

Hybrid Mesh Firewall Solution Toolkit



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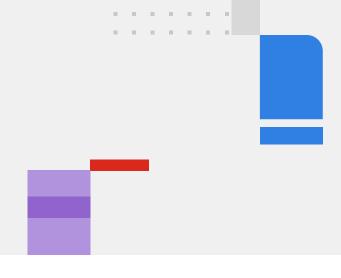
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INDUSTRY INSIGHTS

Hybrid Mesh Firewall: An Essential Solution for Today's Distributed Enterprise



What Is a Hybrid Mesh Firewall?

Today's cybercriminals are exploiting the fact that most organizations lack consistent visibility across various segments of their distributed networks. And because of the interconnected nature of data center, campus, cloud, and branch environments, east-west traffic has increased, allowing a successful breach in one part of the network to quickly spread to others. The most effective way to address this challenge is to deploy the exact same security in every part of the network, thereby enabling centralized threat correlation and coordinated protection to multiple areas of enterprise IT simultaneously. But the complexities and differences between various network ecosystems have made that difficult. That's why Gartner has begun advocating for the broad adoption of hybrid mesh firewalls (HMF).

Hybrid mesh firewalls combine the ability to deploy critical NGFW functions anywhere across your network—campus, data center, virtual/cloud, and FWaaS/SASE environments—with remote unified management. This creates a single, integrated platform that can span, scale, and adapt to today's dynamic and distributed networks. From its unified management console, an HMF coordinates protection across



"By 2026, more than 60% of organizations will have more than one type of firewall deployment, which will prompt the adoption of hybrid mesh firewalls."

IT domains (corporate sites, public and private clouds, and remote workers). This integrated approach allows IT teams to automate threat detection and response, orchestrate configurations, and enforce policies without investing needless manual hours—especially when the cybersecurity skills gap is already constraining resources.

The Need for Hybrid Mesh Firewalls

Gartner states in its latest Magic Quadrant for Network Firewalls that "by 2026, more than 60% of organizations will have more than one type of firewall deployment, which will prompt adoption of hybrid mesh firewalls." They add, "As network firewalls evolve into hybrid mesh firewalls with the emergence of cloud firewalls and Firewall-as-a-Service offerings, selecting the most suitable vendor is a challenge."

These solutions are designed to address four critical challenges today's IT organizations face:

1. Managing IT complexity

Many of today's NGFWs cannot support HMF capabilities, forcing enterprise IT end-users to purchase separate security solutions for corporate sites, public and private cloud environments, and remote workers. This creates operational inconsistencies, including misconfigurations that can lead to network breaches.

2. The cybersecurity skills gap

In addition to complexity, point products add to organizational risk due to their long ramp times. Multiple point products increase your cybersecurity IT staff's time learning new features and dashboards. This puts enterprises at even greater risks, as over one-third of cybersecurity roles remain unfilled due to the global talent gap.

3. The rise of advanced threats

Complexity and cybersecurity skills shortages aren't the only factors driving the need for HMFs. There is a real, growing threat across the globe in the form of advanced cyberthreats. These advanced threats are becoming more difficult to detect and are increasingly devastating to businesses. Their attack vectors span the web, applications, content, and devices. Ransomware, for example, continues to disrupt industries across verticals, including operational technology (OT), state and local governments, manufacturing, and healthcare organizations.

4. The role of AI/ML and threat intelligence

Complexity, manual oversight, and an expanding threat landscape require coordinated protection. It's not enough that your firewall can span the different areas of your network. They must also contain the artificial intelligence and machine learning (AI/ML) capabilities required to protect against known and unknown threats. Adding AI/ML-powered security to HMFs enables them to identify and classify applications, web URLs, users, devices, malware, and more, all while automating policy enforcement across domains. AI/ML is at the heart of HMF automation and can significantly reduce the amount of manual work involved in protecting enterprise IT.

What to Look for in a Hybrid Mesh Firewall

Centralized and unified management

The most vital benefits of an HMF are seeing threats, managing policies, and automatically orchestrating responses to threats anywhere across your network using every tool at your disposal. If separate domains, such as corporate sites, public and private clouds, and remote workers, require different dashboards, you don't have an HMF.

