Garrulity

Excessive talkativeness, esp. on trivial matters

Fluff

Soft fibers from fabrics such as wool or cotton that accumulate in small light clumps: he brushed his sleeve to remove the fluff.

Garrulity and Fluff

Carsten Bormann
a decade of sensor network research

- everything has to be done in a different way
- Internet protocols use too much:
  - energy
  - spectrum
  - gates ...
- greenfield architectures, future internet, etc.
the problems are real

- constrained **nodes**
  - little power (∼ μW), lots of sleeping
  - little ROM (code space), RAM (state)
- constrained **networks**
  - high loss
  - not an Ethernet (multicast, reliability, ...)


wait,
we heard this before

• Attempts at redoing everything for some 10x quantitative reason:
  • “lightweight protocols” (XTP and friends)
  • WAP
  • ATM
  • ...

why did WAP&co fail?

• (insert reason here) +

• Moore’s law

• In the **time** you need to get 10x performance out of a new architecture,

Moore’s law gives you 10x performance with the **old** architecture
in constrained node/networks, Moore’s law barely applies

- In the low-power, low-cost area, gains from Moore’s law are used
  - to save power
  - to save cost
- Performance, ROM, RAM grow very slowly
meanwhile...

• people are *building* the Internet of Things

• focus on what we can do while maintaining much of the Internet architecture

• “Embedded Internet”
what hurts

• architectural issues

• garrulity

• fluff
please re-calibrate your complexity meters

• **code** is expensive
  • “class 1” = 100 KiB, “class 2” = 250 KiB

• **state** is expensive
  • “class 1” = 10 KiB, “class 2” = 50 KiB

• **packets** are expensive

• **listening** is even more expensive

• and multicast doesn’t work
current approaches

• some protocols can be fixed
  • ND ➾ 6LoWPAN-ND

• some protocols can be re-used after removing sources of complexity
  • e.g., DTLS without X.509

• some architectures can be re-used with more appropriate protocols
  • e.g., reincarnate HTTP’s REST in CoAP
your protocol may be next

• unless it only runs on aircraft carriers and up

• If not, start thinking about ways to:
  • reduce garrulity
  • actively get rid of fluff