EION ByTES

CBRS vs PTP vs PTMP

CBRS

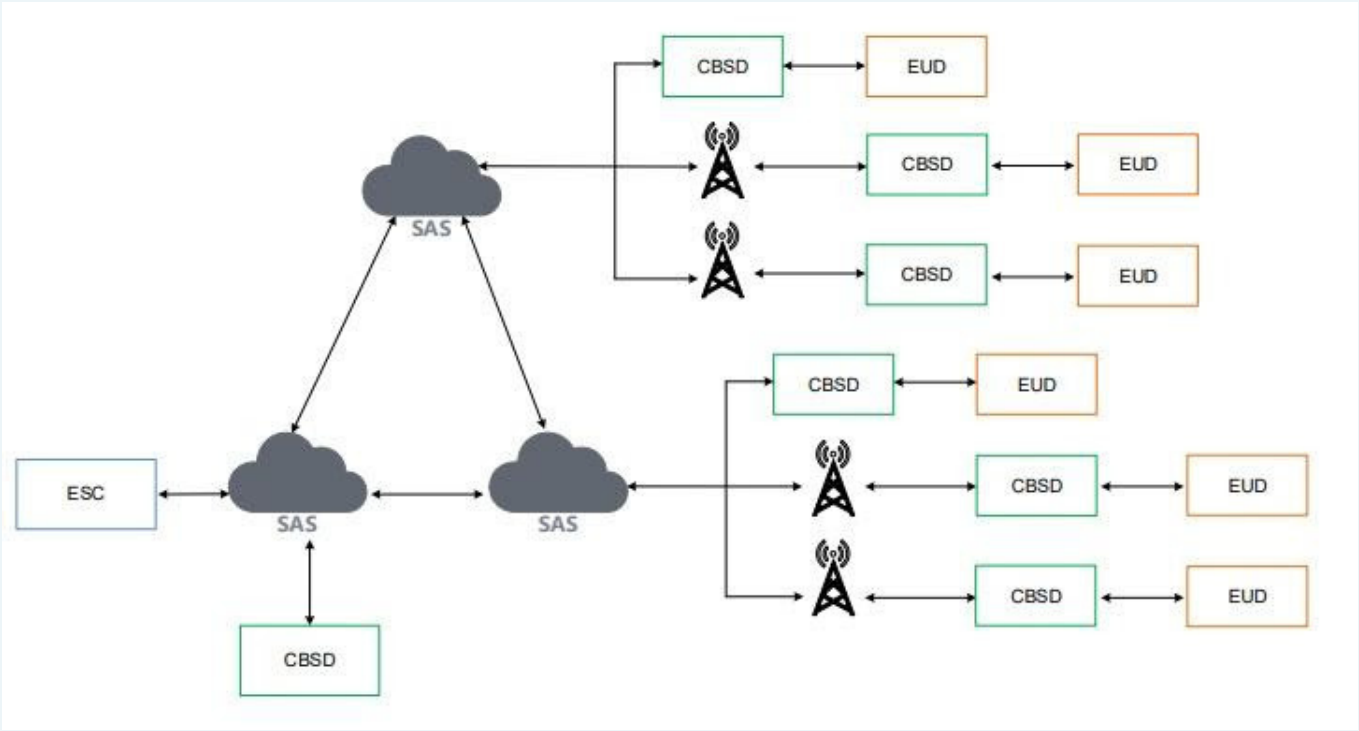
CBRS (Citizens Broadband Radio Service) network is a NEW spectrum sharing wireless communication service operating in the 3550-3700 MHz band and is being used to deploy private LTE networks especially for FWA (Fixed Wireless Access).

For a complete CBRS network architecture, there should be a Spectrum Access System (SAS) to grant CBRS devices spectrum access, Environmental Sensors (ESC) to detect incumbent operation thereby allowing the incumbent's priority use of the shared spectrum over others in the CBRS spectrum, and EPC software for core network communication.

CBSD A or B devices are required for distribution nodes and EUD for end-user connectivity to the CBRS network.

With CBRS TDD transmission, speeds of up to 100Mbps over distances several miles are possible with a clear LOS.

EION 9750 CBRS Solution



PTP

In wireless communication, Point-to-point (PtP) refers to communication/link between two nodes/radios. These nodes communicate via licensed or unlicensed frequencies and using appropriate authentication. The following unlicensed frequencies are commonly used: 900MHz, 2.4GHz, 5GHz, and 60GHz mmWave.

Other frequencies that can be used for unlicensed PtP include the shared spectrum bands (Citizens Broadband Radio Service) CBRS and Television White-Space (TVWS) bands which employ special architecture to ensure licensed users have preferential access to the shared frequency bands.