Unified management coordinates and unifies your domains into a single enterprise IT security solution—enabling simple, automated protection that extends from corporate sites to the cloud and remote workers. And because different organizations have different requirements for managing their dispersed network firewalls, all form factors must be supported, including appliances, VMs, SaaS, and managed firewall services.

Your HMF must also bring your network operations center (NOC) and security operations center (SOC) teams together through its single pane of glass to manage and monitor your entire attack surface.

ASIC-based appliances

Every environment in your network has unique security challenges. Corporate sites require appliances that can scale security functions, ensuring consistent protection without impacting user experience. An HMF should never be the reason for a network bottleneck.

Today's performance-hungry organizations need appliances that include enhanced application-specific integrated circuits, or ASICs, to increase the speed of critical security services. A security appliance built with a custom ASIC can offload numerous resource-intensive functions, like firewalling, VPN, IPS, and even SSL or deep packet inspection (DPI). This ensures your corporate sites are protected with multi-layered security controls without impacting network performance.

Cloud-native firewall

Cloud-native firewalls protect public cloud application workloads deployed in laaS environments as Infrastructure-as-Code. Adding a cloud-native HMF to your cloud environment also reduces your network security operations workload by expanding visibility while eliminating the need to configure, provision, and maintain a firewall software infrastructure, allowing security teams to focus on policy management.

Virtual firewall

Virtual firewalls are commonly used to protect virtualized environments in software-defined data centers and multi-cloud environments. Because they are the least expensive and the most portable solution, IT staff can quickly move a virtual firewall from cloud to cloud. But the virtual firewalls within an HMF solution further enable a comprehensive security ecosystem for your software-defined data center, aiding your consolidation process while protecting your environment from threats using a variety of cybersecurity services beyond stateful firewalling.



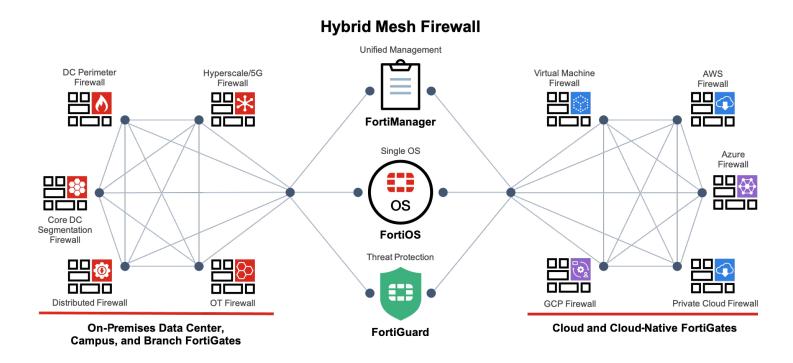
Firewall-as-a-Service

Firewall-as-a-Service (FWaaS) is a firewall solution delivered as a cloud-based service. This allows companies to simplify and scale their IT infrastructure. In many ways, FWaaS is much like the hardware firewall you deploy on-premises, providing the full range of NGFW capabilities, like web filtering, advanced threat protection, IPS, and DNS security. And an HMF deployed as an FWaaS solution extends its unique capabilities to distributed users and devices, combining nearly instantaneous scalability with centralized control.

A single operating system

The rapid expansion of network edges has compounded the challenges of vendor and point solution sprawl. Disparate point solutions cannot work together or share information, making consistent security policy, end-to-end visibility, and automation impossible. Trying to maintain and monitor numerous hybrid, hardware, software, and X-as-a-Service solutions also overburdens security teams.

A single operating system is the foundation of HMFs, consolidating numerous technologies and use cases into a simplified, single policy and management framework. While its unified management console unifies its front-end operations, a single operating system ensures that its various deployments, such as appliances, virtual and cloud-native firewalls, and FWaaS agents, can all interoperate on the back end.



