

# Versatile Low Power Media Access for Wireless Sensor Networks (B-MAC)

## Wireless Seminars

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# Article Reference

J. Polastre, J. Hill, D. Culler

***Versatile Low Power Media Access for Wireless  
Sensor Networks***

Proceedings of the 2nd international conference on  
Embedded networked sensor systems

Pages 95 - 107 November 2004

# Introduction

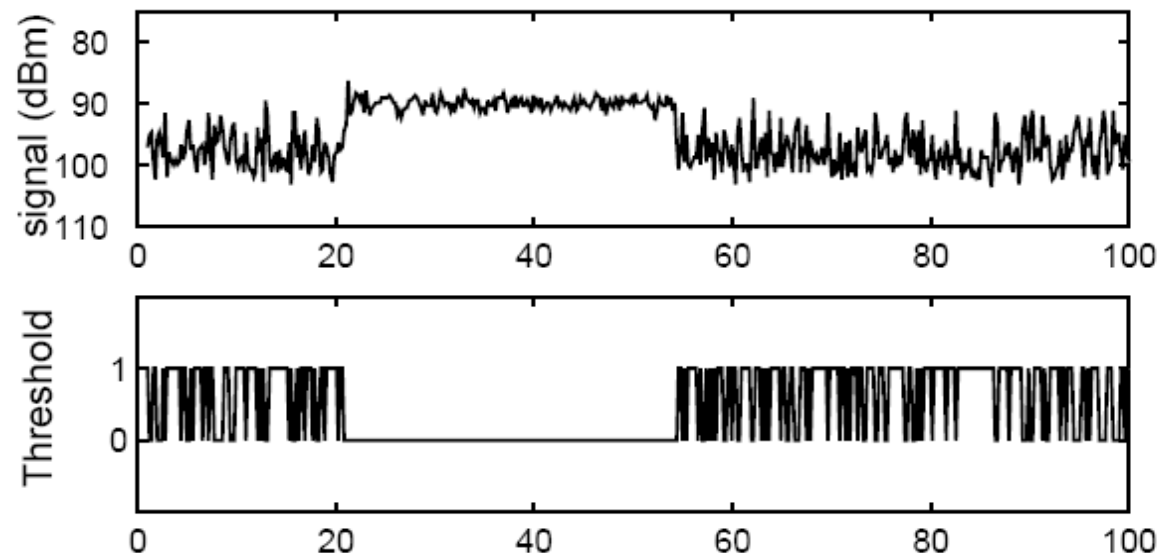
- WSNs usual characteristics:
  - Energy consumption constrain
  - Large number of sensors
  - Multihop networks
- MAC different from traditional Wireless MAC protocols
- Transceiver is the most consuming component
- MAC protocol directly influences its operation

# Introduction

- Berkeley MAC (B-MAC)
- Goals
  - Low power operation
  - Collision avoidance
  - Simple implementation
  - Efficient channel utilization
  - Reconfigurable
  - Tolerant to to changing network and channel conditions
  - Scalability

