International Journal of Advanced Pervasive and Ubiquitous Computing
Volume 8 • Issue 3 • July-September 2016

Monitoring and Optimization of Pilot Pollution in High-Rise

Tianze Li, Udutech, Inc., Shijiazhuang, China
Tao Gao, North China Electric Power University, Baoding, China
Ye Liu, Udutech, Inc., Shijiazhuang, China
Yuhan Wang, Southeast University, Nanjing, China
JiaHui Chen, Beijing University of Posts and Telecommunications, Beijing, China

ABSTRACT

With the development and construction of the city, more and more high-rise buildings, more and more intensive, urban high-rise building pilot pollution problems become more and more prominent, urgent technical researchers continue to optimize the current communication network solutions. CDMA (Code Division Multiple Access) system has great operating prospects, in the third generation of mobile communication development process, the network competitiveness, network operation quality put forward higher requirements. This paper first introduces the self-interference characteristic of CDMA network, first introduces the concept of pilot pollution for CDMA network. Secondly, from the causes of high-level pilot pollution problems, the solution of high-level pilot pollution concentration is put forward for different situations. Finally, the problem of high-level pilot pollution is further analyzed with practical examples.

KEYWORDS

CDMA, Pilot Pollution, Solution, Traveltowatchindustry

1. INTRODUCTION

1.1. The Research Background and Meaning

With the rapid development of mobile communications and the rapid growth of the number of users, the network has been expanding, improve the operation quality of the network and realize the rational allocation of network resources has become an important subject for the rapid development of the network.

However, the rapid development of CDMA wireless network technology, the increasing number of users, the coverage requirements of network services are more and more extensive, which will inevitably lead to the number of base stations must also be increasing in order to meet the growing Multi-user requirements. At the same time as CDMA is a self-interference system, with the number of base stations increased greatly, the distance between the base stations to become smaller and smaller, and because of the concentration of urbanization, urban high-level also more and more wireless environment Buildings continue to increase and become more and more complex, In this case it is easy to cause weak coverage, no pilot coverage and other phenomena to form the pilot pollution area, thus affecting the system capacity, the user's call quality and connection rate, dropped calls and other KPI indicators. (Ru,2015) Therefore, in the planning and optimization of wireless networks, pilot pollution becomes a need to pay special attention to, focus on solving the problem.

DOI: 10.4018/IJAPUC.2016070103

Especially in high-level pilot pollution problems in the actual use of the user perception will be highlighted particularly prominent, but also the most prone to the risk of pilot pollution in the region, But also in the different regions of the high-level pilot pollution probability of occurrence is also different, the whole in the window more likely to happen, which is precisely the perception of the user is somewhat different from the general perception. High-level pilot pollution problem is not only as an academic problem requires us to continue to explore and research, it will be more in the actual network communication affect the user's perception, it can easily lead to the process of receiving calls dropped calls, or even call out the failure to be a second call, seriously affect the quality of user calls.

Therefore, high-level pilot pollution problems will largely restrict the development of CDMA networks, since 2008, China Unicom CDMA standard transfer of property rights to China Telecom, China Telecom has been committed to providing users with better quality of service, allowing users to enjoy the highest quality call service(Li,2015), This requires us to continue in all aspects of the optimization for the telecommunications network, On the one hand to the existing building environment and wireless environment on the existing equipment commissioning, on the other hand also for emerging buildings on the current impact of the network environment for the overall network adjustment, or combined with the actual site to take a different network planning and adjust the program, as far as possible in the early to the highest level of pollution to the problem of high-level pilot.

There is still no solution can solve the problem of high-level pilot pollution, and CDMA network in the overall planning period, the most or consider the open air and outdoor road network signal problems, Therefore, the early stage of planning a reasonable way to prevent the prevention of high-level pilot pollution problems in the practical effect of little effect, so the solution to the problem of high-level pilot pollution mainly rely on continuous testing optimization to solve. And only continue to optimize, we can do the greatest possible to reduce the impact of pilot pollution, improve the user perception, to provide users with more quality services to improve the competitiveness of enterprises to further expand the market, But at the same time operators must also take into account the cost of transport, so they need to continue to explore better and more reasonable solution.

1.2. Research Status of Pilot Pollution Problem

1.2.1. The Status of Domestic Development

March 30, 2011, China Telecom announced in Beijing, as of March 29, Telecom CDMA users exceeded 100 million, more than 9,000 million more than the number of US users Verizon Wireless, Telecom became the world's largest C network operators. Prior to this, Telecom has built the world's largest CDMA network. The fact is that since 2008, China Unicom's ownership of CDMA transferred to China Telecom, on behalf of China Telecom officially completed the acquisition of China Unicom CDMA, since the beginning of China Telecom is committed to the continuous development of CDMA network distance. After both sides the smooth completion of the C net asset property delivery in 2009, and then in 2010, China Telecom successfully made CDMA2000 3G licenses, It can be said that China Telecom to achieve a smooth and smooth development, with the ensuing user base is increasing, the need to set up more and more base stations (Hu, 2013), Because CDMA is a self-interference system, the same frequency band is used for communication, so it is easy to cause the problem of high-level pilot pollution due to improper parameter configuration.

At present, the basic situation of the domestic network is more clear, First, China's telecommunications industry leader in China Mobile's first network, today it has a certain scale, followed by China Telecom, China Unicom have to share this delicious network communication market cake, China Telecom in the network planning and construction of major imitation of China Mobile's standard, cost savings in the advantage, the head of the problem is the occurrence of pilot pollution, and with the number of users has increased, expanding the system capacity has become the inevitable trend, thus greatly increases the difficulty of pilot pollution problems to solve.