Data Sheet

VELOS ADC Modular Chassis System

High-Performance Scalable Application, Security, and AI Networking Delivery

As enterprises and service providers continue their digital transformation, application traffic is reaching unprecedented levels driven by expanding user bases, the proliferation of new services, and the increasing adoption of AI driven solutions. However, many organizations still rely on aging hardware platforms that struggle to handle these demands, resulting in high operating costs, appliance sprawl from numerous point products, tedious manual processes, and escalating maintenance challenges.

Today's world is no longer purely cloud first; it's a multi-network ecosystem that spans public cloud environments, on-premises data centers, co-location facilities, and more. While this interconnected approach enhances flexibility, certain applications, particularly those that require highly predictable performance, extensive capability, or specialized support for AI workloads, still benefit from a robust integrated hardware system. Unfortunately, legacy platforms often prevent organizations from embracing modern architectures like DevOps-oriented microservices without imposing significant engineering overhead and complexity on operations teams.

The F5 VELOS platform is the next generation of F5's industry leading chassis systems, delivering unparalleled performance and capability within a single application delivery controller (ADC). Building on more than a decade of success with the F5® VIPRION® chassis, VELOS enables seamless capacity expansion by simply adding modular blades. This design avoids the need to deploy and configure new appliances, ensuring that users and applications remain unaffected by changes and essential capability in today's dynamic multi network world.

Key Benefits

Multi-terabit performance for the most demanding environments
VELOS supports up to 16 400 Gbps blades and 6 Tbps of high-speed throughput for the most demanding high-performance environments such as modern AI workloads and FWA deployments.

Ensure Uninterrupted Availability for AI Workloads
Meet the increasingly complex and large data traffic volume demands of modern AI workloads. Dynamic Resource Allocation and Advanced Load Balancing optimally route AI data across systems, ensuring rapid processing, low latency, and uninterrupted availability.

Secure Applications and Mitigate Threats
Protect against a complex threat landscape while maintaining optimal performance enabled by offload to state-of-the-art FPGAs. Built-in security layers include Firewall, DDoS, Advanced WAF, SSL/TLS encryption, and bot defense software.

Get More Done with Automation
Reduce your current deployment time from weeks to minutes and improve operational agility with an API-first architecture that powers automation.

Future Proof Your Infrastructure
F5 VELOS is the next-generation chassis application delivery controller (ADC). It bridges to new microservices based software for flexibility and automation and uses Kubernetes-based hardware in F5OS for cloud-native, 5G, and emerging AI deployments.

VELOS now scales to multi-terabits of throughput, suitable for the highest performance with Network Equipment Building System (NEBS)-compliant requirements of both service providers and enterprises. Furthermore, VELOS can also bridge traditional and modern application architectures by supporting a mix of traditional F5® BIG-IP® tenants as well as next-generation BIG-IP Next tenants, which will unleash the true power of running on a microservices-based architecture.

VELOS provides 6 Tbps of high-speed throughput for demanding Fixed Wireless Access (FWA) deployments, an exceptional 6.4 billion concurrent connections (400 million per blade) for exceptional scalability, and 80 million L4 connections per second firewall security. This is alongside optimized data packet routing, load balancing, and low latency for AI data ingest and real-time data processing needs.

A Microservices-Based Platform for Future-Proofed Deployments

VELOS Is built on a Kubernetes based platform layer, F5OS, tightly integrated with F5 TMOS software to support modern, microservice-oriented architectures. By embracing this microservice foundation, VELOS introduces features and capabilities not possible on previous BIG-IP platforms, without requiring administrators to learn Kubernetes or microservices concepts. Managing VELOS remains familiar through CLI, GUI, and API interfaces, while the underlying microservices operate behind the scenes.

VELOS also enables you to run both traditional BIG-IP and next-generation BIG-IP Next on the same chassis. This flexibility allows you to shift workloads across on-premises and cloud environments without disruptive migrations or extensive application refactoring. You can seamlessly mix and match different BIG-IP versions to adopt new features as they become available, ensuring your deployments remain ready for whatever comes next. With F5OS, you can efficiently manage BIG-IP tenants and containerized application services with a single, cohesive platform.

