

Book Review: High Performance Browser Networking

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By:
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The Good News is..

- PART I: Networking 101
 - Primer on Latency and Bandwidth
 - Building blocks of TCP, UDP , TLS Optimizations
- PART II: Performance of WIFI Networks
 - Wireless Networks
 - Mobile Networks/ E2E Carrier Architecture
- PART III HTTP*
 - Brief History of HTTP*
 - HTTP Optimizations for Application Delivery
- PART IV Browser APIs
 - XHR, SSE, WebSockets, WebRTC.
 - Q&A

The Bad News is..

- I may begin to rant.. Please be patient
- I am a QA Engineer, however I am NOT a Developer
- Limited Knowledge of Browser APIs prior to reading High Performance Browser Networking
- Deadlines are NOT my friend :-)

Pt 1: Primer on Latency and Bandwidth

- “Latency is the Bottleneck Not Bandwidth”
 - Latency vs Bandwidth
 - Latency time from source sending packet to destination
 - Bandwidth
 - Logical or Physical communication path
 - (i.e Core and Edge Networks)
- Foreword quote: “Good Developers know how things work. Great Developers know why they work”
- Slight mentions of WPO and Google Performance Engineers Steve Sounders and Illya Grigorik(Author)

Pt 1: Building Blocks of TCP UDP TLS Optimizations

TCP

- TCP Fast Open (TFO)*new* Client/Server app data sent in SYN packet.
- Window Scaling (cwnd/rwnd) = increasing window scaling allows high-latency
- Slow Start Restart (SSR) = Improved performance of long-lived TCP connections which transfer data in burst.
- Bandwidth-Delay Product

UDP

- **STUN - Session Traversal Utilities for NAT. Allows app to discover presence of Network Address Translator on Network**
- **TURN - Traversal Using Relays around NAT. Failover to TCP if all else fails**
- **ICE - Interactive Connectivity Establishment establish the most effective tunnel between TURN and STUN participants**
- **Application SHOULD handle all TCP optimizations**
***What?!?!* this is where the Browser APIs come in.**

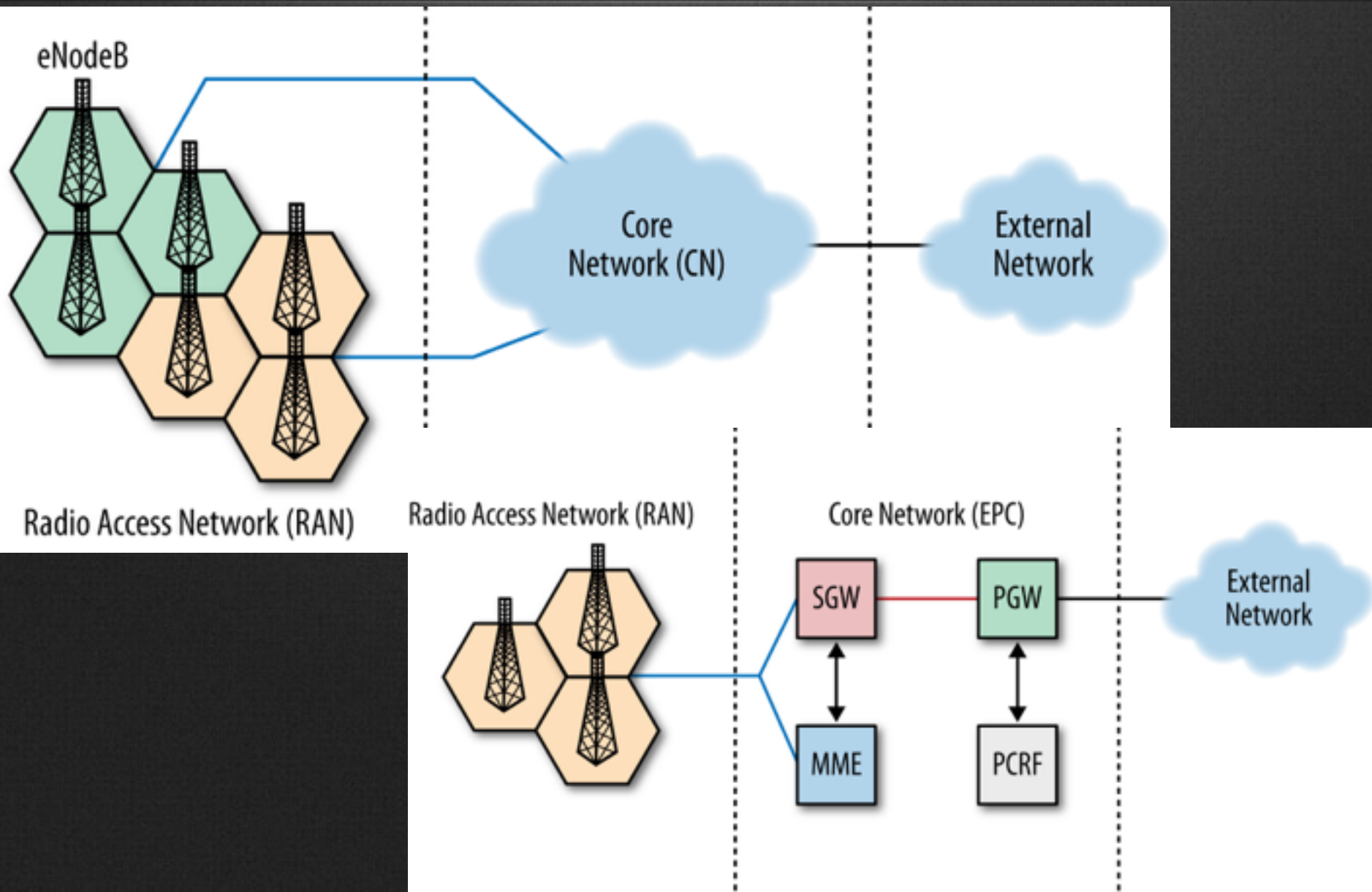
PART II: Performance of Wireless Networks

- Measure Everything Against Real-World Wifi Performance!
- Signal Power (SNR) - Signal Power -to- Noise
- Modulation
- Packet Loss
- You should be skeptical of the notion of “ideal conditions” and network weather. Use bandwidth and signal measurement tools
 - WWMM
 - inSSIDer

Mobile Networks/ E2E Carrier Architecture

- RAN - Radio Access Network
 - MME-
 - eNodeB
 - PGW
 - SGW
 - Did you know this is the telecom core network that makes LTE possible?
- HetNets
- Brief History of G`s
- All Optimization techniques for TCP UDP and TLS are applicable here

Mobile Networks/ E2E Carrier Architecture



HTTP*

- **Primer on the History of HTTP**
- **HTTP v0.9 - The One-line Protocol, Single Client ASCII request**
- **HTTP v1.0 - Responsible for the Internet Boom of 1990s due to the establishment of HTTP-WG and Improvements to HTTP 0.9 Client/Server Standards**
- **HTTP v1.1 - “The Internet Standard” leveled up HTTP 1.0 to an official IETF Standard.**
- **HTTP 2.0 - Improvements to Transport Performance**

PART IV BROWSER APIs

- XHR
- SSE
- WebSockets API and Protocol
- WebRTC

To Be Continued...

- Q&A