Study of Combined GuardChannel and Mobile Assisted Handoff Call Admission

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***Abstract*: With the emergence of a variety of mobile data services with variable coverage, bandwidth, and handoff strategies, and the need for mobile terminals to roam among these networks, handoff in hybrid data networks has attracted tremendous attention. This article presents an overview of issues related to handoff with particular emphasis on hybrid mobile data networks. Issues are logically divided into architectural and handoff decision time algorithms. In our study, we observe that the latency is significant enough to affect the quality of service for many applications (or network connections). Further we find variations in the latency from one hand-off to another as well as with APs used from different vendors. Finally, we discuss optimizations on the probe phase Based on the study, we draw some guidelines for future handoff schemes.**

***Keywords*: handoff, latency, network connections, hybrid data networks**

Introduction

Recent activity in mobile computing and wireless networks strongly indicates that mobile computers and their wireless communication links will be an integral part of future internetworks. Communication over wireless links is characterized by limited bandwidth, high latencies, sporadic high bit-error rates and temporary disconnections that network protocols and applications must deal with. In addition, protocols and applications have to handle user mobility and the handoffs that occur as users move from cell to cell in cellular wireless networks. These handoffs involve transfer of communication state (typically network-level state) from one base station (a router between a wired and wireless network) to another, and often result in either packet loss or variation in packet delays. Handoffs typically last anywhere between a few tens to a few hundreds of milliseconds in most systems.

The remote correspondence framework with reference to support arrangement is described in current time by versatile access whenever and anyplace. WLAN and cell systems are the prime two access advances of WC, for instance, the “Worldwide System for Mobile” (GSM) correspondence, “General Pocket Radio Service” (GPRS), and “All inclusive Mobile Telecommunications System” (UMTS). However, the WLAN is competent to give the information at higher rates and lower cost contrasted with the cell systems, it can't contend with the last in light of its constrained inclusion territory and equivalently lesser help for the "rapid portability". The interconnection of cell and WLAN systems, with QoS bolster offers a viable and productive method for upgrading the administrator administration. Figure 1.1 speaks to the schematic portrayal of the said combination.

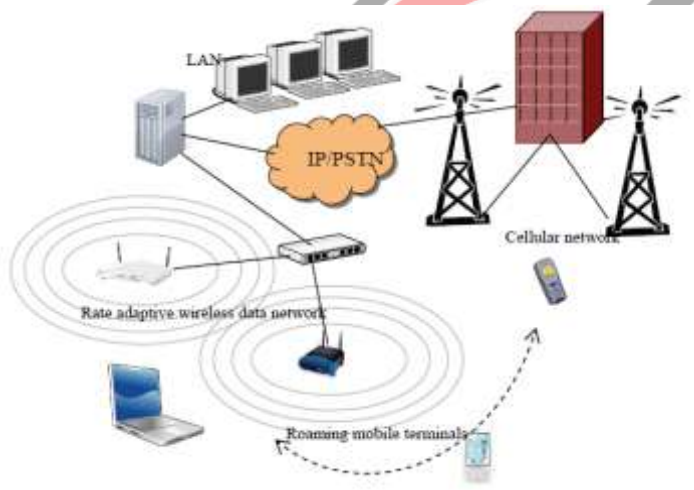

Fig Error! No text of specified style in document.**..1** Cellular and WLAN network architectures

The forthcoming up and coming age of the remote frameworks speaks to a domain including access to heterogeneous system having contrast in the transmission capacity, inertness and cost. At that point upgrade in the application is additionally rising the issue of dealing with the versatility to help the moving of clients starting with one framework then onto the next.

One of such prime administration segments is the “handover the executives” (HM). There are a few factors that measure the HM viz., choice calculations or plans, choice methods, measurements and versatility circumstances (flat and vertical handoff circumstances). Handovers in homogeneous systems are started with a point of better availability or QoS, on opposite, the point of handovers in heterogeneous system is to give comfort or the QoE. The serious issues in VHO are extensively characterized into two

principle classifications viz., consistent administration and computerization of the system exchanging process. The HM methods initially should choose the perfect time and reasonable system to start the handover for the required administration and later keep up the coherence to the administration.

