Build Your Competitive Edge in Big Data with Cisco

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Senior Global Marketing Manager Big Data
Cisco Systems
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Big Data Trends
Increasingly Everything will be Connected to Everything
Massive increase in connections between people, process, data, and things

In the Internet of Everything Era, Big Data will Get Much BIGGER!

All of these connections will be capable of producing data

**50B**

“Smart Connections”

**Inflation point**

**BILLIONS OF CONNECTIONS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Connections (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>6.8</td>
</tr>
<tr>
<td>2015</td>
<td>7.2</td>
</tr>
<tr>
<td>2020</td>
<td>7.6</td>
</tr>
</tbody>
</table>

**WORLD POPULATION**

- 2010: 6.8 billion
- 2015: 7.2 billion
- 2020: 7.6 billion

**TIMELINE**

- 2010
- 2015
- 2020
Big Data Investments Continue to Rise

Investments in Big Data Technology

<table>
<thead>
<tr>
<th>Year</th>
<th>Don't know</th>
<th>No plans</th>
<th>Plan within 2yrs</th>
<th>Plan within 1yr</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>10%</td>
<td>30%</td>
<td>50%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>8%</td>
<td>32%</td>
<td>50%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>5%</td>
<td>35%</td>
<td>50%</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>
Data & Analytics Unlock the Value in the Internet of Everything

$7.3T$ of the $19T$ IoE Opportunity over the Next 10 Years will be Realized Through Data & Analytics

Source: Cisco Consulting Services primary research, 2013
Despite the Opportunities, Big Data Adoption is at the Early Stages

Which of the following best describes your organization's stage of big data adoption?

- 24% No plans to invest at this time
- 19% Developing strategy
- 27% Piloting and experimenting
- 13% Deployed

Only 13% have reached deployment, up from 8% in 2013.
Brave New World
Getting Insight from the Data is the Client’s Biggest Challenge

- **Things**
  Connecting the right “things” (e.g., machines, devices, equipment) to capture useful data

- **Data**
  Effectively capturing, storing, and analyzing data generated by connected “things” (e.g., machines, devices, equipment)

- **People**
  Enabling workers to effectively use IoT solutions through means such as training and providing user-friendly systems

- **Process**
  Updating our business and operational processes to benefit from IoT solutions

1230 Respondents

Source: Cisco Consulting Services Global IoT Study, 2014
A New Approach is Needed to Reach and Analyze That Data

Structured Data
- Traditional Data Warehouse

Unstructured Data
- Big Data Store

Data Streaming at the Edge

Analytics 1.0
- Days/Hours

Analytics 2.0
- Hours/Minutes/Seconds

Analytics 3.0
- Seconds/Milliseconds
Data & Analytics Use Cases

**AUTOMOTIVE**
Auto sensors reporting location, problems

**COMMUNICATIONS**
Location-based advertising

**CONSUMER PACKAGED GOODS**
Sentiment analysis of what’s hot, problems

**FINANCIAL SERVICES**
Risk & portfolio analysis
New products

**EDUCATION & RESEARCH**
Experiment sensor analysis

**HIGH TECHNOLOGY / INDUSTRY SCIENCES**
MFG.
Mfg. quality
Warranty analysis

**MEDIA/ENTERTAINMENT**
Clinical trials
Genomics

**ON-LINE SERVICES / SOCIAL MEDIA**
People & career matching
Web-site optimization

**OIL & GAS**
Drilling exploration sensor analysis

**RETAIL**
Consumer sentiment
Optimized marketing

**TRAVEL & TRANSPORTATION**
Sensor analysis for optimal traffic flows
Customer sentiment

**UTILITIES**
Smart Meter analysis
for network capacity

**LAW ENFORCEMENT & DEFENSE**
Threat analysis - social media monitoring, photo analysis

**HEALTH CARE**
Patient sensors, monitoring, EHRs
Quality of care

**LIFE SCIENCES**
Clinical trials
Genomics

**HIGH TECHNOLOGY / INDUSTRY SCIENCES**
MFG.
Mfg. quality
Warranty analysis

**MEDIA/ENTERTAINMENT**
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Sensor analysis for optimal traffic flows
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for network capacity

