LTE EVOLUTION: CARRIER AGGREGATION AND SPECTRUM EFFICIENCY

Jan Lahodný, Frequency Strategy & Planning Tools Specialist
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LTE-A CARRIER AGGREGATION IN THE CZECH REPUBLIC

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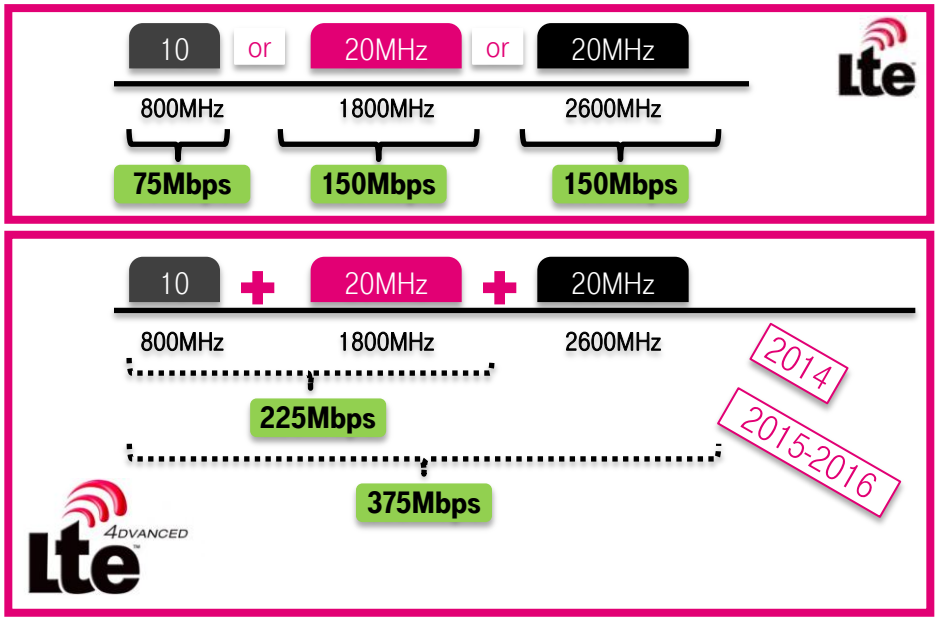
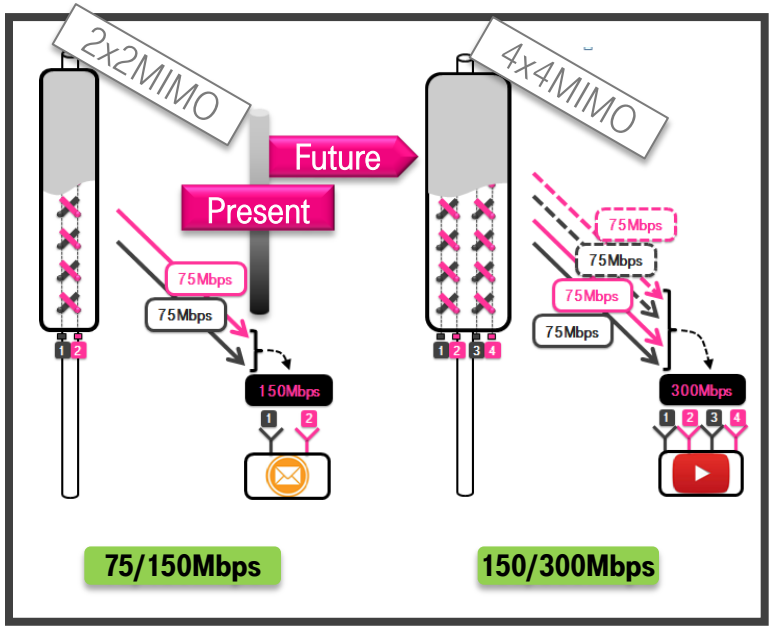
LTE USER EXPERIENCE IMPROVEMENT

