F5 SLEDFest 2022

BIG-IP Next
VELOS & rSeries Platforms

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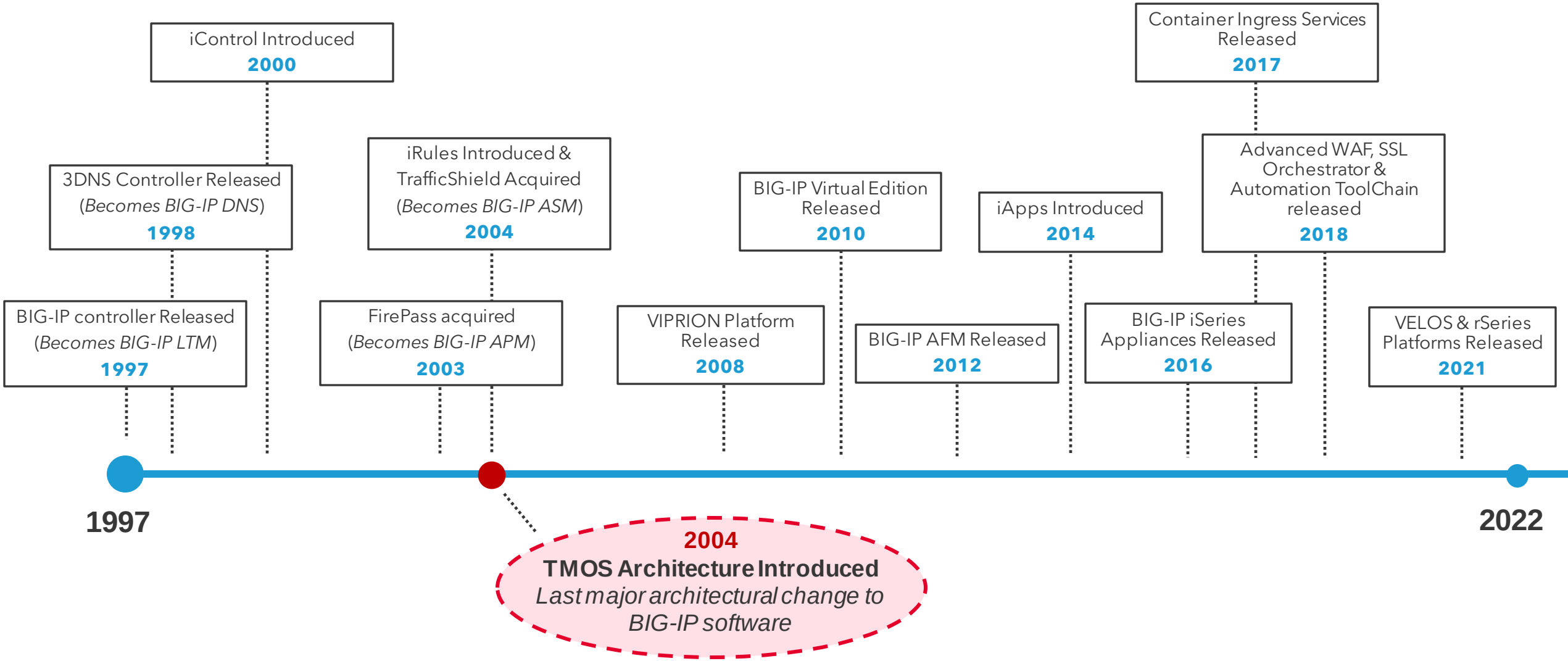
Session Agenda

- Current application landscape & evolving requirements of ADC's
- Overview of the next generation software architecture and design
- Key capabilities and the value the software will deliver
- Overview of the BIG-IP Next and it's hardware platforms: rSeries & VELOS

Adaptive Apps

Adaptive Applications bring **intelligence and real-time changes** to the world of application deployments, which today are mostly static and manual

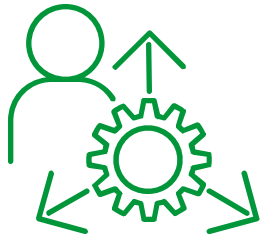
BIG-IP TMOS – The most trusted ADC for the last 25 years



The application landscape is transforming

The future remains cloudy

- 87% of customers are adopting multi-cloud[1]
- On average 2.6 public clouds and 2.7 private clouds in use[2]
- 58% state ensuring security & compliance is the #1 challenge[1]



Automation & DevOps rise

- 83% of orgs are now implementing DevOps processes and tools[3]
- 73% of organizations are automating network operations to boost efficiency[1]
- 25% of developers & DevOps teams solely responsible for app operations[1]

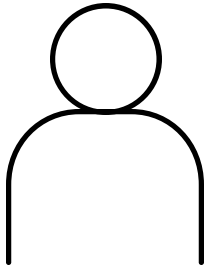
Technology is changing

- 75% of organizations are modernizing applications[1]
- Containers will become the default choice for 75% of customer enterprise apps before 2024
- 83% of Internet traffic is now APIs, only 17% is HTML[5]

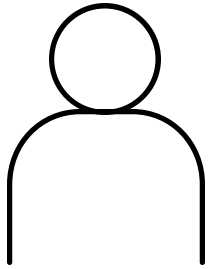
[1] F5 State of Application Services Report 2020
[2] Flexera State of the Cloud Report 2021
[3] State of DevOps Report 2021
[4] Gartner Forecast Analysis: container management
[5] Akamai State of the Internet Report 2019

Requirements of ADC's are continuously evolving

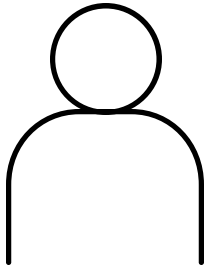
App Environments becoming much larger and complicated, spanning 100's/1000's of apps and requiring high level of orchestration



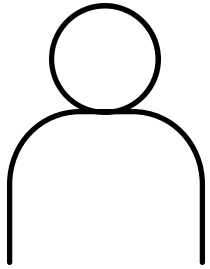
Traditional ADC solutions don't meet the requirements of modern DevOps practitioners – slowing deployment speeds and causing inter-team friction



Multi-cloud expansion results in service/tool inconsistency, increased management overhead, security gaps and a lack of visibility



Constantly evolving cyberthreats require advanced security solutions that can be updated quickly and on a regular basis to stop emerging threats

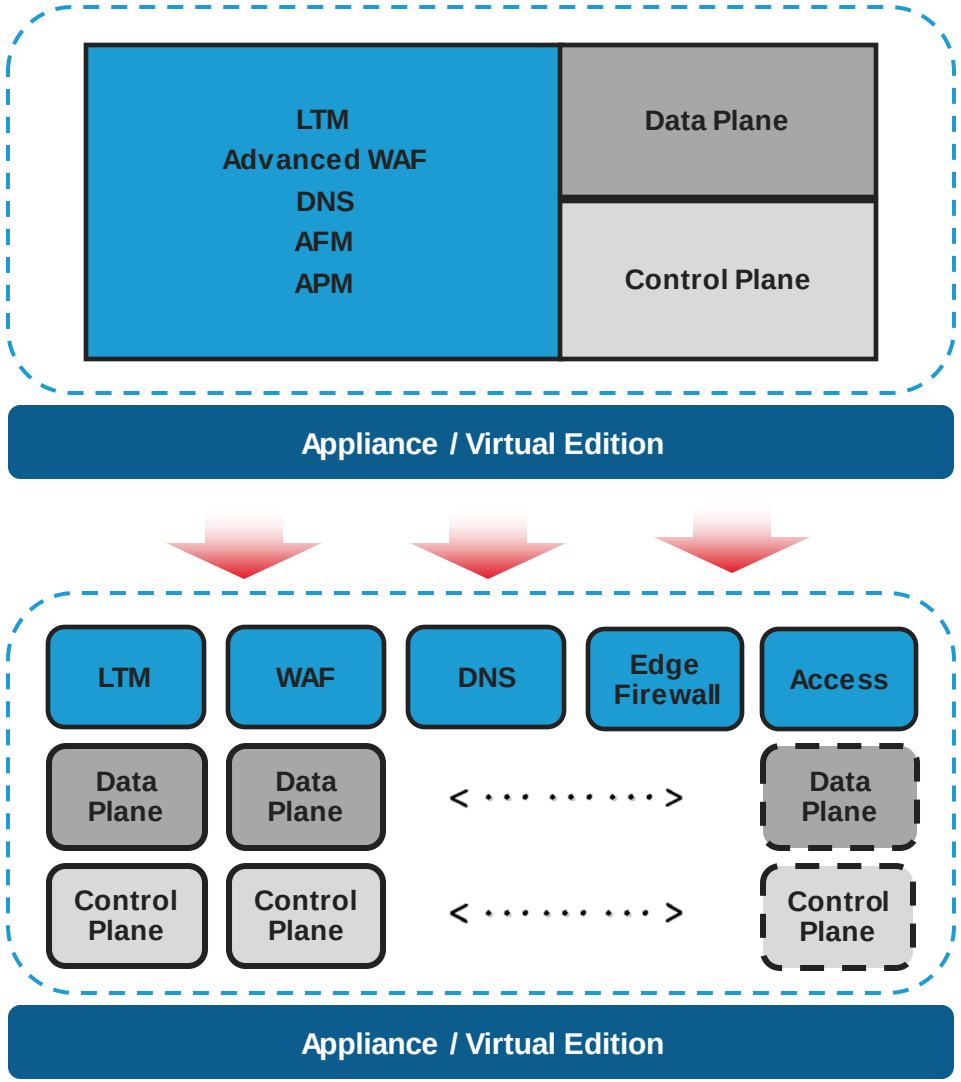


The time has come for the next generation of BIG-IP software…

BIG-IP Next

BIG-IP Next - F5's Next Generation BIG-IP Software

- Modernized core using interconnected, containerized services
- Individually deployable BIG-IP product modules
- Declarative & app-centric, API-first framework
- Rearchitected, high performance control plane
- Fully integrated automation and telemetry tooling



BIG-IP TMOS

(Monolithic)

