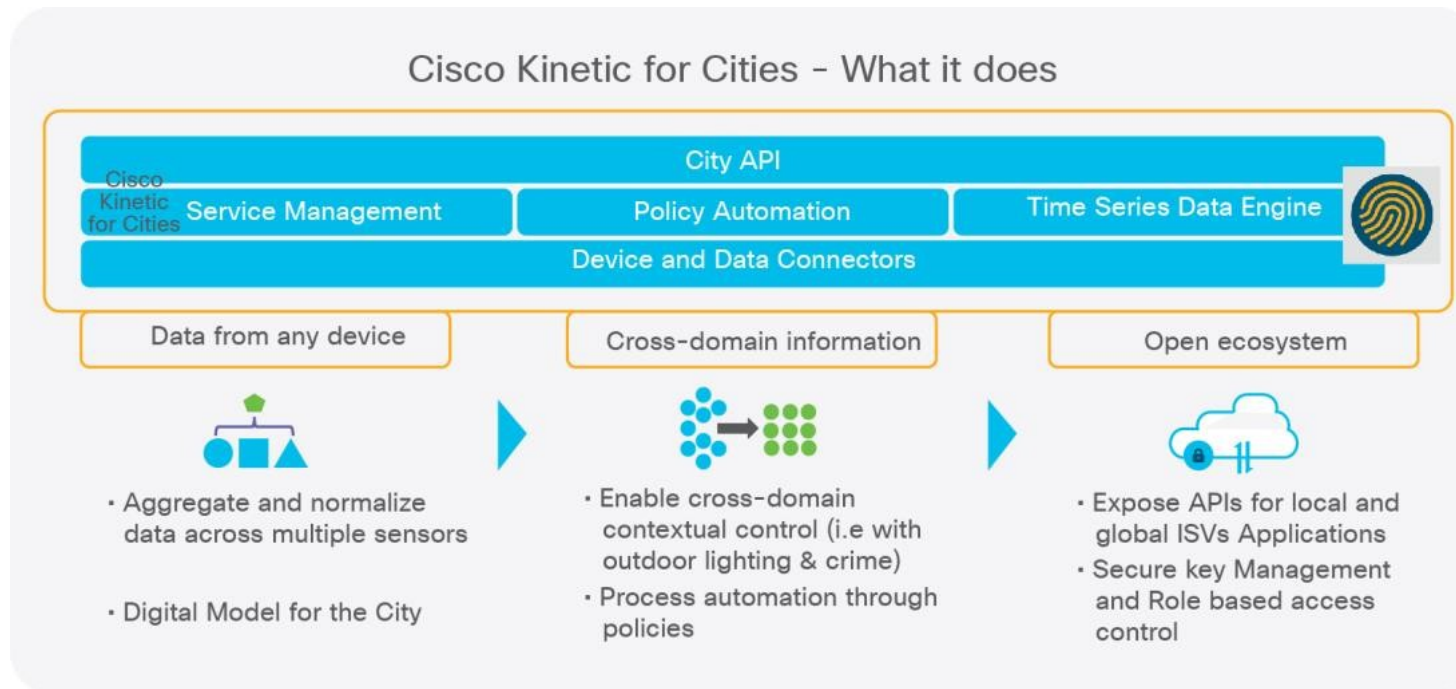# Cisco Kinetic for Cities

Smart decisions make smart cities

An alarm goes off to wake an early riser for her morning jog. Before lacing up her shoes, she checks the air-quality alert on her smartphone app, which tells her that she can breathe easy this morning. Starting at a slow pace in the dark hours before dawn, she gains speed as the street begins to come to life and lights the way for her. Crossing through a park scene that could cause anxiety, this morning jogger knows that video surveillance is capturing and analyzing human behavior to keep her route safe. Looping back to return home, she sees trucks sporadically collecting trash from bins throughout the city. No mistake here, though. These drivers known exactly which bins are at capacity and ready for pickup, avoiding time wasted on collecting nearly empty containers.

