



LTE

HERE AND NOW

TECHNOLOGY – SERVICES – BUSINESS

HTE INFOKOM 2012,
MÁTRAHÁZA OKT 10-12



Csaba Novák
Senior Advisor LTE

TOPICS



LTE in the World Today

Business and Service Challenge

Ericsson LTE Technology Look



TOPICS



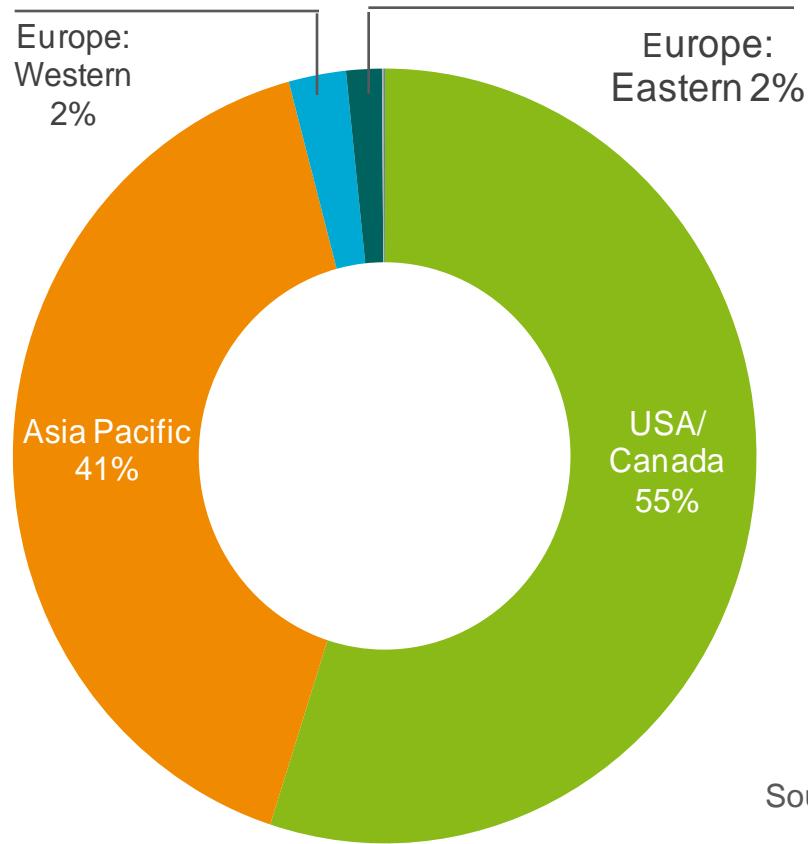
LTE in the World Today

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33 M LTE SUBSCRIBERS



Source: WCIS+

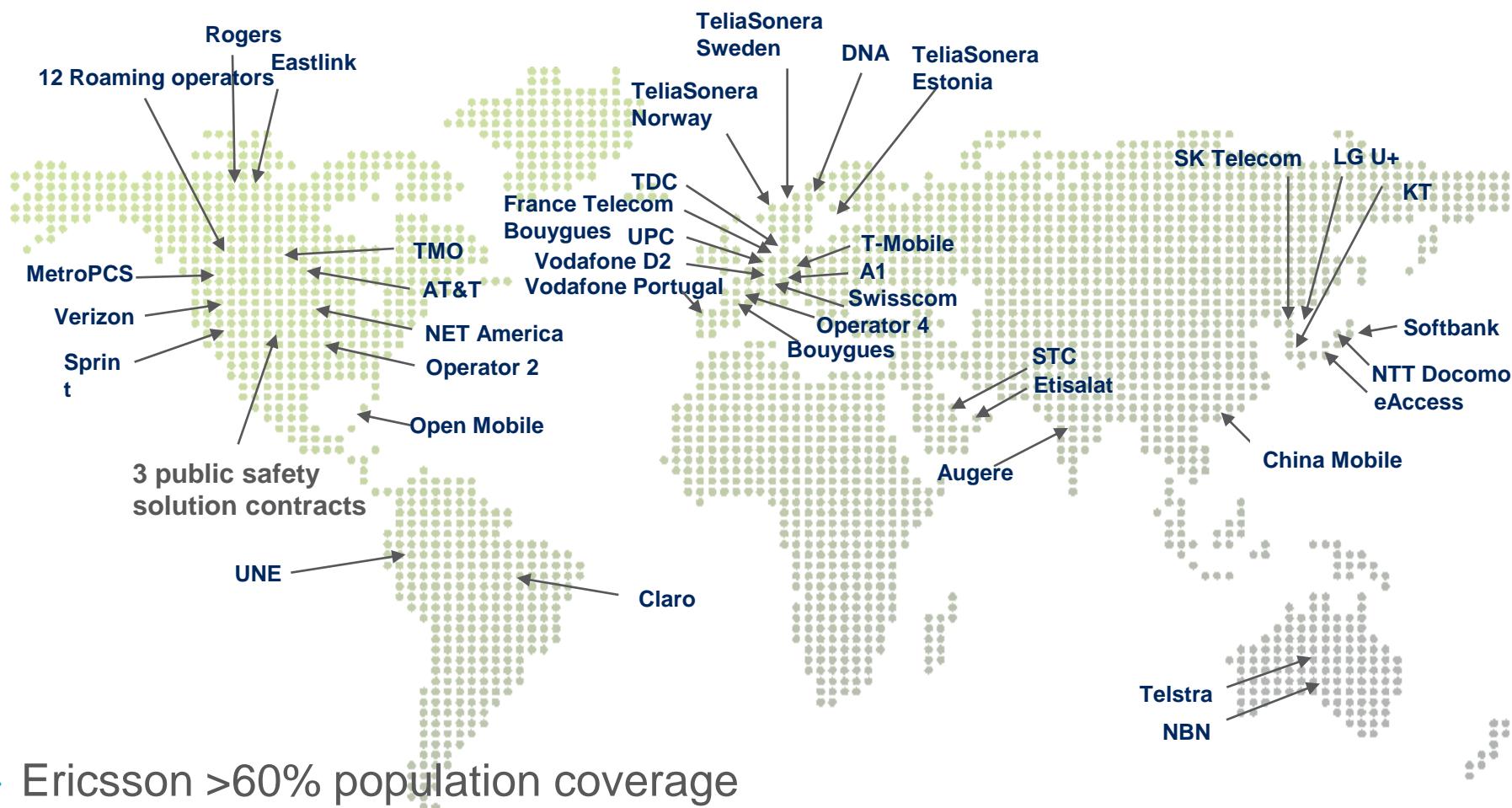
LTE uptake driven by
Smartphone
introduction

