# Increase the Value and Relevance of Data in Motion



## What You Will Learn

Today's world is becoming increasingly connected. The Internet of Everything is emerging, with a continuous interaction among people, processes, data, and things. Sensors, networks, and smart devices are everywhere, providing a torrent of streaming data, or "Data in Motion." Although this data has tremendous potential, it retains its highest value for only a short period of time.

The intelligent network enables organizations to transform the challenges of Data in Motion into competitive advantages, with better decision making, enhanced customer experiences, and increased efficiency, all while the data is in motion.

Data in Motion represents a compelling opportunity for organizations in a variety of industries that rely on extracting value from data before it is stored, including retail, healthcare, manufacturing, energy production, and service provider market sectors.

With an intelligent network based on a secure architectural approach that can meet needs now and in the future, organizations can unlock the full potential of Data in Motion and build a foundation for sustainable growth through targeted communications, greater productivity, enhanced efficiency, and tangible service differentiation.

## Unlocking the Value of Dynamic Data

In today's increasingly connected world, organizations of all types have access to more data than ever before. A new Internet of Everything is taking shape around us, with people, processes, data, and things connecting together and collaborating in innovative ways. According to the 2012 Cisco® Visual Networking Index (VNI), there will be nearly 19 billion connected devices by 2016 - almost 2.5 connections for each person on earth.

Businesses have been grappling with massive amounts of stored data, or Data at Rest, for years. This huge store of data is often called "Big Data" and underlying it is the idea that the more data that is collected over time, the more valuable the data becomes. As the next step in the Internet evolution occurs, the vast number of connections will create extremely large quantities of data at an accelerated pace.

Although this new data has huge potential, much of it has value for only a short amount of time. Finding the data is not difficult, but choosing the best data to use from among all the data available can be difficult. The challenge is how to manage and extract value from a constant stream of information and turn it into a competitive advantage. This data stream is called Data in Motion.

The power of Data in Motion is not in the analysis of the stored data or examination of historical data. The real power of Data in Motion lies in the capability to create tools and interactions that matter here and now, in real time. By harnessing the value of Data in Motion through the intelligent network, organizations can make better decisions; deliver enhanced experiences to their customers, partners, and employees; and develop a competitive advantage over the long term (Figure 1).

**Figure 1.**    Data in Motion Is Easier to Capture Than Data at Rest, but Its Value Diminishes with Time
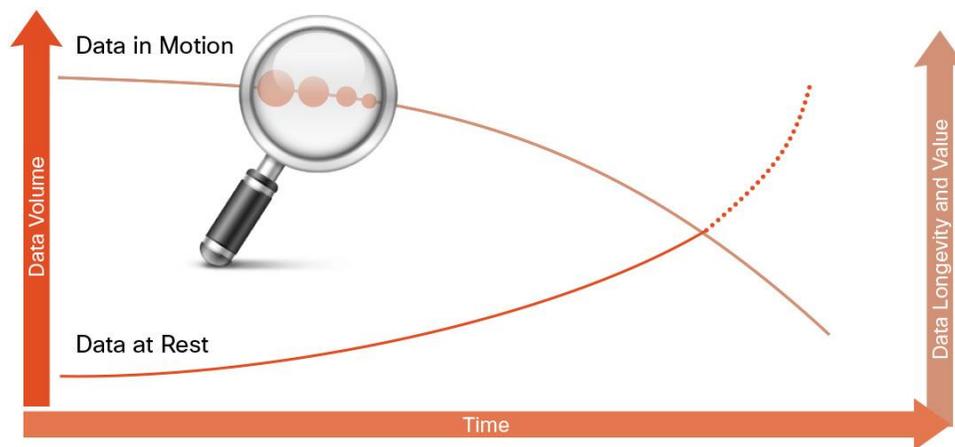


## The Internet of Everything Emerges

Networking has experienced tremendous change over the past 20 years, evolving beyond interaction and e-commerce toward the Internet of Everything, characterized by intelligence everywhere and ubiquitous automation.

The Internet of Everything brings together people, processes, data, and things to make networked connections more valuable and relevant. Sensors are appearing in every conceivable object and business environment, from automobiles and manufacturing equipment to handheld mobile devices and even home appliances.

The Internet of Everything builds on the foundation of the Internet of Things by adding network intelligence and security that allows convergence, orchestration, and visibility across previously disparate systems. As more things get online, Machine-to-Machine (M2M) interactions are increasing dramatically. According to Cisco's 2013 VNI Mobile study, global mobile M2M traffic is on pace to grow nearly 24-fold, from 24 petabytes per month in 2012 to over 560 petabytes per month by 2017.