VELOS CX1610

VELOS CX410

VELOS BX520

VELOS BX110

VELOS scales to multi-terabits of throughput, suitable for the highest performance NEBS-compliant requirements of both service providers and enterprises.

Introducing: BIG-IP Next: Modern Application Delivery on VELOS

At its core, BIG-IP Next is still the same BIG-IP that customers know and trust, simply modernized and optimized for the future. BIG-IP Next is the next generation of BIG-IP software built to reduce operational complexity, improve performance, strengthen security and enhance observability. Significantly faster software upgrades, enhanced control plane performance, and accelerated feature development are just some of the many benefits afforded by BIG-IP Next. Supporting the same comprehensive suite of advanced app delivery and security use cases as BIG-IP TMOS, BIG-IP Next continues to offer everything from local and global traffic management and DNS services to application security and access controls—along with the same breadth of deployment form factors and consumption models as its predecessor.

Predictable Performance and Maximum Scale for Demanding Applications

F5 has a longstanding reputation for delivering high-performance ADCs with chassis-based systems, starting more than a decade ago with the VIPRION platform. As the next-generation chassis, VELOS carries on the tradition with industry leading Layer 4-7 throughput, connection handling, and SSL TPS (RSA/ECC), enabling you to efficiently secure and manage even the most demanding applications. By offloading traffic from the web and application servers VELOS maximizes efficiency while maintaining a fully non-blocking, multi-terabit-per-second backplane, offering the best performance per rack unit available.

Beyond raw performance, VELOS is fully integrated and rigorously tested, so you get consistent, predictable results without having to assemble your own application stack. Instead of combining separate server hardware, operating systems, hypervisors, and ADC software, you can rely on VELOS to provide a streamlined, all-in-one solution for your critical workloads.

VELOS is available as a thirty-two-slot (VELOS CX1610) and an eight-slot (VELOS CX410) chassis, with future support for mix-and-match 100 Gbps and 400 Gbps blades compatible with both chassis.

The BX520 blade is a half-width 400 Gbps blade. The CX410 chassis with its 8 slots will support 4 of the blades, while the CX1610 will support 16. As a result, VELOS will scale to 6 Tbps of high-speed throughput for the most demanding deployments, such as service provider FWA security, with 80 million connections per second (cps) for firewall security.

VELOS delivers an exceptional 6.4B maximum L4 concurrent connections (400M per blade), which is the total number of simultaneously established Layer 4 (L4) connections. This provides industry-leading scalability. More concurrent connections mean the system can handle a larger number of clients simultaneously. This is crucial for applications with high traffic or large user bases. It provides more efficient load balancing, ensuring optimal resource utilization and preventing overload on individual servers and improved resilience. More concurrent connections enhance fault tolerance. If one server fails, the load balancer can redirect traffic to other healthy servers, maintaining service availability.

Ensure Uninterrupted Availability for AI Workloads

Scaling to 6 Tbps, VELOS is designed to handle the demands of modern AI workloads, which involve increasingly complex and large volumes of data traffic. It enables secure, resilient, and high-performance load balancing that optimally routes AI data across systems, ensuring rapid processing and uninterrupted availability.

VELOS proves multi-terabit throughput with low latency and optimized, hardware-assisted data packet routing and low latency for AI data ingest and real-time data processing needs. It dynamically allocates resources based on workload demands, optimizing traffic flow and ensuring AI models receive the data processing they need without excess lag.

VELOS enables advanced load balancing, providing reliable distribution of data across processing nodes, ensuring both high availability and efficient resource utilization, critical for sustaining real-time AI applications.

Service Provider Solutions for the Data Center and N6/S/GI-LAN

Globally, service providers are investing heavily in cloud-native and 5G networks and in trying to win the battle for both their consumer and business markets. Capacity demands for broadband services continue to grow and FWA is a notable success story within the realm of 5G. FWA is already necessitating increased bandwidth and scalability for subscriber services, and this will only continue to grow as more consumers and enterprises leverage FWA for broadband services. VELOS is a consolidated solution which brings together multiple subscriber services into a single solution; DNS, Firewall, DDoS, CGNAT, TCP, and Video Optimization.

