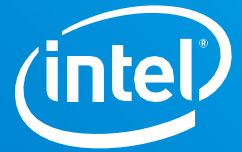


## SOLUTION BRIEF

Intel® Data Center Blocks for Cloud – Microsoft Windows Server\*, Designed with Certified Windows Server\* Ingredients, Optimized for Storage Spaces Direct, Software-Defined Storage (SDS)



# Accelerate Data Center Transformation with Software-Defined Infrastructure



## Intel® Data Center Blocks for Cloud

- **Certified Data Center Blocks** save time and money<sup>1</sup>, freeing up resources to focus on value-add and competitive differentiation
- **Simplify SDI Market Access** with systems designed for Storage Spaces Direct
- **Unbranded Systems** allow resellers to incorporate products into their branded portfolios
- **Intel® Quality & Reliability** with world-class integration, validation, certification, and support
- **Standard Intel 3-year Warranty** with 5-year warranty options available to ensure customers' satisfaction
- **Intel® Select Solutions-ready designs**, workload-optimized and verified reference architectures, provide resellers a simplified path to marketing program participation



## Accelerating the Path to Private Cloud with Intel® Data Center Blocks

Modern businesses require more scalable, reliable, and secure IT infrastructures. Today's storage systems are often critical for the improved performance of business applications, but can prove expensive, siloed, and challenging to scale. As a result, IT departments are transforming their traditional data centers with software-defined infrastructure (SDI) technologies and hybrid cloud. Research demonstrates that outdated infrastructures result in a six-times slower rate for product innovation and time to market<sup>2</sup>. For modern businesses wishing to remain competitive in a fast-moving global economy, adopting an IT modernization strategy is critical.

To help customers with this transformation, Intel and Microsoft have collaborated across the areas of compute, storage, networking, and security to deliver server system configurations that optimize the features and performance of Windows Server\* and help customers accelerate the path to hybrid cloud.

**Intel® Data Center Blocks for Cloud (Intel® DCB for Cloud) — Microsoft Windows Server\*** overcome barriers to software-defined storage (SDS) with out-of-the-box, validated systems that speed the transition to hybrid cloud and SDI deployments for more rapid time-to-value. Working together, Microsoft and Intel optimized the features and performance of Windows Server and the 2nd Generation Intel® Xeon® Scalable processor family to maximize Windows Server 2019 features like Storage Spaces Direct (S2D), Hyper-V, Software Defined Networking, and Windows Admin Center.

Intel® DCB for Cloud — Microsoft Windows Server is tailored for high performance computing, hyper-converged architecture, and storage scenarios requiring outstanding performance. Available in All-Flash and hybrid storage configurations, these systems offer partners the flexibility to build innovative, cost-effective solutions more quickly and efficiently.

### Simplified Management with Windows Admin Center

Intel DCB for Cloud embraces the new Windows Admin Center, available in Windows Server 2019. In the past, gaining systems insights required administrators to switch among multiple consoles to monitor system resources and event activities. The new Windows Admin Center, however, offers administrators a holistic view of system resources including physical machines, virtual machines, and other resources — all in a simplified dashboard. Windows Admin Center features a browser-based graphical user interface and tools needed for an integrated, secure management interface to access fine-grained network details. Also, it offers the flexibility to manage hyper-converged infrastructure scenarios.

### Featuring Intel® Optane™ DC Persistent Memory

Based on Intel® 3D XPoint™ memory media, Intel® Optane™ DC Persistent Memory enabled solutions offer higher storage density than DRAM, combined with greater speed than legacy NAND-based solutions. When used in App Direct Mode for

cache storage, Intel® Optane™ DCPMM places data closer to the processor, reducing latency as compared to traditional slower storage. When used in Memory Mode, Intel® Optane™ DCPMM can offer an affordable alternative to DRAM and can increase both capacity and VM density.