Data in Motion has characteristics unlike any data source that came before. It has massive volume - an estimated 5 exabytes of information every two days according to Google CEO Eric Schmidt. It also has rich variety, including personalized social data, video, and information created by a plethora of new devices and sensors. All this data is moving at tremendous velocity, and its value is fleeting unless it can be captured, analyzed, and responded to in real time. For some industries, such as financial services organizations, even a few milliseconds can have multimillion-dollar implications.

Unlocking the promise of these massive, dynamic sets of data requires more than data analytics; it requires the capability to create applications that matter here and now. It involves an architectural approach to the network, with an intelligent, scalable infrastructure that combines sophisticated automation with robust security in every step of the process.

In today's highly instrumented world, organizations can capture more data than ever before, making the true challenge deciding which data to store and which data to ignore. Storing too much data is cumbersome and costly, but discarding valuable data has a cost as well, in missed opportunities.

Applying intelligence is crucial to harnessing the potential of Data in Motion. The network is the logical place to start, because it is the only infrastructure element that touches data through its entire lifecycle of creation, processing, and consumption. It offers the scalability and manageability required to address the complex demands of Data in Motion as well as the capability to filter data based on relevance in real time, prioritizing data to help determine which data should be analyzed and which data should be discarded.

With the right infrastructure, Data in Motion becomes faster and cheaper to use than Data at Rest because Data in Motion is easier to locate and does not need to be retrieved from its stored state and then pushed through the analytical engines. The intelligent network enables organizations to transform the challenges of Data in Motion into a competitive advantage. At the same time, organizations can position themselves to unlock substantial benefits for their businesses, customers, and partners by:

- Creating new personalized services
- Empowering customers and citizens
- Creating more interactive, relevant experiences to build better relationships
- Providing deeper customer insights for better decision making
- Managing security, risk, and compliance more effectively

## Forging Lasting Relationships with Retail Customers

Acquiring - and acting on - timely data is especially critical for retail environments. Today's retailers can potentially access enormous amounts of data from consumers. The real challenge is making sense of the data and putting it to use while it still offers value.

Using Data in Motion streams from video, social, and mobile sources, retailers can create new ways to engage with customers, boost revenue, and deliver a richer, more interactive customer experience.

For example, video is already a significant source of Data in Motion. Using the intelligent network, retailers can tap the value hidden in this data to understand and interact with customers better and faster than ever before. Using high-definition video surveillance cameras in combination with data analysis, they can gain insight into age, gender, emotional state, and socioeconomic indicators and employ facial recognition technologies.

Comprehensive video and data analysis can also support smart mirrors that combine live video of the customer with product images of, for example, clothing and accessories and then display the result. Using this smart mirror technology, a customer can "try on" a virtual outfit, experiment with a variety of colors and patterns, and share their new look online before making a purchase.

Mobile devices also provide a powerful way to gain new insight into customer behavior. By tracking a consumer's location and online interactions, retailers can develop valuable contextual information while enabling store touch points such as real-time promotions with mobile access. According to the Cisco Internet Business Solutions Group, adopting these technologies can improve retail profit margins by as much as 54 percent.

## Delivering More Proactive, Cost-Effective Healthcare

Healthcare is another area in which Data in Motion delivers substantial benefits. The healthcare industry is facing significant challenges, including rising costs and greater demands from an aging population.

In response, many health organizations are turning to IT solutions to reduce expenses and to overcome barriers to communication, collaboration, and productivity. As medical devices become increasingly connected, healthcare providers are gaining access to an abundance of data from medical sensors, imaging equipment, and other devices. They are looking for better ways to extract value and act on this data in real time, to enhance efficiency, control costs, and improve patient outcomes.

For example, to maintain and improve patient care in a cost-effective way, healthcare providers can use M2M technology to remotely monitor the progress of patients in their homes. Remote monitoring is more efficient and cost effective than having patients repeatedly visit healthcare facilities. It also makes healthcare accessible to patients who are unable to travel easily or who live in remote areas.

In medical emergencies, when every second counts, patient monitoring devices can automatically transmit data from a patient traveling in an ambulance to a hospital's emergency room. Additional remote patient care services include delivery of clinical services at a distance (telemedicine), in-home health monitoring (telehealth), and telecounseling, and use of devices that can monitor falls and detect fires.

According to a study by the Cisco Internet Business Solutions Group, connected healthcare and patient monitoring can create US$106 billion in value.

## Enhancing Manufacturing Across the Supply Chain

The manufacturing industry has been generating and capturing massive amounts of data to design and build products for decades. Manufacturers collect data related to equipment events, product genealogy, product traceability, and regulatory conformance to boost productivity, improve quality, reduce costs, and improve quality.

Data analysis is not new in manufacturing, but as new automation technologies appear and the global supply chain evolves, the volume, variety, and velocity of data is increasing dramatically. According to Cisco's 2013 VNI Mobile Data Forecast, by 2017, there will be 1.7 billion M2M wireless connections, including asset tracking systems in shipping and manufacturing sectors. With Data in Motion, manufacturers can apply network intelligence to extract more value from data throughout all their processes.

