



# Sun™ Modular Datacenter

The world's first virtualized datacenter —  
what, when, and where you want it



## Highlights

- Rapid deployment in 1/10th the time of a typical datacenter
- Game-changing economic value enables incremental growth in datacenter capacity
- Mobility provides flexibility for global deployment and redeployment as needed, where needed
- High-density computing with 25-kW-capable racks — 4x denser per rack than a typical datacenter
- Eco value with 40 percent lower cooling costs, independent of payload, from an innovative, closed-loop water cooling system



Sun™ Modular Datacenter (Sun MD), widely known as Project Blackbox, is a high-density, energy-efficient datacenter configured in an enhanced 20-foot standard-size shipping container for rapid deployment — virtually anywhere. Engineered to minimize energy and space requirements while maximizing compute density and operating efficiency, Sun MD delivers compute capacity where and when it's needed most, without the up-front expense of building an entire new datacenter. There's no need for special computer rooms, raised floors, or air conditioning, and Sun MD can be configured, deployed, and redeployed quickly — so compute capacity can be added incrementally and on demand.

## Inside-the-box innovation

Sun Modular Datacenter combines Sun Microsystems' trademark innovation and expertise in network computing to deliver a game-changing solution — a fully integrated datacenter in a box — that enables customers to quickly add massive datacenter capacity virtually anywhere in the world. Sun Modular Datacenter comes in two configurations — the original eight rack 'S20', which is an ideal platform for high density HPC and Web 2.0 deployments, and the new seven rack 'D20' edition, which supports deeper profile enterprise class servers, disks, and tape, enabling Service Providers, health care providers, and other fast growing organizations to deploy a broader range of business critical applications. Based on a standard-size, 20-foot (6.1 meter) shipping container, Sun MD is enhanced with

seven (D20) or eight (S20) high-density racks; a patent-pending, water-based cooling system; and shock absorption technology for ultimate transportability. Designed to house a payload of 19-inch rackmountable servers, storage, telecommunications, and networking equipment, Sun MD can be installed permanently or can be deployed and later repurposed and relocated to meet ever-changing business demands or new market opportunities. Multiple units can be distributed geographically to provide a complete global datacenter or disaster recovery solution.

Each Sun MD hosts one 12.5-kW rack for network and system management equipment and six (D20) or seven (S20) 25-kW-capable general-purpose racks for servers, storage, or other equipment both Sun and third-party hardware is supported. This makes it an ideal platform for

new generations of blade servers and other high-density equipment that many existing datacenters today are unable to support due to their limited power or cooling capabilities. With the ability to power and cool as much as 25-kW per rack—four times the density per rack of a typical datacenter—Sun MD can also help reduce clutter and chaos in the datacenter by serving as the ultimate consolidation and virtualization platform.

### Big capacity, small footprint, just in time

With a 200-kW cooling capacity in only 160 square feet of space and a highly mobile form factor, Sun Modular Datacenter can do the same job as a typical datacenter in just 1/8<sup>th</sup> the amount of space. And it can be delivered and brought online far more quickly—typically in weeks versus years, or roughly 1/10<sup>th</sup> the time it typically takes to deploy a traditional brick-and-mortar datacenter.

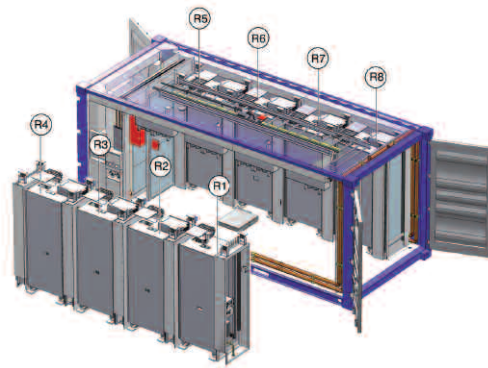
### Help save the planet—and the IT budget

Sun Modular Datacenter makes good sense both ecologically and economically. Thanks to its unique closed-loop water cooling system, Sun Modular Datacenter is more than 40 percent more energy-efficient at cooling than a typical datacenter. With high-efficiency water cooling in a small enclosed area, much less energy is consumed per compute unit than in an air conditioned datacenter. Consequently, Sun MD can help reduce CO<sub>2</sub> emissions by up to 1459 metric tons per platform in just five years, which can help businesses meet new, more stringent environmental regulations. Customers can realize additional energy cost savings and eco value by locating the unit near less expensive or renewable power sources.

