

Determination of Busy Hour in Mobile Communication in Nigeria

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Abstract

This paper is focused on determination of busy hour in Mobile Communication in Nigeria, using Lagos as a case study. Busy hour, it is a given period within a day that have the highest traffic intensity. The traffic intensity values obtained within the busy hour are used to calculate the traffic load, capacity of the mobile communication network equipment and to determine traffic performance indicators. Data was obtained from OMC for a period of a year. The OMC is in-built within the mobile communication network, that help to monitor and measure all the entire event in the mobile communication system. The obtained data was analyzed using excel package to determine the busy hour which was observed to be 19:00 (7.00pm) shown in figure 2.1 to figure 2.6 the call intensity for various days of the week is as followed, Monday with the highest call intensity, 26,492, followed by Friday with 23,138, Tuesday with 19,080, Wednesday with 17,892, Thursday with 16,467, Saturday with 15,491 and Sunday with 12,119.

Index terms—

1 INTRODUCTION

Recent time, the world has witnessed different standards of mobile communication network, ranging from second generation (2G) to third generation (3G) standards. What gave room to this change is human quest to have better coverage quality, Grade of Service (GOS) and capacity (Gunner, 1998).

Despite all these evolution from one stage to another, mobile communication subscribers, still have some difficulties when making calls or initiating calls during some particular period of time. For us to determine the performance of the mobile communication, the grade of service must be determined, firstly the peak busy hour must also be determine, the peak busy hour it is the given period within a day that bears the highest traffic intensity. The 'peak busy hour' traffic is use to determine the equipment quantities of the network. The reason to use busy hour traffic is that this period usually has the highest amount of blocked or lost calls. If the dimensioning of equipment at this period is correct and blocked calls can be minimized, all other non-busy hour traffic should then be handled satisfactorily (Sanjay;2010).

The operation and maintenance centre (OMC), the OMC-counter is in-built inside the mobile communication system. These OMC-counter is used to measure the traffic variation on the traffic interfaces.

The operation and maintenance centre is subdivided into three. They are;

? Fault management? Configuration management ? Performance management

The performance management unit is responsible for monitoring the performance of all the event (activities). Example are, calls intensity, time duration per call and time duration per hour. Etc. the traffic activities is being handled by sub-section known as (PMR) performance management traffic recording unit (John;.

2 II. EXPERIMENTAL PROCEDURE

To determine the peak busy hour of traffic saturation in mobile communication network in Nigeria, we can measure traffic by three different methods, they are;

7 CALLS INTENSITY

43 ? Driving test ? Protocol analyzer ? OMC-counter (Operational and Maintenance Centre-Counter) (Gunner,
44 1998).

45 In this experiment we deployed the use of the OMC-counter for measurement, which is in-built in mobile
46 communication network, measurement have shown, that traffic is characterized by two major components they
47 are;

48 ?

49 3 DATA PRESENTATION

50 The data obtained from operation and maintenance centre was presented in the following table below:

51 4 RESULT ANALYSIS

52 The graphics below shows different peak busy hour of call intensity for various routes and six areas in Lagos
53 State from a leading Mobile Communication Network in Nigeria. Data obtained was simulated by Excel package
54 to obtain a resultant graphics.

55 The highest call intensity was also determined for days of the week. From table 1.2 the resultant output shows
56 that Monday has the highest call intensity, followed by Friday, Tuesday, Wednesday, Thursday, Saturday and
57 Sunday. Shown in figure 2.7. For easy comparison the bar chart was used for different days of the week. V.

58 5 DISCUSSION

59 The data obtained are represented in graphys for easy interpretation for various routes in fig. ??

60 6 CONCLUSION

61 From this thesis, the data was obtained from operation and maintenance centre (OMC-Counter). The data
62 obtained was analyzed by Excel package. It was observed that there are two active busy hour, they are 10:00 hr
63 and 19:00 hr. graphical representation of all the routes was shown in fig. ?? The call intensity for various days of
64 the week was examined. Monday with the highest call intensity 27,567, followed by Friday, Tuesday, Wednesday,
65 Thursday, Saturday and Sunday, shown in figure 2.7.

66 7 Calls Intensity

Series1 ¹ ²



Figure 1:

67

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S/NO	AREA	ROUTE ID	PEAK BUSY HOUR	ATTEMPT CALLS
1.	MUSHIN	BSC 0-10	19:00	1092
		BSC 1-10	19:00	818
		BSC 2-10	19:00	1511
2.	IKOTUN	BSC 0-10	20:00	858
		BSC 1-10	19:00	1218
		BSC 2-10	19:00	1915
3.	EJIGBO	BSC 0-10	20:00	672
		BSC 1-10	19:00	1083
		BSC 2-10	19:00	838
4.	APAPA	BSC 0-10	19:00	806
		BSC 1-10	15:00	1345
		BSC 2-10	11:00	666
5.	ALABA	BSC 0-10	20:00	247
		BSC 1-10	19:00	1071
		BSC 2-10	19:00	1337
6.	OYINGBO	BSC 0-10	19:00	1185
		BSC 1-10	19:00	847
		BSC 2-10	19:00	722

The above table have, different areas such are Mushin, Apapa, Alaba, Oyingbo, Ejigbo and Ikotun was consider in this research work due to their population intensity in Lagos.

Each area have a routes incorporated into 3 Base Station Controller (BSC). While 3 routes were consider under one base station controller (IBSC). The attempts calls for 24 hours, in each route are also recorded.

Figure 2: Table 1 .

1

S/No	Call Intensity Days of the Week	IV.
1.	Sunday	12,119
2.	Monday	26,492
3.	Tuesday	19,080
4.	Wednesday	17,892
5.	Thursday	16,467
6.	Friday	23,138
7.	Saturday	15,491

Figure 3: Table 1 .

VI.

Figure 4:

Figure 5:

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