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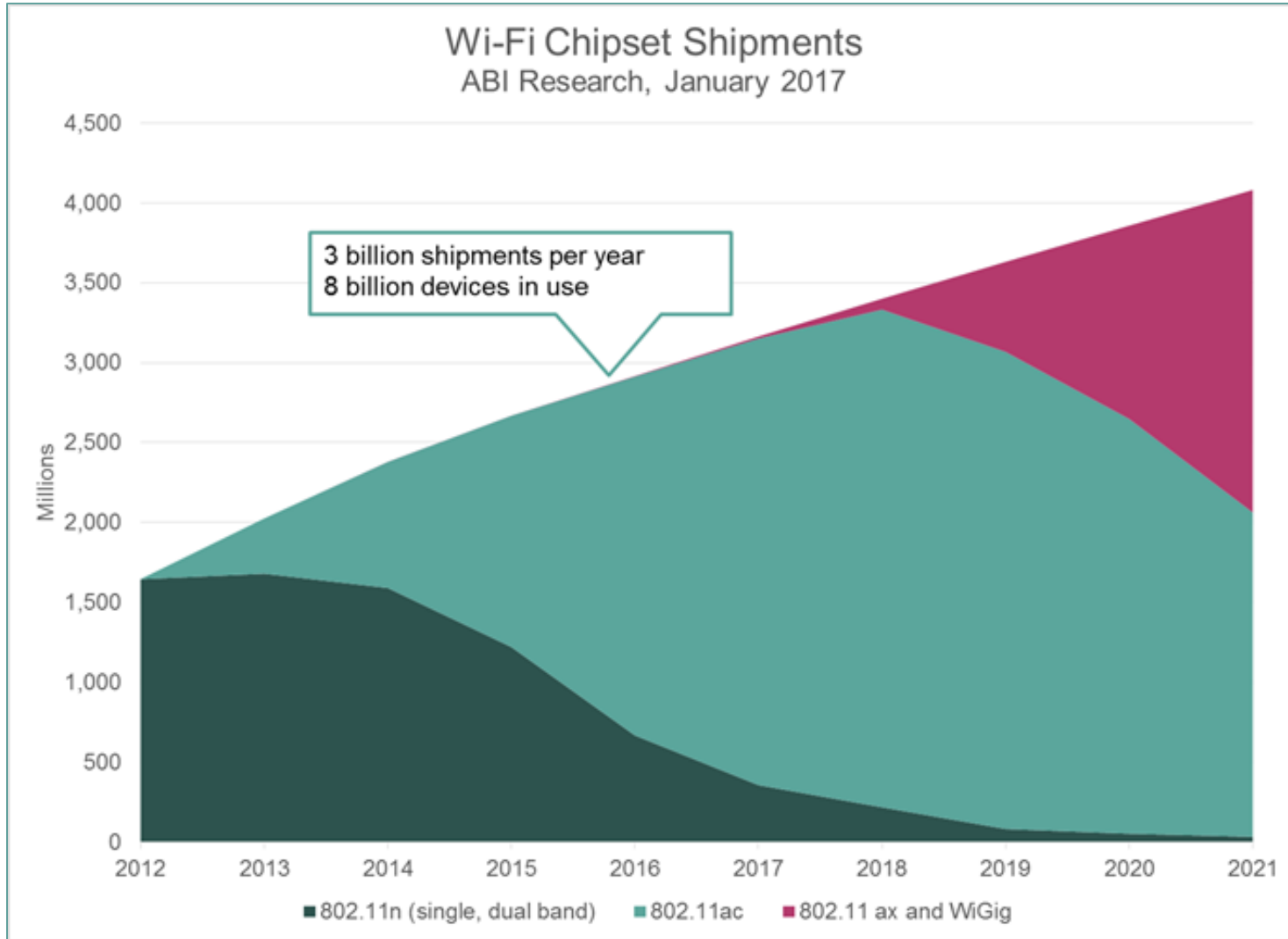
# 5G in a Wi-Fi World

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Chuck Lukaszewski  
Vice President, Hewlett-Packard Enterprise

