

Containers as a Service on Cisco HyperFlex Systems

Imagine managing your entire application stack from the perspective of your applications. With containers as a service on Cisco HyperFlex™ systems, you can deploy, orchestrate, secure, scale, optimize, and manage all of your cloud-native applications, as well as their associated infrastructure—simply, efficiently, and consistently.

For too long, application teams have been disconnected from their infrastructure management teams. As microservices architecture adoption continues to rise, underlying software-defined infrastructure needs to be DevOps focused. Rather than being fixed and cumbersome, it needs to adapt quickly, responding and molding to new applications with a new pace of operational agility and simplicity to match code release velocity.

The Cisco Intersight™ Workload Engine is the foundation for this application-driven infrastructure. Intersight Kubernetes Services layers on top to take the simplicity of hyperconverged infrastructure all the way to cloud-native applications. The Cisco Intersight cloud operations platform provides lifecycle management of the entire infrastructure, from deployment to workload optimization. This can radically simplify IT operations and increase agility for DevOps.

Highlights

- **Ready for the future:** A foundational platform for your current and future application modernization
- **Economical:** Supports containers as a service (CaaS) with no additional third-party hypervisor licensing cost
- **Agile:** DevOps focus enables teams to increase code release velocity and ensure consistency

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Enterprise-ready storage features

One of the key benefits of combining Kubernetes with Cisco HyperFlex systems is that the hard problem of providing persistent storage to containers is solved for you. The distributed, clustered file system supported by the Cisco HyperFlex HX Data Platform is built to provide enterprise-grade storage without needing a storage administrator to integrate, configure, or enable its features. Through the industry-standard Container Storage Interface volume driver, all of the following enterprise storage features are available automatically to the Kubernetes environment. These include:

- **Highly scalable, industry-leading hyperconverged storage performance**
- **Deduplication and compression** to increase storage efficiency
- **Synchronous and asynchronous data replication** across short and long geographic distances (respectively)
- **Encryption** for data at rest
- **Thin provisioning**
- **Fast, space-efficient clones**
- **Data protection API** that enables enterprise backup tools to protect persistent container data

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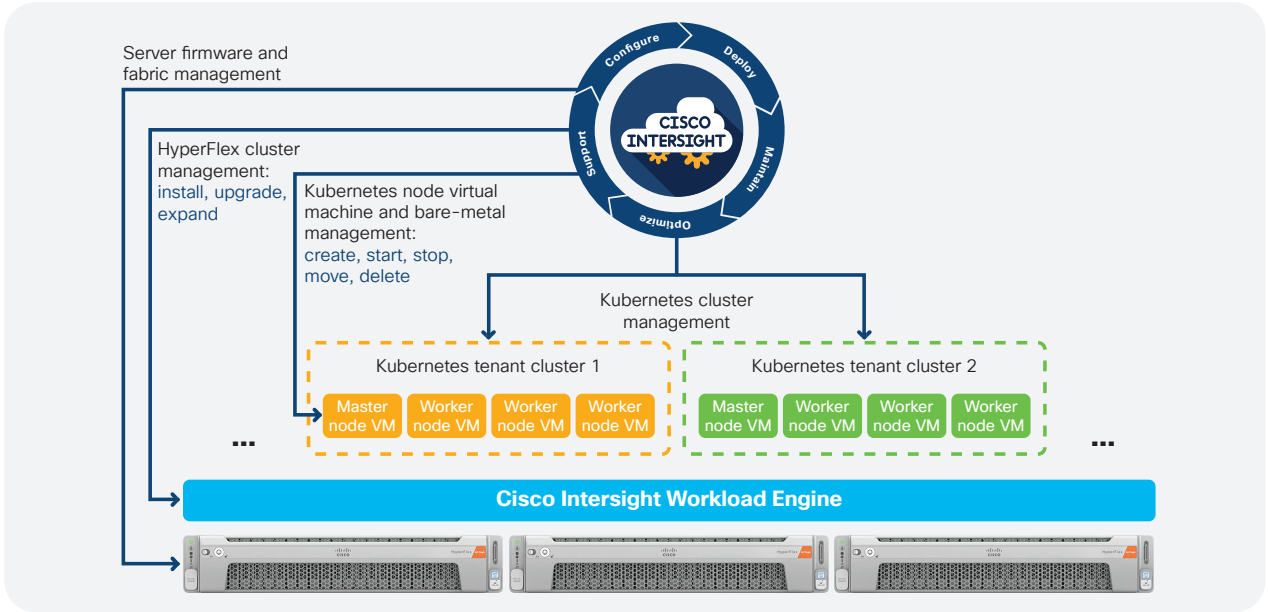
Economical, agile, and ready for the future

The Intersight Workload Engine provides the software infrastructure to run Intersight Kubernetes Service either virtualized or on bare-metal servers in a Cisco HyperFlex cluster. The result is a ready-to-consume Kubernetes containers-as-a-service (CaaS) platform that balances the need for increased application release velocity with the traditional IT needs for reduced cost and complexity. It is a fully integrated solution that supports every infrastructure layer needed to support modern microservices-based applications—from the physical layer to the software stack (Figure 1).

