



Intel® Corporation Presents:  
The Eco-Technology Great Debates

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# Container Data Centers

# Microsoft Datacenter Solutions

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# Container Solutions

- Use a standard ISO (40',20',10' x 8 x 8'6") shipping container to hold servers
  - Portability allows the Delivery and operation of servers in self contained units
    - Move costs from long lead to short lead equipment, increased ROI Capital
    - Optimize server delivery at 1000U+ as a unit vs. 40+U in a rack and a Single SKU & Warranty
- Containers seen as a solution to burst demand and temporary
- Microsoft's approach is different – use them as a primary packaging unit

**Cost:** *It costs less to ship 2,000 servers in one container than it does to ship and then install individual racks. Additional savings come from not needing raised floors or fans for each server, and requiring a lot less wiring, packaging and shipping.*





# Container Solutions

- The container gives us the opportunity to test new technology such as increased supply air temperature, removal of fans from servers, managed airflow with hot aisle containment, significantly increased WPSF and more efficient electrical distributions
- Microsoft have stand alone units running in production today and are running proof of concepts on newer technology

**Energy efficiency:** At more than 1,000 Watts per square foot, containers allow us to power a lot more servers in a given area. This is the key reason containers have become economically viable. PUE numbers tested in a POC measured at peak ~1.3



# Container Solutions

	Pros	Cons
Economy of Scale	A Larger unit of compute allows 10x scale to deploy. CBlox manufacturing can occur in parallel with Datacenter	Risk with Large unit of compute of stranding power. Large scale material handling system for movement
Flexibility	Self contained small remote deployment. Can go anywhere with power and network connections	Today Homogeneous solutions to a single vendor – no vendors supporting multiple HW manufacturers yet
Expandability	Essentially unlimited expansion up to power capability, with sufficient land available	Cost for expansion is stretched over time, compared to fixed facility
Energy Efficiency	More energy efficient design than our data centers today at a higher power density which allows more servers in the same footprint	Same technology can be applied to a data center



# Container Solutions

	Pros	Cons
Refresh	Opportunity to refresh data center technology if there is a positive ROI with HW refresh cycle	Replacement of containers may be costly per container if not refurbished
Risk	Secondary protection of assets in containers from a physical disaster such as smoke or water – destruction testing in progress	New technology risks for code, compliance, engineering and operations
Reliability	Design allows for smaller failure mode – 1 container at a time versus 1 Colo	Today CBlox are lower reliability and require application to have geo redundancy and ability to take downtime for maintenance