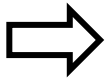
Carrier Aggregation



Spectrum Efficiency



Combination



1Gbps

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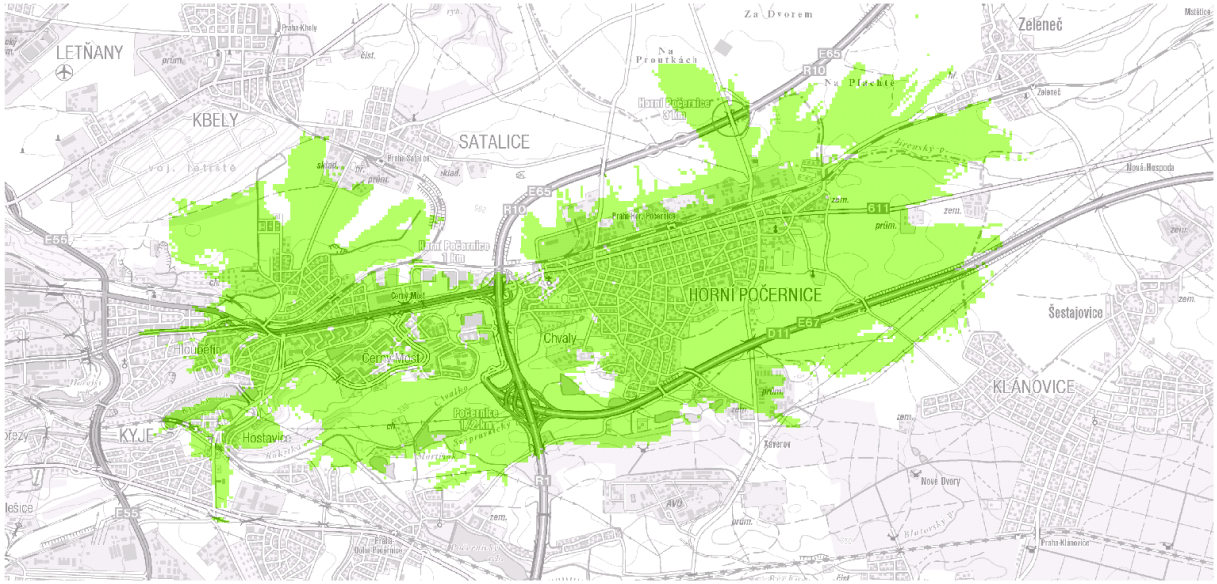
LTE-ADVANCED IN THE T-MOBILE CZ NETWORK

- Launched by TMCZ as the 1st operator in the Czech Republic on 30 June 2014 in Mladá Boleslav
- Now also available in Prague (3 localities: Černý Most, Horní Počernice, Roztyly)
- 1800 MHz (20MHz bandwidth) + 800 MHz (10MHz bandwidth)
- **Speeds of up to 225/50 Mbps**



Cat. 6 terminals in TMCZ's portfolio:

