Sabre Technology Overview

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Senior Vice President / Chief Technology Officer
26 September 2012

World Class Technology Talent

= **GDC Hubs**

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“Any sufficiently advanced technology is indistinguishable from magic”

- Arthur C. Clarke

Focus as many of our resources as possible on that which differentiates us from our competition

i.e. The Magic

Focus On The Differentiators

Sabre Travel Network. travelocity

Sabre Airline Solutions.

CONTENT	VALUE
Presentation	Customer
+	+
Efficient Access	Revenue
+	+
Depth & Breadth	Productivity

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Unsurpassed Demands On Our Technologies

24 hours
Every day – 7 days a week
It's always peak hour somewhere in the world!

245 million+
Requests per day via Web Services

1 billion+
API requests - daily

150 million+
Flight availability requests – daily

80,000+
Transactions – every second

700 billion+
Transactions processed in 2011

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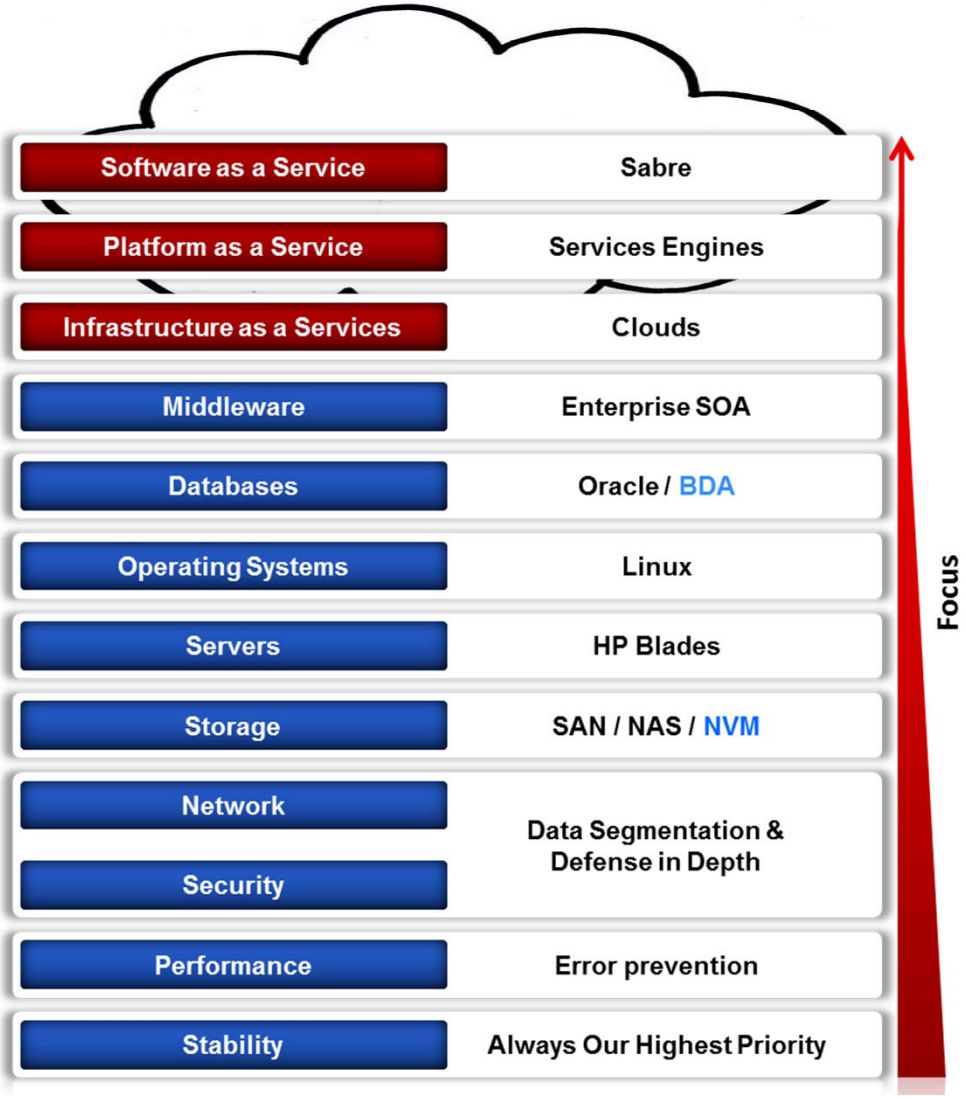
Non-Differentiators



2001 - 2005

- SOA foundation (messaging, security, session)
- Commodity hardware

2006 - 2008

- Sabre-wide standards for hardware, storage, OS, performance, and operations

2009 - Current

- Private cloud automation
- Platform as a Service
- Web Service orchestration
- Data standards, integration

The Laws

The number of transistors on a chip will double every two years!

Moore's Law
Computing

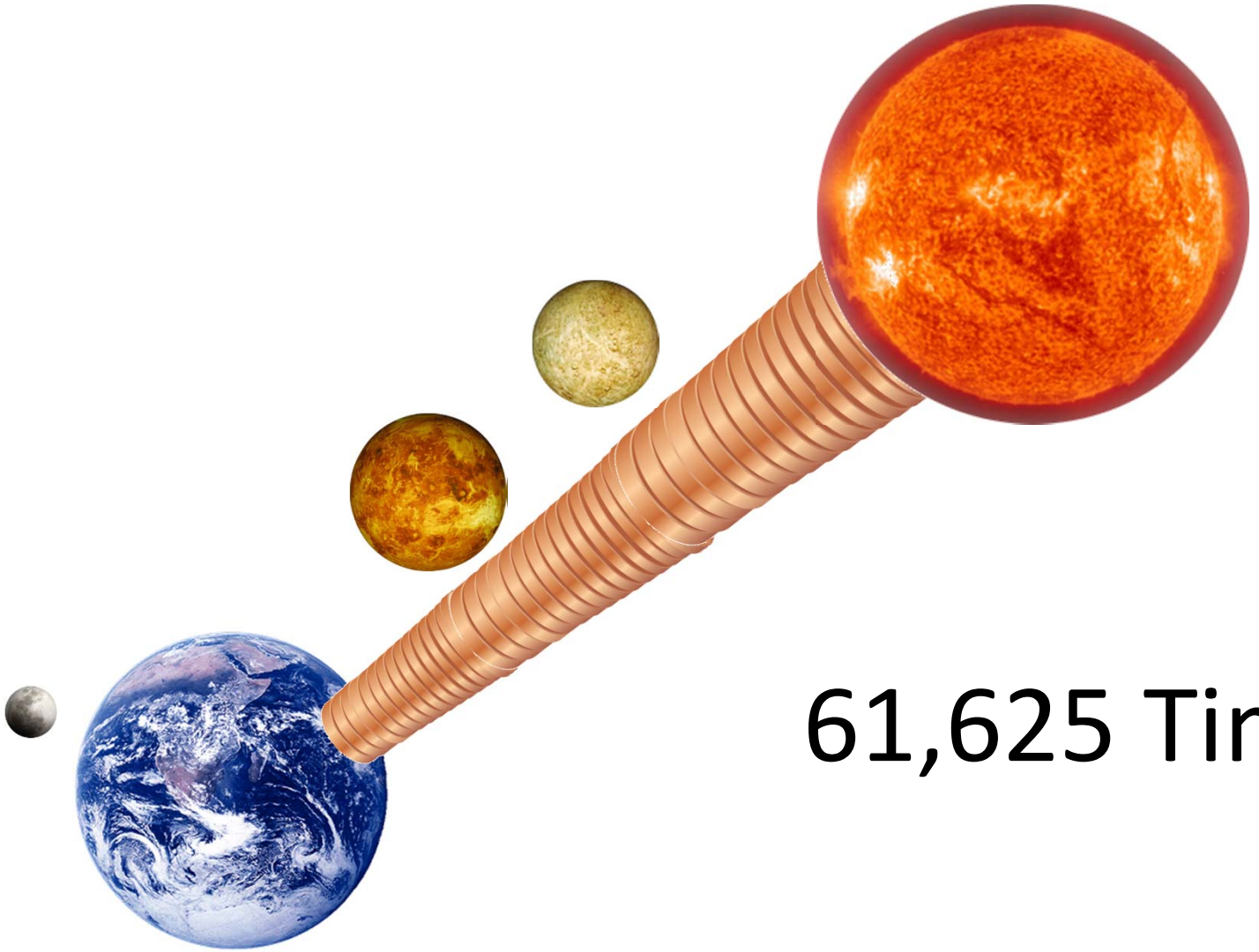
Network speeds will double every 9 months – causing costs to half

