

Impact of MAC layer collisions on SMFgoodput

Preliminary experimental results

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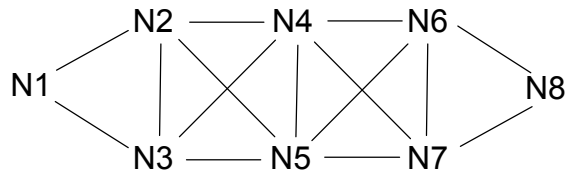
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Experimental set-up

- 8 nodes
- NRL SMF 1.1b2
- MAC layer is IEEE 802.11 in IBSS mode
- Emulation of physical medium (using TNO's AHNEMUL)
- Classic Flooding

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Node topology



- Only Node 1 originates multicast traffic:
1 packet / s for 300 s

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Some intermediate results

TTL = 5

<i>Node</i>	<i>Recv</i>	<i>Mrcv</i>	<i>Dups</i>	<i>Fwd</i>
1	787	0	0	0
2	1167	1167	867	300
3	1166	1166	866	300
4	1416	1416	1116	300
5	1375	1375	1075	300
6	874	874	574	300
7	874	874	574	300
8	585	585	286	299

TTL = 4

<i>Node</i>	<i>Recv</i>	<i>Mrcv</i>	<i>Dups</i>	<i>Fwd</i>
1	640	0	0	0
2	1155	1155	854	301
3	1155	1155	854	301
4	1376	1376	1075	301
5	1272	1272	971	301
6	860	860	559	301
7	861	861	560	301
8	579	579	278	95

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What does this mean?

- MAC layer collisions cause packet loss (no L2 retransmit for multicast)
- 'Capture effect' and redundancy through flooding mitigate packet loss
- However, may result in re-ordering
- Adding jitter (~ 1 ms or lower) may help
- Current Jitter I-D is for Control plane only
- More experimental work to be done

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Back-up slides

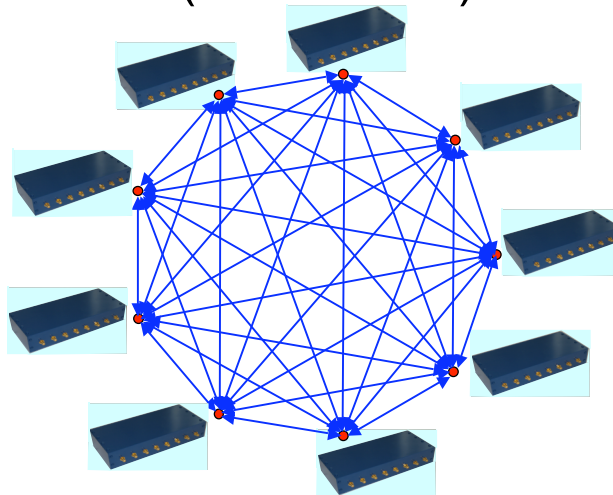
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Testbed details

- Nodes are Soekris net4826 with mini-PCI WLAN card, running 2.6.20 Linux kernel
- AHNEMUL is 9-port full-mesh of software controlled attenuators (50 – 150 dB per channel)
- Using NRL's MGEN for traffic generation

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Ad Hoc Network Emulator (AHNEMUL)



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