

Data Center Challenges

Data center professionals are being challenged to address major market, globalization, and technology trends that will drastically change the way data center infrastructures are deployed and operated over the next decade. The primary challenges include:

- **Business alignment:** To help ensure its continued relevance to the business, IT must be capable of facilitating rapid change and enabling new business processes and customer offerings. This means deploying business applications rapidly and optimized application delivery to increasingly diverse and mobile users.
- **Cost and power efficiency:** IT is faced with hosting more business-critical applications and information, while accommodating new architectural models all within a limited budget. New hosting models are needed to lower TCO and improve energy efficiency, while still enabling growth and flexibility.
- **Risk management and compliance:** Increasing dependence on IT, consolidation of assets, 24x7 globalization, and increased regulation mean that previous business continuance models are neither adequate nor economical in today's business environment. IT needs to adopt more advanced and cost-effective approaches to protecting and recovering from planned and unplanned disruptions and attacks.

Data Center Trends

A new data center architecture is emerging in response to these challenges. This latest iteration (the third such major transformation in the last 20 years) is based on a shared, virtualized infrastructure model: services abstracted from the underlying physical assets that can be dynamically adapted to changing application and service level requirements. This architecture enables the emerging enterprise and service provider "cloud" models.

This transformation is more heavily reliant on the network than ever before. Indeed, in many ways the network now becomes the underlying foundation upon which the virtualized data center infrastructure runs. The network has uniquely desirable characteristics for this expanded role, including:

- **Pervasiveness:** By definition, the network touches all physical and virtualized networked resources.
- **Neutrality:** The network is built on standards that embrace openness and interoperability, making it independent of any specific vendor, device, or content.
- **Scalability:** The network's proven distributed scalability makes sure data centers can safely handle increasing loads.

What Is Cisco Data Center 3.0?

Cisco® Data Center 3.0 is Cisco's strategy and vision for facilitating data center transformation to this new virtualized model by using the network as the underlying platform. It combines an innovative architecture with an integrated technology roadmap, design best practices, and services, all designed to help customers transform their data center infrastructures, processes, and organizations with maximum effectiveness and minimum risk, cost, or disruption.

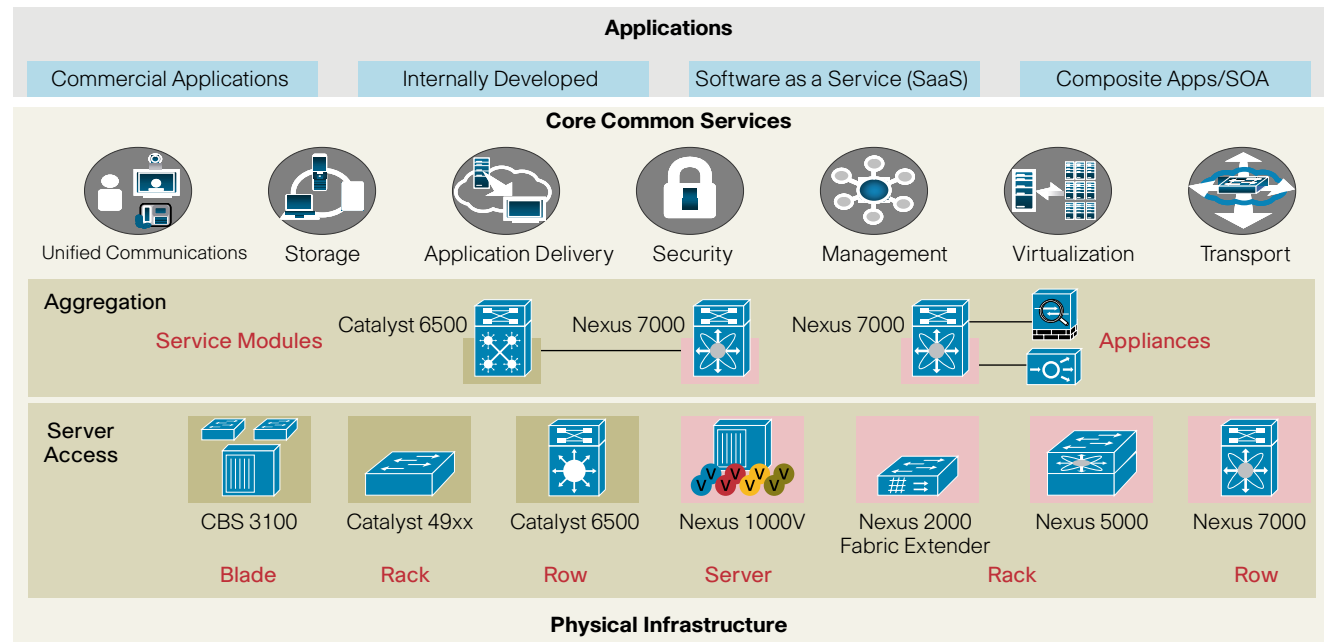
Cisco Data Center 3.0 Technology Portfolio

The Cisco Data Center 3.0 technology portfolio includes the most comprehensive range of networking products and solutions designed specifically to help IT organizations transform their data center infrastructures.

