KONG Xiao

Infra / Network Systems Engineer

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github.com/kongxiao0532

Basics

- Infra/Network systems engineer for latency-critical real-time streaming; strong CS fundamentals; English proficient.
- 6+ years shipping/operating networked systems across edge & WAN; first-author NSDI publication.
- Own design→rollout→iteration; focus on reliability, observability, and performance under real traffic.
- **Skills**: Linux networking, TCP/QUIC/WebRTC, real-time streaming, congestion control, loss recovery, C/Python.

Education

Master of Science in Computer Networks — **Tsinghua University**
Advisor: Prof. Jianping Wu. GPA: 3.9/4.0, top 10%. Beijing, China. — *Sept 2019 – Jul 2022*

Bachelor of Engineering in Computer Science — **Nankai University**
Advisor: Prof. Jun Bi (late), Prof. Jingdong Xu. GPA: 92/100, top 2%. Tianjin, China. — *Sept 2015 – Jun 2019*

Experience Highlights

Network Systems Engineer — **Tencent**
START Cloud Gaming Team, Shenzhen, China — *Jul 2022 – Aug 2025*

- Built a high-performance multi-protocol transport stack for realtime streaming —∼20ms + >30Mbps + <0.5‰ stutter.
- Productionized novel telemetry-driven loss mitigation stack for cloud gaming; 30%+ stutter reduction (NSDI'26[1]).
- Shipped zero-queue & high-throughput congestion control tuned for interactive streaming; 90%+ stutter reduction[2].
- Pushed networking service down to low-cost edge; built lock-free, zero-copy cross-process global flow controller + monitoring to fix node stability/bw bottlenecks; coordinated with Ops/Compute teams to meet QoS/SLO —30%+ lower cost.
- Built E2E metrics and alerting; ran large-scale A/B experiments to continuously optimize latency and performance.
- Hands-on Linux networking(kernel/user space), high-performance proxies and WebRTC transport.

Network Engineer Intern — **Alibaba**
Alibaba Cloud, Hangzhou, China — *Jun 2021 – Sept 2021*

- Built a transparent proxy over MP-QUIC for robust mobile connectivity; delivered resiliency in unstable scenarios.
- Evaluated and tuned flow scheduling / queuing for scenario-aware MP transport, balancing throughput, latency, and cost.

Research & Prototype Systems

Programmable Networks & NFV Systems — *Tsinghua University*

- *A Cloud Gateway:* DPDK NFV gateway with predictive state checkpointing for scalable failover and fast recovery.
- *An In-network Accelerator:* Erasure-coding accelerator offloaded to programmable data planes to boost storage throughput.
- *An Anti-spoof System:* Data-plane spoofed-IP filtering for DDoS mitigation via joint control/data-plane design.

Hairpin: Low-Latancy Packet Loss Recovery[3] — *Tsinghua University*

- Modeled TCP loss recovery as a discrete process for interactive streaming and derived an optimal policy for recovery.
- Cut stutters by 40% and bandwidth overhead by 32% through a jointly-designed loss recovery model by trace-driven replay.
- Owned modeling→derivation→simulator implementation→validation pipeline end-to-end.

Misc

Languages

Mandarin: Native

English: Professional Working Proficiency — *TOEFL iBT: 106, CET6: 630 (Top 2%)*

Honors and Awards

Outstanding Contributor *(Tencent)*, 2024H1/2024H2 — *Top 10%*

National First Prize of *CUMCM* (Mathematical Modeling), 2017 — *Top 0.9%*

National Scholarship *(Ministry of Education of China)*, 2016/2018 — *Top 2%*

Volunteering

Volunteer for stadium technologies World Economic Forum, Annual Meeting of the New Champions, 2016/2018, Tianjin
Volunteer for foreign guests

[1] **Joint first author**. Paper in NSDI '26 (to appear). See *From Source to Solution: Tackling Packet Losses in Large-scale Cloud …*
[2] Paper published in NSDI '24. See *Pudica: Toward Near-Zero Queuing Delay in Congestion Control for Cloud Gaming.*
[3] Paper published in NSDI '24. See *Hairpin: Rethinking Packet Loss Recovery in Edge-based Interactive Video Streaming.*

孔 啸

网络系统工程师

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基本信息

- 超低时延网络与实时系统/网络基础设施工程师，具备扎实的计算机科学与工程基础; 英语可作为工作语言;
- 6 年以上边缘网络//广域网的生产与研究经验; 主导低时延网络拥塞与丢包治理在生产环境落地; NSDI 一作;
- 设计-上线-迭代的端到端能力，擅于真实环境下的设计权衡; 可观测/可回归/稳定性与性能并重，推动跨团队协作;
- 技能：Linux 网络栈与性能优化; TCP/QUIC/WebRTC; 低延迟拥塞控制算法; 丢包治理; C/Python.

