Urbanization and Future Networks
The Great Data Escape

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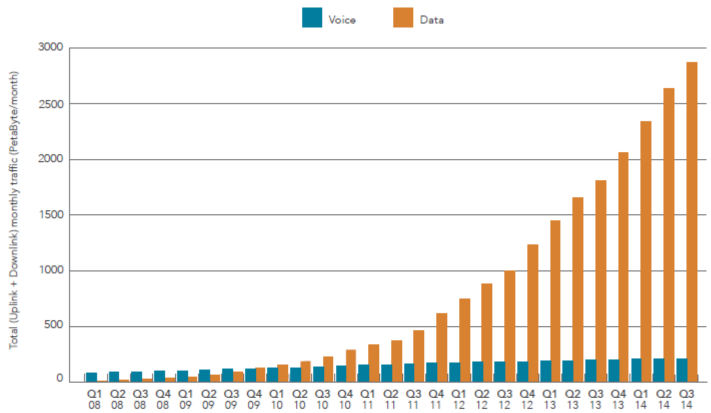
Forces Shaping Wireless Future

- Demand growth
- Application growth
  - Social
  - Entertainment
  - IoT
- Network evolution
  - Air Interface
  - Core
  - Sites

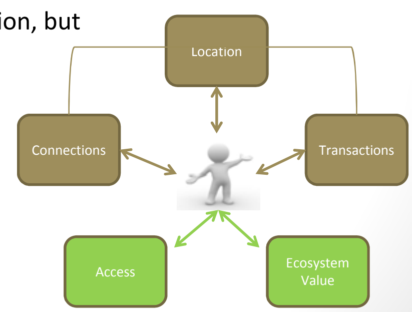
Mobile Usage Growth



Source: Ericsson

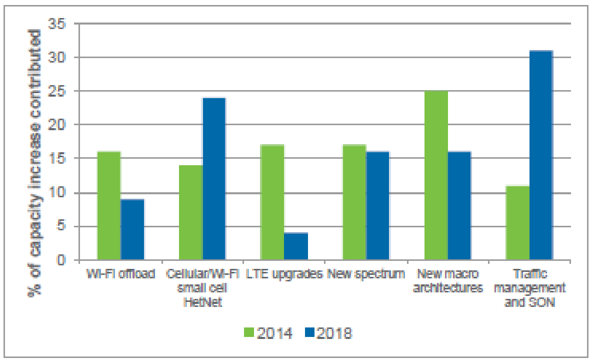
Potential Mobile Data Escapes

- Carrier dilemma
  - Demand growth exceeding network capacity growth
  - Coverage expectations are commodity level (for 85% of POPs)
  - Monetization of growth constantly changing
  - Stickiness tied to service consistency (and performance)
  - Offload is a cost effective option, but
    - Site access is tough
    - Service integration lags
    - Others want to grab traffic
- Space is created for others



Addressing Data

- WiFi + Small Cells to account for 1/3 of MNO capacity growth
- Can MNOs transition to controlled WiFi experience?



Source: State of the Market 2014, Wireless Broadband Alliance

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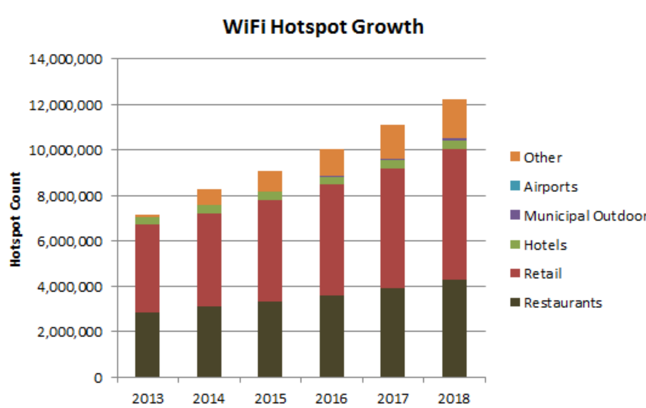
WiFi Sites

70% Growth 2013 to 2018 (excludes cable hotspot growth)



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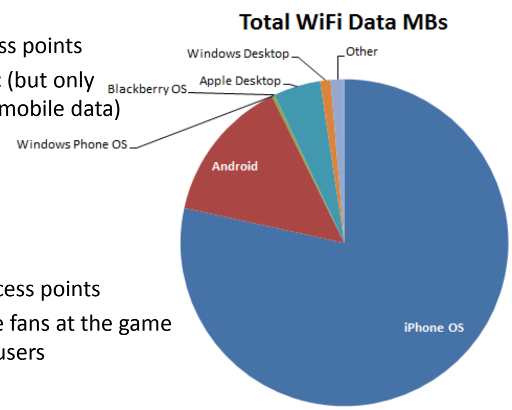
A Glimpse of the Future?

- Major DAS site (game day)
  - Mobile network
    - More than 770 access points
    - 100% of voice traffic (but only equivalent to 5% of mobile data)
    - 1.41 TBs of traffic
    - ~ 22% of data traffic
  - LTE broadcast
  - WiFi
    - More than 1,200 access points
    - Almost a third of the fans at the game were simultaneous users
    - ~78% of data traffic
    - 4.93 TBs of traffic (in a 4 hour period)



Implications

- Network type and Customer Data
  - Who knows a lot – wireless
  - Who knows something – cable
  - Who knows the least – ?
  - Who knows the most – maybe app and OTT providers
  - Who makes use of connected intelligence?

Who can synthesize?
Who can be secure?
Who can you trust?

- Some valuation shifts
  - Mobile macro site to WiFi or small cell site
    - Locations still important but height?
  - Owned to shared
    - Already shifting away from tower structure
    - WiFi operates under a partner model
    - DAS venues in turf grab cycle but headed for sharing
    - Small cells outdoor?
  - Network core shift
    - From dedicated nodes to shared platforms (SDN and NFV)
    - 90% swap out in 3-4 years
- Other Issues for valuation
  - 'Middle' or 'Edge Core 'network drops out
  - Network realities lag optimized solutions