

Chapter 1 : Ad Hoc Networks - Special Issues - Elsevier

Routing Protocols and Challenges Faced in Ad hoc Wireless Networks On-demand or Reactive routing protocols Reactive protocols produce routing table only when it is actually needed.

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Chapter 2 : Ad Hoc Networks - Journal - Elsevier

An ad hoc network typically refers to any set of network where all devices have equal status on a network and are free to associate with any other ad hoc network device in link range. Ad hoc network often refers to a mode of operation of IEEE wireless networks.

These early packet radio systems predated the Internet, and indeed were part of the motivation of the original Internet Protocol suite. Another third wave of academic and research activity started in the mids with the advent of inexpensive Current wireless ad-hoc networks are designed primarily for military utility. The project did not proceed much further until the early s when wireless ad hoc networks are born. Perkins was working on the dynamic addressing issues. Toh worked on a new routing protocol, which was known as ABR " associativity-based routing. Another routing protocol known as AODV was subsequently introduced and later proven and implemented in Minimal configuration and quick deployment make ad hoc networks suitable for emergency situations like natural disasters or military conflicts. The presence of dynamic and adaptive routing protocols enables ad hoc networks to be formed quickly. Wireless ad-hoc networks can be further classified by their applications: It is sometimes known as "on-the-fly" networks or "spontaneous networks". Intelligent vehicular ad hoc networks InVANETs are a kind of artificial intelligence that helps vehicles to behave in intelligent manners during vehicle-to-vehicle collisions, accidents. Vehicles are using radio waves to communicate with each other, creating communication networks instantly on-the-fly while vehicles are moving on the roads. Smart phone ad hoc networks SPANs [edit] A SPAN leverages existing hardware primarily Wi-Fi and Bluetooth and software protocols in commercially available smartphones to create peer-to-peer networks without relying on cellular carrier networks, wireless access points, or traditional network infrastructure. It has been claimed that this is going to "change the world". In a fully connected mesh, each node is connected to every other node, forming a "mesh". A partial mesh, by contrast, has a topology in which some nodes are not connected to others, although this term is seldom in use. Wireless ad hoc networks can take the form of a mesh networks or others. A wireless ad hoc network does not have fixed topology, and its connectivity among nodes is totally dependent on the behavior of the devices, their mobility patterns, distance with each other, etc. Hence, wireless mesh networks are a particular type of wireless ad hoc networks, with special emphasis on the resultant network topology. While some wireless mesh networks particularly those within a home have relatively infrequent mobility and thus infrequent link breaks, other more mobile mesh networks require frequent routing adjustments to account for lost links. Ad hoc mobile communications [23] come in well to fulfill this need, especially its infrastructureless nature, fast deployment and operation. Military MANETs are used by military units with emphasis on rapid deployment, infrastructureless, all-wireless networks no fixed radio towers , robustness link breaks are no problem , security, range, and instant operation. MANETs can be used in army "hopping" mines, [24] in platoons where soldiers communicate in foreign terrains, giving them superiority in the battlefield. Tactical MANETs can be formed automatically during the mission and the network "disappears" when the mission is over or decommissioned. It is sometimes called "on-the-fly" wireless tactical network. UAVs can be remotely controlled i. With wireless ad hoc network technology embedded into the UAVs, multiple UAVs can communicate with each other and work as a team, collaboratively to complete a task and mission. Navy ad hoc networks[edit] Navy ships traditionally use satellite communications and other maritime radios to communicate with each other or with ground station back on land. However, such communications are restricted by delays and limited bandwidth. Wireless ad hoc networks enable ship-area-networks to be formed while at sea, enabling high speed wireless communications among ships, enhancing their sharing of imaging and multimedia data, and better co-ordination in battlefield operations. Sensors are increasingly connected via wireless to allow large scale collection of sensor data. With a large sample of sensor data, analytics processing can be used to make sense out of these data. The connectivity of wireless sensor networks rely on the principles behind wireless ad hoc networks, since sensors can now be deploy without any fixed radio towers, and they can now form networks on-the-fly. Ad hoc home smart lighting[edit] ZigBee is a low power form of wireless ad hoc

networks that is now finding their way in home automation. Its low power consumption, robustness and extended range inherent in mesh networking can deliver several advantages for smart lighting in homes and in offices. The control includes adjusting dimmable lights, color lights, and color or scene. The networks allow a set or subset of lights to be controlled over a smart phone or via a computer. Ad hoc street light networks[edit] Wireless ad hoc smart street light networks are beginning to evolve. The concept is to use wireless control of city street lights for better energy efficiency, as part of a smart city architectural feature. A single gateway device can control up to street lights. Using the gateway device, one can turn individual lights ON, OFF or dim them, as well as find out which individual light is faulty and in need of maintenance. Efforts have been made to co-ordinate and control a group of robots to undertake collaborative work to complete a task. Centralized control is often based on a "star" approach, where robots take turns to talk to the controller station. However, with wireless ad hoc networks, robots can form a communication network on-the-fly, i. At times of disasters floods, storms, earthquakes, fires, etc. Especially at times of earthquakes when radio towers had collapsed or were destroyed, wireless ad hoc networks can be formed independently. Firemen and rescue workers can use ad hoc networks to communicate and rescue those injured. Commercial radios with such capability are available on the market. The advantages and challenges cons can be briefly summarized below:

Chapter 3 : Wireless ad hoc network - Wikipedia

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Chapter 4 : Mobile ad hoc network - Wikipedia

This paper is based on study of ad-hoc wireless networks and related issues in various architectures and protocols for ad hoc networks. Thus the paper provides an.