Huawei Technologies

Intelligence for Agile Business - Huawei Fusion Insight Big Data Solution

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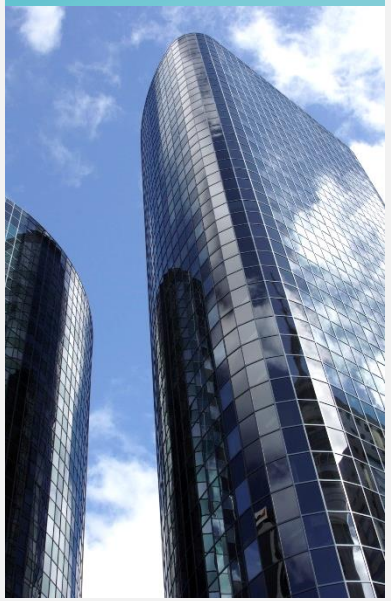
Huawei: A Global Leader of ICT Solutions

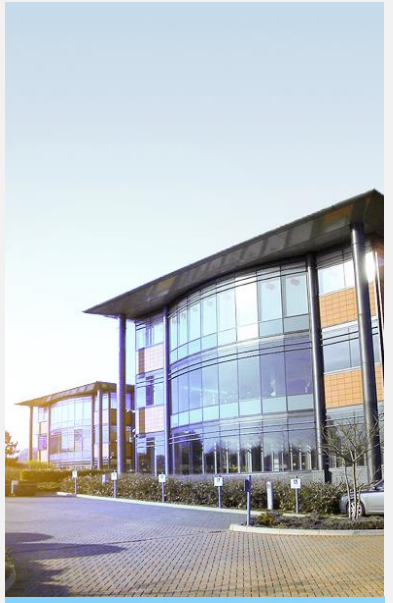
170+
Countries

129
Ranking in Fortune Global 500 (Jul 2016)



176,000
Employees

79,000
R&D Engineers



36
Joint Innovation Centers

16
R&D Centers

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Continuous Innovation Investment

R&D Investment

USD37 billion over 10 years (from 2006 to 2015)

10%+ percentage of R&D investment to total sales revenue

79,000 employees: **45%** are R&D engineers

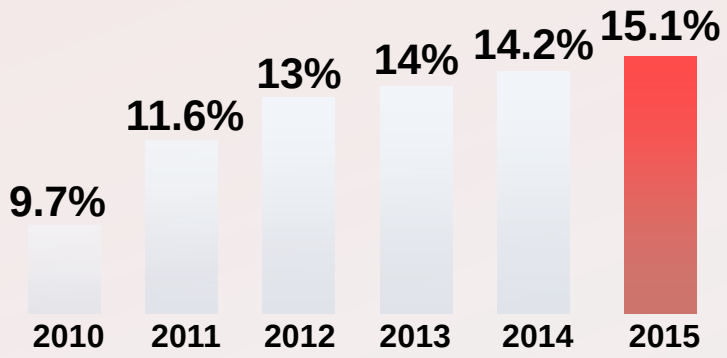
Standards

300+ international standards organizations, industry alliances, open-source communities

280 important positions in standards organizations

43,000 accumulated proposals

Continuous Increase in Percentage of R&D Investment to Total Sales Revenue



Patents

50,377 —— patents authorized

52,550 —— patent applications in China

30,613 —— patent applications outside China

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1 Industry Trend

Big Data Era

Booming IT Industry

Mobile Internet

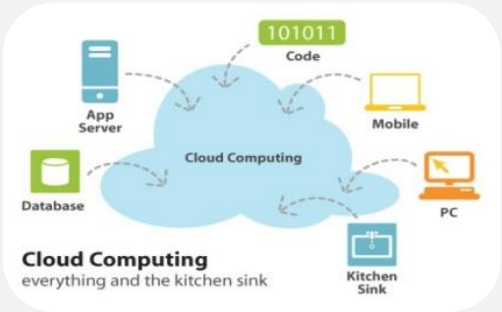
7+ billion users
Approximate to the global population

78% compound annual growth rate (CAGR)

Sociality

Sociality as business

86% enterprises explore businesses using social media



Cloud computing

Cloud as new-generation IT infrastructure

56% SMEs buy cloud services

Big data

Data as asset

In the next **five** years, data is critical to the competitions between enterprises.

