



Kun Tan, PhD.

## Work Experience

**VICE PRESIDENT, CENTRAL SOFTWARE INSTITUTE**

**DIRECTOR OF DISTRIBUTED AND PARALLEL SOFTWARE LAB., HUAWEI, BEIJING – 2018-PRESENT**

Leading technical innovation and software development in the area of distributed systems, networking, AI framework and cloud computing.

**DIRECTOR OF CLOUD NETWORKING LAB., HUAWEI, BEIJING – 2016-2018**

Leading technical innovation and software development for Huawei's cloud networking, including network virtualization, high-performance networking, and network function cloudification.

**RESEARCH MANAGER, MICROSOFT RESEARCH ASIA, BEIJING – 2013-2016**

Leading the distinguished Wireless and Networking Group for fundamental networking research and developing key technologies that have been successfully transferred in Microsoft's products and services.

**RESEARCHER/SENIOR RESEARCHER, MICROSOFT RESEARCH ASIA, BEIJING – 2002-2013**

Performing fundamental system research in networking and contributing many novel technologies in areas of congestion control, software-defined radio, Wi-Fi protocols, white-space and MIMO communications, and datacenter networks.

## Education

Ph.D./M.E./B.E., Computer Science and Technology, Tsinghua University, Beijing, 2002/1999/1997

## Professional Activities

TPC members in SIGCOMM 2017, 2015~2013, 2011; Mobicom 2016, 2009~2013; NSDI 2012, DySPAN 2011, SECON 2014, 2013, 2011, MobiHoc 2014, 2010, 2009, IWCNC 2009, 2008, 2006, ICC 2008, 2007, 2006, PFLDNet workshop 2007

Steering committee co-chair, APNet 2016~Present; Demo and Poster chair, SIGCOMM 2014; Workshop co-chair, ACM CellNet 2014 ( in conjunction with ACM SIGCOMM 2014); TPC Co-chair, SRIF 2013 ( in conjunction with ACM SIGCOMM 2013); Publicity co-chair, SECON 2010; TPC Co-chair, MobiArch 2009 (co-located workshop with MobiSys 2009)

Associate Editor - IEEE Trans. Mobile Computing, 2011-2016

## Awards and Honours

Honour of HUAWEI Scientist, 2021

Level 8 Software Expert (top ranked), HUAWEI, 2020

Test of Time Award, USENIX, 2019

Member of Golden Technical Team, HUAWEI, 2021/2020/2019/2018  
ACM SIGCOMM Best Demo Award, 2010  
USENIX NSDI Best Paper Award/Best Demo Award, 2009  
ACM Mobicom Honourable Mention Demo, 2009  
Microsoft Research Asia Top Innovation Award, 2008

## Selected Publication

T. Li, K. Zheng, K. Xu, R. Jadhav, T. Xiong, K. Winstein, K. Tan. TACK: Improving Wireless Transport Performance by Taming Acknowledgments. SIGCOMM 2020.

Z. He, D. Wang, B. Fu, K. Tan, B. Hua, Z. Zhang, K. Zheng. MasQ: RDMA for Virtual Private Cloud. SIGCOMM 2020.

W. Bai, S. Hu, K. Chen, K. Tan, Y. Xiong. One More Config is Enough: Saving (DC)TCP for High-speed Extremely Shallow-buffered Datacenters. SIGCOMM 2020.

Y. Lu, G. Chen, B. Li, K. Tan, Y. Xiong, P. Cheng, J. Zhang, E. Chen, T. Moscibroda. Multi-Path Transport for RDMA in Datacenters. NSDI, 2018.

J. Son, Y. Xiong, K. Tan, P. Wang, Z. Gan, S. Moon. Protego: Cloud-Scale Multitenant IPsec Gateway. ATC, 2017.

W. Bai, K. Chen, S. Hu, K. Tan, Y. Xiong. Congestion Control for High-speed Extremely Shallow-buffered Datacenter Networks. Proceedings of the First Asia-Pacific Workshop on Networking (APNet), 2017.