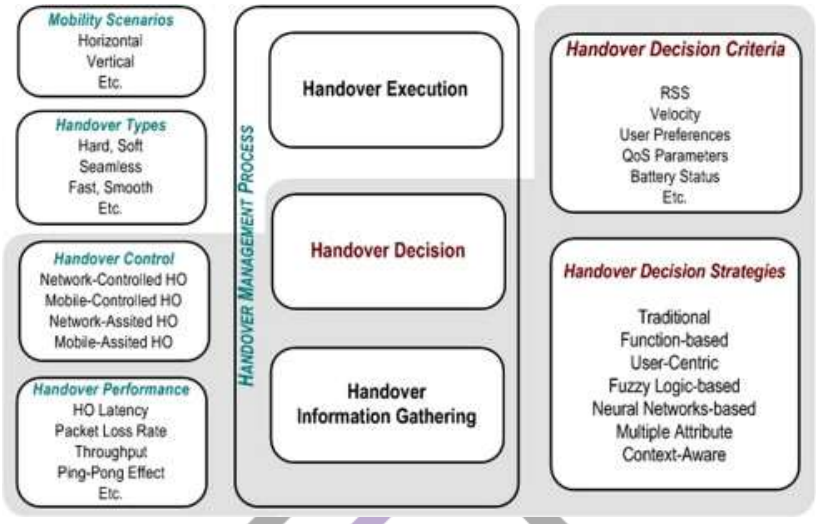

Fig: Error! No text of specified style in document..**2.** Variables of HM

This section explains the structure and parts of handoff examination in remote Local Area and Wide Area Network for execution improvement. Handoff Analysis is created utilizing distinctive procedures to accomplish improved administration quality and experience seeing to the issues and difficulties of Local Area Network and Wide Area Network, it is important to structure, Handoff Analysis taking into account the necessities of the considerable number of systems which make LAN and WAN Networks. Conventional handoff calculations were reliant lone on RSS yet with the development of Internet and Communication innovation, numerous new parameters were added to the rundown for precise outcomes. With the growing rundown of parameters, numerous new calculations and strategies were additionally continued expanding to accomplish better and productive outcomes. LAN and WAN systems are the diverse kinds of systems which contrast in data transfer capacity, inclusion, delay, cost and so forth. To give consistent availability to MS in a heterogeneous situation, it is imperative to understand the present condition of system before changing the MS starting with one BS then onto the next. This section centers on the structure of the handoff investigation in remote Local Area and Wide Area Network for execution improvement

4.2. Procedure

The area talks about in insight concerning the trial look into strategy adjusted in the present work. The methodology towards accomplishing every one of the four noteworthy goals prior expressed to achieve the exploration work is displayed in this segment of the proposals report.

- ✓ Set up simulation arena
- ✓ Random deployment of nodes ()
- ✓ Two sink node established ()
- ✓ Nodes are being randomly activated for moving from one cluster of access to another.
- ✓ Estimate Received signal strength Intensity (RSSI) and Power level (PR) being calculated at each instance of time ().
- ✓ To perform the handoff technique
- ✓ To perform the each handoff scenario and save the data of each execution in test file.
- ✓ Generate the text file through trace file
- ✓ Select the handoff scenario for each instance of signal through
- ✓ Compare the same scenario for two area (WAN and WLAN)

4.2.1Model Formulation

This sub-area depicts in detail the orderly method for figuring the considered vertical handoff basic leadership issue.

4.3Vertical Handoff Decision Algorithm

This sub-area manages the depiction of how the proposed and planned model can be utilized to look at the VHO basic leadership calculation.

4.3.1Pseudo Code for Handoff

Select the present cell number (I) and get the comparing data;

If $I_{dwell>Avg} > T_{call\_Avg}$

Then set the value of W_of_t(i)to LOW;

End If;

Else

Then set the value of W_of_t(i)to HIGH;

EndElse;

While J ∈ A, A is the set of adjacent cells of cell (i)

Begin

Set the W_of_m(i)to be the value of move probability from cell(i) to cell(j);

Calculate the accumulation function

Aw(j) = k(v)* W_of_k(i)+ W_of_t(i)+ W_of_m(i);

Sum up Aw(k) (k is the adjacent cells of cell j) in cell j

$\tilde{A}w(j) = \sum AW(i)$

Reserve the necessary resource and adjust the number of guard channel in cell(j);

by total accumulation function $\tilde{A}W(j)$

GCS_num = Total channels — $\tilde{A}W(j)$* Predict_basis — num_ofnew_call;

Prepare the handoff to the cell(j);

EndWhile;

Result and Discussion

This part quickly portrays the recreation condition and different parameters picked to mimic the steering conventions. This segment shows the execution assessment of handoff investigation utilizing NS2.35. Assessment is practiced for all conventions under a similar situation of the reproduction referenced before in this section. A similar exhibition measurements and information parameters are utilized here again to assess the conventions in MANETs. Recreations are done utilizing NS2 adaptation 2.35 on Linux stage - Ubuntu 12.04.