VELOS provides hardware-assisted L4 offload, native, high-performance security services to protect public-facing websites and data center applications from distributed, multi-layer

cyberattacks through BIG-IP Advanced Firewall Manager™ (AFM), and real-time hardware-assisted DDoS mitigation of DDoS vectors, per endpoint DoS protection and wildcard VS SYN cookie protection.

With 80 million cps per chassis—5 million per blade, VELOS provides unsurpassed firewall performance. Cps is a performance index that measures how fast a firewall can establish new TCP, UDP, and other protocol connections. A firewall is an inline device that inspects and forwards incoming packets to their intended destinations. If a firewall can't process all the traffic it receives, it can become a performance bottleneck or point of failure on the network.

F5® BIG-IP® Carrier-Grade NAT (CGNAT) eases IPv6 migration and improves network scalability with IPv4 address management. Combine BIG-IP CGNAT and other functions for a secure, subscriber-aware network firewall that masks subscriber addresses, or as part of an optimized N6/S/Gi-LAN solution.

F5® BIG-IP® Policy Enforcement Manager™ (PEM) can create differentiated services and manage traffic by leveraging subscriber and application awareness and implementing policies to enforce them.

Both the CX1610 and the CX410 chassis are Network Equipment Building Systems (NEBS) compliant. A requirement for service providers in the United States, NEBS standards are used all over the world for commercial, utility, and defense applications. The standards are designed to ensure that the equipment continues to work at extreme temperatures, or after an extreme event, such as an earthquake or a severe thunderstorm.

Make Automation Standard Practice

With the demands of your business, you are under pressure to move faster to deploy and scale applications. Now you don't need to implement software-only infrastructure to take advantage of continuous integration and continuous delivery (CI/CD) toolset integration, declarative APIs, and telemetry-based implementations. With its API-first architecture, VELOS provides a fully automatable system that can deliver the agility you need today.

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With VELOS, you can take advantage of the F5® BIG-IP® Automation Toolchain. BIG-IP Automation Toolchain offers a way to simplify and streamline your F5 portfolio with simple, yet powerful declarative interfaces that minimize F5 knowledge requirements, reduce errors, increase deployment velocity, and make workflows more repeatable. BIG-IP Automation Toolchain is comprised of a unified set of REST API endpoints that are built using human-readable JSON source of truth documents installed on BIG-IP or on F5® BIG-IQ® in any environment where those solutions are supported. The BIG-IP Automation Toolchain makes it faster, easier, and more programmatic to configure and deploy F5 application delivery and security services.

When operating BIG-IP Next on VELOS, users can shift entirely to a declarative model where desired end-state declarations built around use cases are all that is required to automatically stand-up or configure instances. This is achieved via the AS3 declarative API and not only makes it faster to deploy and configure applications but also replaces the need for extensive domain knowledge—making it easier to automate tasks. BIG-IP Next also continues to support iControl®—an imperative REST API—allowing existing automation frameworks built around BIG-IP TMOS deployments to continue functioning.

BIG-IP Management and Visibility with BIG-IQ and BIG-IP NEXT Central Manager

BIG-IQ allows you to take an application-centric approach to core IT—networking, development, and deployment—with a unified tool for managing your F5 application delivery and security portfolio, including VELOS. BIG-IQ extends the operability and value of your F5 investment with the ability to create, configure, deploy, analyze, orchestrate, troubleshoot, upgrade, and patch the entire F5 security and application delivery services portfolio.

BIG-IQ supports the management of BIG-IP physical and virtual devices, both locally and in the cloud, including third-party certificate management. From per-app virtual editions to traditional hardware appliances, BIG-IQ makes it possible to gain deep visibility into F5 services and devices, build native and third-party integrated automation workflows, simplify configuration and deployment tasks, assign role-and-user-specific permissions, and ensure every team—and every app—has the resources required for optimal performance.

For BIG-IP Next deployments, customers may in the future elect to use the BIG-IP Next Central Manager which will afford centralized control and visibility for their entire BIG-IP Next fleet.