The Value of Hybrid Mesh Firewalls

Hybrid mesh firewalls bring enormous benefits to enterprise IT. These include increased IT operational efficiency, simplified cybersecurity operations, reduced organizational risk, relief from the cybersecurity skills gap, resilient protection against known and unknown cyberthreats, automation and coordination via AI/ML, and a lower total cost of ownership.



Making the Best Hybrid Mesh Firewall Choice

Not all organizations understand HMFs. With so much marketing noise, it can be challenging for enterprise IT buyers to find meaningful information. In many cases, what's advertised as an HMF is instead a disjointed set of incomplete solutions, a niche point product that doesn't run in every environment, a traditional firewall without hybrid capabilities, or a collection of solutions that do not interoperate.

What organizations need is a solution that combines the functionality of an NGFW, the flexibility of a wide variety of form factors, the acceleration and scalability that comes with advanced ASIC technologies, a common operating system to ensure consistency and interoperability between deployments, advanced AI-based services to keep it tuned to the latest threats, and unified management, orchestration, and response. Such HMFs, available in various form factors, can then operate, correlate data, and respond as a single solution anywhere, in any environment, all the time.

¹ Gartner, Magic Quadrant for Network Firewalls, Rajpreet Kaur, Adam Hils, Tom Lintemuth, 19 December 2022.



New Solutions

Supporting and securing hybrid architectures requires single-lens visibility across the entire distributed network. This includes knowledge of every user and device on the network and the applications and resources they are accessing. Plus, it's necessary to identify anomalous behavior and malicious activity everywhere it occurs. Marshaling all necessary security resources to direct a timely, coordinated response is also key to stopping threats. To support today's expanding networks and their numerous edges, many businesses have begun adopting disparate secure access service edge (SASE), software-defined wide area network (SD-WAN), and zero-trust network access (ZTNA) solutions. This creates complexity while fracturing visibility, compromising user experience, and limiting the ability to respond effectively to attacks.

What's needed is a new next-generation firewall (NGFW) approach that integrates these functions to provide contextually coordinated security across the network. An HMF solution combines on-premises and cloud-native solutions with a unified management component. A unified security solution provides coordinated protection to multiple areas of enterprise IT, including corporate sites, branches, campuses,



data centers, public and private clouds, and remote workers. Because of its native interoperability, an HMF deployment simplifies operations, ensures compliance, reduces complexity, and enables broad automation to increase operational efficiency. It doesn't matter if you have all on-premises firewalls, all cloud firewalls, or a mix of both. The enhanced value lies in centralized and unified management across all firewall deployments.

Fortunately, regardless of where security needs to be deployed—whether a campus or data center environment, multi-cloud network, branches, or home offices—use cases are remarkably similar. Addressing them requires breaking down security into three primary functions: protect, converge, and scale. By understanding these three concepts, you can implement a security strategy designed to deliver a seamless user experience and protection aligned with business goals.

Protect

The main objective is to prevent any threat from entering the network. But if that should happen, then the next step is to minimize business disruptions as fast as we can. An NGFW needs to be aware of the entire application life cycle, including interoperating with tools to accelerate application access and use. This includes providing essential web filtering augmented with advanced image recognition and video content filtering to ensure acceptable use and compliance.

An NGFW solution also needs to provide advanced security solutions to prevent known, zero-day, and unknown attacks with integrated intrusion prevention system (IPS) and anti-malware. It needs to support constantly shared threat-intelligence feeds from complementary products like email security and sandboxes to detect and prevent the latest threats.

And it needs to interoperate with other solutions, such as endpoint detection and response (EDR), web application firewalls (WAFs), and other security systems. This combination of native threat protection and integration with other technologies ensures that the network is effectively protected against all current and emerging threats.



Converge

An NGFW should also provide full visibility into sophisticated attacks that hide in secure HTTPS channels to steal data and load ransomware. It should also seamlessly integrate essential networking and security functions into a unified solution—whether delivered directly from an on-premises NGFW or through a cloud-delivered SASE—that combines advanced routing and connectivity functions with dynamic security solutions.