**LAW ENFORCEMENT & DEFENSE**
Threat analysis - social media monitoring, photo analysis
Growth in Big Data Has Significant Implications for IT

**Performance and High Availability**
Enterprise-grade performance and high availability become table stakes

**Management**
Hundreds/thousands of servers and switches will require a large numbers of management tasks

**Deployment Speed**
As big data grows, IT will need to quickly and cost-effectively scale resources

**Scalability**
Larger data clusters will require significant increases in capacity, scalability

**TCO**
Overall economics become even more important

It’s Important to Choose the Right Big Data Solution from the Outset to Maximize Impact and ROI
The Old Data Lifecycle

*Multiple Silos. Multiple Views. Multiple Goals.*
The Old Data Lifecycle

*Multiple Silos. Multiple Views. Multiple Goals.*

- Manage
  - Data Center Operator
  - IT

- Build
  - Architect
  - Data Scientist

- Query
  - Business User
  - LOB
Cisco Big Data and Analytics Partner Ecosystem

Data Management
- Hadoop
  - Cloudera
  - MapR
  - Hortonworks
  - IBM
  - IBM HD

Massive Parallel Processing
- Pivotal
- Greenplum
- Qubole

NoSQL
- Oracle
- MongoDB
- DataStax
- MarkLogic
- MongoDB
- Matrix

Data Integration
- splunk
- SAS
- Elasticsearch
- SAP
- Informatica
- AppFluent

Analytics / Business Intelligence
- Tableau
- Zettics
- MicroStrategy
- RetailNext
- AGT International

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Financial Services Example  
Gaining a 360-Degree Customer View

<table>
<thead>
<tr>
<th>CHALLENGES</th>
<th>INSIGHTS AND IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Customer experience</strong>: Develop relevant and forward-looking customer solutions that drive a better, more personalized experience for both senders and receivers.</td>
<td>• In real time, the company can now affect transactions and improve customer compliance in a way that results in better conversions for the company's customers</td>
</tr>
<tr>
<td>• <strong>Security, risk, and compliance</strong>: Use real-time ingest, processing, and analytic capabilities on multistructured data—streaming from mobile, web, and retail sources—to help reduce risk and enhance anti-money-laundering (AML) compliance at scale.</td>
<td>• Queries now execute two orders of magnitude faster than before</td>
</tr>
<tr>
<td></td>
<td>• 99% of all queries now execute in less than 15 minutes.</td>
</tr>
<tr>
<td></td>
<td>• Data reload times are now 60 times faster than before.</td>
</tr>
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<table>
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<tr>
<th>SOLUTION</th>
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<tr>
<td>• Cisco UCS® Integrated Infrastructure for Big Data (third generation of Cisco UCS Common Platform Architecture for Big Data)</td>
</tr>
<tr>
<td>• Red Hat Enterprise Linux</td>
</tr>
<tr>
<td>• Major Hadoop distribution</td>
</tr>
</tbody>
</table>
Retail Industry Example
Delivering Market Research to the Retail Industry

CHALLENGES

- Cut costs by decreasing mainframe loads and reducing mainframe support needs
- Build the foundation for a more cost-effective, flexible, and expandable data processing and storage environment.
- Continue to find ways to collect, process, and manage big data efficiently so the company can provide its clients with leading insights and contribute to its business growth.