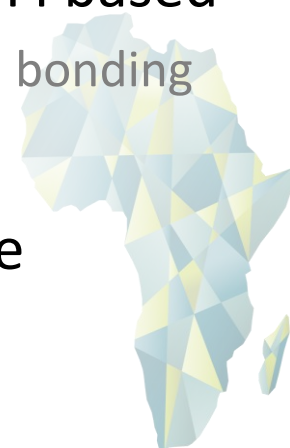


# It's a Wi-Fi World: 4B devices/year by 2021



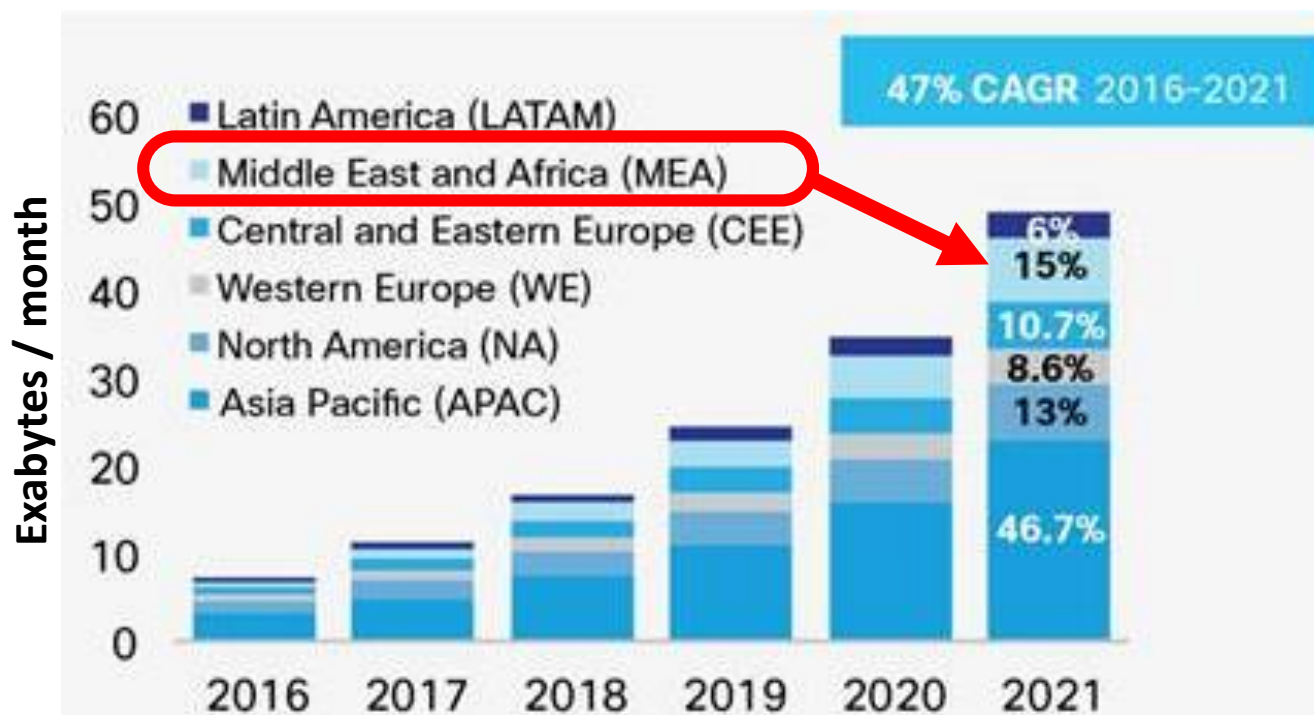
# 5G Success Depends on Wi-Fi & WiGig

- Wi-Fi carries most public & private Internet traffic worldwide
  - Between 50-80% depending on country.
- Many IEEE technologies are core elements of 5G
  - IEEE and 3GPP are working together on 5G, coordinating at the highest level
- 5G radio aggregation technologies will natively incorporate Wi-Fi
  - 802.11 is a peer member of the 5G “RAT Family” or 5RGF
- 5G radio edge requires indoor small cells that will be Wi-Fi based
  - Like “Gigabite LTE,” 5G achieves high data rates from unlicensed bonding
  - Indoor small cells are mandatory to achieve this vision
- We need significantly more unlicensed spectrum to serve expected demand from both IMT and non-IMT
  - Dynamic Spectrum Access technologies will be critical