Benefits

- Unlock data from the source, and gain a secure platform to capture and transform disparate data insights for faster decision-making and greater cost-effectiveness

- Customize and grow based on unique goals, with simplified and seamless inclusion of new solutions, applications, and devices as needed

- Learn from city data to improve both near-term and long-term livability, economic viability, and environmental sustainability

- Cash in on the value of data with an urban service marketplace that develops unprecedented revenue and employment opportunities

Cisco Kinetic for Cities: What it does

Cisco Kinetic for Cities – What it does

Cisco Kinetic for Cities

City API

Service Management | Policy Automation | Time Series Data Engine

Device and Data Connectors

Data from any device
- Aggregate and normalize data across multiple sensors
- Digital Model for the City

Cross-domain information
- Enable cross-domain contextual control (i.e with outdoor lighting & crime)
- Process automation through policies

Open ecosystem
- Expose APIs for local and global ISVs Applications
- Secure key Management and Role based access control

Cisco® Kinetic for Cities is a cloud-based platform that provides automated, secure data sharing across community infrastructures, solutions, applications, and connected devices. It enables you to easily and cost effectively get the maximum value out of your IoT data to drive new initiatives around increasing safety, managing resources more effectively, delivering new services when and where they are needed, and more.

Cities around the world are being made smarter and are connected more securely through Cisco Kinetic for Cities, together with solutions for environment, lighting, parking, safety and security, urban mobility, and waste management that are enhancing city livability and vitality.

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> ## "This platform is the foundation of how we look at all the data we're collecting from sensors that we have throughout the city."

— **Michael Sherwood,**
   CIO, City of Las Vegas,
   Nevada, USA

Cisco Kinetic for Cities: How it all works together

Upgrade your city operations

The world is changing at an increasingly rapid rate. Cisco Kinetic for Cities can help address the challenges of change and growth. As the number of connected things grows exponentially, this platform can help cities scale quickly, with an open architecture that supports the integration of multiple solutions, applications, and devices. And as the urban landscape evolves, the vast Cisco solutions portfolio will offer a specialized approach to help solve problems, meet unique goals, and achieve desired outcomes.

We collaborate with a trusted ecosystem of partners to help bring these solutions and services to life, complementing Cisco's extensive expertise in secure networking infrastructure.

The power of digital transformation lies in your data. Cisco Kinetic for Cities allows you to unlock your data to help you:

• Be more responsive to citizen needs

• Find cost savings by better understanding how resources are being used

• Create innovative partnerships for continued growth and success

• Generate environmentally sustainable practices

• Keep people and public spaces safer

• Help form more coordinated and effective incident response across different city agencies and organizations

• Inspire new revenue sources through application development, data analytics and modeling, and asset use optimization

• Get traffic and transit where they want to go, quickly and efficiently

And much more. The opportunities continue to grow with Cisco Kinetic for Cities.

For more information

For more information about Cisco Kinetic for Cities, visit cisco.com/go/kineticforcities.

Cisco HyperFlex Systems

Any application

Any cloud

Anywhere

Hyperconvergence for the core, cloud, and edge

You need infrastructure that can follow your data and increase the speed of business regardless of where it takes place: from your core data center (enterprise applications, big data, and deep learning) to private and public clouds (virtualized and containerized applications) and edge locations (remote offices, branch offices, retail and industrial sites). Cisco HyperFlex™ systems with Intel® Xeon® Scalable processors deliver hyperconvergence with power and simplicity for any application, on any cloud, anywhere. Engineered on the Cisco Unified Computing System™ (Cisco UCS®), Cisco HyperFlex systems deliver the agility, scalability, and pay-as-you-grow economics of the cloud with the benefits of multisite, distributed computing at global scale.

