SAPTHAGIRI COLLEGE OF ENGINEERING

14/5, Chikkasandra, Hesaraghatta Main Road, Bangalore-560057

Department of Computer Science and Engineering

Certificate

Certified that the project work entitled **"COST-EFFECTIVE RESOURCE ALLOCATION OF OVERLAY ROUTING RELAY NODES"** carried out by **SUNITHA N NANDI (1SG11CS086), SUSHMA K (1SG11CS087), USHA B WALI (1SG11CS088), SOWMYA S (1SG10CS078),** bonafide students of **SAPTHAGIRI COLLEGE OF ENGINEERING,** in partial fulfillment for the award of **Bachelor of Engineering** in **Computer Science and Engineering** of **Visvesvaraya Technological University, Belgaum** during the academic year **2014-15.** It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said degree.

Madhushree 2/6/15	2/6/15	2/6/15
Signature of the Guide	**Signature of the HOD**	**Signature of the Principal**
Mrs.Madhushree	**Dr.C.M.Prashanth**	**Dr.Aswatha Kumar M**
Assistant Professor	Professor & Head	Principal

Name of the Examiners	**Signature with date**
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Abstract

Overlay routing is a very attractive scheme that allows improving certain properties of the routing (such as delay or TCP throughput) without the need to change the standards of the current underlying routing. However, deploying overlay routing requires the placement and maintenance of overlay infrastructure. This gives rise to the following optimization problem: Find a minimal set of overlay nodes such that the required routing properties are satisfied. In this paper, we rigorously study this optimization problem. We derive a nontrivial approximation algorithm for it, where the approximation ratio depends on specific properties of the problem at hand. We examine the practical aspects of the scheme by evaluating the gain one can get over several real scenarios. The first one is BGP routing, and we show, using up-to-date data reflecting the current BGP routing policy in the Internet, that a relative small number of less than 100 relay servers is sufficient to enable routing over shortest paths from a single source to all autonomous systems (ASs), reducing the average path length of inflated paths by 40%. We also demonstrate that the scheme is very useful for TCP performance improvement (results in an almost optimal placement of overlay nodes) and for Voice-over-IP (VoIP) applications where a small number of overlay nodes can significantly reduce the maximal peer-to-peer delay.