# Africa is Leading the World in Data Traffic Growth

- In 2016, global mobile data traffic grew an estimated 63% Y/Y
- In 2016, Africa and the Middle East grew over 96% Y/Y
- Africa and Middle East will increase 12X by 2021
- Between 50-70% will be carried on Wi-Fi (depending on country)



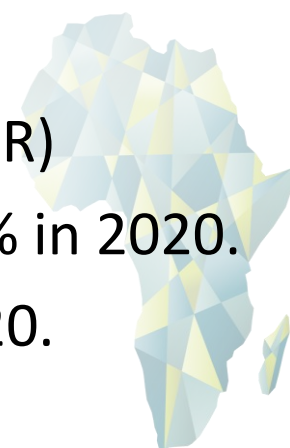
# Unlicensed Spectrum is Carrying the Burden in Africa

## South Africa

- Wi-Fi IP traffic grew 36% in 2015.
- Wi-Fi IP traffic will grow 3X from 2015 to 2020 (22% CAGR)
- Wi-Fi was 62.7% of total Internet traffic in 2015 → 61.5% in 2020.
- Wi-Fi Internet traffic will be 3.4X more than Wired in 2020.

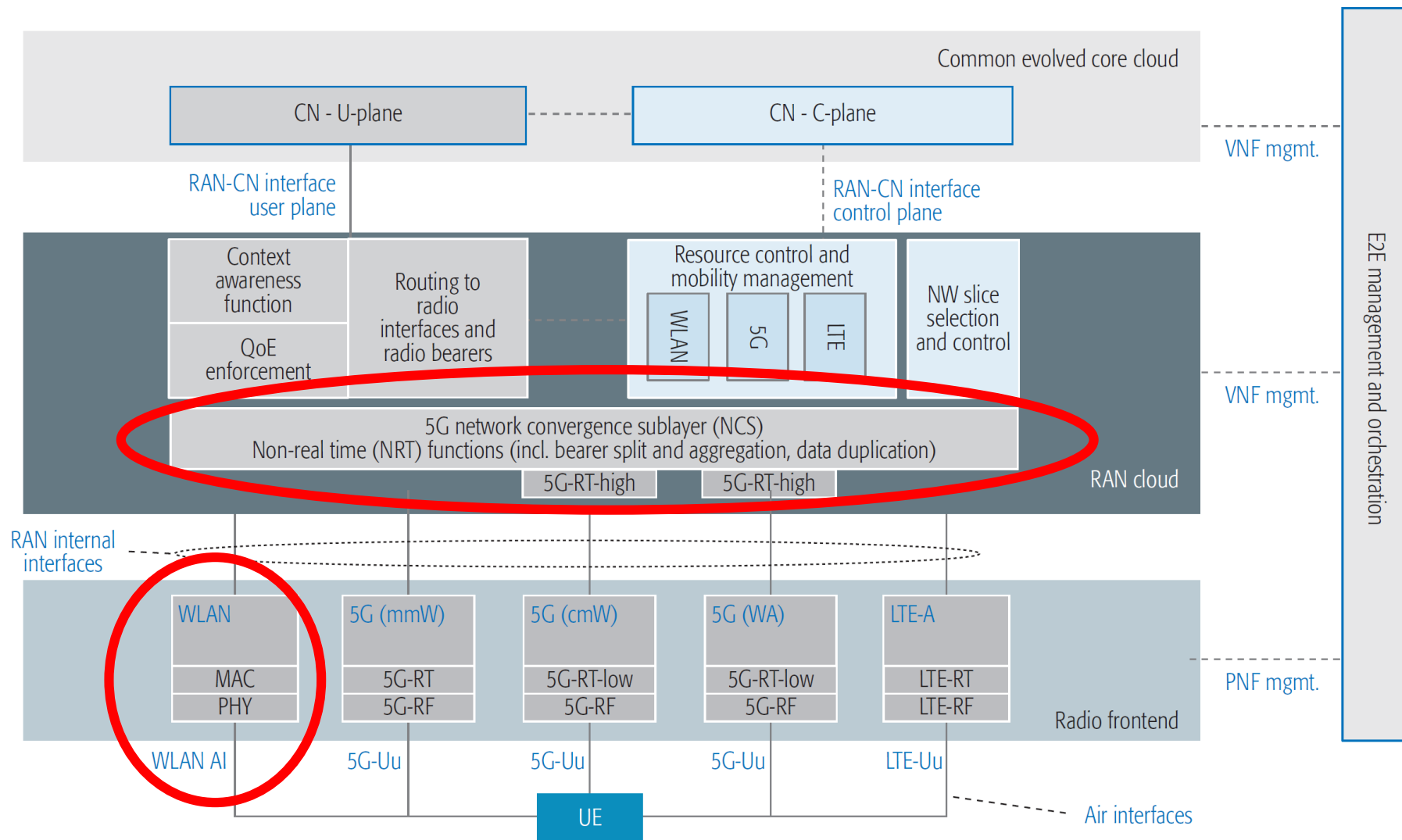
## Rest of Africa & Middle East (excluding KSA)