It also needs to identify any user, device, or application requesting access and automatically assign it to its appropriate network segment. This requires natively integrated proxy services. When a device makes its initial access request, the firewall needs to work with endpoint clients (for users and servers) and network access control (for Internet-of-Things [IoT]/Industrial-Internet-of-Things [IloT] devices) solutions. It also needs to support multi-factor authentication to determine the role of a user or device, link it to associated policies, and only grant access to the application or segment of the network required to do its job.

For applications and workflows that move from one environment to another, an NGFW needs to understand, implement, and enforce the same policy everywhere. This consistent orchestration and enforcement approach, built with single-pane-of-glass management, allows security to follow applications, workflows, and other transactions end to end.

Scale

Regardless of where a firewall is deployed, one thing remains true: It needs to be fast. And it will need to be even faster tomorrow. Today's data centers generate and process massive amounts of data at transactional speeds—whether it's big data for advanced modeling, low latency for high-speed financial transactions, or hyper-performance for massive multiuser environments.

Speed refers to how quickly a firewall can inspect data and its ability to support automation. An NGFW needs to effectively protect the network from high-speed attacks with advanced and coordinated security as well as not be bogged down with time-consuming manual provisioning efforts. Manual operations slow things down, and configuration errors can be compromised by ransomware and other attacks.

The challenge is that most traditional firewalls are already running at capacity, which means they can't scale to match growing business demands. That's because they were never designed with hyper-performance in mind. Their biggest problem is they rely on off-the-shelf processors in an age when everything—whether graphics cards, smartphones, or cloud servers—runs on custom chips. Security is a processor-intensive activity. Scaling to meet today's performance demands requires delivering full firewall functionality without sacrificing performance or overwhelming limited IT and security budgets.



CHECKLIST

Top 6 Recommendations to Improve User Productivity with a Hybrid Architecture

The speed of business is accelerating the data center's journey toward digital transformation, requiring new hybrid network architectures that combine on-premises data centers with multiple public and private cloud deployments to form a hybrid mesh firewall (HMF) environment. However, to meet the needs of organizations expanding their digital transformation, the underlying enabling technologies must be more reliable and energy-efficient. They must also deliver consistent security across the hybrid architecture to defend against threats.

On-premises and virtual data centers are vital in today's ever-evolving network. In this new model, security is essential to protect resources and assets and to enable the network to accelerate and adapt without introducing unknown risks that can jeopardize the enterprise.

6 Things Organizations Need to do to Position Themselves for Success

Invest in a Flexible Next-Generation Firewall

Organizations need to invest in a next-generation firewall that includes technologies like SD-WAN, Universal ZTNA, inline sandbox, and SOC-as-a-Service. These technologies improve WAN connectivity by providing better user experience with direct internet access, while LAN and WLAN provide faster access to local devices and users.

☑ Deploy Unified Networking and Security

Security can't be an afterthought. When security solutions are not well-integrated with each other or the underlying network, security risks and gaps arise as the attack surface expands and adapts. These blind spots are vulnerable to sophisticated multi-step attacks and are partly responsible for the dramatic rise in successful ransomware attacks. Hence, it is important to look for a unified security framework to deliver automated and reactive security that spans the HMF architecture for all firewall deployments to cover the entire attack surface. Organizations must also converge their security with networking to protect digital acceleration efforts

✓ Adopt a Secure-Networking Strategy

With new network edges being created on-premises and in the cloud, it is critical that the unified convergence of networking and security be available everywhere, combined with ZTNA to enable explicit access for applications and continuous verification of users and devices. This convergence is the heart of a secure networking strategy. Also, flexibility in providing this convergence is key in securing digital acceleration for hybrid deployments.

Speed Operations with Centralized and Automated Management

The exponential growth of network edges, cloud platforms, and tools can significantly increase operational complexity. Furthermore, poor visibility and analytics gaps in the network along with tasks performed manually degrade the end-to-end digital experience.

These issues increase the time to configure, manage, and troubleshoot. They also add to operation costs and errors that can cause network outages and reduce flexibility. A hybrid mesh firewall architecture provides centralized and automated management to unify and deliver consistent security policies and network services across the organization. Removing manual configuration eliminates a major cause of downtime and security breaches.