Butter's Law
Network

Storage density will double every two years – causing costs to half

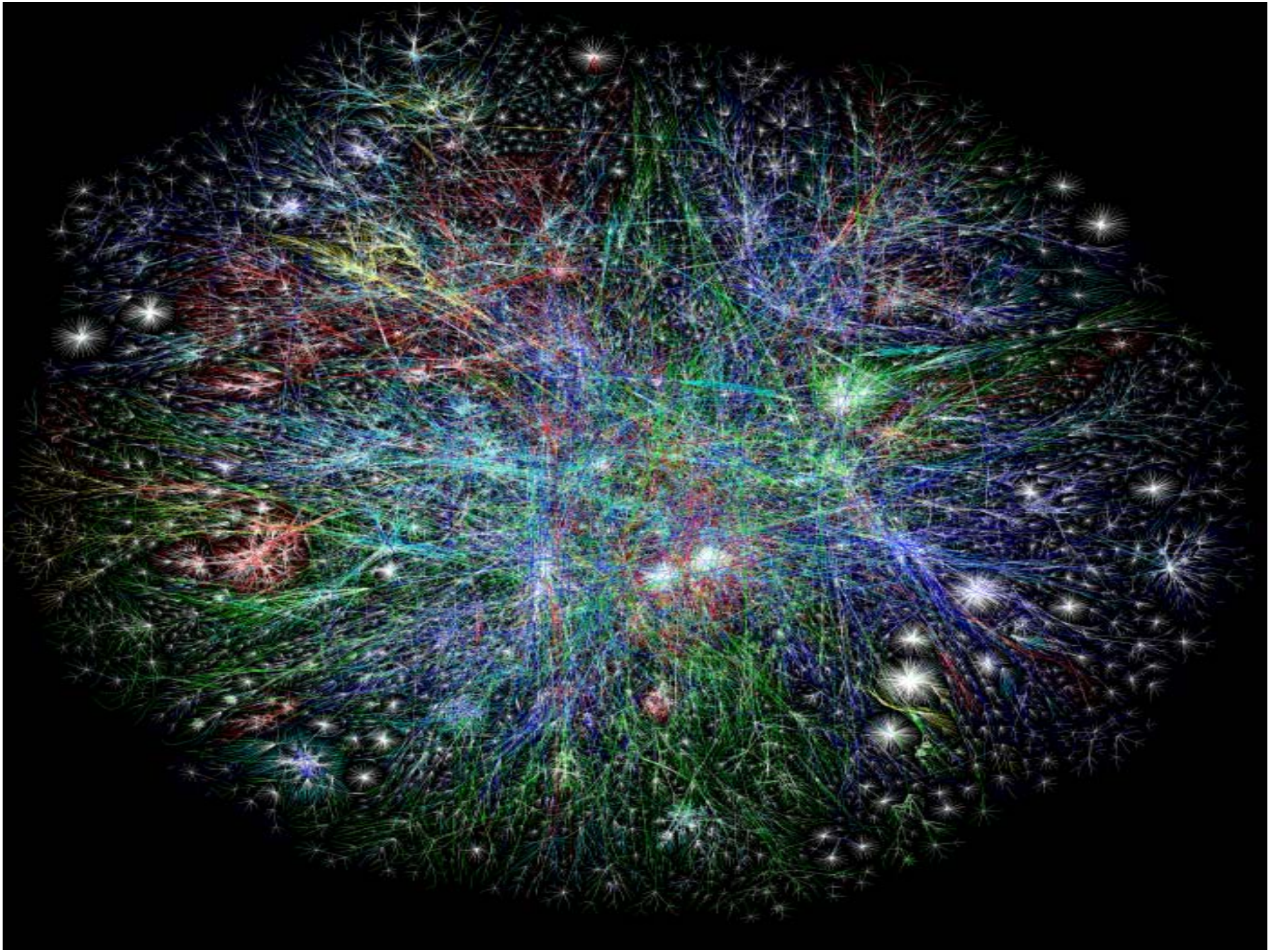
Kryder's Law
Storage

The Power Of Doubling

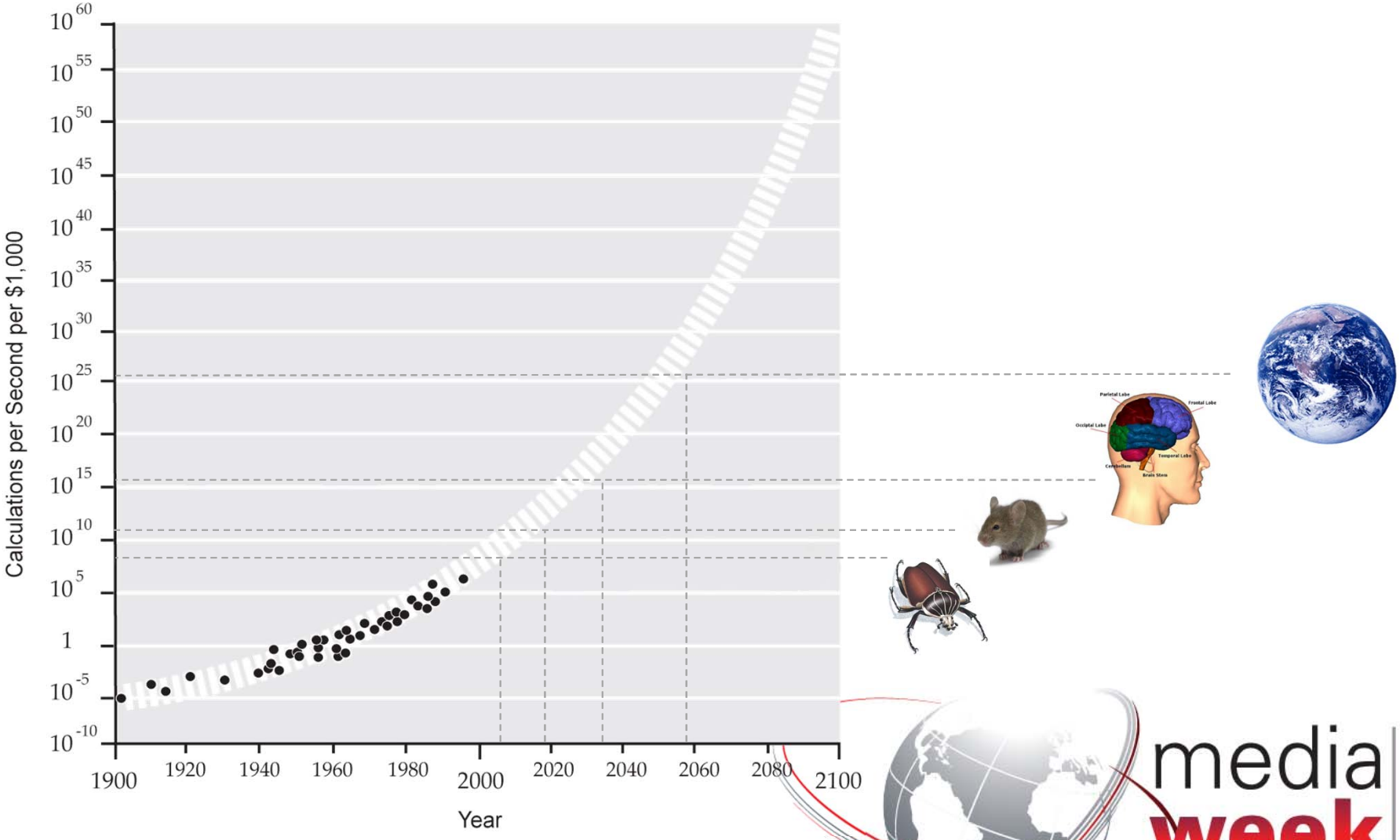


61,625 Times

Source: Robert Shrimpton

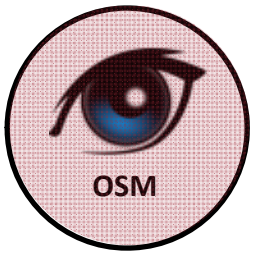


Calculations Per Second Per $1,000



http://www.singularity.com/charts/page70.html

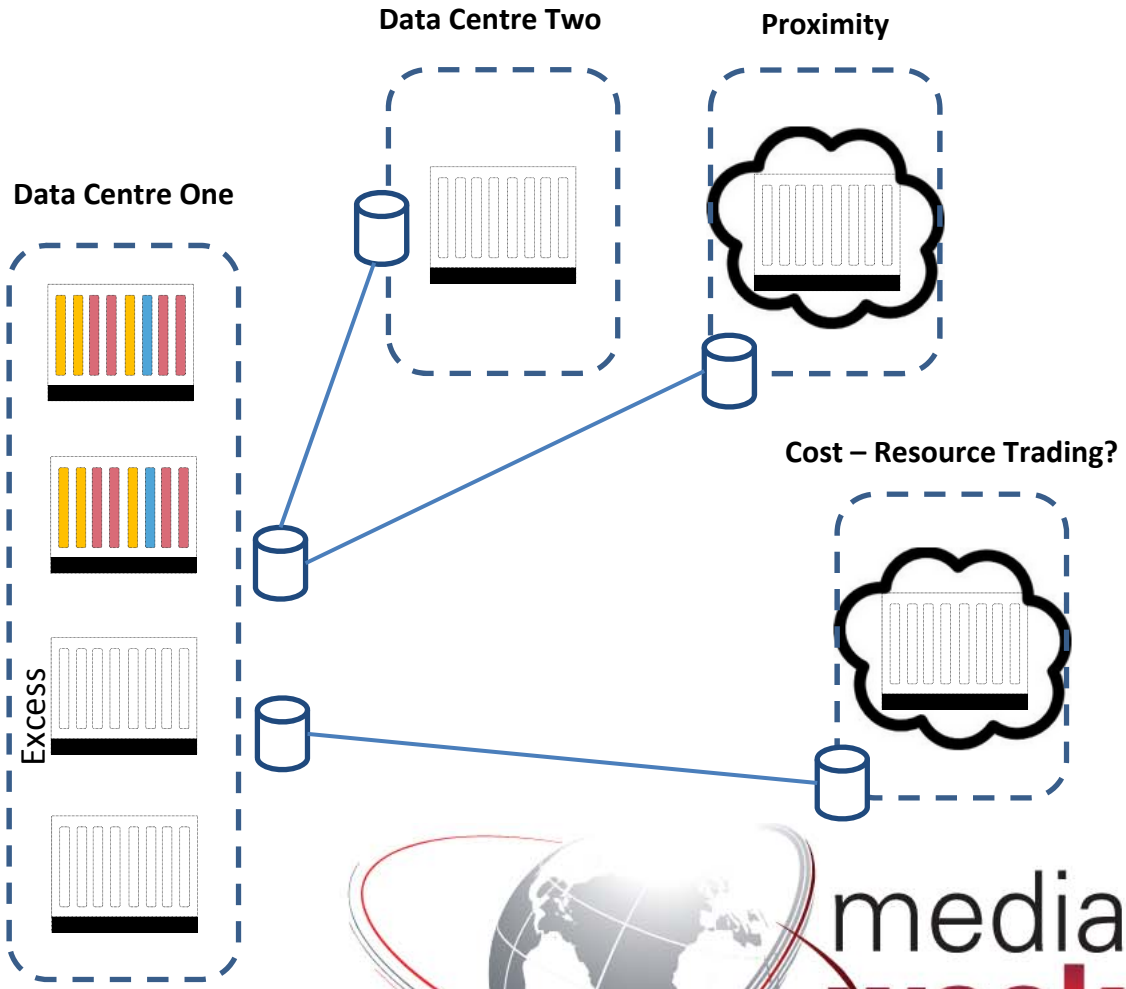
Organic Server Management – Cloud Efficiency



1. Apps must be ready:
   - Secure
   - Auto-Provisionable
   - Visible
   - Standard Deploy
   - Design isolation

2. **Low cost fast networks?**

3. **Low cost fast storage?**



Kbit – 10^3 / Mbit – 10^6 / Gbit – 10^9 / Tbit – 10^{12} / Pbit – 10^{15} / Ebit – 10^{18} / Zbit – 10^{18}

Kilo
1,000
(thousand)

Mega
1,000,000
(million)