The solution

Our platform includes hybrid, all-flash, all-NVMe, and edge configurations, an integrated network fabric, and powerful data optimization features that bring the full potential of hyperconvergence to a wide range of workloads and use cases. These faster-to-deploy, simpler-to-manage, and easier-to-scale systems provide a unified pool of infrastructure resources to power applications as your business needs dictate.

Cisco HyperFlex systems with Intel Xeon Scalable processors

intel
XEON
PLATINUM
inside™

Cisco HyperFlex Anywhere

- **Any application.** Tested and validated for numerous enterprise applications— virtualized and containerized

- **Any cloud.** Tools for cloud mobility including deployment, monitoring, and application placement

- **Anywhere.** True global scale that reaches to your network edge.

What's new?

Platform version 4.0 implements Cisco HyperFlex Anywhere capabilities:

- **Flexibility and scalability at the edge.** 2-, 3-, and 4-node edge configurations support a wider set of use cases. Template-based lights-out deployment, configuration, management, and monitoring speeds anywhere deployment at scale, anywhere

- **Cisco Intersight™ invisible cloud witness.** Automatic, cloud-based witness for 2-node clusters eliminates the complexity of configuring and maintaining a witness node for each edge site.

- **Inferencing at the edge.** You can perform deep learning on GPU-only nodes in the data center and drive inferencing with up to two NVIDIA® Tesla® T4 and P6 GPUs in edge nodes and up to six NVIDIA Tesla GPUs in Cisco HyperFlex HX240c nodes.

- **All-NVMe nodes.** These deliver the highest performance for mission-critical data center workloads. We provide an architectural performance edge with NVMe drives connected directly to the CPU rather than through a latency-inducing PCIe switch. **Intel Optane™ SSDs** also connect to the PCIe bus to accelerate caching for even greater performance than NVMe drives alone.

Any application, anywhere

Cisco HyperFlex systems include a purpose-built, high-performance, low-latency hyperconverged platform that adapts to support any application, in any cloud, anywhere (Figure 1). The platform supports multiple hypervisors and virtualized environments (Microsoft Windows Server 2019 Hyper-V, VMware vSphere), Docker containers with Kubernetes, multicloud services, and edge deployments to efficiently and economically deploy, monitor, and manage applications.

Cisco® Validated Designs give you the benefit of pretested enterprise application deployment using the best practices developed by Cisco engineers. These guidebooks for implementation help you accelerate deployment and reduce risk for virtual desktop environments (Citrix or VMware), Oracle Database, Microsoft SQL Server, big data applications including Splunk and SAP HANA, and graphics-accelerated high-performance computing, artificial intelligence (AI), and machine learning (ML) applications.

Complete solution

Designed with an end-to-end software-defined infrastructure, the platform eliminates the compromises found in other hyperconverged products. It combines software-defined computing using Cisco UCS servers, software-defined storage using the Cisco HyperFlex HX Data Platform, and software-defined networking (SDN) using Cisco Unified Fabric,

which integrates smoothly with the Cisco Application Centric Infrastructure (Cisco ACI™).

With hybrid, all-flash, and all-NVMe configurations, self-encrypting drive options, and a new acceleration engine, the systems deliver a preintegrated cluster that is up and running in an hour or less and that scales resources independently to closely match your application resource needs (Figure 2). The systems support virtualized and containerized applications, multicloud services, and edge deployments with a simple, low-cost option for remote and branch-office locations. Optional GPU acceleration speeds AI and ML software for model training, machine learning, and inference generation.
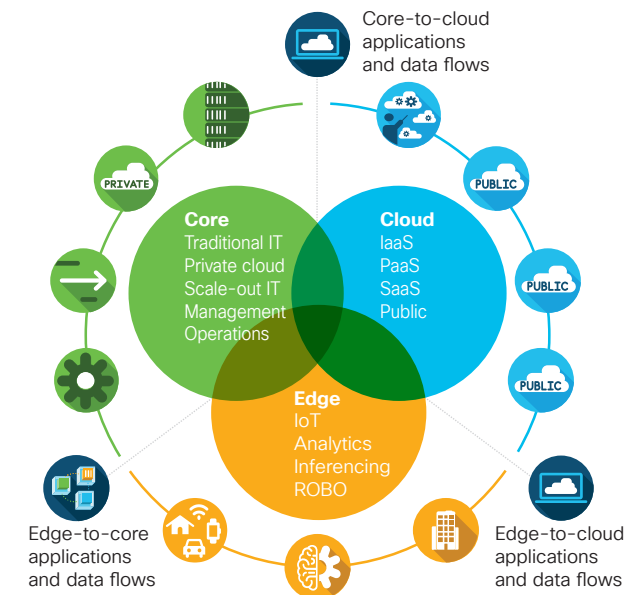