BIG-IP Next

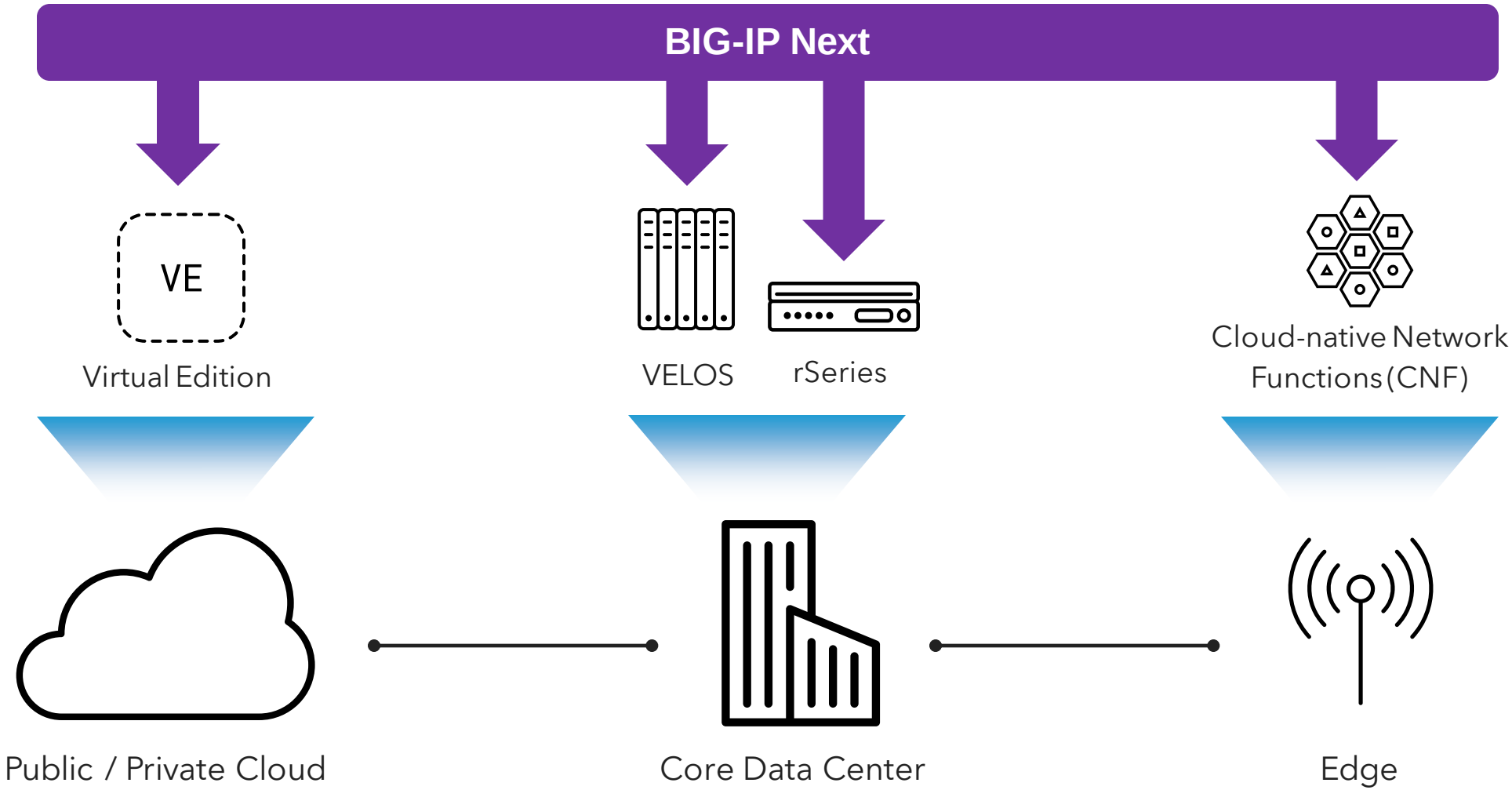
(Container-based)

All the value of BIG-IP TMOS carried forward

1. **Product Modules*:** All existing BIG-IP modules carried forward: LTM, DNS, Access (APM**), WAF (Advanced WAF**), Edge Firewall (AFM**), SSL Orchestrator, Policy Enforcer (PEM**) & CGNAT
2. **Platform Flexibility:** On-premises, cloud and edge deployment options, including VELOS, rSeries, Virtual Edition and Cloud-native Network Functions
3. **Automation Suite:** Fully integrated AS3 & FAST templates empower declarative L4-L7 services configuration, while device instantiation will be possible via an API similar to Declarative Onboarding (DO)
4. **Container Ingress Services:** Advanced application services for containerized apps, leveraging integrations with container orchestration systems including Kubernetes and OpenShift
5. **Telemetry Streaming:** Stream application & BIG-IP health & usage data in real-time to 3rd party visualization and analytics tools with streaming capabilities built-upon OpenTelemetry
6. **iRules*:** Obtain complete control over L4-L7 traffic flows by programmatically manipulating the data plane - iRules will be mostly compatible across both BIG-IP TMOS and BIG-IP Next
7. **Flexible Licensing:** Variety of licensing options including subscriptions, pay-as-you-go and flexible consumption program (formerly Enterprise Licensing Agreement) to align to your organizations purchasing preferences

* May not offer complete feature parity
** Formerly known as

Built for distributed app portfolios



Management of BIG-IP Next

Instance Manager (On-Box UI)

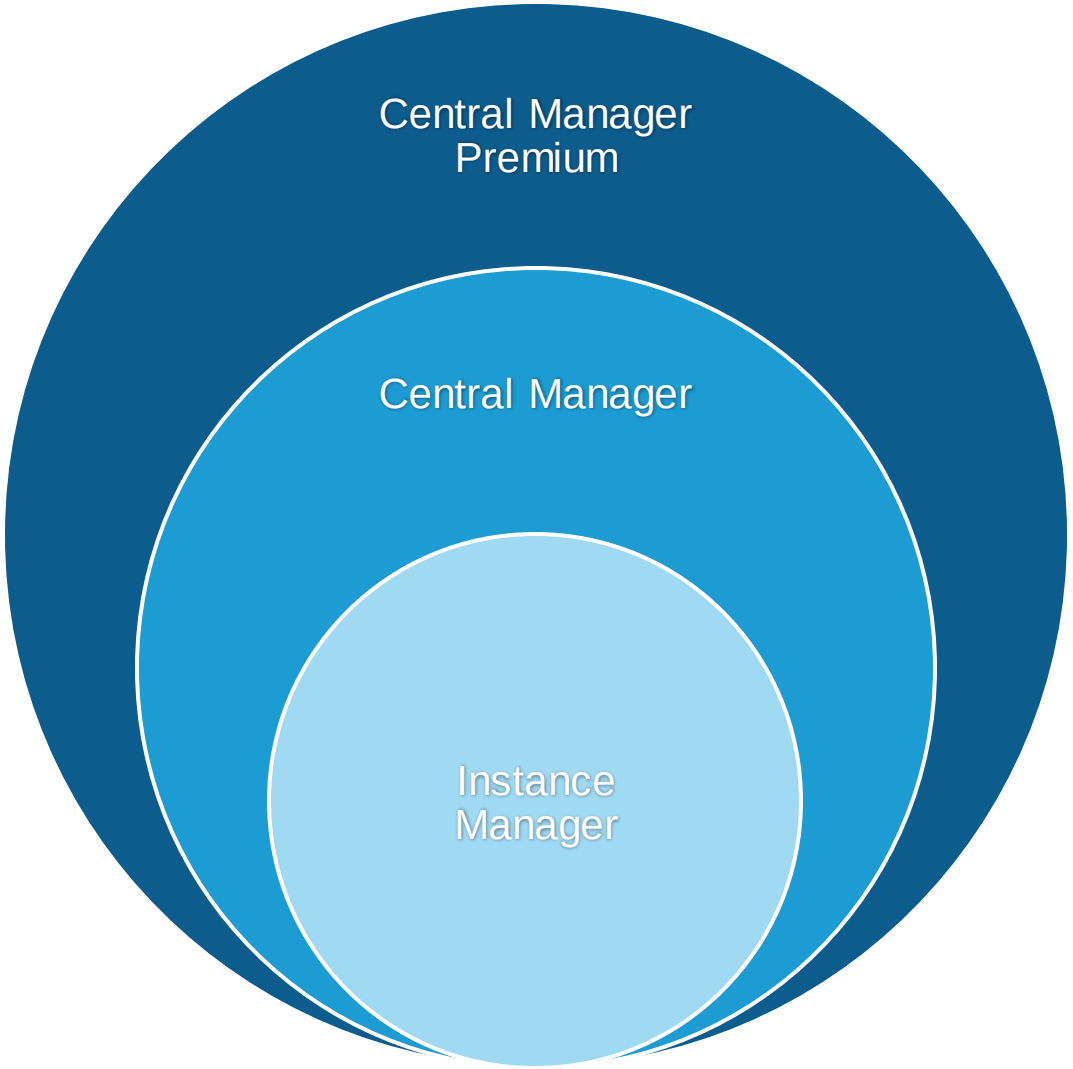
- Packaged with every Next-Gen BIG-IP instance.
- Capabilities reduced to a minimal set of workflows to get the BIG-IP Next instance up and running.
- On Box UI can only bring up a single BIG-IP Next instance

Central Manager

- Easily deployable central management solution with light footprint.
- Available as a Virtual Edition
- No added cost

Central Manager Premium

- Offers rich workflow management, deep visibility and analytics, and 3rd party integrations.



High automatability for accelerated time to value

ACCELERATING DEPLOYMENTS & CONFIGURATION CHANGES WITHIN THE MOST DYNAMIC APP ENVIRONMENTS

	BIG-IP TMOS	BIG-IP NEXT	BENEFITS
API Design	Imperative (iControl) & Declarative (AS3) API's	Declarative API (AS3)	*Simplified orchestration, empowering users to declare end-state configurations without defining individual steps needed to get there. Significantly reduces number of operations and F5 domain knowledge needed to complete tasks*
API Efficiency	Tens of operations / sec	Hundreds of operations / sec	*Prevent control plane overload and ensure configurations are updated in real-time in even the most dynamic environments.*
Task Concurrency	Non-concurrent	Concurrent (atomic operation)	*No need to serialize tasks – multi-threading enables numerous tasks from multiple disparate orchestrators to be performed simultaneously. Benefits multi-tenancy deployments and highly dynamic & automated environments.*
Automation Tool Compatibility	Integration with most leading orchestration & automation tools	Integration with most leading orchestration & automation tools	*BIG-IP Next's declarative API (AS3) can be used by operations teams, DevOps teams or developers to automate deployment/configuration of app services via leading automation/orchestration tools.*

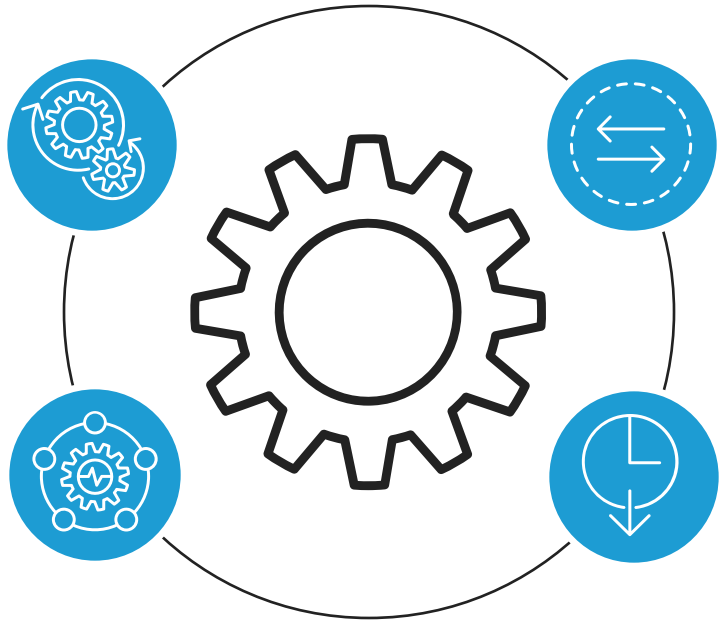
Reduced Operational Complexity

Fully-Integrated Automation & Telemetry Suite

AS3, FAST, automated device instantiation & telemetry streaming (OpenTelemetry) built-in to all instances

Comprehensive Fleet Management via CM

Perform majority of management & configuration tasks from BIG-IP for Distributed Cloud Central Manager



Optimized Cluster Management

Simplify cluster management by controlling both instances via a single management interface

