Cloud data center must provide computer platforms along with diversified user requests quickly, in reasonable price.
- One of the solutions is a "disaggregated platform" which has resource pools of CPUs, storages, GPUs, and other devices.
- PCIe is appropriate interconnection
- Simple protocol, vast hard/soft assets.
- However, the transport layer of PCIe doesn’t reach DC-scale.
- Connection distance and port count are limited to in-box scale.
- Coupling of host and I/O devices are too tight to disaggregate them into shared resource pool.

**Architecture 1/2 : Distributed PCIe switch**

To be PCIe compliant, Ethernet must be transparent.
- Internal bus of PCIe switch chip is extended by Ethernet.
- ExpEther appears as a single hop PCIe switch for OS/software.
- Utilize commodity device, OS, device driver w/o modification.

**Architecture 2/2 : Reliable Ethernet**

To maintain PCIe connection, Ethernet must be reliable.
- Prevent packet loss by congestion control and retry
- xN bandwidth and redundancy by multipath transport
- Utilize conventional Ethernet switch w/o modification

**Implementation**

To have comparable performance with PCIe switch, all functions are implemented in a chip w/o S/W stack.
- Main functional blocks are PCIe Ethernet Bridge (PEB) and Ethernet Forwarding Engine (EFE).
- External interface are standard: PCIe Express and Ethernet.

**Seamless Disaggregated Computer**

To make a computer providing user-required performance and function, necessary devices can be selected and attached from resource pool.
- ExpEther provides a single-hop PCIe connection for all CPU / devices in the resource pool over Ethernet.