



Gain Competitive Advantage with Cisco Big Data Solutions

Today's businesses operate in a constant state of competitive upheaval. To be successful, businesses are continuously searching for ways to deliver a competitive advantage that can lower costs, increase revenue, and improve speed.

The emerging Internet of Everything (IoE) market transition is enabling billions of connections between people, processes, and things, and each of these connections will be able to produce data. IoE will provide enterprises with fundamentally better access and better data allowing them to become more aware, more predictive, and more agile. This kind of intelligence – gained by applying big data and analytics – fuels continuous improvement: enterprises can continue to analyze data in new ways to deliver new innovations. The enterprise that can apply the power of big data pervasively throughout its organization can create multiple sources of ongoing innovation – generating a perpetual and powerful competitive edge.

Cisco's revolutionary innovations deliver leading-edge infrastructure and analytics to our customers to unlock the intelligence in their data, providing a sustainable competitive advantage to their business.

Cisco Big Data and Analytics Solutions

Thinking Big: The Ideal Infrastructure for Long-Term Big Data Success

Exponential increases in data volumes mean that big data environments will eventually get much bigger and more distributed, potentially consisting of hundreds or thousands of servers and switches. Consequently, IT departments will need an infrastructure is designed for cost-effective management, massive scalability, comprehensive security that extends from the data center through the network to every connected device, and lower TCO. And as use of big data becomes more critical to day-to-day decision making – and more pervasive in the industry – high performance and availability of big data solutions will become more important to help ensure faster and predictable delivery of insights to key decision makers.

Traditional infrastructure simply is not designed to meet these long-term requirements of big data environments. Cisco, however, provides a comprehensive and distributed big data infrastructure that is optimized for long-term success because of its unified design, intelligence, and robust security.

Distributed Infrastructure Designed for Efficient Scalability and Flexibility

The fabric-based infrastructure of the Cisco Unified Computing System™ (Cisco UCS®) uniquely integrates server, network, and storage resources. This highly efficient infrastructure lets businesses manage up to 10,000 Cisco UCS servers as if they were a single pool of resources, so they can support the largest data clusters. The integrated design also delivers outstanding performance.

Enterprises need to be able to capture intelligence from both data at rest in the data center and real-time data at the data center edge. Cisco's broad portfolio of Cisco UCS solutions provides the flexibility to process data where it makes the most sense. The Cisco UCS C240 M4 Rack Server system is extremely popular for Hadoop-based big data deployments at the data center core. The Cisco UCS Mini is an all-in-one solution that's excellent for processing data at the network edge, delivering servers, storage, and networking in an easy-to-deploy, compact form factor.

Accelerating Delivery of Customized Analytics Solutions

As more businesses implement analytics solutions to create the foundation for a renewable competitive edge, the pace of competition will increase. So time-to-market of analytics solutions is of the essence. Cisco provides the software, tested and proven analytics solutions, full ecosystem of partners, and expertise that enterprises need to facilitate development and delivery of the right analytics solutions for their businesses.

Helping Ensure Easy Access to All Enterprise Data

As the volume of data continues to grow, it creates challenges for the data scientist, who must not only identify the right data to deliver the insights, but also locate it when data is distributed throughout the enterprise. The Cisco Data Virtualization solution abstracts data from multiple sources and transparently brings it together to give users a unified, friendly view of the data that they need. And because enterprises can analyze data wherever it's located, they will be able to quickly and easily make better business decisions faster.

Accelerating Analytics Solution Delivery

Cisco delivers a robust portfolio of solutions composed of prevalidated functional analytics building blocks that take full advantage of the Cisco big data infrastructure, making it faster and easier to deploy a wide range of big data solutions. For example, Cisco Connected Analytics for Contact Center is a bundle of analytics software and decision-science services that can be integrated into a call center to improve service, reduce both customer churn and costs, and increase agent productivity. Cisco also offers a call center analytics package, a network analytics package, and a threat analytics package – all designed for easy integration.

Enabling Breakthroughs in Management Automation and TCO Reductions

The simplified and integrated Cisco UCS foundation is highly programmable, enabling breakthroughs in management orchestration and automation to increase efficiency and speed as your big data infrastructure grows. At the center of the capability of Cisco UCS to provide unified management across network, server, and storage is Cisco UCS Manager. Every element of the physical infrastructure – including server identity (LAN addressing, I/O configurations, firmware versions, boot order, QoS policies, etc.) – can be dynamically configured through software. This logical abstraction also simplifies the configuration of big data Hadoop nodes and adapts dynamically to changing workloads, leading to dramatic reduction in OpEx. Cisco UCS Central Software brings these same capabilities across multiple domains, providing the capability to extend to large clusters of up to 10,000 nodes within the same management pane.