- Samsung GALAXY Alpha
- Samsung GALAXY Note 4
- HUAWEI Mobile WiFi E5786

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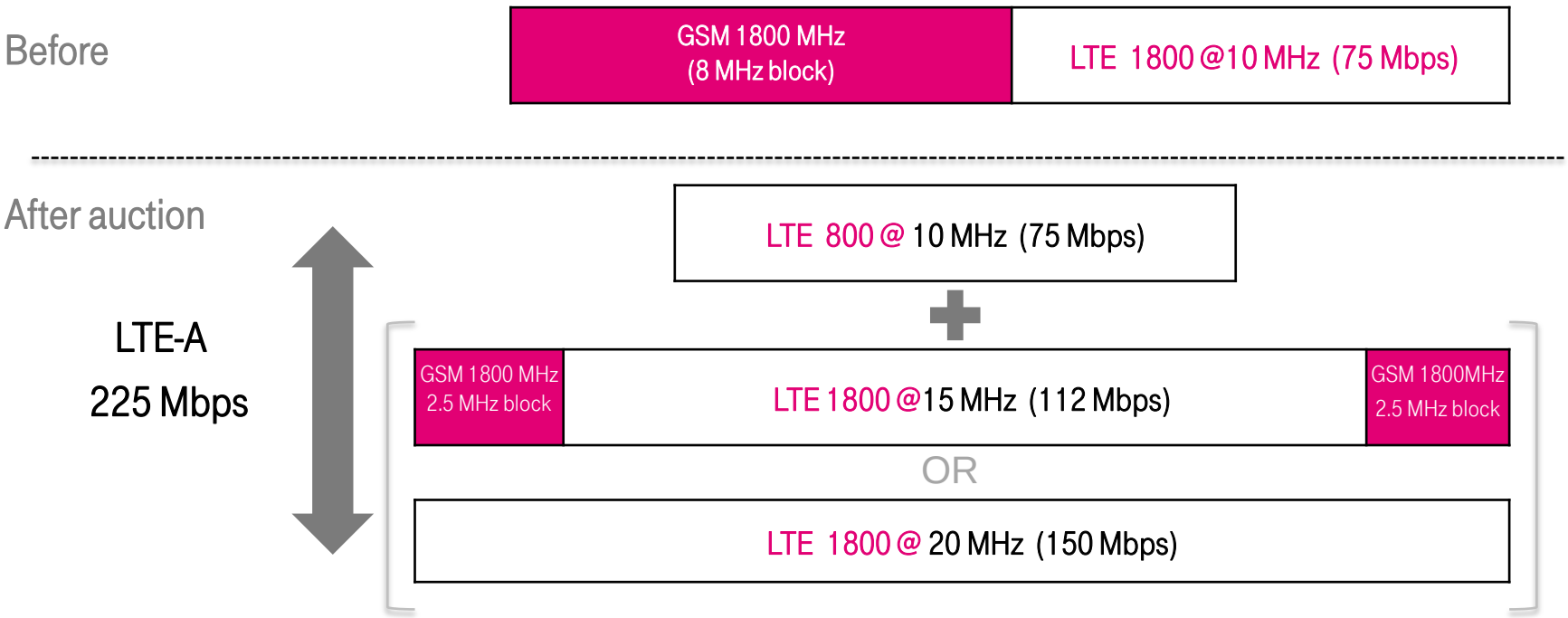
NEW 1800 MHZ SPECTRUM ARCHITECTURE
ABOVE PRAGUE/MLADÁ BOLESLAV

- GSM 1800 traffic off-loaded to GSM 900 or UMTS 2100 (~1000 cells)
- 1800 MHz band refarming
- GSM/LTE co-existence