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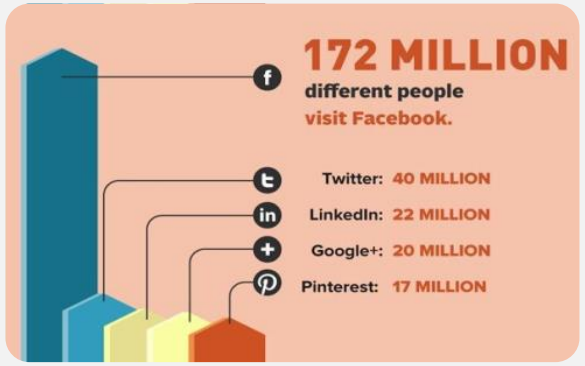
Embarking on an Big Data Era



1000+ PB

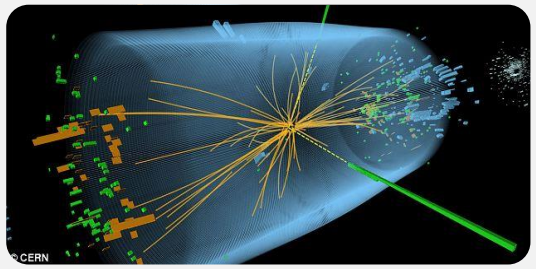
(Data generated by 240 million netizens per day)

63% GAGR

(Unstructured data growth rate)

