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SDN in 1980s

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THE 1980s

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Those who cannot remember the past are condemned to repeat it

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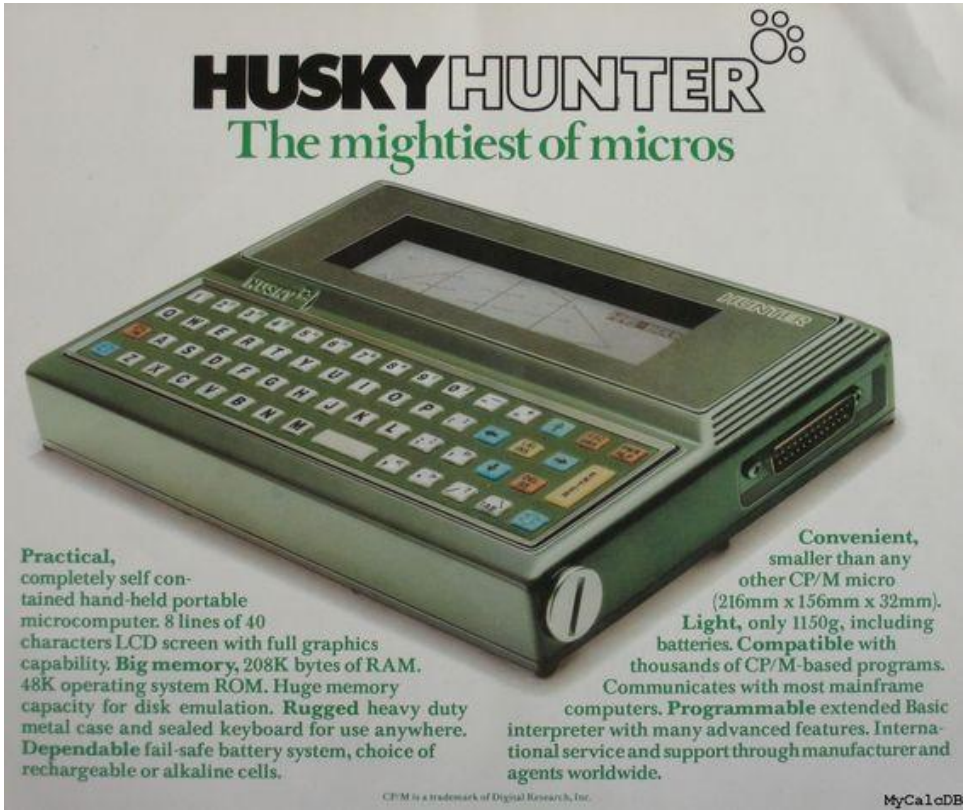

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SDR, SDN

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OpenFlow, P4

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P4 goals

reconfigurability
protocol independence
target independence

*P4 and beyond - unpublished - 2016

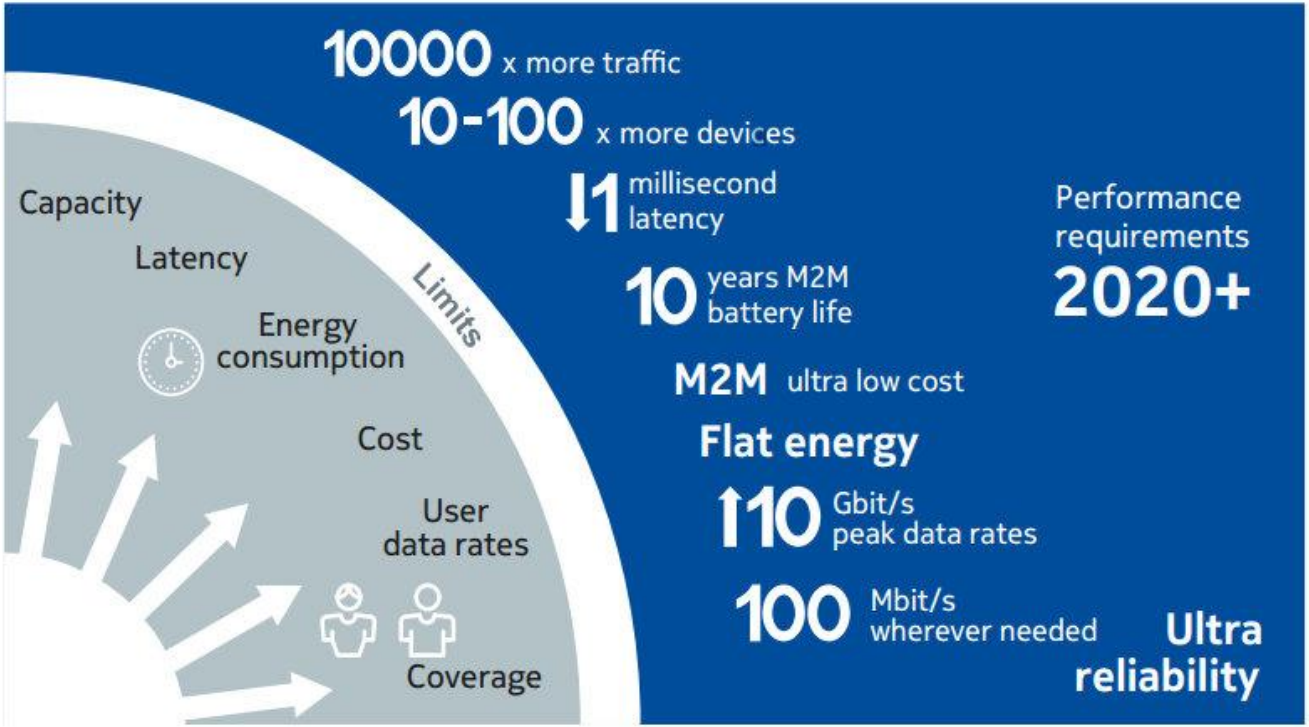
P4 issues

- Stateless processing - (no stateful firewalls)
- Traffic Management
- Multicast -
- Load-balancing/output port selection

First P4 paper states: "…., several aspects of a switch remain undefined (e.g., congestion-control primitives, queuing disciplines, traffic monitoring)"
Latest P4 version - ; P4 language specification make no mention of these topics at all (but calls out to a broken link for a 'Portable Switch Architecture'…):
A later 2016 paper from the same authors ("PISCES: A Programmable, Protocol-Independent Software Switch") doesnt mention any of these topics, other than 'Users will want to see how queues are evolving, latencies are varying,

Multicast - packet cloning capability for multicast is an essential hardware acceleration function if multicast functions are required. OpenFlow addressed this requirement explicitly through special logical port types and with the 'group table' concept which allows multiple output actions to be concisely combined and managed. P4 does not touch on the topic at all.

Load-balancing/output port selection - OpenFlow introduced rudimentary solutions to enable packets to be dynamically distributed over a range of ports, P4 loses this...


10000 x more traffic
10-100 x more devices
1 millisecond latency
10 years M2M battery life
M2M ultra low cost
Flat energy
110 Gbit/s peak data rates
100 Mbit/s wherever needed
Ultra reliability
Performance requirements 2020+
Capacity
Latency
Energy consumption
Cost
User data rates
Coverage
Limits

Thanks for listening!

Questions?

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