SOLUTION

- Cisco UCS® Integrated Infrastructure for Big Data
- Red Hat Enterprise Linux
- Leading Hadoop distribution

INSIGHTS AND IMPACT

- Company saves over $1.5 million per year by using a big data solution incorporating Cisco UCS and Red Hat Enterprise Linux to speed up performance and reduce the mainframe load.
- Hadoop is not only saving the company money, but it also provides a flexible platform that can easily scale to meet future corporate growth.
Telco Industry Example
Wireless Service Provider Gains Powerful Insights and Efficiencies

**CHALLENGES**

- Improve efficiency of new product development
- Reduce data analysis costs
- Increase efficiency of infrastructure and management
- Improve customer satisfaction

**INSIGHTS AND IMPACT**

- CapEx savings of $1.2 million, with a significant portion of savings coming from cabling and switching efficiencies
- Reduced management complexity and OpEx, with ability to deploy new systems in minutes, instead of hours or days
- Ability to gain valuable intelligence from processing unstructured data

**SOLUTION**

- Cisco UCS® Integrated Infrastructure for Big Data
  Cisco UCS C-Series Rack Servers
  Cisco UCS 6200 Series Fabric Interconnects
  Cisco Nexus® 2232 Fabric Extenders
  Cisco Nexus 7000 Series Switches
- Red Hat Enterprise Linux
- Leading Hadoop distribution
## Insurance Industry Example
Big Data Used to Tailor Products, Improve Customer Satisfaction

### CHALLENGES

- Become more competitive and regain market share
- Significantly increase speed of data analysis
- Effectively use vast quantities of structured and unstructured data

### INSIGHTS AND IMPACT

- Data analysis is 75 times more accurate, supporting better decision making
- Able to better tailor policies based on improved risk analysis
- Data processing is 500 times faster, speeding timely decisions
- Simplified operations and lowered TCO

### SOLUTION

- Cisco UCS® Integrated Infrastructure for Big Data
  - Cisco UCS C240 M3 and C460 M2 Rack Servers
  - Cisco UCS 6200 Series Fabric Interconnects
  - Cisco Nexus 2232 Fabric Extenders
  - Cisco Advanced Services
- Red Hat Enterprise Linux
- Leading Hadoop distribution
Why Cisco
#1 Americas revenue market share in x86 blades

#1 Networking Vendor

More than 85% of all customers have invested in UCS

40,000+ UNIQUE UCS CUSTOMERS

$10B+ Data Center Annualized Revenue Run Rate

3,700+ UCS CHANNEL PARTNERS

100+ World record performance benchmarks to date

Fortune 500

$10B+ Annualized Revenue Run Rate 2

Source: 1 DC Worldwide Quarterly Server Tracker, 2014Q1, May 2014, Vendor Revenue Share

Source: 2 As of Cisco Q3FY14 earnings results. Data Center Revenue is defined as Cisco UCS and Nexus 1000V
Cisco and Red Hat Together Help You to Meet Big Data Infrastructure Challenges and Uncertainties

- 30 years of network innovation
- Cisco UCS® server platforms taking the world by storm in just five years
- Industry-leading big data portfolio with Cisco UCS Integrated Infrastructure for Big Data (third generation of Cisco UCS Common Platform Architecture for Big Data)

- Leading innovator of open-source solutions
- Red Hat Enterprise Linux is trusted by 90% of Fortune 500 companies
  - Over a quarter of Red Hat’s Enterprise Linux customers deploy for big data applications
- Enterprise-grade solutions through community-driven innovation

Industry-Leading Portfolio with Major ISV and Storage Provider Partners
Cisco UCS Integrated Infrastructure for Big Data

- Industry leading solution deployed across major industry verticals
- Areas of focus: Hadoop, NoSQL, MPP Databases and Analytics
- Broad ecosystem partnerships with leading ISVs
- Pre-tested, pre-validated and documented best practice designs optimized for performance and capacity – lowering risk and TCO
- Designed to scale from small to very large as business demands
- Unified and centralized management with seamless Integration with enterprise applications
- ACI: simplify, optimize and accelerate
- Easy to {order, deploy, service}

Single SKU
Big Data Bundles

- Big Data Starter
- High Performance
- Performance Optimized
- Capacity Optimized
- Extreme Capacity
Easily Scale Cisco UCS for Big Data

SINGLE RACK
16 Servers

SINGLE DOMAIN
Up to 10 Racks, 160 Servers

MULTIPLE DOMAINS
Up to 10,000 Servers
Now you can buy Apache Hadoop directly from Cisco

Cisco now sells and supports all three Hadoop partners, Cloudera, Hortonworks and MapR, directly from Cisco, or from Cisco’s channel partners, worldwide.

