

L&T GREEN EDGE DATA CENTER

(Software Defined)





Introducing L&T Green Edge Data Center

L&T Green Edge Data Center is a revolutionary **Software defined Edge Data Center**, offering environmental and other benefits powered by **Immersion Cooling Technology**.

The immersion cooling technology enables immersing a general purpose server into a safe and dielectric liquid to increase the heat absorption and decrease the cost of cooling a standard Data Center. Through this technology, all the heat generated by the hardware is absorbed by the liquid. This dielectric liquid can capture 1500 times more heat than air, for the same volume. The chosen liquid has a flash point which is above 155°C and a high stability to prevent any risk of evaporation, overpressure, or flammability. The physical-chemical properties of the dielectric coolant, allow higher heat transfer performance than air. The Dielectric Coolant used by various PODS in the Immersion Cooling solutions is a synthetic fluid, 100% non-hazardous for people or the environment and readily biodegradable according to OECD 301 norm.

The PODS are completely Software Defined Data Center (SDDC) to run all elements of the infrastructure - networking, storage, compute (CPU / GPU) and security in a virtualized

manner. SDDC methodology has been adopted by many organization for their current and future data centre deployment. Organizations are moving from the traditional way of managing to the Software-Defined Data Center. L&T Green Edge Data Center is fully Software Defined Data Center that consumes less power and contributes to Green Initiatives.

Deploying Infrastructure at the edge delivers huge value but it is easier said than done. However, in IoT world, the edge is more of a norm than the exception. IoT assets do not sit in a data center but at the edge. L&T Smart World has engineered a full function self-contained liquid cooled edge data center – that does not require traditional air conditioning or a server room. It can be deployed in different places for example in your pantry or even outside the office. Now you can have computing where you need it without the need of building a data center.

Excellent Power Density and Cooling Efficiency

High Power Density: Cooling capability is much better compared to air cooling to achieve higher power density.

Low PUE: It requires no air conditioner for cooling the server hence this technology is more power efficient compared to traditional data Center. 95% of the power in the POD is used for IT Components. It lowers the cost of Data Center operations.

IT Gear Stability: Since IT Equipments are immersed in liquid, it is more durable compared to traditional air cooled setup where IT Equipments are affected by humidity, dust and other external environmental factor.

Easy Maintenance: Immersion cooled server data centers are easy to maintain compared to traditional data center.

Operation Safety: Operators just need to wear gloves for safety and hygiene on top of it, the management system will ensure the safety of the Operator.

Simplified Data Center Management: It reduces administrator burden by simplifying management of Data Center services using Software defined data center model, providing easier provisioning and resource monitoring.

Automated Orchestration: It automates configuration, management and coordination of IT Services which helps IT administrator to more easily manage complex tasks and workflows.

L&T Green Edge Data Center have robust management system to monitor temperature and liquid level of Pod with HMI to manage the system. The system use this management system to control immersion cooling system to achieve best cooling and power efficiency.

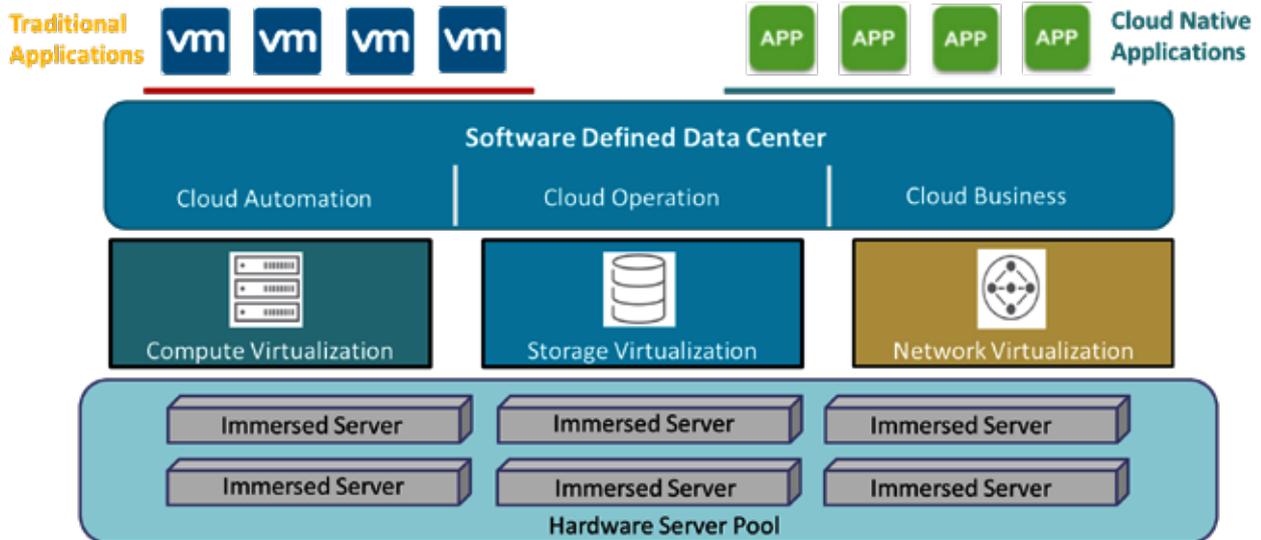
L&T Green Edge Data center offers processing, flexibility and performance in a multi-site deployment where traditional data

