

(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



(10) 国际公布号
WO 2024/041576 A1

(43) 国际公布日
2024 年 2 月 29 日 (29.02.2024)

(51) 国际专利分类号:
G06F 9/455 (2018.01)

(21) 国际申请号: PCT/CN2023/114506

(22) 国际申请日: 2023 年 8 月 23 日 (23.08.2023)

(25) 申请语言: 中文

(26) 公布语言: 中文

(30) 优先权:
202211035631.8 2022年8月26日 (26.08.2022) CN

(71) 申请人: 阿里云计算有限公司(**ALIBABA CLOUD COMPUTING LTD.**) [CN/CN]; 中国浙江省杭州市西湖区三墩镇灯彩街 1008 号云谷园区 1-2-A06 室, Zhejiang 310030 (CN)。

(72) 发明人: 田殿臣 (**TIAN, Dianchen**); 中国浙江省杭州市西湖区三墩镇灯彩街 1008 号云谷园区, Zhejiang 310030 (CN)。

(74) 代理人: 北京同钧律师事务所(**BEIJING TONGJUN LAW FIRM**); 中国北京市海淀区西直门北大街 32 号院 1 号楼 7 层 808 室, Beijing 100082 (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。

(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, 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,

(54) **Title:** LIVE MIGRATION METHOD AND SYSTEM FOR VIRTUAL MACHINE, AND DEVICE AND STORAGE MEDIUM

(54) 发明名称: 一种虚拟机的热迁移方法、设备、系统及存储介质

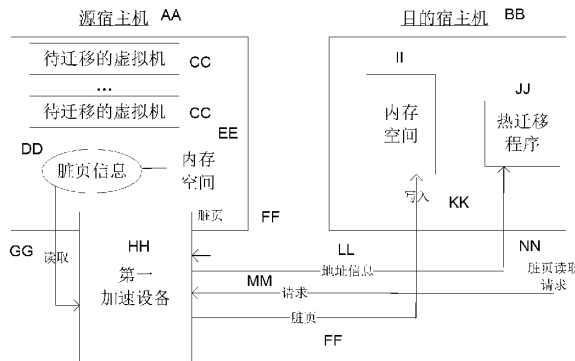


图 1a

AA Source host
BB Destination host
CC Virtual machine to be migrated
DD Dirty page information
EE Memory space
FF Dirty page
GG Read
HH First acceleration device
II Memory Space
JJ Live migration program
KK Write
LL Address information
MM Request
NN Dirty page reading request

(57) **Abstract:** Provided in the embodiments of the present application are a live migration method and system for a virtual machine, and a device and a storage medium. An optimization scheme is proposed for conventional live migration architectures. A source host is configured with an acceleration device, such that, on the source host side, all live migration operations of a control plane and a data plane can be assigned to the acceleration device for execution, and the live migration operations can be completed simply by means of the cooperation of a destination host and the acceleration device. In this way, zero dependence on the resources of the source host by the live migration operations is realized, such that the performance of live migration is not affected even when all the computational resources of the source host are occupied, and the live migration function achieves zero jitter for a virtual machine running on the source host.

[见续页]

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: 本申请实施例提供一种虚拟机的热迁移方法、设备、系统及存储介质。对传统热迁移架构提出了优化方案, 通过为源宿主机配置加速设备, 可在源宿主机侧将控制面和数据面的热迁移工作全部下沉到加速设备上执行, 只需由目的宿主机和加速设备配合即可完成热迁移工作, 这实现了热迁移工作对源宿主机资源的零依赖, 即使在源宿主机计算资源全被占用的情况下, 热迁移的性能也不受影响, 且热迁移功能对源宿主机上运行中的虚拟机实现零抖动。