5.2. Network Simulator

System Simulator (Version 2), broadly known as NS2, is basically an occasion driven reenactment device that has demonstrated helpful in examining the dynamic idea of correspondence systems. Recreation of wired just as remote system capacities and conventions (e.g., routing algorithms, TCP, UDP) should be possible utilizing NS2 It comprises of two reenactment instruments

The system test system (ns2) contains all ordinarily utilized IP conventions. The system artist (NAM) is utilized to envision the reproductions. Ns-2 completely reenacts 80 a layered system from the physical radio transmission channel to abnormal state applications the test system was initially created by the University of California at Berkeley and VINT venture the test system was as of late reached out to give recreation backing to specially appointed system via Carnegie Mellon University (CMU Monarch Project landing page, 1999. NS2 comprises of two key dialects: C++ and Object-arranged Tool Command Language (OTcl) while the C++ characterizes the inside system (i.e., a backend) of the reproduction protests, the OTcl sets up recreation by amassing and designing the articles just as booking discrete occasions (i.e., a frontend). After reproduction, NS2 yields either message based or movement based reenactment results. To translate these outcomes graphically and intuitively, devices, for example, NAM (Network AniMator) and XGraph are utilized. The aftereffect of the reenactments is a yield follow document that can be utilized to do information preparing (figure delay, throughput and so on) and to picture the reproduction with a program called Network Animator (NAM). NAM is a generally amazing representation apparatus that imagines the bundles as they proliferate through the system. A diagram of how a recreation is done in ns2 is appeared in Fig.5.1.

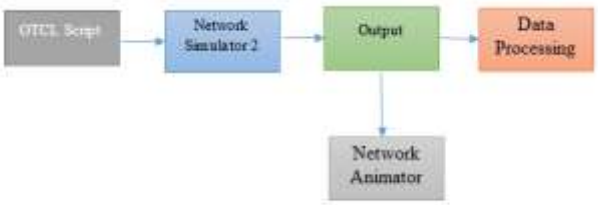

Fig.5.1 Network Simulator 2

Set up of Simulation Environments

We are set up NS2 upon the Linux (Ubantu) for the reenactment devices for the proposed work

- ✓ Linux Operating System for the NS2 environment
- ✓ NS2 For the simulative tool

5.5. NS2 Simulation Steps

The followings demonstrate the three key advance rules in characterizing a recreation situation for estimating the handoff delay and ideal radio asset use in a heterogeneous portable remote system.

Step 1: Reenactment Design the initial phase in reproducing a system is to plan the reproduction. This progression, decides the recreation purposes, Interworking open security LMR/cell organize arrangement and suspicions, the execution measures, and the sort of anticipated outcomes.

Step 2: Arranging and Running Simulation This progression actualizes the plan in the initial step. It comprises of two stages: Network arrangement stage: In this stage organize parts (hub, IMS engineering) are made and designed by the recreation structure. Additionally, the occasions, for example, handoff from open wellbeing LMR to cell organize are planned to begin at a specific time. Reenactment Phase: This stage begins the reproduction which was designed in the Network Configuration Phase. It keeps up the reproduction clock and executes occasions sequentially. This stage as a rule keeps running until the recreation clock achieved a limit esteem determined in the Network Configuration Phase.

Step 3: Post Simulation Processing the principle assignments in this progression incorporate confirming the respectability of the program and assessing the execution of the mimicked system. While the principal task is alluded to as troubleshooting, the second one is accomplished by legitimately gathering and accumulating recreation results

5.5.1. The execution phase

The execution stage is imperative for recreation of handoff process performed under the wide territory organize (WAN) and Wireless neighborhood (WLAN).

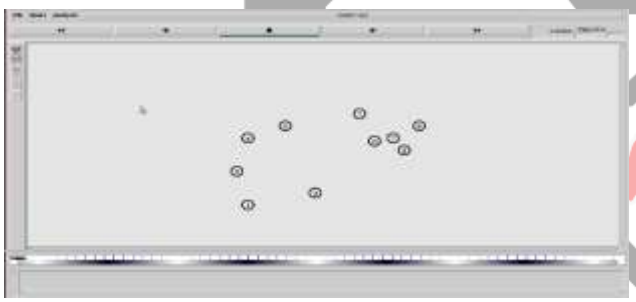

Fig: 5.4nodes communication each other

The above figure demonstrate that NS2 condition has few orbited structure call the correspondence hub which has started in program of NS2 written in TCL record of the proposed reenactment work.

