

INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

I
J
R
C
M



A Monthly Double-Blind Peer Reviewed (Refereed/Juried) Open Access International e-Journal - Included in the International Serial Directories

Indexed & Listed at:

Ulrich's Periodicals Directory ©, ProQuest, U.S.A., EBSCO Publishing, U.S.A., Cabell's Directories of Publishing Opportunities, U.S.A.

Open J-Gate, India [link of the same is duly available at Inlibnet of University Grants Commission (U.G.C.)].

Index Copernicus Publishers Panel, Poland with IC Value of 5.09 & number of libraries all around the world.

Circulated all over the world & Google has verified that scholars of more than 2980 Cities in 165 countries/territories are visiting our journal on regular basis.

Ground Floor, Building No. 1041-C-1, Devi Bhawan Bazar, JAGADHRI – 135 003, Yamunanagar, Haryana, INDIA

<http://ijrcm.org.in/>

CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	HUMAN RESOURCE MANAGEMENT PRACTICES IN HOSPITALS <i>THOTA AMRUTHA VALLI & T. SUBBARAYUDU</i>	1
2.	INVENTORY MODELS FOR DETERIORATING ITEMS WITH STOCK DEPENDENT PRODUCTION AND DEMAND RATES HAVING WEIBULL DECAY <i>ESSEY KEBEDE MULUNEH & K. SRINIVASA RAO</i>	4
3.	CHALLENGES BEFORE BUSINESS EDUCATION IN INDIA <i>DR. SONAL SHARMA & DR. M. K. SINGH</i>	18
4.	MULTI-CORE PROGRAMMING PERFORMANCE AND ANALYZES <i>AJITKUMAR M. PUNDGE, DR. PRAPTI DESHMUKH, SANJAY AZADE & SATISH SANKAYE</i>	22
5.	STUDY ON STREET LIGHTS EXECUTION USING SIMULATION MODEL WITH EXCLUSIVE FOCUS ON ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS <i>ROOPSINGH TAKUR & KARUPPASAMY PANDIAN SP</i>	25
6.	EFFICIENT VIDEO TRANSMISSION FOR WIRELESS COMMUNICATION NETWORKS USING ZIGBEE PROTOCOL <i>MEENAKSHI.S, RAJKUMAR.S & S.MUTHUKUMARASAMY</i>	29
7.	WIRELESS COMMUNICATION <i>K. KRISHNAVENI</i>	33
8.	SPIRAL SECURITY MODEL TO COUNTER THE THREATS DUE TO HUMAN FACTORS IN WEB APPLICATIONS <i>BISWAJIT TRIPATHY & JIBITESH MISHRA</i>	36
9.	AN EFFICIENT METHOD FOR IMAGE RESTORATION FROM MOTION BLUR AND ADDITIVE WHITE GAUSSIAN DENOISING USING FUZZY DE-NOISING AND RICHARDSON LUCY DECONVOLUTION <i>N. UMADEVI & R. SUDHAMATHI</i>	40
10.	STUDY OF LITERATURE FOR EFFECTIVE BUSINESS COMMUNICATION <i>DR. PAWAN KUMAR SHARMA</i>	43
11.	A PROCEDURAL APPROACH TO BRANDING HR <i>DR. KALPANA KONERU & HYMAVATHI CHUNDURI</i>	46
12.	BUYING BEHAVIOUR OF CONSUMERS WITH REGARD TO SOFT DRINKS WITH REFERENCE TO COIMBATORE CITY <i>DR. A. KUMUDHA & THILAGA. S</i>	52
13.	IMPACT OF GLOBAL FINANCIAL CRISIS ON THE FINANCIAL PERFORMANCE OF SELECTED PUBLIC SECTOR BANKS IN INDIA <i>DR. V. MOHANRAJ & S.GOMATHI</i>	57
14.	ELLIPTIC CURVE CRYPTOGRAPHY <i>SANJEEV & DR. NAVEEN VERMA</i>	62
15.	IMPACT OF STRESS ON ACADEMIC PERFORMANCE AMONG POST GRADUATE STUDENTS <i>NEELUFER ASLAM, DR. SRILEKHA GOVEAS & SUMI THOMAS</i>	66
16.	THE NEXT BIG THING IN COMPUTING IS CLOUD COMPUTING: AN INTRODUCTION, CONCEPT AND ISSUES <i>C.VENISH RAJA & A.PAPPU RAJAN</i>	71
17.	ADOPTION OF CONTEMPORARY COST MANAGEMENT TECHNIQUES FOR BETTER MANAGEMENT OF COSTS <i>MANMEET KAUR & RAVINDER KAUR</i>	74
18.	JOB SATISFACTION AMONG THE EMPLOYEES OF INSURANCE SECTOR: A STUDY OF SELECTED PRIVATE INSURANCE COMPANIES IN RAJASTHAN <i>SHUBHASHREE SHARMA</i>	79
19.	CORPORATE FUNDING OF POLITICAL PARTIES UNDER NEW COMPANY LAW <i>MINNY NARANG</i>	84
20.	SIGFREE WITH EXTENDED INSTRUCTION SEQUENCE GRAPH FOR DATA FLOW ANOMALY AND PROXY <i>SHAIK SHAFIA</i>	91
21.	A STUDY ON CHALLENGES OF INDIAN HOSPITALITY INDUSTRY AND REMEDIES FOR SUSTAINABILITY IN THE EVER CHANGING MARKET SCENARIO <i>USHA DINAKARAN</i>	101
22.	A STUDY ON PERFORMANCE EVALUATION OF PUBLIC & PRIVATE SECTOR MUTUAL FUNDS IN INDIA <i>DR. BHUPENDRA SINGH HADA</i>	106
23.	DETERMINANTS OF RURAL HOUSEHOLDS LOAN REPAYMENT PERFORMANCE, IN OROMIA NATIONAL REGIONAL STATE: THE CASE OF DODOTA WODEDA <i>SOLOLOMON ALEMU & ADDISU BAJIRA</i>	112
24.	AN ANALYSIS OF CELEBRITY ENDORSEMENT IN INDIA REGIONAL VS. NATIONAL CELEBRITIES <i>CHARUL CHATURVEDI & DR. SUMAN PATHAK</i>	119
25.	TERRITORIAL ACCOMMODATION OF ETHNIC CONFLICT AND ITS NEXUS WITH POST CONFLICT STATE BUILDING AND PEACE <i>BEDASA TECHAN TEFERA</i>	124
26.	GREEN BANKING SERVICES FOR SUSTAINABILITY <i>VIJAY PULICHERI & SANGEPU RAJASHEKHAR</i>	132
27.	IMPLEMENTATION OF DIRECT TAX CODE (DTC): PROBLEMS AND PROSPECTS <i>AKSHATHA B.G.</i>	136
28.	SERVICE QUALITY AND CUSTOMER SATISFACTION OF PEOPLE'S BANK IN JAFFNA DISTRICT <i>K.THARMILA</i>	142
29.	STAFF DEVELOPMENT FOR AUSTRALIAN HEALTHCARE PROFESSIONALS <i>DR. DAVID JOSEPH PEREIRA</i>	150
30.	HYBRID SCHEDULING ALGORITHM FOR WIMAX- PBDRR <i>UMESH SINGH VISEN</i>	153
	REQUEST FOR FEEDBACK & DISCLAIMER	156