B. Li, K. Tan, L. Luo, Y. Peng, R. Luo, N. Xu, Y. Xiong and P. Cheng. ClickNP: Highly Flexible and High-performance Network Processing with Reconfigurable Hardware. ACM SIGCOMM, 2016.

G. Chen, Y. Lu, Y. Meng, B. Li, K. Tan, D. Pei, P. Chen, L. Luo, Y. Xiong, and Y. Zhao. Fast and Cautious: Leveraging Multi-path Diversity for Transport Loss Recovery in Data Centers. ATC 2016.

Q. Yang, X. Li, H. Yao, J. Fang, K. Tan, W. Hu, J. Zhang, and Y. Zhang, BigStation: Enabling Scalable Real-time Signal Processing in Large MU-MIMO Systems, in ACM SIGCOMM, ACM, August 2013

K. Tan, H. Shen, J. Zhang, and Y. Zhang, Enable Flexible Spectrum Access with Spectrum Virtualization, in IEEE DySpan , IEEE, October 2012

J. Zhang, H. Shen, K. Tan, R. Chandra, Y. Zhang, and Q. Zhang, Frame Retransmissions Considered Harmful: Improving Spectrum Efficiency Using Micro-ACKS, in ACM MobiCom, ACM, August 2012

Z. Zeng, Y. Gao, K. Tan, and P. R. Kumar, CHAIN: Introducing Minimum Controlled Coordination into Random Access MAC, in The 30th IEEE International Conference on Computer Communications (INFOCOM 2011), IEEE, April 2011

K. Tan, J. Fang, Y. Zhang, S. Chen, L. Shi, J. Zhang, and Y. Zhang, Fine Grained Channel Access in Wireless LAN, in ACM SIGCOMM 2010, Association for Computing Machinery, Inc., August 2010 – Best Paper Runner-up

K. Tan, H. Liu, J. Fang, W. Wang, J. Zhang, M. Chen, and G. M. Voelker. SAM: Enabling Practical Spatial Multiple Access in Wireless LAN. In ACM Mobicom2009, Beijing, China, September 2009.

K. Tan, J. Zhang, J. Fang, H. Liu, Y. Ye, S. Wang, Y. Zhang, H. Wu, W. Wang, and G. M. Voelker. Sora: High Performance Software Radio Using General Purpose Multi-core. Processors, in 6th USENIX Symposium on Networked Systems Design & Implementation 2009, USENIX, (NSDI 2009) - Awarded Best Paper

C. Guo, H. Wu, K. Tan, L. Shi, Y. Zhang, and S. Lu. DCell: A Scalable and Fault-Tolerant Network Structure for Data Centers. In ACM SIGCOMM 2008

C. Peng, G. Shen, Y. Zhang, Y. Li, and K. Tan. BeepBeep: A High Accuracy Acoustic Ranging System using COTS Mobile Devices. In ACM SenSys 07, 2007

K. Tan, J. Song, Q. Zhang, and M. Sridharan. A Compound TCP Approach for High-speed and Long Distance Networks. In IEEE INFOCOM 06, 2006

## Full Publication List

### Referred Conference Papers

T. Li, K. Zheng, K. Xu, R. Jadhav, T. Xiong, K. Winstein, K. Tan. TACK: Improving Wireless Transport Performance by Taming Acknowledgments. SIGCOMM 2020.

Z. He, D. Wang, B. Fu, K. Tan, B. Hua, Z. Zhang, K. Zheng. MasQ: RDMA for Virtual Private Cloud. SIGCOMM 2020.

W. Bai, S. Hu, K. Chen, K. Tan, Y. Xiong. One More Config is Enough: Saving (DC)TCP for High-speed Extremely Shallow-buffered Datacenters. SIGCOMM 2020.

Y. Lu, G. Chen, B. Li, K. Tan, Y. Xiong, P. Cheng, J. Zhang, E. Chen, T. Moscibroda. Multi-Path Transport for RDMA in Datacenters. NSDI, 2018.

S. Hu, Y. Zhu, P. Cheng, C. Guo, K. Tan, J. Padhye, K. Chen. Tagger: Practical PFC Deadlock Prevention in Data Center Networks. CoNext '17.