Increase Visibility with End-to-End Digital Experience Monitoring

Traditional network performance monitoring, IT infrastructure monitoring, and application performance monitoring provide network operations center (NOC) teams with limited visibility. These types of monitoring don't provide the performance insights into critical business applications that organizations need. They also severely hinder the visibility that frontline NOC and help desk teams need to resolve issues.

A modern digital experience monitoring (DEM) platform is required to give your NOC team superior visibility. It allows for the observation of any application, starting from the end-user, across any network, and to the infrastructure the application is hosted on. It can enrich incident management and supply holistic remediation of performance issues to resolve problems before users are impacted.



Consolidate and Simplify Operations to Provide Instant ROI

Organizations adopting HMFs with unified management and integrated security achieve better ROI than those using point products with limited security. Secure networking also improves employee productivity with better user experience and simplified operations.

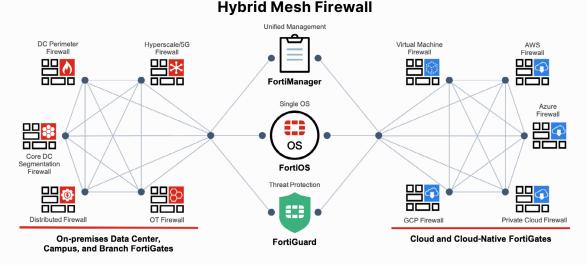


Figure 1: The Fortinet Hybrid Mesh Firewall solution

Conclusion

Many organizations still use a traditional architecture to connect offices to the data center for application access. However, with users working from anywhere and applications distributed across multi-cloud and SaaS environments, this legacy network design is an obstacle for digital acceleration and creates user experience challenges. Organizations that want to have better user productivity and secure network edges need to invest in a modern hybrid network architecture.

Fortinet is the only vendor in the industry to offer an NGFW that includes SD-WAN, Universal ZTNA, inline sandbox, and SOC-as-a-Service that can protect any edge at any scale. Offering the best convergence of networking and security, Fortinet empowers organizations to adopt modern networking technologies essential for digital acceleration. Learn more about Fortinet Secure Networking.



Third-Party Validation

Dec 2022 Gartner® Magic Quadrant for Network Firewalls



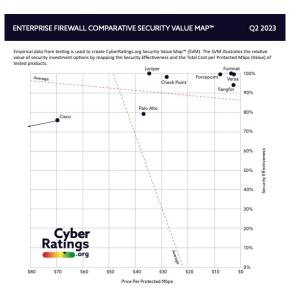
Fortinet named a leader positioned highest in Ability to Execute. This marks the 13th time Fortinet has been included in this Magic Quadrant.™

Gartner Peer Insights™ Customers' Choice



At Fortinet, we strive to put our customers first, and we're very proud to have been named a 2023 Gartner Peer Insights Customers' Choice for Network Firewalls. This distinction, which customers have recognized us for the fourth year in a row, is based on over 500 reviews of our FortiGate Next-Generation Firewalls (NGFWs). In addition to giving FortiGate high ratings, 93% of reviewers are willing to recommend Fortinet NGFWs.

Apr 2023 CyberRatings Enterprise Firewall Report



- 99.88% Security Effectiveness
- · Recommended Rating
- Highest ROI among major players
- "AAA" Rating across all Categories

Oct 2022 Forrester Wave™ Enterprise Firewalls



Fortinet Named a Leader in the Forrester Wave™

Gartner, Magic Quadrant for Network Firewalls, Rajpreet Kaur, Adam Hils, Tom Lintemuth, 19 December 2022.

Gartner, Critical Capabilities for Network Firewalls, Adam Hils, Rajpreet Kaur, Thomas Lintemuth, 16 May 2023.

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Nuvance Health: Fortinet Secures New Hybrid Architecture



Nuvance Health re-engineered its network to deploy a secure data center across a hybrid architecture to ensure all information is protected and will deliver a more reliable, energy-efficient, and secure network.