CHIEF PATRON

PROF. K. K. AGGARWAL

Chairman, Malaviya National Institute of Technology, Jaipur

(An institute of National Importance & fully funded by Ministry of Human Resource Development, Government of India)

Chancellor, K. R. Mangalam University, Gurgaon

Chancellor, Lingaya's University, Faridabad

Founder Vice-Chancellor (1998-2008), Guru Gobind Singh Indraprastha University, Delhi

Ex. Pro Vice-Chancellor, Guru Jambheshwar University, Hisar

FOUNDER PATRON

LATE SH. RAM BHAJAN AGGARWAL

Former State Minister for Home & Tourism, Government of Haryana

Former Vice-President, Dadri Education Society, Charkhi Dadri

Former President, Chinar Syntex Ltd. (Textile Mills), Bhiwani

CO-ORDINATOR

DR. SAMBHAV GARG

Faculty, Shree Ram Institute of Business & Management, Urjani

ADVISORS

DR. PRIYA RANJAN TRIVEDI

Chancellor, The Global Open University, Nagaland

PROF. M. S. SENAM RAJU

Director A. C. D., School of Management Studies, I.G.N.O.U., New Delhi

PROF. S. L. MAHANDRU

Principal (Retd.), Maharaja Agrasen College, Jagadhri

EDITOR

PROF. R. K. SHARMA

Professor, Bharti Vidyapeeth University Institute of Management & Research, New Delhi

EDITORIAL ADVISORY BOARD

DR. RAJESH MODI

Faculty, Yanbul Industrial College, Kingdom of Saudi Arabia

PROF. PARVEEN KUMAR

Director, M.C.A., Meerut Institute of Engineering & Technology, Meerut, U. P.