Because of our commitment to eco responsibility and minimizing eWaste, we'll take back any unit we sell from anywhere in the world and reuse, recycle, or dispose of it in an environmentally responsible way.

### A turn-key datacenter—just add water and power

Sun can deliver all the tools and services necessary to make it easy to load, install, and



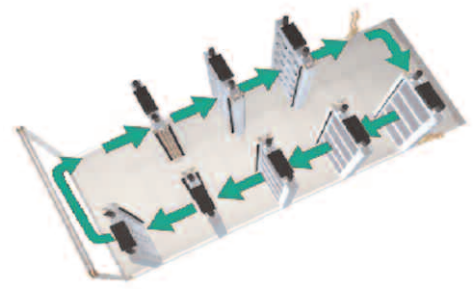
*Sun Modular Datacenter S20—a high-capacity, high-density eight rack compute platform*

operate Sun Modular Datacenter worldwide including water chiller, UPS, and standby generator if needed.

The Sun Customer Ready Systems (CRS) program simplifies project implementation, reduces risk, and accelerates Sun MD deployments by integrating and testing Sun MD with customer payload before it ships. By conducting design validation, cabling, integration, and testing of Sun and third-party equipment and software at the Sun factory, the CRS program helps ensure that the entire solution arrives at the customer site ready for deployment.

With global reach, Sun Services delivers the expertise to install, support, and maintain each Sun MD at the highest levels of performance. Sun offers a full suite of services for Sun MD platform, plus a complete portfolio of lifecycle services for the servers, storage, and software. Customers can utilize Sun Services to deliver a complete turnkey solution including power and cooling infrastructure or select specific services as desired. These services are designed to provide customers with everything they need to get their system up and running *fast*. Key services offered include:

- Project management
- Site assessment and preparation
- Architecture
- Factory-build and on-site installation
- Lights out management and support
- Training



*Sun Modular Datacenter S20—high-efficiency cooling system*

### The wherever, whenever solution

As a leader in network computing innovation, Sun continues to change the economic equation for IT. We've applied our unique and extensive knowledge of network, high performance and energy-efficient computing to the design of Sun Modular Datacenter. The result is a one-of-a-kind datacenter solution that can be placed in almost anywhere, which is particularly useful for rapidly growing firms and in emerging markets where infrastructure development trails demand for advanced IT services.

If a lights-out environment is required, customers can manage Sun MD remotely with Sun virtualization and management solutions, such as Sun xVM Ops Center. Sun MD's flexible, transportable form factor allows it to be located in an existing warehouse space, a parking lot, or on a mobile platform to assist with disaster relief operations. The possibilities are virtually endless.

### The Sun advantage

For more than 25 years, Sun has been pioneering, advancing, and delivering innovative technologies that have changed the face of network computing. Sun MD continues this trend by delivering a revolutionary approach to adding datacenter capacity quickly and simply, with the flexibility to reconfigure and redeploy to meet changing business needs.

## Sun Modular Datacenter Specifications

### Dimensions and weight

Length	• 6.06m (20 ft)
Width	• 2.44m (8 ft)
Height	• 2.59m (8 ft 6 in.)
Shipping weight (no payload)	• <8165 kg (<18,000 lb)
Maximum weight	• <15,422 kg (<34,000 lb)

