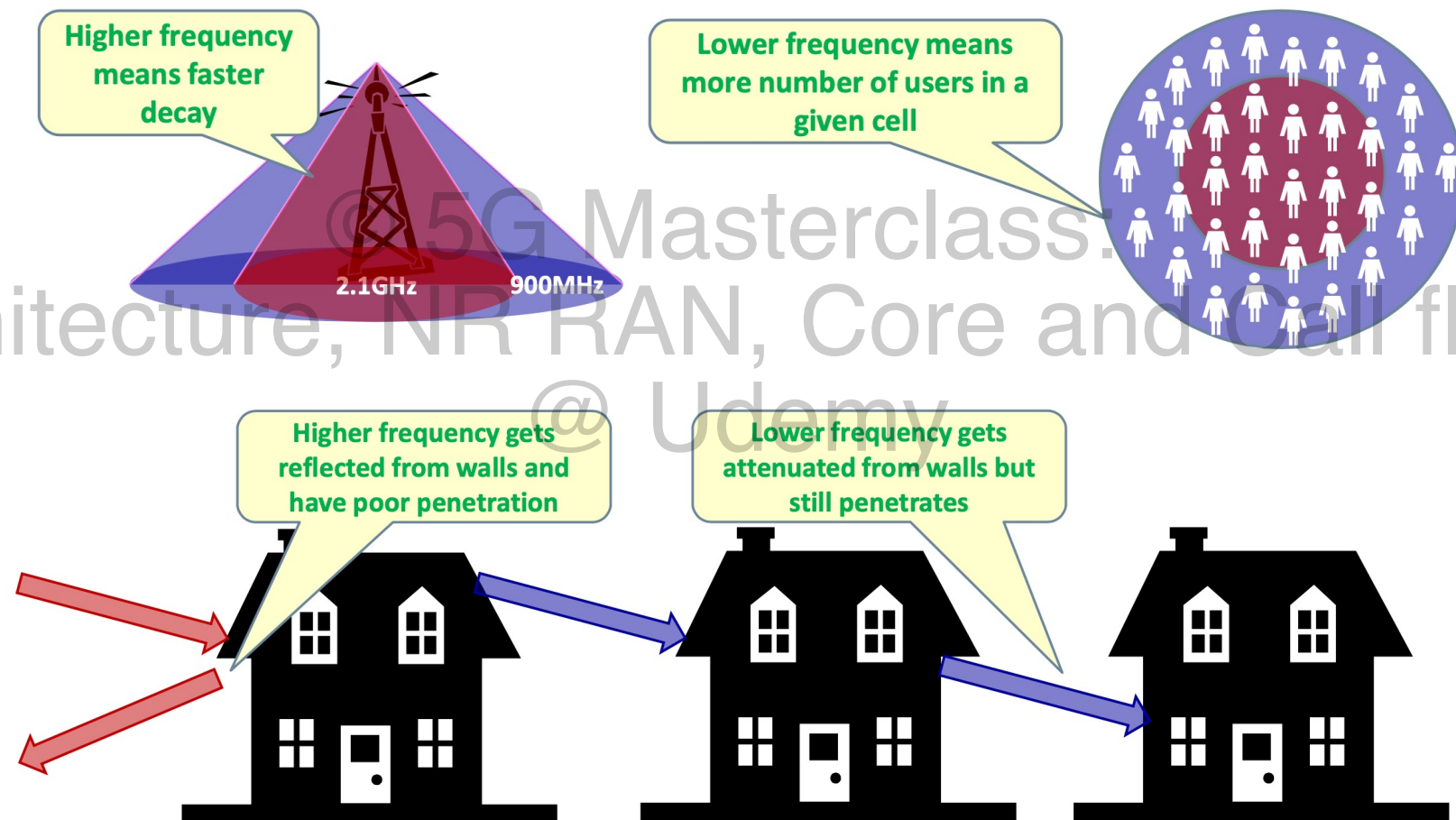


5G NR: Radio  
Access  
Networks

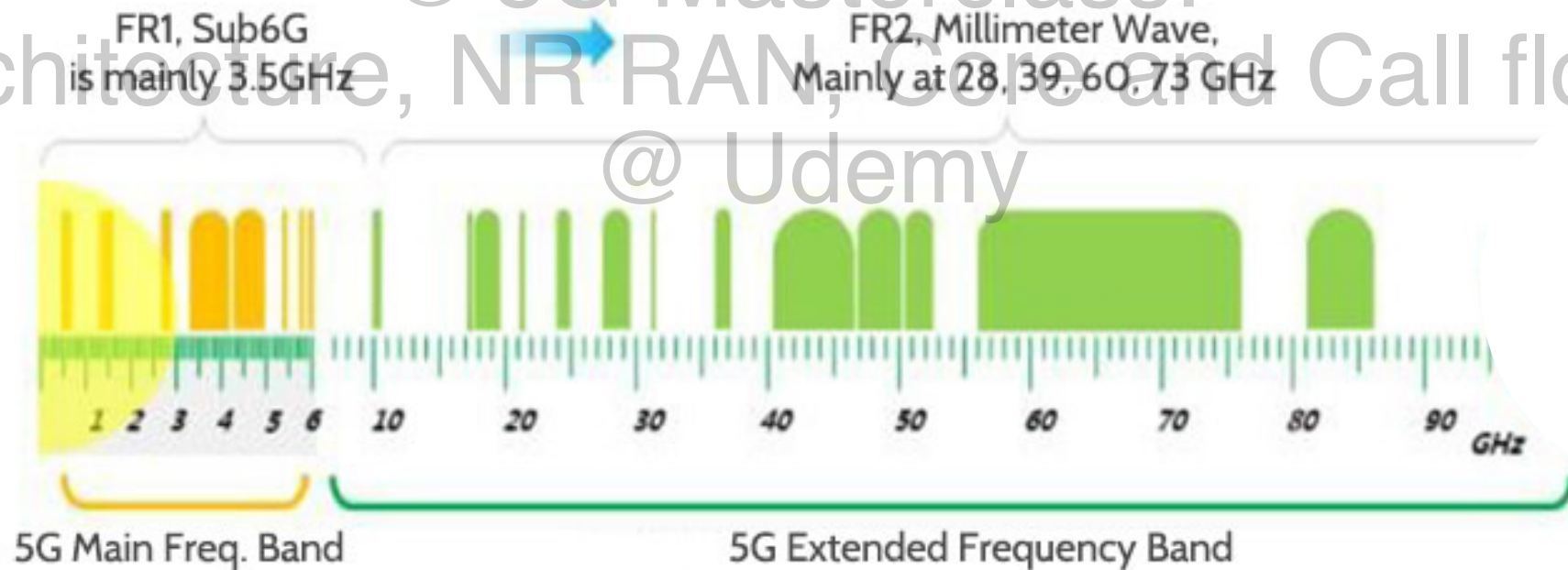
SPECTRUM

# The 5G Spectrum



# The 5G Spectrum - 3GPP definition

Frequency range designation	Corresponding frequency range
FR1	410 MHz – 7125 MHz
FR2	24250 MHz – 52600 MHz