PROF. H. R. SHARMA

Director, Chhatrapati Shivaji Institute of Technology, Durg, C.G.

PROF. MANOHAR LAL

Director & Chairman, School of Information & Computer Sciences, I.G.N.O.U., New Delhi

PROF. ANIL K. SAINI

Chairperson (CRC), Guru Gobind Singh I. P. University, Delhi

PROF. R. K. CHOUDHARY

Director, Asia Pacific Institute of Information Technology, Panipat

DR. ASHWANI KUSH

Head, Computer Science, University College, Kurukshetra University, Kurukshetra

DR. BHARAT BHUSHAN

Head, Department of Computer Science & Applications, Guru Nanak Khalsa College, Yamunanagar

DR. VIJAYPAL SINGH DHAKA

Dean (Academics), Rajasthan Institute of Engineering & Technology, Jaipur

DR. SAMBHAVNA

Faculty, I.I.T.M., Delhi

DR. MOHINDER CHAND

Associate Professor, Kurukshetra University, Kurukshetra

DR. MOHENDER KUMAR GUPTA

Associate Professor, P.J.L.N. Government College, Faridabad

DR. SAMBHAV GARG

Faculty, Shree Ram Institute of Business & Management, Urjani

DR. SHIVAKUMAR DEENE

Asst. Professor, Dept. of Commerce, School of Business Studies, Central University of Karnataka, Gulbarga

DR. BHAVET

Faculty, Shree Ram Institute of Business & Management, Urjani

ASSOCIATE EDITORS

PROF. ABHAY BANSAL

Head, Department of Information Technology, Amity School of Engineering & Technology, Amity University, Noida

PROF. NAWAB ALI KHAN

Department of Commerce, Aligarh Muslim University, Aligarh, U.P.

ASHISH CHOPRA

Sr. Lecturer, Doon Valley Institute of Engineering & Technology, Karnal

TECHNICAL ADVISOR

AMITA

Faculty, Government M. S., Mohali

FINANCIAL ADVISORS

DICKIN GOYAL

Advocate & Tax Adviser, Panchkula

NEENA

Investment Consultant, Chambaghat, Solan, Himachal Pradesh

LEGAL ADVISORS

JITENDER S. CHAHAL

Advocate, Punjab & Haryana High Court, Chandigarh U.T.

CHANDER BHUSHAN SHARMA

Advocate & Consultant, District Courts, Yamunanagar at Jagadhri

SUPERINTENDENT

SURENDER KUMAR POONIA

CALL FOR MANUSCRIPTS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the areas of Computer Science & Applications; Commerce; Business; Finance; Marketing; Human Resource Management; General Management; Banking; Economics; Tourism Administration & Management; Education; Law; Library & Information Science; Defence & Strategic Studies; Electronic Science; Corporate Governance; Industrial Relations; and emerging paradigms in allied subjects like Accounting; Accounting Information Systems; Accounting Theory & Practice; Auditing; Behavioral Accounting; Behavioral Economics; Corporate Finance; Cost Accounting; Econometrics; Economic Development; Economic History; Financial Institutions & Markets; Financial Services; Fiscal Policy; Government & Non Profit Accounting; Industrial Organization; International Economics & Trade; International Finance; Macro Economics; Micro Economics; Rural Economics; Co-operation; Demography; Development Planning; Development Studies; Applied Economics; Development Economics; Business Economics; Monetary Policy; Public Policy Economics; Real Estate; Regional Economics; Political Science; Continuing Education; Labour Welfare; Philosophy; Psychology; Sociology; Tax Accounting; Advertising & Promotion Management; Management Information Systems (MIS); Business Law; Public Responsibility & Ethics; Communication; Direct Marketing; E-Commerce; Global Business; Health Care Administration; Labour Relations & Human Resource Management; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; International Relations; Human Rights & Duties; Public Administration; Population Studies; Purchasing/Materials Management; Retailing; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Technology/Innovation; Tourism & Hospitality; Transportation Distribution; Algorithms; Artificial Intelligence; Compilers & Translation; Computer Aided Design (CAD); Computer Aided Manufacturing; Computer Graphics; Computer Organization & Architecture; Database Structures & Systems; Discrete Structures; Internet; Management Information Systems; Modeling & Simulation; Neural Systems/Neural Networks; Numerical Analysis/Scientific Computing; Object Oriented Programming; Operating Systems; Programming Languages; Robotics; Symbolic & Formal Logic; Web Design and emerging paradigms in allied subjects.

