



C band spectrum STA extension at Ericsson Plano, Texas

Report

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Contents

1 Introduction 3

2 Setup overview 3

 2.1 Interference testing and mitigation setup3

 2.2 Advanced Massive MIMO functionality testing5

3 Accomplishments and plan ahead 6



1

Introduction

With the upcoming C band spectrum auctions planned by FCC, there is lot of interest in the industry to study the spectrum for effective utilization. Success with C band spectrum utilization for 5G is critical for US leadership in the critical 5G communication segment.

C band spectrum auction is expected to be made available in two phases for the Cellular Service Providers (CSPs) as shown in the figure below:

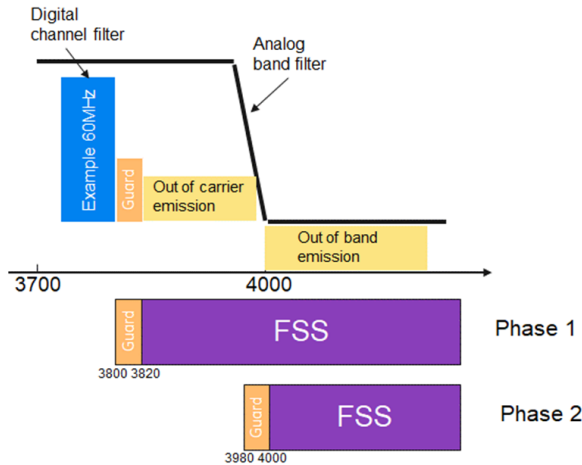


Figure 1: C band spectrum auction phases and example of Ph-1 deployment

The challenge with phase 1 is that FSS providers would still be operating between 3820MHz – 4000MHz and it is important to protect the FSS operation from interference from CSPs

Ericsson has setup a testing and verification facility in the Plano, Texas campus primarily focusing on the Phase 1 coexistence of CSP and FSS operation.

In addition to the interference mitigation solution testing and verification, it is also critical for CSPs to be able to efficiently use the valuable spectrum and provide excellent 5G services to consumer and enterprise. Ericsson, Plano – TX setup is also being used for verification of innovative features and functionalities that would provide high capacity and performance for the end users of CSPs.

2

Setup overview

2.1

Interference testing and mitigation setup

Ericsson has setup a C band testing zone in the Plano campus with two sites as shown in the picture below:

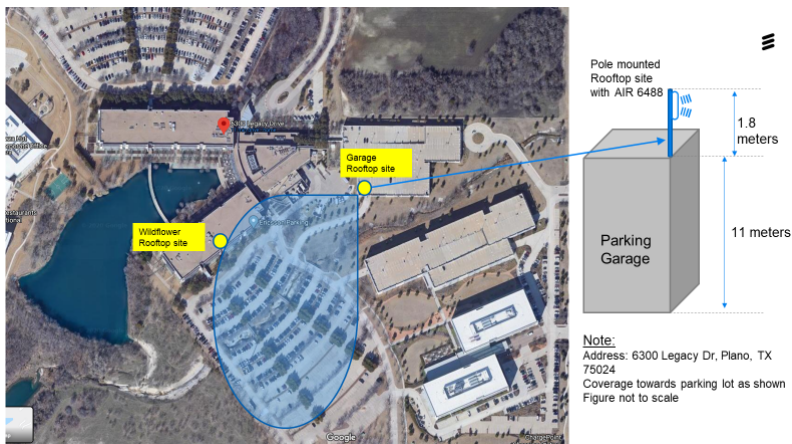


Figure 2: C band coverage overview at Ericsson Plano campus

For evaluating the FSS interference measurement per FCC guidelines, Ericsson has setup a testing solution comprising of a C band dish antenna along with relevant feed horn, waveguide filter, Low Noise Amplifier (LNA) etc. The dish antenna is mounted on a trailer which can be pulled to different locations for measurements



Figure 3: C band dish antenna setup for interference measurement

The van is equipped with signal generator, spectrum analyzer to capture the measurements received signal and interference:



Figure 4: Interference measurement setup inside the van

2.2 Advanced Massive MIMO functionality testing

The 2nd C band radio installed in Plano campus is used for testing, development and demonstration of advanced massive MIMO functionality for C band. Some of the advanced functionalities already tested and demonstrated as SRS based Multi-User MIMO (MU-MIMO). This feature allows extreme system capacity and very efficient utilization of precious mid-band TDD spectrum. We are able to reach the spectral efficiency of nearly 54bits/Hz.



Figure 5: MU-MIMO testing in Plano with 8 devices

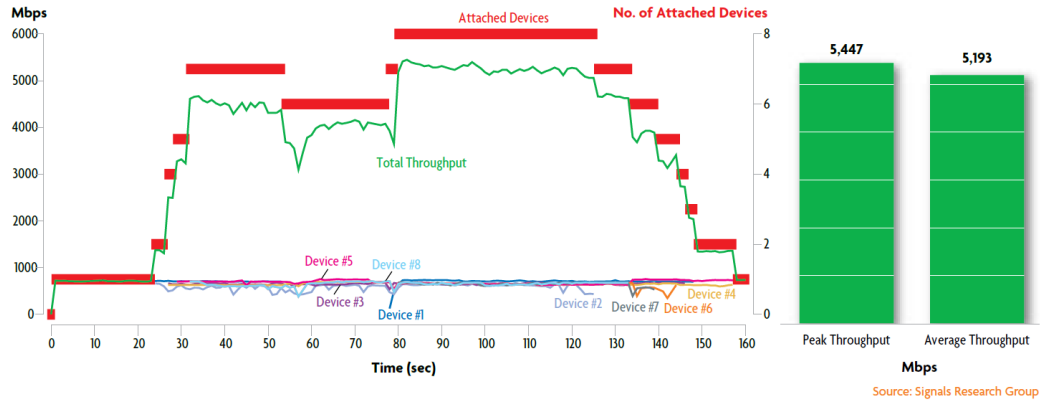


Figure 6: MU-MIMO testing results in Plano

3 Accomplishments and plan ahead

Ericsson has already made significant progress towards characterizing a C band network and its coexistence challenges with C band satellite operation. The results and learning from the measurements done in Plano is being used for network simulation and planning activities. The learnings are also being fed back to the development unit for further improvement and optimization of the solution.

Ericsson plans to use the setup in 2021 to continue testing new and innovative features for C band satellite interference mitigation solutions which would be essential for the success of 5G in US.

In addition to the above-mentioned interference testing, the test spectrum would also be used for development and testing of new use cases in 5G, such as low latency use cases.