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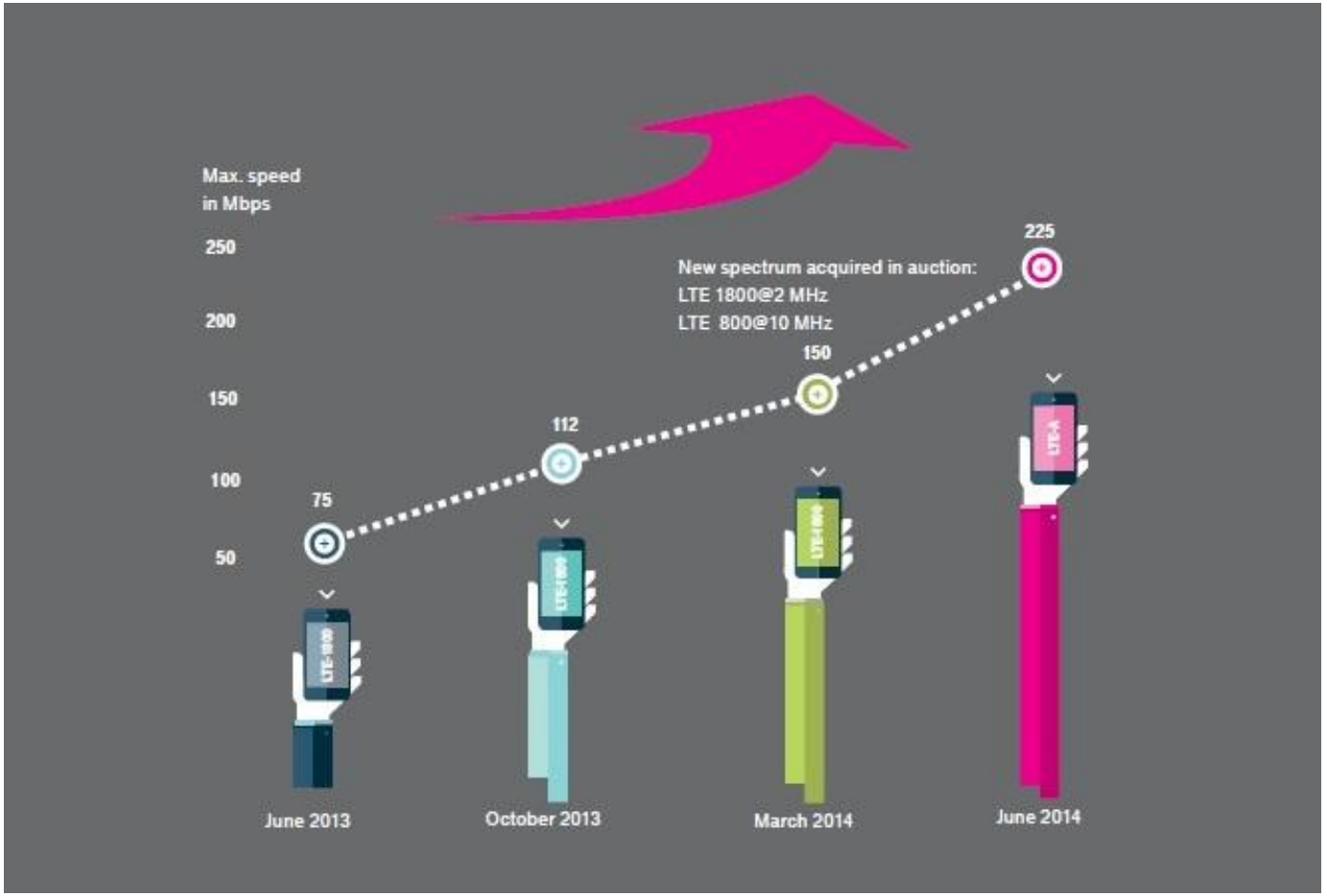
LTE SPEED EVOLUTION IN THE T-MOBILE CZ NETWORK

INCLUDING A LIVE DEMO...



