MESSAGE MULTICAST WITH COUNTING BLOOM FILTER FOR NAME-BASED HOME AD HOC NETWORKS

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Wireless capable devices have become a common part of daily life. In recent times technology innovation has enabled a growth in the number of wireless devices in the home environment as well. This trend continues to introduce wireless capabilities to household appliances and sensors which monitor many aspects such as safety and energy consumption as well. Creating a network of wireless devices at home will greatly assist the home dwellers to control and monitor their household environment. Household devices today are mostly fitted with technologies such as Wi-Fi, but there are some devices with different short range technologies such as Bluetooth or Infrared. Wi-Fi also has other disadvantages, for example sensors with limited power may soon run dry communicating with a distant access point. It may also have coverage issues and the central access point can also cause the entire network to fail. The appliances and sensors in the household have different functions and capabilities. The transmission distance, processing power and memory etc. of the appliances and sensors may vary. Hence the heterogeneity of the home appliances needs to be considered when forming a network. This paper introduces a futuristic home environment where wireless enabled household appliances and sensors are connected via an ad hoc network. Long-range networks such as Wi-Fi access points are also considered as being a part of the entire network. This network will enable users to access and control home appliances and sensors from anywhere in the network through other appliances or sensors. Such a network is cost effective as no extra equipment is required and it also supports the heterogeneity of nodes. The nodes in the network are identified using everyday names such as "Living room TV, Kitchen light" etc. to increase usability. This paper uses a counting bloom filter as a routing cache for forwarding messages to home appliances and sensors. The paper investigates multicasting of messages using a counting bloom filter for name-based home ad hoc networks.

Keywords: Ad hoc network, Counting bloom filter, Home network, Multicast name-based addressing