70th ANNUAL NECPUC SYMPOSIUM

There's an App for That

IoT, 5G and Big Mobile Data from T-Mobile

Derek Doan

Senior Manager for the Northeast Region for Public Sector and Education Sales

INTERNET OF THINGS
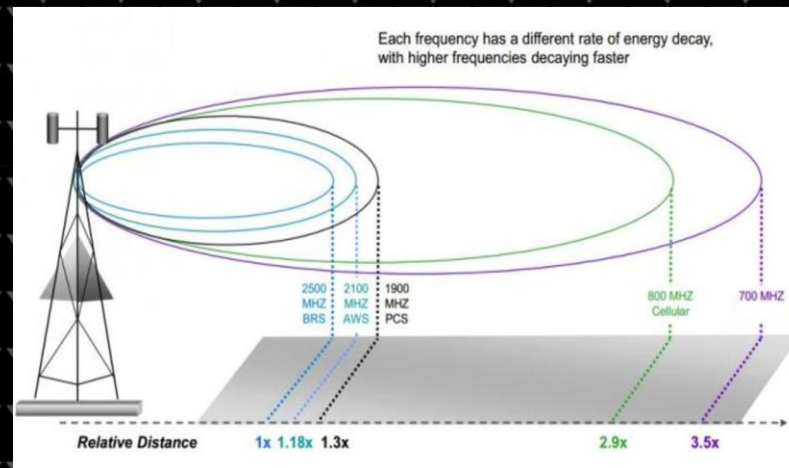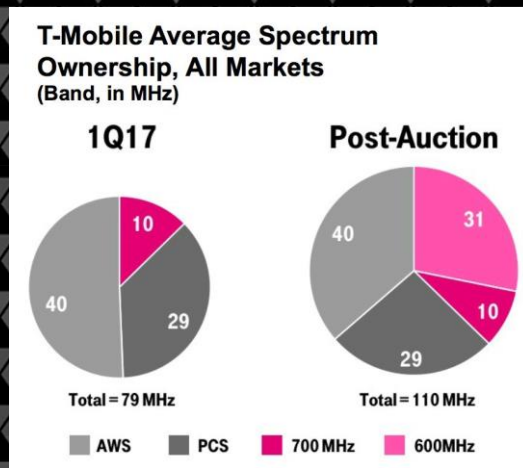
A CONNECTED WORLD OF
ENDLESS POSSIBILITIES

"IoT has a total potential economic impact of $3.9 trillion to $11.1 trillion a year by 2025."

—McKinsey – Unlocking the potential of the IOT.

Spectrum + Speed = New Class of Applications

Spectrum: Low Band, Mid-Band, High-Band – why all three are equally important…

Speed: 250MB's + Burstable Speeds up to 1GB+ with fiber at each site…

T-Mobile Average Spectrum Ownership, All Markets (Band, in MHz). 1Q17: Total = 79 MHz. Post-Auction: Total = 110 MHz. Legend: AWS, PCS, 700 MHz, 600MHz.

Each frequency has a different rate of energy decay, with higher frequencies decaying faster. Relative Distance: 1x, 1.18x, 1.3x, 2.9x, 3.5x. Frequencies: 2500 MHZ BRS, 2100 MHZ AWS, 1900 MHZ PCS, 800 MHZ Cellular, 700 MHZ.

The Un-Carrier takes on IoT

COMPLEX & CONFUSING

PROHIBITIVE COSTS
Costly rate plans and billing plan management
Multiple certifications complexity
Multi-carrier and 4G module expenses

LACKING CONTROL
Data threats and ownership
Multi-carrier management
Global roaming

SHORTFALLS
Lack of secure or open standards
Competing standards
Access to sales and support resources
2G sunset

THE UN-CARRIER APPROACH

SIMPLE
Simple pricing: throughput and usage-based
Low cost, wide area, and low power Cat1 to NB-IoT
Industry standard roadmap, low cost modules

OPEN
The most open and comprehensive developer offering
Innovative partnerships
Self-serve capabilities through the Hub

INNOVATIVE
Clear 5G product path, Cat1 LTE today, NB LTE by 2018
Leader in LTE rollout and penetration
5G Immersion and testing

IoT and 5G In Healthcare

5G Connected Smart Bandages To Monitor Wounds

The bandages are to use nano-sensors to detect wound conditions, relaying this and other patient data to doctors over 5G networks

Patient Tracking Nano-Sensors

Sensors are used to track newborns and also alert families when their loved one is out of surgery.

