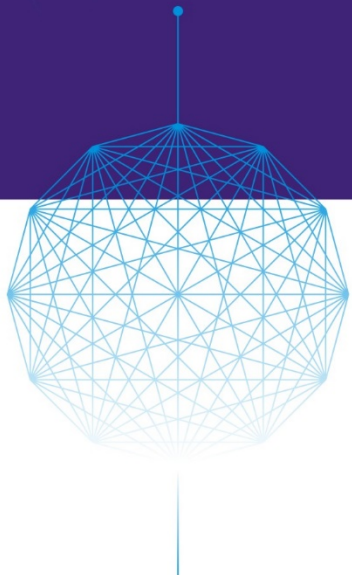







DPDK SUMMIT CHINA 2017



主办方：

参与方： 腾讯云  ZTE  美团云  Panabit®  太一星晨   云杉网络

协办方： SDNLAB 专注网络创新技术 视频支持方： IT大咖说



F-Stack - a full user-space network development kit


BASED ON DPDK, FREEBSD TCP/IP STACK

Fengbo Jiang, Hailong Wang






DPDK China Summit 2017, Shanghai



主办方: 

参与方:  腾讯云  ZTE  美团云  Panabit  太一星晨   云杉网络

协办方:  SDNLAB  中国网络创新技术 视频支持方:  IT大咖说



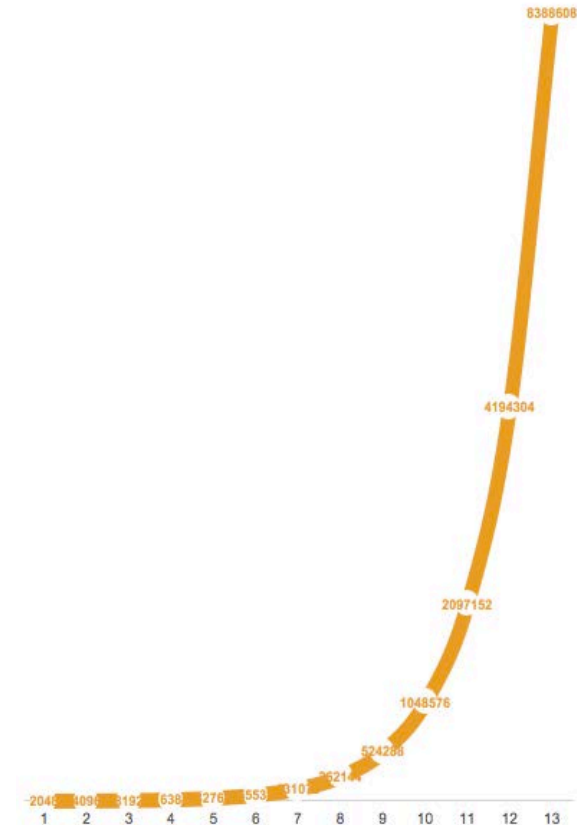
Explosive growth of data services

▶ Challenges

- ▶ service traffic: CDN, live streaming (RTMP), etc.
- ▶ DDoS, CC

▶ Solution

- ▶ NIC: 25GbE → 40GbE → 100GbE
- ▶ CPU: 24Cores → 48Cores → 56Cores
- ▶ L2/L3: Kernel bypass (DPDK)
- ▶ L4/L7: ?





