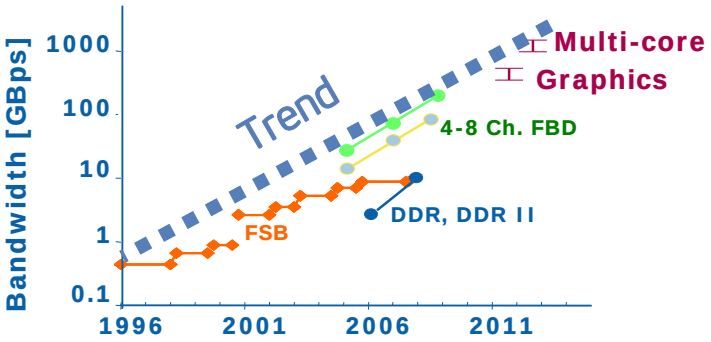
Scalable I/O With Record Energy Efficiency

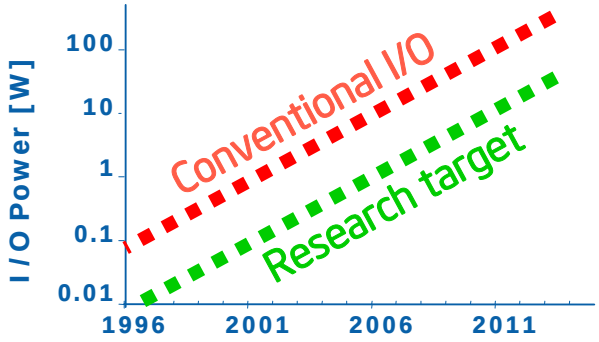
"The real challenge is how to … feed the beast. How do you bring enough memory bandwidth into this complex system of processors to make the whole endeavor worthwhile?"

—Justin Rattner, Chief Technology Officer, Intel

Tera-scale Bandwidth Demand



"Feeding" Many Cores



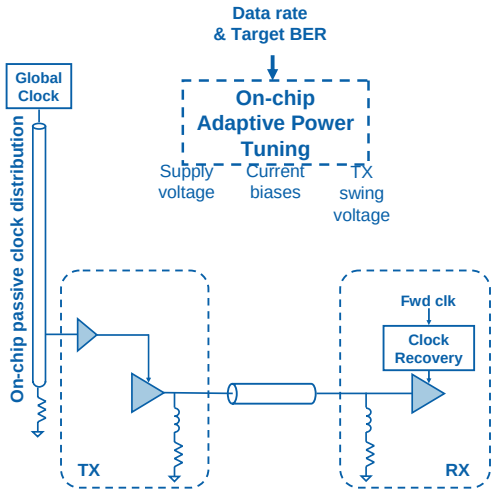
Low-Power I/O Research Innovations

Demand-based I/O
Customized performance based on I/O demand to reduce power by as much as 5X

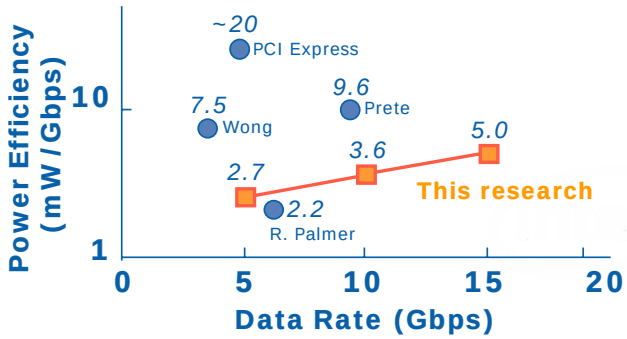
Adaptive Power Tuning
Optimize transceiver parameters to ensure minimum power consumption at the required data rate

Power-free Interconnect Compensation
Circuits to compensate for distorted high-speed digital signals that require little or no power.

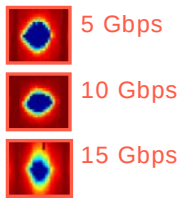
Adaptive Power Tuning



I/O Power Comparison



Measured "Eye" Diagrams



<14% of the power of 5 Gbps I/O used today
<40% of the power of the best R&D alternative at 10Gbps

Research at Intel

www.intel.com/research