LTE Top 10 (Msub):

Verizon US	12.4
SKT Korea	4.0
NTT DoCoMo	3.8
AT&T US	3.5
LGU+ Korea	3.0
Korea Telecom	1.6
MetroPCS	0.8
W Europe	0.8
Rogers	0.7
Telstra	0.5

[90% OF SHIPPED LTE DEVICES ARE SMARTPHONES]

ERICSSON LTE EXPERIENCE

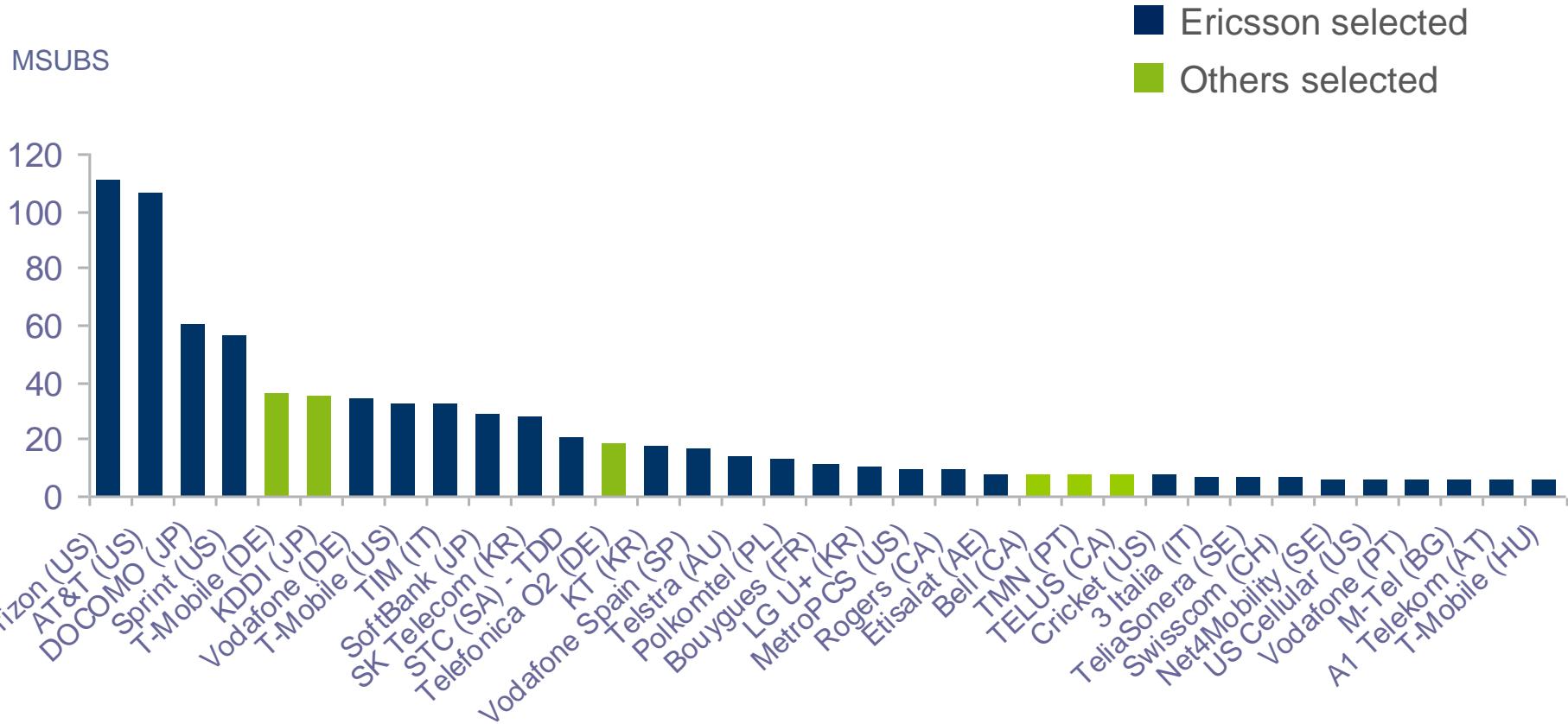


- › Ericsson >60% population coverage
 - 305 million of 455 million population covered
- › More than 70 LTE contracts in 34 countries and 5 continents

LTE RAN COMMERCIAL CONTRACTS



By operator size; excluding smaller rollouts



Subscriber figures from World Cellular Information Services, March 2012

HTE Infokom'12 | Commercial in confidence | © Ericsson Hungary 2012 | 2012-10-11 | Page 6

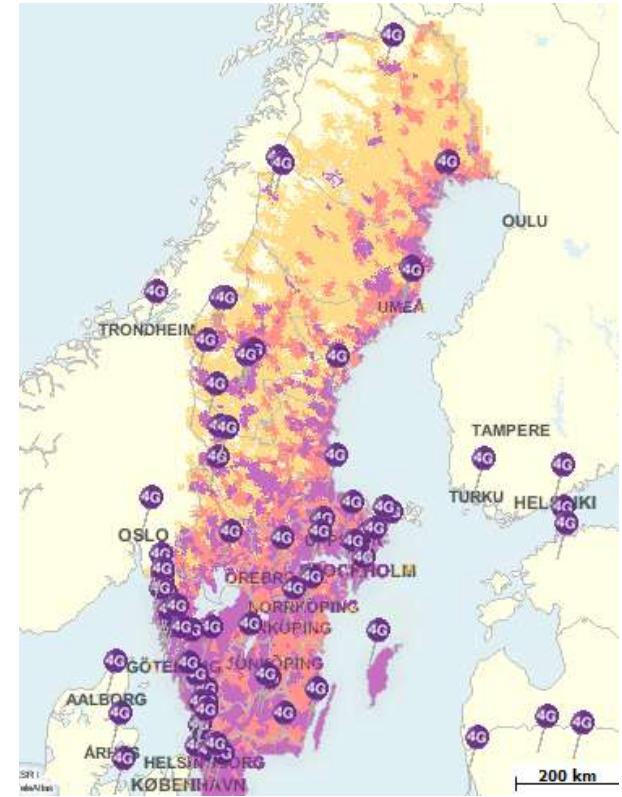
Ericsson has ~40 additional contracts not shown due to that the operators current subscriber base is small or to Non Disclosure Agreements (NDA)

TELIASONERA LTE LAUNCH DEC 2009

WORLD'S FIRST LTE NETWORK



- › Available in shop December 14th 2009
- › Documented High In Service Performance
- › Multi mode dongle July 2010
- › Complete solution LTE/EPC network and O&M Center
- › Network managed by Ericsson incl. competence transfer



- › 28 cities by end of 2010
- › 228 cities by end of 2011

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iPhone 5

The biggest thing to happen
to iPhone since iPhone.

LTE. The right way.

You rely on your iPhone. So a thin, light design and outstanding battery life are important to you. But so is a fast data connection. LTE wireless technology is built for speed, but adding it to a phone can create bulk and drain battery life quickly. iPhone 5 does LTE the right way — optimized for better battery life and designed for ultrafast connectivity in a thin profile. The very things you want most from your smartphone.²

IPHONE 5 MODELS



› GSM model A1428

- UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- **LTE (Bands 4 [2100 MHz] and 17 [700 MHz])**



NA and LATAM markets
(AT&T, Rogers, Bell/Tellus)

› CDMA model A1429

- CDMA EV-DO Rev. A and Rev. B (800, 1900, 2100 MHz)
- UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- **LTE (Bands 1 [2100 MHz], 3 [1800 MHz], 5 [850 MHz], 13 [700 MHz], 25 [1900 MHz])**



- CDMA operators
(Verizon, Sprint, KDDI, KT)
- SR-LTE perf. Enhancem.

