Thriving in the Age of Applications

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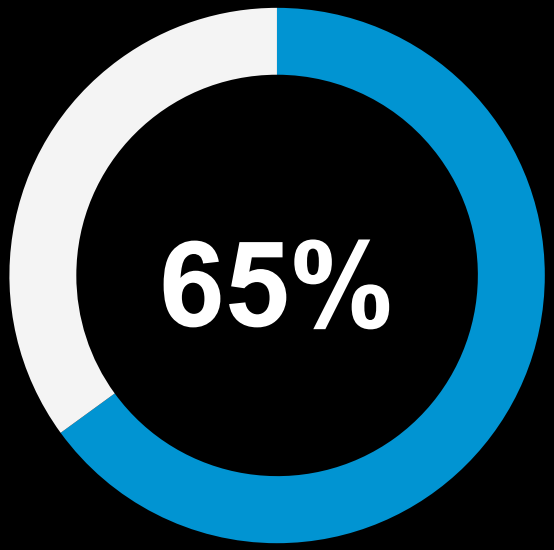
March 19, 2019

Applications are the most valuable asset of modern organizations

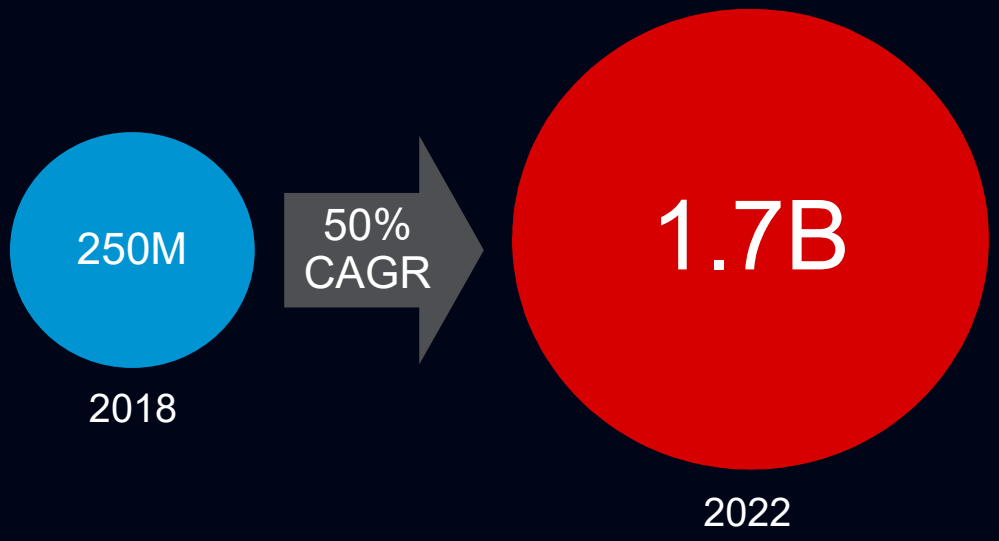
Digital transformation: Unlocking business value through applications & digital services