### Reduce Complexity, Improve ROI & Speed Time-to-Market

Designing, testing and certifying SDS solutions is a costly and resource-intensive process. By starting with a higher - level of integration and certification, partners can reduce costs and accelerate time-to-market with unbranded server blocks tailored for specific workloads. This approach gives partners more flexibility and choice about where to invest R&D resources and ensure they remain competitive and drive differentiation in the market. There is also increased acquisition value to the partner, since they source a validated bundle of products with a single order code, rather than acquiring each component individually.

### A System with Intel Quality and Performance via Single Order Code

#### Smart Boards Ensure System Stability and Increased Uptime

Intel Server Boards have more than 100 sensors built in that monitor all critical functions and use management capabilities to automatically flag problems before they impact business operations. Event logs and light-guided diagnostics also assist in rapid identification and issue remediation.



### Breakthrough Performance

Intel® Data Center Blocks for Cloud (Intel® DCB for Cloud) — Microsoft Windows Server offer a comprehensive, validated, and supported system which accelerates cloud and software-defined storage deployments. The latest Cloud Blocks featuring Microsoft Windows Server 2019 enable an optimized solution incorporating enhanced security, networking, and memory technologies including Intel® Optane™ DC persistent memory.

Intel DCB for Cloud server solutions are optimized for high-performance computing, hyper-converged infrastructure, and outstanding storage performance. The 2nd Gen Intel Xeon Scalable processors accelerate virtualized storage - with features such as Intel® Advanced Vector Extensions and Intel® Virtualization Technology. The integrated RDMA support further enhances S2D performance with up to 45% lower latency for application I/O, up to 50% more IOPs for application I/O and up to 40% fewer CPU cycles per I/O<sup>3</sup>.

Supplementing the Intel Xeon Scalable processors, Intel Optane DC Persistent Memory in App Direct Mode offers world-class, low-latency storage performance. Combined under one hood, these new Intel technologies, plus the advanced feature set of Windows Server 2019, the Intel DCB for Cloud is now available as a single SKU. Leverage the MCB2208WFAF10R design, configured with a DCPMM-based storage cache tier and high performance NVMe capacity tier, to exceed your most demanding customers' business needs and help them create a competitive advantage.

### Cloud Data Center Specialist designation

To further help partners succeed, Intel® Technology Providers have an opportunity to qualify for Intel Technology Provider Cloud Data Center Specialist designation. Cloud Specialists have access to exclusive resources specifically designed to help streamline the delivery of cloud-optimized solutions. Specialist benefits include access to the Intel experts and engineering resources to assist Cloud Specialists as they identify exact customer requirements. Other benefits include access to valuable solutions guides and marketing content to help build customer value.



### Pre-Configured, or Configure-to-Order

While Intel® Data Center Blocks (Intel® DCB) offer feature validated and pre-defined configurations, each customer has unique workload needs which is why resellers have the option to order a customized Intel® Data Center Block through Intel's Configure-To-Order (CTO) program. CTO offers the flexibility for resellers to create Intel® Data Center Block solutions that map to their specifications, drawing from a list of Intel-validated components.

### Intel Warranty Delivers Value and Confidence

Intel® Data Center Blocks for Cloud are backed by Intel's standard 3-year warranty from the date of purchase, with optional 5-year warranty plans available for select components.

Intel® Data Center Blocks are also eligible for Advanced Warranty Replacement whereby Intel will send a replacement part before the defective part is returned, reducing downtime and speeding time to resolution.

Warranty details are available online at [https://www.intel.com/content/dam/support/us/en/documents/services/DCB\\_Warranty\\_Brief.pdf](https://www.intel.com/content/dam/support/us/en/documents/services/DCB_Warranty_Brief.pdf)

### Engage with Intel Today

Intel continuously delivers leading-edge technologies to help resellers innovate and differentiate themselves in the market. Intel Data Center Blocks for Cloud, are designed to help partners realize a more accessible path to reliable SDI solutions. Contact your Intel sales representative or Intel authorized distributor for any inquiries.