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Kbit – 10^3 / Mbit – 10^6 / Gbit – 10^9 / Tbit – 10^{12} / Pbit – 10^{15} / Ebit – 10^{18} / Zbit – 10^{21}

Giga
1,000,000,000
(billion)

DL/iPod

Tera
1,000,000,000,000
(trillion)

55

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Kbit – 10^3 / Mbit – 10^6 / Gbit – 10^9 / Tbit – 10^{12} / Pbit – 10^{15} / Ebit – 10^{18} / Zbit – 10^{21}

Peta

1,000,000,000,000,000

(quadrillion – million billion)

Tulsa Data Center

Exa

1,000,000,000,000,000,000

(quintillion - billion billion)

5 exabytes

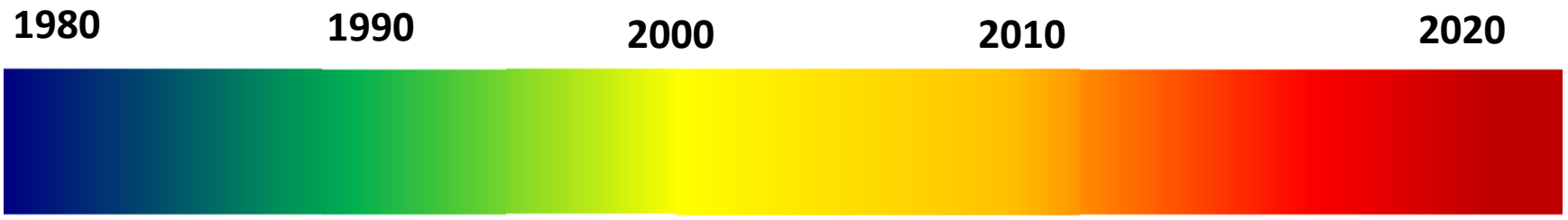
Kbit – 10^3 / Mbit – 10^6 / Gbit – 10^9 / Tbit – 10^{12} / Pbit – 10^{15} / Ebit – 10^{18} / Zbit – 10^{21}

Zetta
1,000,000,000,000,000,000,000
(sextillion – trillion billion)

All Storage Today – Internet Bandwidth in 10 years

FAT PIPES

Internet Network Speeds (Bits Per Second)



