

3G

International Mobile Telecommunications-2000
(IMT-2000)

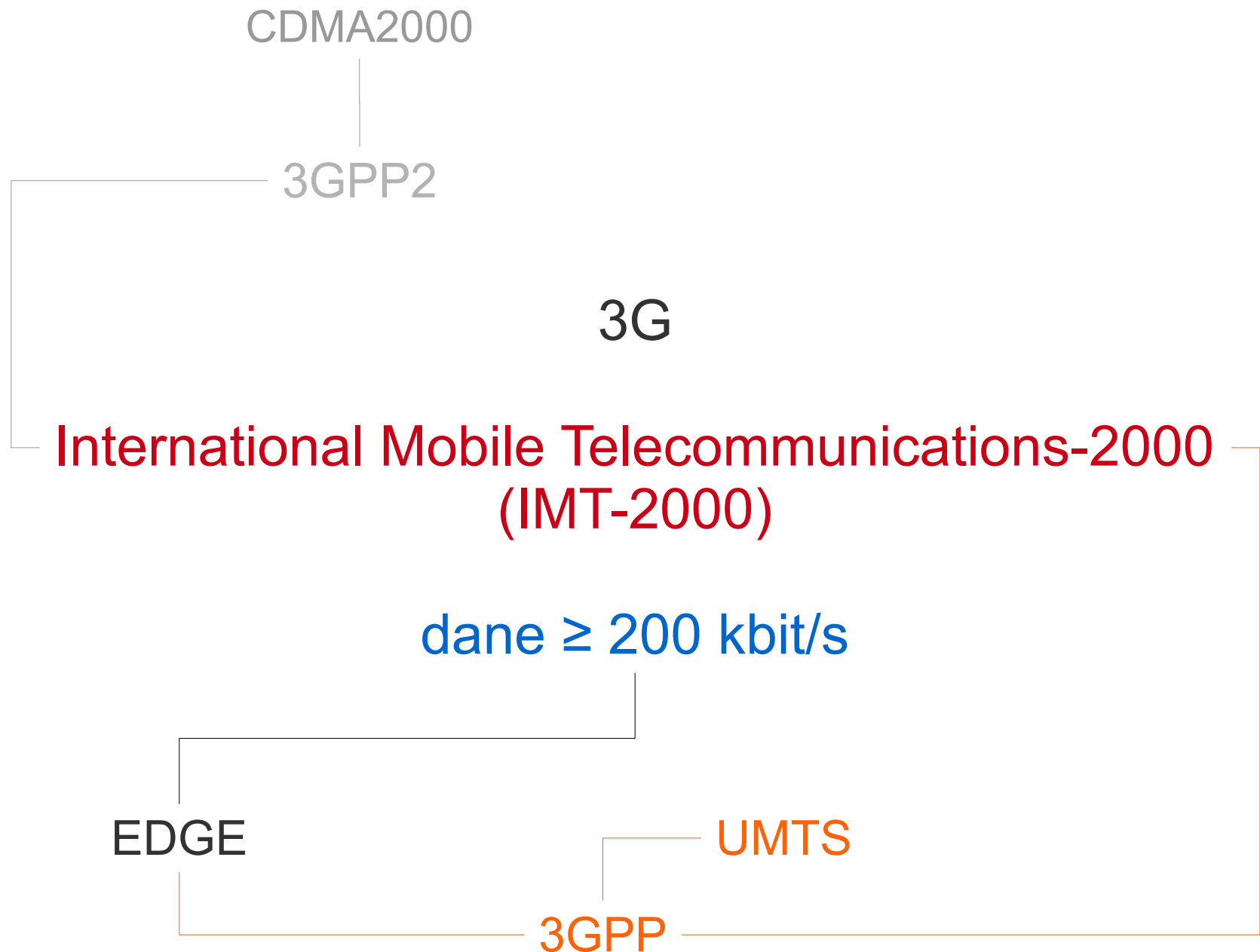
3G

International Mobile Telecommunications-2000
(IMT-2000)

