

ABSTRACT

The increasing use of wireless communication also increases the frequency requirements, frequency frequency is a limited resource. Therefore, Cognitive Radio (CR) technology is needed which is able to overcome the problem of radio spectrum scarcity. Cognitive radio is a system that senses or senses its operational frequency and can adjust radio operational parameters appropriately on a wireless network.

D2D communication, is one of the techniques chosen for research on cognitive radio technology with D2D as a Secondary User (SU). This research method uses the Geometric Water Filling (GWF) algorithm which will fill the blank spectrum in allocating radio resources. Primary User (PU) and Secondary User (SU) who are in the same geographic area will be tested in the simulation. SU is an underlay on PU and occupies a side by side spectrum.

The results of this study indicate that the spectrum can operate optimally and the SU with the multiple access underlay scheme can efficiently utilize throughput, power, and spectrum in order to increase the slot for wireless network users.

Keywords: *Cognitive Radio, D2D communication, Primary User (PU), Secondary User (SU), Geometric Water Filling Algorithm (GWF).*