Figure 1. Cisco HyperFlex systems support data center core, multicloud, and edge use cases

What's new? (continued)

- **Cisco HyperFlex Acceleration Engine.** Improves performance and efficiency in the data center with faster and lower-latency data compression operations. More compression makes more efficient use of storage resources.

- **Enhanced Cisco Intersight management as a service.** End-to-end lifecycle management lets you install, configure, manage, and monitor with a worldwide reach. We integrate the entire hardware stack for lights-out zero-touch deployment; no other vendor offers this capability. Full-stack provisioning and upgrades keep firmware, hypervisor, and data platform revisions at the level you specify. Parallel, heterogeneous deployment lets you handle massive scale. So do cluster profiles that make it as easy to deploy hundreds of sites as it is to deploy a single one. Connected Cisco TAC can automatically initiate support cases based on cloud-based monitoring.

Engineered on Cisco UCS

Cisco UCS fabric interconnects provide a single point of connectivity integrating Cisco HyperFlex HX-Series all-flash, all-NVMe, or hybrid nodes and other Cisco UCS servers into a single unified cluster. You can choose the combination of CPU, flash memory, graphics acceleration, and disk storage resources you need to deliver an optimal infrastructure for your applications. Incremental scalability allows you to start small and scale up and out as your needs grow.

Powered by next-generation data technology

The Cisco HyperFlex HX Data Platform combines the cluster's SSDs, HDDs, and NVMe drives into a single distributed, multitier, object-based data store. A self-healing architecture replicates data for high availability, remediates hardware failures, and alerts IT administrators so that problems can be resolved quickly and your business can continue to operate.
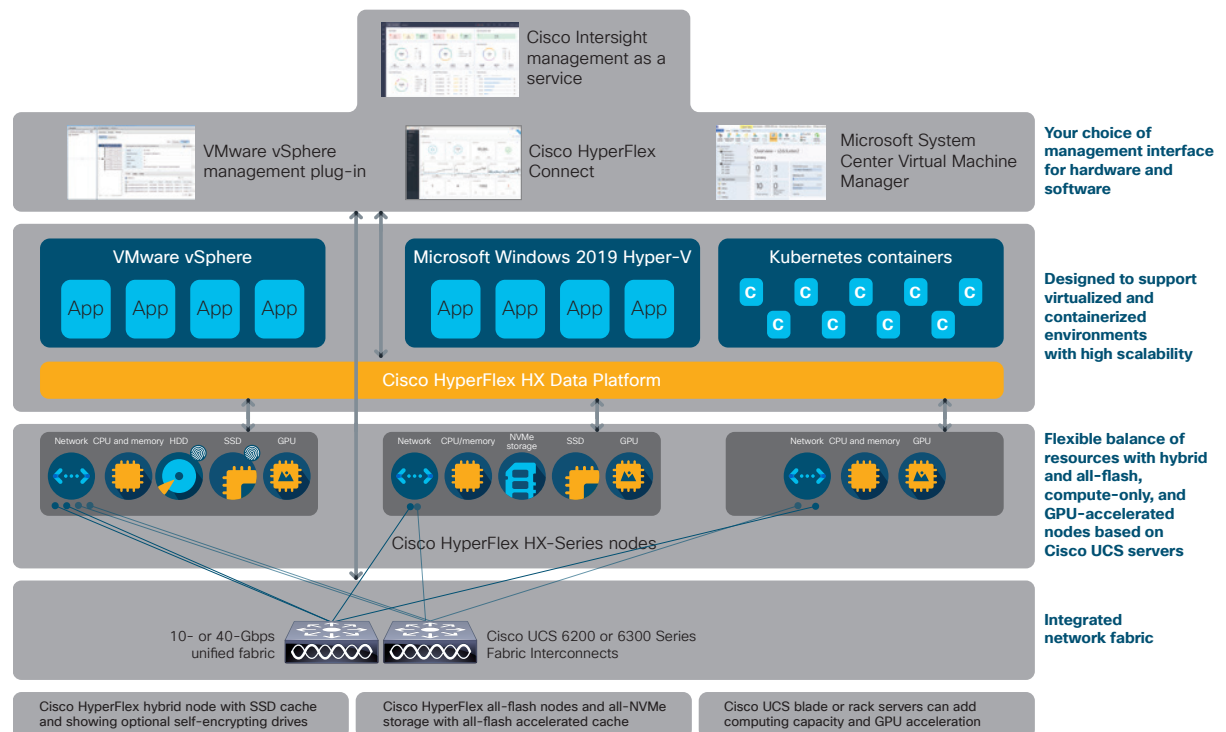

