

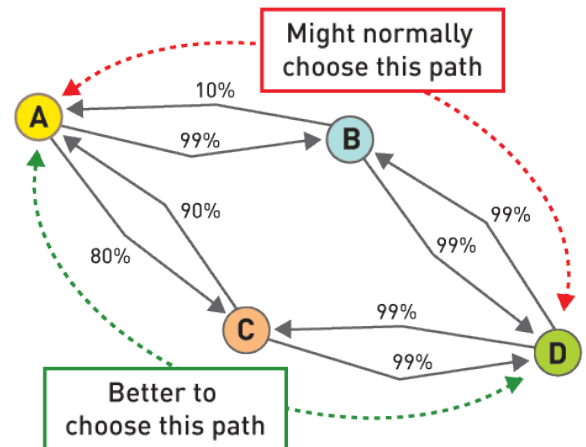


Autonomic Network Management in Wireless Mesh

Motivation

In conventional routing protocols whenever a node receives a beacon from another node, it is assumed that the link to that node is bi-directional. Unfortunately, such an assumption may not be true for ad-hoc wireless networks. One reason for this to happen is that the transmission range of two neighbor devices differs.

There are several reasons for transmission ranges to differ. One reason is the increasing heterogeneity of ad-hoc networks. That is, we have a network that consists of different types of wireless devices. Another reason could be resource management protocols which dynamically adapt the transmission power of a device, for example, to save energy. Last but not least, irregularities of the transmission ranges can also be caused by interferences from other wireless devices.



(*) Picture taken from silabs

Your Task

Your task is to implement an Autonomic Network Management (ANM) function that performs asymmetric link detection, reports the state of the network to a primary (and a backup) node. Based on the gathered information, this particular node makes a decision which network parameters have to be adapted in order to fix the detected problem. Furthermore, this node must be able to detect oscillations in the wireless link so it does not take wrong decisions and verify that the triggered change leads to the desired effect.

In order to evaluate the approach, an existing routing protocol has to be employed (such as B.A.T.M.A.N. or RPL). The evaluation has to be performed on our mesh testbed, consisting of 15 Intel Canyon PCs (Next unit of computing - Core i3 CPU, 16 GB of RAM, etc.).

Requirements

Knowledge about Linux and programming skills.
Experiences with wireless mesh networks are helpful.

Contact

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