Subsea Cloud

GB 200 Unit Architecture

General

Type:	Immersion	Temp. min (liquid):	3degC	Power sources: Grid, renewables, UPS, COP
Depth rating min.:	3m	Temp. max (liquid):	67degC	Liquid: Readily biodegradable, marine safe
Depth rating max.:	2700m	Redundancy:	N+1 & N+2	Voltage supply: AC-480/AC4160/AC22000
Weight in water:	11.18ton	Power:	Ring-net	
Transport weight:	46.0ton	Bandwidth:	Ring-net	
System dimensions:	30 x 11 x 9.5ft			

Performance

Racks:	16
Nodes:	288
GPUs:	1,152
Rack density:	120kW
Total density:	1920kW
PUE:	1.01
WUE:	0

Layout

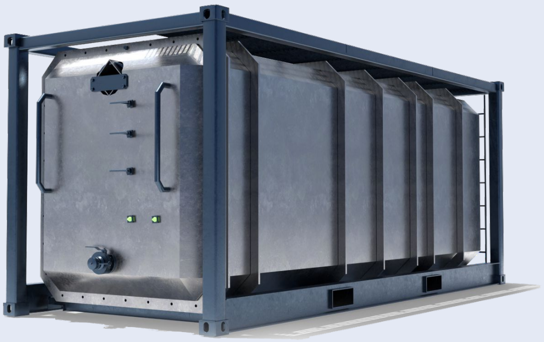
Two mirrored rows (8x8)
Management racks: 2 x 48U
NvLink internal com bus
Optical POD to POD communication
Bypass loop for service mode
Wet-mate hot-stab connection
Internal UPS backup

Materials

Steel, stainless steel, or aluminum. All materials, recycled or recyclable.
Readily biodegradable fluid selection.
Lifespan of housing: 20+ years

Thermal Profile

Compute power real:	1920KW
P1 – P2 transfer:	1920KW
P2/M2:	14.2Kw
Sun IR equivalent:	2400m2



Calculation: average mass of ocean water at a uniform depth of 20m and 100m2, where:

- Q is the energy transferred: 45.6MWH/day
- m is the mass of the water: 2,050,000 kg
- c is the specific heat of water: 4.18J/g∘C, and
- ΔT is the change in temperature: 0.79degC/h
- ΔF is the flow rate of the water : 10x

Per these inputs, the change in temperature per hour for a theoretically still body of water will be:
0.79 degrees Celsius 1m from the outer water of the unit and 0.213 degrees Celsius 2m from the unit*
Calculated with a natural flow rate of just 10 times, the temperature increase in the waterbody will be negligible.

*****_This is much lower than the environmental warming effect of a traditional air-cooled data center at the same load. The calculation assumes all heat from the SSC unit raises the water temperature, without accounting for heat loss to the surroundings. In real-world conditions, factors like heat dissipation and thermal conductivity would affect the accuracy of this analysis._

Power Profile

SSC's data centers are powered by continuous operating power (COP) and will also benefit from a main supply and a redundant supply of power. Each data center module (unit) is connected subsea from two independent sources, (types of sources, e.g., wind, nuclear, traditional, are location dependent). Much less power will be needed for both the ICT and the DCPI due to the data centers being placed subsea. ***Note: a third source is introduced from the collocated renewable asset (where applicable).***

Maintenance

Maintenance of the pods is accomplished in multiple ways:
Should physical maintenance be required, we can retrieve a pod within 2h of reaching the site.
We remain within a 12h sailing radius when in coastal waters (rather than ports, rivers, dams, where times are shorter).
Redundancy – like most data centers, we have redundancy built into the system.
We employ remote hands for equipment testing and troubleshooting, circuit testing & power cycling where possible.

Use Cases: AI, enterprise and hyperscale

Placement: Rivers, ports, dams, coastal, international, national waters

Lead Times: Ramp up: 45 – 100 days / delivery 12 weeks

Integration: Telecoms cables; power cables; renewable wind, solar & tidal farms; nuclear sites; offshore asset zones

Sensors: Pressure sensors; fluid measurement; optical level switch; float switch; seismic; differential pressure; liquid immersion temperature; chemical; electrochemical: sensors and cameras.