Reliable Optimised Flooding in Ad hoc Networks

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Outline

1. Begin
   - Abstract
   - Basic Knowledge
2. Proposed Reliable Flooding Mechanism
   - RMST
   - Unicast Transmission Mechanism
3. Conclusions
   - Broadcast Reachability
   - Energy consumed

Flooding

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Optimised Flooding

- limits the broadcast storm problem
- reduces the inherent level of redundancy

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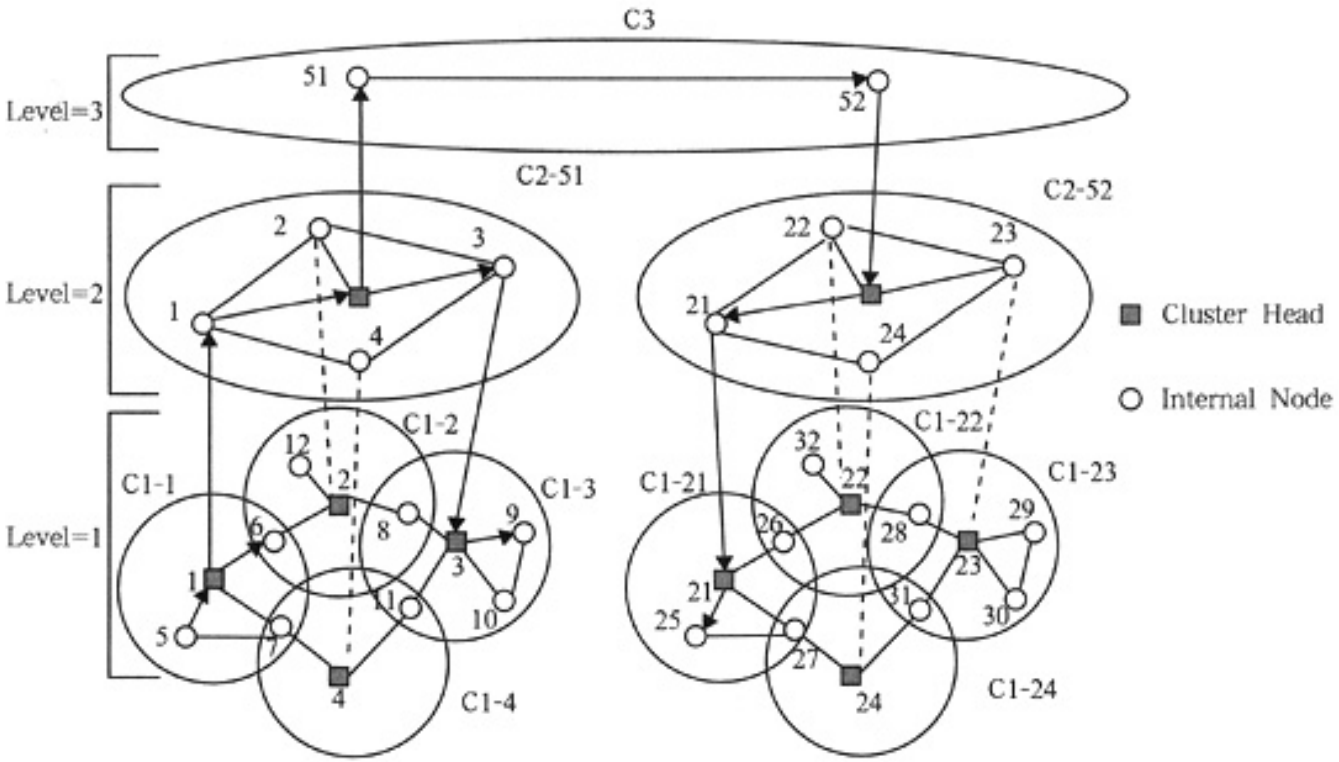
1. 不固定, 移动性
2. 相互协作, 远距离传递转发
3. 每一个节点同时是一个路由器

Ad hoc Networks



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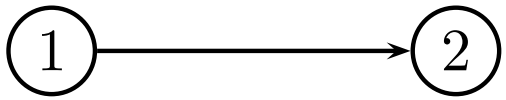