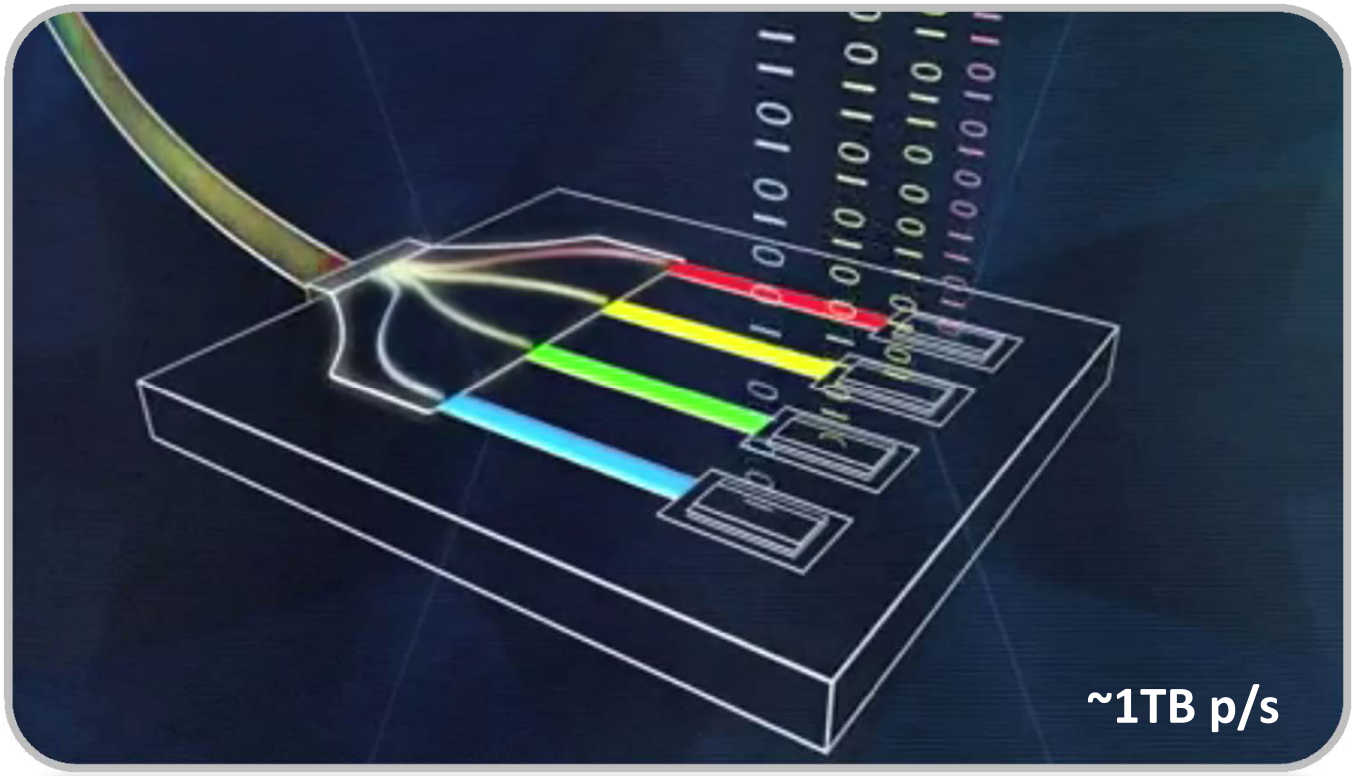
1Gb
(Google Fiber)

Global: 55 Tbps

Global: n Zbps

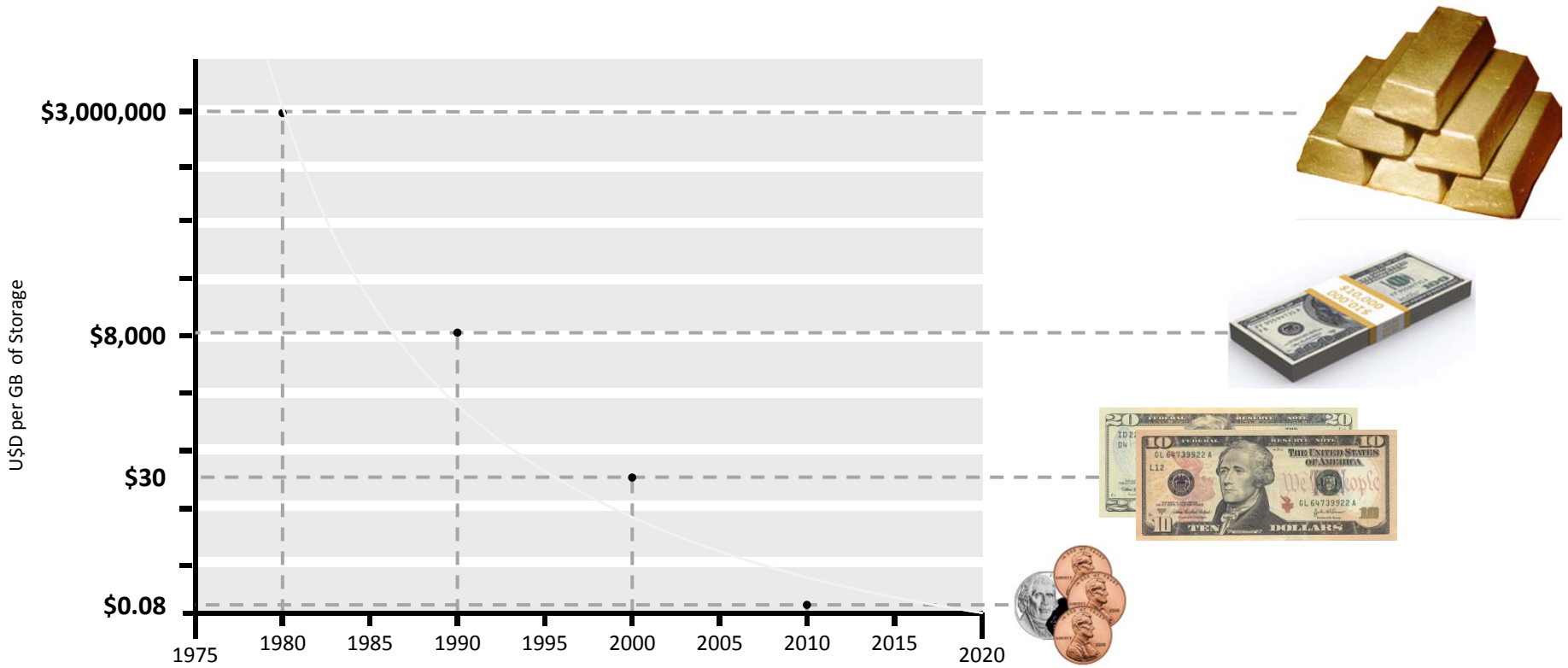
1 Hour video 700MBytes
2000 : ~28 hours
2010 : ~3 minutes
2011 : ~6 seconds
2020 : ~6/1000 seconds

