指定国(除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ,

(54) Title: COPY-ON-WRITE METHOD, PROCESSOR CORE, STORAGE CONTROLLER, COMPUTER SYSTEM, AND DEVICE

(54) 发明名称: 写复制方法、处理器核、存储控制器、计算机系统及设备

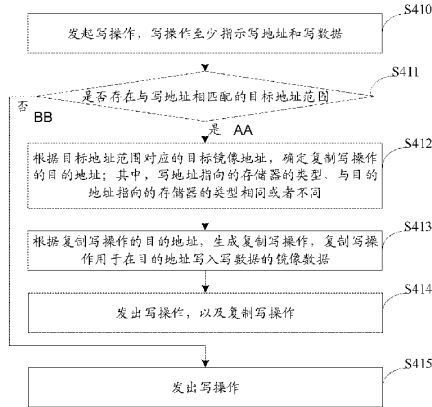


图 4

S410 Initiate a write operation, wherein the write operation at least indicates a write address and write data
S411 Does a target address range matched with the write address exist?
S412 Determine a destination address of a copy-on-write operation according to a target mirror image address corresponding to the target address range, wherein the type of a memory to which the write address points is the same as or different from the type of a memory to which the destination address points
S413 Generate the copy-on-write operation according to the destination address of the copy-on-write operation, wherein the copy-on-write operation is used for writing mirror image data of the write data at the destination address
S414 Send the write operation and the copy-on-write operation
S415 Send the write operation
AA Yes
BB No

(57) Abstract: The present application provides a copy-on-write method, a processor core, a storage controller, a computer system, and a device. The method comprises: initiating a write operation, wherein the write operation indicates a write address and write data; determining whether a target address range matched with the write address exists in an address range indicated by a mirror image address table, wherein the mirror image address table indicates at least one address range allowing copy-on-write and a mirror image address corresponding to each address range, and the type of a memory to which the address range points is the same as or different from the type of a memory to which the mirror image address points; if the target address range exists, determining a destination address of a copy-on-write operation according to a target mirror image address corresponding to the target address range, wherein the type of a memory to which the write address points is the same as or different from the type of a memory to which the destination address points; generating the copy-on-write operation according to the destination address; and sending the write operation and the copy-on-write operation. According to embodiments of the present application, copy-on-write can be performed on a write operation initiated by a processor core, and the use limitation of copy-on-write is reduced.

[见续页]

NA, RW, SC, SD, SL, ST, 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, ME, 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)。

本国际公布：
— 包括国际检索报告(条约第21条(3))。

(57) 摘要: 本申请提供一种写复制方法、处理器核、存储控制器、计算机系统及设备, 其中方法包括: 发起写操作, 写操作指示写地址和写数据; 判断镜像地址表指示的地址范围中, 是否存在与写地址相匹配的目标地址范围; 镜像地址表指示有允许写复制的至少一个地址范围, 以及各地址范围对应的镜像地址, 地址范围与镜像地址指向的存储器的类型相同或者不同; 如果存在目标地址范围, 根据目标地址范围对应的目标镜像地址, 确定复制写操作的目的地址, 写地址与目的地址指向的存储器的类型相同或者不同; 根据目的地址, 生成复制写操作; 发出写操作以及复制写操作。本申请实施例可实现对处理器核发起的写操作进行写复制, 并降低写复制的使用局限。