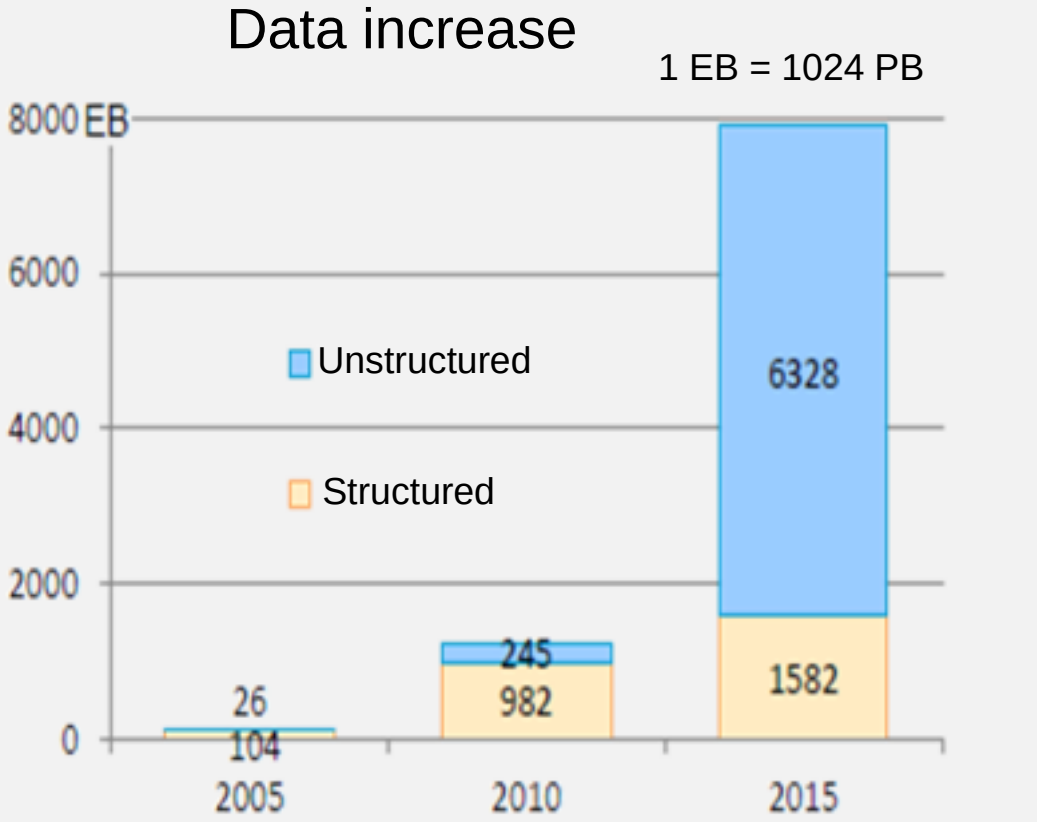
30+ TB

30+ million transactions/day



1 PB/second

CERN: speed of data nuclear



Moore's Law: $Y = C \times 2^X$

X: Time ; Y: Shared data volume; C: Currently shared data volume

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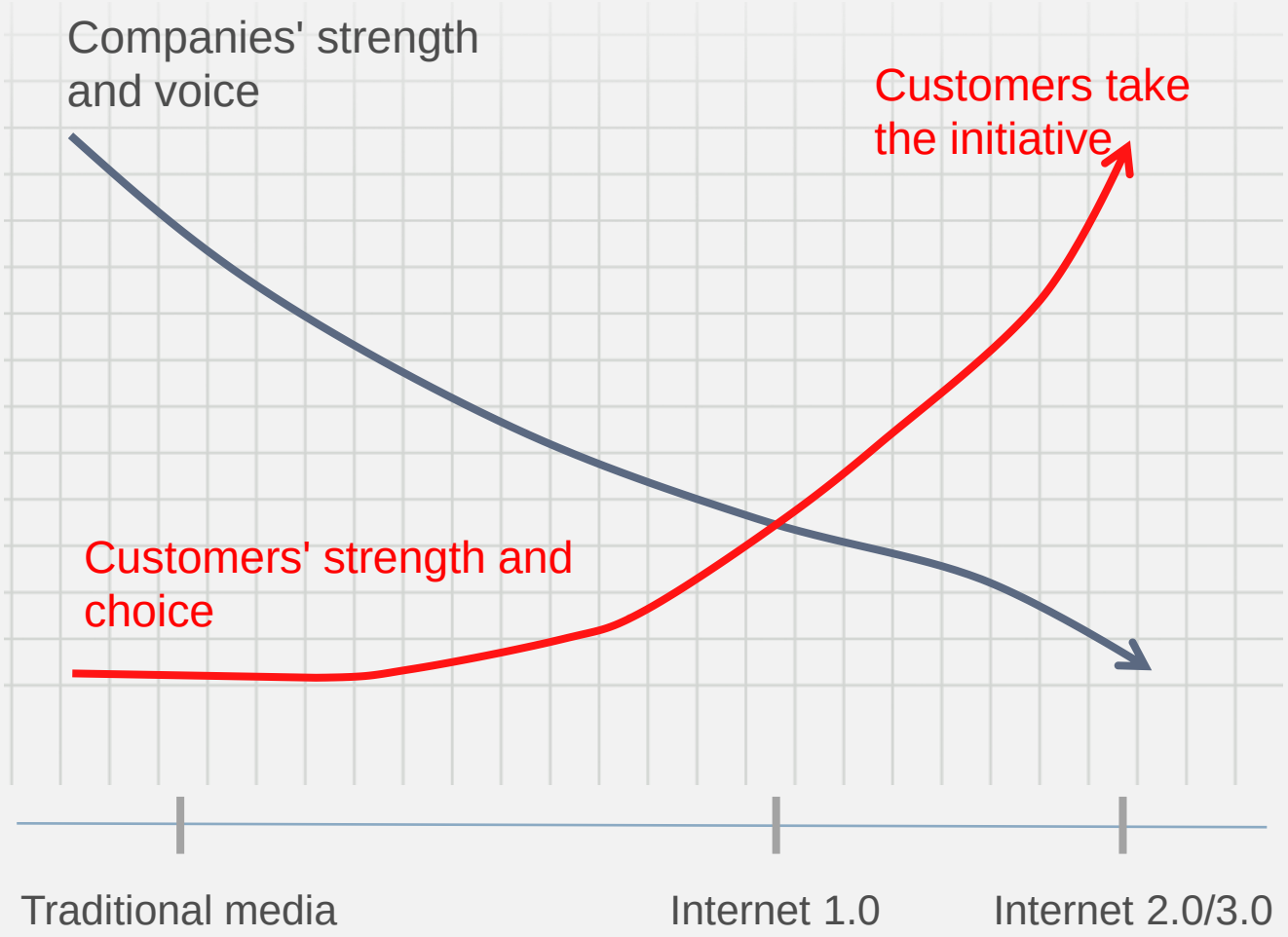
Efficient Data Analysis Helps Improve Enterprise Competitive Strength



Big data enables accurate prediction of customer demands, insight into the market, and product innovation.

- Finance: real-time credit investigation, precision microfinance, and anti-spoofing …
- Telecommunication: traffic management, customer retention, and service plan precision marketing
- Public security: peer vehicles and automobile crash analysis
- E-commerce: "anticipatory shipping" launched by Amazon
- Media: *House of Cards* by Netflix
- …

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2 Big Data Challenges

Mainstream Challenges and Practical Examples

Customer: Big Data Practical Challenges

Silo Application Internally	Traditional System Architecture	Weak Big Data Analysis Capabilities	Lack of External Data Monetization Platform

"The data is not centralized, it is spread out in different systems and in several provinces. So, it takes ***long time to collect information, to trust on that and to work out on data mining.*** *Fundamental changes need to be done to overcome this scenario."*