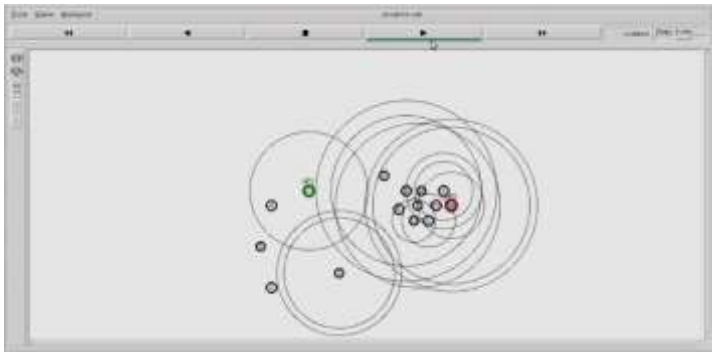

Fig: 5.5 nodes communication

As the above simulation figure demonstrates that the circle has been rise out of from the hub. Here the two hub are quite certain one is in red (AP2) and other is in green shading (AP1). Here absolute two passageways are put to play out the hand off circumstance.

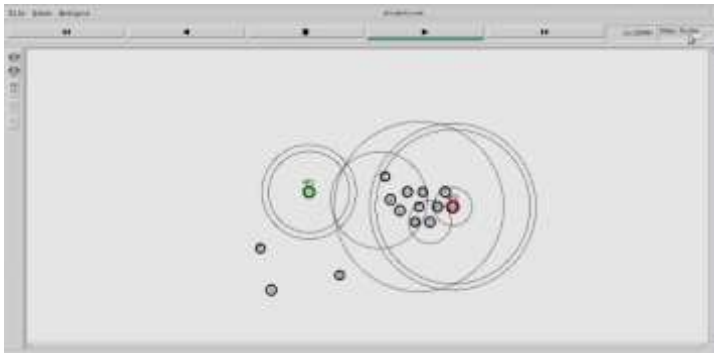

Fig: 5.6. Nodes communication

The above figure demonstrates that the hand off is being executed with two overabundance point AP1 and AP2. Moving of passage starting with one then onto the next will have slight move in topological move in the proposed reproduction situations.

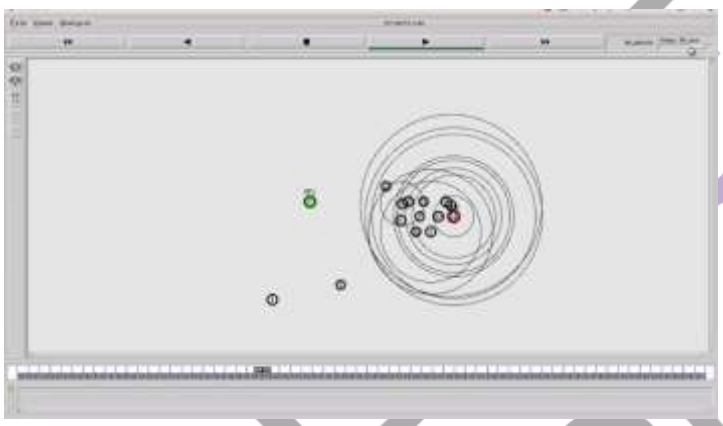

Fig: 5.7 nodes communication each other

One node of AP1 handoff to AP2 with the endeavor of access toss. Further another handoff is being executed.

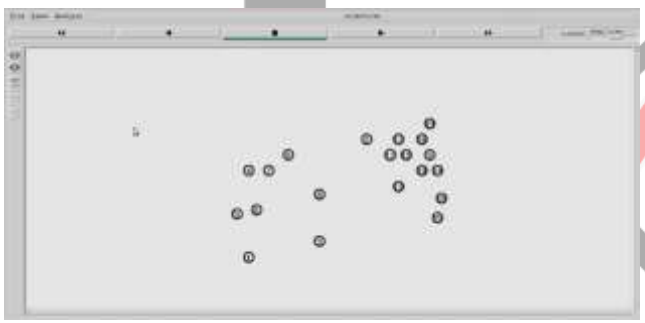

Fig 5.8 nodes communication

Further upgrade of hubs for further investigations of reenactment conditions developed under the nS2 situations. This figure has not the correspondence initials so no round structure has been found in above figure.