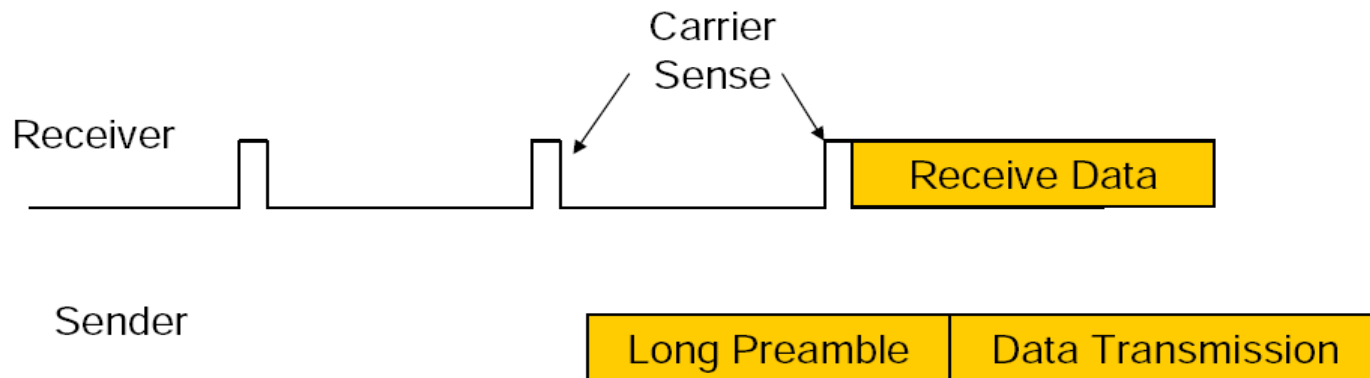
# B-MAC Design

- Clear Channel Assessment (CCA)
  - Estimates noise floor → Software automatic gain control
  - The samples are taken after transmitting a packet
  - The median of samples is used as a low pass filter
  - 802.15.4 uses only one sample → high false negatives

