Composable Infrastructure

Sections

Introduction to Liqid CI
The Liqid Platform
Differentiators
Technical Specifications
Remote Create Physical Servers In Seconds
Welcome To The New Lights-Out Datacenter

“Mode 2 (IT) is exploratory and nonlinear, emphasizing agility and speed.”

- Gartner

By enabling your infrastructure to be painlessly refactored or dynamically adjust to real time application requirements, Liqid Composable Infrastructure (CI) transforms your DataCenter to adapt beyond the constraints of the traditional, static, "purchase cycle" adoption of technology. Liqid CI replaces the manual provisioning of IT infrastructure which is locked in an inflexible motherboard / chassis paradigm with a modern architecture that allows system elements (GPU, CPU, Storage, Networking) to connect to an intelligent PCIE switch that supplants the mechanical motherboard. Systems can now be composed, disassembled or modified live - whether scaling GPUs to meet the demands of HPC workloads, or optimizing ratios of CPU, networking and storage to accommodate research, IT, or DevOps requirements. By allowing policy driven infrastructure via REST API or administrative system control via GUI or CLI, Liqid has extended machine automation to the physical layer to enable true, on-demand IT.
THE LIQID CI OPEN PLATFORM

Liqid Command Center
Extensible CI management software that automates, orchestrates, and dynamically composes physical computer systems from pools of individual bare-metal elements

Liqid Switch
The ultra-low latency, intelligent, and managed PCIE fabric switch that electrically interconnects pools of disaggregated system elements

Liqid Elements
Physical bare-metal (compute, storage, networking, and graphics) system resources designed for efficiency and composability

Liqid Formation
Asset Chassis where bare-metal system resources reside to form serviceable pools of disaggregated elements
DIFFERENTIATORS
OF LIQID CI

The Liqid CI Platform is designed with an open-systems philosophy focused on leveraging proven, off-the-shelf commercially available technology. Hardware is intended to be interchangeable with 3rd party providers.

True bare-metal resource disaggregation permits elements to be physically organized and optimized for space, cooling, and power efficiencies.

Liqid Command Center software composes computer systems dynamically using PCIe-based fabrics, enabling independent scaling, provisioning, and management of bare-metal system resources.

Liqid composed systems support bare-metal operating systems and modern hypervisors. No customization or special drivers required when migrating to Liqid CI.

Agility and scalability is at the core of Liqid CI with an emphasis on HPC Clustering, DevOps, and Mode 2 IT methodologies.
TECHNICAL SPECIFICATIONS

Hardware Specification

Solution: Composable Infrastructure Controller
Management: Liqid Command Center
Protocol: Managed PCIe Gen 3.0 Switching Fabric
Architecture: Disaggregated Bare-metal Infrastructure
Physical Interconnect: Photonics and/or Copper over MiniSAS HD Cabling
Number of Ports: 24-Ports (16 front, 8 rear), 96-Lanes, Gen3 x4 Per Port
Port Bandwidth: 8 GB/s – Full Duplex
Total Bandwidth: 192 GB/s – Full Duplex
Port Latency: 150 ns
Management CPU: Intel Xeon D-1548 – 2.00 GHz 64 GB DDR4 w/ECC
Cable Configurations: x4, x8, or x16 (SRIS Ready)
Management port: Secured, 1 GBASE-T
Control Plane: Private, Redundant 10 GbE SFP+
Fail Over: N+1 Support via Multi Switch

Power Specifications

Typical Power: 170 W
Input Voltage: 90-264 VAC
Efficiency: 80 PLUS Gold
PSU: 200 W x2 (Redundant fail in place, field replaceable)

Supported Modules & Cables

Mini-SAS HD - short and long range photonics
Mini-SAS HD - passive and active copper
SFP+ - passive direct attached (control plane)

Physical Characteristics

Form Factor: 200 W
Dimensions: Height 43.8 mm, Width 200.0 mm, Depth 508.0 mm
Weight: 4.540 kg (10 LB)

Preliminary specifications are subject to change. Patents Pending.
Environmental Specifications

Fan 2 K – 20 K Variable Speed (Redundant)

Ambient Temperature
Operating: 5 to 35 °C, Non-Operating: 0 to 50 °C

Relative Humidity
Operating: 10% to 80%, Non-Operating: 5% to 95% (Non-Condensing)

Altitude
Operating: -50 to 3000 m, Non-Operating: -100 to 10,000 m

Acoustics
< 30.0 dBA at 1m Idle

Conducted Emissions
CISPR22 (EN55022)

Input Harmonics
EN61000-3-2

ESD
IEC 61000-4-2, Level 3

Radiated Immunity
IEC 61000-4-3, Level 2

EFT Common Mode
IEC 61000-4-4, Level 3

Surge Immunity
IEC 61000-4-5, Level 3

Conducted RF Immunity
IEC 61000-4-6, Level 3

Voltage Dips
EN61000 4.11, Level 3, Class B,

Liqid Command Center Management Software

Composable Infrastructure
Policy-based Automation, Provisioning, and Orchestration
(CPU, NIC, SSD/HDD, and GPU)

Cluster Management (Create, Edit, Delete)

Bare-metal Machine Management (Create, Edit, Delete)

Package Management (OS Deployment, Configuration, Snapshots)

Liqid Module Deployment (Advanced Machine Statistics & Fabric DMA NIC)

Management & Security
User policies (admin access control for clusters, machines, and devices)

GUI, RESTful API, and CLI

Secure, remote configuration and management over IPv4/IPv6

Dedicated control plane

Switch Chassis Management
Fabric Clustering Capable

Cluster, machine, and device health monitoring, statistics, and diagnostics

Device policy failover and migration

Dynamic performance and QoS provisioning

Error, event and status notifications

System Alarms and event notification

Auto Temperature Control

Port Counters

Preliminary specifications are subject to change. Patents Pending.
CONTACT INFO

info@liqid.com

liqid.com

Liqid, Inc.
1408 Horizon Ave., Ste 204
Lafayette, CO 80026

office: +1 303.500.1551