of organizations are digitally transforming

Source: F5 Networks 2019 State of Application Services research

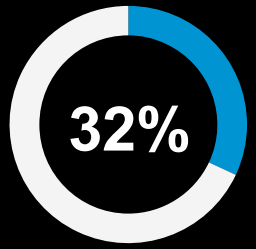
The number of applications is exploding



Source: IDC application workload forecast, 2018

The average public sector organization uses

680 applications

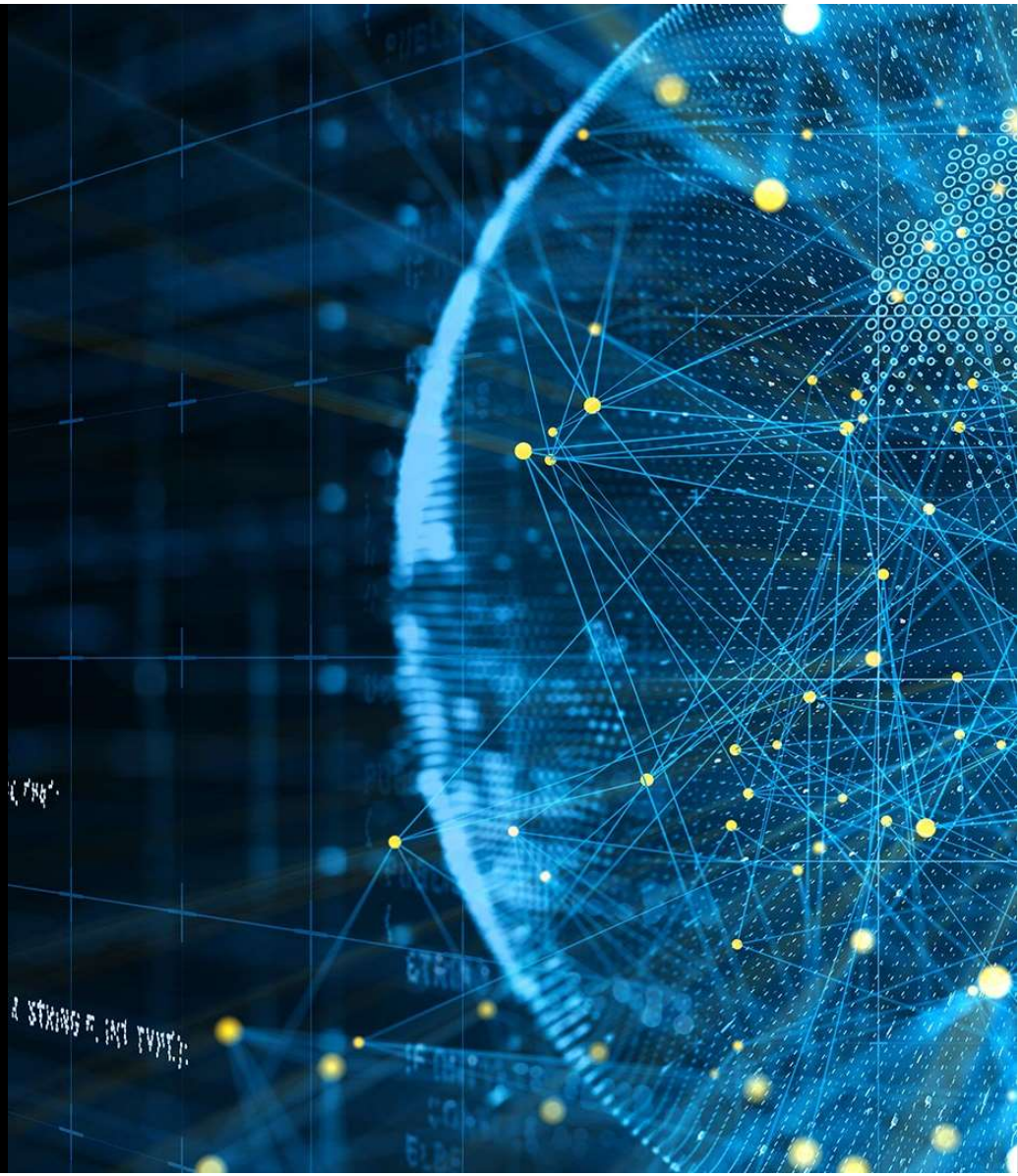


of which are considered mission critical

Source: 2018 F5 Labs Application Protection report

Thriving in the Age of Applications

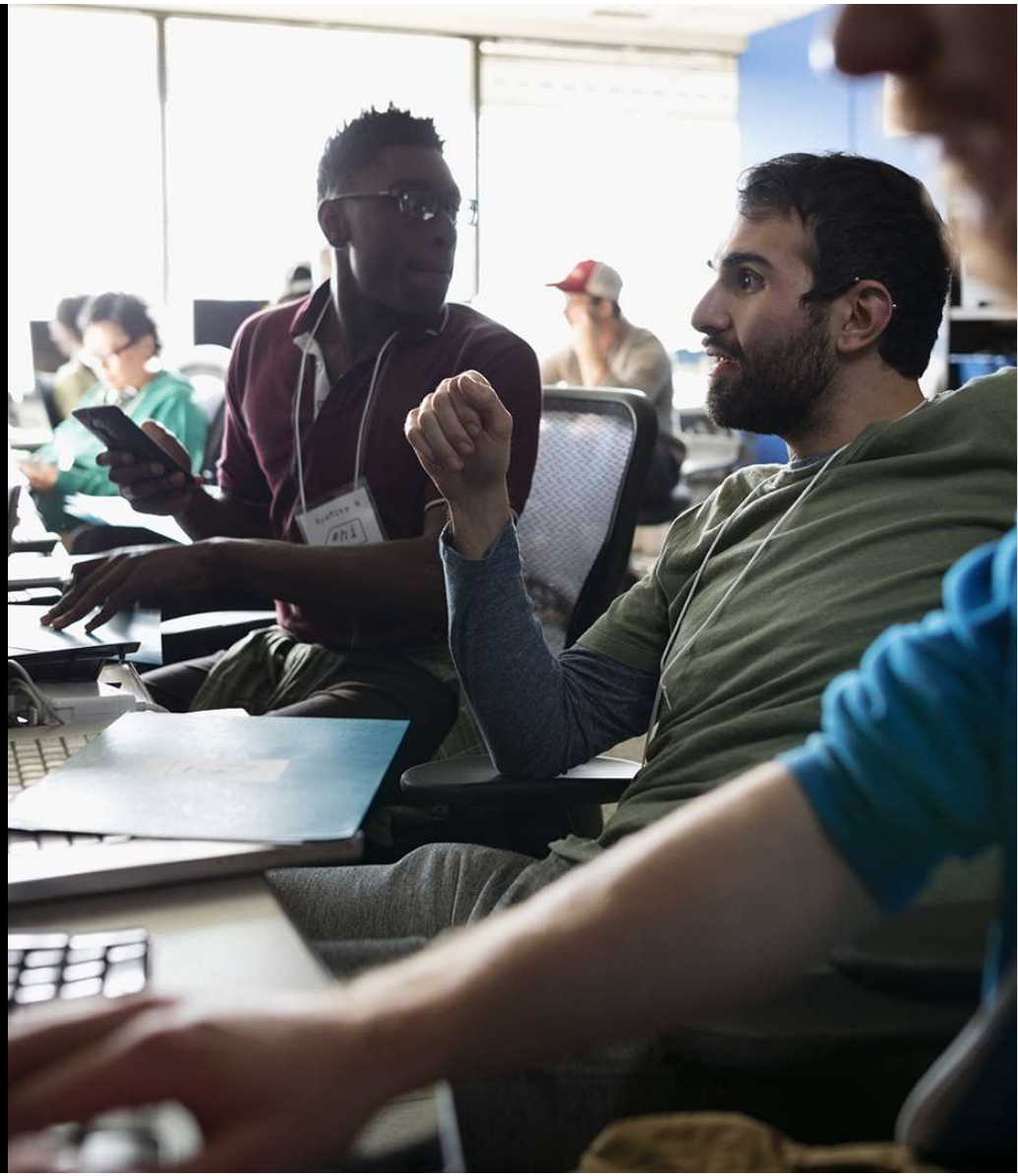
- Key differentiator is the ability to scale, iterate, and secure digital services
- Urgent need to manage, secure, and optimize the enterprise application portfolio
- All in the context of an Enterprise Application Strategy and Policy



Every organization will have to overcome several challenges

Challenge: Developers are a scarce resource

- World-wide software developer shortage
- Scarce resources must be used as efficiently as possible
- Every second wasted by a developer impacts value creation and successful delivery of the mission