Increased Performance and Greater Agility with Programmable System Resources

VELOS offers even more hardware-accelerated performance than previous generations with blades that double the field-programmable gate array (FPGA) chipsets, and with FPGA technology tightly integrated with the BIG-IP TMOS technology and software. This means that, for specific use cases, you can avoid CPU-exhaustion scenarios and gain performance that cannot be replicated on any other system with similar resources.

VELOS uses a new generation of hardware with the latest Intel processing for CPUs. VELOS uses two FPGAs, the Application Traffic Services Engine (ATSE) and the VELOS Queuing FPGA (VQF). The newer generation Intel chipsets provide more modern SSL cipher support and can offload elliptical curve cryptography (ECC)-based ciphers in hardware. FPGA technology enables high-performance capabilities tightly integrated with the F5OS technology and software.

They include:

- L4 offload, enabling leading throughput rates and reduced loads on software.

- Hardware-accelerated SYN flood protection.

- Real-time hardware detection and mitigation of more than 100 types of denial-of-service (DoS) and DDoS attacks.

- Support for F5® Intelligence Service, with denylist, allowlist, and temporary rejection capabilities.

In addition, integrated Intel® QuickAssist Technology provides high performance SSL and compression offload.

Multi-Tenancy Security with Full Isolation

Multi-tenancy allows organizations to host multiple independent environments, known as tenants, on a single shared platform while maintaining complete separation of traffic, data, and administrative access. This approach meets various business and networking needs, including consolidating services or integrating existing networks, and it is especially valuable for enterprises running applications with different security and performance requirements.

VELOS enhances these benefits by supporting a higher tenant density than its VIPRION predecessor, resulting in more efficient resource allocation and a stronger ROI on F5 hardware. Each tenant can run its own software version and licensed modules, and administrators can perform upgrades and patches on one tenant without affecting others. This full isolation ensures that any changes remain contained within a specific tenant, minimizing the risk of downtime or security issues elsewhere. By delivering robust isolation and flexible resource management, multi-tenancy on VELOS empowers organizations to secure diverse application environments while making the most of their infrastructure investments.
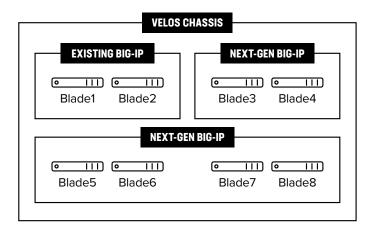

Figure 1: VELOS enables customers to host different BIG-IP software tenants on the same chassis.

Uninterrupted Performance and Always-on Availability

F5 duplicates system resources to avoid the type of catastrophic failures that are possible with other chassis-based designs.

In today's demanding environment, maintaining reliable application infrastructure is more important than ever. VELOS was designed from the ground up to provide robust, uninterrupted performance for your applications.

F5 duplicates system resources to avoid the type of catastrophic failures that are possible with other chassis-based designs. VELOS employs two redundant system controllers that can be paired in active-active or active-standby modes, ensuring fast failover when issues arise. Common system components, such as power supplies and fans are also fully redundant; if one encounters a problem, the other continues running without disrupting service. Administrators can replace a failed module or add chassis blades without restarting the system or affecting users. In addition, blades can be configured for N + N failover or failover to a separate VELOS chassis, offering flexible paths for scalability and high availability.

F5 extends this redundancy across the system to prevent the type of severe failure seen in some chassis-based designs. Each blade has two backplane interfaces that connect to both system controllers, creating an active-active data path while the control and management plane remains in active-standby mode. When you begin configuring the chassis, the floating management IP is assigned to the primary controller. The secondary controller then automatically synchronizes configurations, licenses, orchestration data, and logs. This design lets you manage a single device while VELOS handles all redundancy and reliability behind the scenes.

Consolidated Platform with BIG-IP Application and Security Services

The VELOS platform offers the full BIG-IP portfolio of comprehensive and industry-leading application delivery and security services. These solutions can be consolidated onto a single chassis-based VELOS platform, reducing management complexity and overhead while offering superior performance and scalability.

F5 solutions for application delivery and security services are made up of the following modules:

- F5® BIG-IP® Local Traffic Manager™ (LTM): Provides advanced traffic management, load balancing, and application delivery.

- F5® BIG-IP® DNS: Hyperscales and secures the DNS infrastructure during DDoS attacks and keeps global applications online.

