Google Cloud

Transforming financial services through AI innovation

What organizations need to stay competitive and how Google Cloud and F5 navigate application complexity, security, and resilience.

Contents

Technology drivers for financial services

Digital transformation in the industry is ongoing, driven by changing customer expectations, competitive pressures, and technological advancements. Most financial institutions have at least partly migrated to cloud-native infrastructures, along with API-driven ecosystems and AI-powered intelligence.

Hybrid multicloud is now the norm, with institutions deploying applications across multiple environments to optimize for cost, compliance, and performance. In fact, 94% of organizations overall now manage apps across multiple locations or deployment models,[1] and financial institutions use three to four cloud service providers on average.[2]

Technology adoption is fueled by:

Increased customer expectations

Consumers expect seamless digital experiences that include personalized service, immediate responses, and frictionless transactions—all while keeping their sensitive financial data secure.

Companies that don't meet these expectations risk losing market share, as research shows that 58% of customers acquired at least one product from a new provider in the past 12 months.[3]

Competitive pressures

Traditional financial institutions face intense competition from digital-first challengers that aren't burdened by legacy infrastructure.

To remain competitive, established businesses must balance the need to innovate with the requirement to maintain the security and stability that customers expect from trusted financial brands.

Regulatory and compliance considerations

Compliance controls across the technology stack are necessary to ensure that applications and data adhere to evolving regulations and industry-specific requirements. However, only around one in ten financial services managers say their company is prepared for forthcoming AI regulations, leading some organizations to delay AI adoption.[4]

81%

of global banking CEOs view generative AI as a crucial investment for driving business transformation, with over half of banking executives aiming to enhance productivity and reduce costs through AI.[5]

Embracing AI as a competitive advantage

AI is ushering in a new era of operational efficiency, risk mitigation, and digital customer experiences. Financial services organizations expect to see significant value from AI investments, with nearly 70% of companies investing in AI reporting revenue increases of at least 5%, and more than 60% seeing annual cost reductions of 5% or more.[6]

Half of management respondents said they've deployed their first generative AI service or application, with an additional 28% planning to do so within the next six months.[7]

How AI benefits financial institutions

Enhanced decision-making

AI platforms analyze vast datasets for better capital market decisions, credit risk scoring, and loan underwriting.

Stronger personalization

AI, powered by retrieval-augmented generation (RAG), provides more tailored interactions based on institution-specific data and customer context.

Process improvements

AI optimizes workflows, ensuring accurate and timely tracking while adhering to standardized frameworks and regulatory requirements.

"We expect that financial services firms will double down on data agents that can assist analysts, quants, bankers, underwriters, risk managers, fraud investigators, and many others in querying diverse sets of data sources."

Zac Maufe, Managing Director, Regulated Industries, Google Cloud

Essential technology building blocks

Secure, scalable infrastructure

Combining cloud with on-premises data centers allows financial firms to store sensitive data locally while leveraging the scalability and advanced services available in the cloud. It's particularly important for AI workloads, which often require substantial computational resources best suited for the cloud. Inference apps are deployed at the edge, closer to users, to improve performance and comply with data sovereignty laws.

API management and security

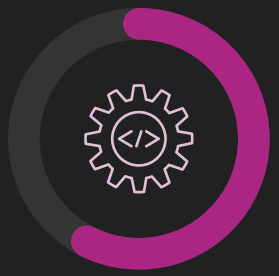
Modern financial applications and AI-powered apps rely on APIs as their foundation, enabling third-party integrations and open banking initiatives. However, APIs expand the attack surface and increase risk, making discovery and protection essential for maintaining system integrity and customer trust.

Application performance and delivery

With digital banking now the primary channel for many customers, performance directly impacts customer satisfaction, and even minor issues can lead to significant business impact. Financial applications must deliver consistent performance across diverse devices and network conditions for traditional, modern, and AI apps, requiring sophisticated application delivery capabilities that optimize traffic and ensure resilience.