› GSM model A1429

- UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- **LTE (Bands 1 [2100 MHz], 3 [1800 MHz], 5 [850 MHz])**



Refarm GSM 1800

› 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)

› Bluetooth 4.0 wireless technology



SPECTRUM FOR MOBILE BROADBAND

- REGIONAL MAINSTREAM HSPA & LTE DEPLOYMENTS

North America

Base: 850, 1900, US700 & AWS

New: **2600**



Europe

Base: 2100 & 900

New: **2600, 1800 & 800**



Latin America

Base: 850 & 1900

New: **AWS & 2600**

2012+: 2300 & APT700



Japan

Base: 2100, 1700, JP850

New: **1500 & refarm**

2012+: 900 & APT700

MEA

Base: 2100

New: **1800, 900 & 850**

2012+: 2600, APT700

APAC

Base: 2100

New: **2300, 1800, 900 & 850**

2012+: 2600 & APT700

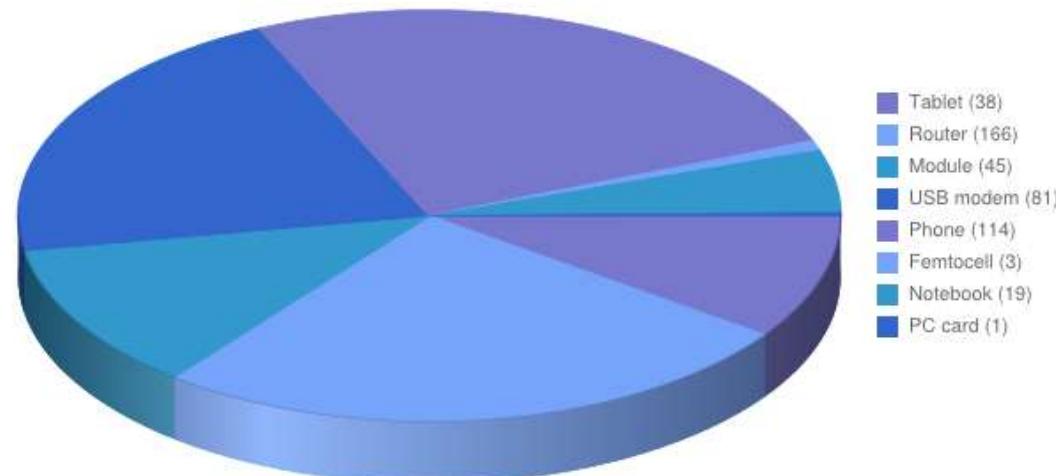
FREQUENCY BANDS SUPPORTED



467 devices (FDD & TDD)

LTE FDD

- › 700 MHz 170 devices
- › 800 MHz (Band 20) 72 devices
- › 1800 MHz (Band 3) 75 devices
- › 2600 MHz (Band 7) 94 devices
- › 800/1800/2600 MHz 57 devices
- › AWS (Band 4) 72 devices

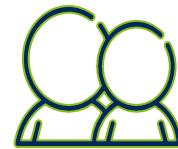


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WHY IS HIGH PERFORMANCE LTE NETWORKS IMPORTANT?



END USERS



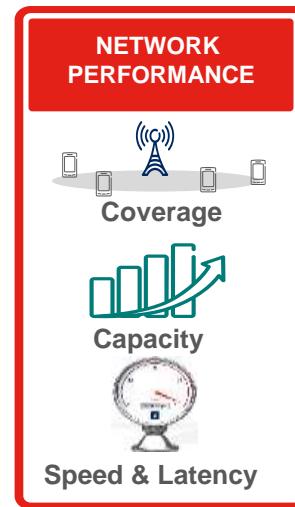
OPERATOR



HIGH END & MASS
MARKET DEVICES



SERVICE
DIFFERENTIATION



NETWORK
PERFORMANCE

Expectations

Needs

Results

Benefits

SEAMLESS USER
EXPERIENCE
ANYTIME
EVERWHERE

IMPROVED
USER
EXPERIENCE

LESS CHURN AND
LOWER
SUBSCRIBER
ACQUISITION COST

QUALITY
DIFFERENTIATOR
HAPPY USERS AND
INCREASED ARPU

LTE KILLER APPLICATIONS



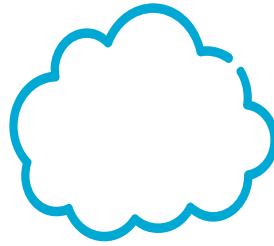
› Mobile internet access services



Live Mobile
Video



Mobile/Portable
gaming



Cloud-Based
Computing



Augmented
Reality



Emergency
Response and
Telemedicine

MOBILE INTERNET ACCESS
SERVICES WILL BE THE
“KILLER 4G SERVICE”

http://www.pcworld.com/article/195500/4g_killer_apps_a_top_five.html

#1 CHALLENGE - WORLD ROAMING



- › Number of LTE frequency bands supported in LTE devices
 - 2010: Single band LTE
 - 2011: 2 – 3 bands LTE
 - 2012: 4 – 5 bands LTE