user space TCP/IP stack

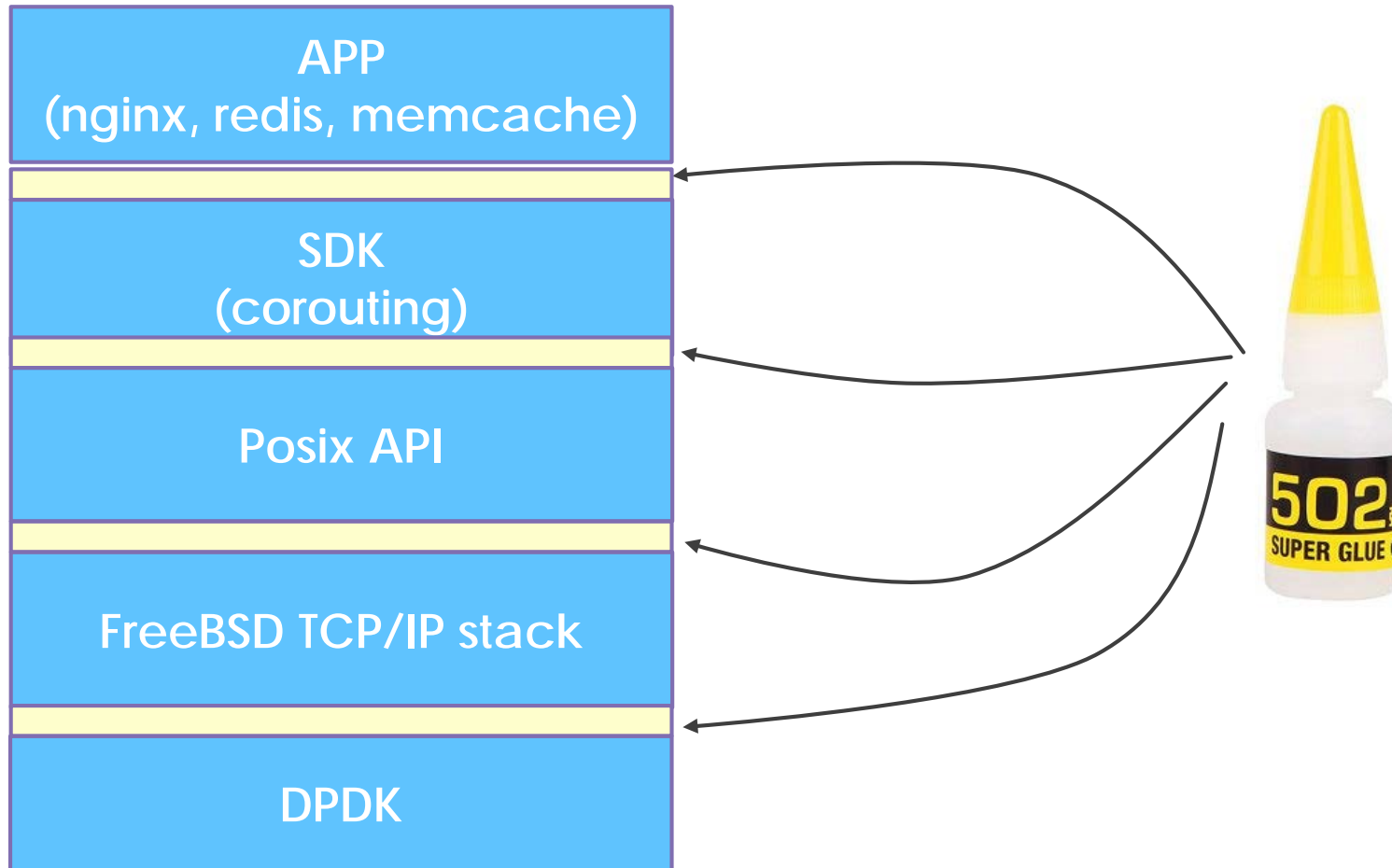
- ▶ Seastar's native stack
 - ▶ problems in WAN
 - ▶ incompatible with existing programs
- ▶ mTCP's user-level stack
 - ▶ tcp only.
 - ▶ too simple to be a production ready stack