Intel Silicon Photonics Link



SEXY STORAGE

Price Per Gigabyte Of Storage



2011: 3.5 cents / GB

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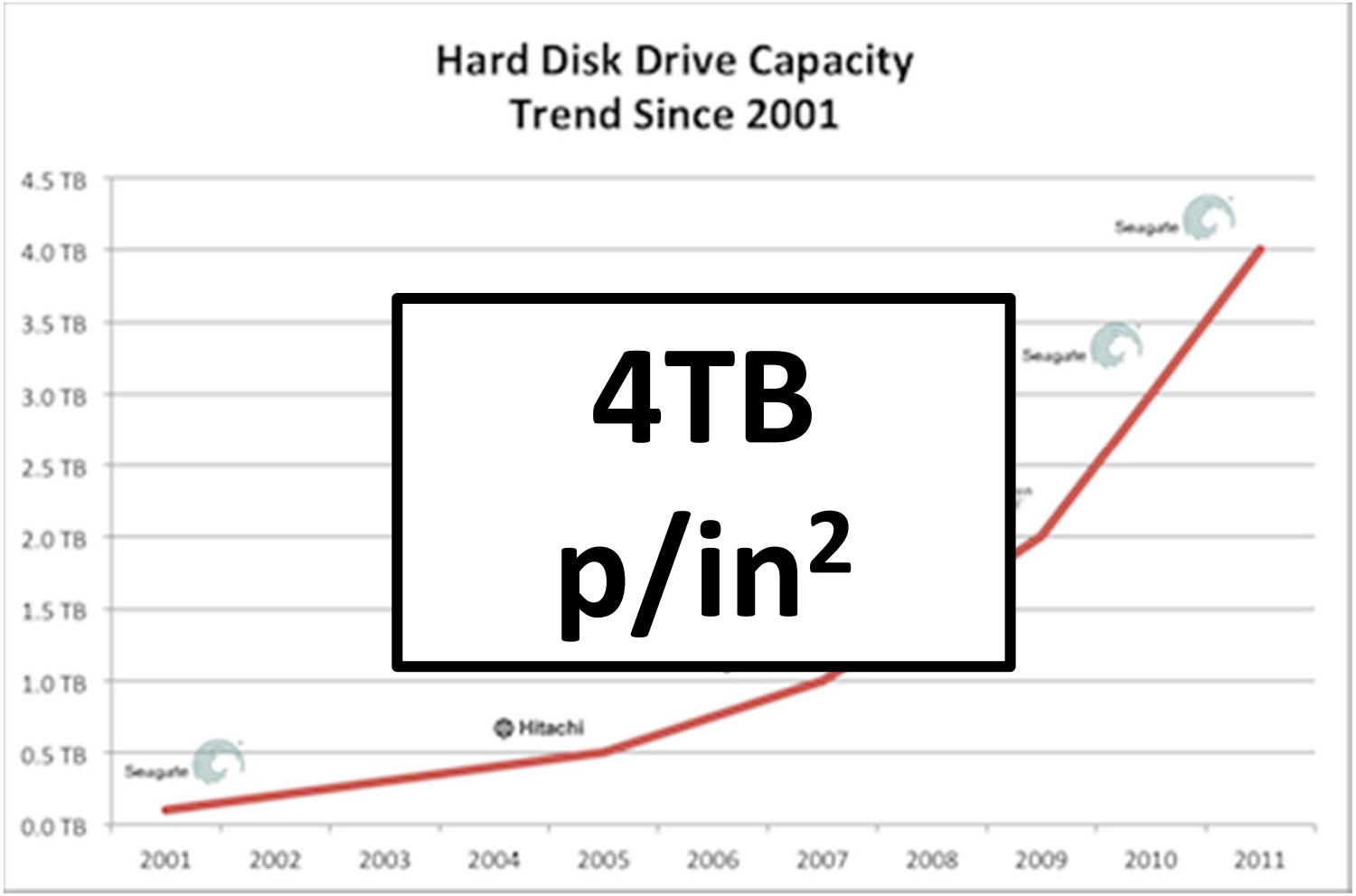
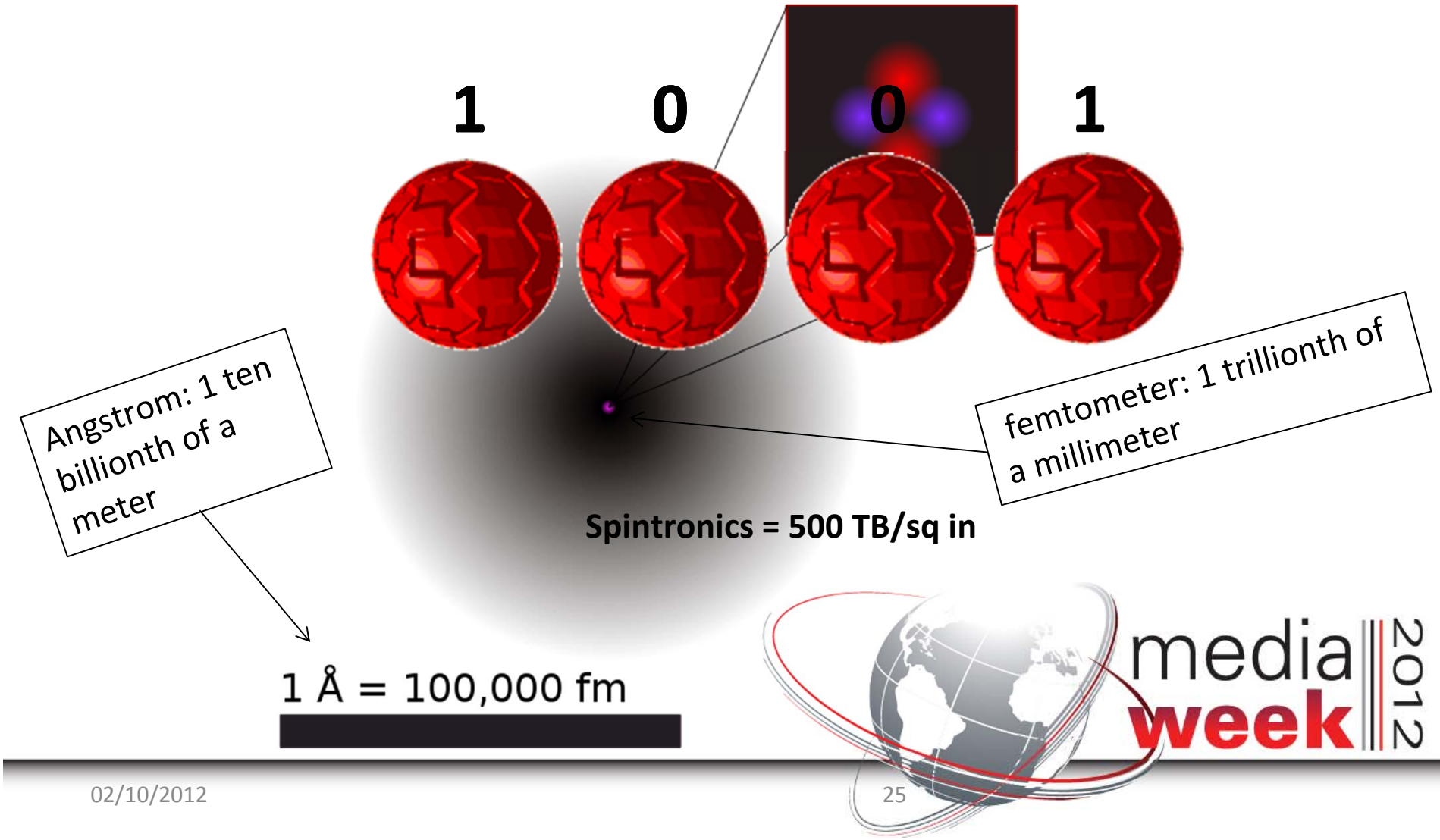
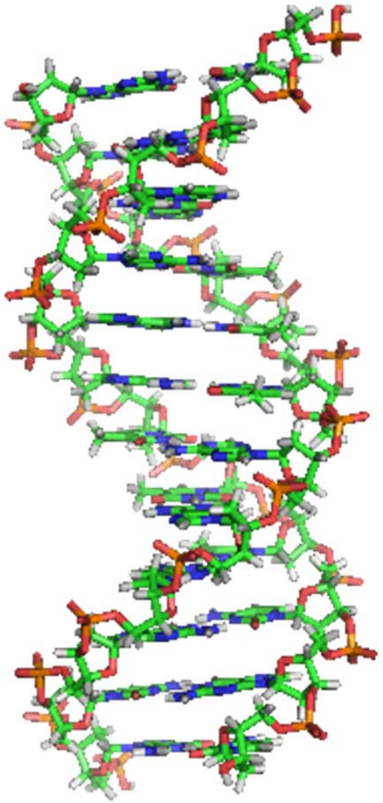
http://www.mkomo.com/cost-per-gigabyte


Hard Disk Drive Capacity
Trend Since 2001
4.5 TB
4.0 TB
3.5 TB
3.0 TB
2.5 TB
2.0 TB
1.5 TB
1.0 TB
0.5 TB
0.0 TB
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Seagate
Hitachi
Seagate
Seagate
4TB
p/in²