Anybody can submit the **soft copy** of unpublished novel; original; empirical and high quality **research work/manuscript anytime** in **M.S. Word format** after preparing the same as per our **GUIDELINES FOR SUBMISSION**; at our email address i.e. infoijrcm@gmail.com or online by clicking the link **online submission** as given on our website ([FOR ONLINE SUBMISSION, CLICK HERE](#)).

GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. **COVERING LETTER FOR SUBMISSION:**

DATED: _____

THE EDITOR
IJRCM

Subject: SUBMISSION OF MANUSCRIPT IN THE AREA OF

(e.g. Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/Engineering/Mathematics/other, please specify)

DEAR SIR/MADAM

Please find my submission of manuscript entitled '_____ ' for possible publication in your journals.

I hereby affirm that the contents of this manuscript are original. Furthermore, it has neither been published elsewhere in any language fully or partly, nor is it under review for publication elsewhere.

I affirm that all the author (s) have seen and agreed to the submitted version of the manuscript and their inclusion of name (s) as co-author (s).

Also, if my/our manuscript is accepted, I/We agree to comply with the formalities as given on the website of the journal & you are free to publish our contribution in any of your journals.

NAME OF CORRESPONDING AUTHOR:

Designation:
Affiliation with full address, contact numbers & Pin Code:
Residential address with Pin Code:
Mobile Number (s):
Landline Number (s):
E-mail Address:
Alternate E-mail Address:

NOTES:

- a) The whole manuscript is required to be in **ONE MS WORD FILE** only (pdf. version is liable to be rejected without any consideration), which will start from the covering letter, inside the manuscript.
- b) The sender is required to mention the following in the **SUBJECT COLUMN** of the mail:
New Manuscript for Review in the area of (Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/Engineering/Mathematics/other, please specify)
- c) There is no need to give any text in the body of mail, except the cases where the author wishes to give any specific message w.r.t. to the manuscript.
- d) The total size of the file containing the manuscript is required to be below **500 KB**.
- e) Abstract alone will not be considered for review, and the author is required to submit the complete manuscript in the first instance.
- f) The journal gives acknowledgement w.r.t. the receipt of every email and in case of non-receipt of acknowledgment from the journal, w.r.t. the submission of manuscript, within two days of submission, the corresponding author is required to demand for the same by sending separate mail to the journal.

2. **MANUSCRIPT TITLE:** The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.

3. **AUTHOR NAME (S) & AFFILIATIONS:** The author (s) **full name, designation, affiliation (s), address, mobile/landline numbers, and email/alternate email address** should be in italic & 11-point Calibri Font. It must be centered underneath the title.

4. **ABSTRACT:** Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain the background, aims, methods, results & conclusion in a single para. Abbreviations must be mentioned in full.

5. **KEYWORDS:** Abstract must be followed by a list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.
6. **MANUSCRIPT:** Manuscript must be in **BRITISH ENGLISH** prepared on a standard A4 size **PORTRAIT SETTING PAPER**. It must be prepared on a single space and single column with 1" margin set for top, bottom, left and right. It should be typed in 8 point Calibri Font with page numbers at the bottom and centre of every page. It should be free from grammatical, spelling and punctuation errors and must be thoroughly edited.
7. **HEADINGS:** All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.
8. **SUB-HEADINGS:** All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.
9. **MAIN TEXT:** The main text should follow the following sequence:

INTRODUCTION**REVIEW OF LITERATURE****NEED/IMPORTANCE OF THE STUDY****STATEMENT OF THE PROBLEM****OBJECTIVES****HYPOTHESES****RESEARCH METHODOLOGY****RESULTS & DISCUSSION****FINDINGS****RECOMMENDATIONS/SUGGESTIONS****CONCLUSIONS****SCOPE FOR FURTHER RESEARCH****ACKNOWLEDGMENTS****REFERENCES****APPENDIX/ANNEXURE**

It should be in a 8 point Calibri Font, single spaced and justified. The manuscript should preferably not exceed **5000 WORDS**.