### Capacity

Rack quantity	<ul style="list-style-type: none"> <li>• S20 – Eight racks: seven for payload and one for network and internal control equipment</li> <li>• D20 – Seven racks: six for payload and one for network and internal control equipment</li> </ul>
Rack units (RU)	<ul style="list-style-type: none"> <li>• 40 RU per rack</li> <li>• 280 RU in S20, 240 RU in D20 available for IT equipment</li> <li>• 25 RU available for network equipment in the infrastructure rack</li> <li>• 15 RU reserved for Sun MD monitoring, management, and control equipment</li> </ul>
Rack dimensions	• EIA/ANSI (RETMA) standard 19-inch (48.26 cm) EIA RS-310-D
Height (usable)	• 177.9 cm (70 in.)
Depth (usable)	<ul style="list-style-type: none"> <li>• S20 – 78.1 cm (30.75 in.) all racks</li> <li>• D20 – 78.1 cm (30.75 in.) racks 1 - 4</li> <li>– 115 cm (45.25 in.) racks 5 - 7</li> </ul>

\*Includes cable, bezel, and handle depth

Width (usable)	• 48.26 cm (19 in.)
Load capacity (per rack)	• 862 kg (1900 lb)
Power (per rack)	• 12.5-kW standard per rack; 25-kW high-power option for payload racks

### Power options

Low-voltage configuration	North America/Japan
Input voltage	• 110/190 to 127/220 VAC, 3-phase, 50/60 Hz
Internally distributed voltage	• 110 to 127 VAC, single-phase and 190-220 VAC, 3-phase, 50/60 Hz (Internal single phase not accessible)

### High-voltage configuration International

Input voltage	• 220/380 to 240/415 VAC, 3-phase, 50/60 Hz
Internally distributed voltage	• 220 to 240 VAC, single-phase and 220/380 to 240/415 VAC, 3-phase, 50/60 Hz (Internal single phase not accessible)

### External network connections

Two network panels supported (choice of one option for each side)	
Network panel options	<ul style="list-style-type: none"> <li>• RJ-45 network panel (8 x RJ-45 connectors)</li> <li>• LC Fibre network panel (8 x LC Fibre connectors—single mode or multimode)</li> <li>• RJ-45/LC Fibre network panel (4 x RJ-45 and 4 x LC Fibre—single mode or multimode)</li> <li>• Bulk cable pass-through panel</li> </ul>

### Environmental

External operating temperature and humidity range (doors closed)	• -29°C to +54°C (-20°F to +130°F), up to 100% humidity
Internal operating temperature and humidity range (doors closed)	• +10°C to +35°C (+50°F to +95°F) and 20% to 80% relative humidity (RH), noncondensing
Altitude	• 3048m (10,000 ft) or lower depending on payload maximum
Noise	• 56.0 dBA (external at 2 m) 78.5 dBA (internal at nominal load)

### External water connections

Water hook-ups (each side)	• 50-mm (2-in.) supply and return
Water pressure	• 50 PSIG nominal, 80 PSIG maximum
Water flow and temperature	• 170 to 246 LPM (45 to 65 GPM), +18°C to +22°C (+64°F to +71°F) nominal

### Regulations (meets or exceeds the following requirements)

Safety	<ul style="list-style-type: none"> <li>• UL 60950-1 (ETL classification marking)</li> <li>• UL 50, Ed. 11 (NEMA 3R equivalent levels)</li> <li>• Russia GOST R</li> <li>• CB Scheme with national differences</li> <li>• CAN/CSA C22.2 No. 60950-1</li> <li>• EN 60950-1</li> <li>• CENELEC EN 60529 (IP-44 levels)</li> </ul>
RFI/EMC	<ul style="list-style-type: none"> <li>• EN 55022 (Sun MD and payload)</li> <li>• VCCI (Sun MD and payload)</li> <li>• AS/NZS 3548 (Sun MD and payload)</li> <li>• Korea MIC (Sun MD and payload)</li> <li>• Russia GOST R (Sun MD and payload)</li> </ul> Payload relevant testing <ul style="list-style-type: none"> <li>• CFR47, Part 15, FCC Class A</li> <li>• ICES-003 Class A</li> <li>• CNS-13438</li> </ul>
Immunity	<ul style="list-style-type: none"> <li>• EN 55024</li> <li>• Korea MIC</li> <li>• Russia GOST R</li> </ul>

### Certifications

Safety	• CE Mark, GOST, ETL Classified, CB Report with National Differences
EMC	• CE Mark, ITS Technical Construction File, C-Tick, GOST-R, MIC
RoHS	• RoHS-compliant (with lead-in solder exemption) for control and management equipment

