

An Investigation of Performance Versus Security in Cognitive Radio Networks with Supporting Cloud Platforms

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Abstract : The growth of wireless devices affects the availability of limited frequencies or spectrum bands as it has been known that spectrum bands are a natural resource that cannot be added. Many studies about available spectrum have been done and it shows that licensed frequencies are idle most of the time. Cognitive radio is one of the solutions to solve those problems. Cognitive radio is a promising technology that allows the unlicensed users known as secondary users (SUs) to access licensed bands without making interference to licensed users or primary users (PUs). As cloud computing has become popular in recent years, cognitive radio networks (CRNs) can be integrated with cloud platform. One of the important issues in CRNs is security. It becomes a problem since CRNs use radio frequencies as a medium for transmitting and CRNs share the same issues with wireless communication systems. Another critical issue in CRNs is performance. Security has adverse effect to performance and there are trade-offs between them. The goal of this paper is to investigate the performance related to security trade-off in CRNs with supporting cloud platforms. Furthermore, Queuing Network Models with preemptive resume and preemptive repeat identical priority are applied in this project to measure the impact of security to performance in CRNs with or without cloud platform. The generalized exponential (GE) type distribution is used to reflect the bursty inter-arrival and service times at the servers. The results show that the best performance is obtained when security is disable and cloud platform is enable.

Keywords : performance vs. security, cognitive radio networks, cloud platforms, GE-type distribution

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