Challenges

- Risk management: reducing exposure to potential attack
- Cost reduction: cost-savings requirements after merger
- Network complexity: consolidating network management

Benefits

- Reduced complexity
- Increased visibility
- Increased response speed

Business Impact

- Saved time for security operations teams with automated processes
- Reduced power usage for operational cost savings
- Improved network management



- A system of award-winning nonprofit hospitals and outpatient healthcare services
- 7 healthcare facilities throughout New York and Connecticut
- 15,000 healthcare professionals
- 13,000 employees

"Fortinet certainly gives us the ability to reduce the amount of pure network security staff and firewall management staff and allows us to focus other area on other areas [of security] that we have concerns with."

Ben Smith

VP, Chief Information Security Officer of Nuvance Health



CUSTOMER SUCCESS STORY: FINANCE

Nubank Relies on Fortinet Cloud Security Solutions



Customer Overview

Nubank runs its applications entirely on Amazon Web Services (AWS) and the IT staff is responsible for protecting the customer information residing in the cloud, from both external and internal threats.

Challenges

- Scale to support growth of company and employees
- Improve internal security
- Protect customer information
- Optimize communication with AWS cloud environment

Benefits

- Improved network security
- Reduced latency increased time dedicated to higher priority projects
- Improved visibility
- Reduced costs associated with network/security stack

Business Impact

- Greater reliability and physical security of connected devices
- Better communication with AWS, optimizing the IT team's time
- Improved control over infrastructure, users, and information

Read the Case Study

- Largest fintech bank in Latin America, located in Sao Paulo, Brazil
- 6,100 employees
- 90M customers worldwide
- \$1.7B in revenues

"We were looking for solutions that would support our internal security team and improve communication with our Amazon Web Services cloud environment. In just five months, we managed to reorganize our environment, and we are already thinking about the next steps."

Gabriel Diab

Software Engineer, Nubank Brazil





City of Portland Secures Innovative Community Services



Customer Overview

The City of Portland is pioneering several leading-edge data management initiatives that are designed to better protect its community services against cyberattacks.

Challenges

- Had inadequate vendor support
- Needed effective protection against DDoS attacks
- Wanted to build a zero-trust network architecture
- Were searching for long-term, strategic partner

Benefits

- Avoids service disruption with effective, timely protection
- Improved confidence among city leaders that innovative city solutions and services remain secure

Business Impact

- Built a zero-trust network framework that manages users and application controls for better governance and control
- Simplified operations by automating to avoid manual configurations

Read the Case Study

- Oregon's largest city with more than 642,000 residents
- Among the top 30 largest U.S. cities
- Known for being a sustainability-minded city

"The fewer devices and vendors you use, the fewer passes through the stack where packets could get sidelined. That is why we are all-in with Fortinet."

Christopher PaidhrinSenior Information Security
Officer, City of Portland





QIAGEN Strengthens Security Across Its Distributed Workforce



Customer Overview

QIAGEN needed to streamline security and management of its global network and effectively support a more distributed workforce to seamlessly manage and control remote access and endpoint security.

Challenges

- Needed to replace edge security company-wide
- Required application-aware firewall
- Did not want to "piecemeal security add-ons" to cybersecurity solution
- Wanted to maintain cost structure

Benefits

- Streamlined management of the Security Fabric
- Reduced latency across the WAN
- Increased network visibility and management
- Integrated a solution of complementary products

Business Impact

- Minimized brand and competitive risks by protecting crucial intellectual property (IP), financial, and customer data
- Optimized productivity of business users by minimizing latency connecting to the corporate network or internet via VPN

- and applied testing for pharmaceutical research
- 35 offices in more than 25 countries

Molecular diagnostics

- 6,000 employees
- \$2.2B in revenues

"Fortinet has been a fantastic partner, particularly in overcoming the challenges around getting the firewalls installed in certain locations. They went above and beyond in ensuring that we were successful in this major deployment."

Jonathan Martin Director, Global IT Infrastructure, QIAGEN

Read the Case Study



www.fortinet.com

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