center would be too large and too expensive to provide an optimal solution. L&T Green Edge data center offers the functionality of a traditional data center in a much more efficient way in terms of maintenance and cost.

Why Software Defined Data Center?

Software defined data center provides better way for management and scaling resources. It is based on the concept of virtualization and automation which enables agility on the infrastructure side, making data center more flexible, scalable and efficient.

L&T SWC Cloud and Edge COE have deployed and tested the SDDC stack on Green Edge data center using different Hypervisors. It is ready to use for running critical workloads on a software defined data center.



Key Benefits

- Easily Scalable
- Cost Efficient
- Simplified Data Center Management
- Easier resources provisioning and monitoring
- Automated Orchestration

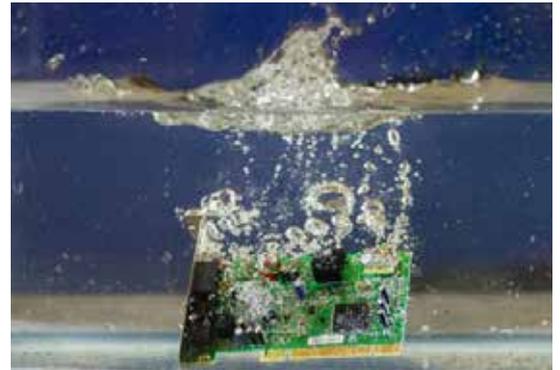
Software Defined Data Center : Best Practices

- Usage of Virtualization
- Use of software and hardware supporting REST APIs
- Infrastructure Automation
- Divides Infrastructure in reusable components

Why Immersion Cooling?

For Immersing cooling process server equipment is fully Immersed in specially Engineered Dielectric medium with exponentially high heat carrying capabilities compared to Air.

Such a method allows for **efficient heat dissipation of up to 95%** from various sources in computing equipment Highly efficient & Ecofriendly solution for future ready Data Centers and Computing needs with Power Usage Effectiveness (PUE) of **<1.05**



Key Benefits



High Rack densities up to 200kW



Improved IT equipment Life



Up to 50% savings on total Operating costs



Up to 40% reduction in carbon emissions per MW



PUE <1.05



Reduction of overall Data centre footprint



EcoPod

- Immersion cooling Pods with **50kW to 200kW** heat dissipation in **24U and 42U rack form** factors.
- EcoPod enables high rack space utilization for Optimizing overall footprint needs and lowering carbon emissions
- Up to **95% reduction in cooling energy** needs compared to other methods

Ecopod Specification

Product Series	EcoPod 24 / EcoPod 42
Server Rack Space	24U / 42U
Cooling Capacity	Up to 50kW (24U) / 200kW (42U)
Cooling System Efficiency - PUE	< 1.05
Redundancy	Pumps, Heat Exchanger, Controller - 2N Dry / Adiabatic Cooler - N+1
Pod dimensions (W X D X H)	EcoPod 24 - 1450mm X 820mm X 1245 mm EcoPod 42 - 2050mm X 935mm X 1245 mm
Pod weight with Coolant	1000 kg (24U) / 1700 kg (42U)
CDU dimensions (W X D X H)	1550mm X 800mm X 2100mm
CDU weight	Up to 350kg
Heat Rejection Mechanism	Dry / Adiabatic Cooler / Chilled Water Loop
Dry Cooler	Up to 35 °C Ambient Temperature
Adiabatic Cooler	Up to 45 °C Ambient Temperature
Chilled Water Loop	Water temperature range 15 °C - 30°C