73%

of organizations say deploying generative AI models at the edge is important, especially in sectors like financial services.[8]



58%

of organizations consider APIs a significant pain point when managing application delivery and security.[9]

"For most respondents, app performance is the top determinant of delivering a great digital experience."[10]

Comprehensive security controls

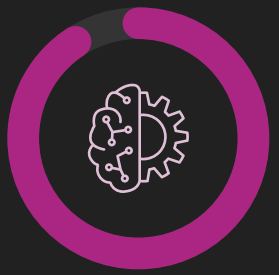
Financial institutions remain prime targets for cyberattacks, facing threats ranging from sophisticated fraud to distributed denial-of-service (DDoS) attacks. AI further expands the attack surface and faces threats not covered by traditional application security tools. A multi-layered security approach is essential to protect sensitive financial data and maintain customer trust.

Unified visibility

With applications distributed across hybrid multicloud environments, financial institutions need comprehensive visibility into AI application performance, security posture, and user experience. Siloed monitoring tools create blind spots that can hide emerging threats or performance issues. Unified observability solutions that integrate security and performance data from across all environments are essential for proactive issue detection, ensuring regulatory compliance, and optimizing customer experiences.

$6.08M

is the cost of a data breach in financial services in 2024, which is 22% higher than the global average.[11]



93%

of organizations have established strategies for managing observability data, recognizing this as a critical foundation for implementing AI-driven management and security capabilities.[12]

Building secure, scalable infrastructure to support AI initiatives

Financial institutions need infrastructure that can accommodate expanding digital operations and AI initiatives while maintaining strict compliance requirements. Google Cloud's global network infrastructure provides over 30 regions and 100 points of presence, ensuring low-latency connections for AI-powered customer interactions worldwide. This global reach means customers experience consistent AI performance regardless of location, critical for real-time personalized banking services.

Hybrid and multicloud capabilities

Google Cloud supports financial workloads with robust cloud infrastructure, high-performance computing resources for AI model training, and flexible deployments in the cloud or on-premises with Google Distributed Cloud, allowing institutions to keep sensitive data local while still leveraging cloud technologies. F5 complements this foundation with seamless and secure connectivity and unified policy management across hybrid multicloud environments.

AI development platform

Google Cloud eliminates the traditional barriers to building AI-powered applications. Instead of requiring deep machine learning expertise, developers can leverage the Google Cloud Vertex AI platform for end-to-end machine learning (ML) model development and deployment. Pre-trained first- and third-party models serve as a starting point to build or fine-tune from, which can then be deployed and served from Google Kubernetes Engine (GKE).

End-to-end security

F5 works with Google Cloud to operationalize the Secure AI Framework (SAIF) across the entire AI application stack. Protect AI models, applications, systems, and users with capabilities including:

AI prompt monitoring

Inspect prompts and responses in real time with F5® AI Gateway to implement adaptive controls with faster feedback loops. Google Cloud Model Armor for Vertex AI also provides built-in screening to protect against risks like prompt injection and harmful content. AI Gateway adds a centrally managed layer of policy enforcement that spans hybrid multicloud environments.

Data loss prevention

Inspect user inputs with AI Gateway and Google Cloud Sensitive Data Protection to automatically detect and redact PII or other confidential data from prompts and responses, providing robust, automated DLP for AI applications.

API security

Discover shadow APIs and protect the numerous critical APIs that connect AI apps with models and data sources using F5 Distributed Cloud API Security to reduce the risk of a breach or costly resource overconsumption.

Key AI use cases transforming financial services

Financial institutions are leveraging AI across four primary use cases to gain measurable business value while enhancing customer experiences and operational efficiency. These scenarios demonstrate how AI can transform core banking operations when supported by the right infrastructure and security foundations.

Enhanced account holder experience

Deliver highly personalized customer interactions by analyzing individual preferences, transaction history, and behavior patterns to provide tailored recommendations and proactive financial guidance.