10. **FIGURES & TABLES:** These should be simple, crystal clear, centered, separately numbered & self explained, and **titles must be above the table/figure. Sources of data should be mentioned below the table/figure.** It should be ensured that the tables/figures are referred to from the main text.
11. **EQUATIONS:** These should be consecutively numbered in parentheses, horizontally centered with equation number placed at the right.
12. **REFERENCES:** The list of all references should be alphabetically arranged. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow **Harvard Style of Referencing**. The author (s) are supposed to follow the references as per the following:
 - All works cited in the text (including sources for tables and figures) should be listed alphabetically.
 - Use **(ed.)** for one editor, and **(ed.s)** for multiple editors.
 - When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order.
 - Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
 - The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
 - For titles in a language other than English, provide an English translation in parentheses.
 - The location of endnotes within the text should be indicated by superscript numbers.

PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:**BOOKS**

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19-22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 <http://epw.in/user/viewabstract.jsp>

HYBRID SCHEDULING ALGORITHM FOR WIMAX- PBDRR

UMESH SINGH VISEN
STUDENT
BANSAL INSTITUTE OF SCIENCE AND TECHNOLOGY
BHOPAL

ABSTRACT

Worldwide Interoperability for Microwave Access (Wi-MAX) networks were expected to be the main Broadband Wireless Access(BWA) technology that provided several services such as data, voice, and video services including different classes of Quality of Services (QoS), which in turn were defined by IEEE 802.16 standard. Scheduling in WiMAX became one of the most challenging issues, since it was responsible for distributing available resources of the network among all users; this led to the demand of constructing and designing high efficient scheduling algorithms in order to improve the network utilization, to increase the network throughput, and to minimize the end-to-end delay. In this study, we present a simulation study to measure the performance of several scheduling algorithms in WiMAX, which were Strict Priority algorithm, Round-Robin (RR), Weighted Round Robin (WRR), Weighted Fair Queuing (WFQ) Algorithm.

JEL CODE

C63

KEYWORDS

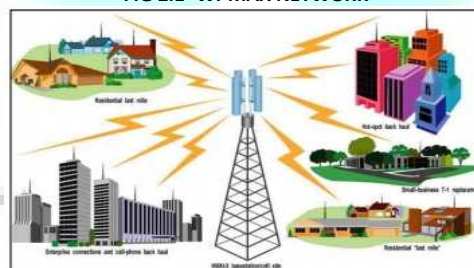
IEEE802.16, Packet, QoS, Scheduling, WiMAX.

1- INTRODUCTION

WiMAX (Worldwide Interoperability for Microwave Access), is a cell-based technology aimed at providing last-mile wireless broadband access at a cheaper cost [1]. The "last mile" is the final leg of delivering connectivity from the service provider to the customer. This leg is typically seen as an expensive undertaking because of the considerable costs of wires and cables. The core of WiMAX technology is specified by the IEEE 802.16 standard that provides specifications for the Medium Access Control (MAC) and Physical (PHY) layers. The term WiMAX was created by the WiMAX forum that promotes conformance and interoperability of the standard. Wireless Broadband (WiBRO) is a technology developed by the Korean telecommunications industry that mirrors the specifications of the IEEE 802.16 standard. Efforts are already underway to define interoperability of WiMAX and WiBRO equipment. Broadband wireless networks (including WiMAX) can be categorized into a single hop, a single-hop network contains a central entity such as a Base Station (BS) that makes and delivers decisions to all the nodes such as Subscriber Stations (SSs) in its cell. A cell is a basic geographic unit of a cellular system.

2- REVIEW OF LITURATURE**2.1- WIMAX ARCHITECTURE**

WiMAX based on the standard IEEE 802.16, which consist of one Base Station (BS) and one or more Subscriber Stations (SSs), as shown in Figure 1, the BS is responsible for data transmission from SSs through two operational modes: Mesh and Point-to-multipoint (PMP), this transmission can be done through two independent channels: the Downlink Channel (from BS to SS) which is used only by the BS, and the Uplink Channel (from SS to BS) which is shared between all SSs, in Mesh mode, SS can communicate by either the BS or other SSs, in this mechanism the traffic can be routed not only by the BS but also by other SSs in the network, this means that the uplink and downlink channels are defined as traffic in both directions; to and from the BS. In the PMP mode, SSs can only communicate through the BS, which makes the provider capable of monitor the network environment to guarantee the Quality of Service QoS to the customer sired at intermediate SSs that will relay information to other SSs that are not in direct contact with the BS.