dane ≥ 200 kbit/s

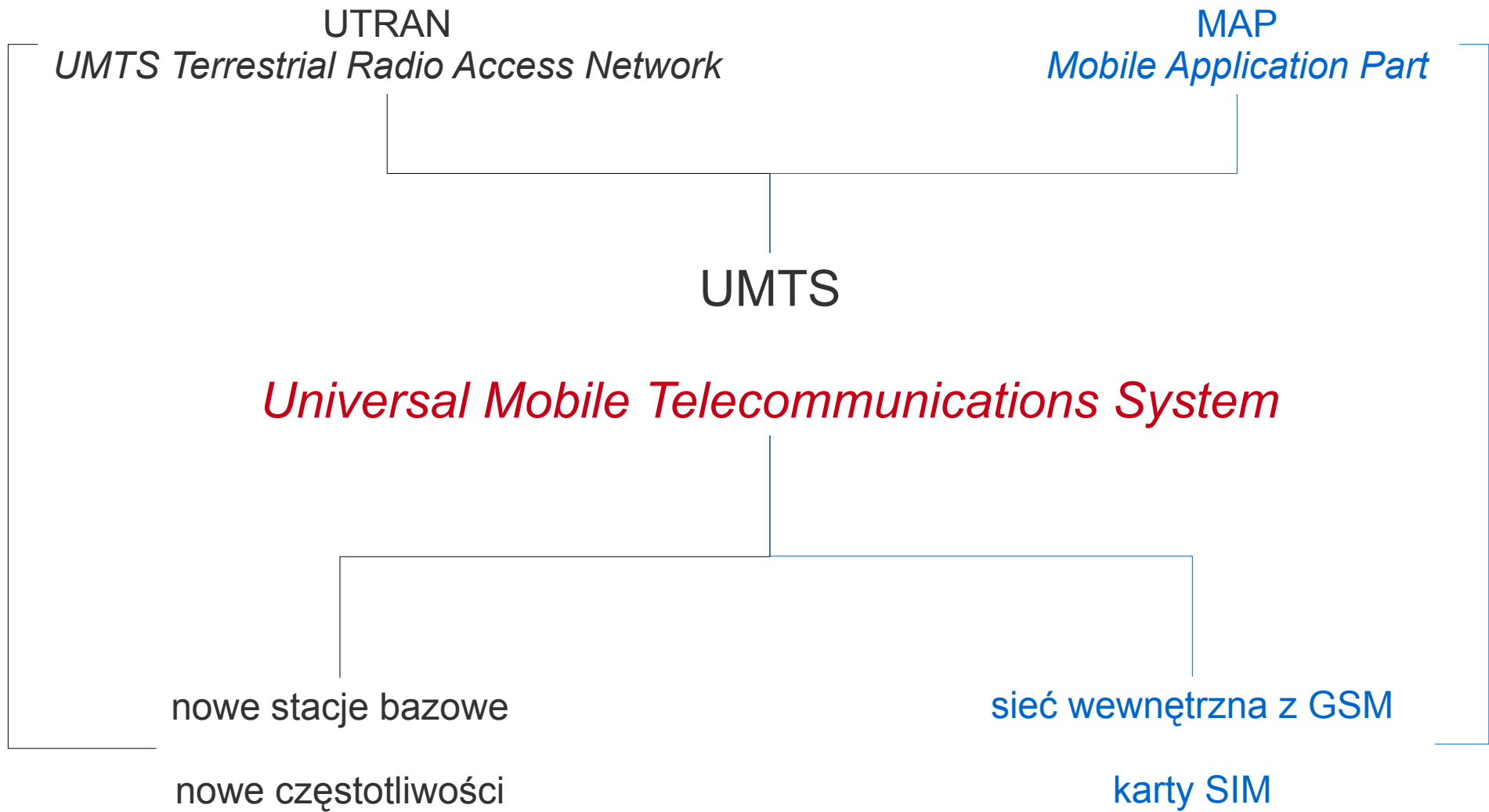
EDGE: 200-400 kb/s





UMTS

Universal Mobile Telecommunications System



UTRAN

*UMTS Terrestrial Radio Access Network*W-CDMA
(UTRA-FDD)