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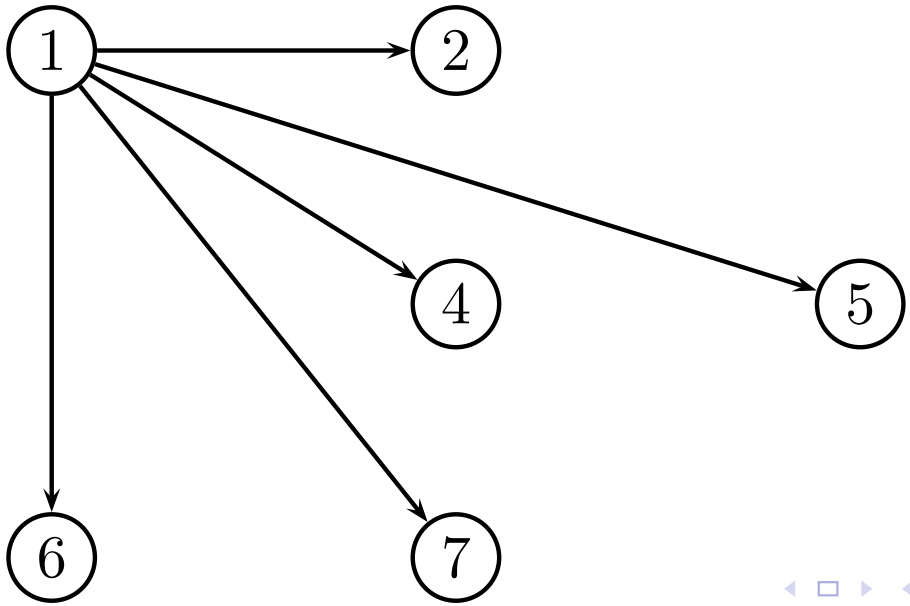
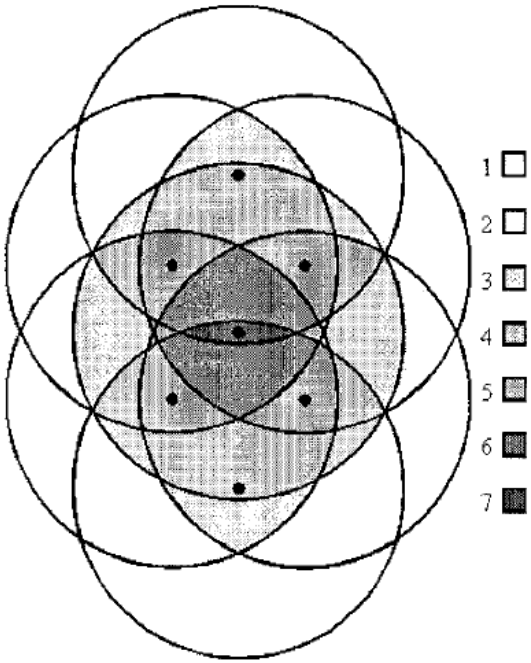


Broadcast Flood Problem



RMST–Reliable Minimum Spanning Tree

RMST is a reliable and optimised flooding mechanism taht computes a local MST based upon one hop neighbour knowledge in a distributed manner.