Faster, more accurate fraud prevention

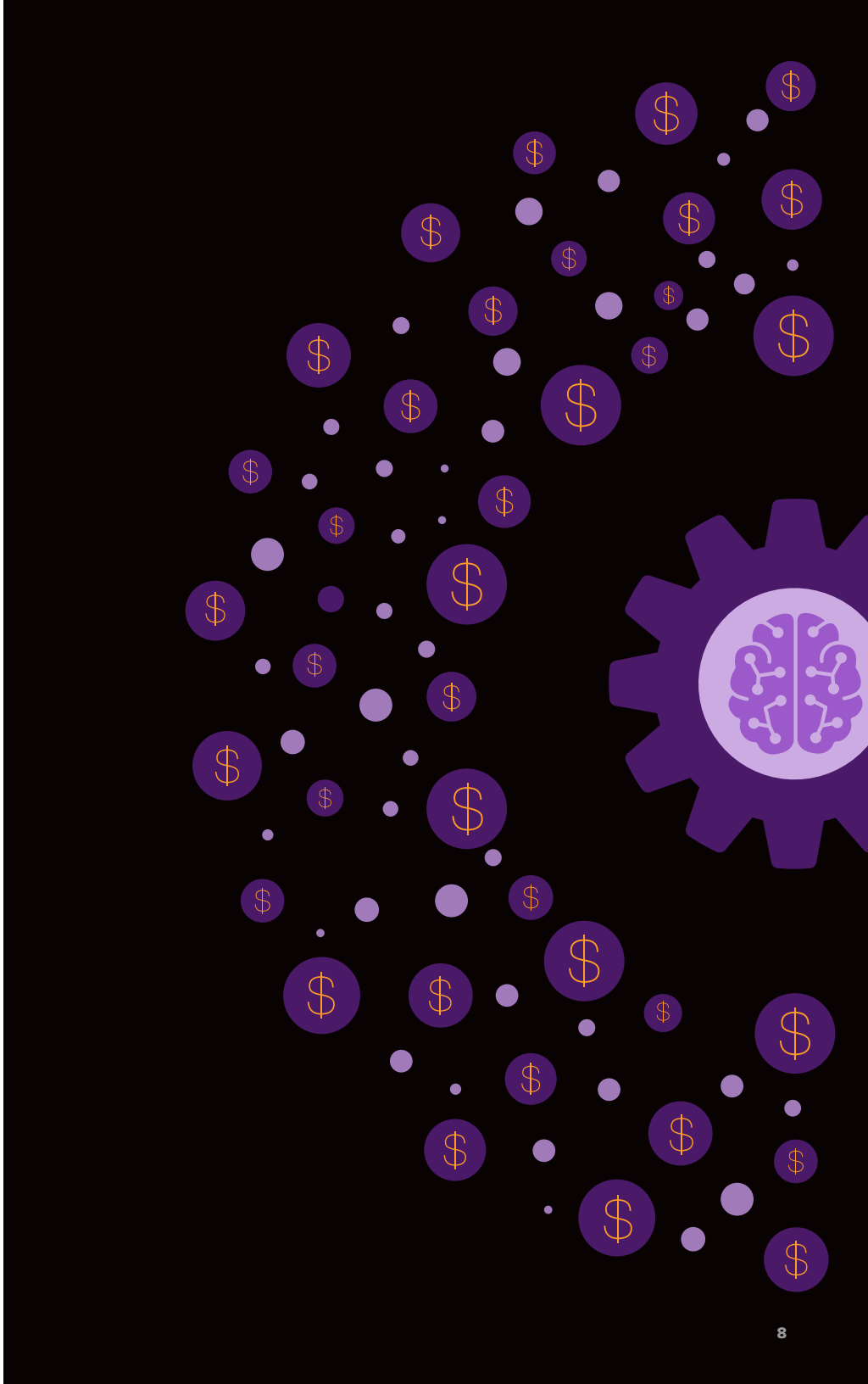
Continuously analyze transaction patterns and user behaviors to detect fraudulent activities in real-time while minimizing false positives that disrupt legitimate customer transactions.