Figure 2. Cisco HyperFlex systems support virtualized and containerized applications and let you choose the exact combination of resources to power your enterprise applications

"HyperFlex's approach ensures high performance of Microsoft SQL and Oracle databases and critical applications with faster delivery of the environment, lower costs, and more effective management."

Edivaldo Rocha
CEO
CorpFlex
Read the story

- **In-cluster synchronous replication** stripes and replicates data across the cluster. Data remains available if one or more components fail (depending on the replication factor).

- **Compression and deduplication** are always on with dedicated resources for consistent performance. The Cisco HyperFlex Acceleration Engine can improve performance and efficiency through lower-latency data compression operations and higher compression ratios

- **Space-efficient, pointer-based snapshots and clones** facilitate backup operations.

- **Logical availability zones** increase availability for larger clusters by automatically partitioning the physical cluster into logical zones and then intelligently placing data to increase cluster resiliency to node and component failures.

- **Stretch clusters** support deployment into two geographically split locations for active/active operations even through a data center failure.

- **Thin provisioning** allows large data volumes to be created without dedicated storage, enabling a "pay-as-you-grow" procurement model.

- **Self-encrypting drive options** securely store data at rest in coordination with enterprise key management software.

- **Native replication** transfers virtual machine data to local or remote clusters for backup or disaster-recovery purposes. You can script, test, and execute failover plans with PowerShell scripting or integrate with third-party products.

- **Data protection API** integration enables enterprise backup tools to protect your data.

Management at scale

Cisco Intersight™ management as a service extends computing from the core data center to the cloud and edge, at virtually any scale. A single interface lets you manage all of your clusters at once with support for installation, inventory management, data platform configuration, and health status. A recommendation engine can tell you when you vary from best configuration practices, and a connection to the Cisco Technical Assistance Center (TAC) enables it to automatically open service requests when the management platform detects a problem. Unique in the industry, the update feature lets you upgrade your node firmware, hypervisor, and the HX Data Platform software with rolling, nondisruptive updates.

If you choose to host local management tools, all of your cluster operations can be managed with locally hosted Cisco HyperFlex Connect software. Virtual-machine-level management is supported in Microsoft System Center Virtual Machine Manager (SCVMM), Microsoft Hyper-V Manager, or the VMware vSphere plug-in.

Next steps

To deploy any application, in any cloud, anywhere, contact your Cisco sales representative or authorized partner.

