A Review on "Handoff Analysis of Adaptive Keep-Alive Interval Network"

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ABSTRACT

A gateway approach is adopted in the GAN architecture to integrate 3GPP core network with other radio technologies. The Generic Access Network (GAN) is developed by 3GPP extends services to unlicensed spectrum. A mobile station (MS) with multiple air interfaces can access 3GPP services through GAN and roam seamlessly between different radio access networks. However, mobility management and resource management are critical issues in GAN. To allocate GAN resources efficiently, we propose Adaptive Keep-alive Interval (AKI). By using AKI, an MS can send less signaling messages. In addition, AKI can increase system utilization by releasing unused resources. A mathematical model is to be evaluate the handoff analysis of the proposed AKI. The analysis is validated by extensive simulations. The results show that the proposed AKI can reduce handoff failure probability and increase GAN utilization significantly.

Key words: 3GPP Generic Access Network (GAN), interworking, performance analysis, mobility and resource management,

1. INTRODUCTION:

Third Generation Partnership project(3GPP) develop the Generic Access Network (GAN) evolves from the Unlicensed Mobile Access (UMA). It extends Global System for Mobile Communications GSM)/General Packet Radio Service (GPRS)/Universal Mobile Telecommunications System (UMTS) services to unlicensed spectrum. Basically, a gateway approach is adopted in the GAN architecture to integrate 3GPP core network with other radio technologies. From the viewpoint of a 3GPP core network, GAN is just another Radio Access Network (RAN) like GSM/EDGE RAN (GERAN). A Mobile Station (MS) with multiple air interfaces can access 3G services through GAN and roam seamlessly between GAN, GERAN, and UMTS Terrestrial RAN (UTRAN). Besides, many different wireless access technologies, such as IEEE 802.11Wireless Local Area Networks (WLAN) and Bluetooth, can be applied to GAN

Wireless Communications is the main source of expansion in the area of communications in recent years; it has evolved rapidly and is one of the most promising areas of research. Third generation networks, with provision for streaming applications, internet access and gaming have now been commercially realized and the standardization of fourth generation technology has already begun.

2. REVIEW

Handover refers to the process of transferring an ongoing call or data session from one channel connected to the core network to another.

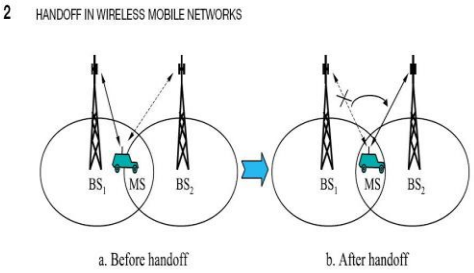

Figure 1.1 Hard handoff between the MS and BSs.

Seamless handoff across the different wireless networks is becoming increasingly important. Whereas wired networks regularly grant high bandwidth and consistent access to the Internet, wireless networks make it possible for users to access a variety of services even when they are moving. As a result, seamless handoff, with low delay and minimal packet loss, has become a crucial factor for mobile users who wish to receive continuous and reliable services. Seamless handover is when a handover from one cell to another takes place without perceptible interruption of the radio connection Seamless handover is a fundamental concern in any system with mobility. There are not signals generated internally that control the selection of the output multiplexers. Instead, the input signal, exhibiting a full voltage swing and no extra delay, is used to drive the multiplexers.

3. OBJECTIVE OF WORK

As mentioned earlier, in our previous paper, we have evaluated the proposed AKI with various performance metrics by simulation. Through simulation experiments, we found that the GAN handoff probability is the most important factor affecting mobile users to access GAN services. To get more insights of the problem, in previous paper mathematical analysis for handoff failure probability is conducted. In that paper the mathematical analysis is described. In the analysis, handoff is defined as the switching of radio connection from a Base Station (BS)/Access Point (AP) to another BS/AP.

GAN Architecture illustrates the network topology used in the analysis. cells and GAN cells are overlapped. Therefore, an MS can seamlessly roam between different cells. Please note that Fig does not show the overlaps of the cells. There are two types of cells GERAN/UTRAN cell and GAN cell. For each cell, there are Nnb neighboring cells consisting of Ng GAN cells and $(Nnb - Ng)$ GERAN/UTRAN cells. In Fig. there are 2 neighboring GAN cells and 2 neighboring GERAN/UTRAN cells around each cell. There are 4 moving directions for each MS. The topology is wrapped-up. That is, an MS moving up outside the boundary will reach to the bottom cell, and same as that in left and right sides. With different user preferences, the handoff decision will be different.

4. CONCLUSION

When traffic load is heavy, in order to allocate resource for an MS which will use GAN service soon, the serving GANC releases some reserved resources also illustrate the simulation results of the three different policies (maximum interval first, minimum interval first, random). We also compare them with the results of the static keep-alive interval. An interesting point is that the three different policies in the proposed AKI perform similarly. Again, they all outperform the static keep-alive interval.

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