------Megafon marketing head, Mr. Leonid Savkov

"Currently we spend ***90% of the time to collect information and just 10% analyzing it****, pushed by HLs that are looking for conclusions and results.* ***Formats are all different*** *and needs to be unified."*

"Internal monetization is the key focus now *but will reach a limit.* ***DaaS is a new field and it is necessary to start now*** *once this is where the new revenues will come from in the future."*

-----Mobily chief BI & data officer, Mr. Carlos Domingo

"The ***key challenge for big data is capable human resource to analyze data from different systems and to come up with business insights.*** *In Turkcell, we are using start ups to make this work for us."*

------Turkcell CTO, Mr. Ilker Kuruoz

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Finance – Big Data Helps Banks to Better Understand Customers and Identify Potential Risks

A customer wants to apply for a credit card.

2-4 weeks

- Customer information system
- Transaction system
- Credit system
- …

Big data platform

Real-time credit investigation, precision marketing, online details, and precision microfinance

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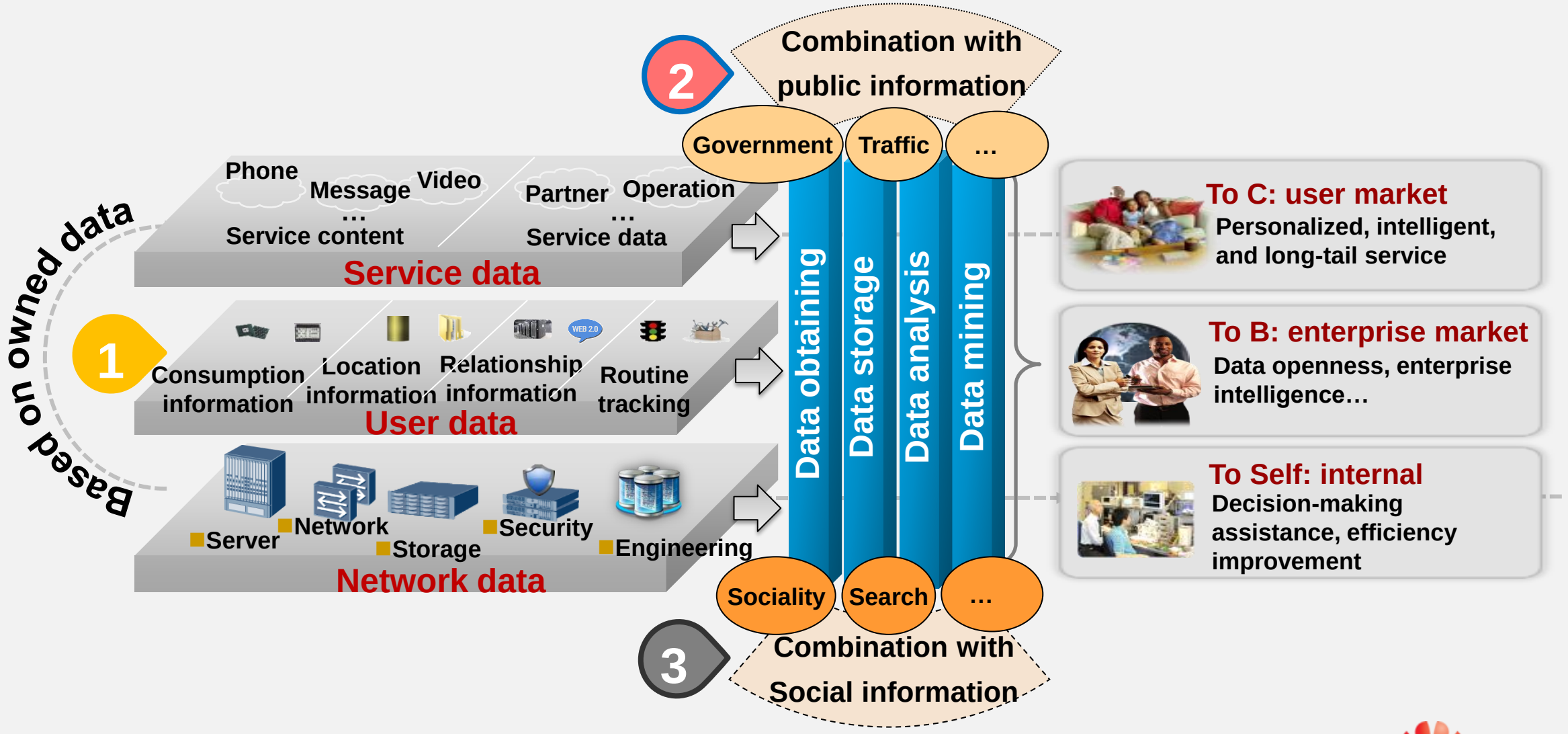
Carrier – Big Data Supports Transformation to Digital Telco



