

# Overview and Evaluation of Bluetooth wireless Technology

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## ARTICLE DETAILS

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## ABSTRACT

Bluetooth Network application is fast growing applications in sciences and engineering technologies because bluetooth network is low cost, low power wireless communication technology. Performance is one of the most important aspects concerned with the quality of software. Performance measurement bluetooth of computer and other system network is an essential task. Study the concept of measuring performance it helps to determine how the system is performing and approach needed to improve the performance. The Performance measurement tool has better performance with good scalability as well as resource sharing. These tools are useful for the measure the performance of the data transmitted between master & slave node using Bluetooth network. Design and Developed performance of data represented by Graphical method.

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## 1. Introduction

Bluetooth is a wireless technology use of low-power radio communications to link phones, computers and other network devices over short distances without wires. The name Bluetooth is borrowed from Harald Bluetooth, a king in Denmark more than 1,000 years ago. exchanging data over short distances from fixed and mobile devices, creating personal area networks. Bluetooth network is low cost, low power wireless communication technology, creating personal area networks. Wireless signals transmitted with Bluetooth cover short distances, typically up to 30 feet (10 meters). Bluetooth devices generally communicate at less than 1 Mbps.

Bluetooth networks is a dynamic topology called a piconet or PAN. A piconet contains one master node and up to 7 active slave nodes. All transmissions among Bluetooth devices in the same piconet are supervised by the master node operating over a channel-hopping sequence generated from the master's Bluetooth device address at a rate of 1,600 hops per second. Devices communicate using protocols that are part of the Bluetooth Specification. Definitions for multiple versions of the Bluetooth specification exist including versions 1.1, 1.2 and 2.0,3.0,4.0.

A personal area network consists of mater slave model. Master slave model provides simplicity for connection. However communication always takes place between slave and master. Slave to slave direct communication is not possible. Two slaves can communicate to each other through master. This adds extra data bit for master to carry out communication. Before data transmission starts connection has to be established between the devices. Performance is one of the most important concept of quality of software. There are variety of performance measurement of tools like Windows Performance Monitor Tool(WPM), NS-2,Netsim,OPENET are available. Using operating system windows 7/XP's built in performance tool to evaluate the performance. It helps to check various components of computer system and stores

output as (text, HTML, excel) data and display information in different ways.

It is capable to monitor servers, workstations, and network. Windows 7/XP's built in performance tool used to measure network performance. In software engineering, performance testing is testing that is performed to determine how fast some aspect of a system performs under a particular workload. It can also serve to validate and verify other quality attributes of the system such as scalability, reliability and resource usage. Resource sharing is very common in computer system. Resources are any physical or logical entity that software needs for its execution. Processor, memory and hard disk are the three basic components which affect the performance of a computer system. Here we concentrate on scalability and resource usage parameter. To check scalability and resource usage capability of developed tool consider three basic resources of computer system that is,1) Processor,2) Memory,3) Hard Disk.

To measure scalability and resource sharing parameters we use have used performance tool of windows 7/XP. The windows Task Manager provide a quick snapshot of system performance. A more robust system tool, the performance console, allows us to monitor a much longer list of performance metric than is available in windows Task Manager .We log performance data to disk files and export it to programs like Microsoft Excel for detailed analysis we set "alerts" that causes windows XP to take specific actions when performance threshold are crossed, and monitor remote systems as well as local machine.

## 2. Significance of the topic

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength microwave transmissions in the ISM band from 2400–2480 MHz) from fixed and mobile devices, creating personal area networks (PANs). Created by telecom vendor Ericsson in 1994, it was originally conceived as a wireless alternative to

RS-232 data cables. It can connect several devices, overcoming problems of synchronization. Using operating system windows 7/XP's built in performance tool to evaluate the performance. It helps to check various components of computer system and stores output as (text, HTML, excel) data and display information in different ways. The research will enhance learners focus study by Performance measurement of the Data Collection, Data Transformation and Data Visualization. To perform these steps windows 7/XP's performance tool is used. improving their data transmitting speed and Wireless signals transmitted with Bluetooth cover long distances, typically up to more than 30 feet (10 meters) .

### 3. Problem statement

This work will study techniques of performance measurement of data transmitting one device to other. Use of windows 7/XP's built in performance tool to evaluate the performance. It helps to check various components of computer system and stores output as text, HTML, excel data. These performance data distributed in statistical method such as Mean, Median, Mode, Variance, Standard Deviation. For Data visualization Microsoft Excel built in graph tool was used.

Experimental performance data is presented in graphical format against sampled interval or time. improving their data transmitting speed and Wireless signals transmitted with Bluetooth cover long distances .

### 4. Experimental study

Processor, memory and physical disk are essential components of computer system for performance measure. These factors influence structural characteristics of any software. To carry out an experiment we use a computer system with specifications Intel Core™2 CPU4400 @2.20 GHz, 2 GB of RAM and other Mobile device specification Nokia 7210 Supernova java based of 2.5 bluetooth configuration used for case study.