RMST

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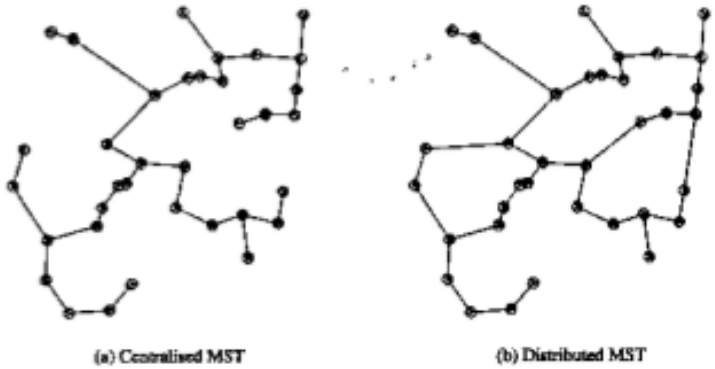
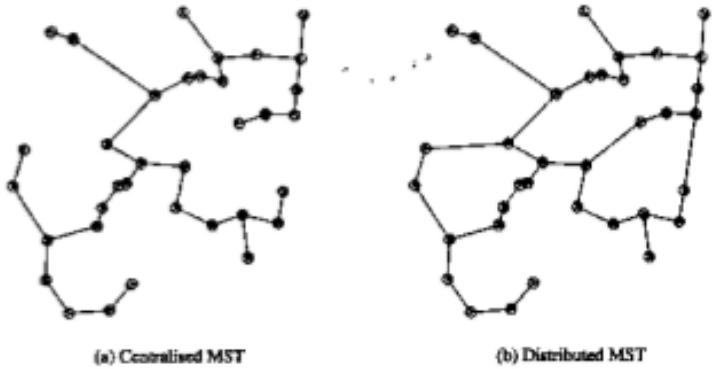


Fig. 1. Centralised and Distributed MST

RMST



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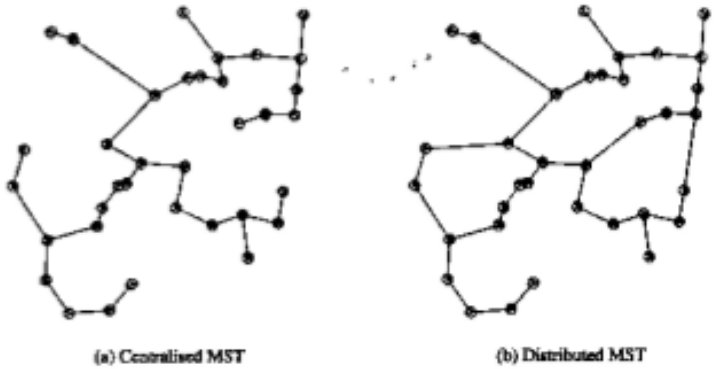

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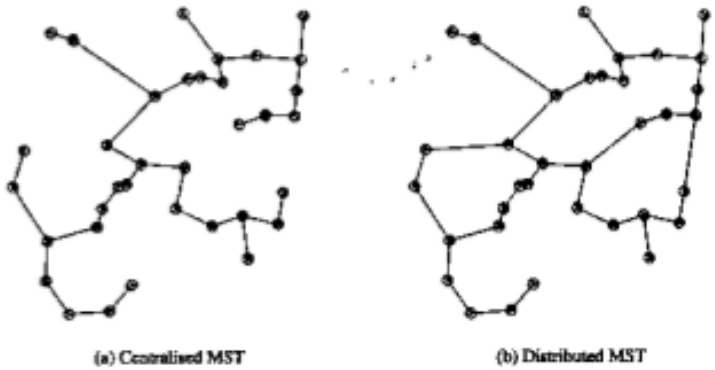

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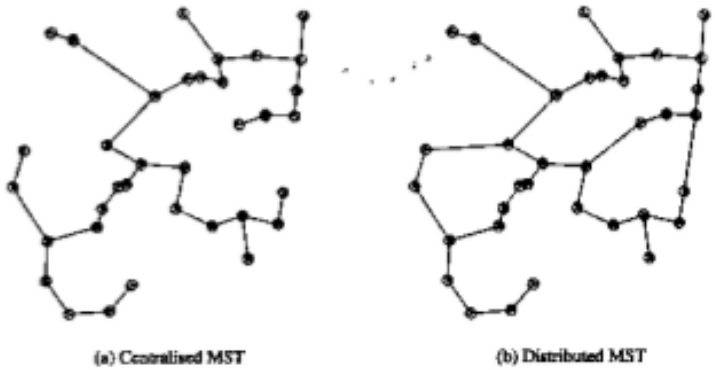

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- the distributed MST results in a connected graph with
  - a neighbour degree greater than one but less than six
  - an average neighbour degree of less than 2.04 nodes

