When You Build Your Cloud, Infrastructure Matters

Cisco UCS is excellent for cloud deployments

Whether you plan to deploy private or hybrid clouds, infrastructure matters. Cisco Unified Computing System™ (Cisco UCS®) gives you the agility to deploy cloud services with unified management across clouds and multiple geographic locations.

Every day, businesses perform a delicate balancing act: working to outperform competitors with IT resources that often are unresponsive and unmanageable. Those limitations result in incremental improvements rather than real innovation. Many organizations now have been given a mandate to deliver an application-centric, cloud-enabled, digitally transformed environment that enables business. Cisco UCS is excellent for building the cloud solutions that can move your business forward with private and hybrid cloud services. This programmable and unified system and its associated management capabilities give you the agility and choice you need.

Cisco UCS: Built for cloud deployments

As you turn to cloud computing to enhance business agility, your infrastructure must be easy to deploy, integrate, scale, automate, and orchestrate. Cisco UCS can help you meet your IT and business goals by enabling self-service, infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS) capabilities and solutions (Figure 1).
Programmable

Organizations that move to the cloud recognize that flexibility matters—and that cloud infrastructure, regardless of where it is located, should let you easily allocate and use resources on a moment’s notice. That means that your cloud infrastructure shouldn’t be rigidly defined and configured: that is, completely defined by the hardware. Cisco UCS uses a stateless, programmable approach that gives you exceptional flexibility to determine how, when, and where your resources are deployed and used. A single unified network fabric allows you to connect every resource equally, with features such as isolated networks and Fibre Channel connectivity created through software, not separate physical networks.

Stateless computing

Cisco UCS abstracts server identity, personality, and I/O connectivity from the hardware, enabling these characteristics to be applied on demand. These abstractions, called Cisco UCS service profiles, allow every aspect of a server’s configuration—from firmware revisions and BIOS settings to network profiles and virtual interfaces—to be assigned through the system’s open, documented, standards-based XML API, a command-line interface (CLI), or the Cisco UCS Manager GUI.

Cisco UCS service profiles allow you to treat your server resources as raw computing capacity and networking bandwidth that can be allocated and reallocated among application workloads. This approach supports a more dynamic and efficient use of server capacity regardless of whether server virtualization is being used. Because this intelligent system knows how objects fit together and can apply service profiles in a consistent manner, you can be assured that your servers are configured in compliance with your specifications. If you want to move a workload to a more powerful or different type of server, blade or rack, you can apply the same service profile to the new server and boot your workload onto it.

Model-based management

Cisco UCS is programmed through a single, embedded, model-based management interface to accelerate the deployment and performance of physical, virtualized, and cloud
environments. An extensive API with a software development kit (SDK) that includes an emulator facilitates custom development to achieve new levels of system visibility and control. With the Cisco UCS API, your IT organization can easily tap into your private and hybrid cloud resources and manage your entire system with Microsoft Windows PowerShell and Python scripts that you customize for your unique cloud deployment or with higher-level management platforms.

Unified fabric
All components are connected through a unified fabric that delivers up to 10 and 25 Gbps or 40, 50, and 100 Gbps on the fourth-generation Cisco UCS 6454 Fabric Interconnects for high-performance data and storage networks. Because the networking is included, deployment is radically simplified and accelerated, and operating costs are dramatically reduced. The high-performance, low-latency, and deterministic characteristics of Cisco UCS help ensure the speed of your business applications and the quality of the user experience. Its integrated network services provide high-speed connectivity and high availability and reduce the security risks associated with multitenant environments. Unlike other approaches, which require you to recable and redesign your network as your needs grow, Cisco UCS lets you scale bandwidth simply by adding cables—everything else is configured through software.

Unified management
Management is unified across all Cisco UCS implementations. With its unified API, Cisco UCS enables learn-it-once, use-it-everwhere policies whether a deployment is on your premises, at a remote site, or in a hybrid cloud environment. Cisco Intersight is a cloud-based management offering that makes infrastructure management more intuitive. You can manage your Cisco UCS and Cisco HyperFlex™ infrastructure securely wherever it is located.
Choice
You recognize that your users—both line-of-business application users and DevOps users—expect continuous operation and immediate response. This is the world we live in today. So when there are delays in delivering new applications or environments, especially for DevOps, your users look to the cloud for a faster response to rapidly changing needs.

Now you can deliver the response that your users are looking for. Cisco UCS lets you move from technology silos to a holistic approach that transforms your data center infrastructure into pools of resources that can be easily allocated and repurposed. Your applications can run more efficiently within, between, and beyond your data center boundaries—and your IT department can evolve to an IT-as-a-service (ITaaS) model to accelerate service delivery and increase revenue.

Automate and orchestrate
Traditional management approaches make your IT environment difficult to use and scale. In the past, management has been an
afterthought, resulting in incomplete solutions that fail to deliver unified infrastructure management. Cisco breaks down the barriers that limit traditional approaches so you can simplify, deploy, and maintain your physical, virtual, and cloud platforms with better visibility and control.

Automation, orchestration, and lifecycle management capabilities simplify deployment and enable your IT staff to reduce complex, time-consuming, manual, and compartmentalized processes. A self-service web interface abstracts the complexity of devices, hypervisors, and virtual machines so you can stand up infrastructure within minutes and get the most from your cloud deployments. This capability not only optimizes your resource use, but it also improves business outcomes through increased agility, efficiency, and simplicity for both IT and your business users (Figure 2).