Non-Volatile Memory: Convergence Of Memory And Storage



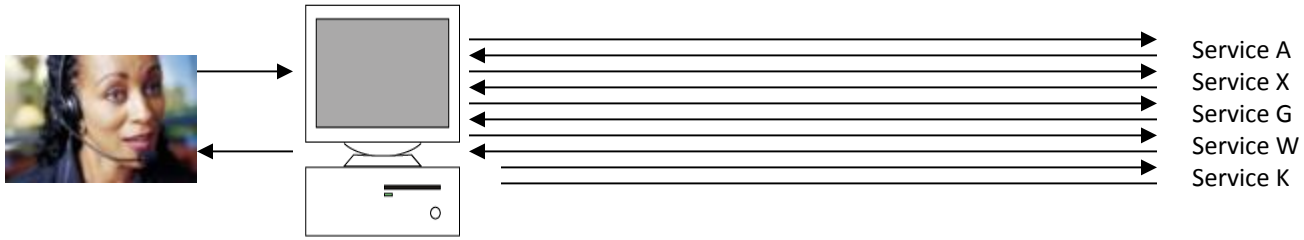
But Wait, There's More…



August 2012 Scientists at Harvard stored 700TB in a single gram of DNA

Learning From Landscape Designers

Learning from Customers



Sabre Holdings

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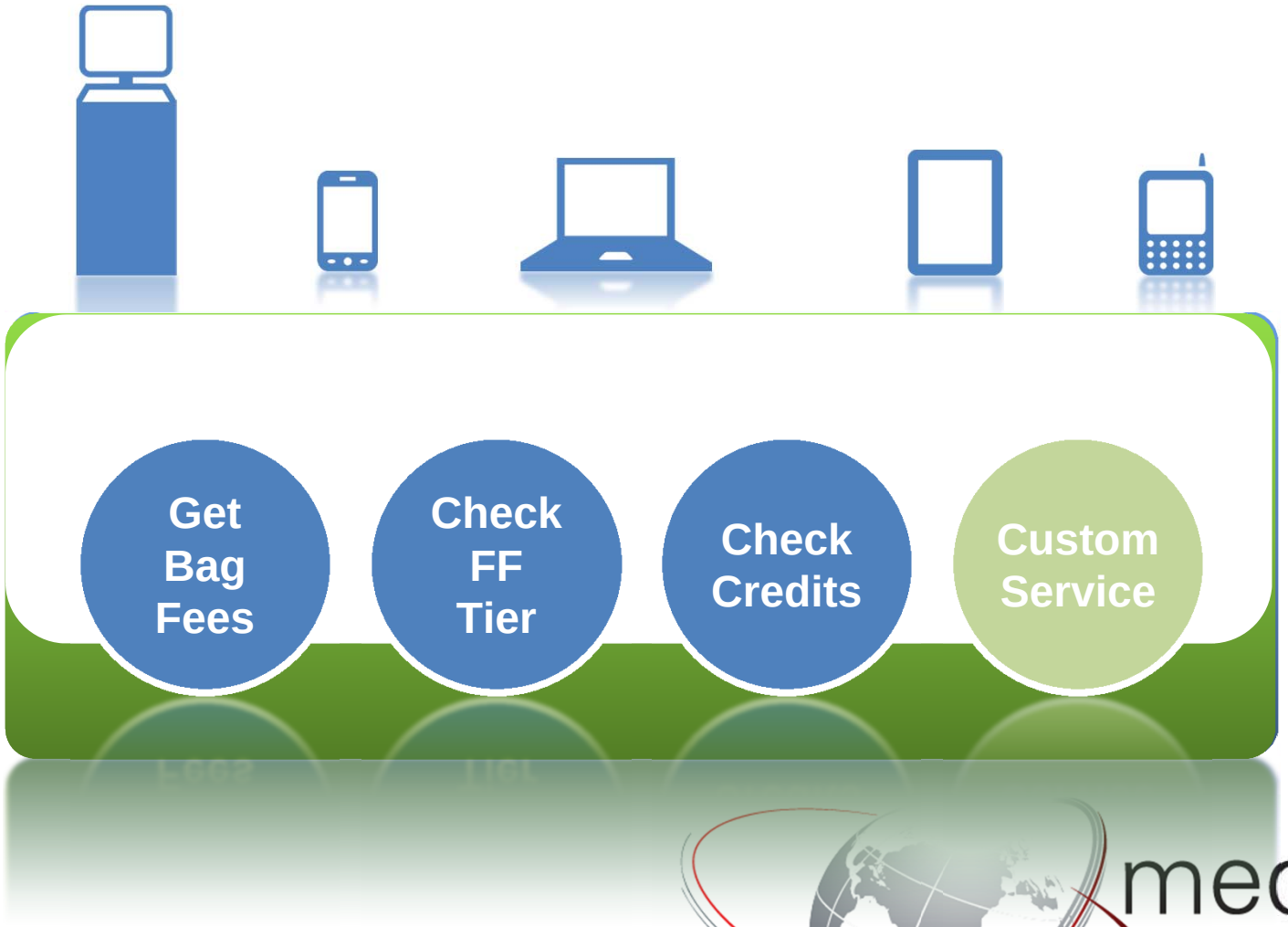
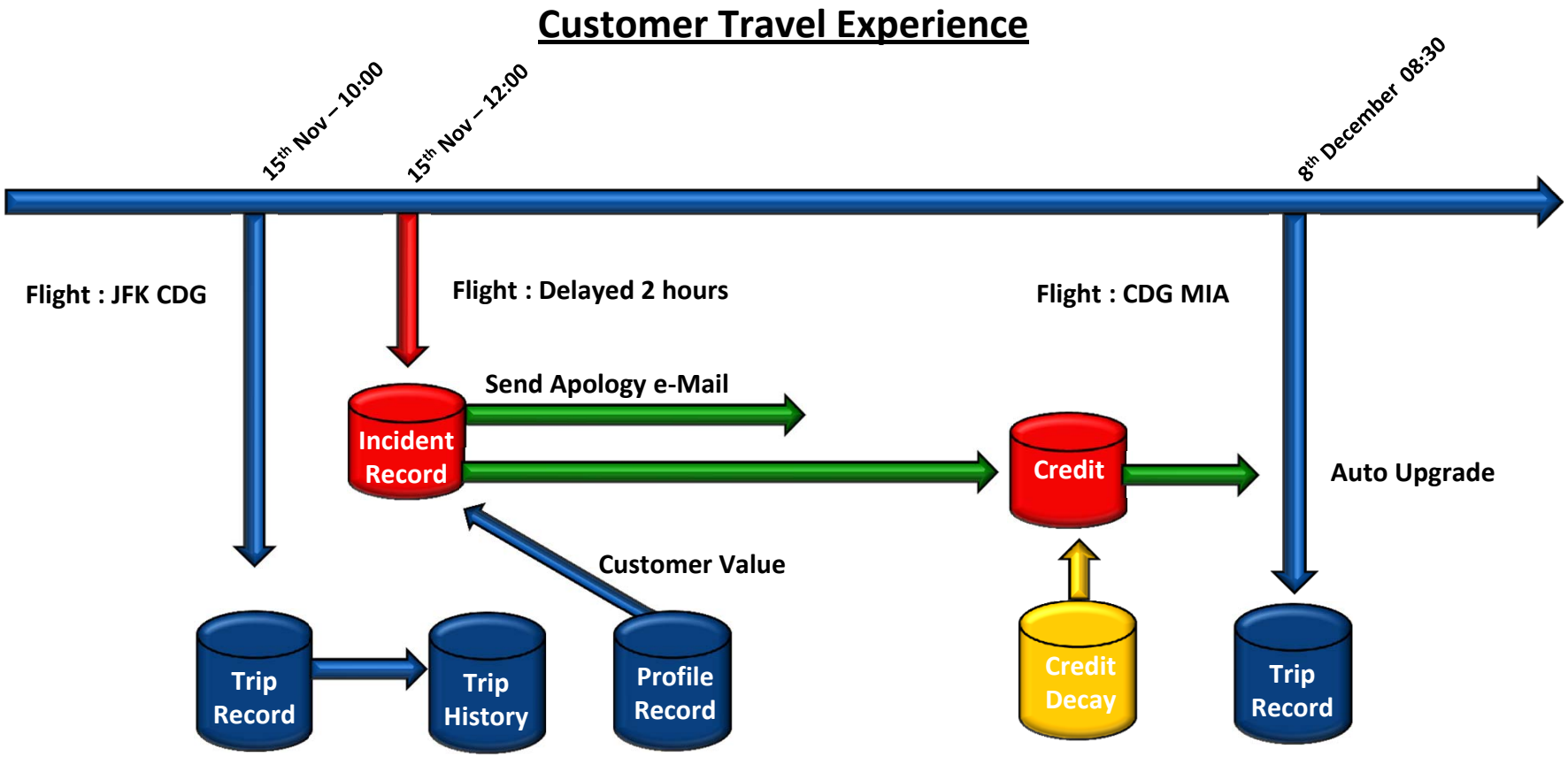
Services Engine