Accelerated & Hitless Upgrades

Fast, simplified upgrade process without the need for application downtime

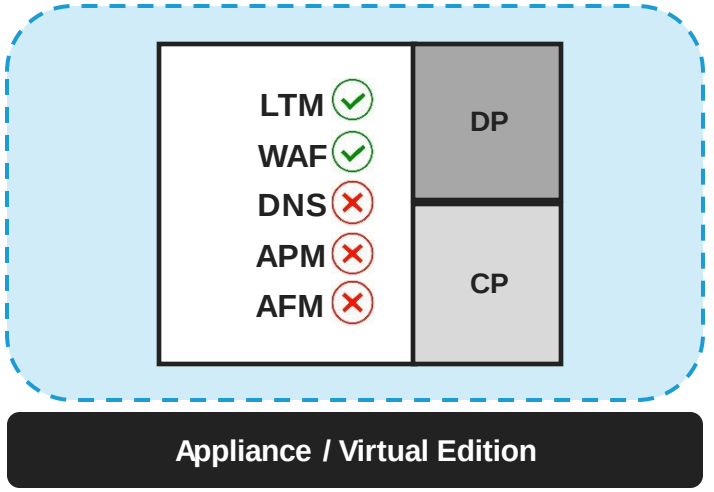
Elevated Control Plane Scale & Performance

BUILT TO SUPPORT THE MOST RESOURCE INTENSIVE APP CONFIGURATIONS

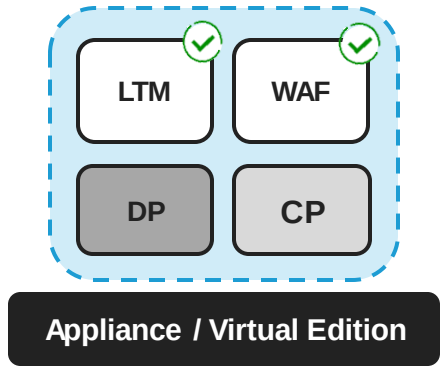
1. Manage **many more configuration objects** with a single instance of the Next-Gen BIG-IP
2. Allocate **dedicated compute resources** to support the BIG-IP Next control plane as environment demands change

Lower cloud operational costs through instance optimization

- Right-size instances by deploying only the modules required – shrinking cloud footprint
- Smaller image sizes enables faster spin-up times to accelerate time to value
- Instances are optimized to reduce resource consumption (RAM, CPU etc.) to cut infrastructure costs



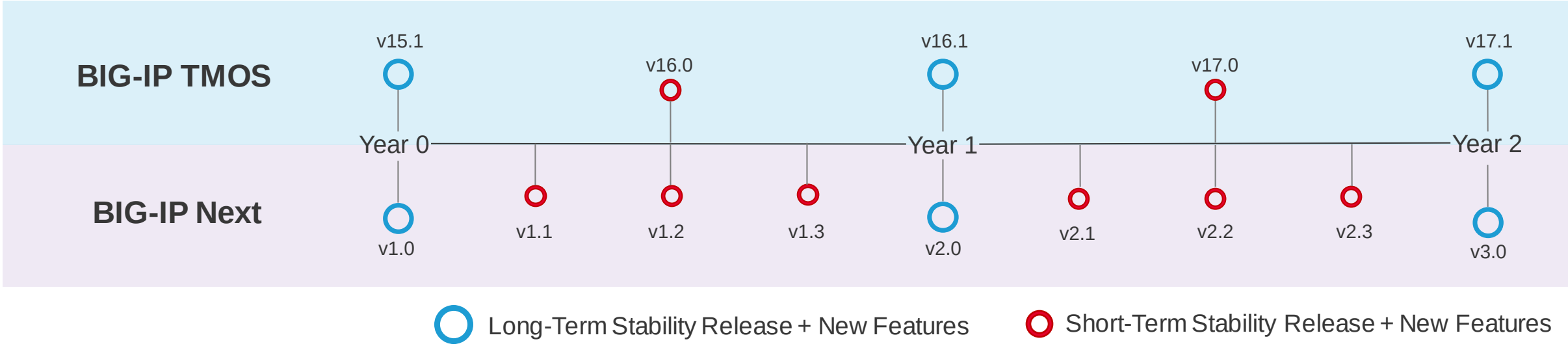
BIG-IP TMOS
Monolithic Instance



BIG-IP Next
Optimized Instance

CP = Control Plane
DP = Data Plane

Accelerated Feature Delivery & Improved Release Quality



- Incremental app delivery & security features delivered **4 x per year** within 1 LTS release and 3 STS releases
- Implement the most **cutting-edge security posture** by upgrading to protect against newly detected threat vectors
- All releases developed following an optimized CI/CD development process with a security-first mandate, ensuring **frequent, high quality & secure releases**

rSeries - Next Generation Appliance

Next Generation Appliance: rSeries

Previous generation

- Traditional BIG-IP platforms
- Limited Programmable FPGA

BIG-IP iSeries

- Programmable FPGA (TurboFlex)
- Improved optics and port configurations
- Around 2x scale over previous generation
- Runs current gen of BIG-IP software

rSeries

- **Rearchitected with new delayered F5OS platform software**
- **Runs current BIG-IP (future: new BIG-IP modular)**
- **Larger, modern FPGAs**
- **Further improved optics and port configurations**
- **Up to 2x performance improvement vs. iSeries**

rSeries platform– rSeries 5k/10k and rSeries 2k/4k

iSeries to rSeries Transition

- No projected End of Sale (EoS) date.
- Our typical EoS policy is to provide a one-year notice for EoS of hardware platforms
- EoSD will be 3 years from EoS
- There is still a long lifecycle for customers who want to buy iSeries HW.
- First customer ship was 2016-2018 (depending on model)
- Previous HW platforms, average time from first customer ship to EoS is 6-7 years
- Last Classic BIG-IP version for iSeries projected to be v17.1
- rSeries will be replacement for iSeries

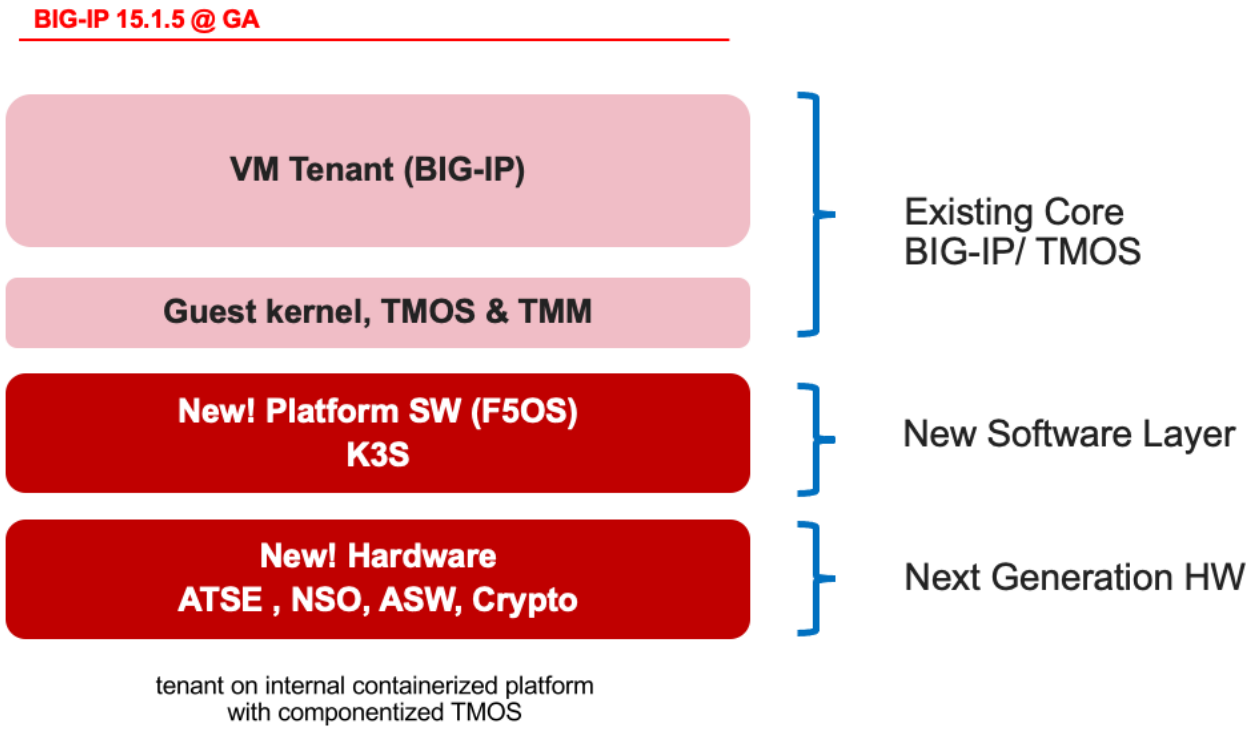
rSeries Improvements Over iSeries

DESIGNED FOR A NEW APPLICATION LANDSCAPE

iSeries	rSeries	rSeries Advantage
Hardware	Larger FPGAs / 1RU Form Factor	2x enhanced performance
SSL	Modern SSL offload hardware	Up to 200k SSL TPS
Software	New microservices layer (F5OS)	Supports modern architecture
Automation	API-first design	Deployment: weeks to minutes
Licensing	Pay-as-you-Grow licensing	Higher performance as needed
Architecture	Runs current & next-gen BIG-IP	Easy migration path