- Wi-Fi IP traffic grew 41% in 2015.
- Wi-Fi IP traffic will grow 6X from 2015 to 2020 (43% CAGR)
- Wi-Fi was 56.9% of total Internet traffic in 2015 → 49.1% in 2020.
- Wi-Fi Internet traffic will be 9.0X more than Wired in 2020.



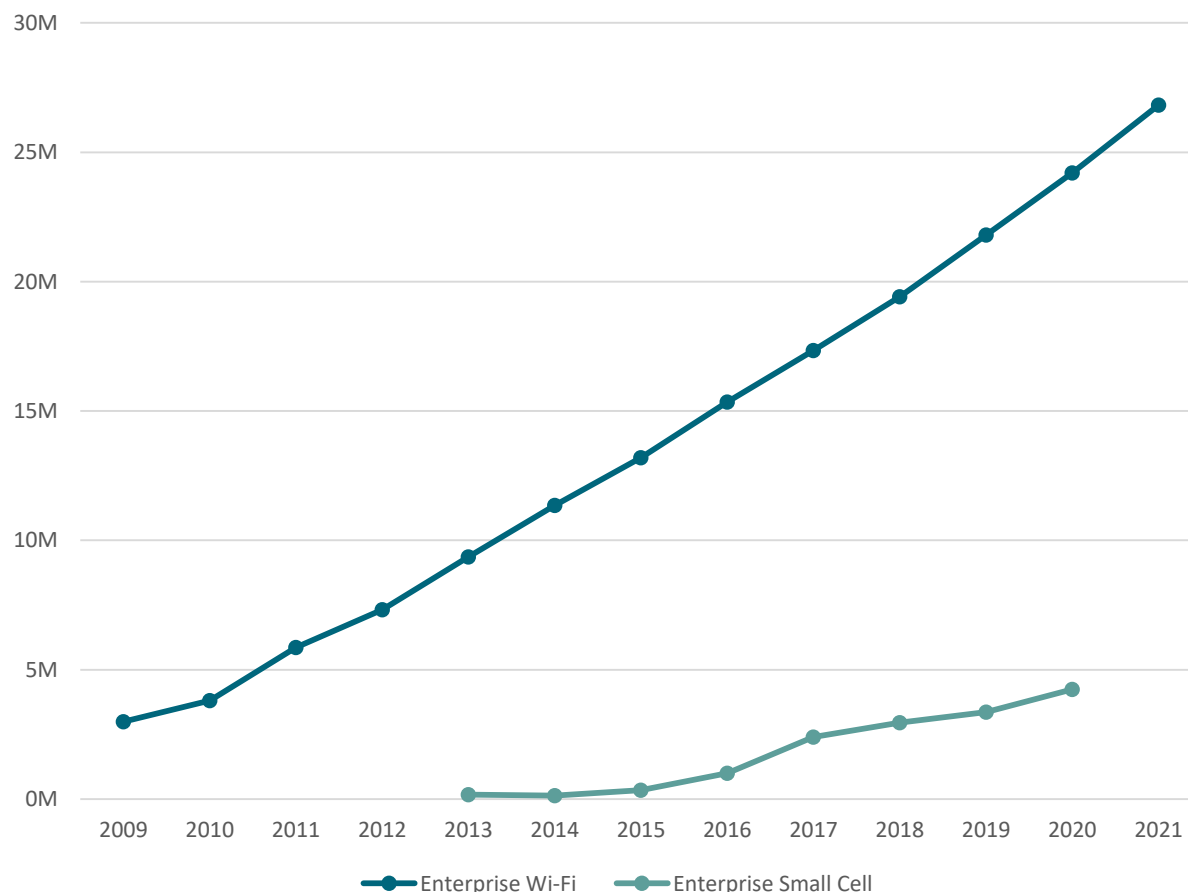
Source: Cisco VNI June, 2016 ([http://www.cisco.com/c/m/en\\_us/solutions/service-provider/vni-forecast-highlights.html#](http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html#) )

