



w-Metro Product Family Guide

Data Center Solutions



 **WAVE2WAVE**
BRINGING DATA CENTERS TO LIFE™

-  w-MetroExpress™
-  w-MetroMono™
-  w-MetroVault™

*Secured, Mobile Enclosures (with cooling, active fire suppression),
Power Distribution Units (PDU), Uninterruptible Power Supplies (UPS),
Network Connectivity and Cabling*

Introduction

In today's rapidly changing information technology (IT) environment, businesses are looking for solutions to manage their infrastructure, reduce costs, and improve operational efficiencies. Traditional "bricks and mortar" data centers have become overly complex, costly to build, and extremely inefficient. Even containerized data centers, which are an alternative, fail to adequately address all space, cost, and energy inefficiencies.

Wave2Wave Solution Corp.'s modular, mobile data centers go to the next level in terms of implementation, management, mobility, energy-efficiency, and cost-effectiveness. Our w-Metro™ family of "data centers in a box" offer the most advanced IT solutions on the market today. They include the w-MetroExpress™, w-MetroMono™, w-MetroVault™ and w-MetroXtreme™.

Energy Efficient

Skyrocketing electrical costs to cool and maintain data centers are among the most critical problems in today's IT world. Wave2Wave's patented, onboard closed loop cooling (see figure 1) confines the hot and cold aisles within the enclosure so that cooling is applied directly to the equipment.

- Manage power consumption, cooling delivery, and temperature set points at a rack level
- Dramatically reduce your cooling and electrical costs by up to 50%, compared to a traditional data center
- Significantly reduce harmful greenhouse gas emissions

High-Density=Capex, Opex Savings

If you plan to build a new data center or are in need of a data center retrofit, our Micro-Modular Data Centers offer a quick and cost-effective solution. Traditional data centers require that the majority of the infrastructure be built upfront and support not only current needs but future demands as well. Our enclosures can be designed, built, fully populated, and delivered within 8 weeks compared to 5 to 24 months for a traditional data center.

- Reduce the costs to plan, build, and implement your new facility by up to 80%
- Have a fully functional data center that is cost, space, and energy-efficient within weeks instead of months or years

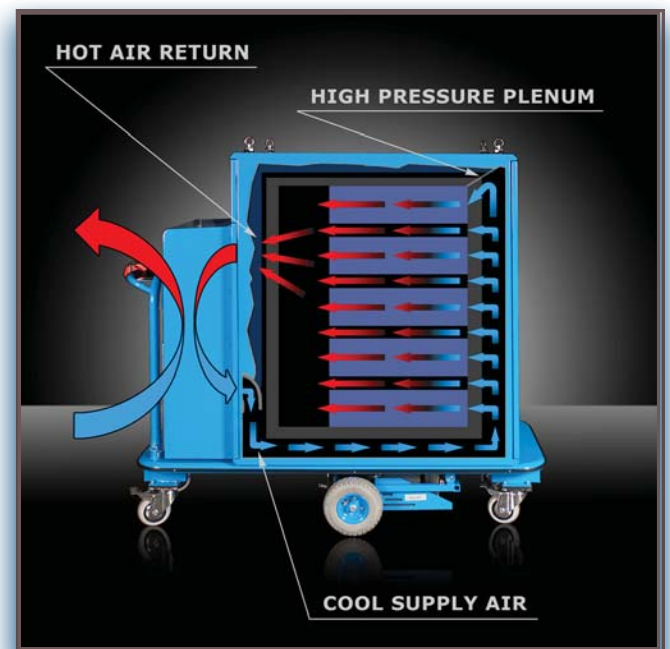


figure 1: Onboard Closed Loop Cooling

Our industry standard 19-inch racks are fully adjustable and allow you to utilize the latest high-density solutions including powerful blade servers, network, and Telco gear. A choice of customized options enables you to increase server capacity and take advantage of co-location, cloud computing, and virtualization technologies. Our airtight enclosures include onboard cooling, security, and fire-suppression.

