TEACHING

The Case That 802.11 Needs Its Own Forwarding Plane

By **Keith Parsons, CWNE #3** · 2026-07-01 · originally on LinkedIn

Watch this talk. Bob McMahon spent more than 15 years testing 802.11 silicon at Broadcom, and maintains iPerf2.

Wi-Fi was sold as software disguised as Ethernet McMahon's first claim is 802.11 got adopted by presenting itself to the software stack as 802.3, Ethernet without the wires. Handy abstraction. Underneath, an 802.3 frame is just a payload riding inside an 802.11 header, and the decisions that actually govern user experience happen below the layer most networking tools can even see.

The scarce resource is the transmit opportunity, the TXOP. Listen-before-talk plus stochastic backoff means that even arbitrating for the medium and sending nothing burns around 100 microseconds. His backoff math lands where the birthday paradox does: with a contention window pulling between 2 and 15, roughly 5 active transmitters gives you a 50% chance two of them talk at once. Aggregation raises the stakes.

Then the line that got the room: great PHY, broken MAC. He calls it a Ferrari engine bolted onto a garbage truck. The signal-processing work inside a modern Wi-Fi chip is genuinely brilliant. The medium-access logic wrapped around it is not, and every vendor runs its own autonomous rate-adaptation firmware with zero coordination between them. Adding more APs does not rescue this. Their clocks are not synchronized, they share the same noise floor, and no AP holds shared RF state for the ones around it.

The strongest idea: history already solved this Here is the part I keep chewing on. Networking has tamed shared-medium chaos before. Twice. Layer 3 routing broke up broadcast storms. Then Layer 2 Ethernet switching killed collisions outright by giving every port its own path. Wi-Fi, McMahon argues, is back to hubs, and it is demanding the same treatment those hubs got: a forwarding plane of its own.

We've taught Wi-Fi as a 'Hub' for the past 25 years... and it is true. Wi-Fi acts like old-fashioned hubs!

The cure is a founder's pitch, so weigh it as one Where the talk turns from diagnosis to sales, keep your practitioner hat on. McMahon is nine months into founding Umber Networks, and the proposal serves that company: split the chip, push cheap PHY-only radio heads he thinks should cost a dollar or less, move the MAC and scheduling onto a host, and run DPDK as the user-space forwarding plane that coordinates the whole building.

None of this is shipping. No AP vendor wants to turn its premium product into a dumb radio head. Treat the DPDK-and-dollar-radio-head vision as a thesis a founder is raising money behind, not as where Wi-Fi is headed.

The cure is unproven and vendor-shaped. Watch the talk, then tell me this: in your own dense deployments, is the MAC the wall you keep hitting, and would a host-side scheduler holding shared RF state actually move your latency numbers?

Why 802.11 Needs a Forwarding Plane, and Where DPDK Fits" — https://lnkd.in/e4rhswFe

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