IJRRECS/March 2014/Volume-2/Issue-3/2134-2139 **ISSN 2321-5461**

INTERNATIONAL JOURNAL OF REVIEWS ON RECENT ELECTRONICS AND COMPUTER SCIENCE

AN APPROACH TOWARDS PRICING UNDER CONTROL IN ACCESS NETWORKS

Kolluru Saranya[1], Y.Sankar Rao[2]

[1]**M.Tech Student, Dept of CSE, ST.Mary's Group of Institutions, Chebrolu, Guntur, A.P, India**

[2]**Assistant Professor, Dept of CSE, ST.Mary's Group of Institutions, Chebrolu, Guntur, A.P, India**

ABSTRACT:

Pricing can be described in the area of communication networks as the optimization-oriented intended for network resource distribution. The appropriate design of pricing turns out to be particularly challenging in the present days due to the exponential expansion of data volume in addition to applications in both networks of wire-line and wireless. Both complete information in addition to incomplete information scenarios were considered and intend various pricing schemes with different implementation complexity levels. The consequence of studying the complete information is two-fold and serves as the standard of realistic designs and provides significant insights for the analysis of incomplete information. In networks of wireless communication, the scheme of usage-based pricing seems to turn out to be increasingly accepted due to the rapid expansion of wireless data traffic. Besides the scheme of single pricing, it is also probable to devise schemes of differentiation pricing under imperfect information.

Keywords: Wireless data, Single pricing, Usage-based pricing, Network distribution.

1. INTRODUCTION:

The optimization-oriented prices in quite a lot of network utility maximization formulations frequently correspond to the Lagrangian multipliers of a variety of resource constraints and are used to organize different network entities to accomplish the performance of maximum system in a distributed manner [4]. Revenue maximization problem of a monopolist service provider facing numerous groups of users was studied. Besides complete

information, incomplete information scenarios were considered and intend various pricing schemes with different implementation complexity levels. To make the most of the surplus, which is the dissimilarity among its utility in addition to payment each user concludes its optimal resource demand [8]. To a more common nonlinear pricing case with the imperfect network information circumstances the study was expanded. In wireless communication networks, the scheme of usage-based pricing seems to turn out to be increasingly accepted due to the rapid expansion of wireless data traffic. The service provider selects the pricing schemes to make the most of his revenue, subject to a restricted resource [1]. The scheme of single pricing under imperfect information was discussed by them by means of a continuum distribution of types of user. Unlike several preceding works that considered a scheme of flat-fee pricing where the payment does not relies on the resource consumption, the problem of revenue maximization with the linear schemes of usage-based pricing, was studies where a user's total expense is linearly proportional to allotted resource [11]. Besides higher maintenance expenditure, schemes of complex pricing are not customer friendly and put off customers from making use of the services. Uppermost possible revenue accomplishment often with complex pricing schemes require knowing each customer information, which can be challenging in networks of large scale communication. Besides the scheme of single pricing, it is also probable to devise schemes of differentiation pricing under imperfect information [3]. In the strategies of pricing on the interaction among various service providers embodied was focussed rather than the design of the pricing method. Pricing is significant for the design, function, and supervision of communication networks [14]. Network utility maximization structure was consequently developed to forward-engineer numerous novel network protocols.

2. METHODOLOGY:

Numerous sophisticated pricing mechanisms were introduced to extort surpluses from the consumers in addition to making best use of revenue for the providers. Pricing can be described in the area of communication networks as the optimization-oriented intended for network resource distribution and it is made popular by seminal work of Kelly's on the control of network congestion

[9]. An illustration of the effective market is shown in fig1. Information structures were considered such as complete information: in which the service provider identify function of each user's utility. Incomplete information: in which the service provider identifies the total groups, the number of users in each group and the utility function of every group [7]. It does not make out which user fit in to which group and such possibility in our discrete setting is equivalent to that the service provider makes out merely the users' types allocation in a continuum case. Pricing can be described in the area of communication networks as the optimization-oriented or economics-based [2]. The admission decisions intended for groups not in the effective market are inappropriate to the optimization, in view of the fact that those users put away zero resource. Complete Price differentiation difficulty is not simple to solve, in view of the fact that it is a non-convex optimization difficulty with a non-convex objective utility, a coupled constraint as well as integer variables [15]. It is possible to exchange it into a corresponding convex formulation all the way through a series of transformations, and consequently the difficulty can be solved resourcefully. The Complete Price differentiation scheme augments the revenue by means of charging the elevated willingness groups by means of high prices, consequently the revenue gain increases initially when the difference of willingness to pays augments [12]. In view of the fact that the service provider can make out different groups of users under complete information, it makes known the pricing and the decisions of admission control to various groups of users. Effective market notion was introduced which signifies all the groups owed nonzero resource [5]. In addition to higher maintenance expenditure, schemes of complex pricing are not customer friendly and put off customers from making use of the services. For the sub-problem of resource allocation the threshold explains the size of the effectual market. By means of indices all groups no larger than threshold are effective groups, and users within these groups as effective users [10]. It is probable to make the most of the revenue by means of charging a different price to every group of users in view of the fact that the service provider knows the effectiveness and the individuality of each user. A network was considered by means of a total amount of restricted resource that can be rate,

bandwidth, and time slot. To form the proportionally fair resource allotment in communication networks the logarithmic utility function is normally used. While the complete information is an extremely strong assumption, it is the mainly studied situation in the literature of network pricing. Significance of studying the complete information is two-fold and serves as the standard of realistic designs and provides significant insights for the analysis of incomplete information. All the way through long term annotations of an immobile user population statistical data can be obtained [6]. When the dissimilarity of willingness to pay is extremely huge, the scheme of complete price differentiation get hold of most revenue from the high eagerness to pay users. The schemes of pricing details rely on the data structure of the service provider. The scheme of single pricing, and the scheme of partial price differentiation to comprehend a required trade-off among the implementation complexity can be decided from the scheme of complete price differentiation in addition to the entire revenue [13]. Under imperfect information, it publishes a general price menu to all users, and permits users to generously decide a particular price alternative in this menu.