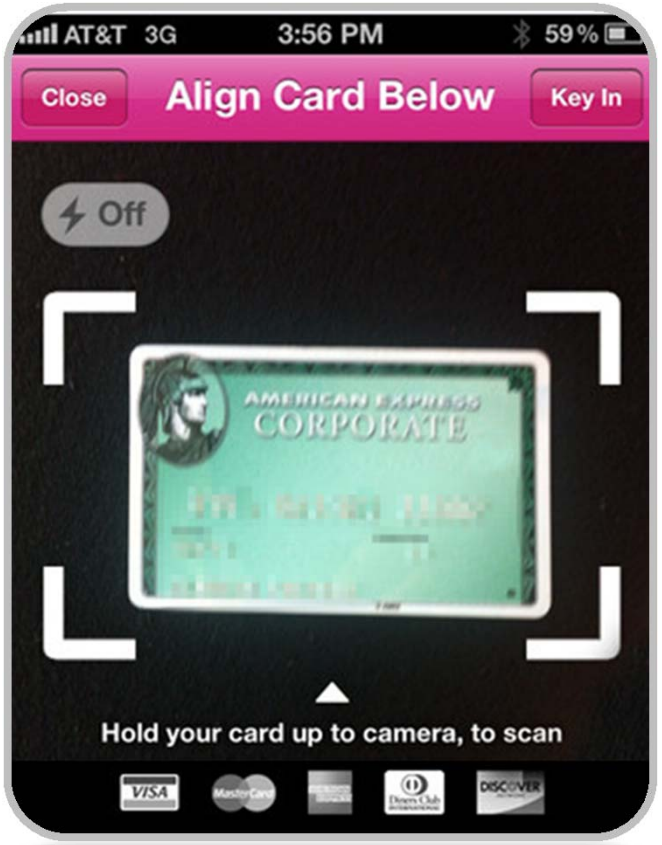
Configure vs Code



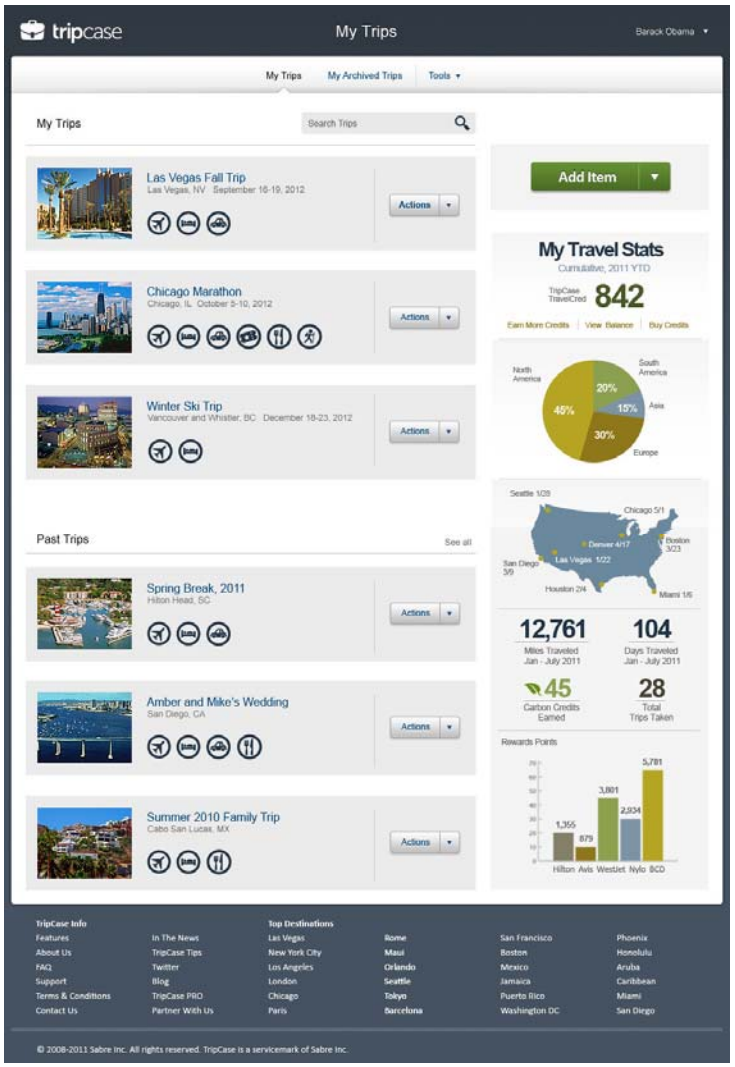
The API to our Customers

Bar Code / Blue-Tooth / NFC

Photographic Card Reader



New TripCase - Redesign



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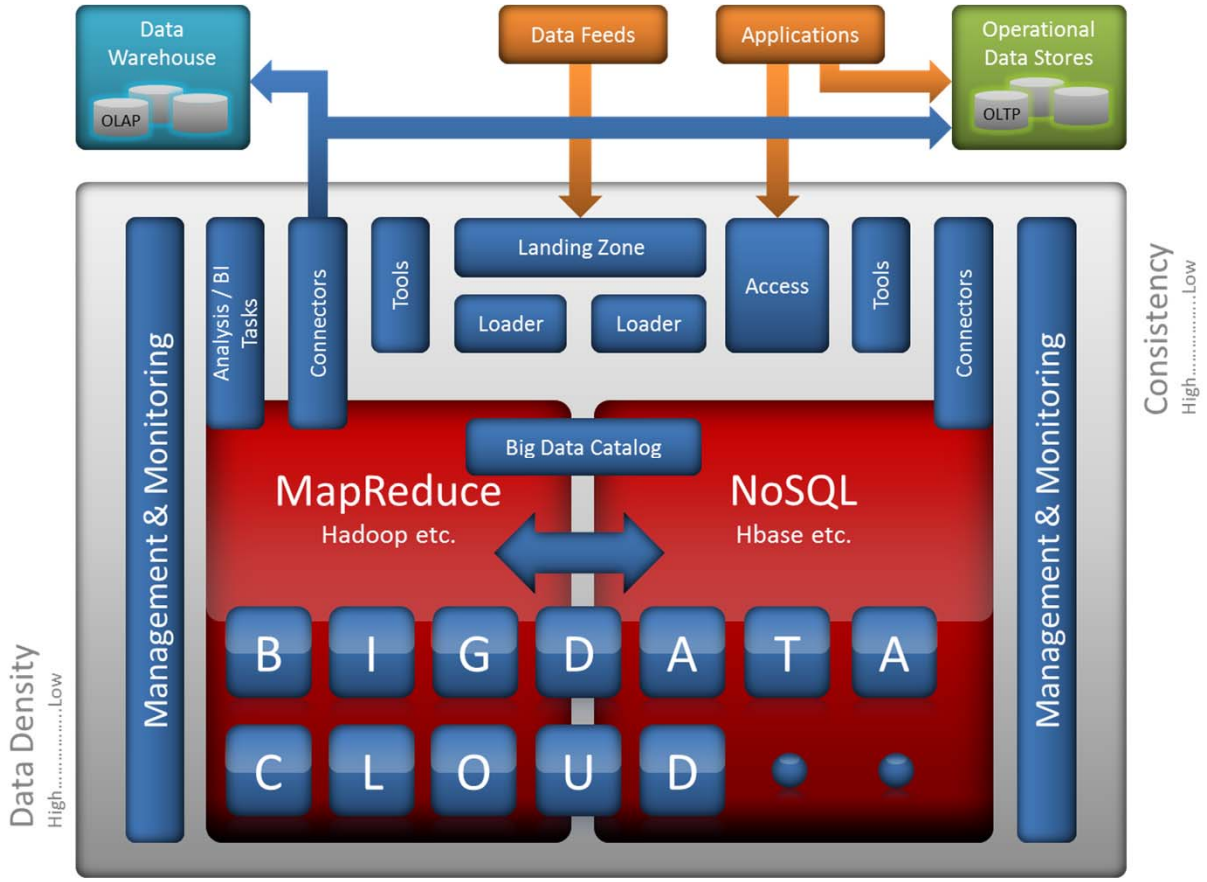
Micro-Content