- F5® BIG-IP® Advanced Firewall Manager™ (AFM): This advanced network security solution forms the core of the F5 application protection solution. It provides full SSL visibility at scale as well as network-layer and session-layer distributed denial of service (DDoS) mitigation.

- F5® BIG-IP® Advanced WAF®: Delivers application security, web scraping and bot prevention, and HTTP DDoS mitigation.

- F5® BIG-IP® Access Policy Manager® (APM): This secure, flexible, high-performance access management proxy solution delivers unified global access control for your users, devices, applications, and APIs.

- F5® BIG-IP® Advanced Firewall Manager™ (AFM) Intrusion Prevention System (IPS): Protects infrastructure and protocols and compliance verification.

- IP Intelligence and Geolocation: These additional services provide IP reputation and geolocation information for added context-aware security.

- F5® BIG-IP® SSL Orchestrator®: Enhances SSL/TLS infrastructure, makes encrypted traffic visible to security solutions, and optimizes existing security investments.

- F5® BIG-IP® Policy Enforcement Manager™ (PEM): Optimize and monetize the network with flexible, context-aware policy enforcement.

- F5® BIG-IP® Carrier-Grade NAT (CGNAT): Fast, scalable, and secure IPv4/IPv6 IP address management as part of a suite of consolidated functions.

BIG-IP Next Application Delivery Services

The majority of existing BIG-IP software capabilities will migrate to the next generation of BIG-IP software. The following BIG-IP Next product modules will be made available on VELOS in future, offering direct replacements for all existing BIG-IP TMOS product modules over time.

- F5® BIG-IP® Next™ Local Traffic Manager™ (LTM): Intelligently manage and load balance traffic to ensure apps are highly performant and available.

- F5® BIG-IP® Next™ WAF: Defends applications against the latest OWASP Top 10, complex application layer attacks, and API attacks.

- F5® BIG-IP® Next™ Access: Enables zero-trust access for all apps—legacy and modern— with highly scalable identity- and context-based access controls.

- F5® BIG-IP® Next™ SSL Orchestrator®: Maximizes infrastructure and security investments with dynamic, policy-based decryption, encryption, and traffic steering through security inspection devices.

- F5® BIG-IP® Next™ DNS: Hyperscales infrastructure during high query volumes, offers global server load balancing and secures against DNS threats including DNS DDoS attacks.

- F5® BIG-IP® Next™ Edge Firewall: Protects the network edge and core from incoming threats, including complex DDoS and protocol attacks.

- F5® BIG-IP® Next™ Policy Enforcer: Provides intelligent Layer 4—7 traffic steering, network intelligence, and dynamic control of your network resources through subscriber- and context-aware solutions.

- F5® BIG-IP® Next™ Carrier-Grade NAT (CGNAT): Enable service providers to transparently support and interoperate IPv4 and IPv6 devices and content.

Beyond the continued availability of these key functions, critical features in use by many BIG-IP customers today such as iRules and telemetry streaming will also be maintained.

Migrating to VELOS

VELOS offers proven performance and versatility and will scale for years to come—providing unmatched return on investment.

Developed to facilitate effortless shifts between BIG-IP solutions, the F5 Journeys Migration Utility helps with BIG-IP TMOS to BIG-IP TMOS upgrades/migrations. Journeys assists users in adopting newer platforms by providing a frictionless migration experience. It allows users to migrate from any source platform (F5 chassis, appliance, or VE) running any BIG-IP software version (on or above 11.x) to the platform of their choice. The tool assists in checking feature compatibility issues between different platforms and software versions, identifying and troubleshooting migration issues, and reducing overall complexity and time spent on migration.

Future Proof Your Infrastructure and Maximize Return on Investment

Enterprises and services providers have deployed the trusted, scalable high-end modular chassis system, VIPRION for over a decade. VELOS is the next-generation chassis application delivery controller (ADC). It bridges to new microservices based software (BIG-IP Next) for flexibility and automation and uses Kubernetes-based hardware in F5OS for cloud-native, 5G, and emerging AI deployments. And beyond that, it offers proven performance and versatility and, like VIPRION, will scale for years to come—providing excellent return on investment.

