

BreezeCOM and Floware unite



BreezeACCESS VL

Increasing Capacity through the use of 10 MHz Channels

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Introduction

BreezeACCESS VL units with HW revision C or higher and SW version 3.0 or higher support a channel bandwidth of 10 MHz (with 5MHz resolution). When compared to BreezeACCESS VL using previous versions, the use of 10 MHz channels provides a much larger number of available channels in the same radio band. Obviously, the higher number of available channels provides reduced interference effects and increased flexibility in radio planning. However, in areas with high population density, the higher number of available channels enables designing cells with a significantly increased capacity. Thus, a single base station site may serve a much higher number of subscribers, providing reduced operational expenses and a much faster ROI. Further more, it supports a highly effective pay-as-you-grow buildup strategy.

This document describes the capacity increase available through the use of 10 MHz channels. The examples are for the FCC 5.8 GHz band (country code 1020). Similar improvements are available in other bands as well (pending on availability of HW revision C in these bands).

Maximum Cell Capacity with 20 MHz Channels

The available 20 MHz channels in the FCC 5.8 GHz band are described in the following figure:

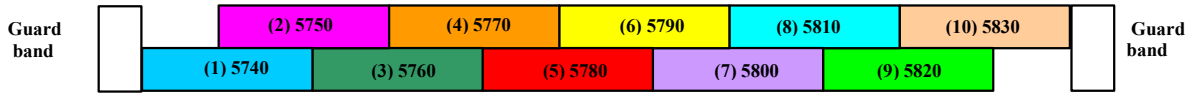


Figure 1: 20 MHz Channels in the FCC 5.8 GHz band

To achieve maximal throughput and avoid co-location problems, the channels may be allocated using either one of the following configurations:

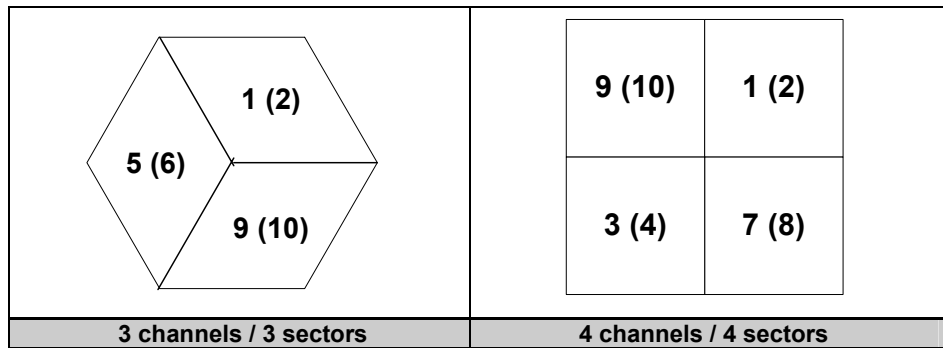


Figure 2: 20 MHz Channels Allocation Options

If the average throughput per 20MHz sector is equal to X , then the total available throughput for a 3-sectors base-station is $3X$, and the total available throughput for a 4-sectors base station is $4X$.

Maximum Cell Capacity with 10 MHz Channels

The available 10 MHz channels in the FCC 5.8 GHz band are described in the following figure:

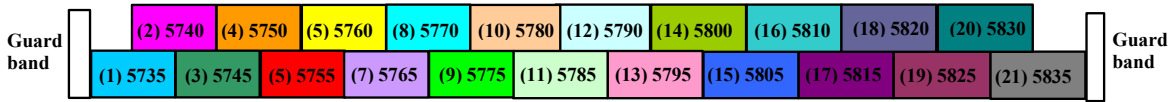


Figure 3: 10 MHz Channels in the FCC 5.8 GHz band

The maximum number of non-overlapping channels increases from 5 x 20 MHz to 11 x 10 MHz. This provides a significant improvement in overall spectral efficiency.

To achieve maximal throughput and avoid co-location problems, the channels may be allocated as described below:

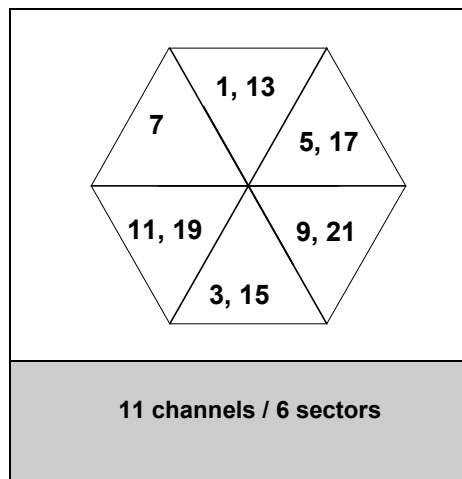


Figure 4: Allocation of 11 x 10 MHz Channels per Cell

The configuration described above enables maximum capacity utilization by using more than one channel (AU) per sector. This “layered” configuration is possible due to the much higher number of available channels. It should be noted that the operator can start with one “layer” (up to 6 channels), and add the second “layer” as demand grows.

If the average throughput per 10MHz sector is $X/2$ (half the throughput of a 20MHz sector), then the total available throughput for a 6 sectors/11-channels base station is $5.5X$. This provides a 37% increase over the maximum capacity achievable with 20 MHz channels (4-sectors cell).

Summary

	20 MHz Channels	10 MHz Channels
Total Number of Available Channels	10	21
Maximum Number of Non-Overlapping Channels	5	11
Maximum achievable Cell Capacity (X is the capacity of a 20 MHz channel)	3X for a 3-sectors cell 4X for a 4-sectors cell	5.5X for a 6-sectors cells

Other benefits of using 10 MHz channels:

- Improved overall spectral efficiency
- Better support of demand-based buildup
- Support a much larger number of subscribers per base-station site:
- Lower number of base-station sites:
 - Lower operating expenses
 - Faster ROI