### Additional Resources:

Detailed SKU configurations can be found at <https://www.intel.com/content/www/us/en/products/servers/data-center-blocks/dcb-cloud.html>

For more information on Intel® Server Products visit: [intel.com/serverproducts](https://www.intel.com/serverproducts)

For more information on Intel® Data Center Blocks visit: [intel.com/dcb](https://www.intel.com/dcb)

For more information on Intel® Select Solutions visit: <https://www.intel.com/content/www/us/en/architecture-and-technology/intel-select-solutions-overview.html>


## Intel® Data Center Blocks for Cloud—Microsoft Windows Server 2019

Now available with 2<sup>nd</sup> generation Intel® Xeon® Scalable Platform



| ALL-FLASH CONFIGURATIONS <sup>5</sup>  |                  |   |
|--|------------------|---|
| ORDER CODE   | FEATURES         |   |
| <b>MCB2208WFAF10R<sup>9</sup></b><br>2U 1 node Intel® Server System R2208WF0ZSR with Intel® Server Board S2600WFOR | Board            | Intel® Server Board S2600WFOR                             |
|  | Processor        | Intel® Xeon® Gold processor 6230                          |
|  | Chassis          | 2U 1 node Intel® Server System R2208WF0ZSR                |
|  | Storage Capacity | 32 TB raw storage capacity                                |
|  | Storage Type     | All-Flash: DCPMM Cache, P4510 (NVMe) Capacity             |
|  | Memory           | 512 GB memory   |
|  | Networking       | 4x 10GbE SFP+ iWARP RDMA Network Connections <sup>6</sup> |
|  | RMM              | Intel® Remote Management Module Lite 2                    |
| ORDER CODE   | FEATURES         |   |
| <b>MCB2208WFAF9R</b><br>2U 1 node Intel® Server System R2208WF0ZSR with Intel® Server Board S2600WFOR              | Board            | Intel® Server Board S2600WFOR                             |
|  | Processor        | Intel® Xeon® Gold processor 6230                          |
|  | Chassis          | 2U 1 node Intel® Server System R2208WF0ZSR                |
|  | Storage Capacity | 24 TB raw storage capacity                                |
|  | Storage Type     | All-Flash: P4800x (NVMe) Cache, P4510 (NVMe) Capacity     |
|  | Memory           | 768 GB memory   |
|  | Networking       | 4x 10GbE SFP+ iWARP RDMA Network Connections <sup>6</sup> |
|  | RMM              | Intel® Remote Management Module Lite 2                    |