VLAN/VxLAN/Tunnel/Bonding/Network Tools are not supported



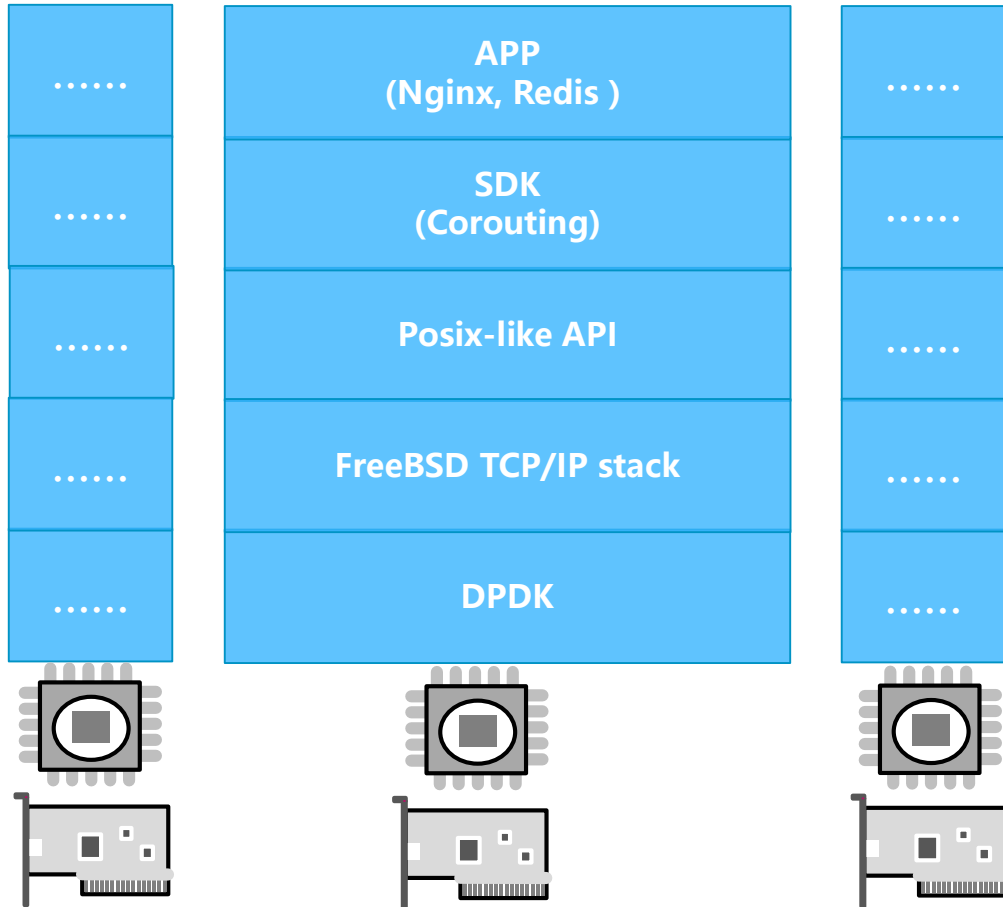


What does F-Stack do ?