With Cisco UCS Director Express for Big Data, these same advantages of flexibility and agility at the physical infrastructure level are now extended into the Hadoop application space. Cisco UCS Director Express for Big Data delivers an integrated, policy-based Hadoop infrastructure across a distributed, big data infrastructure based on Cisco UCS, delivering a world-class infrastructure designed to provide performance at scale. Cisco UCS Director Express for Big Data is integrated with products from major Hadoop vendors to provide centralized visibility across the entire Hadoop infrastructure: IT can provision on-demand Hadoop clusters and manage both physical and software infrastructure from a single management pane.

Finally, as enterprises begin to adopt pervasive use of big data, they'll need to implement standard operational processes to speed predictable delivery of the value of these new analytics workloads. Basic workload schedulers that manage day-to-day batch jobs have limitations that make them unsuited to mission-critical big data workloads. Cisco® Tidal Enterprise Scheduler (TES) can help organizations operationalize Hadoop solutions with enterprise-class workload automation that delivers dependency management, enterprise calendaring, error recovery, SLA management, role-based access control, and the capacity for enterprise scale.

Network Intelligence to Increase Performance and Agility for Big Data Workloads

As the number of an enterprises' big data workloads increases, the network plays a more important role in helping ensure that workloads are completed and insights are delivered on time, securely, and cost effectively. Cisco Application Centric Infrastructure (ACI) provides a common policy-based programming approach across the entire big data infrastructure, beginning with the network and extending to all its connected endpoints.

In addition, Cisco has created highly strategic, custom-built industry solutions for our customers that include our data virtualization and analytics solutions, as well as our data analytics expertise. Cisco Consulting Services possesses the analytics industry background and deep technology expertise to work with an enterprise to develop a customized big data and analytics strategy. And Cisco Advanced Services can help implement those strategies flawlessly, reduce minimize deployment risk and expedite delivery of analytics offerings.

Open for Innovation: Easy Integration with the Broad Big Data and Analytics Ecosystem

The new big data and analytics market opportunity is fueled by innovation that's being delivered by a large partner ecosystem. Because Cisco's big data infrastructure and analytics solutions are founded on an open environment, they work with an enterprise's favorite software, storage, and BI and analytics applications, giving enterprises exceptional flexibility in building their analytics environments.

- **Dynamically optimizing cluster performance in the network:** Cisco ACI policy works with deep telemetry embedded in each Cisco Nexus® 9000 Series Switch to monitor and adapt to network conditions. Using policy, Cisco ACI can dynamically load-balance big data flows across racks on alternate paths. In addition, Cisco ACI applies policy to prioritize the small packets associated with big data traffic traveling between computing nodes – ahead of larger packets associated with other workloads that could otherwise significantly delay big data jobs.
- **Redeploying resources automatically for new workloads to improve utilization and lower TCO:** Initially, big data jobs may be infrequent. To improve utilization and lower TCO, Cisco ACI lets you quickly redeploy cluster resources from Hadoop to other sporadic workloads (such as CRM, e-commerce, ERP, and inventory) and back by using application policy profiles to programmatically re-provision the infrastructure. IT can use a different profile to describe the needs of different applications, including the Hadoop ecosystem. The profile contains the application's network policies, which are used by the Cisco Application Policy Infrastructure Controller (APIC) to create a complete network topology. The same profile can contain computing and storage policies used by other tools, such as Cisco UCS Director Express for Big Data, to provision computing and storage resources.
- **Helping ensure isolation of users and data as resource deployments change:** In a mature big data environment, Hadoop processing can occur between many data sources and clients. Data is most vulnerable during job transitions or redeployment to other applications. Cisco ACI can automatically isolate the entire data path through a programmable fabric according to predefined policies. Access policies for data vaults can be preserved throughout the network when the data is in motion. This can be accomplished even in a shared production infrastructure across physical and virtual endpoints.

Delivering Big Data Security for the IoE Era

With 50 billion devices coming online by 2020, the topic of security has never been more important or challenging. Cisco's big data infrastructure is supported by an extensive security architecture that's designed to address the specific challenges of the IoE era. Our security solutions move beyond static security defenses that seek solely to prevent attacks, to a model that encompasses what needs to be done before, during, and after attacks.

Cisco Advanced Malware Protection (AMP) products act as a nerve center for a threat-centric approach to security. Cisco AMP provides continuous analysis that enables retrospective security capabilities that allow users to detect advanced malware in their systems if it evaded other defenses; track threats and alerts security teams to attack activity, scope, and root causes of a threat that evaded initial detection but was later identified; and precisely remediate it in their ecosystem, without having to deploy a "scorched earth" approach to eliminate the threat.

Big Data Means Big Business

Big data presents a powerful tool to help enterprises become more aware, predictive, and agile. The competitive environment will become more complex as big data grows. The infrastructure an enterprise selects and the speed with which the enterprise implements customized analytics solutions can either help it win or allow it to lose. From strategy to infrastructure, from access to analysis, Cisco helps enterprises use all of their big data to create an ongoing competitive advantage.

For More Information

www.cisco.com/go/bigdata