- › Potential Roaming bands
 - EU - **B7[2600] B3[1800]**
 - Asia, Australia - **B3[1800]**
 - Latam - **B4[AWS], B7[2600]**
 - Korea, US, Japan - **B5[850] / B26 [850], B3[1800]**
 - Within North America - **B4 [AWS], B5[850], B2/25 [1900]**

#2 CHALLENGE - VOICE



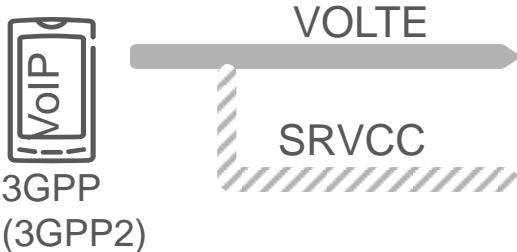
SVLTE – Simultaneous Voice and Data
Voice over LEGACY CDMA
Base for VoLTE Early Adopters
2011 Introduction for 3GPP2



SGLTE – Simultaneous Voice and Data
Voice over LEGACY GSM/UMTS/TD_SCDMA
Late 2012 Introduction



CSFB – Circuit Switched Fall Back
Voice over LEGACY 2G/3G (CS)
2011 Introduction for 3GPP
TBD for 3GPP2



SRVCC – Single Radio Voice Call Continuity
Voice over LTE – VoLTE, fallback from LTE to legacy
2G/3G Circuit Switched
Late 2012 Introduction for 3GPP

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VOLTE LAUNCHED IN AUGUST



Metro PCS



- › LG Connect 4G
- › CDMA Fallback

LGU+



- › LG Optimus II
- › Nationwide LTE Coverage

SK Telecom



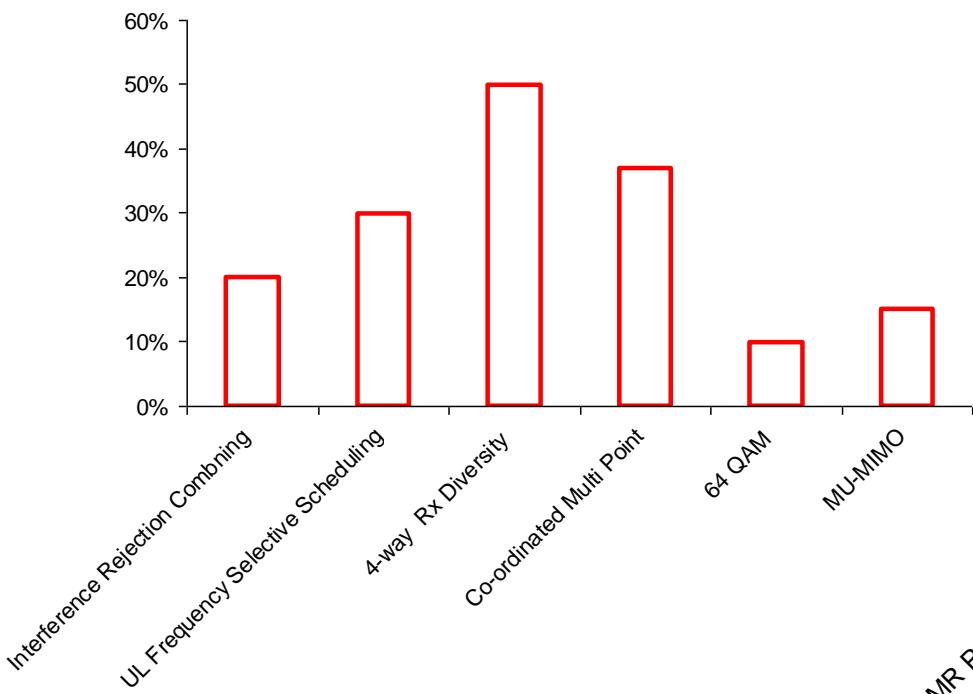
- › Samsung Galaxy SIII
- › WCDMA fallback with SRVCC

