In times of enormous and growing demand for wireless services, limited spectrum resources are an extremely important issue. The users of the telecommunications network need more and more demanding services. It is no longer sufficient to provide voice and simple text messages. Transferring simple images or movies is also not enough anymore. Today's wireless services require many times more data to be transferred - 4K video transmission, similar quality content streaming, network games requiring very low latency. Adding to this the growing expectations of users regarding the quality and stability of services, and additionally the significant popularization of mobile devices with access to the network, many problems related to the radio spectrum are revealed. We use the same limited spectral resources, but we expect more and more. Seemingly, the simplest solution to the presented problem is to use higher (not used so far) parts of the band. However, this approach involves a very complex radio environment and shorter transmission ranges. However, you can look at this problem from a different angle - that is, analyze the use of currently used portions of the band. Such analysis shows that many of the theoretically occupied fragments of the radio band are unused. This situation is dictated primarily by the method of assigning spectrum to individual applications through a tender. The effect of this approach is, in a way, the reservation of spectral resources that ultimately nobody uses. At this point, spectrum sharing should be mentioned, which has been successfully implemented for many years. Spectrum sharing allows multiple users to use the same radio resources while maintaining certain common rules. This solution provides access to services for more users than in the case of static spectrum access. However, this solution is not without drawbacks and will not be effective in all situations. Dynamic spectrum access systems are a more advanced solution, which, based on the current spectrum occupancy, make a decision about access to the spectrum. This approach provides access to services to primary users of a specific band, and also allows unlicensed users to access the same band - in the absence of primary users or with adequate protection of these users. This solution allows for much more effective management of spectrum resources. Unfortunately, the introduction of additional intelligence to such a system is associated with a significant increase in its complexity. In addition, it is necessary to ensure correct and reliable detection of the primary user, because the basis of the system operation is based on the differentiation of the resource allocation process depending on the presence of primary users. The user detection process itself is not reliable, therefore work is underway to support this process with the use of machine learning. In the case of large and dense networks, however, there is a problem with the data transferred to carry out the machine learning process. This problem affects both the amount of additional data transferred, which affects, for example, the battery consumption of the end device, and in general, the sending of additional information reduces the amount of user data that could be sent at the same time. An additional problem is also the privacy of the data transferred, as the user's data leaves the user's device and is further used elsewhere in the network in the machine learning process. In this project, the main goal is to test a potential solution to this problem, i.e. the use of federated machine learning in the process of detecting primary user transmissions. Federated machine learning is a distributed algorithm and assumes that only the parameters of the machine learning model are transmitted, instead of user data. This reduces the amount of information transferred and increases the security of user data. However, it is not possible to obtain the same results as in the case of using classic machine learning methods, as the algorithm does not have access to all data. As part of this project, it is planned to propose a federation learning algorithm without a central node and with a central node and to investigate the impact of the algorithm used on the quality of detection and the overall operation of the dynamic spectrum assignment system. The planned research consists in implementing a simulation of a radio network with several nodes and primary devices, and then checking for several machine learning algorithms both the amount of additional data transferred and the effectiveness of the detection algorithm. In the next stages, it is planned to add a proprietary federation learning algorithm to the described simulation and compare it with the previous algorithms. It is also planned to verify the operation of the proposed system using the hardware implementation of the network on universal transceiver devices. The expected effect of the work carried out is a machine learning algorithm that improves the detection performance in the dynamic spectrum assignment system, with a slightly lower effectiveness than classic machine learning algorithms, but with a significant reduction in the amount of additional information sent.