**ALL-FLASH CONFIGURATIONS (CONTD.)**

| ORDER CODE   | FEATURES         |   |
|--|------------------|---|
| <p><b>MCB2208WFAF8R<sup>9</sup></b></p> <p>2U 1 node Intel® Server System R2208WF0ZSR with Intel® Server Board S2600WF0R</p>  | Board            | Intel® Server Board S2600WF0R                             |
|  | Processor        | Intel® Xeon® Gold processor 6230                          |
|  | Chassis          | 2U 1 node Intel® Server System R2208WF0ZSR                |
|  | Storage Capacity | 16 TB raw storage capacity                                |
|  | Storage Type     | All-Flash: P4800x (NVMe) Cache, P4510 (NVMe) Capacity     |
|  | Memory           | 512 GB memory (DCPMM Memory Mode)                         |
|  | Networking       | 4x 10GbE SFP+ iWARP RDMA Network Connections <sup>6</sup> |
|  | RMM              | Intel® Remote Management Module Lite 2                    |
| ORDER CODE   | FEATURES         |   |
| <p><b>MCB2208WFAF7R</b></p> <p>2U 1 node Intel® Server System R2208WF0ZSR with Intel® Server Board S2600WF0R</p>   | Board            | Intel® Server Board S2600WF0R                             |
|  | Processor        | Intel® Xeon® Gold processor 5218                          |
|  | Chassis          | 2U 1 node Intel® Server System R2208WF0ZSR                |
|  | Storage Capacity | 12 TB raw storage capacity                                |
|  | Storage Type     | All-Flash: P4610 (NVMe) Cache, P4510 (NVMe) Capacity      |
|  | Memory           | 384 GB memory   |
|  | Networking       | 4x 10GbE SFP+ iWARP RDMA Network Connections <sup>6</sup> |
|  | RMM              | Intel® Remote Management Module Lite 2                    |
| ORDER CODE   | FEATURES         |   |
| <p><b>MCB2208WFAF6R</b></p> <p>2U 1 node Intel® Server System R2208WF0ZSR with Intel® Server Board S2600WF0R</p>   | Board            | Intel® Server Board S2600WF0R                             |
|  | Processor        | Intel® Xeon® Gold processor 5218                          |
|  | Chassis          | 2U 1 node Intel® Server System R2208WF0ZSR                |
|  | Storage Capacity | 16 TB raw storage capacity                                |
|  | Storage Type     | All-Flash: Single Tier P4510 (NVMe)                       |
|  | Memory           | 384 GB Memory   |
|  | Networking       | 4x 10GbE SFP+ iWARP RDMA Network Connections <sup>6</sup> |
|  | RMM              | Intel® Remote Management Module Lite 2                    |



**ALL- FLASH CONFIGURATIONS (CONTD.)**

| ORDER CODE   | FEATURES         |   |
|--|------------------|---|
| <b>MCB2208WFAF5R</b><br>2U 1 node Intel® Server System R2208WF0ZSR<br>with Intel® Server Board S2600WF0R | Board            | Intel® Server Board S2600WF0R                             |
|  | Processor        | Intel® Xeon® Gold processor 5218                          |
|  | Chassis          | 2U 1 node Intel® Server System R2208WF0ZSR                |
|  | Storage Capacity | 30.7 TB raw storage capacity                              |
|  | Storage Type     | All-Flash: P4610 (NVMe) Cache, P4320 (NVMe) Capacity      |
|  | Memory           | 384 GB memory   |
|  | Networking       | 2x 10GbE SFP+ iWARP RDMA Network Connections <sup>6</sup> |
|  | RMM              | Intel® Remote Management Module Lite 2                    |
| ORDER CODE   | FEATURES         |   |
| <b>MCB2208WFAF4R</b><br>2U 1 node Intel® Server System R2208WF0ZSR<br>with Intel® Server Board S2600WF0R | Board            | Intel® Server Board S2600WF0R                             |
|  | Processor        | Intel® Xeon® Gold processor 5218                          |
|  | Chassis          | 2U 1 node Intel® Server System R2208WF0ZSR                |
|  | Storage Capacity | 11.5 TB raw storage capacity                              |
|  | Storage Type     | All-Flash: P4610 (NVMe) Cache, S4510 (SATA) Capacity      |
|  | Memory           | 384 GB Memory   |
|  | Networking       | 2x 10GbE SFP+ iWARP RDMA Network Connections <sup>6</sup> |
|  | RMM              | Intel® Remote Management Module Lite 2                    |
| ORDER CODE   | FEATURES         |   |
| <b>MCB2224BPAF3R</b><br>2U 4 node Intel® Server System H2224XXLR3R<br>with Intel® Server Board S2600BPSR | Board            | Intel® Server Board S2600BPSR                             |
|  | Processor        | Intel® Xeon® Gold processor 5218                          |
|  | Chassis          | 2U 1 node Intel® Server System H2224XXLR3                 |
|  | Storage Capacity | 11.5 TB raw storage capacity                              |
|  | Storage Type     | All-Flash: Single Tier S4510 (SATA)                       |
|  | Memory           | 256 GB Memory   |
|  | Networking       | 2x 10GbE SFP+ iWARP RDMA Network Connections              |
|  | RMM              | Intel® Remote Management Module Lite 2                    |