Algorithm

Algorithm RMST(message)

if not seen message before

BSET <- MST(!-hop Neighbours)

i <- previous broadcasting node

H <- nodes that recieved previous broadcast

BSET <- BSET - i

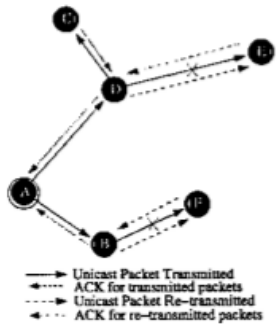
BSET <- BSET - H

for each node i in BSET

T_{power} <- $transmission_{power}(i)$

$Unicast(Message, T_{power})$

Unicast Transmission Mechanism



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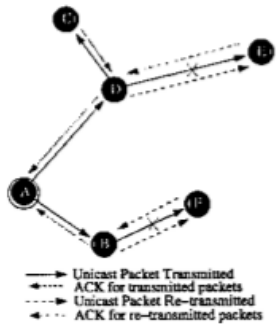

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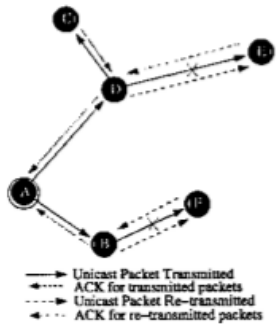

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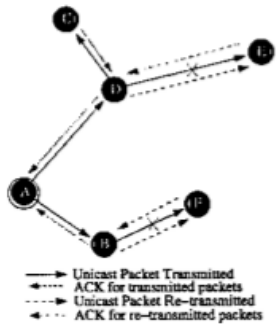

Fig. 2. RMST flood utilising IEEE 802.11 unicast and link layer ARQ

- unicast transmission utilises a frame retransmission mechanism at the MAC layer
- positive acknowledge ment scheme(ARQ)
- a transmitting node will retransmit a frame if it does not receive a positive acknowledgement from the destination node

Broadcast Reachability

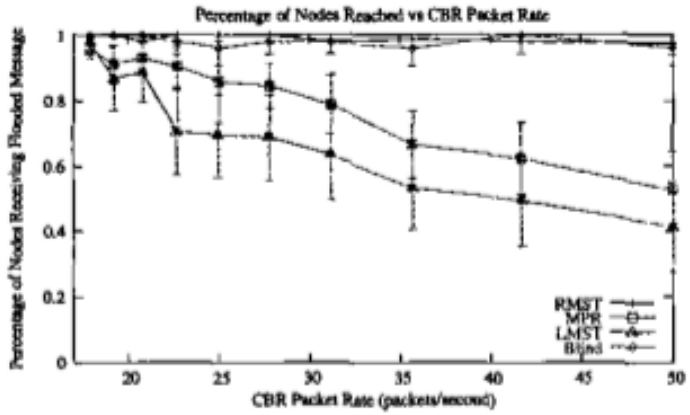

Fig. 3. Broadcast Reachability with Background CBR traffic

bind flooding and RMST provide the best delivery performance and are only slightly affected by background traffic.

Energy consumed

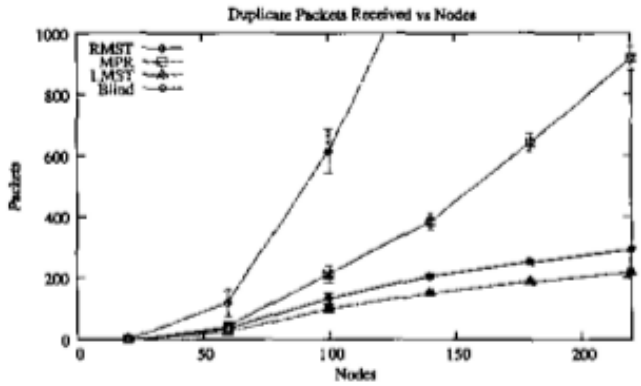

Fig. 6. Duplicate Packets Recieved

It shows the power consumed by each mechanism to complete a flood.

RMST utilises more energy to complete a flood than LMSTflood.

Goodbye

Tankyou!