On the factory floor, Data in Motion can enable manufacturers to achieve better visibility into processes for monitoring and control. For example, video analysis can be used to track the movement of machines, products, and people. If a problem arises, the intelligent network rapidly can locate the most appropriate personnel and help virtual teams collaborate and share information before the problem becomes severe.

The result is improved control, agility, and flexibility and a significant return on investment (ROI). According to the Cisco Internet Business Solutions Group, this smart factory technology can create $1.95 trillion in value by 2022.

## Powering Scalable, Secure Energy Production

Energy and utility environments are excellent areas for Data in Motion applications. Energy companies use multiple communication networks connected to a variety of measurement and control devices used in power grids. Traditionally, the monitoring and management of utility systems and devices has been a slow, sometimes manual process, limiting utilities' capability to measure and respond quickly to changes in equipment condition, power system status, and loads.

By converting disparate traditional communications networks into a single unified infrastructure, utilities can provide greater flexibility and functions for customers while helping ensure reliable and secure delivery of high-quality, sustainable electric power. Organizations can extend visibility, manageability, and robust security all the way to the point of connection with devices throughout the power grid. Smart grid devices can analyze measurement data, act immediately where necessary, and transmit information to other grid devices and to control centers. Increasingly, commercial and industrial buildings and residences are teaming with electric utilities through the use of responsive loads, and they must communicate with the utility for more than metering, using technologies enabled by Data in Motion.

With Data in Motion, utilities can scale communication networks to handle the rapidly increasing data volumes that come with the growing number of intelligent devices needed to support advanced power system capabilities.

## Helping Service Providers Monetize Network Intelligence

Service providers are constantly looking for new ways to differentiate themselves and extend their market reach in a highly competitive marketplace. Through the use of Data in Motion, they can find new ways to monetize their services, gain deeper insight into customers, and deliver a superior, more personalized customer experience.

Data in Motion is still an untapped opportunity for most service providers, who already have an abundance of data flowing through their networks. Their networks and users are constantly generating huge amounts of real-time and near-real-time data, packed with details such as location, content, and subscriber information that can be analyzed and correlated in real time to find usage and traffic patterns, perform network congestion analytics, assess media behavior, perform dwell-time analytics, and more.

By capturing, filtering, and analyzing real-time information, service providers can gain critical intelligence into business-to-consumer, business-to-business, and consumer-to-consumer interactions to both better monetize their existing offerings and find new revenue opportunities.

For example, a service provider can extract detailed data such as a user's device type, data quota, recent Internet activity, and current connection speed. Armed with this real-time intelligence, the service provider can offer highly targeted mobile advertising or sponsored data - and charge a premium for it.

## Building Value Through an Intelligent Network

Cisco offers a unique architectural approach to enable organizations to implement the intelligent infrastructure required to make the benefits of Data in Motion a reality.

In the Internet of Everything, data collection starts at the network edge, including at a variety of endpoint devices and sensors in everyday objects that collect, analyze, and transmit data - including video - automatically, on a massive scale. The velocity and volume of this information make it difficult to bring this data together in one place and extract value from it in a timely way.

Intelligence and automated data processing must be embedded at the network edge. This intelligence takes the guesswork out of selecting the correct data from the torrent, because the network can filter based on relevance. At the same time, it can use value policies to prioritize the data to help determine which data to retain and which data to discard. The capability to deploy analytics anywhere in the network provides tremendous architectural flexibility in designing tomorrow's solutions with outstanding capacity, low latency, and efficiency.

Security is always important for business-critical applications, and it is especially vital for Data in Motion, where data needs to be protected in real time and intrusions need to be detected as rapidly as possible, before irreparable damage occurs. Security at the point of collection, analysis, and use, and at all points in between, is critical in detecting threats and protecting the network against intrusion and tampering.

Scalability is also an essential network requirement, enabling organizations to accommodate increasingly complex demands and escalating sets of dynamic data for business agility and peace of mind.

## Anticipating Tomorrow's Opportunities

The world is becoming more connected than ever before, unleashing a flood of new data. This torrent of information presents challenges, but it also promises great opportunities.

With an intelligent network based on a secure architectural approach that meets needs now and into the future, forward-thinking organizations can capture and act on the most relevant data while it is still in motion, and while it retains its maximum value.

Cisco and its partners provide the technology building blocks needed to achieve the full value of Data in Motion. Cisco solutions include data creation, collection, and security, while also providing intelligent connectivity from the device to the cloud.

By mastering Data in Motion to unlock its potential in real time, organizations can become more predictive, proactive, and insightful.

## For More Information

Read more about Cisco Data in Motion solutions.

Printed in USA

C11-728804-00   06/13