<table>
<thead>
<tr>
<th>Hadoop Software</th>
<th>Cisco PID</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOUDERA ENTERPRISE BASIC EDITION</td>
<td>UCS-BD-CEBN=</td>
</tr>
<tr>
<td>CLOUDERA ENTERPRISE FLEX EDITION</td>
<td>UCS-BD-CEFN=</td>
</tr>
<tr>
<td>CLOUDERA ENTERPRISE DATA HUB EDITION</td>
<td>UCS-BD-CEDN=</td>
</tr>
<tr>
<td>HORTONWORKS ENTERPRISE EDITION</td>
<td>UCS-BD-HDP-ENT=</td>
</tr>
<tr>
<td>HORTONWORKS ENTERPRISE PLUS EDITION</td>
<td>UCS-BD-HDP-EPL=</td>
</tr>
<tr>
<td>MapR M5 EDITION</td>
<td>UCS-BD-M5-SL=</td>
</tr>
<tr>
<td>MapR M7 EDITION</td>
<td>UCS-BD-M7-SL=</td>
</tr>
</tbody>
</table>
Cisco Connected Infrastructure Reaches from the Data Center to the Edge

Operational Consistency
Data Mobility
Optimized Form Factors
Intercloud
Fog & Edge
Core Data Center
BRANCH & REMOTE SITES
ENTERPRISE
APPS
SCALE-OUT
IoT
MOBILITY
CISCO INTERCLOUD FABRIC
UCS Mini
UCS for Enterprise
Nexus Family
ISR
APIC EM
AP
MS
CGR
IE
Video
Cloud Services
and Applications
Partner Clouds
Connected
Home
ENTERPRISE DC & CLOUD

Trend Analysis
6X speed up in fraud detection by utilizing large memory
Fraud Detection
1.5X transaction processing power
Transaction Processing
20-30% better in all aspects but same $/performance as previous generation

Recommendation Engine
4X Compute density, on demand provisioning

Network Plane, Control Plane — ACI, End-to-End Isolation
Management: UCS Central, Director, Manager, Express
Cisco Application Centric Infrastructure
Rapidly Configure the Data Center Fabric for Dynamic Application Needs

Applications Run Natively IN Hadoop

- BATCH (MapReduce)
- INTERACTIVE (Tera)
- ONLINE (Hive)
- STREAMING (Storm)
- GRAPH (GraphX)
- IN-MEMORY (Spark)
- CPU MPI (OpenMPI)
- OTHER (Hadoop)
- YARN (Cluster Resource Management)
- HDFS2 (Redundant, Reliable Storage)

Other Applications (Incl. Big Data)

- SAP
- ORACLE
- Microsoft
- IBM
- BMC
- Splunk
- Symantec

Multi-Tenant Isolation
Keep data flows separate by tenant in shared infrastructure

Workload Optimization
Triple digit (%) improvements in workload completion

Workload Prioritization
Rapid re-deployment across multiple application peaks

Data Center Fabric (Nexus 9000 Series)

Application Policy Infrastructure Controller
**Business Value As Measured by IDC**

**ROI Summary for Cisco UCS as a Platform for Mission-Critical Applications**

- **5 Year ROI**: 368%
- **$4.79M**: 5 Year Total Business Benefit
- **10 MONTHS**: Payback Period

**Business Value Benefits:**

**Average Annual Benefits per 100 Users**

- **Business Productivity**: $3,108
- **Risk Mitigation and User Productivity**: $2,580
- **Infrastructure Cost Reduction**: $701
- **IT Staff Productivity**: $3,172

**Key Performance Improvements Realized from Customers Who Deployed Cisco UCS**

- Reduction in Staff Time Needed for Server Management: 68%
- Reduction in Staff Time Needed for Server Deployment: 84%
- Reduction in Productive Employee Time Lost due to Hardware Downtime and Degradation: 96%

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