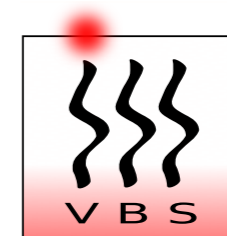


Wireless 100 Gb/s? How do you deliver *that* Data Rate to computing systems?

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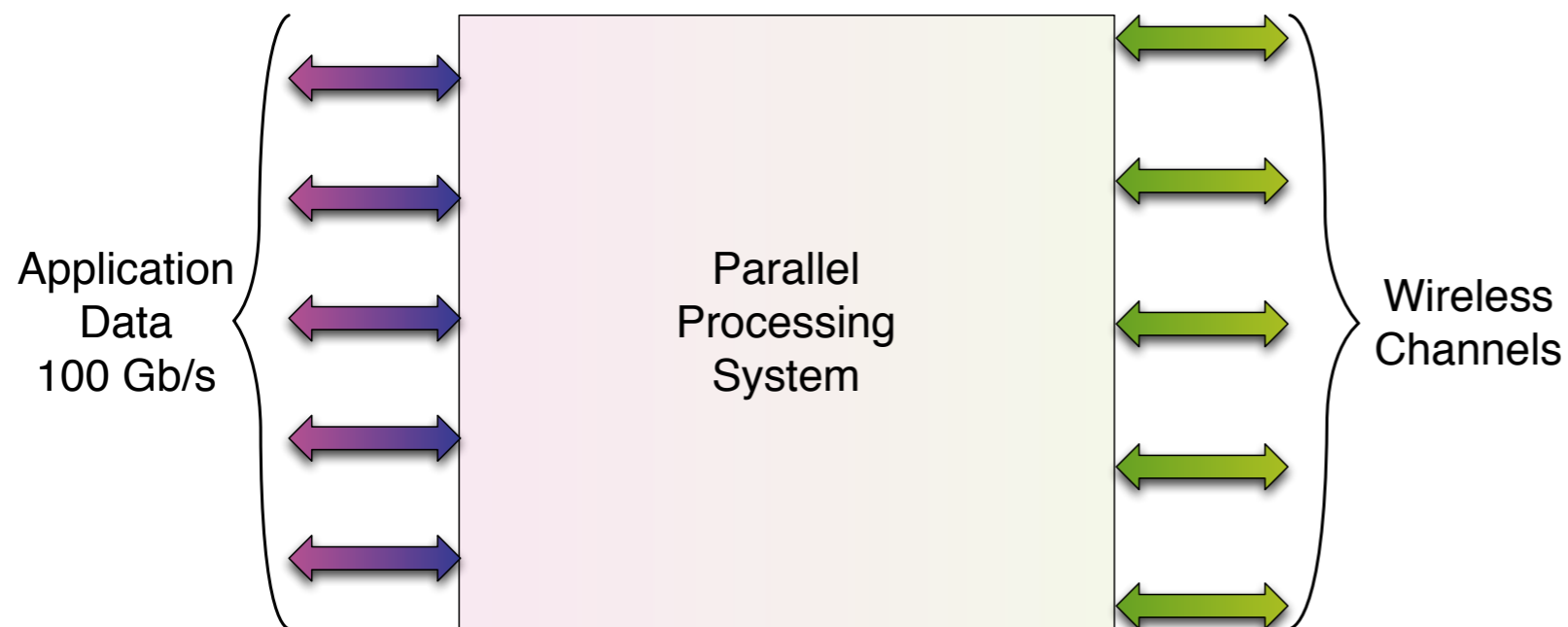


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Problem Statement

- Packet processing in **10Gb/s**-Ethernet is already **challenging**
- ... **CPU/NIC interface** becomes a **bottleneck!**
- ... **frequent interactions** between NIC and OS need to be **avoided**
- **100Gb/s** looks like a **nightmare!**
- How do we cope with the **tremendous data rate?**