Simplified risk and compliance management

Automate complex regulatory reporting and risk assessment processes by processing vast amounts of financial data to ensure compliance and generate accurate predictive models for credit and market risks.

Optimized operational efficiency

Streamline back-office operations by processing documents, routing workflows, and performing routine tasks that traditionally required significant manual effort and oversight.



Enhanced account holder experience

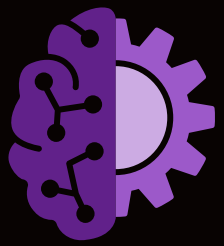
AI creates seamless, personalized customer experiences by dynamically querying relevant data and generating hyper-contextual information in real time. Virtual assistants and chatbots now handle routine inquiries while sophisticated AI systems provide personalized financial advice and proactive service.

Personalized banking through AI

Financial institutions are deploying AI-powered virtual assistants that provide instant, personalized responses by accessing real-time account data, transaction history, and customer preferences. These systems can recommend tailored financial products, provide spending insights, and offer proactive alerts based on individual customer behavior patterns.

Advanced AI models analyze customer interactions across channels to deliver consistent, contextual experiences, whether customers engage through mobile apps, websites, or call centers. Machine learning continuously improves personalization by learning from customer preferences and feedback, creating increasingly relevant and helpful interactions.

Customer service and support represents the top priority area for new generative AI initiatives, with 55% of organizations rating it as important in the next 12 months.[13]



Delivering consistent AI-powered experiences

Google Cloud's global network infrastructure with over 30 regions ensures low-latency AI interactions for customers worldwide, while Google Distributed Cloud and F5 Distributed Cloud Customer Edge deploy AI applications closer to users for real-time personalized banking services with minimal delay.

AI Gateway optimizes customer-facing AI workloads through intelligent routing that directs queries to the most appropriate AI models based on complexity and personalization requirements. Semantic caching identifies similar customer requests to provide faster responses, while rate limiting ensures consistent service quality during peak interaction periods.

F5 Distributed Cloud Network Connect enables AI models to securely access distributed customer data sources in real time using RAG, supporting personalized recommendations that require information from multiple systems. This secure connectivity allows AI assistants to provide comprehensive account insights and tailored financial advice while maintaining strict data protection and privacy standards across hybrid environments.

Faster, more accurate fraud prevention

AI improves fraud detection rates while limiting false positives through real-time monitoring and anomaly detection. Modern fraud protection requires intelligent defenses against malicious bots, behavioral analytics, and predictive modeling to stay ahead of sophisticated attacks.

AI-driven fraud detection

Financial institutions are deploying machine learning models that analyze transaction patterns, user behavior, and device characteristics to identify fraudulent activity in real-time. These systems adapt continuously to emerging fraud tactics, reducing false positives while catching sophisticated attacks that traditional rule-based systems miss.

AI-powered behavioral analytics monitor customer interactions to establish baseline patterns, flagging deviations that may indicate account compromise or fraudulent transactions. Advanced models can detect coordinated attacks across multiple accounts and identify previously unknown fraud patterns through anomaly detection.

> "We'll see banks focusing on AI-powered KYC systems with more robust capabilities to detect counterfeit documents and analyze photos for signs of manipulation."

Google Cloud, AI Business Trends 2025, Nov 2024

Comprehensive fraud protection infrastructure

Google Cloud AI/ML services enable sophisticated predictive fraud modeling through AutoML Tables for custom detection models and Vertex AI for real-time transaction scoring. BigQuery ML processes large transaction datasets to identify emerging fraud patterns, while Google Cloud reCAPTCHA provides frictionless user verification when suspicious activity is detected.

F5 Distributed Cloud Bot Defense provides the first line of defense against automated fraud attempts, using behavioral analytics and device fingerprinting to distinguish legitimate customers from malicious bots attempting credential stuffing or account takeover attacks. This protection prevents fraudulent traffic from reaching core banking systems.