FIG 2.1 -WI-MAX NETWORK**3- IMPORTANCE OF STUDY****3.1- IEEE 802.16 QoS SERVICE CLASSES**

The IEEE 802.16-2004 standard [1] specifies the provision of four scheduling services:

- **Unsolicited Grant Service (UGS):** This scheduling service is designed to support applications that generate fixed-size data packets periodically such as T1/E1 and VoIP without silence suppression.
- **Real-time Polling Service (rtPS):** This scheduling service is designed to support real time applications that generate variable size packets on a periodic basis such as MPEG video or VoIP with silence suppression.
- **Non real-time Polling Service (nrtPS):** nrtPS is designed to support non-real time applications that require variable size data grant bursts on a regular basis. This scheduling service supports applications that are delay tolerant but may need high throughput such as File Transfer Protocol (FTP) applications [5].
- **Best Effort (BE):** This traffic class contains applications such as telnet or World Wide Web (WWW) access that do not require any QoS guarantee.

4- OBJECTIVE**SCHEDULING ALGORITHMS**

Scheduling algorithms are responsible for Distributing resources among all users in the network, and provide them with a higher QoS. Users request different classes of service that may have different requirements (such as bandwidth and delay), so the main goal of any scheduling algorithm is to maximize the network utilization and achieve fairness among all users.

4.1- STRICT PRIORITY (SP)

Strict-Priority packets are first classified by the scheduler according to the QoS class and then placed into different priority queues. It services the highest priority queue until it is empty, and then moves to the next highest priority queue. This mechanism could cause bandwidth starvation for the low priority QoS classes [8].

4.2- ROUND ROBIN (RR)

It serves each priority queue, starting with the highest priority queue that contains packets, services a single packet, and moves to the next lower priority queue that contains packets, servicing a single packet from each, until each queue with packets has been serviced once. It then starts the cycle over with the highest priority queue containing packets [10].

4.3- WEIGHTED ROUND ROBIN (WRR)

Packets are first classified into various service classes and then assigned a queue that can be assigned a different percentage of bandwidth and is serviced in round robin order. WRR ensures that all service classes have access to at least some configured amount of network bandwidth to avoid bandwidth starvation. In order to provide the correct percentage of bandwidth to each class if only all of the packets in all queues are the same size or when the mean packet size is known in advance [5].

4.4- WEIGHTED FAIR QUEING (WFQ)

WFQ is a data packet scheduling technique which is used for various size packets. It allows different scheduling priorities to statistically multiplexed data flows and provides the priority to traffic that automatically sorts among individual traffic streams without the requirement of an access list. If N data flows currently are active, with weights w_1, w_2, \dots, w_N , data flow number i then average data rate can be achieved as shown in equation [1].

$$\frac{Rw_i}{(w_1 + w_2 + \dots + w_N)} \quad (1)$$

By regulating the WFQ weights dynamically, it can be utilized for controlling the quality of service, for example to achieve guaranteed data rate. WFQ gives each flow different weight to have different bandwidth percentage in a way that preventing monopolization of the bandwidth by some flows providing fair scheduling for the different flows [5].

5. SIMULATION AND RESULT

The proposed SS-assisted scheduling algorithm was simulated under the Network Simulator NS-3.17 [19] using first a network topology consisting of 02 SS nodes interconnected through a single BS node. Then, the number of SSs was varied to test the scalability of the proposed approach.

The following parameters are used in scenario:

- ❖ Bottleneck-link-delay – 1 ms
- ❖ Bottleneck Bandwidth – 10 Mbps
- ❖ Transport protocol type – UDP/TCP
- ❖ routing protocol – DSDV
- ❖ Packet size of UDP/TCP – 1500 bytes
- ❖ Scheduler – PBDRR
- ❖ Simulation Duration - 100 sec
- ❖ Modulation – OFDM 64 QAM
- ❖ Coverage area of base station – 500 m radius
- ❖ Other parameters used in queue scheduling schemes are set to the default values