# The 5G Spectrum - 3GPP definition

NR operating Band	Uplink (UL) operating band	Downlink (DL) operating band	Duplex Mode	$\Delta F_{\text{Raster}}(\text{kHz})$	Uplink Range of $N_{\text{REF}}$ (First – <Step size> – Last)	Downlink Range of $N_{\text{REF}}$ (First – <Step size> – Last)
	BS receive / UE transmit $F_{\text{UL,low}} - F_{\text{UL,high}}$	BS transmit / UE receive $F_{\text{DL,low}} - F_{\text{DL,high}}$				
n1	1920 MHz – 1980 MHz	2110 MHz – 2170 MHz	FDD	100	384000 – <20> – 396000	422000 – <20> – 434000
n2	1850 MHz – 1910 MHz	1930 MHz – 1990 MHz	FDD	100	370000 – <20> – 382000	386000 – <20> – 398000
n3	1710 MHz – 1785 MHz	1805 MHz – 1880 MHz	FDD	100	342000 – <20> – 357000	361000 – <20> – 376000
n5	824 MHz – 849 MHz	869 MHz – 894 MHz	FDD	100	164800 – <20> – 169800	173800 – <20> – 178800
n7	2500 MHz – 2570 MHz	2620 MHz – 2690 MHz	FDD	100	500000 – <20> – 514000	524000 – <20> – 538000
n8	880 MHz – 915 MHz	925 MHz – 960 MHz	FDD	100	176000 – <20> – 183000	185000 – <20> – 192000
n12	699 MHz – 716 MHz	729 MHz – 746 MHz	FDD	100	139800 – <20> – 143200	145800 – <20> – 149200
n20	832 MHz – 862 MHz	791 MHz – 821 MHz	FDD	100	166400 – <20> – 172400	158200 – <20> – 164200
n25	1850 MHz – 1915 MHz	1930 MHz – 1995 MHz	FDD	100	370000 – <20> – 383000	386000 – <20> – 399000
n28	703 MHz – 748 MHz	758 MHz – 803 MHz	FDD	100	140600 – <20> – 149600	151600 – <20> – 160600
n34	2010 MHz – 2025 MHz	2010 MHz – 2025 MHz	TDD	100	402000 – <20> – 406000	402000 – <20> – 406000
n38	2570 MHz – 2620 MHz	2570 MHz – 2620 MHz	TDD	100	514000 – <20> – 524000	514000 – <20> – 524000
n39	1880 MHz – 1920 MHz	1880 MHz – 1920 MHz	TDD	100	376000 – <20> – 384000	376000 – <20> – 384000
n40	2300 MHz – 2400 MHz	2300 MHz – 2400 MHz	TDD	100	460000 – <20> – 480000	460000 – <20> – 480000
n41	2496 MHz – 2690 MHz	2496 MHz – 2690 MHz	TDD	15	499200 – <3> – 537999	499200 – <3> – 537999
				30	499200 – <6> – 537996	499200 – <6> – 537996
n50	1432 MHz – 1517 MHz	1432 MHz – 1517 MHz	TDD	100	286400 – <20> – 303400	286400 – <20> – 303400
n51	1427 MHz – 1432 MHz	1427 MHz – 1432 MHz	TDD	100	285400 – <20> – 286400	285400 – <20> – 286400
n65	1920 MHz – 2010 MHz	2110 MHz – 2200 MHz	FDD	100	384000 – <20> – 402000	422000 – <20> – 440000
n66	1710 MHz – 1780 MHz	2110 MHz – 2200 MHz	FDD	100	342000 – <20> – 356000	422000 – <20> – 440000
n70	1695 MHz – 1710 MHz	1995 MHz – 2020 MHz	FDD	100	339000 – <20> – 342000	399000 – <20> – 404000
n71	663 MHz – 698 MHz	617 MHz – 652 MHz	FDD	100	132600 – <20> – 139600	123400 – <20> – 130400
n74	1427 MHz – 1470 MHz	1475 MHz – 1518 MHz	FDD	100	285400 – <20> – 294000	295000 – <20> – 303600
n75	N/A	1432 MHz – 1517 MHz	SDL	100	N/A	286400 – <20> – 303400
n76	N/A	1427 MHz – 1432 MHz	SDL	100	N/A	285400 – <20> – 286400
n77	3300 MHz – 4200 MHz	3300 MHz – 4200 MHz	TDD	15	620000 – <1> – 680000	620000 – <1> – 680000
				30	620000 – <2> – 680000	620000 – <2> – 680000
n78	3300 MHz – 3800 MHz	3300 MHz – 3800 MHz	TDD	15	620000 – <1> – 653333	620000 – <1> – 653333
				30	620000 – <2> – 653332	620000 – <2> – 653332
n79	4400 MHz – 5000 MHz	4400 MHz – 5000 MHz	TDD	15	693334 – <1> – 733333	693334 – <1> – 733333
				30	693334 – <2> – 733332	693334 – <2> – 733332
n80	1710 MHz – 1785 MHz	N/A	SUL	100	342000 – <20> – 357000	N/A
n81	880 MHz – 915 MHz	N/A	SUL	100	176000 – <20> – 183000	N/A
n82	832 MHz – 862 MHz	N/A	SUL	100	166400 – <20> – 172400	N/A
n83	703 MHz – 748 MHz	N/A	SUL	100	140600 – <20> – 149600	N/A
n84	1920 MHz – 1980 MHz	N/A	SUL	100	384000 – <20> – 396000	N/A
n86	1710 MHz – 1780 MHz	N/A	SUL	100	342000 – <20> – 356000	N/A

NR operating band	Uplink (UL) and Downlink (DL) operating band	Duplex Mode	Uplink and Downlink $\Delta F_{\text{Raster}}$ Range of $N_{\text{REF}}$ (First – <Step size> – Last)	
	BS transmit/receive UE transmit/receive $F_{\text{UL,low}} - F_{\text{UL,high}}$ $F_{\text{DL,low}} - F_{\text{DL,high}}$		$\Delta F_{\text{Raster}}$	Range of $N_{\text{REF}}$ (First – <Step size> – Last)
n257	26500 MHz – 29500 MHz	TDD	60	2054166 – <1> – 2104165
n258	24250 MHz – 27500 MHz	TDD	120	2054167 – <2> – 2104165
			60	2016667 – <1> – 2070832
n258	24250 MHz – 27500 MHz	TDD	120	2016667 – <2> – 2070831
n260	37000 MHz – 40000 MHz	TDD	60	2229166 – <1> – 2279165
n261	27500 MHz – 28350 MHz	TDD	120	2229167 – <2> – 2279165
			60	2070833 – <1> – 2084999
			120	2070833 – <2> – 2084999

