



VERTIV™

SmartRow™ Plus

Intelligent, Integrated Converged
Infrastructure solution



SmartRow™ Plus Micro Data Centers

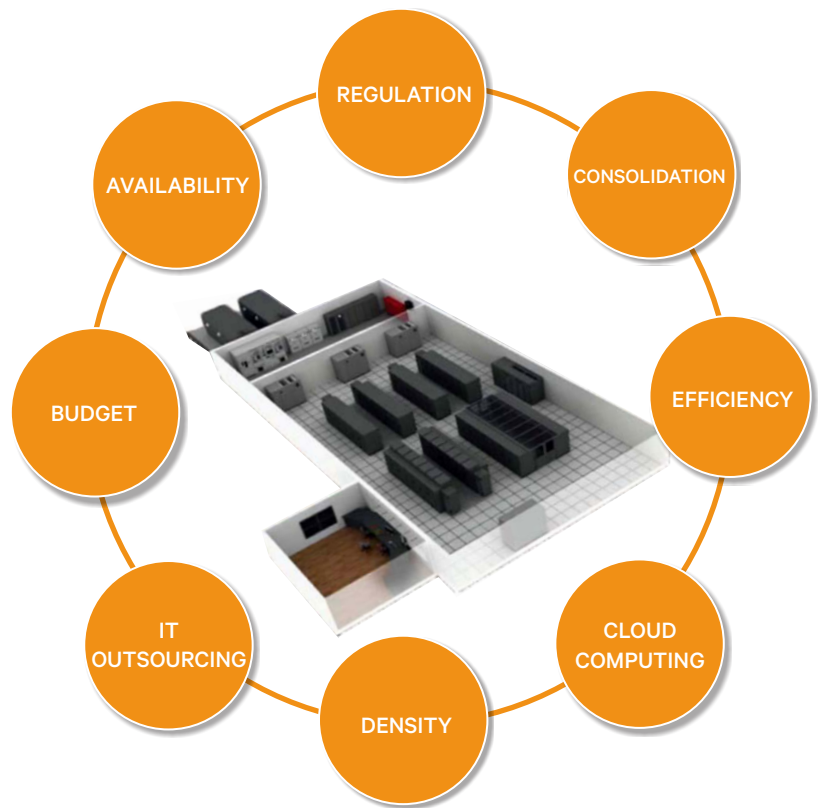
Infrastructure Challenges

Setting up a data center involves lot of complexity with multitude of pain points for

IT Manager like :

- Ever increasing real estate price/rental
- Power and cooling cost
- Upgrade challenges with increased demand
- Setting up infrastructure in remote locations

Failure to properly design and deploy physical infrastructure can lead to underutilized systems, stranded capacity and higher operating costs, preventing you from gaining the full advantage of your data center.



DEPLOY

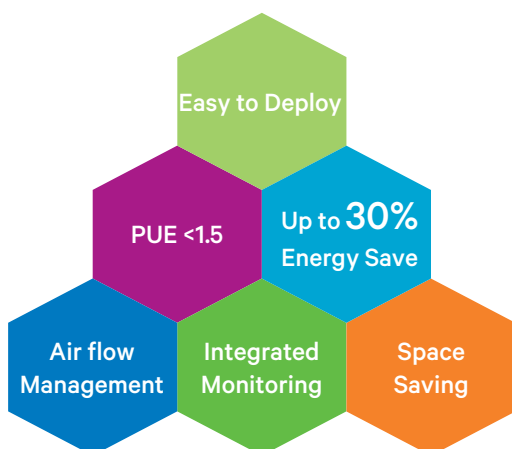
MONITOR

ENERGY

SPACE

SmartRow™ Plus solves all the problem in one go!