- No need for the large room, big iron, HVAC, and raised floors to run your equipment
- Reduce the footprint of your facility by up to 75%
- Save up to 65% in operating costs

Scalable

Our Micro-Modular Data Centers are perfectly scalable, providing you with the building blocks to add computing capacity as needed.

- Eliminate the need for 10- to 20-year projections that result in "over" and "under" builds
- Grow your data center horizontally – from 1 to 100 units – without disrupting existing operations
- Build as you need and pay as you grow

Deployable

Our Data Centers can be moved anywhere in the world very quickly and inexpensively. There's no need for the 20-foot shipping containers and cranes required to move containerized data centers.

Our products can be managed and moved by one individual. The patented adaptive suspension uses In Motion Engineering™ to eliminate the harmful effects of motion, shock, and vibration.

- Have a data center where you want it, when you want it, and for however long you want it; just provide power and network connectivity
- Reduce the costs to pack, transport, and set-up your new facility by up to 50%
- Keep your equipment safe and well-protected in any standard or mobile commuting environment

Mobile

Our w-MetroVault and w-MetroExpress enclosures offer power-assisted mobility (see figures 2 and 3), allowing one individual to move up to 1,000 pounds of rack-mounted IT equipment at the push of a button.

- Micro-sized units can fit through any standard-sized door, be loaded onto and off of a standard elevator, and moved to any part of your office, or relocated to new headquarters
- Our w-MetroMono can be moved with an pallet jack or forklift

Installation Process

Our enclosures are easy to implement requiring: site survey, powered connectivity and installation.

Support

Our "First to Market" solutions, backed by our experienced, certified professionals, guarantee you unparalleled support and peace of mind.

- Products feature on-board security and can be remotely monitored
- EMS enclosures have a one-year warranty and 24/7 technical support
- Extended warranties are available



figure 2: Power Assisted Mobility



figure 3: w-MetroExpress can be easily moved



figure 4: w-MetroExpress

w-MetroExpress

W-MetroExpress (see figure 4) is a 24U, NEMA 12, Micro-Modular Data Center that provides 2.5KW and up to 6KW of onboard closed loop cooling directly to the equipment.

The patented In Motion Engineering™ suspension protects sensitive equipment from vibration and shock sustained in a mobile environment. 24U's small, scalable nature provides an inexpensive data center solution or co-location alternative. The self-propelled feature allows a user to move up to 1,000 pounds of rack-mounted electronic equipment.

A more ruggedized version of the w-MetroExpress is available for extreme and remote environments. Known as the w-MetroXtreme, this highly mobile data center is designed to operate even in the most challenging and harsh locations.

Key Features

- Single or dual onboard closed loop cooling
- Self-propelled platform allows one person to move up to 1,000 pounds of equipment up a 6% grade
- Industry standard 19" wide X 42" deep racks are fully adjustable for depth
- Self-contained I/O panel provides connectivity to the equipment within the enclosure without allowing access to the sensitive equipment inside
- Access point to I/O panel, front door, and motion systems can be secured by tamperproof CyberLock system

Product Features

- NEMA 12 environmental package with NEMA 4 option
- Exterior welded steel shell and frame mounted securely on a power assisted platform
- Welded steel inner frame conforms to industry standard 19" x 42" racks that are fully adjustable for depth
- A/C Power Options – Standard – 208 – 240
- VAC 50/60 Hz or Optional 120 VAC 50/60 Hz
- Air temperature can be controlled by a 2.5 KW single or 6.0 KW dual closed loop A/C units
- Self-propelled platform allows one person to move up to 1,000 pounds of rack-mounted equipment up a 6% grade
- Sound dampening (72 dB = indoor conversation)
- Tamperproof CyberLock security system with programmable electronic lock, multi-tier security and audit trail

CapEx Savings

- Reduce the costs to plan, build and implement your new facility by up to 80% vs. a Traditional Data Center

OpEx Savings

- Reduce footprint up to 75%
- Reduce cooling and electrical costs up to 50%
- Reduce operating costs by 65%
- Perfectly scalable - build as you need and pay as you grow