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THE FIRST WORLDWIDE LTE TRIAL OF 4x4 MIMO IN THE LOW BAND

Jaroslav Holiš, , Senior RN Engeneering Expert

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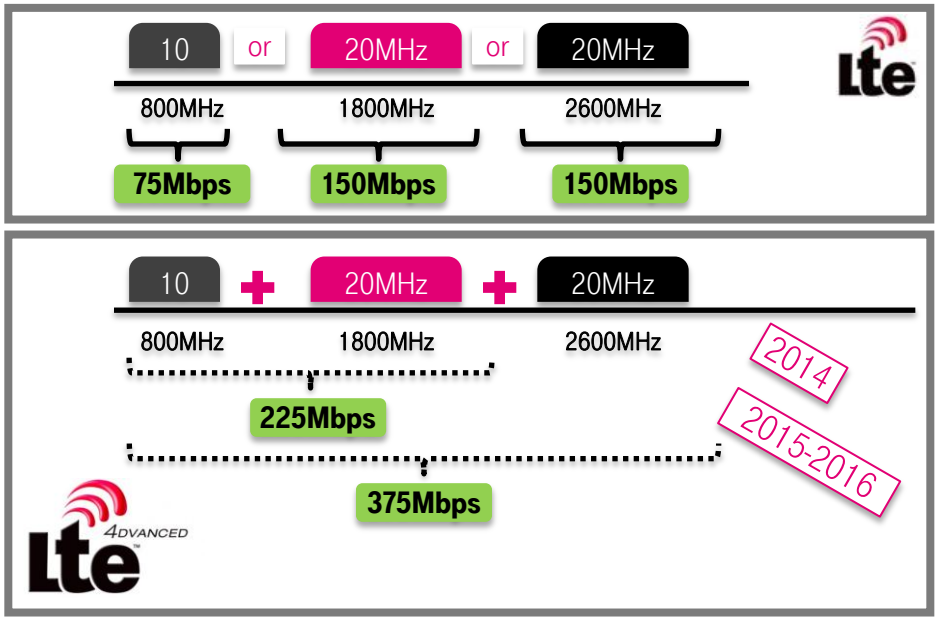
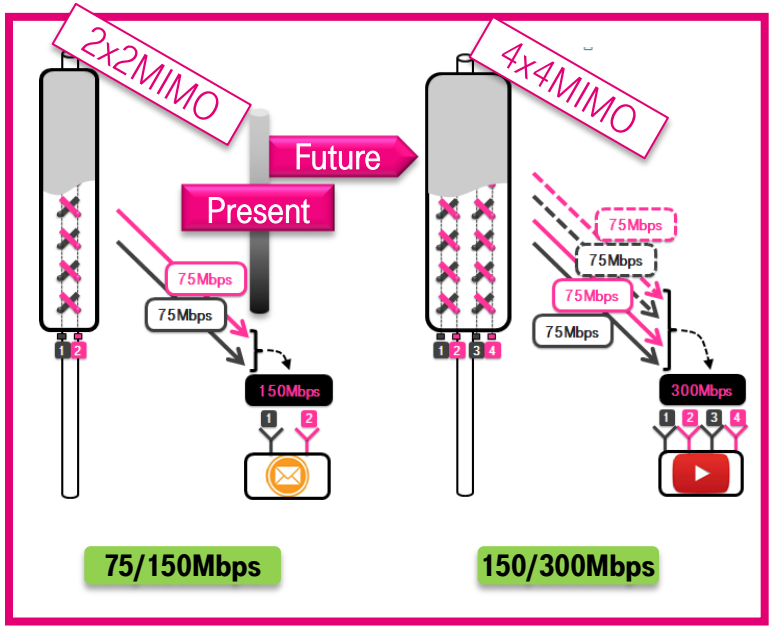
LTE USER EXPERIENCE IMPROVEMENT

Carrier Aggregation



Spectrum Efficiency



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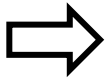


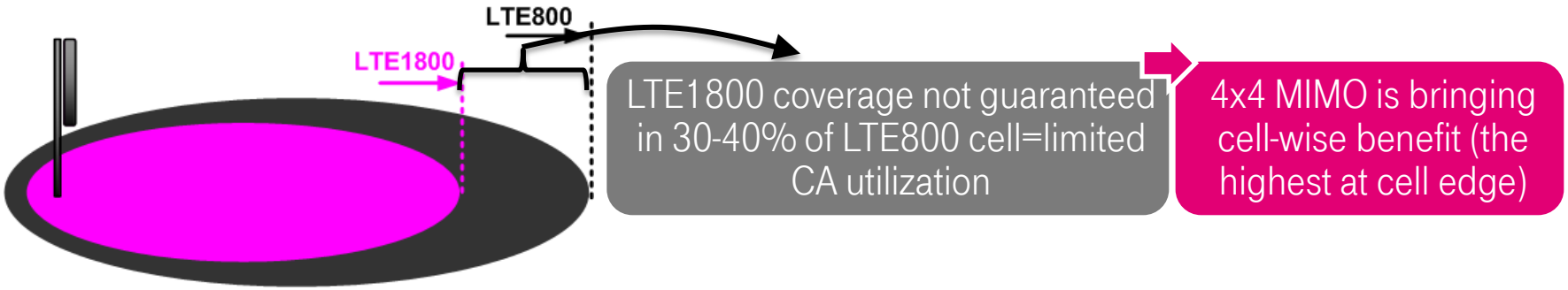
1Gbps

4x4MIMO AS AN ALTERNATIVE TO CA IN THE LOW BAND?