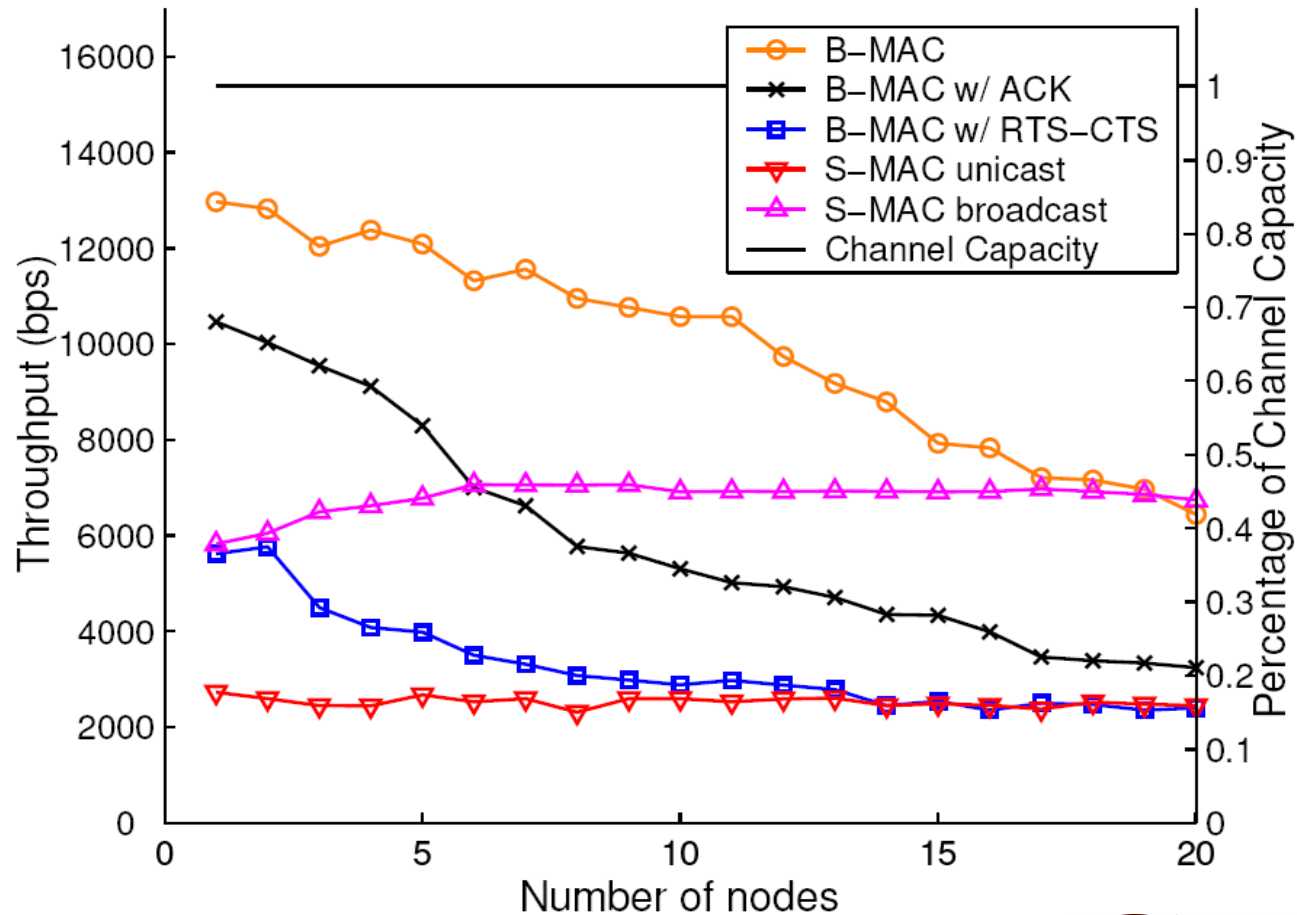


# B-MAC Design

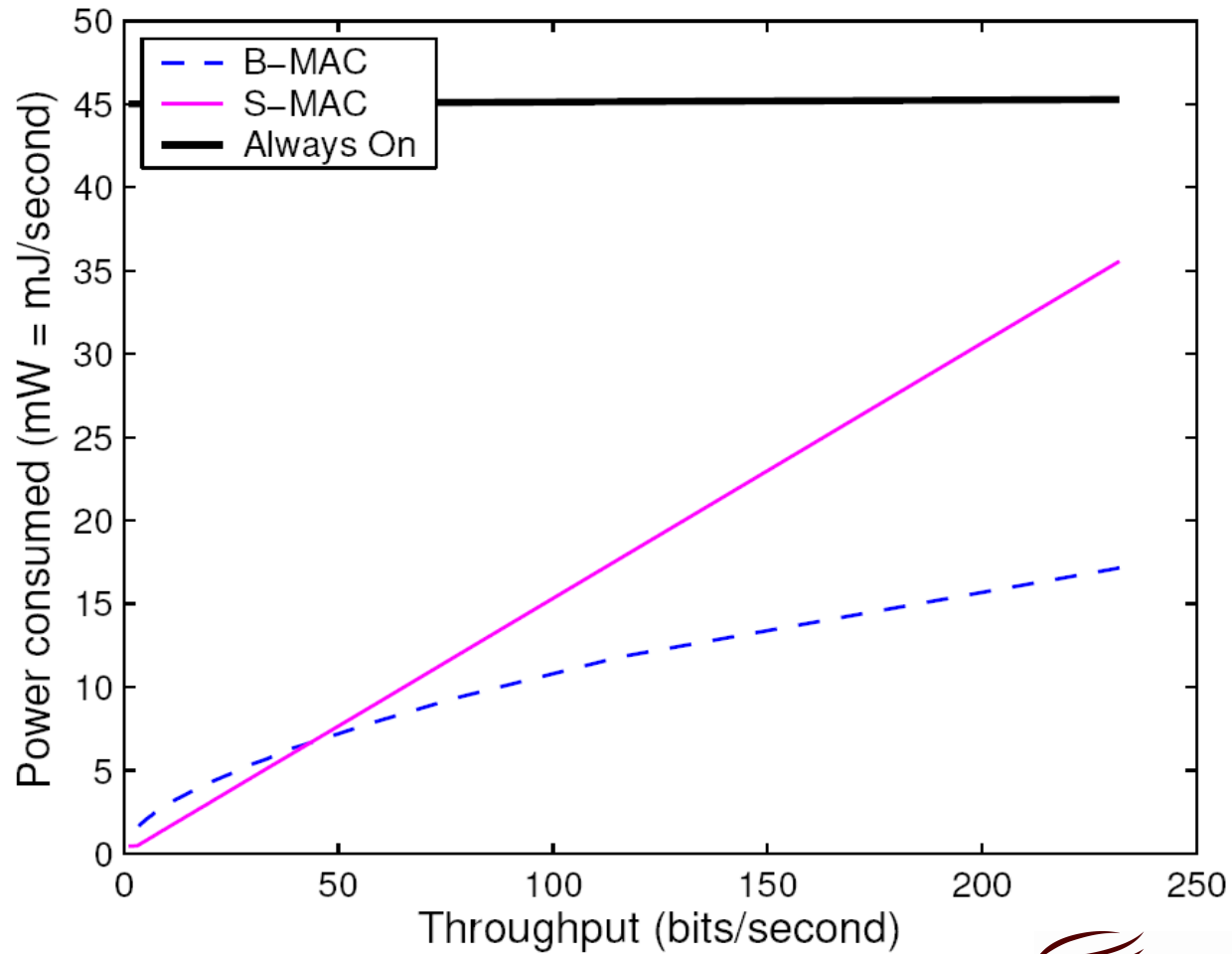
- Low Power Listening (LPL)
  - Duty cycles the radio through periodic channel sampling (LPL)
  - Each the node wakeup, turns on the radio and checks for activity
  - Sender sends a preamble to overlap receivers carrier sense duration



