



The evolving world of intelligent devices will necessitate an architectural shift on taking data produced by the endpoints, processing and analyzing that data at several points along the edge of the network and only transporting vital data back to the cloud.

This new era will move away from one-size-fits-all servers and application-specific hardware to a greater diversity of software-driven applications running on flexible architectures that are tailored towards specific application needs. This transformation to a world where much of the computing moves from the data center to the edge will generate new use cases.

Arm's mission is to ensure that the Arm ecosystem – both its hardware and software partners -- can fully address the challenges of this transition. One of the biggest challenges in this transition is security, how to guarantee secure communication once the device is operating.

Next-Generation Firewalls

Clavister NetWall provides a Next-Generation Firewall (NGFW) software, the first proprietary next-gen firewall that runs on architecture for enterprise on virtualized or bare metal platforms. It includes a full UTM (Unified Threat management) feature set delivered regardless of execution platform—including Application Visibility & Control with Deep Packet Inspection, Botnet protection with IP Reputation and more. Software licenses come with a choice of throughput performance desired and are upgradable to be fully future proof. Clavister NetWall is certified by common criteria at EAL 4+ level making it the ideal platform for everything from distributed offices to critical infrastructures.

Ideal for building a Secure SD-WAN

Combining Clavister NetWalls and management tools with Arm platforms provides the flexibility to build an efficient and secure SD-WAN infrastructure. All versions of NetWall can be connected providing the flexibility of deployment in heavy branches, thin branches, home offices and cloud datacenters. Clavister VPN technology secures reliable connectivity over various access technologies—over large geographic distances. Read more at www.clavister.com/secure-sd-wan.

Arm Ecosystem

Arms growing ecosystem of partners includes a number of popular ODMs who offer white boxes ranging from 2-cores to 32-cores and with a range of I/O options. The ecosystem ensures the right size box is available, providing the foundation for a scalable solution. Customers can select the optimal size while also having a path to expand and optimize with minimal impact.



Empowered by Clavister Ecosystem

Clavister works with many of the world's leading technology companies to improve manageability, strengthen security and ensure faster and more successful deployments. Integrated into the Clavister Next Generation Firewall is an ecosystem with the best of breed components empowering key use-cases named in this paper. Read more at www.clavister.com/eco-system.



Clavister NetWall Security as a Service Licensing



For deployment in a cloud infrastructure or in universal customer premises equipment (uCPE), Clavister NetWall Virtual provides several security as a service licensing options depending on the deployment needs. There is no additional restriction for throughput performance other than specified below.



Clavister Netwall Virtual license	100V MSSP	500V MSSP	1000V MSSP	2000V MSSP	4000V MSSP	6000V MSSP
Firewall Performance (plaintext throughput)*	100 Mbps	500 Mbps	1 Gbps	2 Gbps	4 Gbps	6 Gbps
IPsec VPN Performance (large packets)	100 Mbps	500 Mbps	1 Gbps	2 Gbps	4 Gbps	6 Gbps
Maximum Concurrent Connections	8,000	16,000	64,000	128,000	256,000	512,000
Maximum Concurrent VPN Tunnels	50	250	500	500	1,000	1,500
Maximum Number of Routing Tables (Virtual Routers)	25	25	50	50	125	125
Ethernet Interfaces	Up to 10	Up to 10	Up to 10	Up to 10	Up to 10	Up to 10
Security subscription package	CPS or CSS	CPS or CSS	CPS or CSS	CPS or CSS	CPS or CSS	CPS or CSS
Support for High Availability (HA)	Yes	Yes	Yes	Yes	Yes	Yes




* Actual performance may vary depending on network conditions, number of activated services and host hardware capabilities.

Demo system

Clavister NetWall runs on ARMv8-A architecture from all major hardware vendors such as NXP, Ampere, and Marvell as well as in the cloud with Graviton instances from AWS. Clavister Netwall can run bare metal or as a VNF on a uCPE platform from Telco Systems and Enea or again as a service on a AWS instance. Each deployment will have several Clavister NetWall licensing options depending on the deployment needs for Clavister NetWall. When capacity requirements increase, Clavister NetWall license can be upgraded to cater new needs.

Telco systems NFV Time		ENEA NFV Access
		
Clavister NetWall license	2000V MSSP	4000V MSSP
Firewall Performance (plaintext throughput)	2 Gbps	4 Gbps
Maximum Concurrent Connections	128,000	256,000
IPsec VPN Performance (large packets)	520 Mbps	1200 Mbps
vCPU assignment to Clavister NetWall	2 (1 control plane, 1 data plane)	2 (1 control plane, 1 data plane)
Environment details	Telco Systems NFV Time	ENEA NFV Access, uCPE manager
Architecture	ARMv8-A - Hawkeyetech HK-6010 NXP LS1046A CPU	ARMv8-A - Lenovo ThinkSystem HR350A - Ampere eMAG 8180 CPU