Product Series	EcoPod 24 / EcoPod 42
Operating Conditions	
Ambient Temperature	Up to 55 °C
Power Requirements	
Coolant Distribution Unit (CDU)	1 Phase, 240VAC, 50Hz
Energy Consumption CDU	up to 1.2kW (24U) / 4.8kW (42U)
Dry / Adiabatic Cooler	3 Phase, 380-480VAC, 50Hz
Avg Energy consumption Cooler	up to 1.3kW (24U) / 5.2kW (42U)
Site Preparations	
Floor	Levelled Floor
	Floor strength - 1400 kg /m2
Access to Power	As per site configuration for Pods, CDU & Coolers
Access to water	For Adiabatic cooler & Chilled water loop
Remote Monitoring	
BMS Integration	Modbus, TCP/IP, BACnet

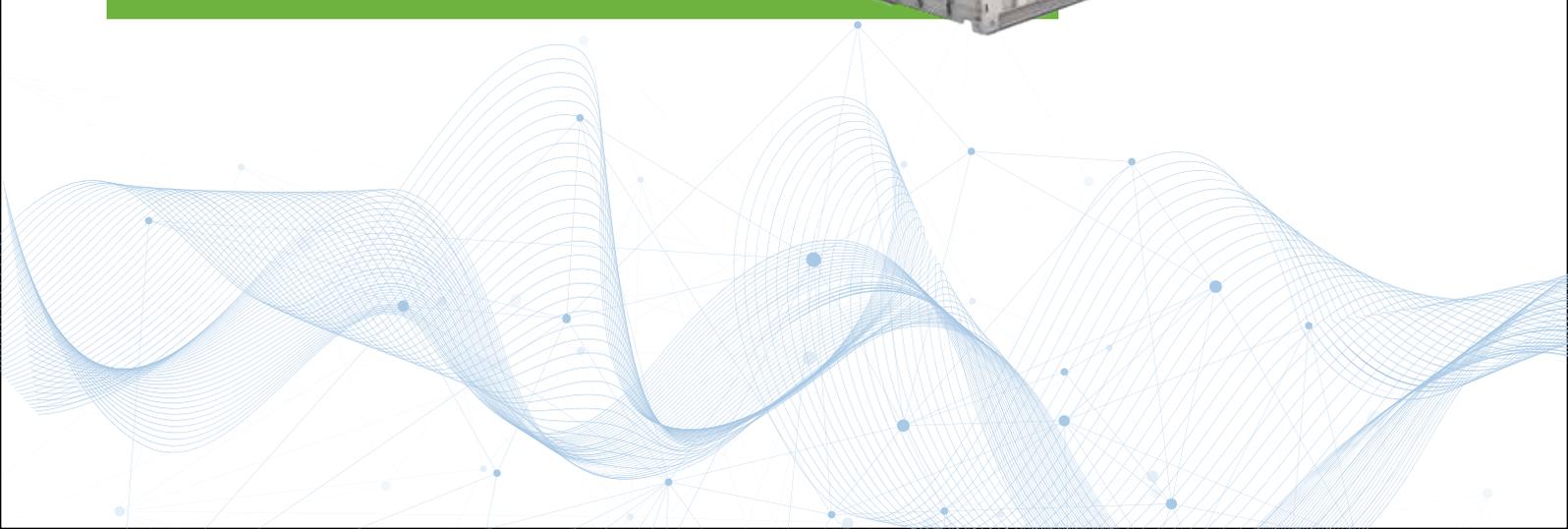


MiniPod

- Rapid deployable solution in a box for offices with On-premises data centers. Edge ready Immersion Cooling solution.
- Plug and Play system with up to **6kW heat dissipation with 8U usable rack space.**

ISOPod

- Ready to deploy Data centre in a box in ruggedized, Weatherproof containers – Best suited for rapid capacity building and remote site deployments.
- Built to **custom requirements** with up to **1MW rack densities** in a **standard shipping container.**



