



Green Energy with OSPF Routing Protocol

Madhuri Dharanguttikar

PG Student, Department of Computer Engineering,
Sinhgad Technical Education Society's,
Smt. Kashibai Navale college of Engineering
Pune, Maharashtra, India

Prof. Sanjay Pingat

Asst. Prof. Department of Computer Engineering
Sinhgad Technical Education Society's,
Smt. Kashibai Navale college of Engineering
Pune, Maharashtra, India

Abstract: - We know that data centres and networking infrastructure require high performance and high availability machines for this devices more energy require. This problem can be solving by proposed system by minimizing the energy consumption. The proposed solution works on IP Network which provides energy saving solution for Internet Service Provider (ISP). The Proposed solution is known as Energy Saving IP Routing (ESIR) this strategy integrated OSPF protocol. ESIR perform SPT Exportation mechanism, in this mechanism shortest path find by using Dijkstra algorithm and Move Mechanism. ESIR is based on Maximum Set Compatible Move(MSCM), this problem in two step 1st step is called basic MSCM problem which is called Basic MSCM problem and 2nd step is full version of problem QoS-aware MSCM problem. In this work the different strategy of energy saving is discussed.

Keywords - IP routing, ISP, OSPF, QoS, IP network, MSCM, Dijkstra algorithm.

I. Introduction

According to ICT survey more energy requires for IT sector is more [2]. Now day global communication requires high capacity network element. This high capacity network element it require more energy for network operation. So lots of work is carried out to minimize energy consumption.

II. Related Work

In this section we first review related works addressing energy saving in Internet Service Provider (ISP) backbone network. There are many techniques available so here is review of all these. Angelo Coiro, Marco Listanti, Alessandro Valenti, and Francesco Matera proposed an approach in which they define energy consumption for transparent circuit switched wavelength division multiplexing (WDM) optical network. Different network scenarios are define by heuristic algorithm to reduce power consumption of optical link. When traffic load is minimum this strategy tries to switch off link, this decision takes place by algorithm according some scenarios [3]. Emre Yetginer and George N. Rouskas define that for energy saving there is another solution to use energy efficient network equipment. In this approach energy consumption of an optical fibre is estimated. Individual lightpath consumed the power this term is used to estimate proposed approach. Proposed system develops Integer Linear Programing (ILP) formulation. If this formulation gives exact solution then maximum energy saving can be achieved [4]. Steven S. W. Lee¹, Po-Kai Tseng², and Alice Chen³ defines that during transient period of topology changes there is lack of stringent synchronization hence to avoid accurate synchronization among routers, here this approach uses RFC 4915 Multi-Topology Routing, which is used to solve the transient loop problem. By controlling the update sequence in In MTR update sequence are controlled so that, there is no transient loop during the period of topology changes. This strategy provides up to 35%-50% energy saving in our experimental cases [5].

Christoph Lange, Dirk Kosiankowski, Rainer Weidmann, and Andreas Gladisch describes energy consumption require during operation phase. In this approach an associated quantity structure of network elements is developed based on traffic volume and subscriber number for certain broadband network services. Evaluation of this work is done under timeframe [6].

III. ESIR Strategy

3.1 Introduction

All above the approach this new strategy developed which can minimize energy consumption as well as increase performance. In this technique shortest path is computed by using Dijkstra algorithm. This shortest path is used to find out maximum set of compatible move, this maximum set of compatible move provide the set of link which can be switch off during low traffic period.



Fig 1. Flow Chart

Fig 1. Shows complete flow of ESIR strategy. In which the energy saving strategy is defined for Internet service provider backbone network . in which nodes are created and network topology form. To send packet to detination with maximum energy saving without packet loss. For this popose we use shortest path which can be computed by using dijkstra algorithm. This strategy intrgrated with OSPF protocol and then we apply sleep awake concept which can switch off inactive node.

This ESIR strategy work with two differnet mechanism one is basic maximum set of compatible move (MSCM) and another is QoS aware maximum set of compatible move (MSCM). In basic MSCM only the maximum set of nodes to be switched off are computed but QoS MSCM provide quality of services also.

3.2 Dijkstra Algorithm

It is graph search algorithm. This algorithm is used to solve single source shortest path problem for graph.this graph must have non-negative link cost. This algorithm finds shortest path tree, hence this algorithm is used in this work to find shortest path so that it can helpful to find inactive node to switch off.

3.3 OSPF Protocol

OSPF is a standardized Link-State routing protocol. OSPF supports IP routing. OSPF will form neighbor relationships with adjacent routers in the same Area. OSPF uses Link State Advertisements (LSAs) to advertise status of directly connected link. When there is change in one of the links and this change will send in update. Basically OSPF is classless protocol. If any one link will fail then it flood the information to all other neighbours, this same information flooded by each node to all its neigbours, this is causes waste of bandwidth and there is processor load. This can be prevented by OSPF which will elect a Designated Router for each multiaccess network.the flooding of LSAs is reduces by OSPF because it forward the updateto Disignated Router when changes occurs to link.

IV. Conclusion

The proposed system gives idea about energy saving solution. It gives overall idea about energy saving strategy developed in recent year. It gives idea about ESIR strategy which can be applicable in the work of energy saving which will coordinate with Dijkstra algorithm and OSPF protocol. Which can be helpful to find shortest path and useful to find nodes which can be switched off to save the energy when there is traffic below the threshold.

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