J. Son, Y. Xiong, K. Tan, P. Wang, Z. Gan, S. Moon. Protego: Cloud-Scale Multitenant IPsec Gateway. ATC, 2017.

Z. Lai, Y. Cui, Y. Jiang, X. Chen, Y. Hu, K. Tan, M. Dai, K. Zheng. Wireless Network Instabilities in the Wild: Prevalence, App (non)Resilience, and OS Remedy. ICNP, 2017.

W. Bai, K. Chen, S. Hu, K. Tan, Y. Xiong. Congestion Control for High-speed Extremely Shallow-buffered Datacenter Networks. Proceedings of the First Asia-Pacific Workshop on Networking (APNet), 2017.

C. Pei, Y. Zhao, Y. Liu, K. Tan, J. Zhang, Y. Meng, D. Pei. Latency-based WiFi congestion control in the air for dense WiFi networks. International Symposium on Quality of Service (IWQoS), 2017.

S Hu, Y Zhu, P Cheng, C Guo, K Tan, J Padhye, K Chen. Deadlocks in Datacenter Networks: Why Do They Form, and How to Avoid Them. Proceedings of the 15th ACM Workshop on Hot Topics in Networks (HotNets), 2016.

B. Li, K. Tan, L. Luo, Y. Peng, R. Luo, N. Xu, Y. Xiong and P. Cheng. ClickNP: Highly Flexible and High-performance Network Processing with Reconfigurable Hardware. ACM SIGCOMM, 2016.

S. Lee, H. Shi, K. Tan, Y. Liu, SK Lee, Y. Cui. Smart and Secure: Preserving Privacy in Untrusted Home Routers. Proceedings of the 7th ACM SIGOPS Asia-Pacific Workshop on Systems (APSys), 2016

G. Chen, Y. Lu, Y. Meng, B. Li, K. Tan, D. Pei, P. Chen, L. Luo, Y. Xiong, and Y. Zhao. Fast and Cautious: Leveraging Multi-path Diversity for Transport Loss Recovery in Data Centers. ATC 2016.

W. Shen, K. Lin, Ming-Syan Chen, K. Tan. Client as a First-Class Citizen: Practical User-Centric Network MIMO Clustering. INFOCOM 2016.

M. Meng, L. You, K. Tan, J. Zhang, W. Wang. SpaceHub: a smart relay system for smart home. HotNets 2015.

J. Zhang, J. Zhang, K. Tan, L. Yang, Y. Zhang, Q. Zhang, Turning Waste into Wealth: Enabling Communication in Guard-band Whitespace. ACM Mobihoc 2015.

Z. Yang, J. Zhang, K. Tan, Q. Zhang, Y. Zhang. Enabling TDMA for Today's Wireless LANs. INFOCOM 2015.

W. Shen, K. Lin, M. Chen, K. Tan. Sieve: Scalable User Grouping for Large MU-MIMO Systems. INFOCOM 2015.

Q. Yang, X. Li, H. Yao, J. Fang, K. Tan, W. Hu, J. Zhang, and Y. Zhang, BigStation: Enabling Scalable Real-time Signal Processing in Large MU-MIMO Systems, in ACM SIGCOMM, ACM, August 2013

S. Yoon, L. Li, S. Liew, R. Choudhury, I. Rhee, and K. Tan. QuickSense: Fast and Energy-Efficient Channel Sensing for Dynamic Spectrum Access Networks. In INFOCOM 2013.