Time Savings

- Enclosures can be delivered within 8 weeks compared to two years for a Traditional Data Center

Optional Upgrades

- 3/8" square or 10-32 tapped rail
- Self-contained I/O patch panel
- Water heat exchanger
- External RF antennas
- Active fire suppression with Novek 1230
- *Second top-mounted A/C
- Aerogel 16R nano-particle insulation

Applications

- Instant Data Center or Network Closet
- Remote Office Support
- Infrastructure Upgrade and Hardening
- Re-establish Communications
- Mobile Computing
- Offsite Data Replication
- High-Density Zone
- Emergency Management
- Disaster Recovery
- Data Center Expansion or Retrofit

Technical Specifications	
Dimensions	60" tall x 24" wide x 66" long*
Weight	850 lbs*
Dynamic Load Capacity	1,000 lbs*
Mobility Range	10 miles*
Speed	2.6 mph
Operational Temperature	0° to 120°F*
Internal Storage Capacity	24U
Total Cooling Capacity	2.5 KW Single A/C Standard; 6.0 KW Dual A/C Optional
<i>* depending upon upgrade options selected</i>	



figure 5: w-MetroMono

w-MetroMono

w-MetroMono™ (see figure 5) is a 42U Modular and Mobile Data Center. It is a NEMA 4 solution that provides 12KW (air cooled) or 16 KW (water cooled) of closed loop cooling directly to the equipment. These enclosures can fully replace the building shell of a traditional data center. Customers can add single units or groups of units as their requirements increase providing a perfectly flexible, scalable, and cost-effective IT solution.

Key Features

- Mission critical venting available
- Exterior welded steel shell and frame provides a rigid support allowing an equipment load of up to 1,500 lbs.
- Welded and sealed panels provide superior strength and create a NEMA 4 enclosure that protects equipment from the elements
- Industry standard 19" wide X 42" deep racks are fully adjustable for depth
- Environmental network monitoring available

Product Features

- Built-in closed loop cooling can support 12KW of IT air cooled or 16KW water cooled
- NEMA 4 enclosure provides superior strength that protects equipment from the elements; NEMA 3R enclosure option provides cost-effective entry solution
- Industry standard 19" wide X 42" deep racks that are fully adjustable
- Dual power inlets for Tier IV capacity
- Sound dampening 65 dB = indoor conversation

CapEx Savings

- Reduce the costs to plan, build, and implement your new facility by up to 80% vs. a Traditional Data Center (TDC)

OpEx Savings

- Reduce footprint up to 75% vs TDC
- Reduce cooling and electrical cost up to 50%
- Product can be moved by a pallet jack or forklift - reduce costs to relocate your facility by up to 50%
- Reduce overall operating costs up to 65%

Time Savings

- Enclosures can be delivered within 8 weeks compared to 2 years for a TDC

Applications

- New Data Center Build
- Data Center Retrofit or Expansion
- High-Density Zone
- Infrastructure Upgrade and Hardening
- Remote Office Support
- Cell Tower Replacement
- Offsite Data Replication
- Disaster Recovery
- Business Continuity

CyberLock Feature

The integrated electronic security system (see figure 6) has 4 levels of security access to the enclosure. The patch panel, both equipment doors, and propulsion system are all secured with unique keys. It provides fully customizable encrypted security access. There is a 4,000 user event auditable trail and it is field serviceable. The CyberLock feature is an optional feature available for every product in the w-Metro product family.



figure 6: CyberLock Feature

Techical Specifications	
Dimensions	83" tall x 30" wide x 75" long*
Weight	1,050 lbs*
Dynamic Load Capacity	1,500 lbs*
Operational Temperature.	- 40° to 131°F*
High Density Equipment Capacity	36U
Low Density (Network) Equipment Capacity	6U
Total Equipment Capacity	12 KW (AC) Standard; 16 KW (Water-Cooled)
Standard	208-240 VAC 50/60 Hz
Optional	460 VAC 50/60 Hz
<i>* depending upon upgrade options selected</i>	

w-MetroVault

W-MetroVault (see figure 7) is a 22U, NEMA 3R, mobile, self-contained Micro-Modular Data Center. The unit is designed for agile, high-density applications where mobility, shielding, environmental protection, and disaster tolerance are priorities. Customers can order a variety of options such as onboard power conditioning, remote monitoring, and integrated WI-FI.