During experiment counter log file stores values at the interval of five second for defined counters. In this table obtained 7 counter selected such as time, Available Bytes, Pages/sec, Avg. Disk Queue Length, Avg. Disk sec/Transfer, % Processor Time, % User Time. Following table contained 20 readings as shown in Table I & II below -

Obs.No	Time	Available Bytes	Pages/Sec	Avg. Disk Queue Length
1	58:43.7	1695780864	0.605631	0.114961
2	58:48.8	1696378880	0.599092	0.252436
3	58:53.7	1695936512	0.80129	0.154547
4	58:58.8	1696194560	0.199693	0.056015
5	59:03.7	1696120832	0.6009	0.226883
6	59:08.7	1695924224	0.798877	0.145618
7	59:13.7	1695891456	0.801192	0.11875
8	59:18.7	1695756288	0.399429	0.114985
9	59:23.7	1700716544	0.801288	0.078746
10	59:28.7	1702195200	0	0.07203
11	59:33.7	1702170624	0.801243	0.089844
12	59:38.7	1702240256	0.199687	0.089284
13	59:43.7	1702064128	1.202052	0.127664
14	59:48.7	1702039552	0.798771	0.055236
15	59:53.7	1703030784	0.600967	0.048097
16	59:58.7	1702248448	0.399395	0.049904
17	00:03.7	1702166528	1.201924	0.049179
18	00:08.7	1703108608	0.59908	0.132598
19	00:13.7	1702731776	0.60097	0.061639
20	00:18.7	1703084032	0.599071	0.048007

Table II Performance of Data

Obs.No	Time	Avg. Disk sec/Transfer	%Processor Time	%User Time
1	58:43.7	0.017281825	65.09418	12.26421
2	58:48.8	0.022983631	62.92818	11.52653
3	58:53.7	0.022691187	58.28106	11.71881
4	58:58.8	0.025499968	59.96866	10.43618
5	59:03.7	0.020592727	59.84356	11.56255
6	59:08.7	0.034723822	61.99359	10.28042

7	59:13.7	0.017963628	59.37481	11.25005
8	59:18.7	0.023032007	60.43595	11.21501
9	59:23.7	0.028078588	62.65608	11.25005
10	59:28.7	0.036069973	65.4204	15.10911
11	59:33.7	0.034499997	60.78107	9.843795
12	59:38.7	0.019439136	61.68206	9.501603
13	59:43.7	0.031864996	60.93732	8.125038
14	59:48.7	0.023050015	61.37054	9.657366
15	59:53.7	0.030012505	61.87482	10.7813
16	59:58.7	0.031237474	59.03408	8.255491
17	00:03.7	0.027277792	61.87482	8.437539
18	00:08.7	0.024592586	61.37054	9.501601
19	00:13.7	0.027972749	58.90606	10.1563
20	00:18.7	0.026711119	59.34561	8.722782

**5. Performing data analysis using graphical method**

Performance analysis data determined as graphical . Performance analysis of the developed tool is divided into three basic steps: Data Collection, Data Transformation and Data Visualization. To perform these steps windows XP's performance tool is used. Data is collected in log file during counters shown in Table I & II.

Performance data is stored at the location C:/PerfLogs. Collected performance data can be export to the Excel file. Built in Excel data transformation techniques are used to reduce size of experimental data. For Data visualization Microsoft Excel built in graph tool is used. Experimental performance data is presented in graphical format against sampled interval.

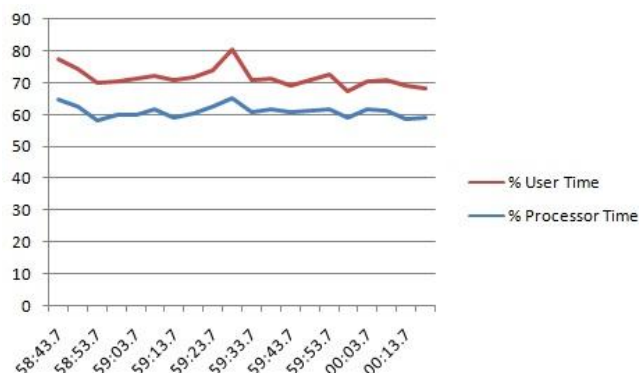
**Graphical Represent data:**

Graphical representation of Data in following fig.



The above fig. show that x-axis obtaining Pages/sec and y-axis are time above fig. shows that data transmitted speed of pages/sec.

Fig. following shows that Time vs % User Time & %Processor Time measured by approximately. The graph shows that % user time & % Processor Time same data determined .



**6. Conclusion**

Performance measurement of the data transmission in bluetooth network. Resources like memory, processor and hard disk are used to measured performance of data transmitted. Data analysis using by the method of Graphical method. To study and understand the concept of measuring performance tools, then improving their data transmitting speed and Wireless signals transmitted with Bluetooth cover long distances .

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