### Standard features and options

• Structurally upgraded and insulated container
• Internal power infrastructure with exterior power connection box
• Internal cooling system with heat exchangers, fans, and plumbing
• Seven (D20) or eight (S20) 19-inch racks with 12.5-kW capacity with cable management system and rack sliding tool
• Control infrastructure, including internal sensor monitoring, lighting, air filters, integrated VESDA® detection and clean agent fire suppression, and dehumidifier
• Warranty and installation service
• Optional upgrade to 25-kW per payload rack
• Optional external electrical disconnect switch

The base Sun MD does not include payload (servers, disk, storage, tape, cables, network routers/switches, etc.), humidification equipment, and infrastructure (chiller, power generation equipment, service shelter, and site preparation).

### Warranty

Duration/term	• 1 year
Phone hours of coverage	• Business hours (M-F, 8:00 a.m. to 5:00 p.m.)
Call-back response	• 8 hours
Onsite hours of coverage	• Business hours (M-F, 8:00 a.m. to 5:00 p.m.)
Hardware response time	• Next business day
Delivery method	• Onsite or customer replaceable units

Refer to [sun.com/service/support/warranty](http://sun.com/service/support/warranty) for complete product warranty information and [sun.com/service/serviceplans/hardware/index.xml](http://sun.com/service/serviceplans/hardware/index.xml) for descriptions of comprehensive warranty upgrade options.

## Sun Modular Datacenter Specifications

### Payload compatibility

Sun or third-party servers, storage, or network equipment that conform to the rack specifications with front-to-back cooling are compatible with Sun MD. The following is a partial list of Sun-branded payload compatible with and supported both Sun Modular Datacenter S20 and D20.

For updates, go to [sun.com/products/sunmd/s20/supported\\_hardware.jsp](http://sun.com/products/sunmd/s20/supported_hardware.jsp)

### Supported Sun servers

Sun Fire™ V125, Sun Fire V210, Sun Fire V215, Sun Fire V245, Sun Fire V440/V445, Sun Fire V480/V490, Sun Fire T1000, Sun Fire T2000, Sun Fire E2900, Sun Fire E4900, Sun Netra 210, Sun Netra 240, Sun Netra 440, Sun Netra T2000 Sun Netra 1290, Sun Netra T5220 Sun Netra X4200M2, Sun Fire X2100M2, Sun Fire X2200M2, Sun Fire X4150 Sun Fire X4450, Sun Fire X4140, Sun Fire X4440, Sun Fire X4240, Sun SPARC Enterprise™ T5120, Sun SPARC Enterprise T5220, Sun SPARC Enterprise T5140, Sun SPARC Enterprise T5240, Sun Fire X4500, Sun Fire X4540, Sun Fire X4100/X4100 M2, Sun Fire X4200/X4200 M2, Sun Fire X4600/X4600 M2, Sun Blade™ 6000, Sun Blade 8000, and Sun Blade 8000P systems and servers.

### Supported Sun storage

Sun StorageTek™ 2530, Sun StorageTek 2540, Sun StorageTek 3120, Sun StorageTek 3320, Sun StorageTek 3510, Sun StorageTek 5310, Sun StorageTek 5320, Sun StorageTek 6130, Sun StorageTek 6140, Sun StorageTek 6540, Sun StorageTek CSM200, Sun StorageTek D240, StorageTek DAT 72 storage, Sun Virtual Tape Library(VTL) Plus 2.0, Sun StorageTek J4200, Sun StorageTek J4400, and Sun StorageTek J4500 systems.

Equipment supported only in Sun Modular Datacenter D20 deep racks are: Sun SPARC Enterprise M4000 and M5000 servers, Sun StorageTek SL500 Modular Library, Sun StorageTek SL24 Tape Autoloader, Sun StorageTek SL48 Tape Library, and Sun StorageTek 9985V System.

### Learn More

For more information on Sun Modular Datacenter, contact a Sun sales representative or authorized reseller, or visit [sun.com/sunmd](http://sun.com/sunmd)