Introduction

- **Goal**
  - Exploiting the broadcast phenomena of wireless transmissions, using characteristics in mobile ad-hoc networks.

- **State of the Art**
  - IP addresses are meaningless in mobile ad-hoc networks. Approaches for mobile ad hoc network are generally based on techniques that have been developed traditional wired infrastructure-based networks. IP addresses are used to identify a node’s physical location in the wired networks. However, in MANETs, mobile nodes are moving through the network and can not only use the IP address to identify the physical location of individual nodes.
  - The epidemic distribution is multiple broadcast algorithm. Its obvious feature of epidemic distribution is a strong resilience of connection failures. This feature makes it much better to be used in mobile ad-hoc networks.
  - The current characteristic-based communication uses the “request” and “reply” mechanism to find and build a connection to the characteristic node. This ignores the important feature of characteristic-based communication - multiple nodes with the same characteristic.

Characteristic Address

- **Definition of Characteristic Address**
  - Characteristic address is used to identify a node with characteristics specified by the data field of characteristic address. As the instead of IP address, characteristic address does not only reflect the characteristics of node, but also the changes of network topology do not lead to any changes in CA. The characteristics of node can be internet access, data collection, information publish or computing capability.

- **Characteristic Address Structure**

  0 27 28 31
  01010101010101010101010101010
  EF

  [0:27] Data field of characteristic address
  [28:31] Extend Flag
  If bit[28:31] = 1111b, indicates that characteristic address extends to next 32 bits
  If bit[28:31] = 1111b, indicates that characteristic address does not extend to next 32 bits

  ![Characteristic Address Structure](image)

- **Characteristic Address Header**

  ![Characteristic Address Header](image)

![Characteristic Protocol](image)

Characteristic Protocol

- Initially, the node Ns listens the network to generate network characteristic address table. Then Ns sends a package to Ni specified by characteristic address.

  - The node N1 and N2 who know Ns receive the package and will forward it at the proper time.

  - Before N2 forwards the package, it will broadcast a control package to inquire whether allows to forward. If reply “Yes”, N2 forwards it and when next hop node sends control package, N2 also acts as the sender. If “No”, N2 will abandon forwarding. If no reply, N2 still forwards but do not anything for this package any more.

  - When Ns send “ACK” to N2, N4 is transmitting so N1 can not hear “ACK” and then will re-forwarding Ns’s package. N3 hearing “ACK” tells N1 to cancel the N’s package’s transmission.

  - If N1 can directly hear Ns’s package forwarding by N2, it will abandon forwarding of this package.

![Research Challenges](image)

Research Challenges

- **Multi-forwarding**
  - Multi nodes may forward the same package. They can not hear that other nodes have forwarded this package, because of communication range or channel collision. This will lead to the decrease in the usage of channel, when the network is comprised of nodes which have the same characteristics.

![Conclusion](image)

Conclusion

- **Advantages**
  - Enables communication with unknown.
  - Facilities the development of applications in mobile ad-hoc networks where the identity of resources is unknown.
  - Extensibility

- **Disadvantages**
  - Multiple nodes with the same characteristics may cause the same package to be forwarded to multiple destinations.
  - Multiple nodes may have the same characteristic so communication with the specified node from them has to use IP or MAC address instead of characteristic address.

![Further Information](image)

Further Information

- **Contact Information**
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