The Problem

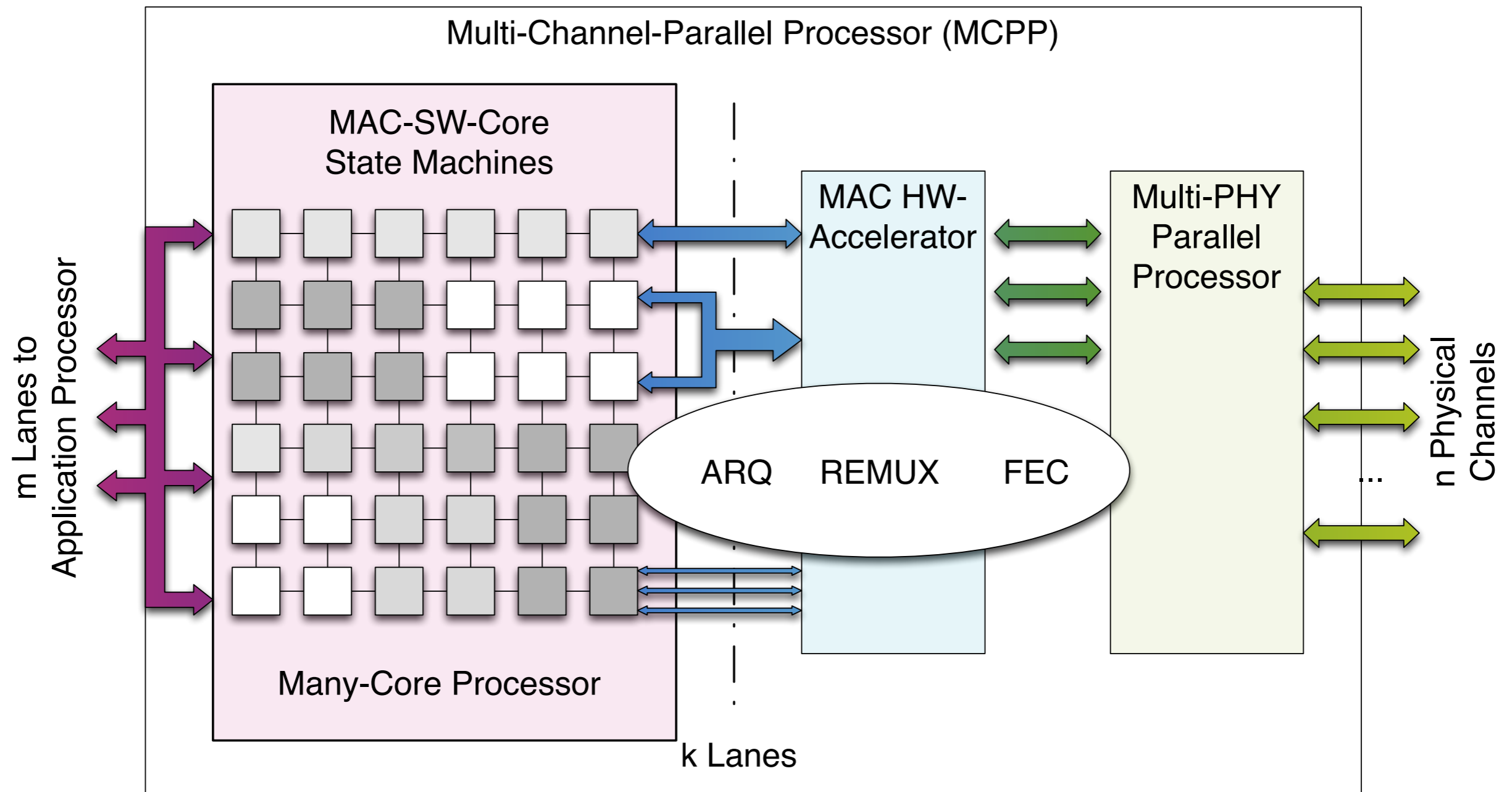


- **Many** wireless channels
- ... need to be **implemented**
- **combined**
- ... and **merged**
- ... onto **few** DMA-channels
- **Parallel processing** is mandatory!

Challenges

- Achieve **low error rates** at PHY level and find the right **balance** between **channel performance** and the **number** of PHY channels
- Design **low-latency** MAC protocols, that can handle **many** PHY channels **simultaneously**
- Design suitable **HW accelerators** for MAC, FEC and packet processing
- Identify suitable **processing models** and design platforms for high-speed **parallel protocol processing**
- Exploit low-power **many-core** technology for high-level **protocol processing**

Is *this* the future NIC?



Conclusion

- A 100 Gb/s network must provide an **end-to-end** solution for applications
- ... it does not make sense to first implement an **ocean** and then try to **drain it with a straw!**
- **Parallel processing** is **mandatory** on each layer !
- A **co-design** of all layers from PHY to higher level protocols **eliminates bottlenecks** and **balances functionality** between layers
- A **Multi-Channel Parallel Processor** with suitable **HW-accelerators** is possibly the solution