F-Stack



1、 Full user-space

- ▶ No context switch
- ▶ Zero copy
- ▶ No hirqs and sirqs

2、 Shared-nothing architecture

- ▶ Linear scalability
- ▶ No schedule
- ▶ No lock
- ▶ No cache locality miss





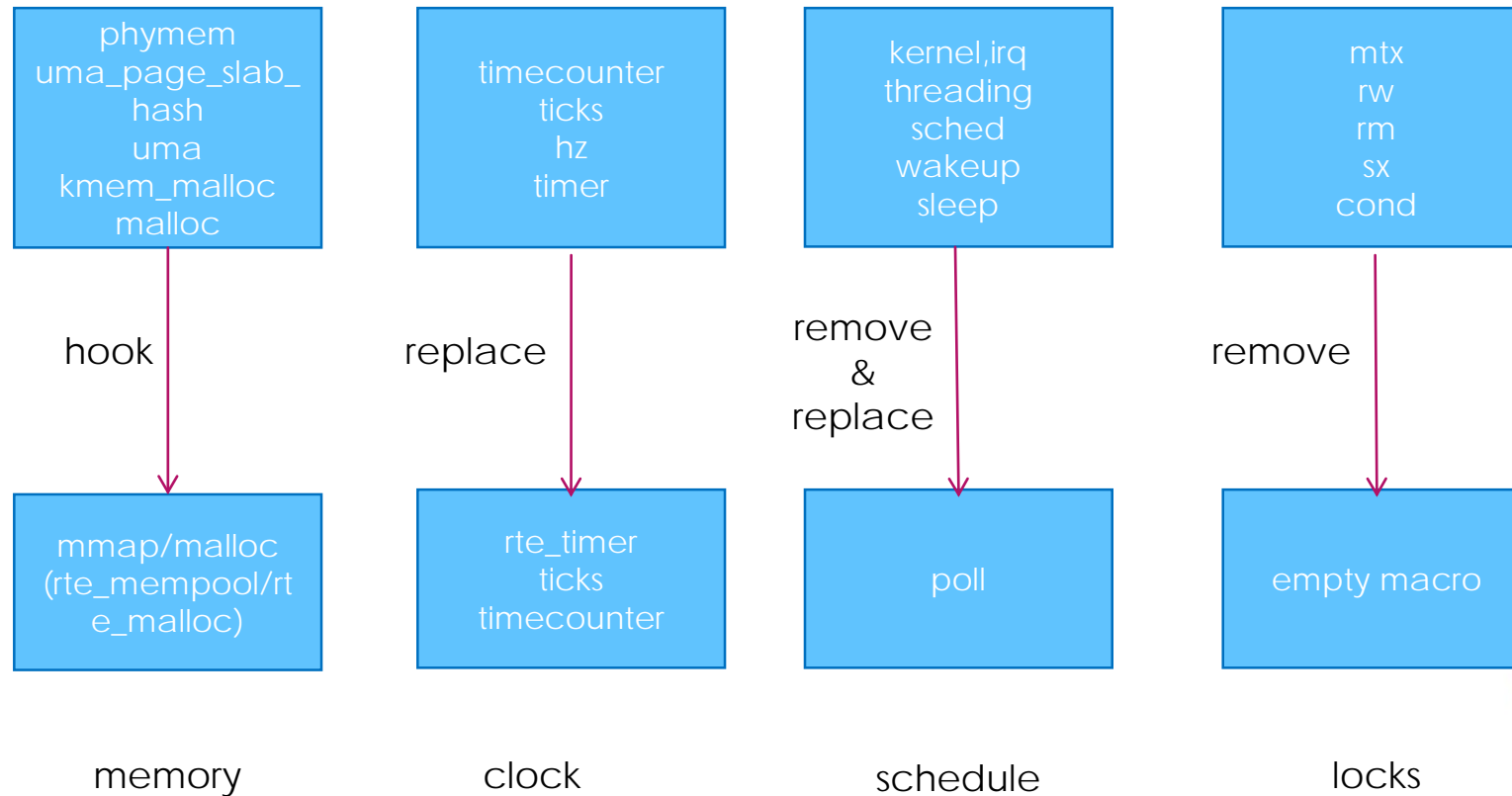
Why FreeBSD

- ▶ Why full TCP/IP stack ?
 - ▶ Advantageous functional, production ready stack, IGMP/IPv6/VLAN/VxLAN/Tunnel/Bonding/Net Tools
 - ▶ Stable.
- ▶ Why not Linux ?
 - ▶ complicated logic.
 - ▶ GPL