What's in it for you

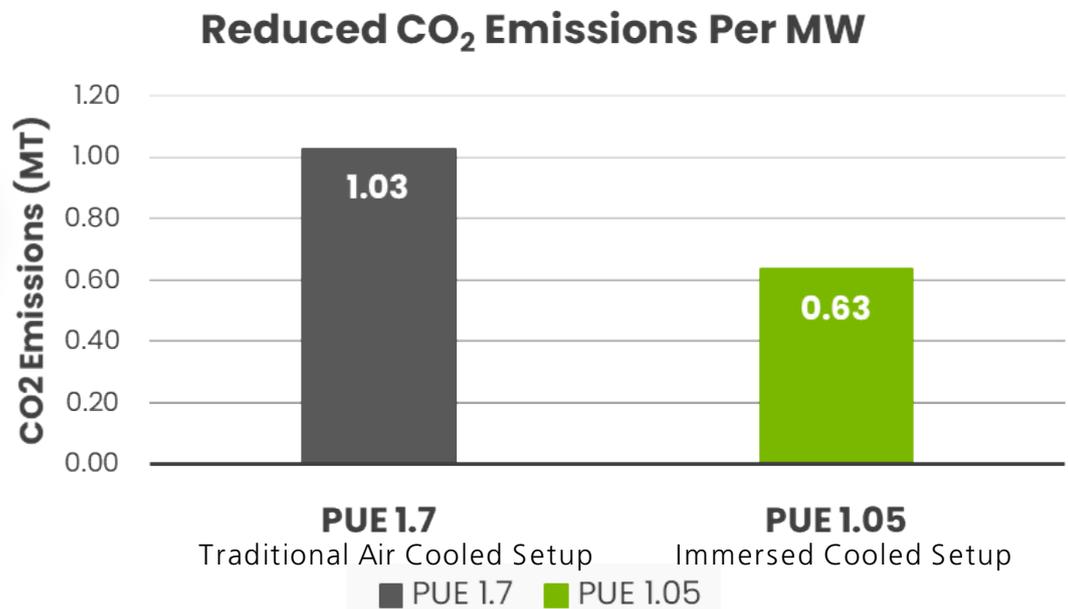
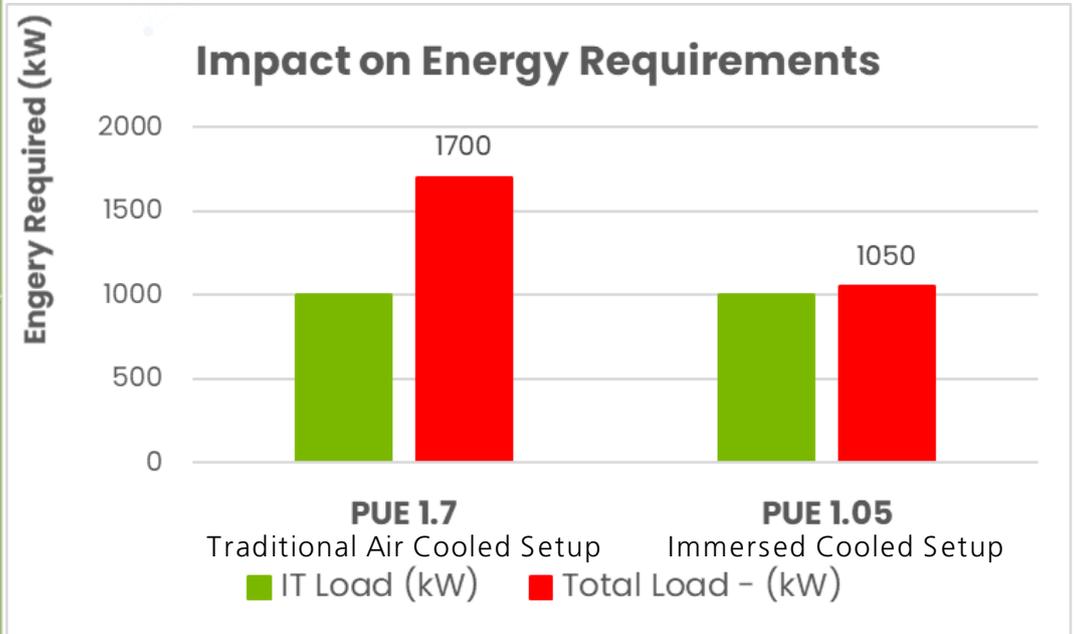
PUE 1.05
Or better with Immersion cooling

50% ↓

- Reduction in overall Data Center energy consumption costs
- Reduced IT cooling costs by **95%**

95%

Increased Server equipment life



L&T gEdge - Defence Use Cases



5G Solutions

L&T Green Edge data centers provide 5G in a box which can help in faster 5G and its use cases deployment.



Drones

L&T Green Edge DC can help aggregate data from multiple drones, particularly in the situations where there will be fleets of drones used for logistics, aerial inspections, etc.



Simulator Platform

Simulation Platform allows comprehensive tests of automation and realistic operator training before real systems go into operation.



De-Centralized Command Center

Edge DC enables decentralized decision making. With the access to data on their own devices, soldiers can quickly assess the threats in front of them, identify who is a target and who is a

co-combatant, and feel confident in their actions to carry out defense missions.



Geo Surveillance

L&T Edge DC provides high computational and analytical power required for Geo Surveillance Workloads.



Edge Cloud solutions

Edge DC enables edge cloud solution for bringing private cloud experience to organization's applications and users when remote deployment is needed.



L&T Smart World

Safe & Smart Cities | Communication

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