This small, yet powerful (up to 6KW) data center can be installed, completely sealed, and connected for a broad range of indoor and outdoor computing scenarios.

Key Features

- Single or dual onboard closed loop cooling
- Self-propelled platform allows one person to move up to 1,000 lbs of equipment up a 6% grade
- Patented In Motion Engineering™ suspension protects equipment from severe shock, motion, and vibration
- Threat Level 1 aluminum armored plate optional
- Industry standard 19" wide X 42" deep racks are fully adjustable for depth
- NEMA 3R sealed environment that protects all equipment from the elements
- Optional 4.0 kVA line conditioner
- I/O panel, front and rear doors, and motion systems can be secured by tamperproof CyberLock system

Product Features

- Aluminum and titanium-bolted assembly outer frame and TIG welded inner frame
- Multi-axis, weight-adaptive, magnetorheologically dampened suspension
- Full mechanical lockdown capability
- Self-propelled, OSHA approved platform with a 1,000 lb payload capacity
- Industry standard 19 x 42" racks
- Self-contained I/O panel provides connectivity with protected equipment inside without breaching the environmental seal
- Tamperproof Cyberlocks with programmable electronic locks, multi-tier security, and audit trail
- Sound dampening (72 dB = indoor conversation)
- Aerogel - 16R nano-particle insulation



figure 7: w-MetroVault

CapEx Savings

- Save up to 80% in upfront build costs vs. a traditional data center and 50% vs. a containerized data center
- Have a full mobile command center that costs up to 66% less than a traditional (MCC)
- Onboard fire suppression, cooling and security provided within the enclosure
- Airtight enclosure protects equipment from the elements

OpEx Savings

- Eliminate set up costs, and investment losses due to damaged equipment
- Eliminate high service fees charged by outside disaster recovery specialists
- Significantly reduce downtime by quickly re-establishing communications

Time Savings

- Have fully configured mobile IT in weeks vs. months

Applications

- Mobile Computing
- Mobile Command Center
- Military Communications
- Border Checkpoints
- Emergency Management
- Airport/Ports of Call
- Infrastructure Upgrade and Hardening
- High-Density Zone
- Disaster Recovery

Technical Specifications

Dimensions	59" tall x 27.5" wide x 66" long*
Weight	900 lbs*
Dynamic Load Capacity	1,000 lbs*
Mobility Range	10 miles*
Speed	2.6 mph
Armored Panels	Threat Level 1
Operational Temperature	0° to 120°F*
Internal Storage Capacity	22U
16R Nano-Particle Insulation	
Total Cooling Capacity	2.5 KW Single A/C Standard; 6.0 KW Dual A/C Optional
<i>* depending upon upgrade options selected</i>	

w-Metro Family Comparisons

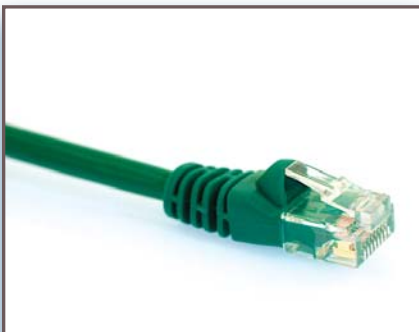
Features	w-MetroExpress	w-MetroMono	w-MetroVault
Patented, On-board Cooling System	✓	✓	✓
Vendor Neutral Standard 19" Rack Systems	✓	✓	✓
Mobile/ Re-locatable	✓	✓	✓
Self-Propelled Platform Allows One Person to Move Up to 1,000 Pounds	✓		✓
Patented Shock and Vibration System	✓	✓	✓
Patented Active Suspension System	✓	✓	
Patented Adaptive Suspension System	✓	✓	✓
Active On-Board Fire Suppression	✓	✓	✓
Completely Sealed Systems	✓ (NEMA 12)	✓ (NEMA 4)	✓ (NEMA 3R)
Fully Scalable	✓	✓	✓
Cyber Lock Encryption Security	✓	✓	✓
Easy Serviceability	✓	✓	✓
Hot & Cold Aisle Containment	✓	✓	✓
Sound Dampening	✓	✓	✓
Full Mechanical Lockdown Capability	✓		✓
Self-contained I/O Patch Panel-Option	✓		✓
Multi-axis, weight-adaptive, magnetorheologically dampened suspension			✓
Self-propelled, OSHA approved platform with a 1,000 lb payload capacity	✓		✓
Remote Monitoring	✓	✓	✓
Integrated Wi-Fi	✓	✓	✓
		✓ (standard)	✓ (optional)