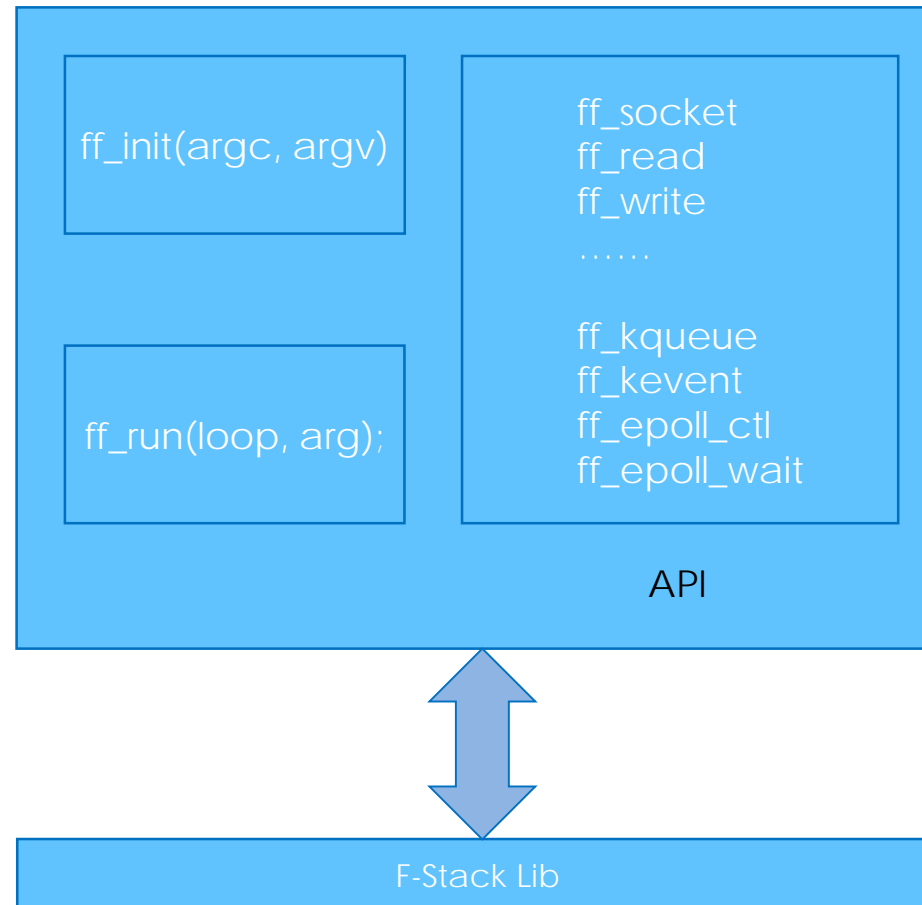


User space FreeBSD TCP/IP stack



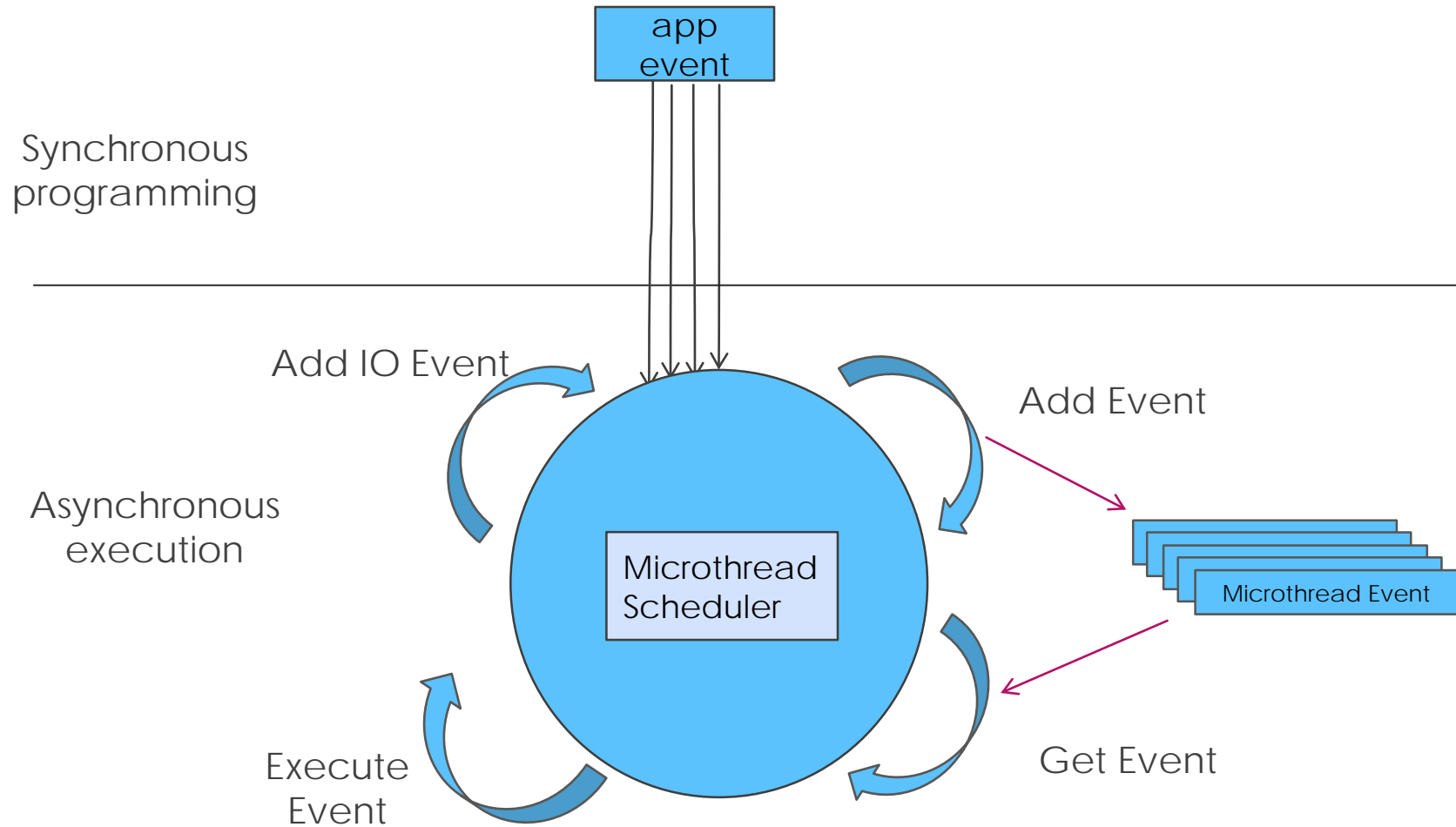


Posix-like API





Coroutine





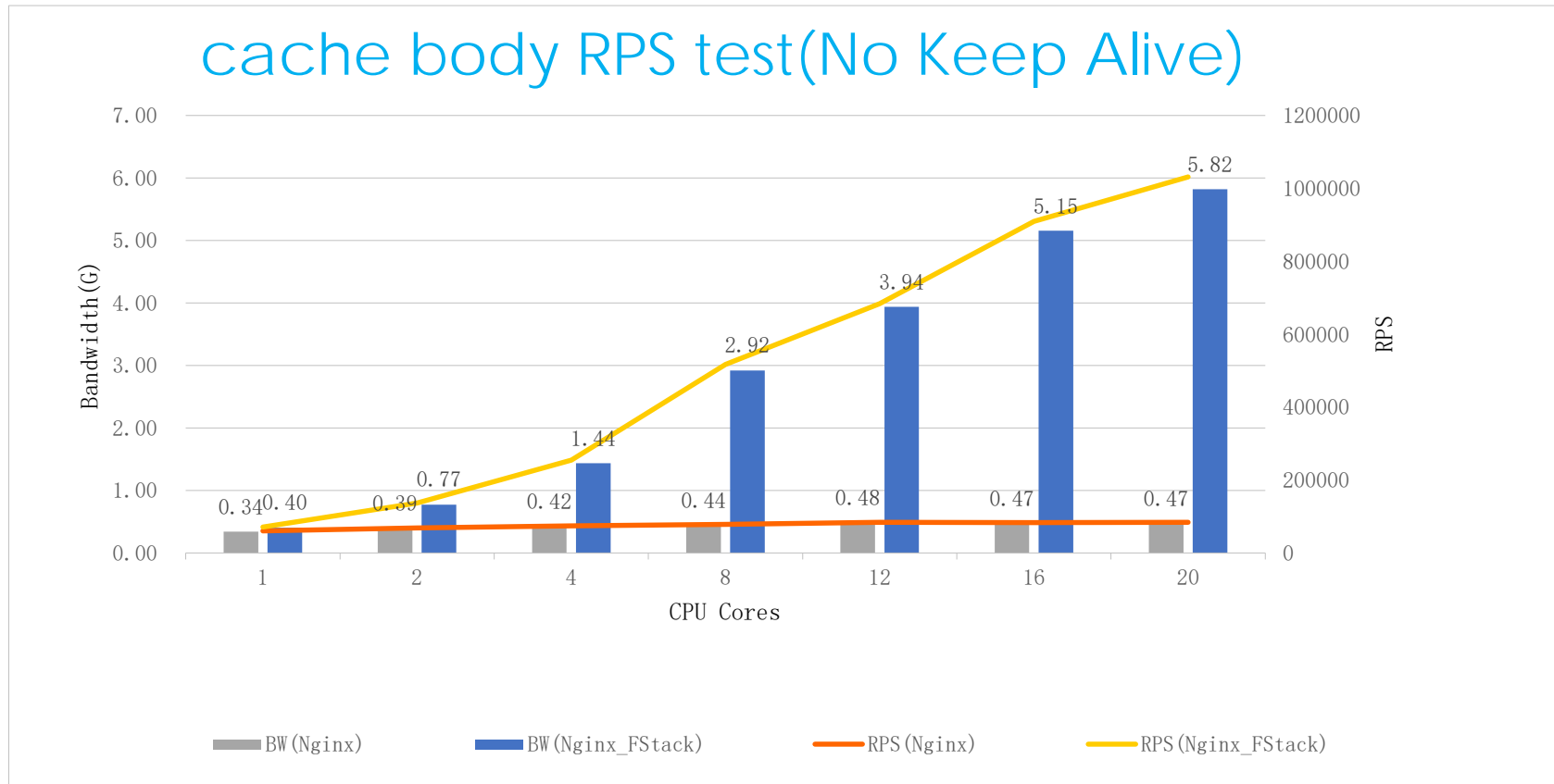
Network tools

- ▶ `sysctl`
- ▶ `ifconfig`
- ▶ `route`
- ▶ `netstat`