- K. Tan, H. Shen, J. Zhang, and Y. Zhang, Enable Flexible Spectrum Access with Spectrum Virtualization, in IEEE DySpan , IEEE, October 2012
- J. Zhang, H. Shen, K. Tan, R. Chandra, Y. Zhang, and Q. Zhang, Frame Retransmissions Considered Harmful: Improving Spectrum Efficiency Using Micro-ACKS, in ACM MobiCom, ACM, August 2012
- H. Cui, C. Luo, K. Tan, F. Wu and C. Chen. Seamless rate adaptation for wireless networking. In Proceedings of the 14th ACM international conference on Modeling, analysis and simulation of wireless and mobile systems, 2011. (Awarded Best Paper)
- Z. Zeng, Y. Gao, K. Tan, and P. R. Kumar, CHAIN: Introducing Minimum Controlled Coordination into Random Access MAC, in The 30th IEEE International Conference on Computer Communications (INFOCOM 2011), IEEE, April 2011
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- L. Li, K. Tan, H. Viswanathan, Y. Xu and Y. Yang. Retransmission= $\neq$  repeat: simple retransmission permutation can resolve overlapping channel collisions. In ACM Mobicom 2010.
- K. Tan, H. Liu, J. Fang, W. Wang, J. Zhang, M. Chen, and G. M. Voelker. SAM: Enabling Practical Spatial Multiple Access in Wireless LAN. In ACM Mobicom2009, Beijing, China, September 2009
- K. Tan, J. Zhang, J. Fang, H. Liu, Y. Ye, S. Wang, Y. Zhang, H. Wu, W. Wang, and G. M. Voelker. Sora: High Performance Software Radio Using General Purpose Multi-core Processors. In NSDI 2009 - Awarded Best Paper
- D. Li, C. Guo, H. Wu, K. Tan, Y. Zhang, and S. Lu. FiConn: Using Backup Port for Server Interconnection in Data Centers. In IEEE INFOCOM 09
- F. C. Kuo, K. Tan, X.-Y. Li, and X. Fu. XOR Rescue: Exploiting Network Coding in Lossy Wireless Networks. In IEEE SECON 2009
- H. Wu, K. Tan, J. Liu, and Y. Zhang. Footprint: cellular assisted Wi-Fi AP discovery on mobile phones for energy saving. 4th ACM international workshop on Experimental evaluation and characterization, 2009.
- C. Guo, H. Wu, K. Tan, Lei Shi, Y. Zhang, S. Lu. DCell: A Scalable and Fault-Tolerant Network Structure for Data Centers. In SIGCOMM 2008.
- J. Zhang, K. Tan, J. Zhao, H. Wu, Y. Zhang. A Practical SNR-Guided Rate Adaptation. INFOCOM 2008 (mini-symposium)
- K. Tan, J. Song, M. Sridharan. CTCP-TUBE: Improving TCP-Friendliness Over Low-Buffered Network Links. PFLDNet 2008

- C. Peng, G. Shen, Y. Li, Y. Zhang and K. Tan. BeepBeep: A High Accuracy Acoustic Ranging System using COTS Mobile Devices. In ACM SenSys 07
- H. Wu, K. Tan and Y. Zhang and Q. Zhang. Proactive scan: Fast handoff with smart triggers for 802.11 wireless LAN. In INFOCOM 2007.
- Y. Liao, K. Tan, Z. Zhang and L. Gao. Modeling Redundance-based Routing in Delay Tolerant Networks. In special session on DTN, CCNC 2007
- K. Tan, J. Song, Q. Zhang, M. Sridharan. A Compound TCP Approach for High-speed and Long Distance Networks. IEEE Infocom, April 2006
- K. Tan, J. Song, Q. Zhang, and M. Sridharan. Compound TCP: A Scalable and TCP-friendly Congestion Control for High-speed Networks. PFLDNet 2006
- Y. Liao, K. Tan, Z. Zhang and L. Gao. Estimation based erasure-coding routing in delay tolerant networks. In ICWMC 2006.
- X. Meng, K. Tan, and Q. Zhang. Joint Routing and Channel Assignment in Multi-radio Wireless Mesh Networks. IEEE ICC 2006
- J. Lu, K. Tan, and Q. Zhang. Path aggregation for Voice over IP in multihop wireless mesh networks. IEEE ICC 2006
- Y. Zhuang, K. Tan, Y. Liu, and V. Shen. VoIP Packet Aggregation in Wireless Backhaul Networks. IEEE ICC 2006
- K. Tan and Q. Zhang. STODER: A Robust and Efficient Algorithm for Handling Spurious Retransmit Timeouts in TCP. IEEE Globecom 2005
- K. Tan, F. Jiang, Q. Zhang, and X. Shen. Congestion Control in Multi-hop Wireless Networks. IEEE SECON, 2005
- K. Tan, Q. Zhang, and W. Zhu. Shortest Path Routing in Partially Connected Ad Hoc Networks. IEEE Globecom 2003, March, 2003
- K. Tan, Q. Zhang, and W. Zhu. An End-to-end Rate Control Protocol for Multimedia streaming in Wired-cum-wireless Environments. IEEE ISCAS'03, 2003
- K. Tan, R. Ribier, S. Liou. Content-sensitive video streaming over low bitrate and lossy wireless network. ACM Multimedia 2001 (Poster session)
- K. Tan, Y. Shi, Guangyou Xu. A Pragmatic Semantic Reliable Multicast Architecture for Distant Learning. IEEE ICMI 2000