More Information

For more information about VELOS, visit f5.com to contact us.
For the latest product specifications, see the applicable platform guide on askf5.com.

Data Sheets

BIG-IP SSL Orchestrator

BIG-IP Local Traffic Manager

BIG-IP DNS

BIG-IP Advanced Firewall Manager

BIG-IP Advanced Web Application Firewall

BIG-IP Access Policy Manager

BIG-IP Policy Enforcement Manager

BIG-IP Carrier-Grade Network Address Translation

Specifications	VELOS CX410-N (DC-NEBS)	VELOS CX410
Dimensions	H: 6.9 inches (17.5 cm) x W: 17.4 inches (44.2 cm) x D: 32.0 inches (81.3 cm) 4U industry standard rack-mount chassis	H: 6.9 inches (17.5 cm) x W: 17.4 inches (44.2 cm) x D: 32.0 inches (81.3 cm) 4U industry standard rack-mount chassis
Weight	Empty chassis, as shipped (0 blades, 8 blanks, 2 power supplies, 1 fan tray, 2 system controllers, 2PSU controllers): 132 pounds (60 kg) DC power supply: 6.8 pounds (3.1 kg) Power supply blank: 0.2 pounds (0.09 kg) Blade blank: 0.1 pounds (0.05 kg) Fan tray: 12.0 pounds (5.4 kg) System controller: 10.5 pounds (4.8 kg) VELOS PSU Controller (VPC): 0.5 pounds (0.2 kg)	Empty chassis, as shipped (0 blades, 8 blanks, 2 power supplies, 1 fan tray, 2 system controllers, 2PSU controllers): 132 pounds (60 kg) AC power supply: 6.4 pounds (2.9 kg) Power supply blank: 0.2 pounds (0.09 kg) Blade blank: 0.1 pounds (0.05 kg) Fan tray: 12.0 pounds (5.4 kg) System controller: 10.5 pounds (4.8 kg) VELOS PSU Controller (VPC): 0.5 pounds (0.2 kg)
Power Supply	Two (default) to four 3000W, -48 to -60 VDC input, 85A per cord (max, 170A total)	Two (default) to four 3000W, 200-240 VAC input, 17A per cord (max, 34A total)
Operating Temperature	23° to 131°F (-5° to 55°C) as per NEBS GR-63-CORE standard	32° to 104°F (0° to 40°C)
Relative Humidity	5% to 85% (40°C) non-condensing Up to 93% (40°C) non-condensing for a maximum of 96 hours	5% to 85% (40°C) non-condensing Up to 93% (40°C) non-condensing for a maximum of 96 hours
Product Compliance Certifications and Approvals	IEC 62368-1:2018 (Third Edition) EN IEC 62368-1:2020+A11:2020 EN 62368-1:2014+A11:2017 CSA C22.2 No. 62368-1:19+Upd.1 (Third Edition) ANSI/UL 62368-1 (3rd Edition including revs (10/2021)) AS/NZS CISPR 32:2015+A1:2020 Class A EN 55032:2015 +A11:2020 +A1:2020 Class A EN 300 386 V2.1.1:2016 Class A EN 61000-3-2:2014 EN 61000-3-3:2013 EN 55035:2017+A11:2020 FCC Part 15 Class A ICES-003 Issue 7:2020 Class A IEC 63000:2018 GR-63-CORE, Issue 5, December 2017 GR-1089-CORE, Issue 8, July 2022	IEC 62368-1:2018 (Third Edition) EN IEC 62368-1:2020+A11:2020 EN 62368-1:2014+A11:2017 CSA C22.2 No. 62368-1:19+Upd.1 (Third Edition) ANSI/UL 62368-1 (3rd Edition including revs (10/2021)) AS/NZS CISPR 32:2015+A1:2020 Class A EN 55032:2015 +A11:2020 +A1:2020 Class A EN 300 386 V2.1.1:2016 Class A EN 61000-3-2:2014 EN 61000-3-3:2013 EN 55035:2017+A11:2020 FCC Part 15 Class A ICES-003 Issue 7:2020 Class A IEC 63000:2018
Redundancy (Power)	Supports N+1 or N+N redundancy	Supports N+1 or N+N redundancy
System Controller SX410	1x 10GbE management port 1x USB 3.0 1x RJ45 console port 1.0TB SSD 8-Core Intel Atom processor 32 GB DDR4 memory	1x 10GbE management port 1x USB 3.0 1x RJ45 console port 1.0TB SSD 8-Core Intel Atom processor 32 GB DDR4 memory
Hardware Certification Model	CX410-N	CX410
Trusted Platform Module (TPM)	TPM 2.0	TPM 2.0

Notes: Please refer to the Platform Guide for more information.

