

应用证明

项目名称	大规模云容器网络的可靠性诊断与增强技术		
应用单位	阿里云计算有限公司		
应用单位联系人	翟恩南	联系电话	13425138486
成果应用起始时间	2024 年 6 月至今		
阿里云与清华大学围绕大规模云容器网络的可靠性问题深度合作，在服务器无感知计算和人工智能大模型训练业务中采用了由李振华副教授规划指导、刘威博士生设计实现的一系列诊断与增强技术，主要包括（1）基于组合因果测试的高速网卡灰盒化性能建模与流表重组；（2）基于流量骨架追踪的轻量化连通性检测与故障定位。这些技术在阿里云灵骏智能计算平台实际部署以后，将容器网络的故障率降低到仅为原先的数十分之一、数据传输吞吐量提升多达40%、端到端通信时延降低多达31%。 Alibaba Cloud and Tsinghua University have engaged in in-depth collaborations on the reliability issues of large-scale cloud container networks. In the services of serverless computing and AI big model training, a series of diagnostic and enhancement technologies — planned and supervised by Zhenhua Li (associate professor), designed and implemented by Wei Liu (Ph.D. candidate) — have been adopted. These technologies mainly include: (1) Gray-box performance modeling and flow-table reorganization for high-speed network interface cards based on combinatorial causal testing; (2) Lightweight connectivity detection and failure localization based on traffic skeleton tracking. After being deployed on Alibaba Cloud’s Lingjun Intelligent Computing Platform, these techniques have significantly reduced the container network’s failures by tens of times, increased the data transmission throughput by up to 40%, and reduced the end-to-end communication latency by up to 31%.			
应用单位盖章  翟恩南 2025 年 10 月 29 日			