# Wi-Fi is a Peer Radio Access Technology (RAT) in 5G



# Wi-Fi Will Be Dominant Indoor Aggregation Technology

## Enterprise Wi-Fi APs Outrunning Small Cells

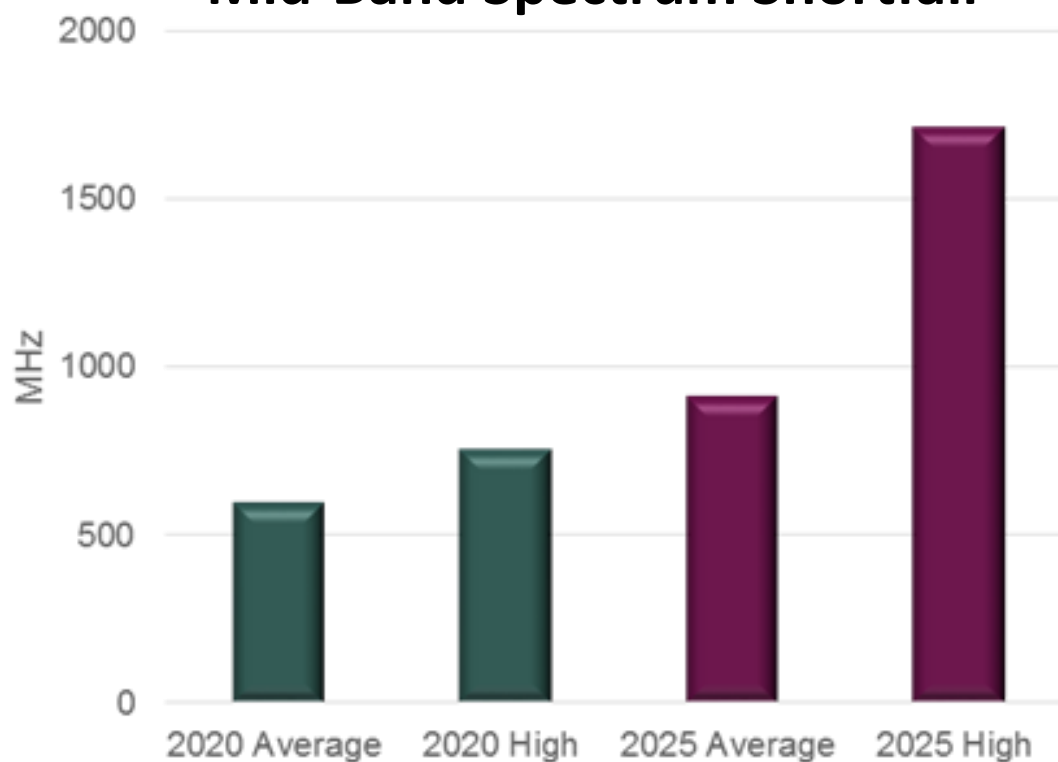


- Enterprise small cells still selling just 500K units/year
- As of March 2016, only 900K total deployed worldwide
- Small Cell Forum forecasts show Wi-Fi lead growing from 14M in 2016 to 20M in 2020.



# Significant C-Band Spectrum Needed to Meet Demand

## Mid-Band Spectrum Shortfall



**Wi-Fi faces a shortfall of 600 MHz – 1.7 GHz** of mid-band spectrum to meet consensus demand forecasts (depending on actual growth rates, usage scenario, country, DFS adoption and other factors)







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Thank you!