Specifications	VELOS CX1610-N (DC-NEBS)	VELOS CX1610
Dimensions	H: 27.9 inches (70.7 cm) x W: 17.4 inches (44.2 cm) x D: 32.0 inches (81.3 cm) 16U industry-standard rack-mount chassis	H: 27.9 inches (70.7 cm) x W: 17.4 inches (44.2 cm) x D: 32.0 inches (81.3 cm) 16U industry-standard rack-mount chassis
Weight	Empty chassis, as shipped (0 blades, 32 blanks, 6 power supplies, 3 fan trays, 2 system controllers, 2PSU controllers): 336 pounds (150.4 kg) DC power supply: 6.8 pounds (3.1 kg) Power supply blank: 0.2 pounds (0.09 kg) Blade blank: 0.1 pounds (0.05 kg) Fan tray: 12.0 pounds (5.4 kg) System controller: 15.5 pounds (7.0) kg) VELOS PSU Controller (VPC): 0.5 pounds (0.2 kg)	Empty chassis, as shipped (0 blades, 32 blanks, 6 power supplies, 3 fan trays, 2 system controllers, 2PSU controllers): 336 pounds (150.4 kg) AC power supply: 5.9 pounds (2.7 kg) Power supply blank: 0.2 pounds (0.09 kg) Blade blank: 0.1 pounds (0.05 kg) Fan tray: 12.0 pounds (5.4 kg) System controller: 15.5 pounds (7.0) kg) VELOS PSU Controller (VPC): 0.5 pounds (0.2 kg)
Power Supply	Six (default) to twelve 3000W, -48 to -60 VDC input, 85A per cord (max, 510A total)	Six (default) to twelve 3000W, 200-240 VAC input, 16A per cord (max, 96A total)
Operating Temperature	23° to 131°F (-5° to 55°C) as per NEBS GR-63-CORE standard	32° to 104°F (0° to 40°C)
Relative Humidity	5% to 85% (40°C) non-condensing Up to 93% (40°C) non-condensing for a maximum of 96 hours	5% to 85% (40°C) non-condensing Up to 93% (40°C) non-condensing for a maximum of 96 hours
Product Compliance Certifications and Approvals	IEC 62368-1:2018 (Third Edition) EN IEC 62368-1:2020+A11:2020 EN 62368-1:2014+A11:2017 CSA C22.2 No. 62368-1:19+Upd.1 (Third Edition) ANSI/UL 62368-1 (3rd Edition including revs (10/2021)) AS/NZS CISPR 32:2015+A1:2020 Class A EN 55032:2015 +A11:2020 +A1:2020 Class A EN 300 386 V2.1.1:2016 Class A EN 61000-3-2:2014 EN 61000-3-3:2013 EN 55035:2017+A11:2020 FCC Part 15 Class A ICES-003 Issue 7:2020 Class A IEC 63000:2018 GR-63-CORE, Issue 5, December 2017 GR-1089-CORE, Issue 8, July 2022	IEC 62368-1:2018 (Third Edition) EN IEC 62368-1:2020+A11:2020 EN 62368-1:2014+A11:2017 CSA C22.2 No. 62368-1:19+Upd.1 (Third Edition) ANSI/UL 62368-1 (3rd Edition including revs (10/2021)) AS/NZS CISPR 32:2015+A1:2020 Class A EN 55032:2015 +A11:2020 +A1:2020 Class A EN 300 386 V2.1.1:2016 Class A EN 61000-3-2:2014 EN 61000-3-3:2013 EN 55035:2017+A11:2020 FCC Part 15 Class A ICES-003 Issue 7:2020 Class A IEC 63000:2018
Redundancy (Power)	Supports N+1 or N+N redundancy	Supports N+1 or N+N redundancy
System Controller SX1610	Two (default) SX1610 System Controller included: 1x 10GBase-T 1x USB 3.0 1x serial console 3.0TB NVMe SSD 16-Core Intel SoC 32 GB DDR4 memory	Two (default) SX1610 System Controller included: 1x 10GBase-T 1x USB 3.0 1x serial console 3.0TB NVMe SSD 16-Core Intel SoC 32 GB DDR4 memory
Hardware Certification Model	CX1610-N	CX1610
Trusted Platform Module (TPM)	TPM 2.0	TPM 2.0