Customer: Big Data Enables Internal Operation Efficiency

Churn Prediction & Customer Retention

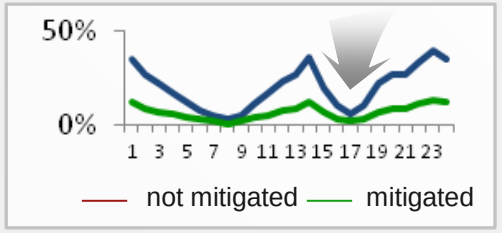
- **18% -** Churn Prediction Accuracy Improved
- **36% -** User Retention Success Rate
- **5-10% -** Churn Rate Decrease

1. **Analysis on source data**
2. **Churn Prediction**
3. **Retention & Closed-loop**

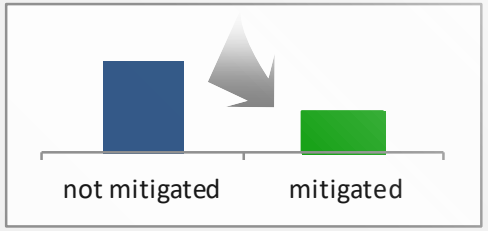
Smart Pipe & User Experience Management

- **80% -** Reduce Complaint Rate
- **100% -** Reduce Expansion for Congested Areas
- Utilize real time network analysis to support dynamic network control and user experience improvement

Improving network KPI



Saving expansion CAPEX



Customer: Big Data Enables External Data Monetization

Mobility Insight for External Monetization

- TLF Dynamic Insight dept. cooperated with GFK to provide digital footprint data services
- **+$10M revenue / year** - Smart Step to provide consumer location streaming information for partners

recise Marketing Services for Partners

- Set up precise marketing department to provide insights data and precise marketing services to partners