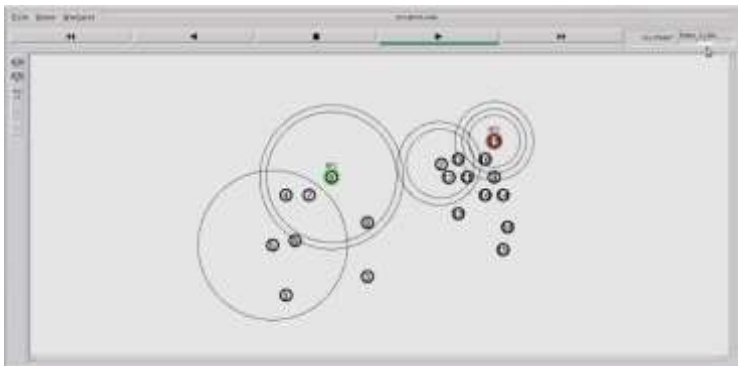

Fig: 5.9 nodes communication

Again the 20-nodes has been again executed to convey. Under the best possible correspondence same handoff has been executed from passageway moving from AP1 to Ap2.

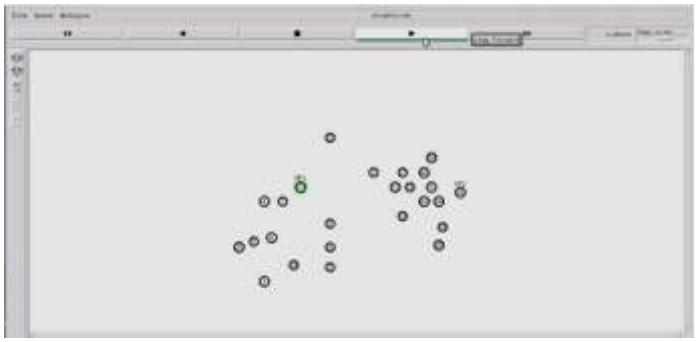

Fig: 5.9 nodes communication

Essentially further increment of the hub (25 nodes) in a similar channel design with comparative two passage. Still no correspondence has been start up with the above figures.

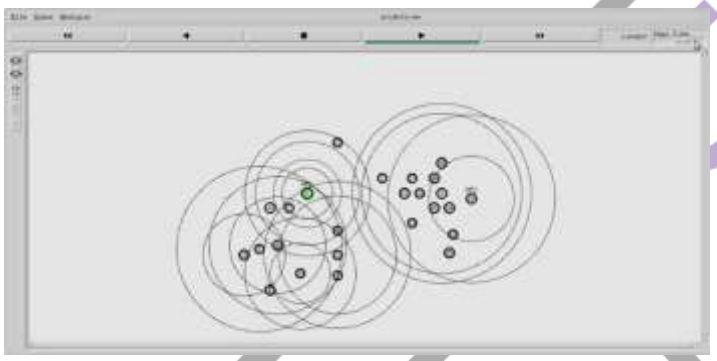

Fig 5.10 nodes communication

Further the correspondence has been begun to play out the handoff circumstance in the middle of the abundance purpose of AP1 to AP2

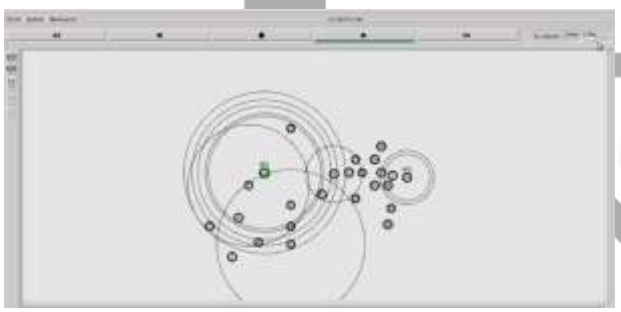

Fig: 5.11 nodes communication

Nodes 5 has been moving from one bunch point which has worked through AP1 from the other group worked on AP2.

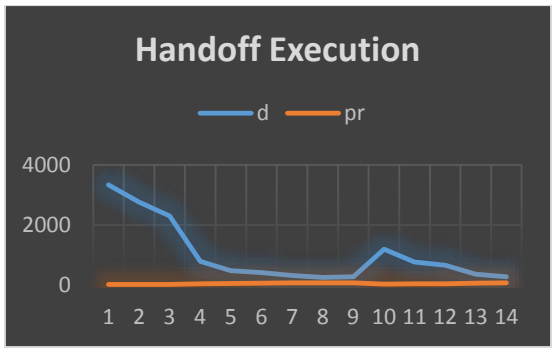

Fig 5.12: Handoff from AP 0 to AP 14

Table 5.1: Distance vs. Power Received

d-distance	Pr-Power Received
3340.207	23.99266
2760.126	26.39372
2303.693	28.89035
791.4118	49.29057
485.7223	62.91744
425.3598	67.23368
330.5115	76.27317
266.1981	84.98898
282.7621	82.46211
1201.739	40
769.113	50
663.0285	53.85165
369.7659	72.11103
282.7621	82.46211

The distance vs. power received is describe in table. The table above describe the power varying with distance during the execution of handoff.

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