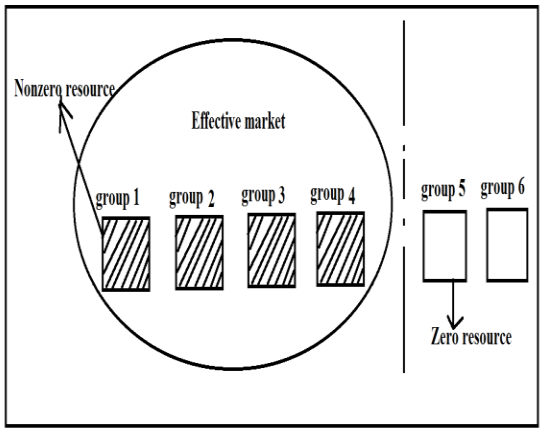

Fig1: An overview of 6-group example for the effective market

3. RESULTS:

Complete Price differentiation difficulty is not simple to solve in view of the fact that it is a non-convex optimization difficulty with a non-convex objective utility, a coupled constraint as well as integer variables. Complete Price differentiation get hold of most revenue from the high eagerness to pay users, when the dissimilarity of willingness to pay is extremely huge, while the Single Pricing scheme turns down the low eagerness to pay users however serves the high eagerness to pays only. Complete Price differentiation scheme augments the revenue by means of charging the elevated

willingness groups by means of high prices, consequently the revenue gain increases initially when the difference of willingness to pays augments. Both schemes lead to comparable resource allocation in this region, and consequently the revenue gain diminishes as the difference of eagerness to pays increases.

4. CONCLUSION:

Numerous sophisticated pricing mechanisms were introduced to extort surpluses from the consumers in addition to making best use of revenue for the providers. Pricing can be described as the economics-based which is applied by means of a network service provider to a variety of objectives together with maximization of revenue. Achieving the uppermost possible revenue often with complex pricing schemes require knowing each customer information, which can be challenging in networks of large scale communication.

REFERENCES:

[1] S. Shakkottai, R. Srikant, A. Ozdaglar, and D. Acemoglu, "The Price of Simplicity," IEEE Journal on Selected Areas in Communications, vol. 26, no. 7, pp. 1269–1276, 2008.

[2] S. Shakkottai and R. Srikant, "Economics of network pricing with multiple ISPs," IEEE/ACM Transactions on Networking, vol. 14, no. 6,pp. 1233–1245, 2006.

[3] F. Kelly, A. Maulloo, and D. Tan, "Rate control for communication networks: shadow prices, proportional fairness and stability," Journal of the Operational Research society, vol. 49, no. 3, pp. 237–252, 1998.

[4] C. Chau, Q. Wang, and D. Chiu, "On the viability of paris metro pricing for communication and service networks," in Proceedings of IEEE INFOCOM, 2010.

[5] K. Talluri and G. Van Ryzin, The Theory and Practice of Revenue Management, International Series in Operations, Research and Management Science, Vol. 68. Springer Verlag, 2005.

[6] H. Shen and T. Basar, "Optimal nonlinear pricing for a monopolistic network service provider with complete and incomplete information," IEEE Journal on Selected Areas in Communications, vol. 25, no. 6, pp. 1216–1223, 2007.

[7] V. Gajic, J. Huang, and B. Rimoldi, "Competition of wireless providers for atomic users: Equilibrium and social optimality," in Proceedings of Allerton Conference, 2009.

[8] P. Hande, M. Chiang, R. Calderbank, and J. Zhang, "Pricing under Constraints in Access Networks: Revenue Maximization and Congestion Management," in Proceedings of IEEE INFOCOM, 2010.

[9] D. Acemoglu, A. Ozdaglar, and R. Srikant, "The marginal user principle for resource allocation in wireless networks," in Proceedings of IEEE CDC, 2010.

[10] S. Kunniyur and R. Srikant, "End-to-end congestion control schemes: Utility functions, random losses and ECN marks," IEEE/ACM Transactions on Networking, vol. 11, no. 5, pp. 689–702, 2003.

[11] A. Daoud, T. Alpcan, S. Agarwal, and M. Alanyali, "A stackelberg game for pricing uplink power in wide-band cognitive radio networks," in Proceedings of IEEE CDC, 2008.

[12] L. Jiang, S. Parekh, and J. Walrand, "Time-Dependent Network Pricing and Bandwidth Trading," in Proceedings of IEEE Network Operations and Management Symposium Workshops, 2008.

[13] V. Valancius, C. Lumezanu, N. Feamster, R. Johari, and V. Vazirani, "How many tiers? pricing in the internet transit market," in Proceedings of ACM SIGCOMM, 2011.

[14] L. He and J.Walrand, "Pricing and revenue sharing strategies for internet service providers," IEEE Journal on Selected Areas in Communications, vol. 24, no. 5, pp. 942–951, 2006.

[15] M. Chiang, S. Low, A. Calderbank, and J. Doyle, "Layering as optimization decomposition: A mathematical theory of network architectures," Proceedings of the IEEE, vol. 95, pp. 255–312, 2007.