- **Data center network infrastructure:** Network infrastructure platforms that provide the physical and logical connectivity and access to all physical and virtualized data center resources (compute and storage). This infrastructure layer supports all heterogeneous servers and storage, including standalone servers, blade servers, virtual machines, and SAN and NAS environments.

- **Data center infrastructure services:** These networked services reside on the infrastructure platforms to help ensure scalable protection, manageability, and reliability for the applications and information hosted in the data center. These services include virtualization, storage, security and application network services.
- **Application network services:** Cisco Application Networking Services (ANS) increase application performance and availability, enable the consolidation of expensive branch office and data center infrastructure, and accelerate new application deployments. These services include data center application services and wide area application services.
- **Data center automation and provisioning tools:** As data center technologies become increasingly sophisticated, Cisco is developing innovative tools and working with partners to help reduce the complexity of deploying and managing a virtualized environment.

Figure 1. Cisco Data Center 3.0 Framework



Cisco Data Center 3.0 People and Processes

Cisco is also helping customers to plan, design, and deploy Data Center 3.0 technologies more rapidly through new data center processes and initiatives. Cisco is taking a leading role in helping to provide the skill sets and best practices required for transparent collaboration across traditionally siloed technology domains. These include:

- Expanded Cisco Data Center Career Certification
- Cisco Data Center Assurance Program (DCAP) Design Best Practices
- Cisco Advanced Services and Support
- Cisco Data Center Partner Specialization Program

Partnering for Complete, Validated Customer Solutions

The Cisco Data Center 3.0 architecture provides an adaptable and neutral foundation for a wide ecosystem of other partners and vendors to offer complete data center solutions. These partners include market leaders such as EMC, Hewlett Packard, HDS, IBM, Oracle, Microsoft, SAP, and VMware as well as a wide range of specialist providers that can facilitate a smooth, integrated delivery of data center infrastructures customized to unique requirements.

Cisco Data Center 3.0 Roadmap

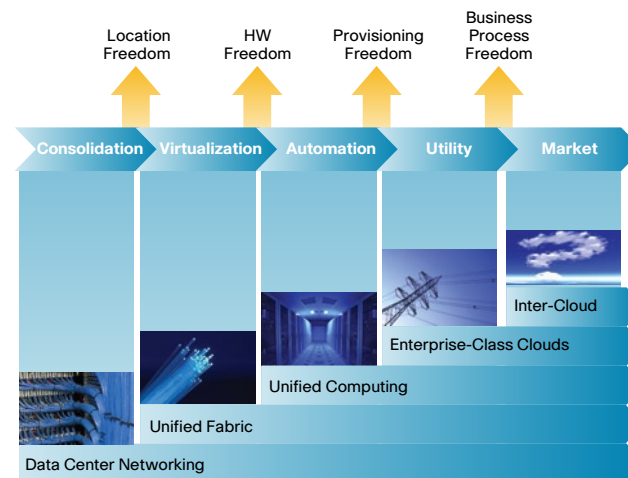
With the Cisco Data Center 3.0 roadmap, IT architects can take an evolutionary approach to migrating from the traditional customized siloed hosting environments to a utility infrastructure market model. This will not happen all at once, but through a planned step-by-step approach that is accompanied by clear immediate benefits along the way.

The Data Center 3.0 roadmap encompasses the following steps:

- **Consolidation:** The deployment of a **data center network** architecture that allows data centers and branches as well as the server, storage and network resources they contain to be standardized and consolidated for improved operational efficiencies, greater utilization and enhanced resilience.
- **Virtualization:** The introduction of a **unified fabric**, optimized for the hosting and orchestration of virtualized server, storage and network resources ensures greater IT responsiveness and application availability.
- **Automation:** The deployment of a **unified computing** architecture allows infrastructure simplification through pre-designed virtualization architecture, extended lifecycle of capital assets and scalable rightsizing as business requirements change.

- **Utility:** An internal **enterprise-class cloud**, based on the previous architectural model allows enterprise data centers to offer clients a service provider model with pay as you go billing, tiered service levels and provision-to-order
- **Market:** By extending internal clouds to operate **inter-cloud** across datacenters and 3rd party service providers, IT can move services and data to the most appropriate hosting environment, based on market forces and business requirements.

Figure 2. Data Center 3.0 Evolution Path



Next Steps

While all IT organizations are faced with pressing data center challenges that can include application and data growth, facilities limitations, or underutilized resources, it is important to take a big picture approach to addressing today's data center infrastructure. For this reason many IT organizations, including Cisco's own, have developed a longer term strategy that incorporates the following steps:

- Develop the desired end-goal data center infrastructure model aligned with business objectives
- Identify the primary near-term data center projects and develop a plan to implement them in the context of the longer term architecture
- Engage with Cisco and our partners to learn how Cisco Data Center 3.0 can help you achieve your data center goals

Additional Information

Cisco invites you to learn more about Cisco Data Center 3.0. Let us help you build a pragmatic roadmap that addresses both your current data center challenges as well as the desired end-state for your future data center.

- Cisco Data Center 3.0: www.cisco.com/go/datacenter
- Cisco data center design best practices: www.cisco.com/go/dcdesignzone
- Cisco data center services: www.cisco.com/go/dcservices
- Cisco IT data center experiences: www.cisco.com/web/about/ciscoitnetwork/data_center/index.html