Industry Best Practices Infrastructure Design & Operations

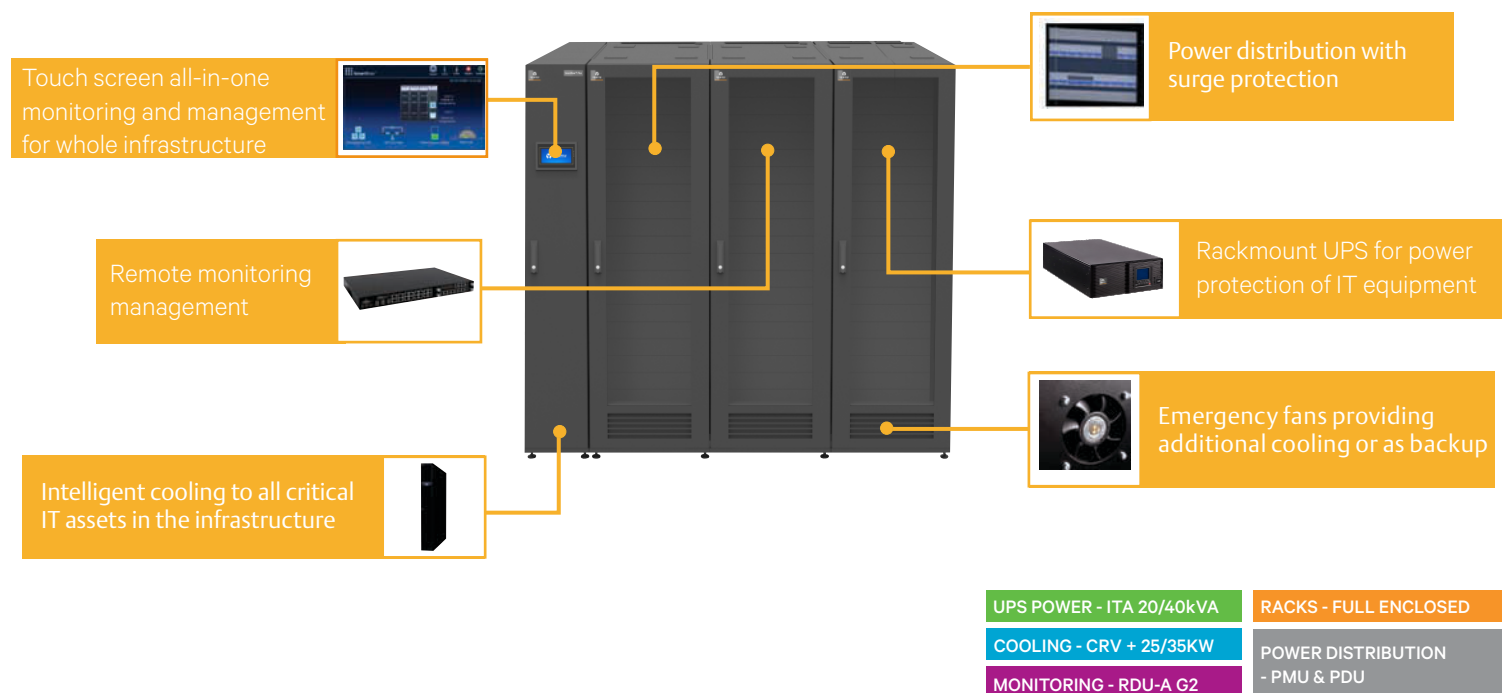


Smart Solutions

Why SmartRow™ Plus?

The SmartRow™ Plus solutions provide a cost-effective power, thermal management and infrastructure management, to help you achieve your IT objectives regardless of data center size and complexity.

Key Components



Thermal Management Liebert CRV plus : In Row Cooling

- Inverter scroll - capacity modulation
- Aisle containment design
- 25kW DX solution, standalone or N+1 redundant
- Flexible in design
- Green Refrigerant



Power Management Liebert ITA : In Rack

- Rack mounted, smaller footprint
- Up to 95% efficiency
- Unity input power factor
- 20kVA, standalone, N+1, or 2N configuration
- THDI < 3%
- Wide input voltage Window
- 0.9 out put power factor
- Rack mounted batteries



Integrated Cabinet Racks

- Sealed design for aisle containment
- IP 5X dust-proof certified
- Suitable for Server (600mm width) and Network (800mm width) application
- Emergency ventilation for hot air dissipation
- MPS Managed PDU. Metered or switched
- High weight load capacity up to 1,300KG
- Full options of cable management, blanking panels,

Intelligent Infrastructure



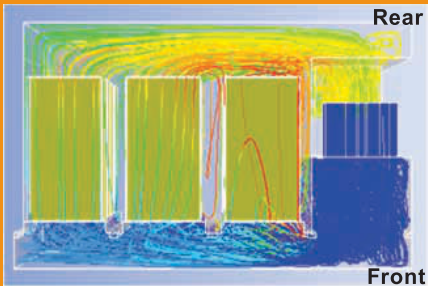
Intelligent Security System

- Fire detection and suppression system (optional) – protect core IT equipment from fire with its intelligent
- Intelligent door lock with ID/IC card authorization management (optional)
- Emergency exhaust Fan - provision for exhaust air ventilation in case of cooling failure



Unified Centralized Infrastructure Monitoring & Management

SmartRow™ Monitoring is powered by the RDU Platform – which allows for all environment sensors & intelligent devices (UPS, Thermal Management, PDU) information to be collected in one display, either in a web browser or the LCD touch screen. In event of cooling failure, emergency fans will be activated



Top View

Full Containment

With the front & rear containment, cooling is optimized and contained within SmartRow™ Plus. Preventing loss of required cooling for the IT equipment to the open space.