Learn how Cisco HyperFlex systems with Intel Xeon Scalable processors can enable your digital transformation at cisco.com/go/hyperflex.

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Cisco Catalyst and Cisco Aironet Access Points Solutions

Wi-Fi 6 Access Points

The world has gone mobile and the demand for reliable, seamless wireless access has never been greater. Dependency on networks is higher than ever. Cisco Catalyst® and Cisco Aironet® Access Points are the next generation of Cisco® wireless Access Points.

The Cisco Catalyst Access Points offer intelligence, resiliency, integrated security, and the benefits of the new, high-efficiency Wi-Fi 6 (802.11ax) standard. Not only that, but these Access Points are ready for growing user expectations, IoT devices and next generation cloud-driven applications.

Cisco Services

Accelerate your intent-based networking journey for wireless with Cisco Services. Our experts provide end-to-end guidance to help you transition to your new Access Points with a full lifecycle of services, from initial planning to implementation, optimization and training. Securely transform your network, innovate faster, stay competitive and extract more value for faster ROI.

Learn more

What does the Wi-Fi 6 standard offer?

- **Higher capacity:** Up to a four times increase over previous standards
- **Reduced latency:** Deterministic and uplink resource scheduling
- **Power efficiency:** Up to three times less power consumption on end devices
- **Greater IoT coverage:** Allows your Internet-of-Things (IoT) devices to be further away from your access points
- **Improved interference mitigation:** Provides a better Quality of Experience (QoE)

Whether your network is large, medium, or small, Cisco has a Wi-Fi 6 access point ready to take care of your network's future needs. Our Wi-Fi 6 Access Points include:

Cisco Catalyst 9120 Series Access Points	Ideal for medium to large-sized organizations, the Catalyst 9120 is Wi-Fi 6 certifiable and available with internal or external antennas. The access point offers four radios, 5GHz, dual bands (2.4 GHz, 5 GHz), Cisco RF ASIC, IoT-ready with BLE and Zigbee. The Catalyst 9120 also comes with Flexible Radio Assignment and next-generation ClearAir.
Cisco Catalyst 9117 Series Access Points	Perfect for small to medium-sized organizations, the Catalyst 9117 is Cisco's first access point to offer a radio that is 8x8:8. The access point is Wi-Fi 6-compatible is available with an internal antenna and employs three radios 5GHz, 2.4GHz and BLE.
Cisco Catalyst 9115 Series Access Points	Ideal for small to medium-sized organizations, the Catalyst 9115 is Wi-Fi 6-certifiable, employs three radios, 5GHz, 2.4GHz and BLE and is available with either an internal or external antenna.

Learn more about [Cisco Catalyst Access Points.](#)

802.11ac Wave 2 Access Points

For organizations that have standardized on 802.11ac Wave 2 or are not ready to make the jump to Wi-Fi 6, Cisco has wireless solutions that will fit your needs. 802.11ac Wave 2 Access Points provide the innovation and functionality needed to make sure that your organization can optimize the user experience and can augment network security to scale for a mobile-first world.

Cisco Aironet 4800 Access Points	As the world's smartest access point, the Aironet 4800 provides high performance, top-notch security, and detailed analytics, including Hyperlocation and integrated BLE. You get a wireless network with stronger security and data analysis without degrading performance.
Cisco Aironet 3800 Series Access Points	Has the ability to stay flexible with built-in modularity and keep up with bandwidth demands from a growing number of wireless devices and applications.
Cisco Aironet 2800 Series Access Points	Goes beyond the Wi-Fi standard and provides features such as Flexible Radio Assignments, Clean Air and Smart Antenna Connector suitable for mission-critical networks to meet ever-changing business goals.
Cisco Aironet 1800 Series Access Points	With up to four different varieties of enterprise-grade Access Points to choose from, these products are optimized to meet your unique needs.

Learn more about the [Cisco Aironet Access Points.](#)