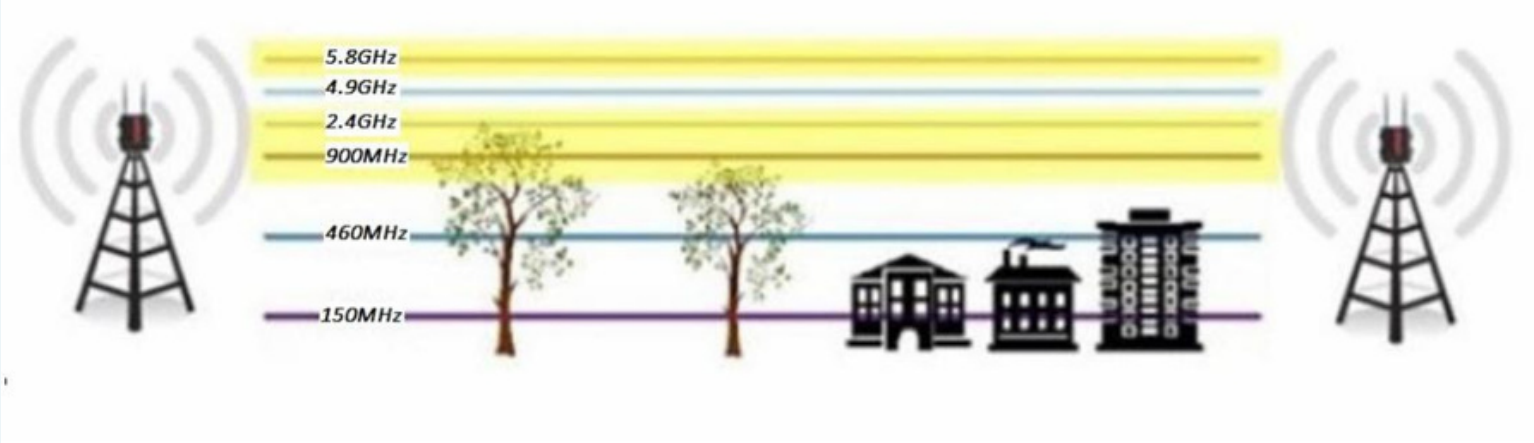
PtP links highly depend on the communication path. Higher frequencies, particularly the millimetre wave (mmWave) bands above 30 GHz, require line-of-sight (LOS) because radio signals attenuate faster at higher frequencies and any obstacle in the path can cause a fatal link distortion.

Other factors that affect wireless signal communication include radio receiver sensitivity, channel bandwidth selected, channel congestion, radio power, and antenna gain which can be used for link budget calculation.

NLOS (Non-line-of-sight) links describe radio links where there is no visual or slightly obstructed path between the transmitter and receiver radio (i.e., obstruction of innermost Fresnel zone by a physical object, e.g., foliage, buildings, hills, etc.). With low and mid-band frequencies like CBRS, 2.4GHz, 900MHz, and TVWS, NLOS communication is possible due to lower attenuation. However, path obstruction reduces the full potential of the link performance.

TVWS and 900MHz band can achieve farther reach compared to other unlicensed bands even with some path blockage. The downside with these bands is that it has a small number of channels or lower total bandwidth.

Licensed frequencies include mostly VHF and UHF ranges as well as 4.9GHz for the public sector.

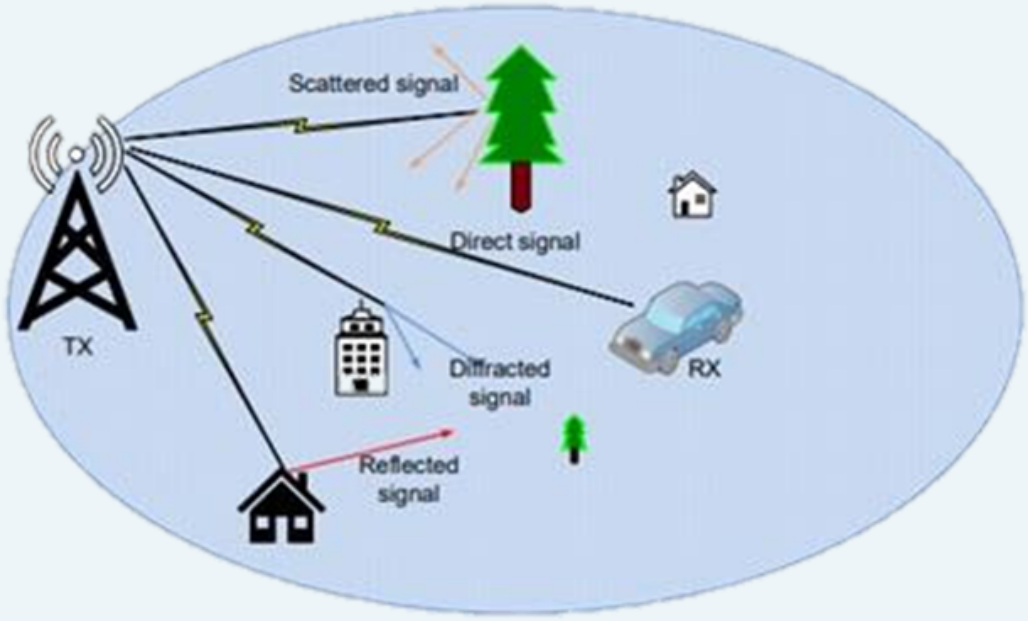


PTMP

While PtP achieves link communication between two nodes, PtMP Point-to-Multipoint is used for communication between a distribution node/AP to various station nodes.

The APs usually use sector antennas such as 360º (Omnidirectional) antennas, 90º, 60º, or 45º. The narrower the azimuth the farther the footprint to connect stations at a far distance to the distribution node.

PTMP Architecture



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