# Experiments

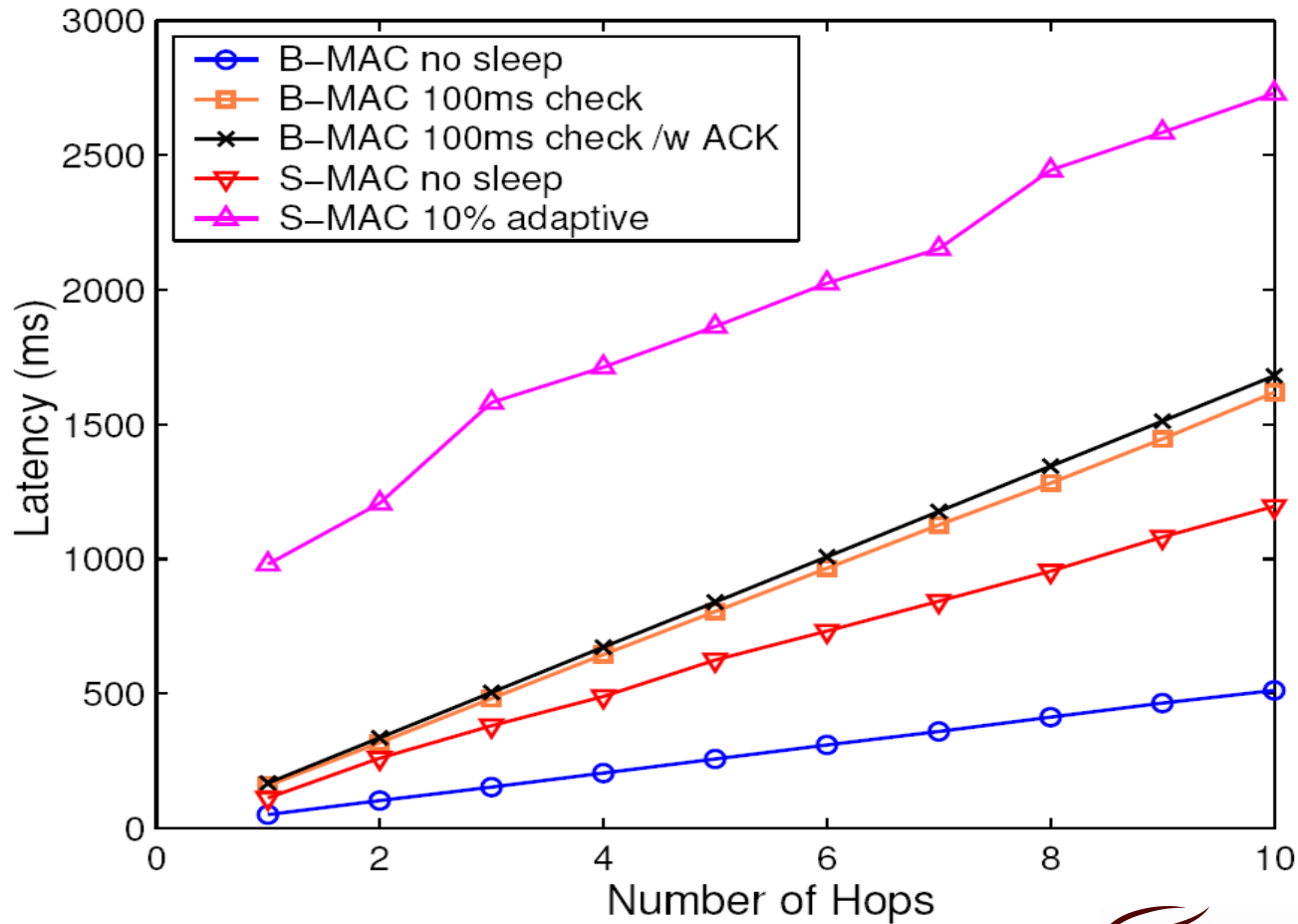


# Experiments





# Experiments



# Conclusions

- It is light weight and configurable
- S-MAC can be implemented as services that use B-MAC as the underlying link protocol
- S-MAC is more than a link protocol
  - Synchronization
  - Organization
  - Hidden Terminal Support

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