FIG 5.1: SHOWS SIMULATION OF 3 NODES

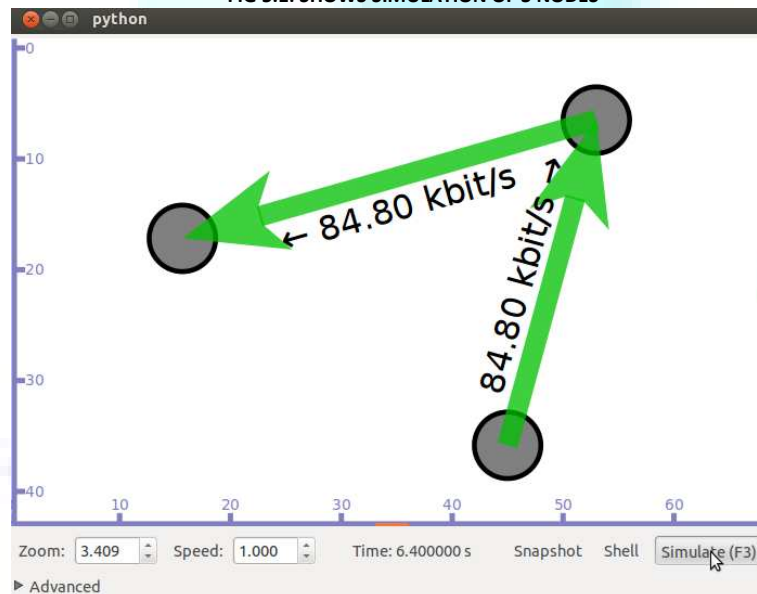


FIG 5.2: SHOWS RESULTS USING NS3

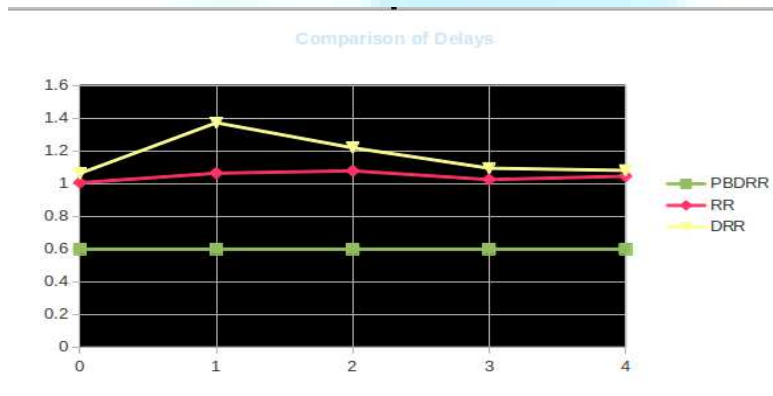
```

umesh@umesh-HP-630: ~/ns/ns-allinone-3.17/ns-3.17
TraceDelay: RX 378 bytes from 12.1.1.2 Sequence Number: 4 Uid: 11959 TXtime: +6040000000.0ns RXtime: +6099702981.0ns Delay: +59702981.0ns
TraceDelay: RX 1012 bytes from 12.1.1.2 Sequence Number: 1 Uid: 11956 TXtime: +6040000000.0ns RXtime: +6099703075.0ns Delay: +59703075.0ns
TraceDelay: RX 506 bytes from 12.1.1.2 Sequence Number: 2 Uid: 11957 TXtime: +6040000000.0ns RXtime: +6099703075.0ns Delay: +59703075.0ns
TraceDelay: RX 122 bytes from 12.1.1.2 Sequence Number: 3 Uid: 11958 TXtime: +6040000000.0ns RXtime: +6099703075.0ns Delay: +59703075.0ns
TraceDelay: RX 378 bytes from 12.1.1.2 Sequence Number: 4 Uid: 11959 TXtime: +6040000000.0ns RXtime: +6099703075.0ns Delay: +59703075.0ns
TraceDelay: RX 1012 bytes from 12.1.1.2 Sequence Number: 1 Uid: 11956 TXtime: +6040000000.0ns RXtime: +6099703120.0ns Delay: +59703120.0ns
TraceDelay: RX 506 bytes from 12.1.1.2 Sequence Number: 2 Uid: 11957 TXtime: +6040000000.0ns RXtime: +6099703120.0ns Delay: +59703120.0ns
TraceDelay: RX 122 bytes from 12.1.1.2 Sequence Number: 3 Uid: 11958 TXtime: +6040000000.0ns RXtime: +6099703120.0ns Delay: +59703120.0ns
TraceDelay: RX 378 bytes from 12.1.1.2 Sequence Number: 4 Uid: 11959 TXtime: +6040000000.0ns RXtime: +6099703120.0ns Delay: +59703120.0ns
Sent 765 bytes to 224.30.10.81
Sent 407 bytes to 224.30.10.81
Sent 504 bytes to 224.30.10.81
TraceDelay: RX 753 bytes from 12.1.1.2 Sequence Number: 5 Uid: 12376 TXtime: +6240000000.0ns RXtime: +6250336263.0ns Delay: +10336263.0ns
TraceDelay: RX 395 bytes from 12.1.1.2 Sequence Number: 6 Uid: 12377 TXtime: +62
    
```