# The 5G Spectrum



# The 5G Spectrum

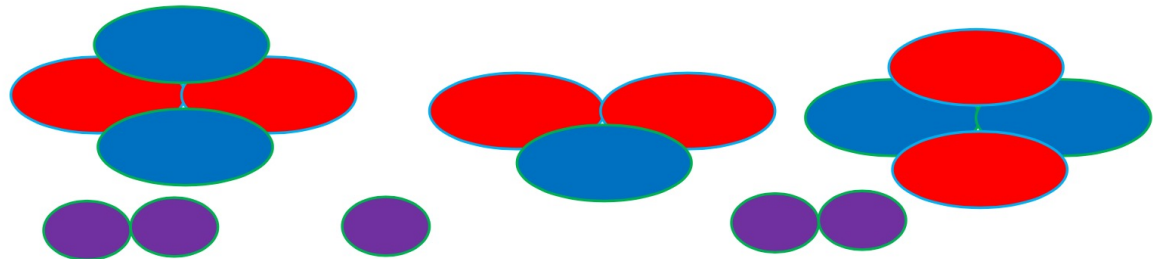
**Coverage Layer**  
Sub-1GHz



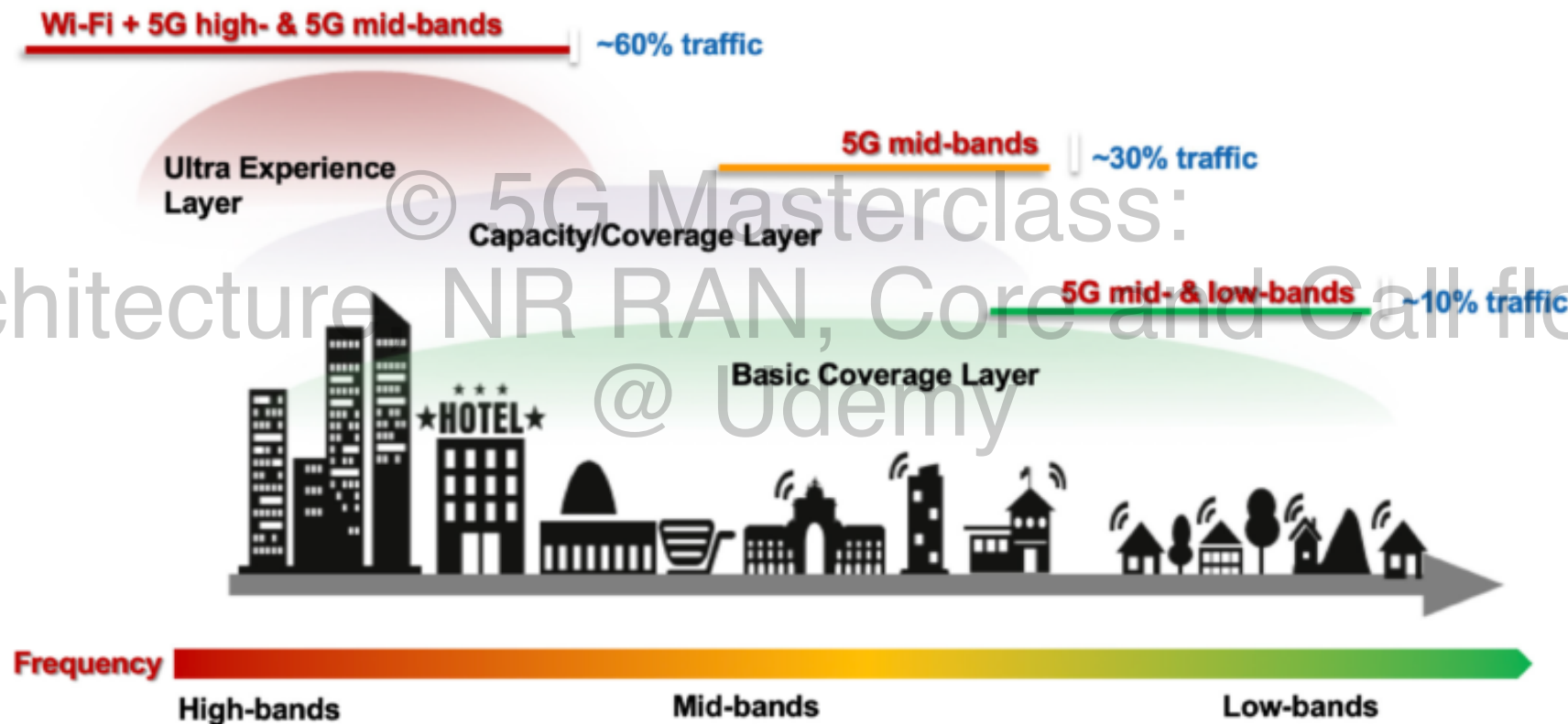
**Capacity Layer**  
1GHz – 6GHz



**High Throughput Layers**  
6GHz – 100GHz



# The 5G Spectrum



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**THANK YOU**