F5 Distributed Cloud Data Intelligence enhances fraud detection accuracy by providing real-time threat intelligence from the F5 Global Network, enabling institutions to identify and block emerging fraud campaigns before they impact customers. The combined solution creates layered protection that automatically adapts to new fraud tactics while maintaining seamless experiences for legitimate use.

Simplified risk and compliance management

AI optimizes compliance workflows and mitigates risks by combining predictive modeling with thorough data-driven insights. Advanced AI models help organizations predict market trends and assess creditworthiness with higher accuracy while maintaining compliance with evolving regulatory requirements.

AI-powered risk assessment and compliance

Financial institutions are using AI to automate regulatory reporting, monitor transactions for compliance violations, and predict credit risks in real-time. Machine learning models analyze vast datasets to identify potential regulatory breaches before they occur, while automated compliance systems ensure documentation meets evolving regulatory standards.

I-driven risk models process historical data, market conditions, and customer behavior to generate more accurate credit assessments and portfolio risk evaluations. These systems continuously adapt to changing market conditions and regulatory requirements, reducing manual oversight while improving compliance accuracy.

Supporting compliant AI operations

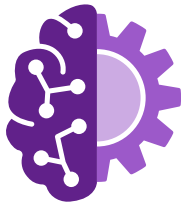
Google Distributed Cloud enables institutions to keep sensitive compliance data on-premises while leveraging cloud-based AI capabilities for risk analysis. This hybrid approach ensures regulatory data sovereignty requirements are met while accessing advanced machine learning models for predictive risk assessment.

View comprehensive audit trails essential for regulatory compliance, including data access patterns, model outputs, and risk assessments, creating the documentation required for regulatory audits and compliance reporting. AI Gateway natively supports the vendor-agnostic OpenTelemetry Protocol (OTLP), which ensures seamless integration not only with Google Cloud's observability suite but also with solutions compatible with OTLP. This integration eliminates observability blind spots with centralized monitoring and makes it easier to get AI data into preferred tools for managing governance, risk, and compliance.

Most organizations (95%) say they're standardizing with observability tools such as OpenTelemetry.[14]

Optimized operational efficiency

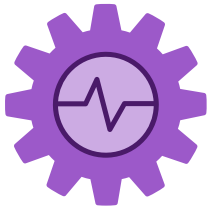
AI drives operational efficiency by automating routine tasks while ensuring compliance and could create up to $340 billion in annual cost savings across the financial services industry, with organizations leveraging AI reporting an 18% boost in customer satisfaction, productivity, and market share.[15]



Transforming operations with AI

Financial institutions are leveraging AI to automate document processing, intelligent workflow routing, loan underwriting, and reconciliation processes. AI-powered systems can extract data from complex financial documents, route customer inquiries to appropriate departments, and automate routine compliance tasks that previously required manual intervention.

Machine learning models analyze operational patterns to optimize resource allocation, predict maintenance needs, and identify process bottlenecks before they impact customer service. This proactive approach reduces operational costs while improving service quality and regulatory compliance.



Scale automation to increase efficiency

Vertex AI accelerates the development of document processing and workflow automation solutions, enabling institutions to build custom models without deep machine learning expertise. GKE provides the scalable infrastructure needed to handle varying operational workloads during peak processing periods.

To keep automation working efficiently, AI Gateway intelligently routes requests to the most appropriate models. Semantic caching eliminates redundant processing for similar requests, significantly reducing processing time and costs. AI models can quickly and securely access customer data, regulatory databases, and legacy systems with Distributed Cloud Network Connect.

Cost savings per engineer in financial services is predicted to be between $500K and $1.1M by 2028.[16]

Accelerate innovation with Google Cloud and F5

Google Cloud's purpose-built AI infrastructure provides the foundation for training and deploying advanced AI models to support financial services use cases, from fraud detection to personalized customer experiences. In addition, solutions like Vertex AI and Google Gemini simplify model development and deployment without requiring deep machine learning expertise.