Remote Mobile Apps

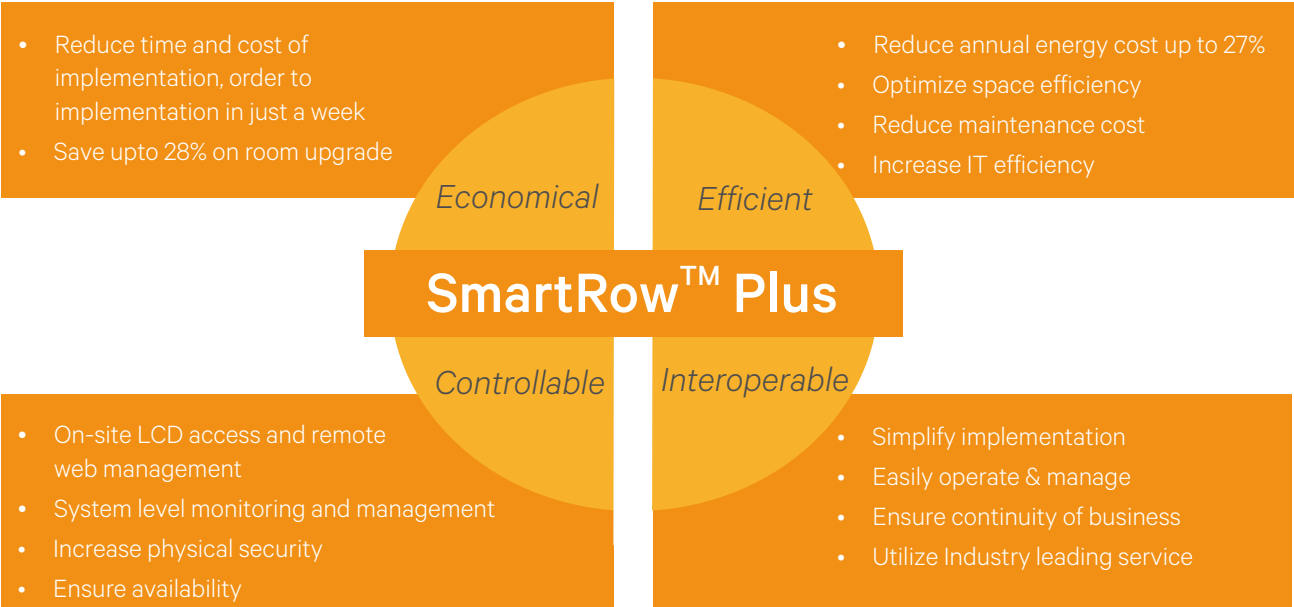
Android device compatible mobile applications put your view where your remote site is. The power and convenience to be updated on actual general health of your investment.