Challenge: Applications are a growing source of enterprise risk

New architectures

85% of app. workload instances are container-based, growing to 95% by 2021

Expanding threat surface area

86% of all cyber-threats target applications and application identities*

Distributed deployments

87% of organizations are adopting multi-cloud

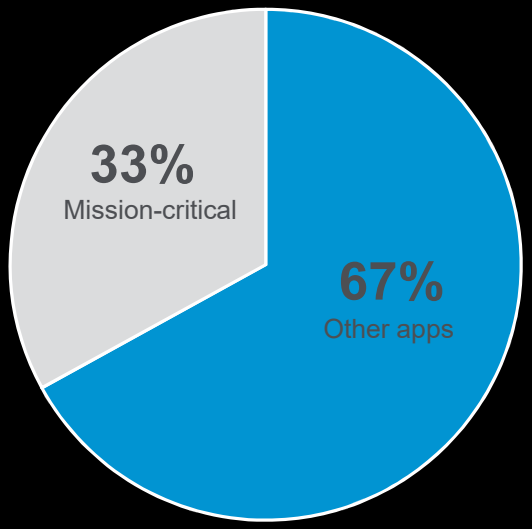
Inadequate visibility

0% of customers can report the number of applications in their portfolio with confidence

* Remaining14% is physical attacks and “other” (including VPN, network, DNS and direct database and ATM attacks)

Source: 2018 F5 State of Application Services report; 2018 F5 Labs Application Protection report; IDC, 2018

Challenge: Every application must be protected, not just the mission-critical ones



Large retailer

Millions of customer records exfiltrated

Billions in damages, market cap; CEO fired

Entry point through **HVAC system**

Casino operator

High-roller database taken

Most lucrative customers at risk

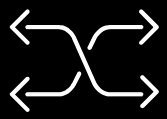
Entry point through a **digital thermometer in the lobby aquarium**

Multi-Cloud Application Services are a part of the solution

Benefits of Application Services

Speed

The performance of an application workload and the ability to deliver it to market quickly

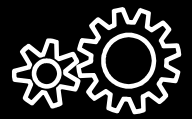


Mobility

The easy movement of an application workload from one physical or logical hosting site to another

Security

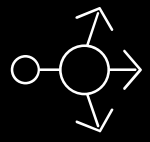
The protection of the application workload and the data associated with it



Operability

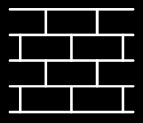
The assurance that an application workload is easy to deploy, keep running, and troubleshoot if it fails