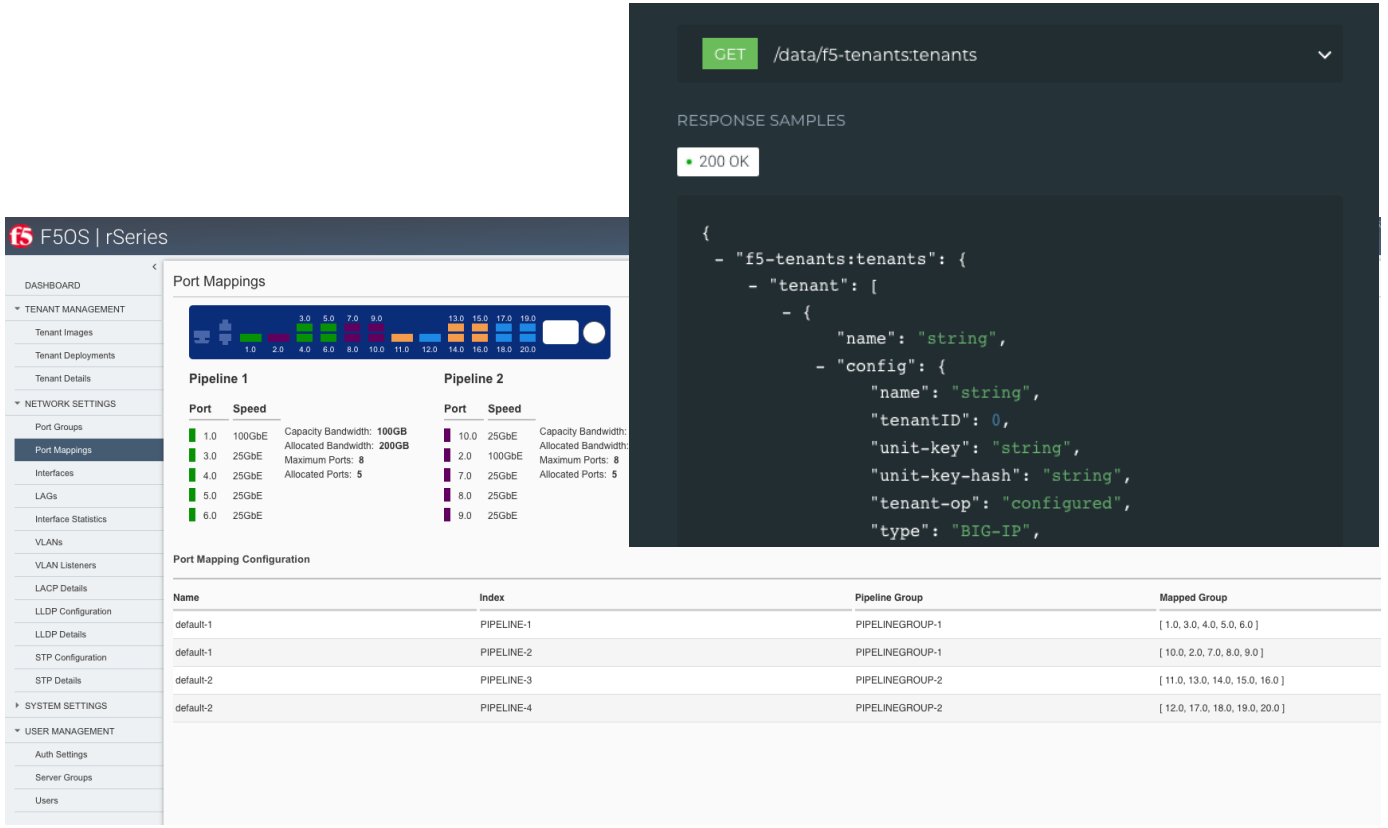
More Than Just a Hardware Refresh

- Leverages microservices architecture to break beyond constraints of TMOS
  - Common F5OS architecture layer with VELOS
  - Kubernetes manages workloads, but is abstracted from the admin, no microservices knowledge required to manage rSeries
- Multitenant by default architecture
- API First design – Full automation @ the F5OS layer
- Lays the foundation for next generation BIG-IP software: BIG-IP Next



F5OS Management

- New F5OS platform layer can be managed via CLI, API, or GUI
- Intuitive GUI, CLI & API provides initial platform setup, monitoring, and tenant lifecycle
- TMOS Tenants are still managed as they are on existing platforms
  - Similar to a vCMP guest management experience

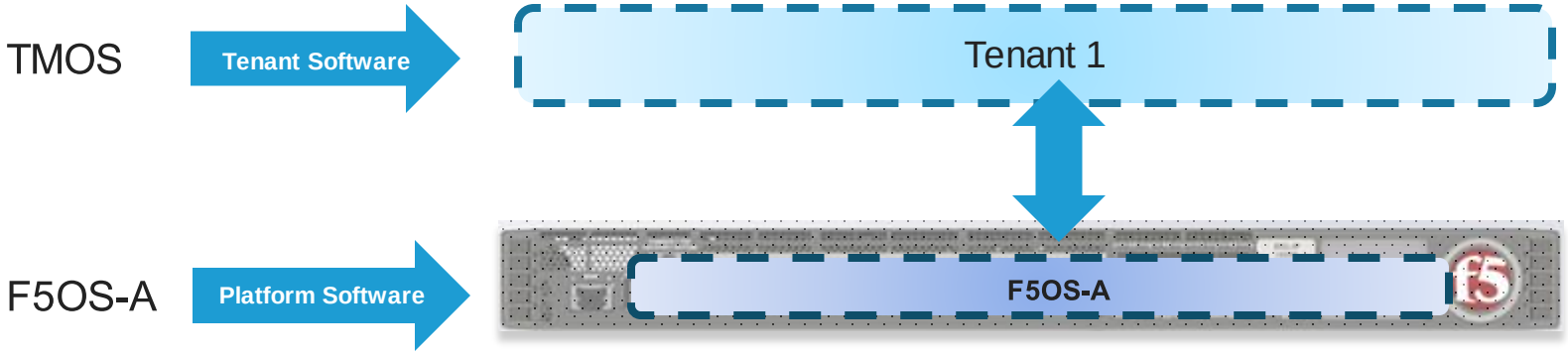



```
Boston-r10900-1# show running-config
cluster disk-usage-threshold config warning-limit 85
cluster disk-usage-threshold config error-limit 90
cluster disk-usage-threshold config critical-limit 97
cluster disk-usage-threshold config growth-rate-limit 10
cluster disk-usage-threshold config interval 60
cluster nodes node node-1
 config name node-1
 config enabled
!
fdb mac-table entries entry 00:94:a1:69:59:27 500 tag_type_vid
 config mac-address 00:94:a1:69:59:27
```

r2000 Series

r2000 Series (r2600) Platform Specs

Runs F5OS-A R2R4 Image



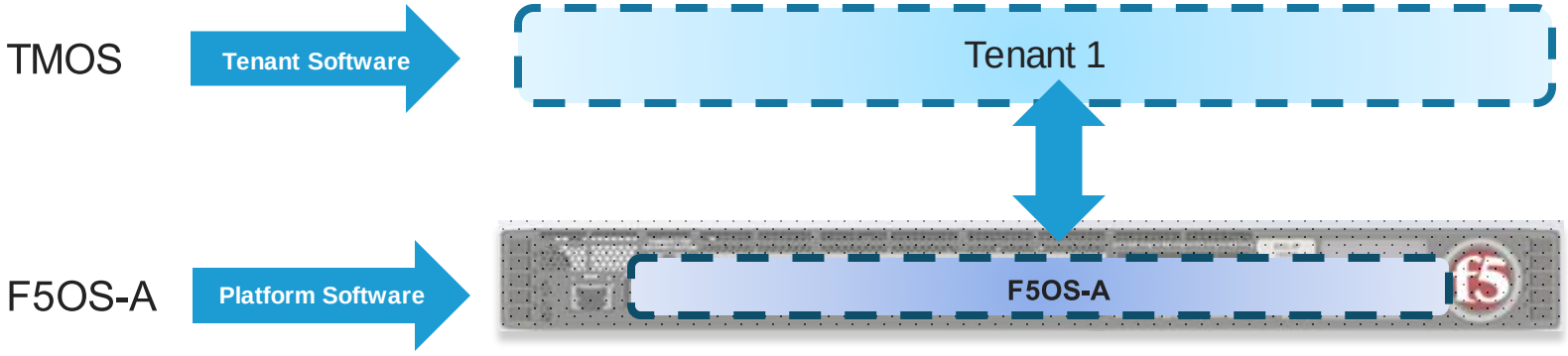
- Total CPU Cores - 8
- Total vCPU's – No Hyperthreading
- CPU Speed – 2.2Ghz
- Disabled CPU's (Licensing) - 4
- vCPU's Available for Tenants – 4 CPU
- Total Memory – 32GB RAM
- Disk Type/Capacity – 480GB SSD
- Max Tenants - 1

Ships with support for TMOS 15.1.6 Tenants only

No CPU's reserved for F5OS platform layer

r2000 Series (r2800) Platform Specs

Runs F5OS-A R2R4 Image



- Total CPU Cores - 8
- Total vCPU's – No Hyperthreading
- CPU Speed – 2.2Ghz
- vCPU's Available for Tenants – 8 CPU
- Total Memory – 32GB RAM
- Disk Type/Capacity – 480GB SSD
- Max Tenants - 1

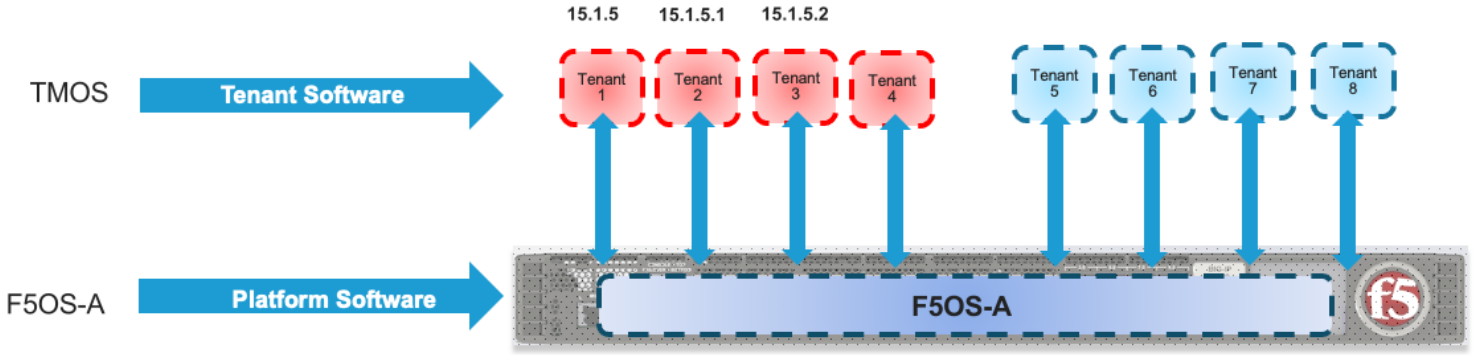
Ships with support for TMOS 15.1.6 Tenants only

No CPU's reserved for F5OS platform layer

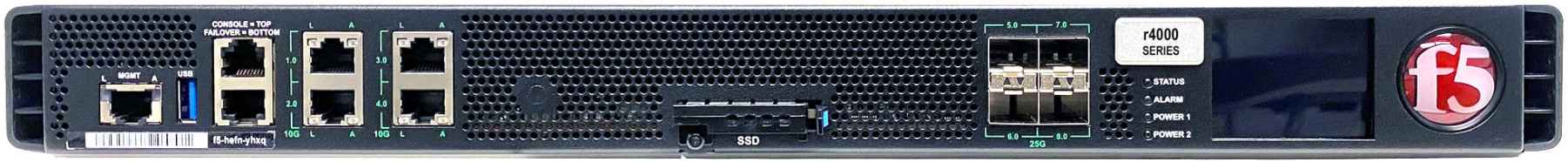
r4000 Series

r4000 Series (r4600) Platform Specs

Runs F5OS-A R2R4 Image



- Total CPU Cores - 16
- Total vCPU's – No Hyperthreading
- CPU Speed – 2.2Ghz
- Disabled CPU's (Licensing) - 8
- vCPU's Available for Tenants – 8 CPU
- Total Memory – 64GB RAM
- Disk Type/Capacity – 480GB SSD
- Max Tenants - 2