Fiber Optic Patch Cords



Wave2Wave manufactures a wide variety of cabling products under the brand names of w-Intense and w-Ignite; we can provide fiber optic patch cables and patch panels, copper networking cables and patch panels, and so much more.



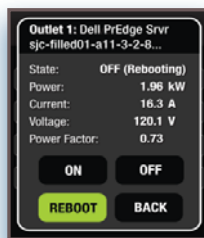
Cat 5/6 Patch Cables



NEMA Type Definitions

Rating	Description
1	General-purpose. Protects against dust, light, and indirect splashing but is not dust-tight; primarily prevents contact with live parts; used indoors and under normal atmospheric conditions.
2	Drip-tight. Similar to Type 1 but with addition of drip shields; used where condensation may be severe (as in cooling and laundry rooms).
3 and 3S	Weather-resistant. Protects against weather hazards such as rain and sleet; used outdoors on ship docks, in construction work, and in tunnels and subways.
3R	Intended for outdoor use. Provides a degree of protection against falling rain and ice formation. Meets rod entry, rain, external icing, and rust-resistance design tests.
4 and 4X	Watertight (weatherproof). Must exclude at least 65 GPM of water from 1-in. nozzle delivered from a distance not less than 10 ft for 5 min. Used outdoors on ship docks, in dairies, and in breweries.
5	Dust-tight. Provided with gaskets or equivalent to exclude dust; used in steel mills and cement plants.
6 and 6P	Submersible. Design depends on specified conditions of pressure and time; submersible in water or oil; used in quarries, mines, and manholes.
7	Hazardous. For indoor use in Class I, Groups A, B, C, and D environments as defined in the NEC.
8	Hazardous. For indoor and outdoor use in locations classified as Class I, Groups A, B, C, and D as defined in the NEC.
9	Hazardous. For indoor and outdoor use in locations classified as Class II, Groups E, F, or G as defined in the NEC.
10	MSHA. Meets the requirements of the Mine Safety and Health Administration, 30 CFR Part 18 (1978).
11	General-purpose. Protects against the corrosive effects of liquids and gases. Meets drip and corrosion-resistance tests.
12 and 12K	General-purpose. Intended for indoor use, provides some protection against dust, falling dirt, and dripping noncorrosive liquids. Meets drip, dust, and rust resistance tests.
13	General-purpose. Primarily used to provide protection against dust, spraying of water and noncorrosive coolants. Meets oil exclusion and rust resistance design tests.

source: Wikipedia



Outlet Control & Metering

w-Matrix™ is a family of intelligent power distribution unit (PDU) available for the w-Metro family of modular and mobile data centers. It is powered by technology from Cyberswitching, a power management leader.



w-WaveBreaker virtual circuit breaker



LCD Touchscreen Control; USB/Network Ports



Wave2Wave provides business essential infrastructure solutions that enable leading enterprises to unlock and realize the benefits of next generation data center technologies. Our data center product families include environmentally friendly and smart network cabling, modular and cost-efficient data centers, optical wavelength management systems and intelligent network infrastructure management software. Our products and solutions serve enterprise, government, military and service provider customers and markets in their mission critical data center and IT applications.



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