Multi-Cloud Application Services can be applied to any app, everywhere

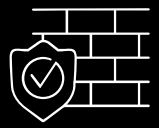


Local load balancing

Global load balancing



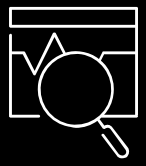
Firewall



WAF

DDoS protection

Access management



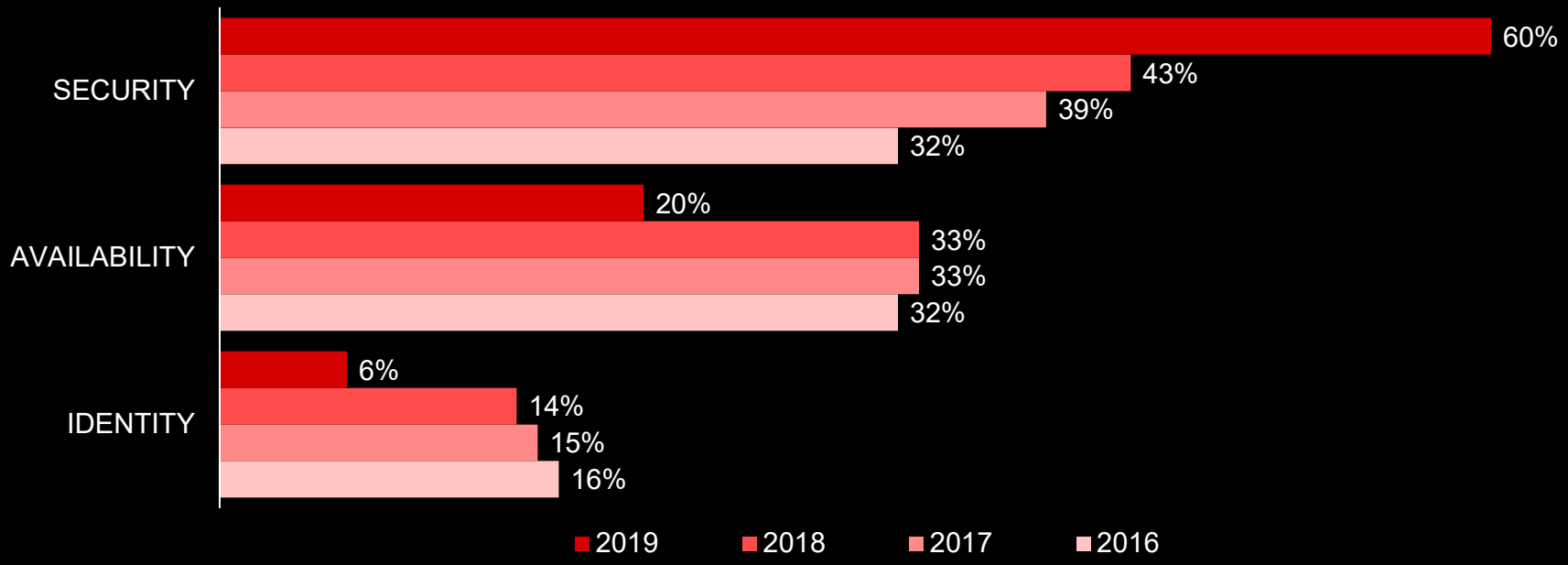
SSL orchestration

Web fraud protection

Application performance management

Application Security recognized as the most important application services

Q. The worst thing I could do is deploy an application without _____!" Select one.
N = 871



Source: 2018 F5 State of Application Services report

To navigate these challenges, every organization should develop an Enterprise Application Strategy

What is an Enterprise Application Strategy?

- A policy designed to directly enhance, speed-up, and protect the organization's digital capabilities as they relate to delivering against the mission
- Addresses how applications in the enterprise portfolio are built/acquired, deployed, managed, and secured

Step 1: Build an application inventory

Catalog of all applications and digital services, whether delivered internally, laterally (e.g., to other government entities), or externally (e.g., to the public), that includes:

- **A description** of the function the application performs
- **The origin** of the application (e.g., packaged SW, 3rd-party service, custom)
- **The data elements** the application requires access to or manipulates
- **Other services** the application communicates with
- **Open Source and other third-party components** that are part of the app
- **The individual(s) or group(s) accountable** for the application

Step 2: Assess cyber-risk for each application

4 primary types of risk:

- **Leakage of sensitive internal information (e.g., military secrets)**
- **Leakage of sensitive user information (e.g., personnel records, tax history)**
- **Tampering of data or applications**
- **Denial of service to data or applications**

Step 3: Identify the application services needed

Application services needed will vary depending on the application

Q. For each of the application services below, please indicate your company's current deployment status
N = 1,851

> 50% EXTERNAL-FACING APPS		< 50% EXTERNAL-FACING APPS	
Network firewall	78%	**Network firewall**	84%
Anti-virus	78%	**Anti-virus**	84%
Load balancing	**75%**	**SSL VPN**	78%
SSL VPN	74%	**IPS/IDS**	73%
DNS	**69%**	**SPAM mitigation**	73%

Source: 2018 F5 State of Application Services report

Step 4: Define app categories & assign min application service requirements for each

Tier 1: *Mission Critical Digital Services that collect and transform sensitive data*
Load balancing, global server load balancing, web application firewall, DDoS protection / prevention, bot detection, SSL encrypt and decrypt, user identity and access management, application / service identity and authentication, application visibility / monitoring

Tier 2: *Mission Critical Digital Services that provide access to sensitive data*
Load balancing, global server load balancing, web application firewall, DDoS protection / prevention, bot detection, SSL encrypt and decrypt, user identity and access management, application / service identity and authentication, application visibility / monitoring

Tier 3: *Mission Critical Digital Services that do not collect or provide access to sensitive data*
Load balancing, global server load balancing, DDoS protection / prevention, application visibility / monitoring

Tier 4: *All Other Digital Services*
Load balancing, application visibility / monitoring

Step 5: Define parameters for application deployment and management

Key questions to address:

- **Which deployment architecture(s) are supported (e.g., hybrid-cloud, multi-cloud)**
- **Acceptable deployment model options for each of the application categories**
- **Which public clouds can serve as access points for applications**
- **To what extent public cloud native services can be leveraged versus third-party**