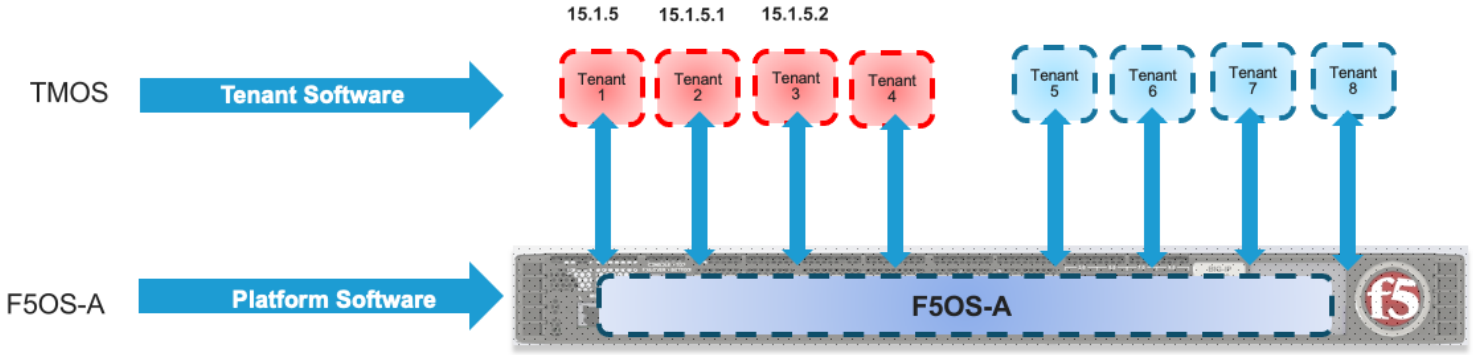


Ships with support for TMOS 15.1.6 Tenants only

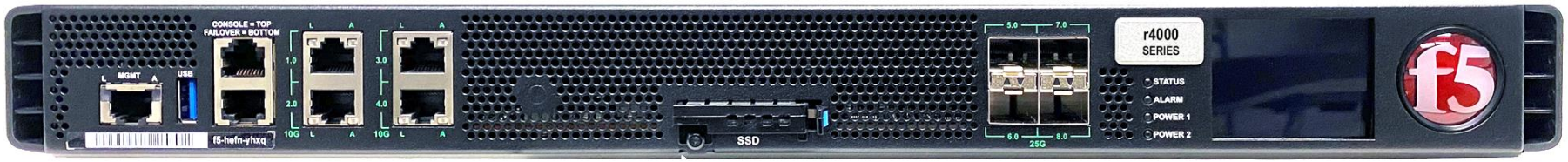
No CPU's reserved for F5OS platform layer

r4000 Series (r4800) Platform Specs

Runs F5OS-A R2R4 Image



- Total CPU Cores - 16
- Total vCPU's – No Hyperthreading
- CPU Speed – 2.2Ghz
- vCPU's Available for Tenants – 16 CPU
- Total Memory – 64GB RAM
- Disk Type/Capacity – 480GB SSD
- Max Tenants - 4



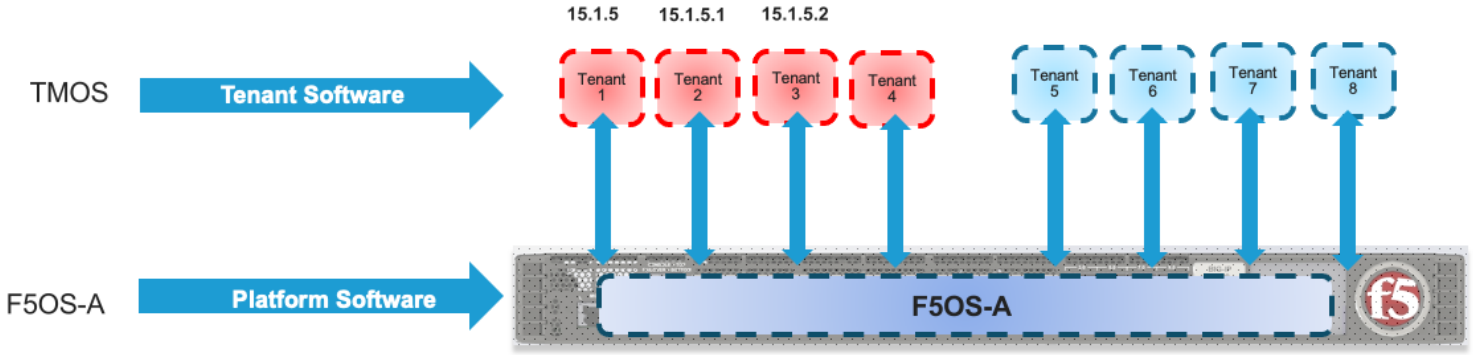
Ships with support for TMOS 15.1.6 Tenants only

No CPU's reserved for F5OS platform layer

r5000 Series

r5000 Series (r5600) Platform Specs

Runs F5OS-A R5R10 Image



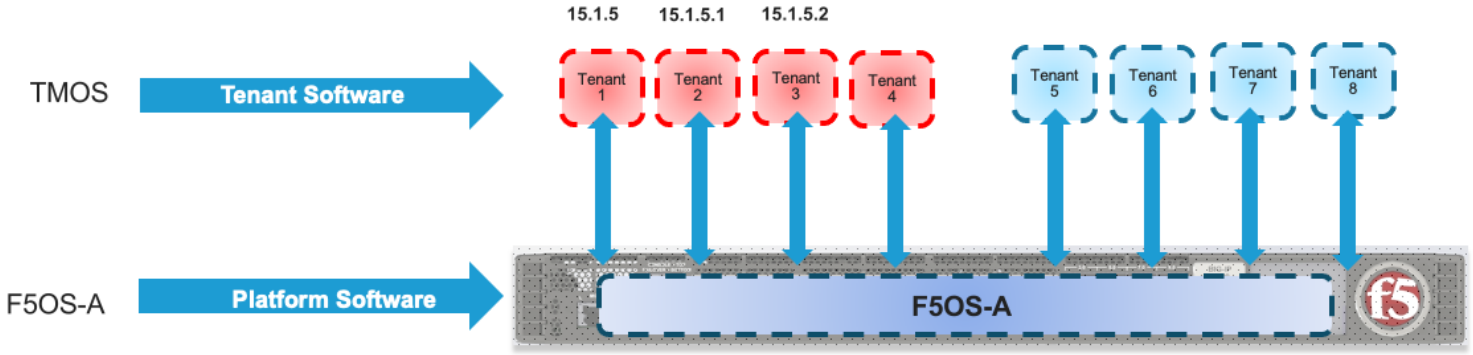
- Total CPU Cores / vCPU's – 16 / 32
- CPU Speed – 2.4 Ghz
- Disabled vCPU's (Licensing) – 14
- vCPU's for F5OS - 6
- vCPU's Available for Tenants - 12
- Total Memory – 128GB RAM
- Disk Type/Capacity – 1TB – M.2 SSD
- 1 Power Supply Included / 2nd Optional
- Max Tenants - 8

Ships with support for TMOS 15.1.5 Tenants only

6 x vCPU's reserved for F5OS platform layer

r5000 Series (r5800) Platform Specs

Runs F5OS-A R5R10 Image



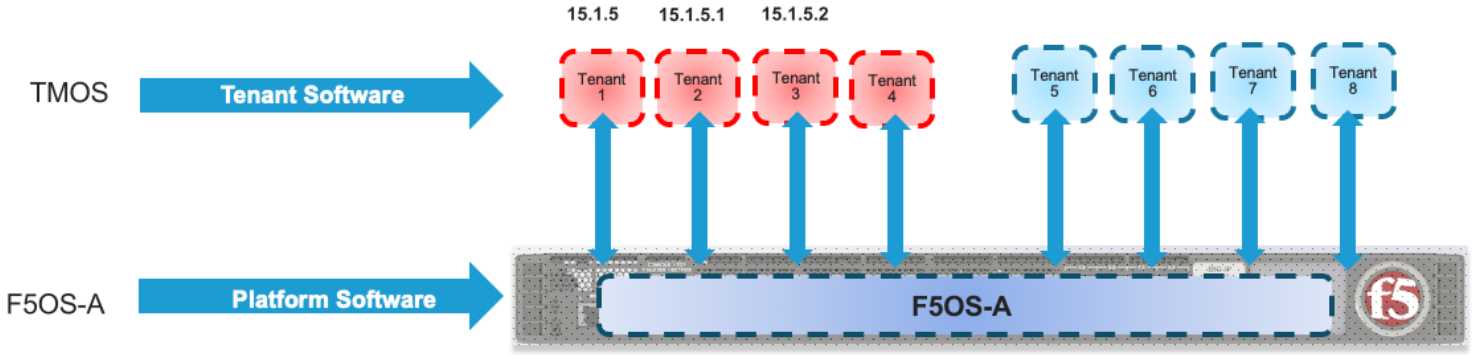
- Total CPU Cores / vCPU's – 16 / 32
- CPU Speed – 2.4 Ghz
- Disabled vCPU's (Licensing) – 8
- vCPU's for F5OS - 6
- vCPU's Available for Tenants - 18
- Total Memory – 128GB RAM
- Disk Type/Capacity – 1TB – M.2 SSD
- 1 Power Supply Included / 2nd Optional
- Max Tenants - 18

Ships with support for TMOS 15.1.5 Tenants only

6 x vCPU's reserved for F5OS platform layer

r5000 Series (r5900) Platform Specs

Runs F5OS-A R5R10 Image



- Total CPU Cores / vCPU's – 16 / 32
- CPU Speed – 2.4 Ghz
- vCPU's for F5OS - 6
- vCPU's Available for Tenants - 26
- Total Memory – 128GB RAM
- Disk Type/Capacity – 1TB – M.2 SSD
- 1 Power Supply Included / 2nd Optional
- Max Tenants - 26

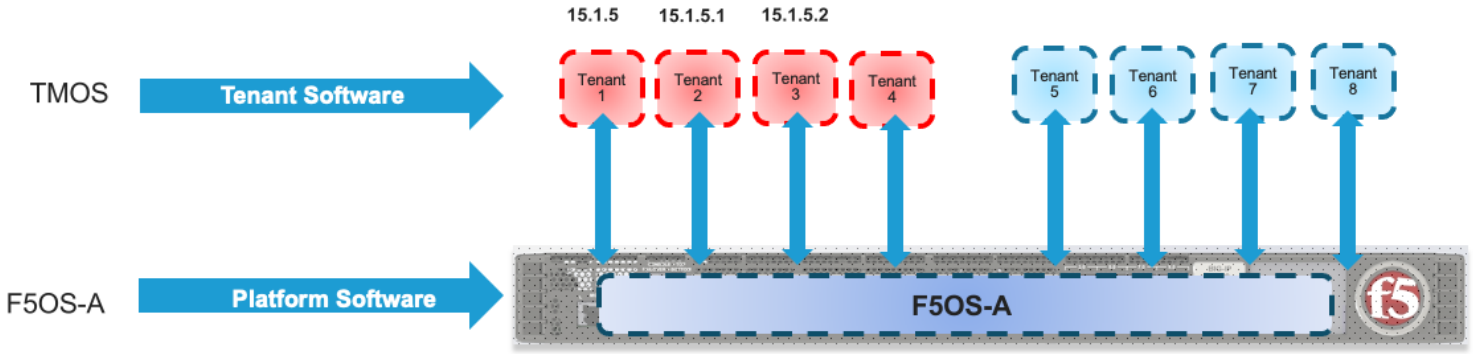
Ships with support for TMOS 15.1.5 Tenants only