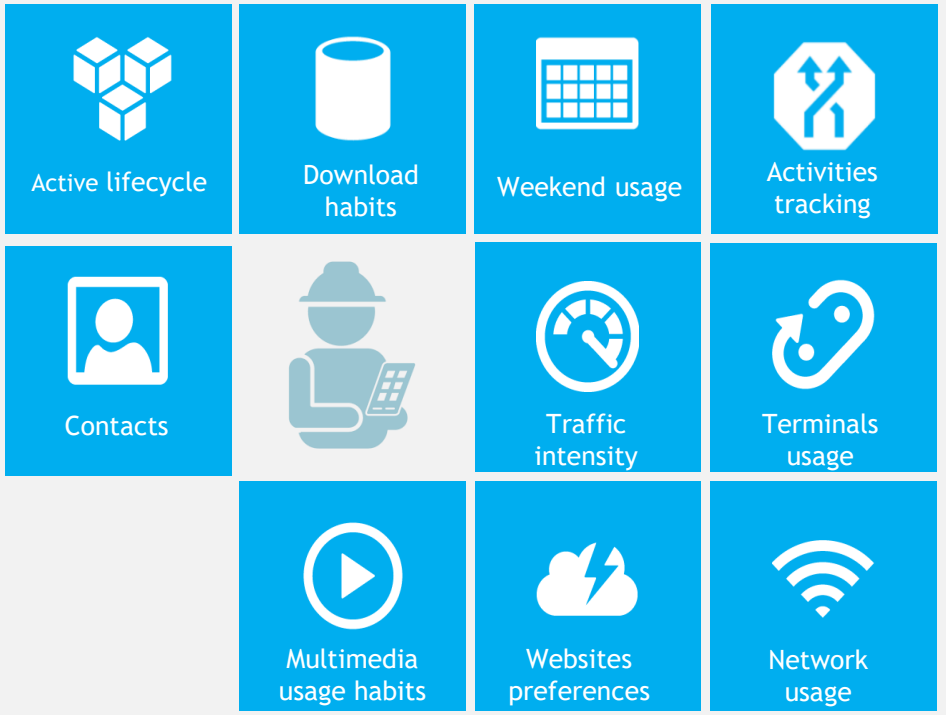
Customer 360° View

Basic Info
Gender, Age, ARPU, etc

Preference
Customer behavior, Channel, Terminal

Social Characteristics
Social Network, etc

Timeline & Geo-Analysis
Active Periods, Customer Location, etc

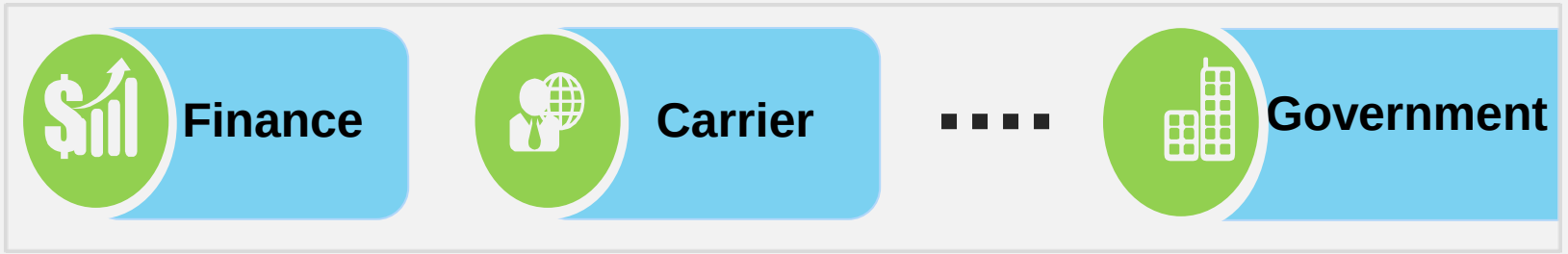


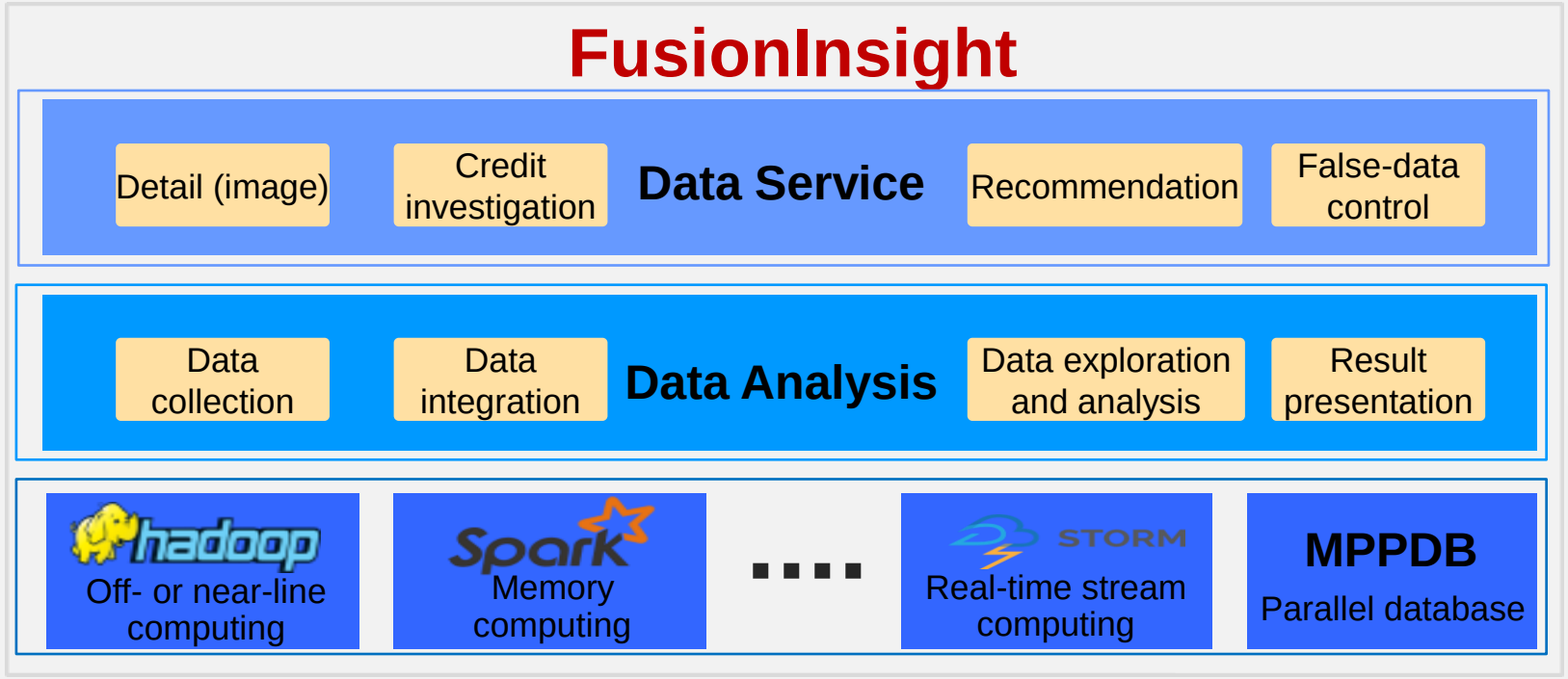
Profile	Tags
Basic Characteristics	94
Terminal info	80
Voice calls	88
Billing info	77
SMS/MMS	121
Traffic	70
Internet behavior	56
Apps	191
Product subscribed	5
IVR/Call center	96
Account settlement	120
Total	**998**