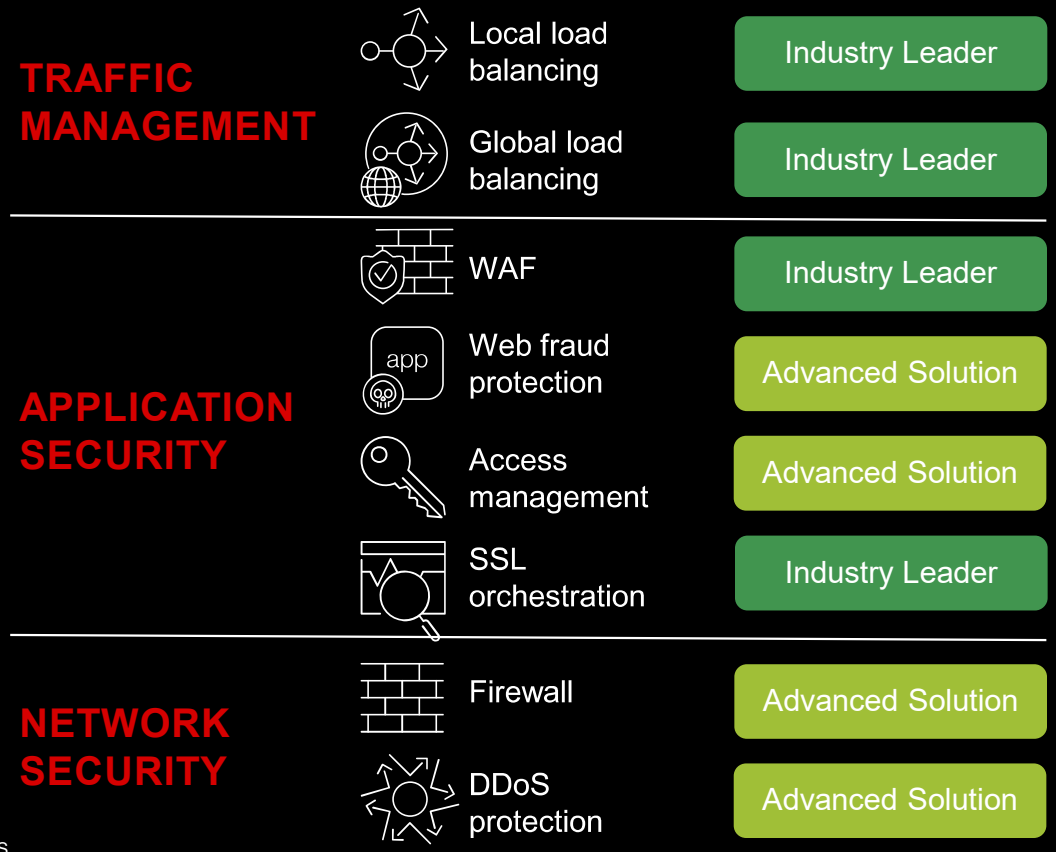
Step 6: Clarify roles and responsibilities

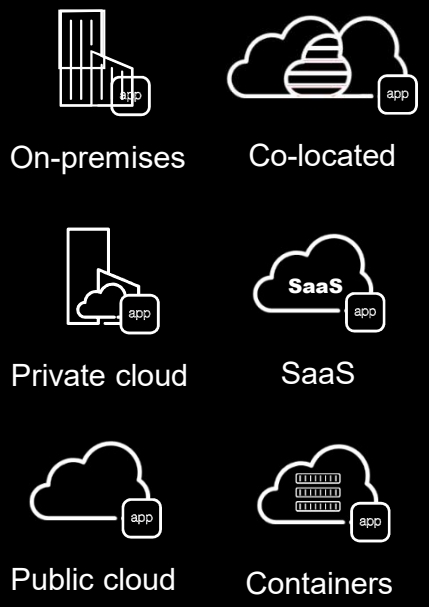
Key questions to address:

- Who has decision rights around optimizing and securing the application portfolio (e.g., tech selection, application disposition, user access assignment)?
- Who will be responsible for deployment, operations, and upkeep of each application in the various environments?
- Who has Privileged User Access to each application?
- Who in the organization is responsible for compliance with the Enterprise Application Policy?
- Who is going to monitor for compliance to the Enterprise Application Strategy goals? And who will they report metrics to?
- Who is going to monitor vendors (including Open Source and third-party component / service providers) for compliance?
- Who is going to ensure all applications and application services are accounted for (as applications and services will keep changing and being added/removed)?