- ▶ `etc..`





Nginx_F-Stack





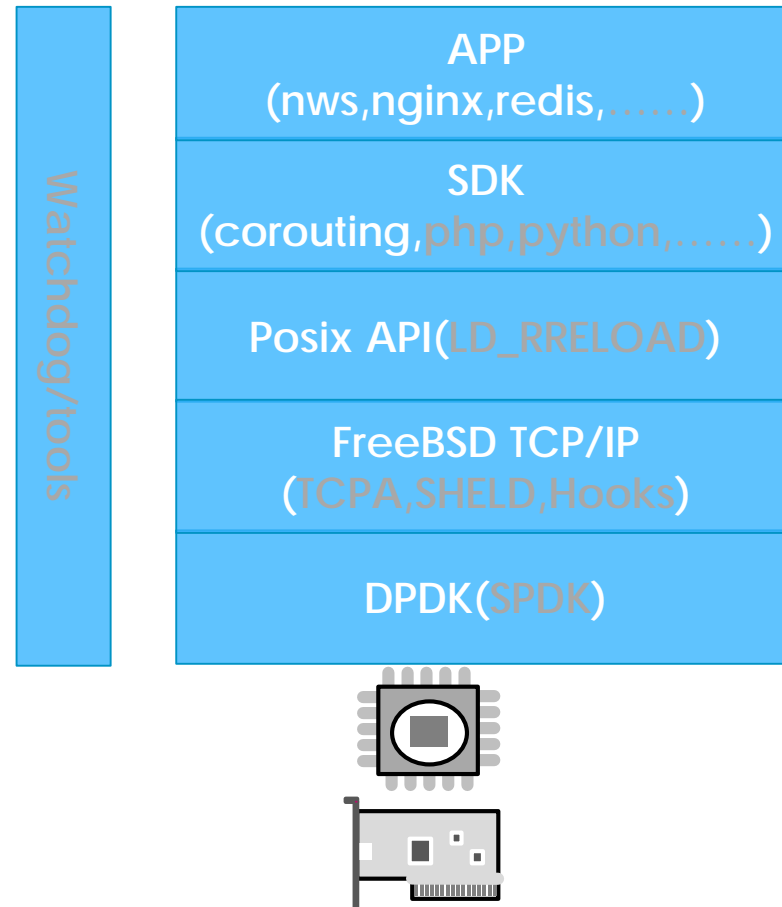
F-Stack in Tencent Cloud

- ▶ 2013 UDP DNS server based on DPDK
- ▶ 2014 TCP(user-space TCP/IP stack) DNS server
- ▶ 2015 L4/L7 gateway application
- ▶ 2016 Used on HttpDNS,CDN,COS(Cloud Object Storage)
- ▶ 2017 Port FreeBSD network stack to F-Stack and open source





Roadmap





Resources



<https://github.com/f-stack>



<http://www.f-stack.org>



F-Stack WeChat subscription





Thanks!!



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