Three networks with VoLTE Service
Three different solutions

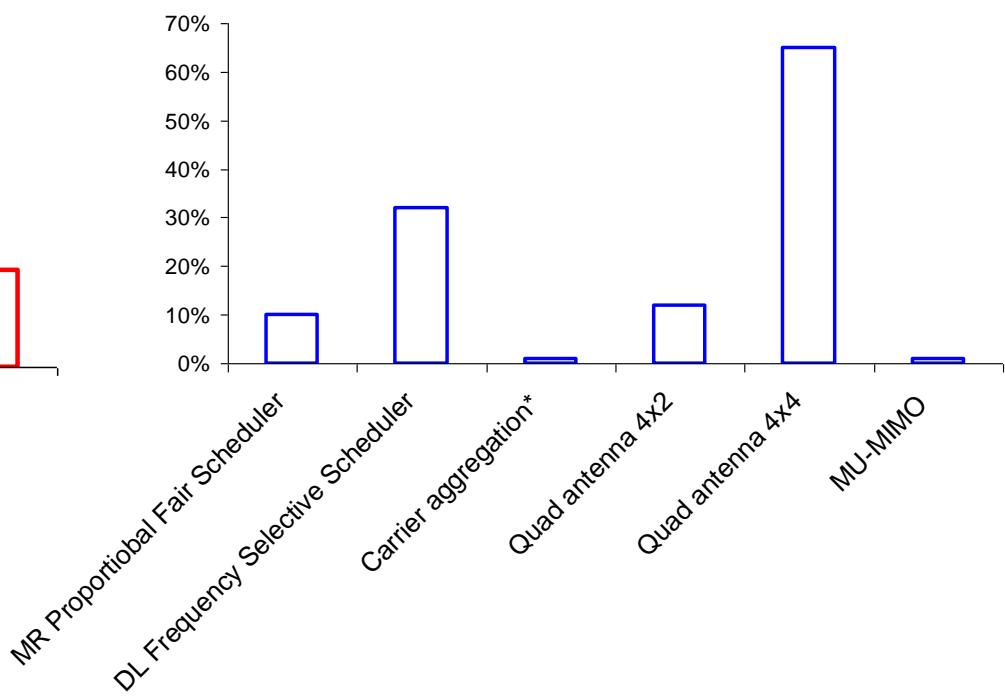
LTE CAPACITY EVOLUTION



Uplink



Downlink





Linear TV and Instant delivery



- › Breaking news
- › Popular TV shows
- › Warning type info

UE caching – pushed content



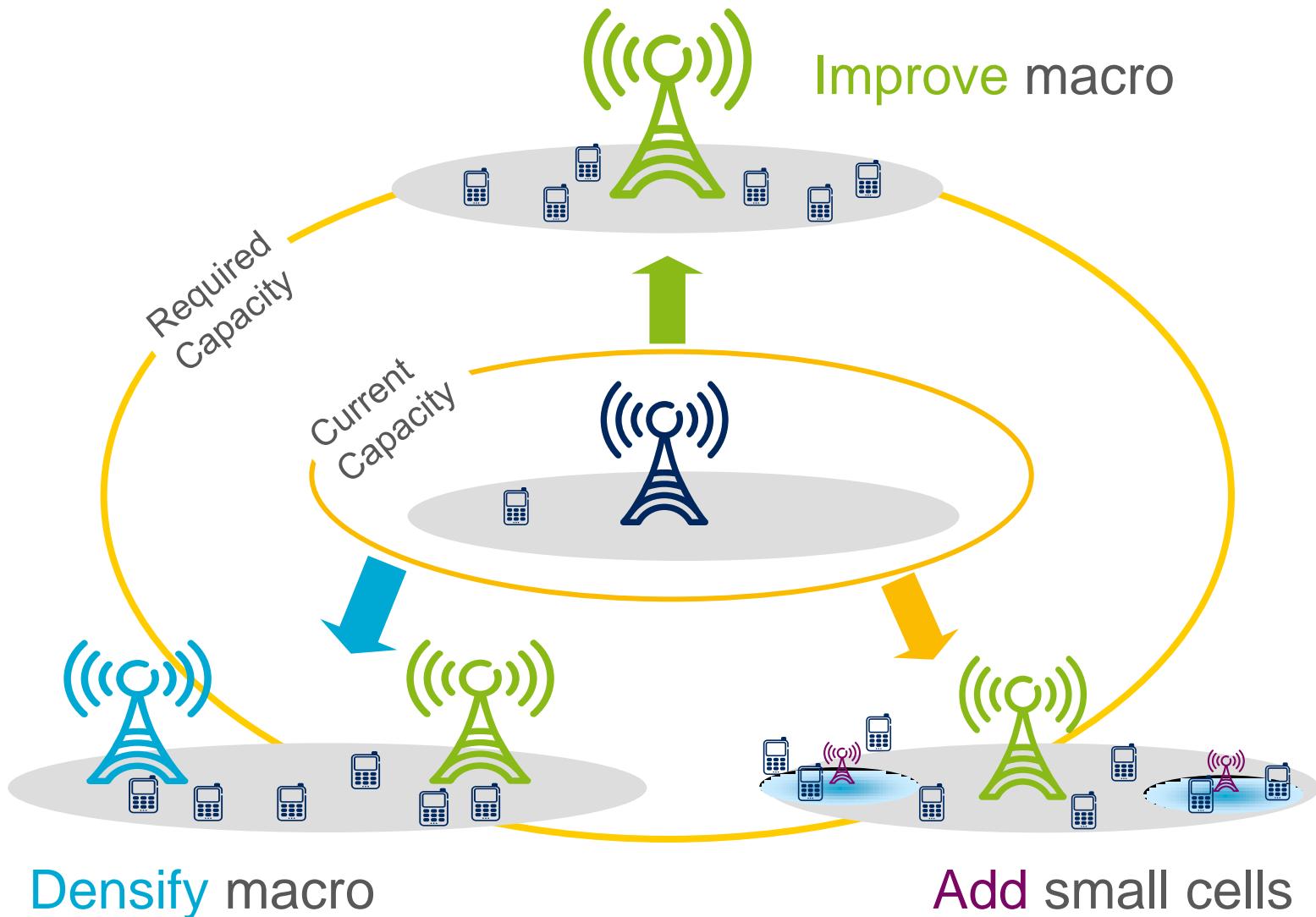
- › Video (Push Video on Demand)
- › Audio books & Music
- › SW updates (M2M)