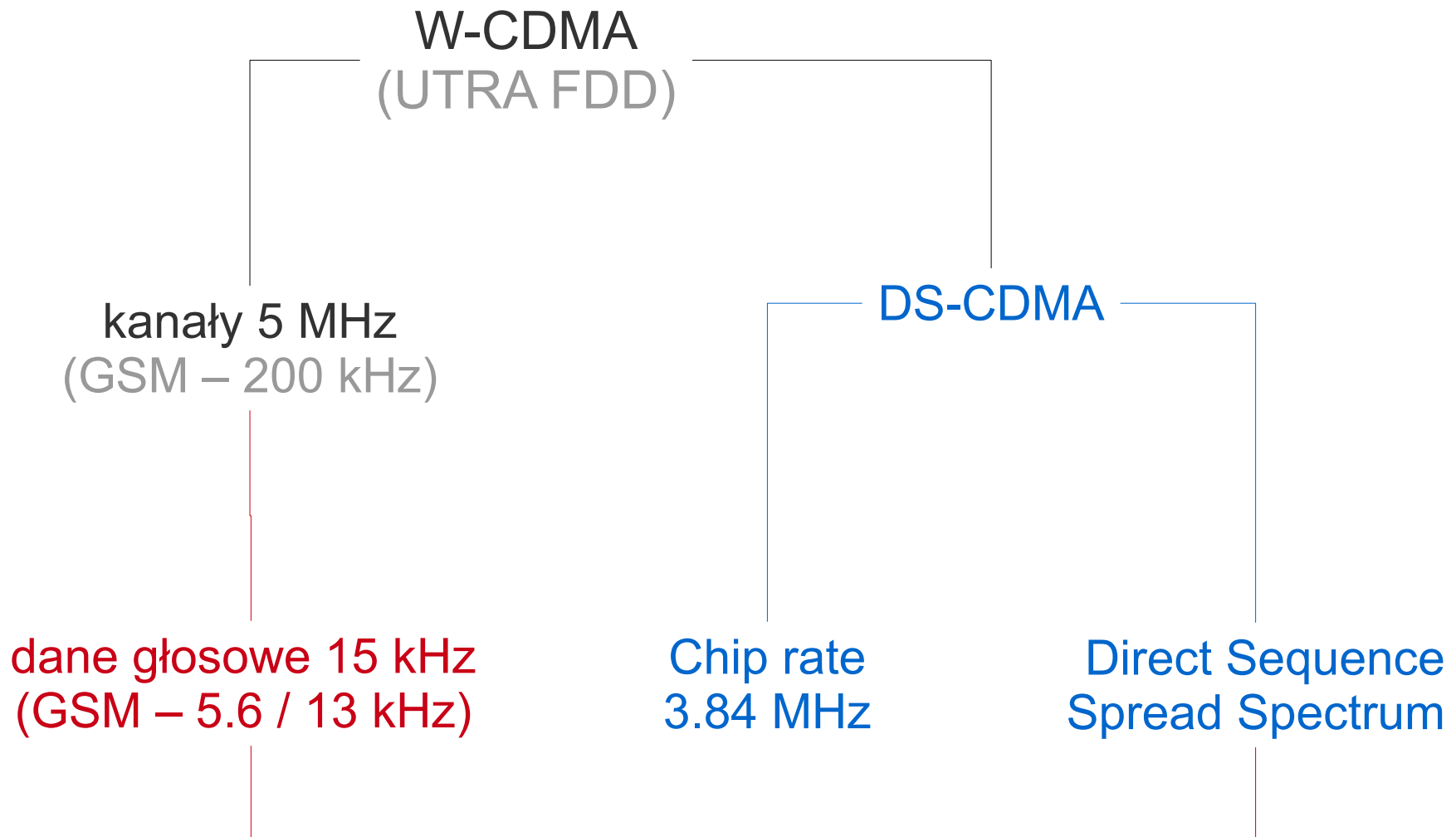
DS-CDMA

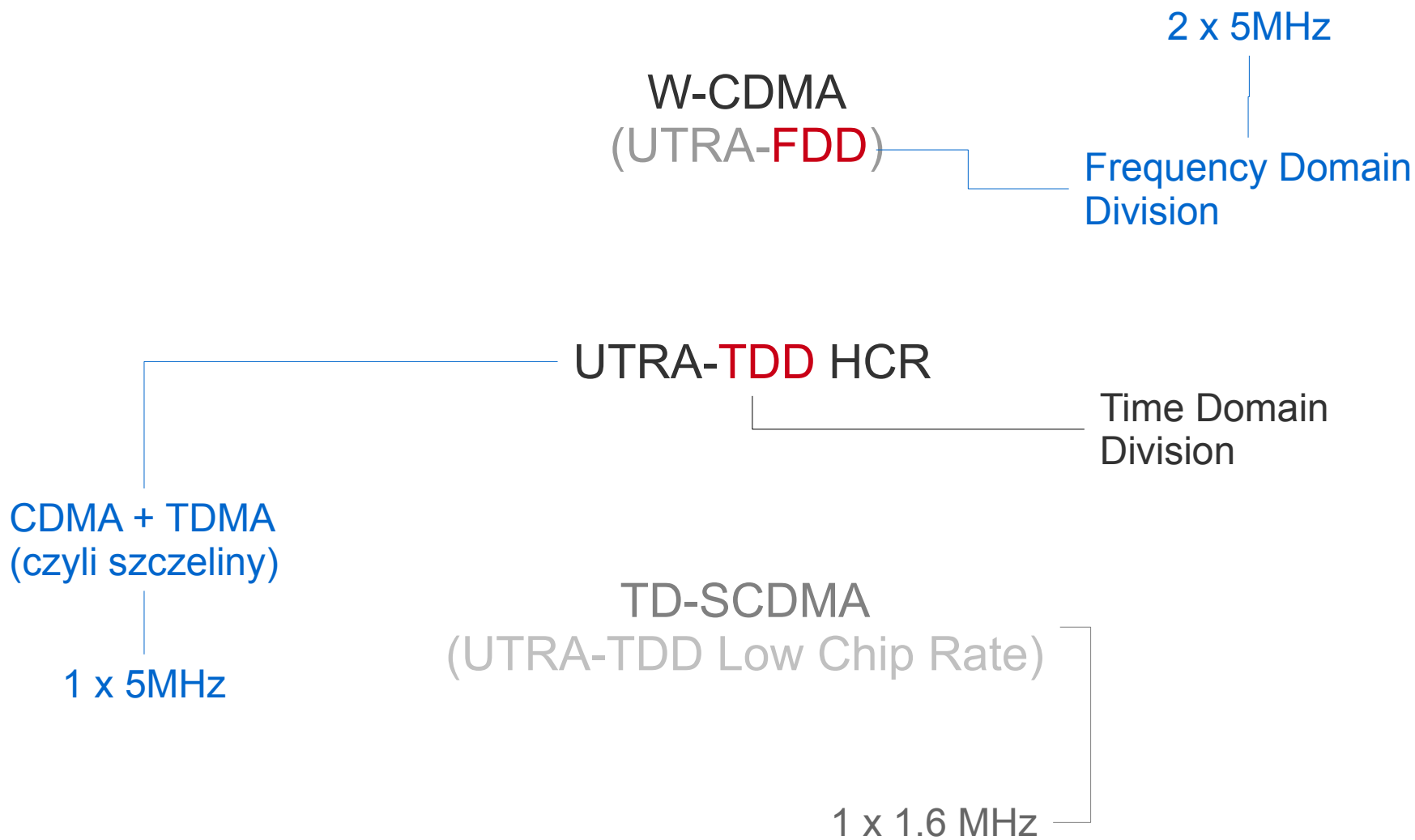
UTRA-TDD HCR

TD-CDMA

TD-SCDMA
(UTRA-TDD Low Chip Rate)

TDMA + Synchron. CDMA





UMTS(-FDD)

Operating Band	Frequency Band	Common Name	UL Frequencies UE transmit (MHz)	DL Frequencies UE receive (MHz)	Channel Number (UARFCN) UL	Channel Number (UARFCN) DL	Region
I	2100	IMT	1920-1980	2110-2170	9612 - 9888	10562 - 10838	Europe, Asia, Africa, Oceania (Telstra, Optus, Vodafone AU & NZ, Three Mobile AU, 2° and Telecom NZ), Brazil
II	1900	PCS	1850-1910	1930-1990	9262 - 9538 additional 12, 37, 62, 87, 112, 137, 162, 187, 212, 237, 262, 287	9662 - 9938 additional 412, 437, 462, 487, 512, 537, 562, 587, 612, 637, 662, 687	Americas (AT&T, Bell Mobility, Telcel, Telus, Rogers)
III	1800	DCS	1710-1785	1805-1880	937 - 1288	1162 - 1513	Europe, Asia, Oceania
IV	1700	AWS	1710-1755	2110-2155	1312 - 1513 additional 1662, 1687, 1712, 1737, 1762, 1787, 1812, 1837, 1862	1537 - 1738 additional 1887, 1912, 1937, 1962, 1987, 2012, 2037, 2062, 2087	USA (T-Mobile, Cincinatti Bell Wireless), Canada (WIND Mobile, Mobilicity, Videotron), Chile (VTR, Nextel)
V	850	CLR	824 - 849	869 - 894	4132 - 4233 additional 782, 787, 807, 812, 837, 862	4357 - 4458 additional 1007, 1012, 1032, 1037, 1062, 1087	Americas (AT&T, Bell Mobility, Telcel, Telus, Rogers), Oceania (Telstra, Telecom NZ), Hong Kong (SmarTone)