- DT traffic load in the rural LTE800 layer is higher (~2-4x) than in the urban LTE1800MHz layer
- Channel bandwidth in LTE800 is only 10MHz, leading to 4x higher spectrum utilization
- The current strategy toward the solution of the capacity issue in rural areas is LTE800 +LTE1800 CA
- 4x4 MIMO can bring:

  DL capacity benefit of up to +80%/90% (typical/edge) for new 4x4MIMO capable terminals and also a benefit of 10%/30% for legacy LTE terminals

  UL coverage and capacity benefit of up to +50% - 4RxDiv will improve not only VoLTE coverage by 3-4dB (improvement on the equal GSM900 level) for all terminals in the network



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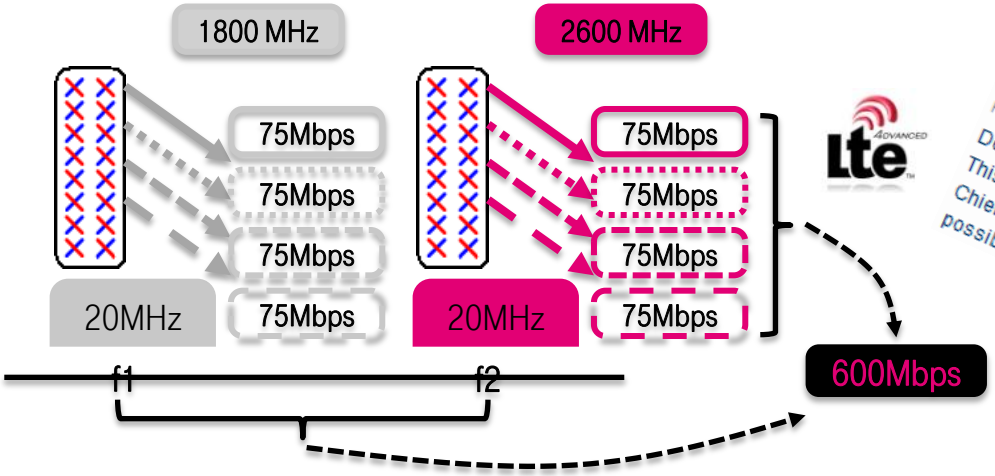
4x4 MIMO TRIAL IN THE LOW BAND AT TMCZ FOR THE GROUP

- The first worldwide 4X4 MIMO trial in the low band
- Network grid will allow to study 4x4MIMO in both the cluster and noise limited environment
- Test terminals will be used for the trial (FPGA platform)

LTE800 4X4 TEST BED AT TMCZ

600MBPS DEMOSTRATION IN TDG'S NETWORK

THE FASTEST LTE-A WITH COMMERCIAL RAN HARDWARE



Deutsche Telekom field test achieves LTE speed of 580 Mbps

Friday 21 February 2014 | 10:43 CET | News

Deutsche Telekom has achieved LTE speeds of 580 Mbps during tests on its network in Alzey. This was possible through the use of frequency bundling and MIMO multi-antenna technology. Chief technology officer (CTO) Bruno Jacobfeuerborn said that the field test showed that it was possible to overcome problems associated with the deployment of MIMO 4x4 technology.

CHALLENGING INTEGRATION OF 4 ANTENNAS INTO A SMART PHONE

4x4 MIMO prototypical terminal

?

4x4 MIMO commercial terminal questionable

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THANK YOU FOR YOUR ATTENTION!

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