Platform architecture

This solution uses the Intersight Workload Engine, an application-defined approach to support your current needs and evolve to support your future needs. The platform is application defined in the sense that it puts your workloads first and adapts its resources to best support them. The platform integrates the computing, storage, and networking resources to eliminate the time-consuming, error-prone process of integrating a set of hardware and software components and installing and configuring layers of software. Once the foundation is laid, the platform can intelligently optimize itself through

Figure 1. The Cisco Intersight platform manages the entire stack from physical servers to the Kubernetes environment



insight into your workload components and their resource consumption. You gain the following:

- Containers and infrastructure as a service
- Rapid deployment
- High performance
- Independent resource scaling (computing and storage)
- Full lifecycle management
- Integration with public clouds for easy workload placement
- Application and data security and protection
- Distributed persistent storage

Application computing services

Deploying containers in a virtualized environment usually carries the burden of hypervisor licensing. The integrated application computing services built into the Intersight Workload Engine and Intersight Kubernetes Service eliminates the need for additional third-party hypervisor licensing and cost-effectively scales from a common SaaS management platform:

- Policy-based workload placement
- Dynamic resource scheduling
- Live migration
- Load balancing
- Affinity and anti-affinity rules

Cisco Intersight software

Cisco Intersight manages application services across the data center, cloud, and edge. This centralized SaaS platform integrates infrastructure, virtual machine, and container management and application optimization to deliver powerful application platform management capabilities. It prepares you to embrace cloud-native, microservice-based application architectures across hybrid cloud environments. It supports full infrastructure and CaaS lifecycle management, and provides application resource optimization with visibility, insight, and action for your applications (see sidebar).

Key benefits

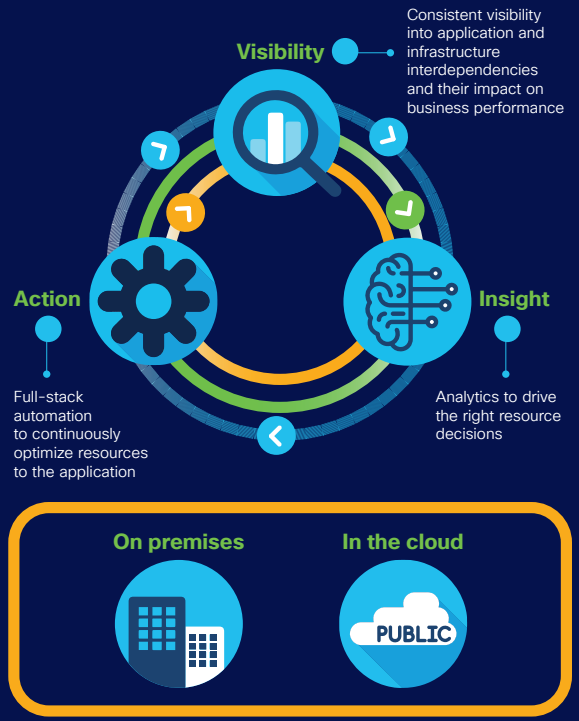
The Intersight Kubernetes Service improves data center economics, gives you greater agility, and positions you to be ready for the future. It is a ready-to-consume container platform that gives you a new balance. Agile development teams gain the on-demand infrastructure they require, while the IT organization has the tools to maintain both quality-of-service levels and compliance.

Economical

Up to this point, providing multitenancy for your Kubernetes deployments has incurred big investment in hypervisor software. The Intersight Workload Engine can help lower operational costs with lower licensing costs, turnkey provisioning, allocation, and access. Cisco Intersight provides full-stack infrastructure lifecycle management and proactive support—all from a single vendor. Our solution simplifies Day-2 container operations while helping you leverage the existing skills, tools, and processes you already have in place.

Workload optimization

Cisco Intersight Workload Optimizer uses application performance metrics to drive better workload placement decisions so that your application platform can more easily adapt to the needs of your business-critical applications. The software gives you visibility into the entire application stack so that you can understand application resource needs based on the workloads they are experiencing. It provides AI-assisted insight to drive application performance optimization decisions. It can suggest or even automate actions based on its insights to help ensure workload performance.



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The Intersight Kubernetes Service helps you balance the need for increased code release velocity with the need for less complex and more efficient operations.

Agile

Your DevOps teams need to have control of their environment and so does your IT staff. This solution delivers a common operating model for developers and operations to increase software release velocity. We have created a truly unique, next-generation solution to help you deliver on your business goals. We leverage hyperconvergence with the ability to rapidly provision pre-integrated persistent storage, virtualization, container technologies, and management to make it easy for you to develop anywhere and deploy anywhere; enabling applications to run and be managed on, or span across, any combination of data centers or clouds. Developers can access their Kubernetes environments anywhere with consistency or access virtual machines and containers with the self-service developer portal.

Ready for the future

The Intersight Workload Engine with the Intersight Kubernetes Service removes the barriers impeding next-generation application environment deployment. We deliver a next-generation hyperconverged solution that is ready to evolve to support for a wide range of applications. It can be deployed and maintained in any location, including your enterprise data center, remote locations, private cloud, and hybrid cloud environments. Why settle for only part of the solution when you can have an application platform that can put your business on a path to a more agile, economical, adaptable, and efficient future?

Learn more

- Cisco HyperFlex systems
- Cisco Intersight software

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