GSM → GPRS → EDGE

UMTS

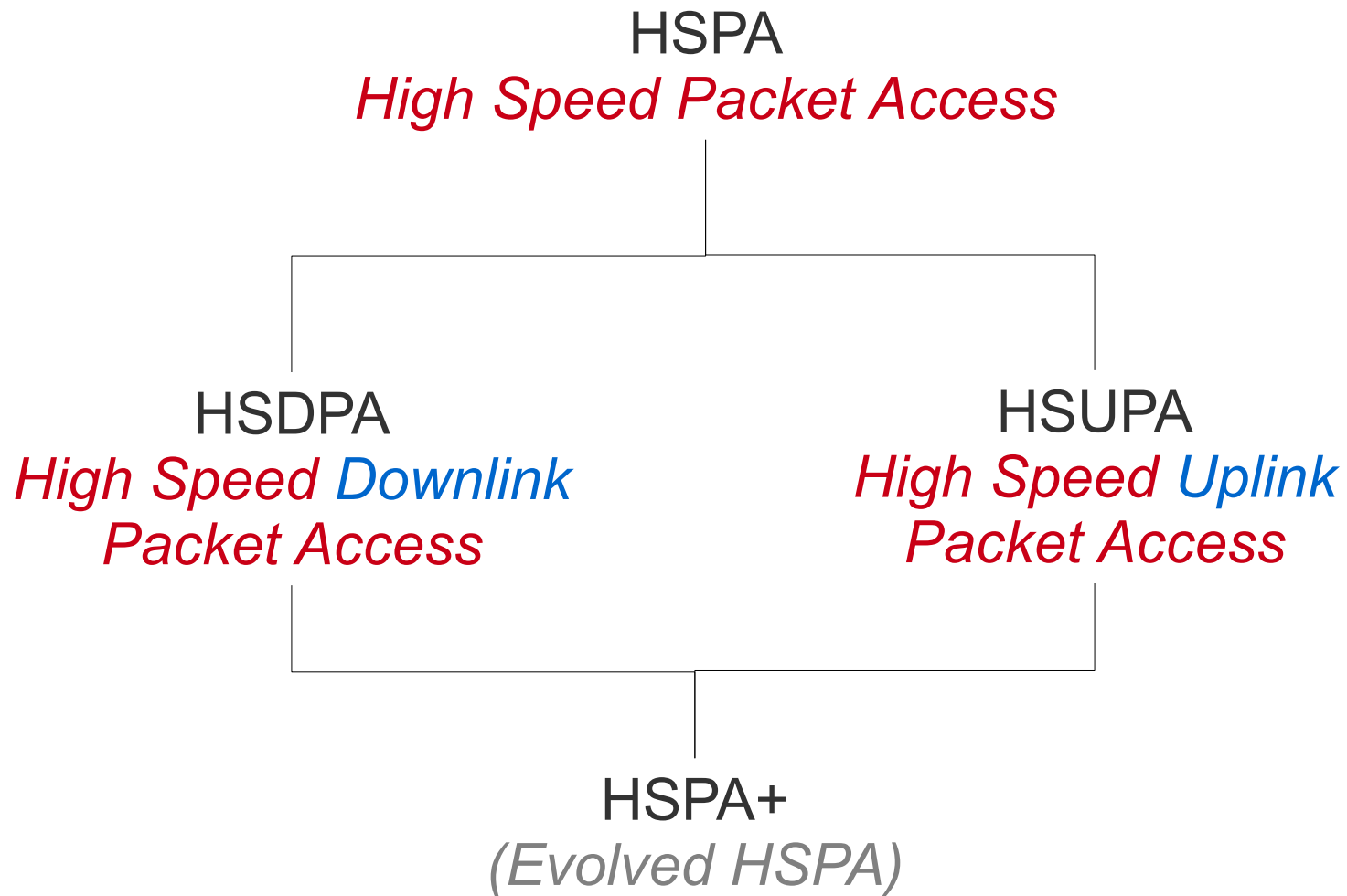


HSPA

High Speed Packet Access



HSPA+



HSDPA
High Speed Downlink Packet Access

do 14 Mb/s

w praktyce
1.8 – 14 Mb/s

wykorzystując
infrastrukturę HSPA+
do 42 Mb/s

HSUPA
High Speed Uplink Packet Access

do 5.8 Mb/s

HSPA+

84 Mb/s down

22 Mb/s up

HSPA (+)

Zwiększone modulacje (do 64QAM) (EDGE - PSK/8)

Dual-cell

MIMO

Dual-cell + MIMO

Ciągła analiza jakości (500/s)

Równoległa wysyłka danych
przez różne kodowania

HARQ