The Smart Choice Over Conventional Data Centers

	SmartRow™ Plus	VS	Conventional
Complete, Integrated Infrastructure	A unique containment that includes all products pertaining to cooling, monitoring, power distribution and management among others that work in conjunction to deliver higher efficiency and availability apart from optimal capacity		Redundant systems where multiple, disparate infrastructure components must be ordered and installed separately, leading to lesser degree of compatibility and lower capacity
Incorporate Industry Best Practices	Implements industry-best and enterprise-grade practices listed below: <ul style="list-style-type: none"> • Hot aisle/Cold aisle separation • High availability and efficiency • Minimal footprint (read less space) • Modular and scalable architecture • Streamlined monitoring and management • Exemplary local support and services 		Infrastructure components may not be designed and configured for best-in-class practices leading to low performance. At times, compromises by choosing one element over other: for example, interchange and choose efficiency over availability.
Lower Capital Expense	Cost-effective implementation that abstracts the conventional data center needs such as a dedicated cooling system and raised floor to mention a few. Scalable architecture that eliminates the need of building a bigger room for higher capacity for futuristic use resulting in significant savings		Additions made to increase the room-level power, cooling, and distribution to support more IT equipment based on the degree of scalability.
Lower Operating Expense	Achieve more than 30% annual savings over conventional designs due to high efficiency, integrated cooling, closed aisle system, and effective power management		Dedicated cooling may be less efficient because the entire room temperature and humidity must be controlled.
Compact Footprint	Streamlined design leads to less floor space; Thermal Management leverages the benefit of concentrated air flow; comes with an advanced power distribution system		Perimeter cooling and dedicated infrastructure requires significantly greater space utilization leading to less efficient cooling; Multiple power distribution panels are mandatory.
Quick Installation	Easy to order and deploy, lesser time required vs conventional data center build		Complex installation owing to cascading requirements, longer timeframes, and requirement of external technicians.
Simplified Project Management	Well connected network of data center experts ensures easy ordering, installation, and servicing		Service and support requires multiple vendors increasing the complexity
Flexibility	All-in-one architecture with 2-6 racks, 25 KW cooling capacity with higher scalability in terms of power, cooling, and supervision.		Adding or changing airflow and power capacity cannot be achieved easily
Monitoring and Management	Built-in monitoring and alarm systems (with notifications on power and cooling among other attributes) provide enhanced control		Monitoring and management may not have built-in components and function parts resulting in inadequate control

Think Smarter, Think GreenerThink SmartRow™ Plus

What makes the SmartRow™ Plus offering Unique?

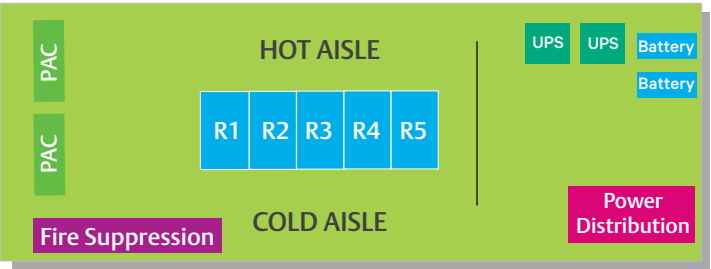


Smart Solutions

Business Case:

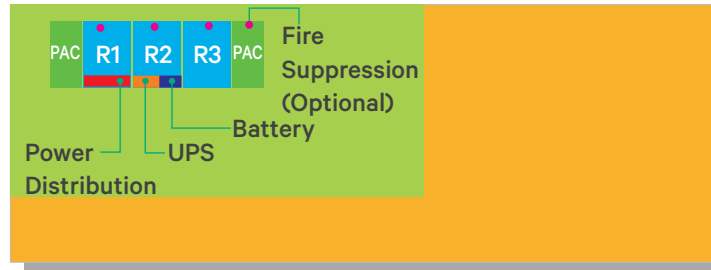
A simple case study reveals design optimization and advantages of SmartRow™ Plus

Situation : Deployment of 25kW IT load on non-IT ready room. Below two envelopes show difference in conventional and intelligent infrastructure.



Conventional Data Centre :

- 5 Racks with 3-4KVA avg load
- 20 KVA - Power density
- PAC - Room Cooling, SAT : 16° C
- Wall mounted power distribution panel
- Fire suppression : Room base
- Room size : 30m²
- Deployment period : 5 weeks



SmartRow™ Plus

- 3 Racks with 6-7KVA avg load
- 20 KVA - Power density
- PAC - Row Cooling, SAT : 20° C
- Built-in power management unit
- Fire suppression : Within the rack
- Room size : 14m²
- Deployment period : 1-2 weeks



SmartRow™ Plus Technical Specification

Configuration	1+2	1+3	1+4	2+4	2+5	2+6
Features						
Quantity of cooling unit	1			2		
Quantity of IT Racks	2	3	4	4	5	6
Useable space (RU)	44~58	86~100	128~142	122~136	164~178	206~220
UPS Capacity	20kVA, standalone or N+1			20kVA, standalone or 2N		
Cooling Capacity	25kW					
Emergency Ventilation	YES					
Cooling Redundancy	Thru emergency fan			YES		
Rack PDU	Metered or Switched, 1 or 2 per rack					
Power Management Unit	1			2		
IT Management	thru Optional KVM					
Fire Suppression	Optional					
Infrastructure Monitoring (local)	Touch panel LCD display					
Infrastructure Monitoring (remote)	YES					

*Specification are subject to change without any prior notification



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CS-EN-AP-1-1-0-17-3