F5 adds specialized security and delivery capabilities designed for legacy and modern apps, as well as AI that work seamlessly on Google Cloud. This collaboration offers the ability to deploy AI-powered applications with confidence across any environment. The Google Cloud and F5 partnership provides:

Broad application and AI security

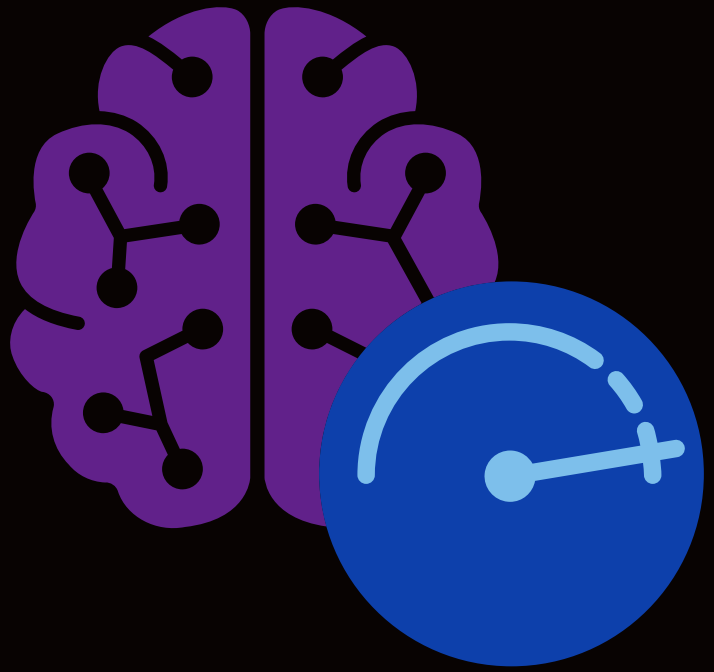
Meet stringent data protection and privacy requirements through layered security that defends applications and data consistently across environments. From web application protection to AI-specific security measures, Google Cloud and F5 help financial institutions maintain compliance while accelerating innovation.

Consistent experiences across hybrid environments

Deliver consistent performance and security regardless of where apps are deployed with application delivery and security services that work seamlessly across Google Cloud, on-premises data centers, and other clouds. Simplify operations and improve resilience in an increasingly distributed application landscape.

Operational efficiency through optimization

Reduce operational costs while improving performance through intelligent resource optimization across the technology stack. Minimize resource consumption for AI workloads, eliminate redundant, manual processes, and streamline operations. The result is faster deployment cycles, reduced overhead, and superior experiences.



GETTING STARTED

F5 solutions are available through the Google Cloud Marketplace, making it easy to deploy enterprise-grade security and delivery capabilities alongside Google Cloud services. This marketplace integration offers simplified procurement and billing, along with technical validation that ensures compatibility and optimized performance.

Appendix

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[2] Infosys Knowledge Institute, Cloud Radar: Banking Industry Report, Oct 2024

[3] Accenture, Banking: The future is back, Jan 2025

[4] EY, Financial service providers holding back on bringing in AI due to lack of expertise and low regulatory preparation, Dec 2024

[5] KPMG, 2024 U.S. CEO Outlook, Sep 2024

[6] NVIDIA, State of AI in Financial Services, Feb 2025

[7] F5, 2025 State of Application Strategy Report, Apr 2025

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[11] IBM, Cost of a Data Breach Report 2024, Aug 2024

[12] F5, 2025 State of Application Strategy Report, Apr 2025

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[15] MIT Technology Review, Finding value in generative AI for financial services, Nov 2023

[16] Deloitte, FSI Predictions 2025, Apr 2025

ABOUT F5

BRINGING A BETTER DIGITAL WORLD TO LIFE

F5 is a multi-cloud application services and security company committed to bringing a better digital world to life. F5 partners with the world's largest, most advanced organizations to secure and optimize apps and APIs anywhere—on premises, in the cloud, or at the edge. F5 enables organizations to provide exceptional, secure digital experiences for their customers and continuously stay ahead of threats.

For more information, go to f5.com. (NASDAQ: FFIV).

Learn more at f5.com/solutions/web-app-and-api-protection