3 Huawei Big Data Solutions

Huawei Products & Solutions

Huawei FusionInsight Positioning: Enterprise-Class Data Processing, Analysis, and Mining Platform





Agile

–Fully open architecture: linear performance improvement
–Various tools supported: efficient development, operation, and maintenance
–Powerful SQL capability: convenient service migration

Smart

–Full modeling: deep insight
–Huawei-developed algorithm: efficient and accurate

Trusted

–HA of all components, remote DR, and financial data protection
–Open-minded and trustworthy partner working for a win-win situation

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Optimal Performance: High Density Servers

High-Performance Servers

X6800

Phi

GPGPU

Compute node

Storage node

I/O node

Highlight

20+ TFLOPS Computing Capability/Chassis

8× double slots GPGPU/Phi

16× ES3000 PCIe cards

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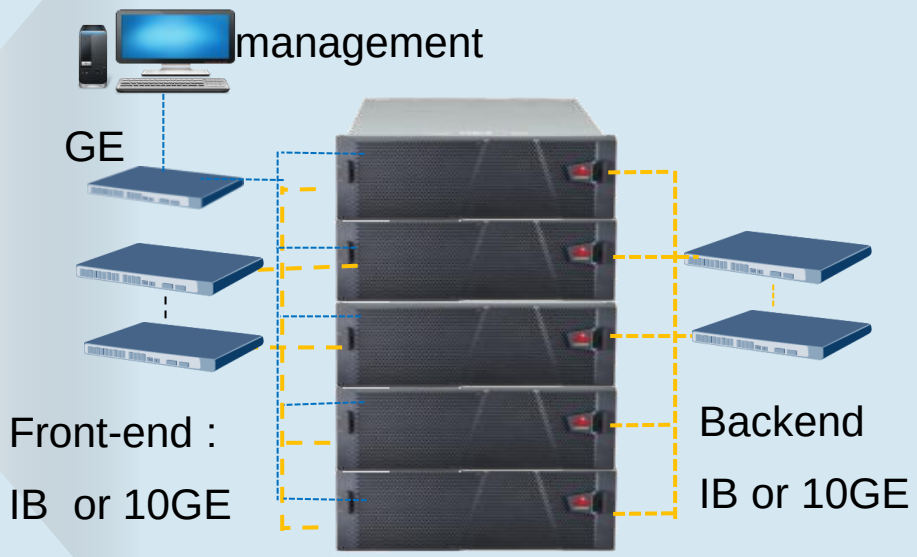
Optimal Performance : Storage Solution

Distributed NAS



Oceastor9000

Highlight

100PB
The biggest file system

400GB/s Bandwidth
linear enhancement

N+M data protection
A fully symmetrical distributed architecture

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4 Huawei Big Data Success Stories

ICM UW is using Huawei Servers for Big Data Computing

Apache Hadoop and later Spark have been used at ICM in projects for several years now across a number of domains. – said **Professor Marek Niezgódka, managing director of ICM**. - *We have decided to acquire a dedicated HPC system for Big Data workloads to address the growing demand for these kinds of computations, boost development of analytical teams and increase competences in the multi-level data analysis. I believe Huawei equipment will meet our requirements in developing new algorithms and methods of data analysis based on multicore, multiprocessor and heterogeneous computing architectures.*

Challenges

- Interdisciplinary Centre for Mathematical and Computational Modelling (ICM) is a leading research centre for computational sciences in Central and Eastern Europe and has become a pioneer in Data Science in the scientific community..
- ICM build the largest Spark Big Data computing cluster in Central and Eastern Europe. A Big Data analysis platform will help to analyze the large scale projects like Visualization of Universe, Alzheimer Disease, Judicial Decisions