6 x vCPU's reserved for F5OS platform layer

r10000 Series

r10000 Series (r10600) Platform Specs

Runs F5OS-A R5R10 Image



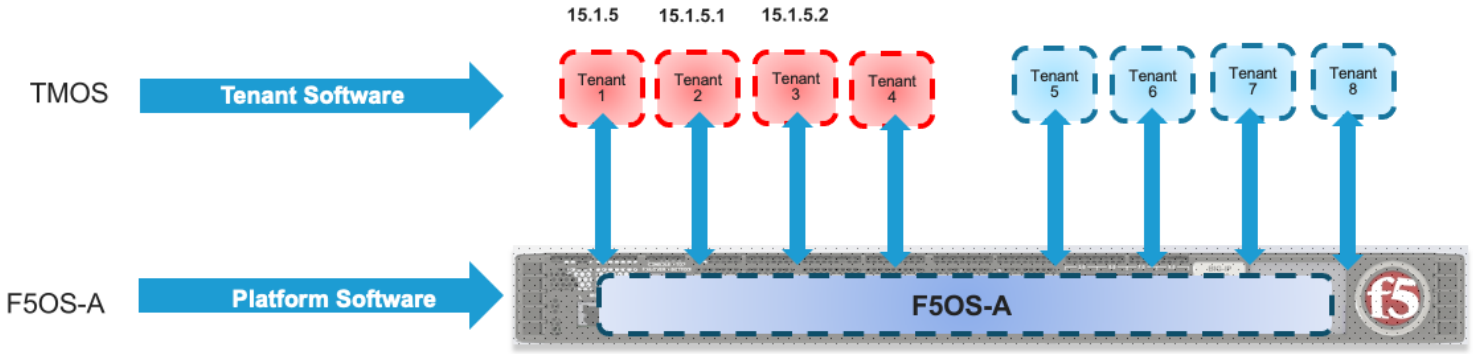
- Total CPU Cores / vCPU's – 24 / 48
- CPU Speed – 2.4Ghz
- Disabled vCPU's (Licensing) – 12
- vCPU's for F5OS - 12
- vCPU's Available for Tenants - 24
- Total Memory – 256GB RAM
- Disk Type/Capacity – 2 x 1TB U.2 SSD
  - RAID1 Mirrored
- 2 Power Supplies Included
- Max Tenants – 24

Ships with support for TMOS 15.1.5 Tenants only

12 x vCPU's reserved for F5OS platform layer

r10000 Series (r10800) Platform Specs

Runs F5OS-A R5R10 Image



- Total CPU Cores / vCPU's – 24 / 48
- CPU Speed – 2.4Ghz
- Disabled vCPU's (Licensing) – 8
- vCPU's for F5OS - 12
- vCPU's Available for Tenants - 28
- Total Memory – 256GB RAM
- Disk Type/Capacity – 2 x 1TB U.2 SSD
  - RAID1 Mirrored
- 2 Power Supplies Included
- Max Tenants – 28

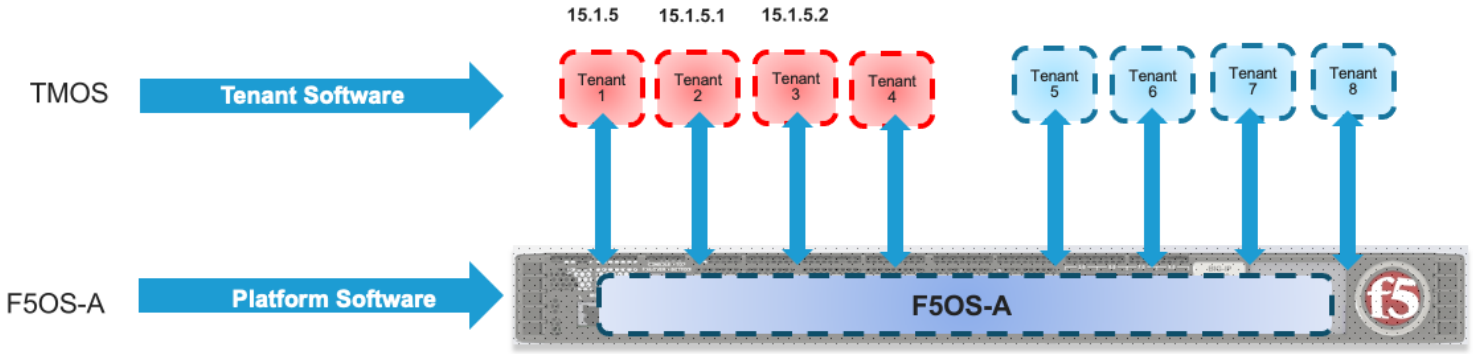
Ships with support for TMOS 15.1.5 Tenants only

12 x vCPU's reserved for F5OS platform layer

r10000 Series (r10900) Platform Specs

Available Now!

Runs F5OS-A R5R10 Image



- Total CPU Cores / vCPU's – 24 / 48
- CPU Speed – 2.4Ghz
- vCPU's for F5OS - 12
- vCPU's Available for Tenants - 36
- Total Memory – 256GB RAM
- Disk Type/Capacity – 2 x 1TB U.2 SSD
  - RAID1 Mirrored
- 2 Power Supplies Included
- Max Tenants – 36

Ships with support for TMOS 15.1.5 Tenants only

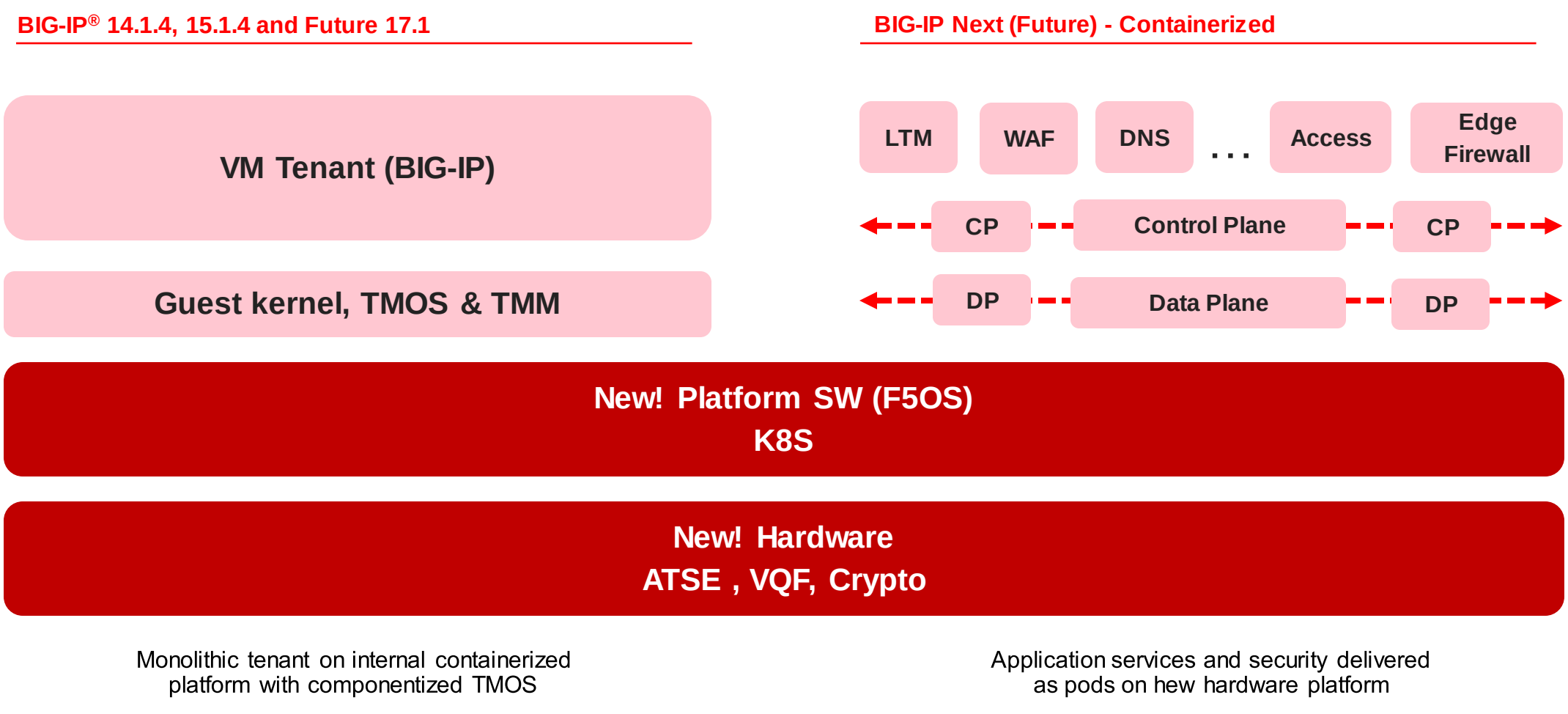
12 x vCPU's reserved for F5OS platform layer

VELOS - Next Generation Chassis

VIPRION to VELOS Transition

- End of sale announced for April 1st, 2023
- End of Software Development announced for April 1st, 2026
- First customer ship was anywhere from 2010 to 2014 (depending on model)
- Last classic BIG-IP version for VIPRION projected to be v17.1
- VELOS will be replacement for VIPRION

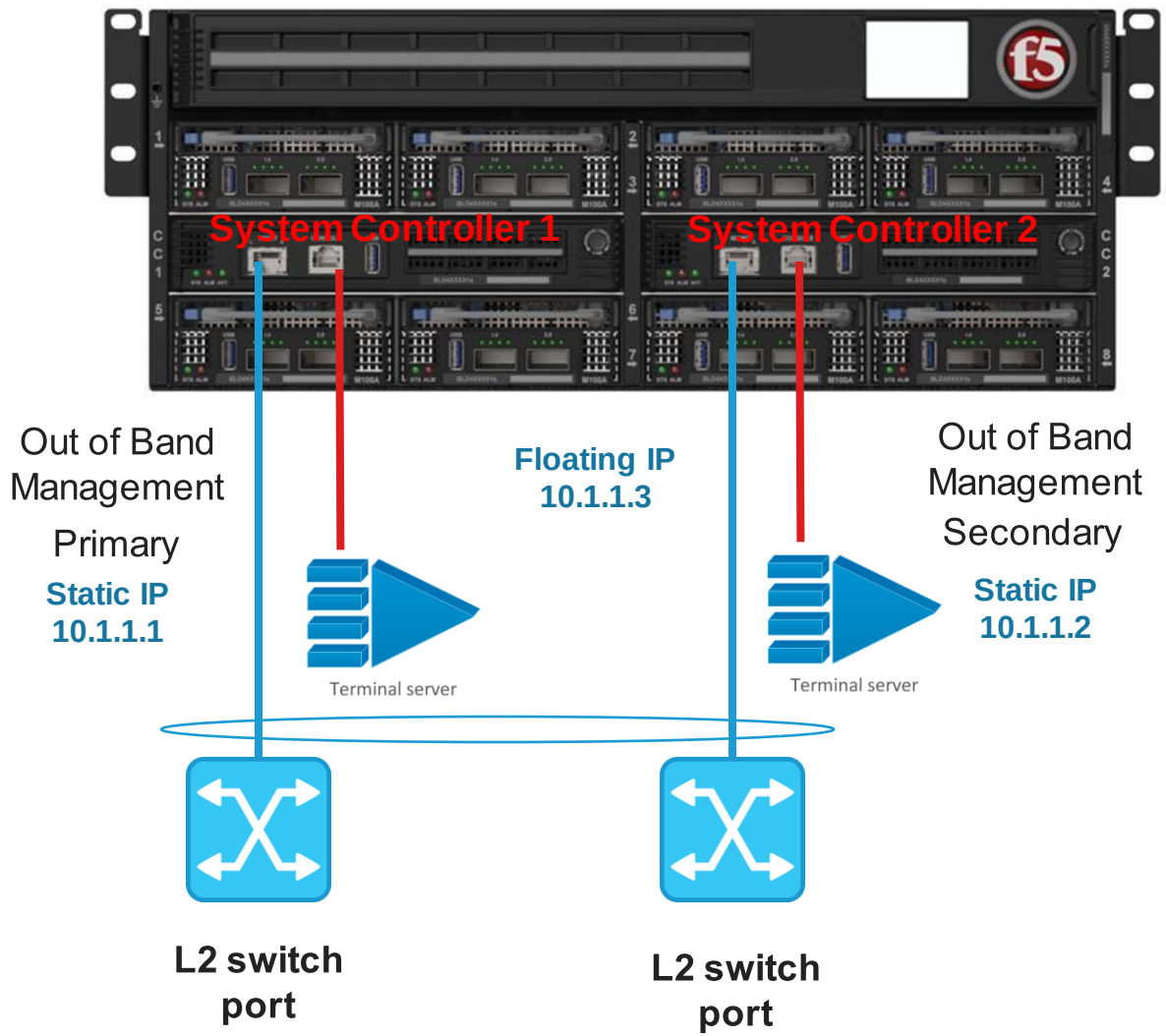
Providing Flexibility and Investment Protection