TABLE 5.1: TABLE SHOWING COMPARISON BETWEEN DELAYS OF DIFFERENT SCHEDULING ALGORITHMS

S.No	PBDRR	RR	DRR
0	0.59762913	1.00421941	1.06123449
1	0.59762981	1.0625	1.371425571
2	0.59762075	1.07692308	1.217944718
3	0.59763075	1.02348993	1.093023256
4	0.5976312	1.04411765	1.079545455

FIG 5.3: ANALYSIS OF DELAY OF DIFFERENT SCHEDULING ALGORITHMS



6. CONCLUSIONS

In this proposed method PBDRR algorithm is implemented using ns3. We analysis delay at various packet size. As results shows delay between frames in minimum for PBDRR scheduling algorithm. In future work develop algorithm for mobile Wi-Max.

REFERENCES

1. IEEE 802.16 standard-Local and Metropolitan Area Networks –Part 16, IEEE Draft P802.16/D3-2001.
2. Jalali, A., Padovani, R. and Pankaj, R., "Data throughput of CDMA-HDR a high efficiency-high data rate personal communication wireless system," Proc. IEEE VTC pp. 1854–1858, 2000, Tokyo, Japan.
3. Liu, Q., Zhou, S. and Giannakis, G.B., "A Cross-layer scheduling Algorithm with QoS support in wireless networks," IEEE Transactions on vehicular Technology, vol. 55, No. 3, May, 2006.
4. Liu, C.L. and Layland, J.W., "Scheduling algorithms for multiprogramming in a hard real time environment", Journal of the Association for Computing Machinery, Vol.20, no. 1, pp. 44–61, Jan., 1973.
5. H. Kushner and P. Whiting, "Convergence of proportional- fair sharing algorithms under general conditions," IEEE Transactions on Wireless Communications, vol. 3, pp. 1250–1259, 2004.
6. H. Wang and V. B. Iversen, "Hierarchical Downlink Resource Management Framework for OFDMA Based WiMAX Systems," in IEEEWCNC Proceedings, 2008, pp. 1709–1715.
7. K. Wongthavarawat and A. Ganz, "Packet scheduling for QoS support in IEEE 802.16 broadband wireless access systems," International Journal of Communication Systems, vol. 16, pp. 81–96, 2012
8. Kim, Seungwoon and Yeom, Ikjun, "TCP-aware Uplink scheduling for IEEE 802.16". IEEE Communication Letter, Feb., 2007
9. M. Andrews, K. Kumaran, K. Ramanan, A. Stolyar, R. Vijayakumar, and P. Whiting, "CDMA QoS scheduling on the forward link with variable channel conditions," Bell Labs Technical Memo, Apr 2000.
10. C. Msadaa, Ikbal, Camara, Daniel, Filali, and Fethi, "Scheduling and CAC in IEEE 802.16 fixed BWNs: a comprehensive survey and taxonomy," in IEEE Communications Surveys and Tutorials, 2010, pp. 1991– 1996.

REQUEST FOR FEEDBACK

Dear Readers

At the very outset, International Journal of Research in Computer Application & Management (IJRCM) acknowledges & appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to request you to supply your critical comments and suggestions about the material published in this issue as well as on the journal as a whole, on our E-mail infoijrcm@gmail.com for further improvements in the interest of research.

If you have any queries please feel free to contact us on our E-mail infoijrcm@gmail.com.

I am sure that your feedback and deliberations would make future issues better – a result of our joint effort.

Looking forward an appropriate consideration.

With sincere regards

Thanking you profoundly

Academically yours

Sd/-

Co-ordinator

DISCLAIMER

The information and opinions presented in the Journal reflect the views of the authors and not of the Journal or its Editorial Board or the Publishers/Editors. Publication does not constitute endorsement by the journal. Neither the Journal nor its publishers/Editors/Editorial Board nor anyone else involved in creating, producing or delivering the journal or the materials contained therein, assumes any liability or responsibility for the accuracy, completeness, or usefulness of any information provided in the journal, nor shall they be liable for any direct, indirect, incidental, special, consequential or punitive damages arising out of the use of information/material contained in the journal. The journal, nor its publishers/Editors/Editorial Board, nor any other party involved in the preparation of material contained in the journal represents or warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such material. Readers are encouraged to confirm the information contained herein with other sources. The responsibility of the contents and the opinions expressed in this journal is exclusively of the author (s) concerned.

ABOUT THE JOURNAL

In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

Our Other Journals