**Better management for greater business advantage**

Whatever management level you choose, your IT staff can easily virtualize, automate, and secure your Cisco UCS deployments and achieve cloud scale for dynamic business applications. You can use application containers to create radically simplified DevOps environments and stable application environments all the way through the application lifecycle. Your IT staff can tap into cloud resources so that your data center can handle spikes in demand. This increased flexibility means that you can scale your infrastructure and workloads up or out, or both, across private and public resources to deliver new and innovative services in shorter time frames, support a growing user community, and increase workload mobility.

**Embedded model-based management**

You need infrastructure that supports automation and orchestration, no matter what software you use. With Cisco UCS, you can use programmatic infrastructure at whatever level your organization prefers, from CLI scripts to fully automated capabilities.

**Integration with DevOps platforms**

The Cisco UCS API is integrated with the common DevOps platforms that automate application environments. This integration gives you a broad choice in the way that you manage your environment from the application down through the stack. Platforms that integrate with Cisco UCS include Docker, Puppet, Chef, and Ansible.

**Platform choice**

The unified infrastructure and architecture-by-design approach of Cisco UCS delivers the scalability, simplicity, and flexibility needed in cloud environments. The system’s unified fabric results in fewer network interface cards (NICs), host bus adapters (HBAs), cables, and upstream switch ports, and it eliminates the need for a parallel Fibre Channel end-to-end network. Traditional chassis-resident switches are replaced by a low-cost, low-power, zero-management fabric extender that enables the entire system to scale across multiple chassis without any addition of management points. All hardware and software components are managed through unified, embedded management to improve operation efficiency with transparent scaling.
Cisco UCS M5 servers

Designed to provide your computing infrastructure now and into the future, Cisco UCS M5 servers give you the benefits of the latest Intel Xeon Platinum processors:

- **More cores** to accelerate parallelized virtualized and bare-metal workloads
- **Larger memory capacity** for better performance and larger in-memory databases
- **Higher memory bandwidth** to accelerate the flow of information to and from the CPU
- **Readiness for Intel 3D XPoint nonvolatile memory**
- **Up to 6 PCIe GPU accelerators** for a smooth user experience in virtual desktop environments
- **Cloud management readiness** with Cisco Intersight

Different workloads and environments require different server types and configurations. Cisco UCS supports a range of form factors within the same domain, so you can choose resources appropriate for the task and manage from a single management platform.

- **Blade servers:** Cisco UCS
  B-Series Blade Servers provide massive amounts of computing power in a compact form factor to increase density in computing-intensive and enterprise application environments. Available in full- and half-width form factors, Cisco UCS blade servers offer dedicated storage and high-capacity memory configurations to support workloads ranging from web infrastructure to distributed databases and business intelligence applications.

- **Cisco UCS Mini:** Cisco UCS Mini provides the power of the same Cisco UCS B-Series Blade Servers but is optimized for branch and remote offices, point-of-sale locations and smaller IT environments.

- **Rack servers:** Capable of operating in standalone deployments or as part of Cisco UCS, Cisco UCS C-Series Rack Servers offer expansion capabilities to help your organization address fluctuating workload challenges. With a wide range of I/O, memory, internal disk, and solid-state disk (SSD) options, you can balance processing power and other resources to meet the requirements of your cloud infrastructure workloads.

- **Hyperconverged systems:**
  Cisco HyperFlex Systems deliver complete hyperconvergence. These systems combine the software-defined networking and computing power of Cisco UCS with the Cisco HyperFlex HX Data Platform. Designed for simplicity, Cisco HyperFlex systems bring increased operation efficiency and adaptability to more workloads in your data center and can be deployed in less than 1 hour.

- **Cisco HyperFlex Edge:** This edge-optimized solution is designed for remote- and branch-office operations. It offers a low-cost, small-footprint option with automated management and the same full feature set that you expect from Cisco HyperFlex systems.

Protect your infrastructure, information, and business

Executives recognize the importance of security, particularly when infrastructure resources are shared. Cisco UCS can help you ensure compliance across your local and distributed data centers.

**Role- and policy-based management**

Typically, subject-matter experts (SMEs) define the way that different
Visibility to enhance communication and cooperation

With Cisco UCS, your server, network, and storage administrators maintain responsibility and accountability for their domain policies within an integrated management environment. Each role has visibility into the actions taken by other roles, enhancing communication and simplifying coordination. Roles and privileges in the system can be easily modified and new roles quickly created. With the capability to empower or limit what your users and administrators can do, your IT department can help ensure consistent configurations as well as reduce the likelihood of security breaches and human errors that can cause downtime.

Cloud security

Many organizations consider hybrid cloud infrastructure to be versatile, giving IT staff the flexibility to access the right resources for each cloud workload and business challenge. Shifting workloads throughout the fabric of connections in hybrid clouds means that your security perimeter is constantly expanding.

The Cisco CloudCenter solution lets you extend your data center and cloud capacity on demand. As a result, your users can easily access additional computing and storage capacity—and your IT staff can be confident that your workloads and data are just as secure in the cloud as they are in your on-premises data center.

Cisco UCS: An excellent cloud infrastructure

Let Cisco UCS help you increase your competitive advantage with cloud infrastructure that delivers programmability, unified infrastructure and management, and choice. Whether you need to deploy a private cloud or extend your capabilities with a secure hybrid cloud approach, Cisco UCS makes it easy to build and consistently manage cloud environments while retaining visibility and control over your entire IT infrastructure.