Existing BIG-IP and BIG-IP Next can run within same VELOS chassis

VELOS Consolidated Cabling via System Controller

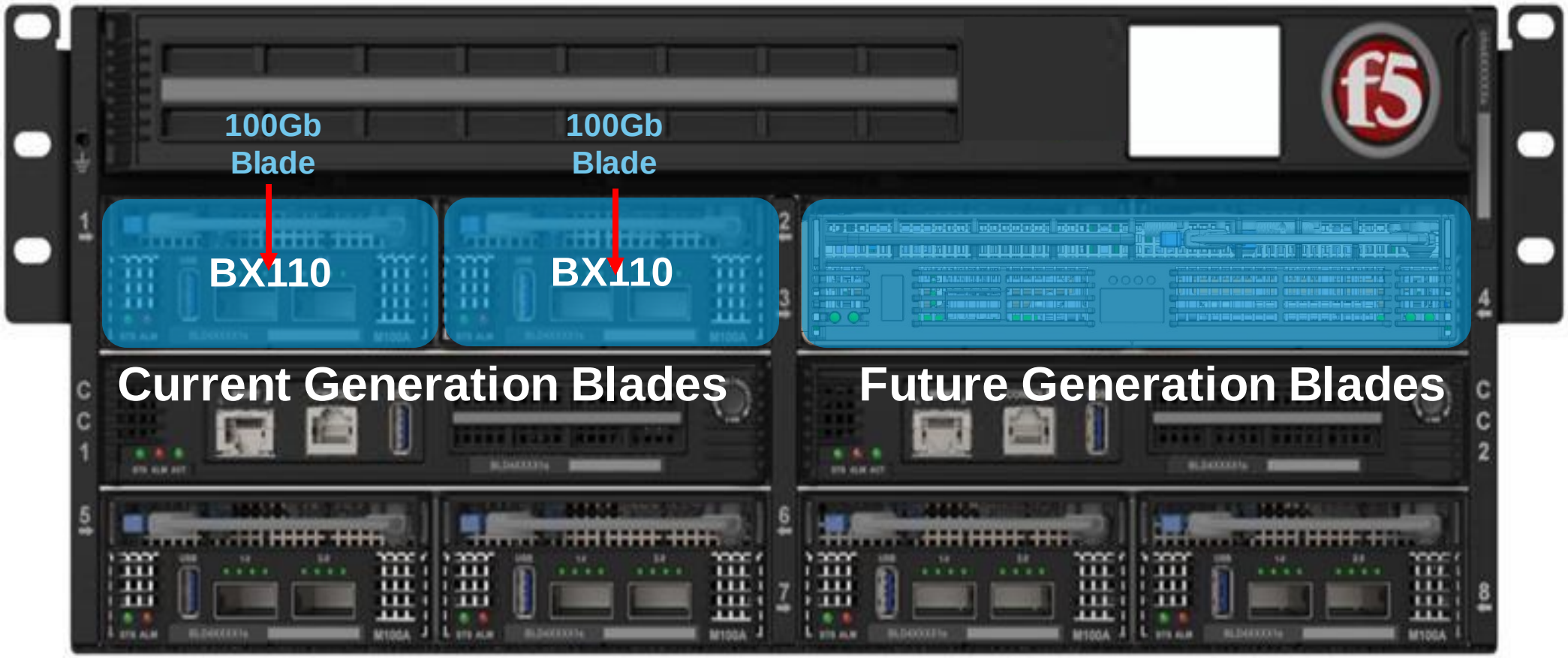
- In *VIPRION* each blade recommended to have their own console and out-of-band connections
- In *VELOS* all out-of-band and console connections are consolidated onto the two System Controllers
  - This simplifies and reduces the amount of cabling, Layer2 switch ports, and external terminal servers
  - Adding blades requires less cabling
  - Each System Controller has its own management IP address
  - A floating IP address will follow the primary



Can be put in a LAG for seamless failover

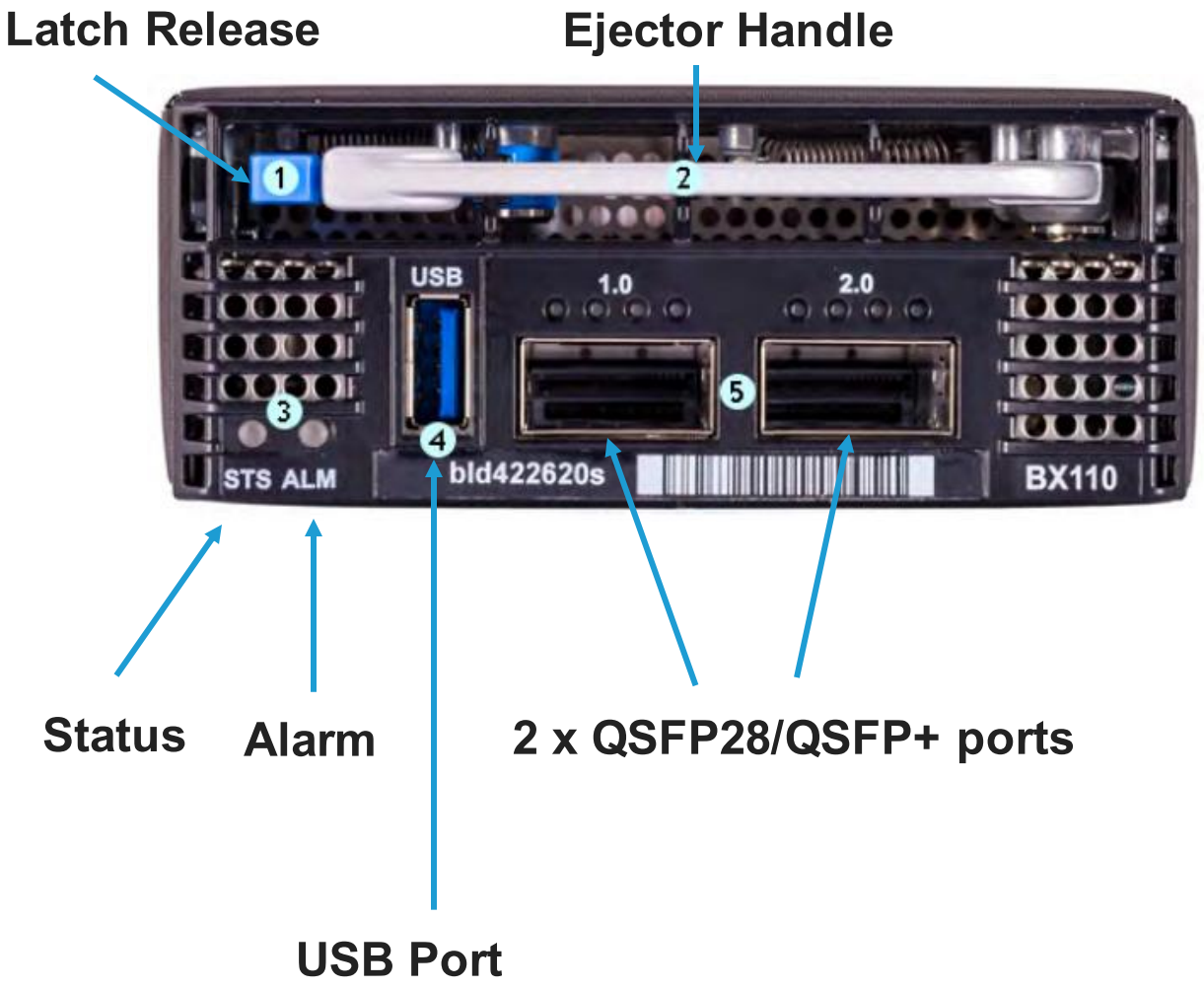
VELOS Provides Improved Investment Protection over VIPRION

Ability to Mix and Match Different Blade Types/Generations



VIPRION only supported one generation of blades per chassis

VELOS BX110 - Details



¼ Width Blade

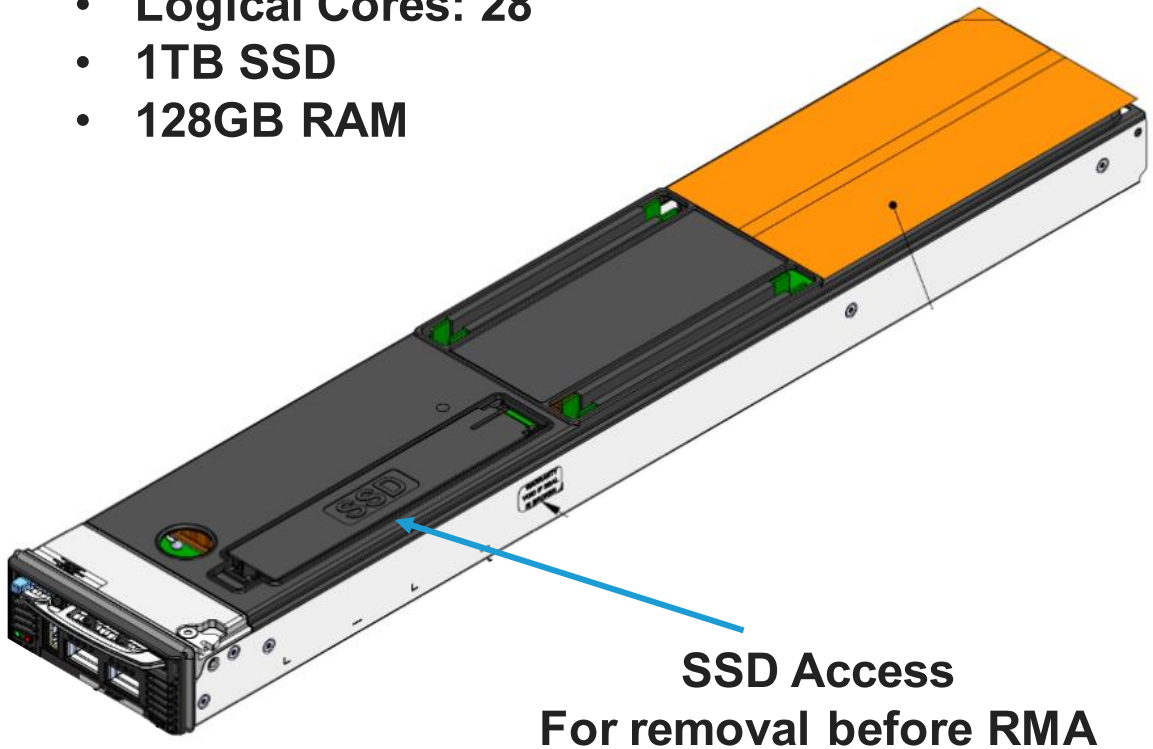
Onboard TPM2.0

Ports can be configured to be:

- **Bundled 2 x (100Gb or 40Gb) or**
- **Unbundled 2 x (4 x 25Gb or 4 x 10Gb)**

6 vCPU's reserved for platform layer

- **Physical Cores: 14**
- **Logical Cores: 28**
- **1TB SSD**
- **128GB RAM**



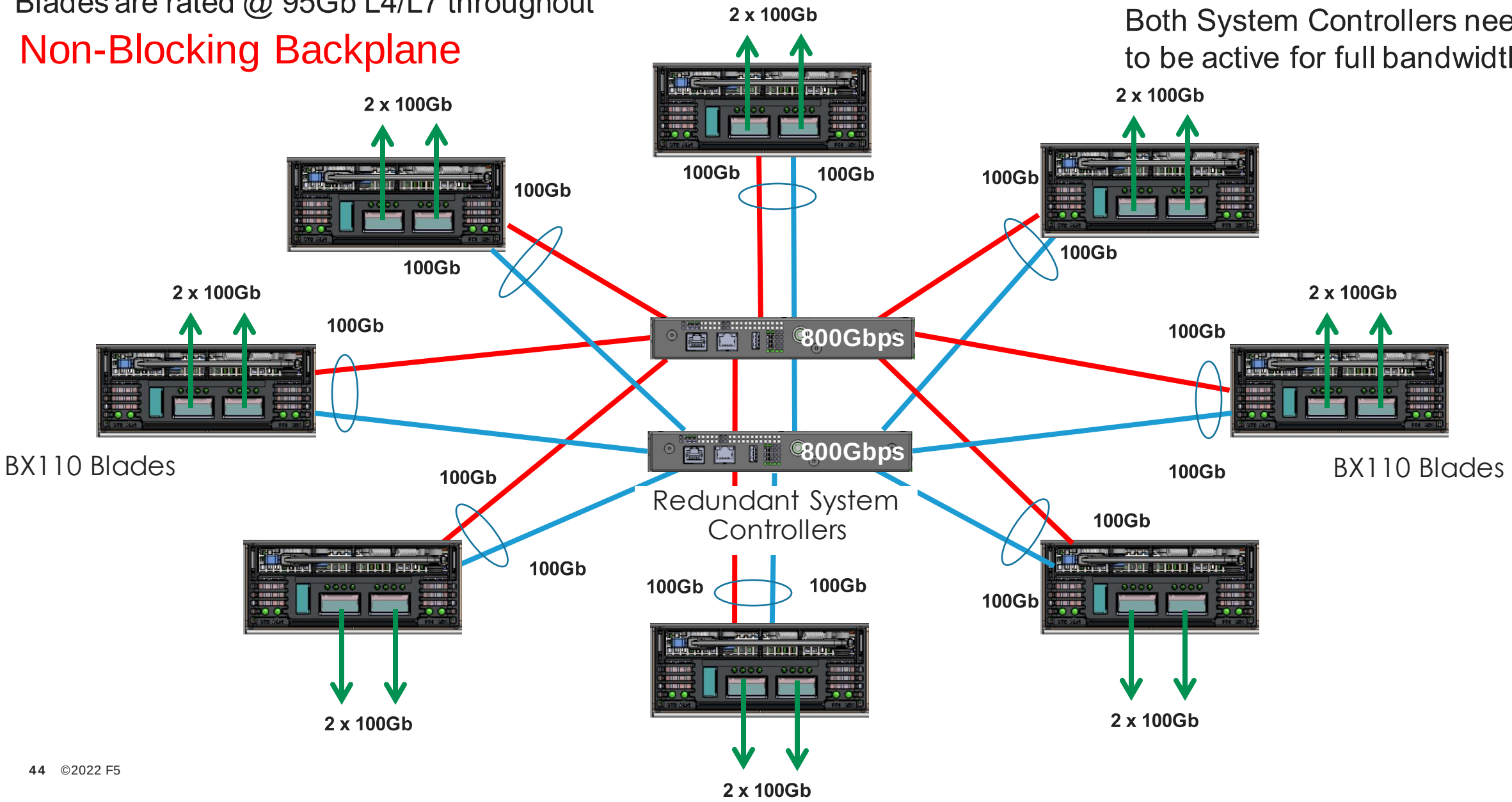
SSD Access
For removal before RMA
Not Field Replaceable

BX110 (2 x 100Gb) in VELOS 8 Slot Chassis

Blades are rated @ 95Gb L4/L7 throughout

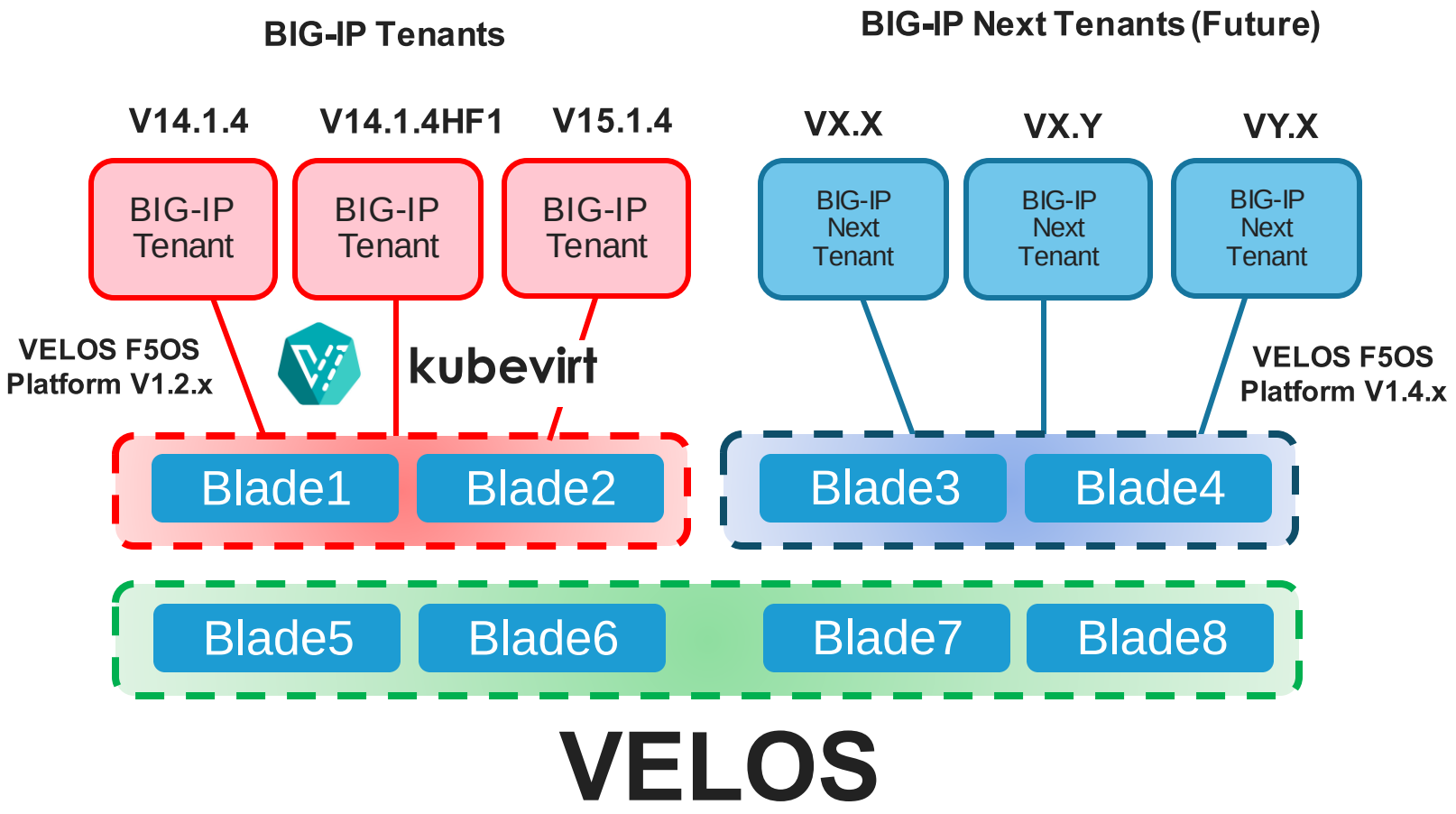
Non-Blocking Backplane

Both System Controllers need to be active for full bandwidth



VELOS Multitenancy

- Similar to VIPRION there will be unique platform and tenant SW versions
- Each BIG-IP tenant can run its own unique instance of SW, just like vCMP
  - Initial release limited to v14.1.4, and now 15.1.4
- Each BIG-IP Next tenant will also be able to run its own unique instance of SW, just like vCMP
  - Software version TBD



Main Differences between VIPRION and VELOS

- VELOS will allow mixing and matching different blade types and generations within the same chassis
- Blades on VELOS are ¼ the width as VIPRION blades which allows double the number of blades per same size chassis.
- VELOS has Higher speed interfaces (2 100Gb interfaces and future 400Gb interfaces)
- VELOS BX110 has the ability to scale 3-6x for L7 RPS and up to 20x for SSL(RSA) vs 4 B2250
- VELOS “Chassis Partition” feature allows another layer of isolation that VIPRION does not offer
- VELOS backplane is non-blocking. VELOS backplane is star wired will fully redundant system controllers/switch fabrics interconnecting all the line cards
- Simplified cable management
- VELOS blades have more modern SSL hardware offload and supports ECC ciphers in HW
- VELOS can run current and future generations of BIG-IP within the same chassis

Putting It All Together!

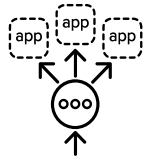
Journeys App Migration Tool – Core BIG-IP

The Journeys application assists **F5 Customers** with **migrating a BIG-IP** configuration to a new **F5 device**. Choose a fully automated migration for ease of use and speed or a detailed, step-by-step process to have more granular control over changes made. Both options are available via API or intuitive GUI.

Full Migration

Migrating a BIG-IP configuration from any version starting at 11.5.0 to a higher one, including VELOS & rSeries systems.

- Support All Modules*
- Config Editor and Load Validation
- API available to automate the process
- Post-migration diagnostics and reporting



Per-Application Services Migration

Migrating mission critical Applications and their dependencies to a new AS3 configuration and deploying it to a BIG-IP instance of choice.

- LTM only (including SSL cert and keys*)
- App inventory building (using rules, e.g. RegEx)
- Conversion to AS3
- Deployment to BIG-IP or BIG-IQ

* No support of HSM key migration, needs to be handle outside

Thank you

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