| HYBRID CONFIGURATIONS <sup>4</sup>  |                  |   |
|---|------------------|---|
| ORDER CODE  | FEATURES         |   |
| <b>MCB2312WFHY2R</b><br>2U 1 node Intel® Server System R2312WF0NPR with Intel® Server Board S2600WF0R               | Board            | Intel® Server Board S2600WF0R                             |
|   | Processor        | Intel® Xeon® Gold processor 5218                          |
|   | Chassis          | 2U 1 node Intel® Server System R2312WF0NPR                |
|   | Storage Capacity | 15.84 TB raw storage capacity                             |
|   | Storage Type     | Hybrid: P4610 (NVMe) Cache, HDD Capacity                  |
|   | Memory           | 128 GB Memory   |
|   | Networking       | 2x 10GbE SFP+ iWARP RDMA Network Connections <sup>6</sup> |
|   | RMM              | Intel® Remote Management Module Lite 2                    |
| ORDER CODE  | FEATURES         |   |
| <b>MCB22224BPHY1R<sup>10</sup></b><br>2U 4 node Intel® Server System H2224XXLR3R with Intel® Server Board S2600BPSR | Board            | Intel® Server Board S2600BPSR                             |
|   | Processor        | Intel® Xeon® Silver processor 4215                        |
|   | Chassis          | 2U 1 node Intel® Server System H2224XXLR3R                |
|   | Storage Capacity | 8 TB raw storage capacity                                 |
|   | Storage Type     | Hybrid: S4610 (SATA) Cache, HDD Capacity                  |
|   | Memory           | 128 GB Memory   |
|   | Networking       | 2x 10GbE SFP+ iWARP RDMA Network Connections              |
|   | RMM              | Intel® Remote Management Module Lite 2                    |



1. Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

2. IDC whitepaper: Why Upgrade Your Server Now, July 2016 (link)

3. Integrated Intel® Ethernet with iWARP RDMA networking efficiency source Intel/ Microsoft. Improved efficiency, latency, IOPS. Windows® Server 2016 Datacenter Edition 14393.693, 4 server nodes, each using Intel® Server System S2600WFD, Integrated Intel® Ethernet x722 Dual port 10Gbps Ethernet\*, 2x Intel® Xeon® E5 6148v5 @2.4GHz, 20 cores, 384 GB DDR4-2133 DRAM, caching drives-2x Intel® SSD DC P3700 Series (1.6 TB), data drives-6x Intel® SSD DC P3500 Series (2 TB). Each node configured with 3.5TB data store, 20x A3 like VMs each containing 60GB OS virtual store and 60GB data virtual store, running 4x Disk speed 2.0.17 in each VM using 1 thread and 32 queues. Testing configurations include 4kB Random Reads, and 8kB Random 70/30 Read/Write workloads, each with RDMA enabled and RDMA disabled, each at Max Performance, and IOPs fixed per VM. This is a snapshot of network performance with current driver, firmware and silicon stepping. Intel continues to work on tuning the performance of integrated Intel Ethernet X722.

4. 3rd party SW stack and HDD NOT included.

5. 3rd party SW stack NOT included.

6. Intel 2x25GbE "Columbiaville" expected to launch after CLX. Will cut in 2x25GbE when ready.

7. MSFT views DCPMM 2LM memory mode as simple memory and adding DCPMM 2LM to a SKU does not impact certification. Customer can add DCPMM for memory mode use on these SKUs through CTO as desired without impacting certifications.

8. Solutions will be certified for Windows Server 2019. Windows Server 2019 certification are recognized for both 2019 and 2016 by Microsoft.

9. Approved for Windows Server 2019 deployment only; not Windows Server 2016.

10. Only supported SATA HDDs with Windows Server 2016. Supports both SATA and SAS HDDs for Windows Server 2019.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com.

Software and workloads used in performance tests may have been optimized for performance only on Intel® microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit intel.com/performance.

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