#### **Referred Journal Papers**

- T Wang, Q Yang, K Tan, J Zhang, SC Liew, and S. Zhang. DCAP: Improving the Capacity of WiFi Networks with Distributed Cooperative Access Points. IEEE Transactions on Mobile Computing, 2017.

K. Lin, W. Shen, M. Chen, and K Tan. User-Centric Network MIMO With Dynamic Clustering. IEEE/ACM Transactions on Networking, 2017.

J. Fang, K. Tan, Y. Zhang, S. Shi, L. Zhang and Y. Zhang. Fine-grained channel access in wireless LAN. ACM/IEEE Trans. On Networking, 2013 (also SIGCOMM 2010)

K. Tan, H. Liu, J. Zhang, Y. Zhang, J. Fang, and G. M. Voelker, Sora: high-performance software radio using general-purpose multi-core processors, in Communications of the ACM , ACM, January 2011 (Republish of NSDI 2009)

D. Li, C. Guo, H. Wu, K. Tan, Y. Zhang, S. Lu, and J. Wu. Scalable and cost-effective interconnection of data-center servers using dual server ports. Networking, IEEE/ACM Transactions on 2011.

S. Yun, H. Kim and K. Tan. Towards zero retransmission overhead: A symbol level network coding approach to retransmission. Mobile Computing, IEEE Transactions on, 2011.

Y. He, J. Fang, J. Zhang, H. Shen, K. Tan and Y. Zhang. MPAP: virtualization architecture for heterogenous wireless APs. ACM SIGCOMM CCR (Extended abstraction of Best Demo in SIGCOMM 2010).

K. Tan, F. Jiang, Q. Zhang, and X. Shen. Congestion Control in Multi-hop Wireless Networks. IEEE Trans. on Vehicular Technology, March 2007

H. Wu, F. Yang, K. Tan, J. Chen, Q. Zhang, and Z. Zhang. Distributed Channel Assignment and Routing in Multi-radio Multi-channel Multi-hop Wireless Networks. IEEE Journal on Selected Area of Communication, special issue on Mesh Network, Nov 2006

C. Guo, H. Wu, K. Tan, Q. Zhang, J. Song, J. Zhou, C. Huitema, and W. Zhu. End-system based Mobility

Support in Ipv6. IEEE Journal on Selected Area of Communication, special issue on Wireless Overlay Networks Based On Mobile IPv6, November 2005

K. Tan, C. Liao, Y. Shi. ASRM - Application Semantic Reliable Multicast. Journal of Software, in Chinese, 2002

C. Liao, K. Tan, Y. Shi, G. Xu. AMTM - An Adaptive Multimedia Transport Model. Journal of Computer, in Chinese, 2002

K. Tan, Y. Shi, G. Xu. Supporting Weak Synchronization over the World Wide Web. Journal of Software, in Chinese, 2000

#### **Internet Drafts**

M. Sridharan, K. Tan, D. Bansal, D. Thaler, "Compound TCP: A New TCP Congestion Control for High-

Speed and Long Distance Networks”, <draft-sridharan-tcpm-ctcp-01.txt>, work in progress, 2008

K. Tan, Q. Zhang, and W. Zhu. STODER: A Reliable TCP Spurious Timeout Detection Algorithm using Repacketization. <draft-kun-stoder-00.txt>, work in progress, 2004