教育

硕士，计算机网络 **清华大学**
导师：吴建平教授. 绩点：3.9/4.0，前 10%. 2019.09 – 2022.07

学士，计算机科学与技术 **南开大学**
导师：毕军教授、徐敬东教授. 绩点：92/100，前 2%. 2015.09 – 2019.06

核心经历

网络与实时系统工程师 **腾讯**
START 云游戏 2022.07 - 2025.08

- 实现高性能多协议传输系统，以支持低延迟 (∼20ms)、高码率 (>30Mbps)、低卡顿 (<0.5‰) 的实时音视频传输;
- 主导 并落地基于线上遥测的数据驱动创新丢包治理体系，在真实流量下将卡顿率降低 30%+ (NSDI'26[1]);
- 研发并上线面向交互式实时流媒体的零排队、高吞吐的拥塞控制, 将卡顿率较业界最佳方案降低 90%+ (NSDI'24[2]);
- 主导 将网络服务下沉至低成本边缘环境，设计并实现无锁、零拷贝的跨进程高性能全局流量控制器 及数据监控，解决节点稳定性和带宽瓶颈问题，同时组织协调运维和计算团队，在保证 QoS/SLO 的前提下，成本降低 30%+ ;
- 构建全链路指标观测与预警体系，通过数据驱动的大规模 A/B 实验监控并持续优化全链路延迟与程序性能;
- 熟悉 Linux 网络内核协议栈，熟悉高性能代理服务编程与排障调优，理解 WebRTC 等实时传输框架的设计实现.

网络系统实习生 **阿里巴巴**
阿里云/达摩院 2021.06 - 2021.09

- 基于 MP-QUIC 设计实现透明传输代理，利用多链路提升弱网下的可靠性与吞吐表现，支撑移动场景的稳定连接;
- 评估并优化多链路流量调度与队列策略，针对不同场景在吞吐-时延-成本之间做可解释的权衡.

研究项目与系统实践

边缘计算场景下交互视频的丢包恢复设计[3] 清华大学

- 面向交互式视频的「低时延强约束」，将丢包恢复过程离散化建模，推导最优冗余与重传联合策略;
- 基于仿真与 trace/回放评测验证：在同等画质约束下，恢复卡顿率降低 40%，额外带宽开销降低 32%;

可编程数据平面加速与安全 清华大学

- 分布式存储纠删码计算加速系统设计：将纠删码卸载到数据平面，解决多流拥塞并提升构建和恢复吞吐 3-8 倍.
- 动态 DDoS 线速防御系统设计: 设计数据平面反欺骗过滤并与控制面协同，实现约 10Tbps 线速 DDoS 防御能力.

可扩展、高效且可恢复的分布式网络功能虚拟化网关设计 清华大学

- 设计了网络功能解耦、状态备份预测的网关系统框架，在降低状态存储开销的同时，保证了可扩展性和可恢复性;
- 负责: DPDK 性能调优; 吞吐、扩展性、故障切换时延三维验证与对比.

其他

语言

英语: 专业工作水平 托福 iBT: 106, 英语六级: 630（前 2%）

奖项

腾讯杰出贡献者, 2024H1/2024H2 前 10%
全国大学生数据建模竞赛**国家一等奖**, 2017 前 0.9%
国家奖学金, 2016/2018 前 2%

志愿

冬季奥林匹克运动会, 2022, 北京 会场技术志愿者
世界经济论坛-新领军者年会, 2016/2018, 天津 外方志愿者

[1] **共同第一作者.** 成果将发表于 NSDI '26（已录用）. 见 "*From Source to Solution: Tackling Packet Losses in ...* ".
[2] 成果发表于 NSDI '24. 见 "*Pudica: Toward Near-Zero Queuing Delay in Congestion Control for Cloud Gaming*" .
[3] 成果发表于 NSDI '24. 见 "*Hairpin: Rethinking Packet Loss Recovery in Edge-based Interactive Video Streaming*" .