Notes: Please refer to the Platform Guide for more information.

Specifications	VELOS BX110	VELOS BX520
Intelligent Traffic Processing*	L4/L7 throughput 95/95 Gbps 3.0M L7 (inf-inf) requests per second 1.2M L4 connections per second 90M max L4 concurrent connections Max hardware compression 65 Gbps SSL bulk throughput 50G Maximum SSL TPS 100,000 (RSA 2K Keys) 70,000 (ECDHE P-256-ECDSA) 55,000 (ECDHE P-256-RSA-2K)	L4/L7 throughput 375/300 Gbps 14M L7 (inf-inf) requests per second 5M L4 connections per second 400M max L4 concurrent connections Max hardware compression 180 Gbps SSL bulk throughput 150 Gbps Maximum SSL TPS 200,000 (RSA 2K Keys) 140,000 (ECDHE P-256-ECDSA) 110,000 (ECDHE P-256-RSA-2K)
Virtualization (vCPUs)	14-core 28 vCPU Multitenancy support: up to 22vCPU available to user supported tenant deployment options (1, 2, 3, 6, 8, 10, 12, 14, 16, 18, 20, 22, vCPUs)	Dual socked 28-core CPUs with 112 vCPUs total Multitenancy support: up to 96vCPU available to user supported tenant deployment options: (4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, vCPUs)
Processors	Single Intel 14-core Xeon processor (total 28 hyperthreaded logical processor cores)	Dual Intel 28-core Xeon processor (total 112 hyperthreaded logical processor cores)
Memory	128 GB (DDR4)	256GB (DDR4) per CPU, 512GB total
Hard Drive Capacity	1x960GBM.2 NVMe SSD (overprovisioned 30%, 700 GB user capacity)	1x 3.84TB-class E1.S SSD, overprovisioned to 3.0TB user capacity
Network Interfaces	2x QSFP28 (backward compatible to QSFP+) ports supporting: 100G QSFP 28 LR4, SR4, and PSM4 (Breakout cable supports 4x SFP28 25G LR or 4x SFP28 25G SR) 40G QSFP+ LR4, SR4, and PSM4 (Breakout cable supports 4x SFP+ 10G LR or 4x SFP+ 10G SR)	2x QSFP-DD ports supporting: 2x 4x100G (400G breakout only) 1x 100G + 1x400G
Power Consumption and Heat	Please refer to the Planning for VELOS Guide for the latest specific power ratings	Please refer to the Planning for VELOS Guide for the latest specific power ratings
Weight	7.3 pounds (3.3 kg)	16.5 pounds (7.48 kg)
Width and Dimensions	Quarter-width Dimensions: 22.64" L (575mm), 4.02" W (102mm), 1.59" H (40.3mm)	Half-width Dimensions: 22.64" L (575mm), 8.11" W (206mm), 1.59" H (40.3mm)
Hardware Compression + SSL	Integrated Intel Quick Assist	Integrated Intel Quick Assist
Front Panel + Backplane Data	100% FPGA	100% FPGA
Management Interfaces	1x USB 3.0	1x USB 3.0
AOM	F5 LOP (Lights-Out Processor)	F5 LOP (Lights-Out Processor)
Trusted Platform Module (TPM)	TPM 2.0	TPM 2.0
NEBS	Yes (with DC NEBS chassis)	Yes (with DC NEBS chassis)
Field Serviceable Components	None	None

Notes: *BX520 data is based on testing with the VELOS CX1610 chassis. Subject to change.
Notes: Please refer to the Planning for VELOS Guide for more information.