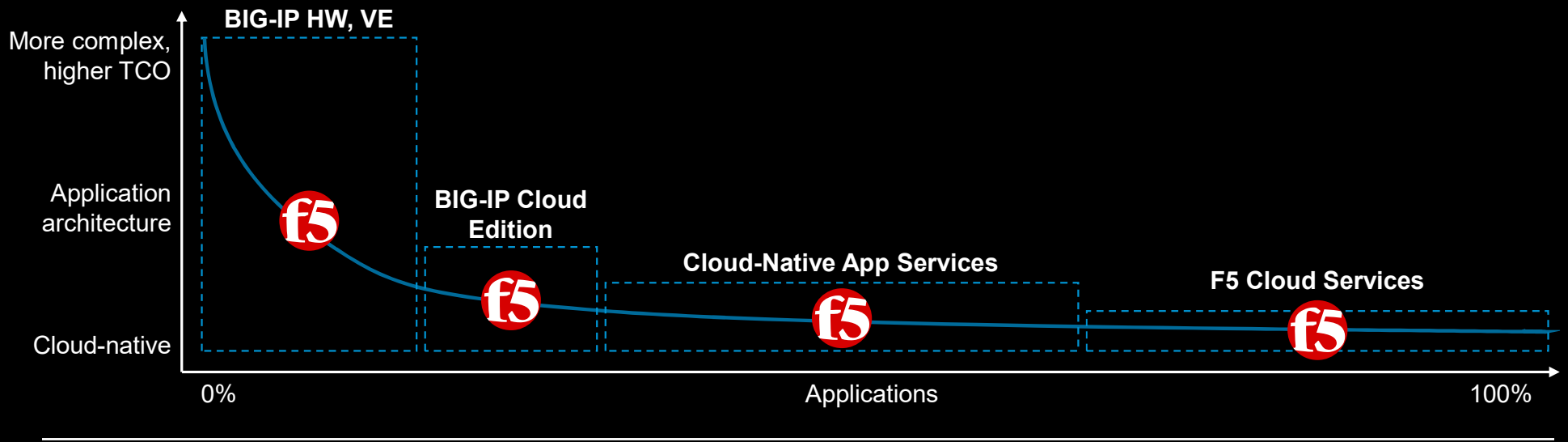
Only F5 has the technology, capabilities, and expertise to deliver against your Enterprise Application Strategy

Only F5 has the broadest and deepest portfolio of application services





Only F5 has Application Service platforms to reach every app, anywhere



# of application workloads, millions	2017	2022
BIG-IP HW, VE	33 M	44 M
BIG-IP Cloud Edition	36 M	198 M
Cloud-Native App Services, F5 Cloud Services	191 M	1,452 M

Only F5 supports flexible consumption and truly multi-cloud deployment options

FLEXIBLE CONSUMPTION	Perpetual Subscription/term Utility Try before buy
MULTI-CLOUD DEPLOYMENT	Hardware systems for high performance needs Software, on-prem and in public cloud — AWS, Azure, GCP, vSphere, KVM As-a-service Managed services

Only F5 boasts a world-class customer support capability with 20 years of experience

Support

Provide post-installation remote assistance and support for F5 software or hardware

Knowledge services

Drive training, certification, knowledge and diagnostic tools that help effectively utilize F5 technology

Professional services

Deliver consulting activities and services to ensure a highly available, scalable, secure, and agile infrastructure

- **Transactional customer satisfaction @ 9.6/10**
- **1000+ employees in 11 sites around the globe**
- **Extensive language coverage**
- **ISO Compliance 9001:2015**
- **260,000 units under contract**
- **32,000 SRs (cases) resolved per quarter**
- **2,500 SOs (RMAs) processed per quarter**
- **195 parts depots around the globe**
- **300K+ members in the Dev Central community**
- **Broad partner ecosystem via Guardian**

Thank You