Tele-Medicine and Real Time Care over 5G Networks

Physicians and Patients and can have real time interactive care discussions via mobile networks; anywhere, anytime.

" *6.4B connected things will be in use worldwide in 2016, up 30% from 2015, and will reach 20.8 billion by 2020.*
—Gartner (November 2015)

…The number of devices will more than double from the current level, with 40.9 billion forecasted for 2020. 75% of the growth between today and the end of the decade will come from non-hub devices: sensor nodes and accessories…
—ABI REASEARCH (August 2014)

…The application of this technology can reduce maintenance costs by up to 25%, cut unplanned outages by up to 50%, and extend the lives of machines by years…
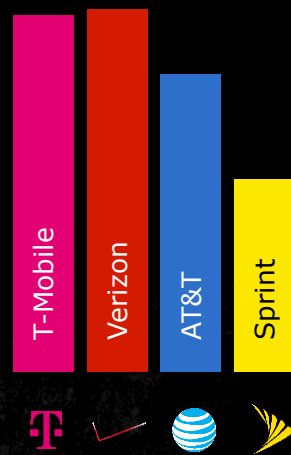**—FORTUNE(JULY 2015)**
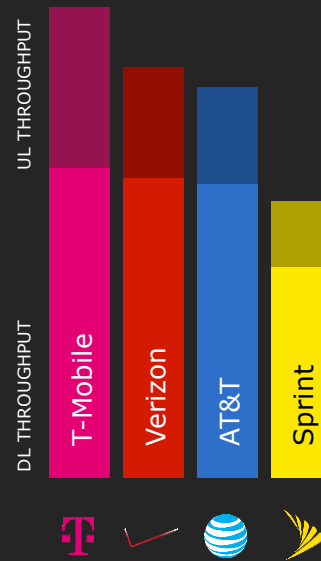"

T-Mobile's LTE network is on par with Verizon

NETWORK AVAILABILITY 4G*

T-Mobile · Verizon · AT&T · Sprint

NETWORK DOWNLOAD SPEEDS 4G*

T-Mobile · Verizon · AT&T · Sprint

TOTAL LTE NETWORK DATA SPEED (Mbps)**

UL THROUGHPUT

DL THROUGHPUT

T-Mobile · Verizon · AT&T · Sprint

FASTEST LTE NETWORK

12
quarters

IN A ROW

Connectivity

Flexible, simple, and transparent pricing

1

ACCESS UNLIMITED
Pay per use

- Global data coverage
- One simplified access fee
- Industry leading price plans
- Easy for everyone

2

ACCESS PACK BUNDLE
Disruptive bundled pricing

- Annual plan
- Cat 1 Module at 2G prices
- Unlimited data option
- Great for developers, mftr

TWO options

THE BEST PRICING FOR IOT

PERIOD.

Simple certification

**"Safe for Network" certification
path on T-Mobile gives you:**

- Select from pre-certified modules to best fit your use case

- Fastest onboarding path with consolidated testing and lower testing costs

- Leverage third party vendor labs and self-testing

- Potential exceptions for devices already certified on ATT/VZ

- TMUS engineering support on certified devices to optimize your products

SAVE TIME. SAVE MONEY.

Open connectivity management platforms

Netcracker
Highly configurable, best for large customers and resellers

Hub
Self manageable through the web, fits most customer needs

Twilio
Supports developers and specialized requirements

1

NETWORK CONNECTIVITY

- Public or Private Static IP capability to support partner specific M2M/IoT use cases
- Provide partner with eSIM (GSMA 3.1 compliant) directly through HUB GUI

BILLING AND RATING

- Wholesale pooled scalable plans to share buckets of data
- Delayed billing to provide partners trial and/or test period use or other specific partner delayed billing use cases

WEB PORTAL AND CUSTOMER SERVICE

- Integrated SIM stock management or easy SIM order fulfillment
- Direct GUI access for eSIM management

REPORTING AND ALERTS

- Partner configurable alerting and notifications

In summary…

Fastest
growing and
best network
for LTE, period

Easiest
to do business
with **simple,
transparent
pricing**

**Most
innovative,**
we're obsessed with
making our network,
your network

T··Mobile·®

A CONNECTED WORLD OF ENDLESS
POSSIBILITIES