AWS a1.medium instance		AWS m6g.large instance
		
Clavister NetWall license	100V MSSP	4000V MSSP
Firewall Performance (plaintext throughput)	100 Mbps	4 Gbps
Maximum Concurrent Connections	8,000	256,000
IPsec VPN Performance (large packets)	No test data	No test data
vCPU assignment to Clavister NetWall	1 (control plane and data plane share)	2 (1 control plane, 1 data plane)
Environment details	AWS (BYOL)	AWS (BYOL)
Architecture	ARMv8-A - AWS Graviton	ARMv8-A - AWS Graviton 2

	Generic NXP LS1043A CPU	Generic NXP LS2088A CPU	NanoPi R2S
			
Clavister NetWall license	1000V MSSP	6000V MSSP	100V MSSP
Firewall Performance (plaintext throughput)	1 Gbps	6 Gbps	100 Mbps
Maximum Concurrent Connections	64,000	512,000	8,000
IPsec VPN Performance (large packets)	490 Mbps	770 Mbps	100 Mbps
vCPU assignment to Clavister NetWall	2 (1 control plane, 1 data plane)	2 (1 control plane, 1 data plane)	1 (control plane and data plane share)
Environment details	Ubuntu18, Open vSwitch DPDK, OpenStack, KVM	Ubuntu18, Open vSwitch DPDK, OpenStack, KVM	Armbian 5.83 Nanopi-r1 Ubuntu-bionic bare metal
Architecture	ARMv8-A - NXP LS1043A	ARMv8-A - NXP LS2088A	ARMv8-A - NanoPi R2S (Rockchip RL3328)

Performance based on latest Clavister cOS Core release. Specifications are subject to change without notice.




















Unique Secure Operating System - Clavister cOS Core

All Clavister NetWall appliances are delivered with the operating system cOS Core developed by Clavister. Thanks to this in-house development of the software in Sweden, including very selective use of third party components, Clavister Firewalls are 100% backdoor-free. Read more at www.clavister.com/nobackdoors.

Clavister NetWall Subscriptions

Depending on customer requirements, all Clavister appliances are supplied with one of two possible subscriptions, either the **Clavister Product Subscription (CPS)** or the **Clavister Security Subscription (CSS)**. The Clavister Product Subscription includes software upgrades, direct 24/7 manufacturer support (online or by phone) as well as the central management software Clavister InControl. The Clavister Security Subscription adds to this security enabling Unified Thread Management use-cases. Also included is the Clavister InCenter Cloud fully hosted including the unique CyberSecurity ScoreCard adding simplified actionable security analytics.

Read more about use-cases at www.clavister.com/use-cases

	CPS	CSS	Ecosystem feeds
Use-Cases			
Connect			
 Reliable Secure VPN Connecting branch offices and remote locations securely and cost effectively.	X	X	
 Routing & Load Balancing Avoid downtime and secure business continuity with redundancy	X	X	
 Secure Network Zones Network segmentation to protect company's digital assets	X	X	
 Server Load Balancing Simplifying scaling and allowing preventive maintenance	X	X	
 Secure Remote Access Empowering remote workers and devices with flexible secure access	X	X	
Protect			
 Firewalling Network Firewalling securing IT resources and users	X	X	
 Network Attack Protection Intrusion Detection and Prevention System, GeoIP restrictions and Denial of Service protection		X	 
 Antivirus Scanning Streaming scanning of attachments in mail, web and file downloads for malicious content		X	
Prevent			
 Active Traffic Optimization Traffic prioritization securing preferred use of resources	X	X	
 Captive Portal Authentication Integration with Active Directory and 2FA procedures for open network access	X	X	
 Botnet Blocking Block outgoing and incoming traffic of known botnet sources through IP Reputation intelligence		X	
 Web Content Filtering Restrict access to inappropriate content and high-risk sites		X	
 Application Visibility & Control Control applications and user behavior to optimize network resource usage		X	
Services & included products			
24/7 Support (online & by phone)	X	X	
Software upgrades (new features & maintenance releases)	X	X	
Centralized management with Clavister InControl	X	X	
Clavister OneConnect SSL VPN Client for Windows and macOS	X	X	
Signature updates from eco system partners for all the protect and prevent use-cases		X	



Central Management and Control

All Clavister appliances can be administered individually via a web interface, and the license to use the central management Clavister InControl is included. The solution offers zero-touch deployment, simplified ways to provision and manage a Secure SD-WAN deployment and firmware upgrade management capacities.

Learn more at www.clavister.com/incontrol



Real-Time Cloud Analytics

Clavister InCenter enables IT administrators to gain insight into their networks. Clavister InCenter provides all the user stories including forensics with log search, dashboarding, alerting and reporting as well as health monitoring. A hosted version of Clavister InCenter Cloud is included with each Security Subscription, and alternatively InCenter is available for on-premises deployment as well.

Learn more at www.clavister.com/incenter



Simplified Actionable Security Analytics

Helping IT Managers and their executives to communicate about the status of their security infrastructure and ensures that funds and efforts are spent where they matter the most – this tool is included in Clavister InCenter available to all Clavister NetWall with a Security Subscription.

Learn more at www.clavister.com/cybersecurity-scorecard



Simple Secure Remote Working

Clavister OneConnect is our SSL VPN windows and macOS client that offers a simple and easy to use solution for remote access and is included in Clavister's NetWall.

Learn more at www.clavister.com/oneconnect



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