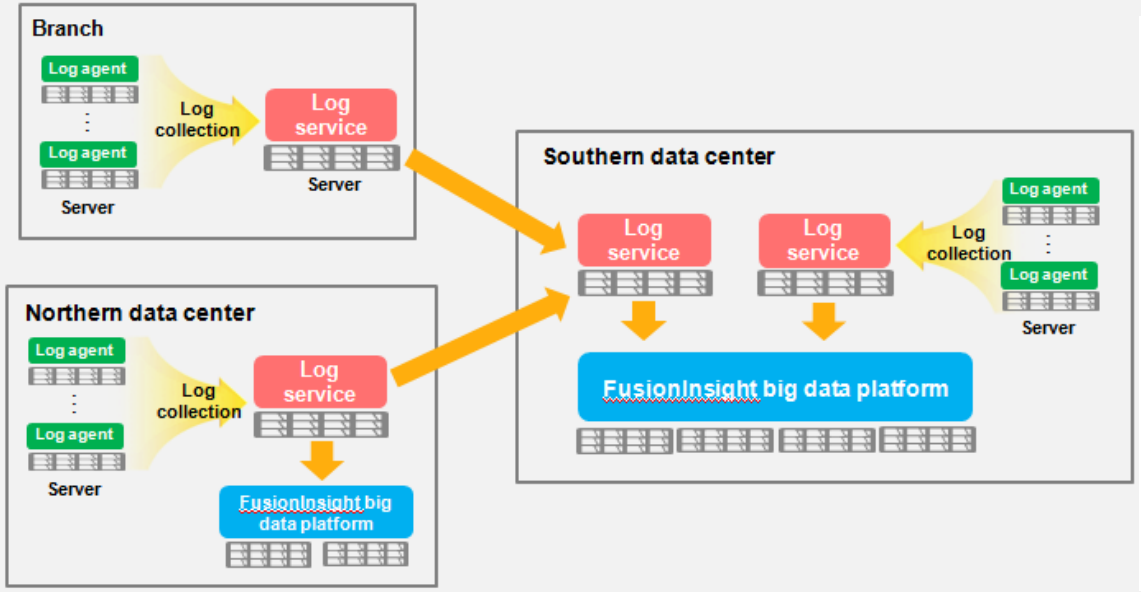
Solutions

- Huawei provided 360+ RH1288 V3 servers to build the Big Data computing
- Agile DC switches CE5855 and CE6810 are used for LAN and Management connectivity
- The Huawei RH1288 V3 server uses the latest Intel E5-2600 v3 series processors, and 6TB HGST hard drives and provides the industry-leading SPEC performance. It is the ideal choice for Spark platform.

Customer Benefits

- The Hadoop platform built with Huawei RH1288 V3 servers provides outstanding performance and improves Big Data analysis performance by 30%.
- Equipped with 6 TB of hard disks, the RH1288 V3 servers meet data storage requirements of the Hadoop platform, reducing the number of external storage devices.
- The innovative energy-saving and heat dissipation design reduces the platform power consumption by 10%.

Huawei Helps ICBC to Build a Distributed Log Collection + Data Analysis Platform



Challenges

- Facing fierce competition in Internet finance, ICBC wants to carry out precision marketing, strengthen its market presence, and raise Internet banking service quality to improve user experience.
- ICBC wants to improve fault locating accuracy and fault response speed based on the correlation analysis of security and O&M logs.

Solution

- **Enterprise-class big data platform:** highly reliable and secure, easy to development and manage
- **Distributed log collection system** automatically collects the logs from branches to the big data platform at the headquarters.
- **Unified management:** distributed log collection system + big data analysis platform
- Log-based **user behavior statistics and analysis model**
- Huawei has powerful **R&D term** and provides professional **consulting and tailored services**

Customer Benefits

- Unified distributed log collection + analysis big data platform
- Enables **real-time + offline precision marketing** based on statistics and analysis of Internet banking customers' behavior.
- Enables **accurate fault locating** based on security + O&M log correlation analysis.

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Huawei Big Data Platform Stimulates Service Innovation for China Unicom Shanghai

Challenges

- Siloed deployment of applications and independent storage for different types of application systems make data sharing impossible. It takes **several months** to collect information from different departments.
- **Inefficient data asset management** poses **data security risks** because the data volume, models, and rules are not clear.
- The current system supports **limited capacity** and low processing speed when the data volume increases.

Solution

- **Unified enterprise-class big data platform** implements tiered data storage. **One data store for each piece of data.**
- Unified **data asset management and data security management.**
- **Data sharing access** interface and capability open interface
- **Linear expansion**
- High concurrent data processing speed when massive data is processed.

Benefits

- The platform storages PB of data and **high concurrent data processing speed.**
- Decoupling of applications from the platform allows sharing of application data and **speeds up application development and deployment.**
- Efficient data asset management enabled enhanced **data mining.**

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THANK YOU