Efficient delivery of live events



- › Broadcast of live events in subscriber dense areas
- › Game statistics
- › Multiple camera angles at stadiums

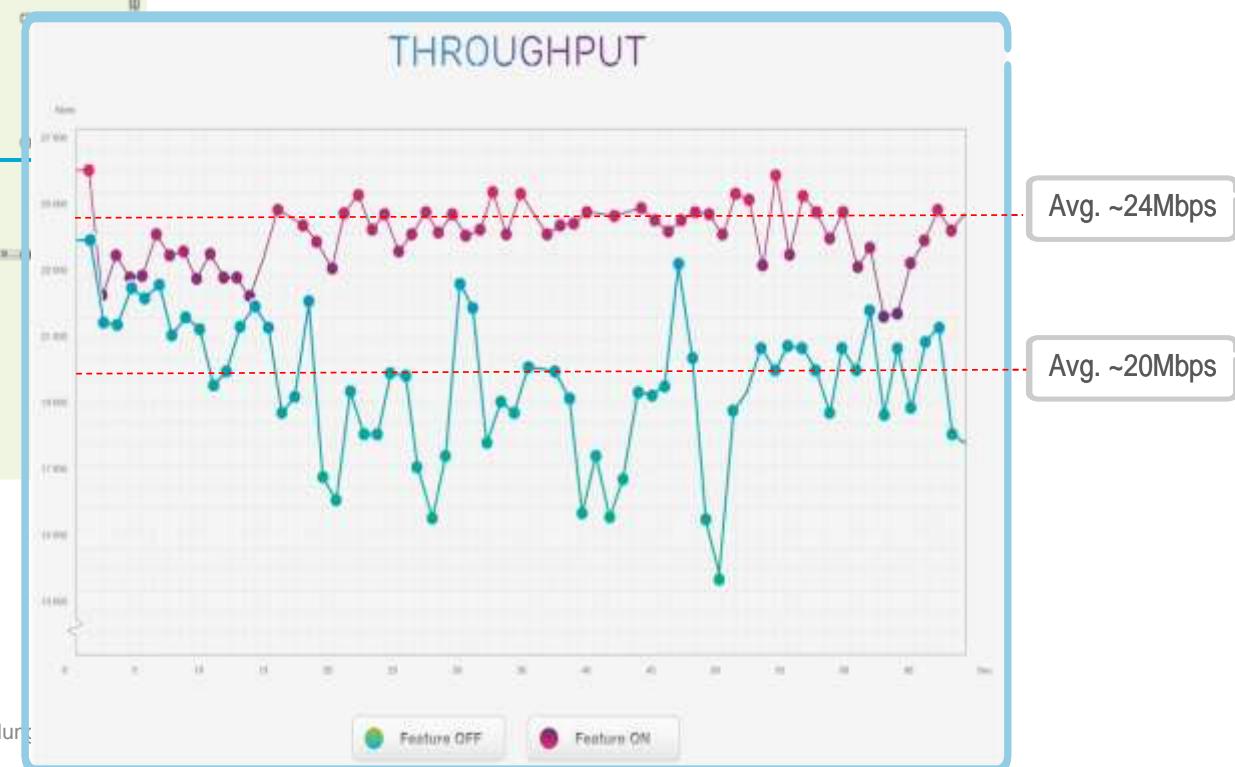
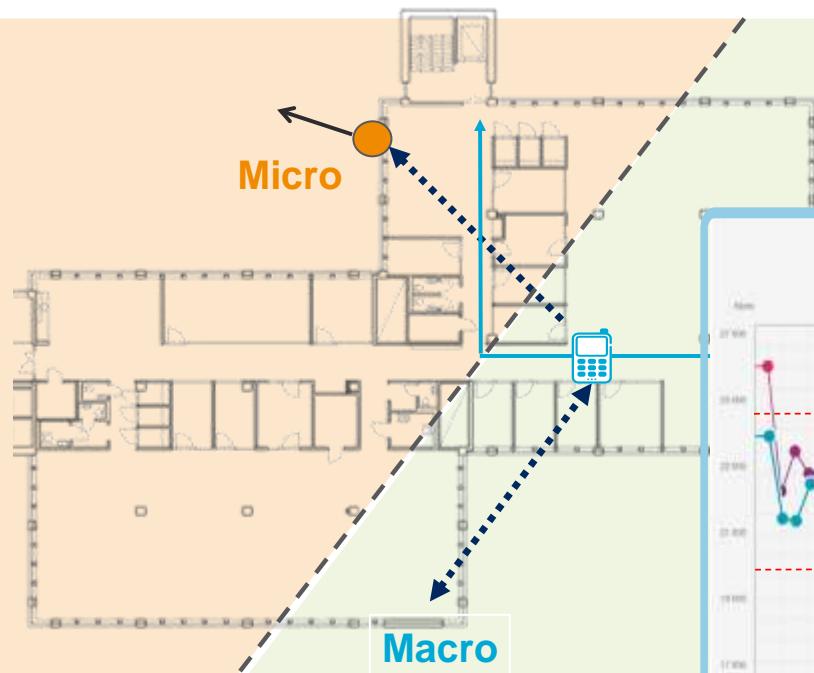
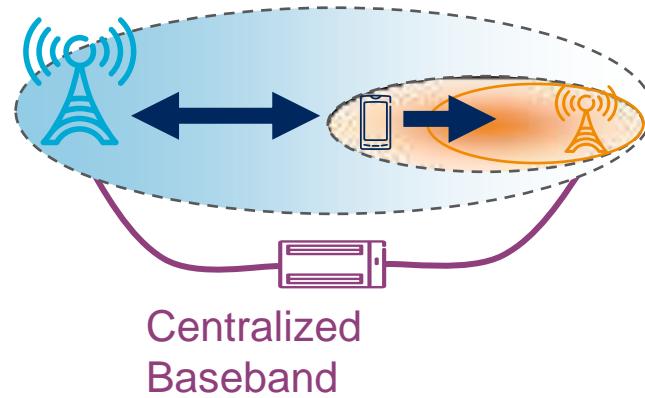
NETWORK EVOLUTION HETEROGENEOUS NETWORKS



1ST HETNET DEMO



- › UL Coordinated Multipoint
- › Demoed at MWC 2012



LIVE IN
COMMERCIAL
NETWORK
SINCE 4Q2011



„AIR“
ANTENNA INTEGRATED RADIO

ERICSSON 1 GBPS LTE

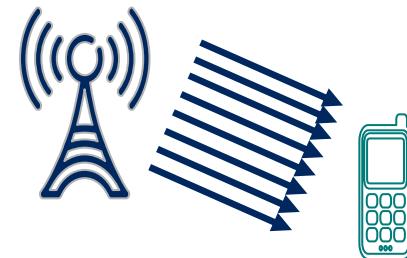


3 x 20 MHz

8x8 MIMO in Downlink

Up to 1.5 Gbps in Downlink

20 MHz 20 MHz 20 MHz



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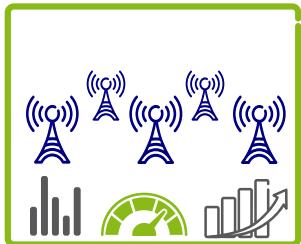
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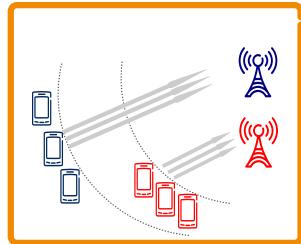


ERICSSON

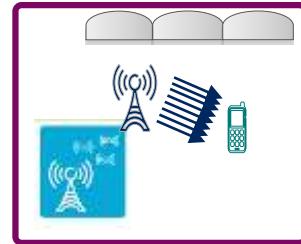
LTE HOT POINTS



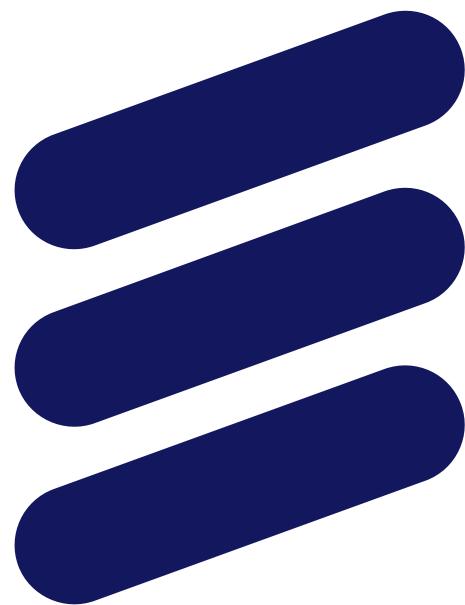
Market &
Ecosystem



Smartphones &
VoLTE performance



LTE-A
Heterogeneous networks



ERICSSON