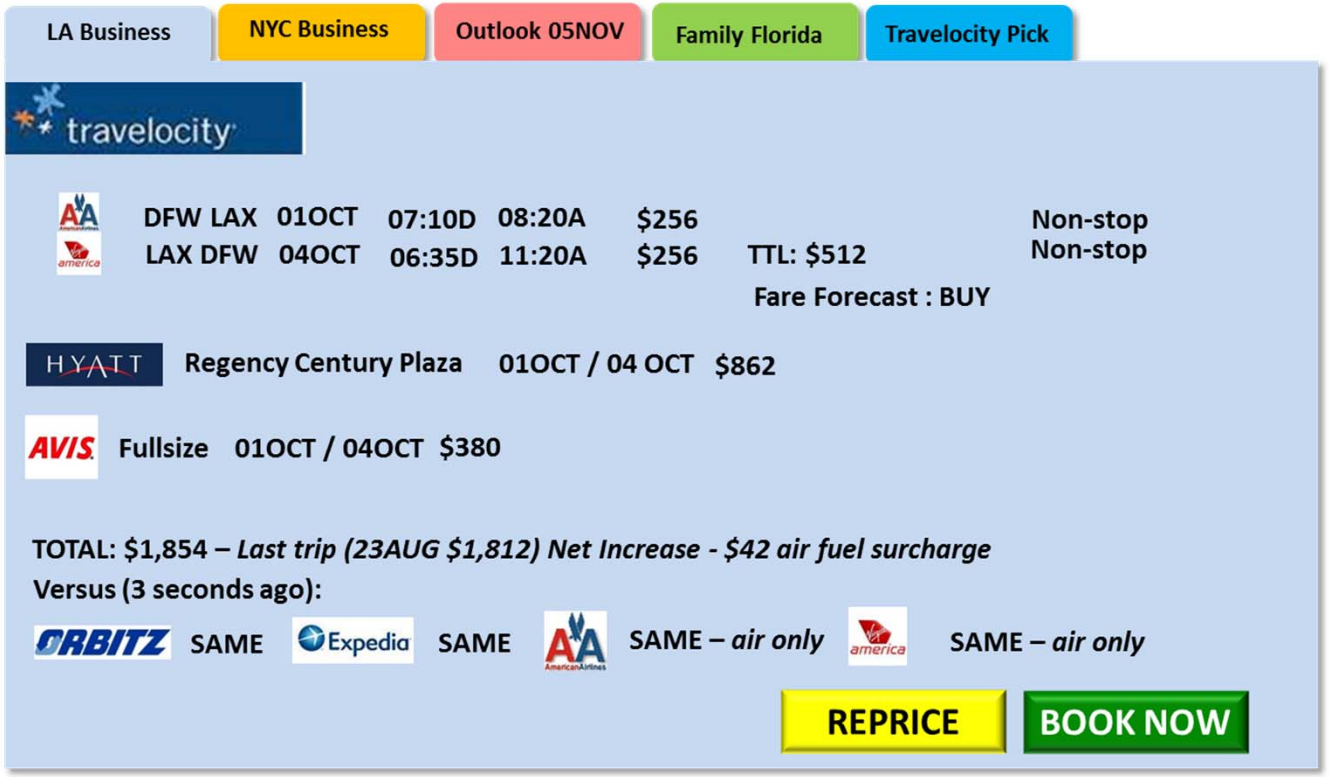
Big Data Landscape



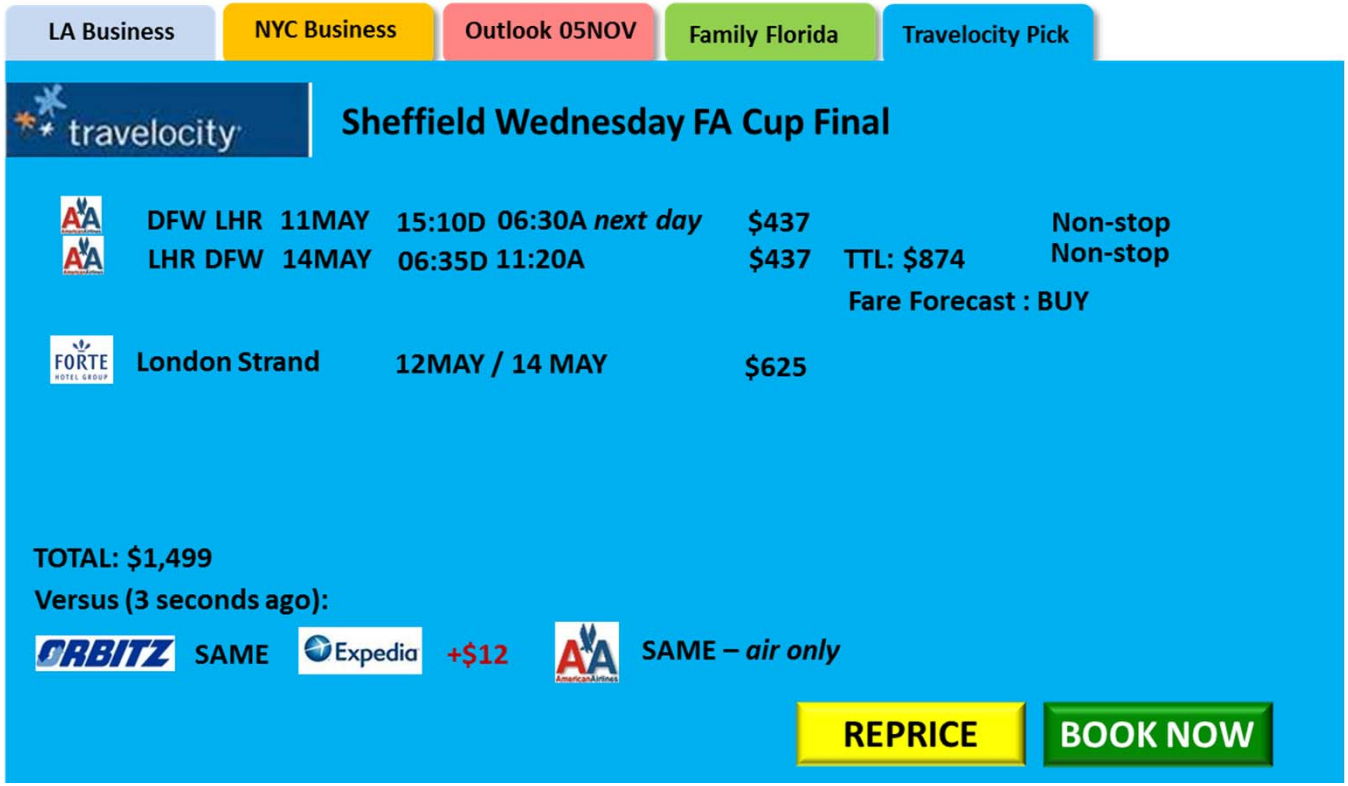
Our Challenge To Our Application Designers…

What would you do if compute speeds, costs (network, storage, processors) were limitless and free?

The Perfect Booking Engine?



The Perfect Booking Engine?



THANK YOU

Any Questions?

Appendix

Sabre Holdings

Sabre Holdings™

$3 billion privately-held holding company
consisting of four primary business units

Sabre Airline Solutions | Sabre Travel Network | Sabre Hospitality Solutions | travelocity

Headquarters in Southlake, Texas, U.S. **10,000** employees *in* **60** countries

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CONVERT TO HAND OUT - ADD TO APPENDIX

Sabre's Business Units Supported By Technology

Sabre Travel Network

Solutions for the travel industry

- $100B in travel spend is booked through Sabre annually
- Connects 350,000 travel professionals in 130+ countries to travel content

Sabre Airline Solutions

Solutions for the air transportation industry

- 400+ airline customers
- 360M+ passengers boarded annually

Sabre Hospitality Solutions

Solutions for the hospitality industry

- 3,700+ hospitality customers
- 10,000+ properties
- 80 currencies
- 27 languages
- Generates $12B+ in revenue each year for its customers

travelocity

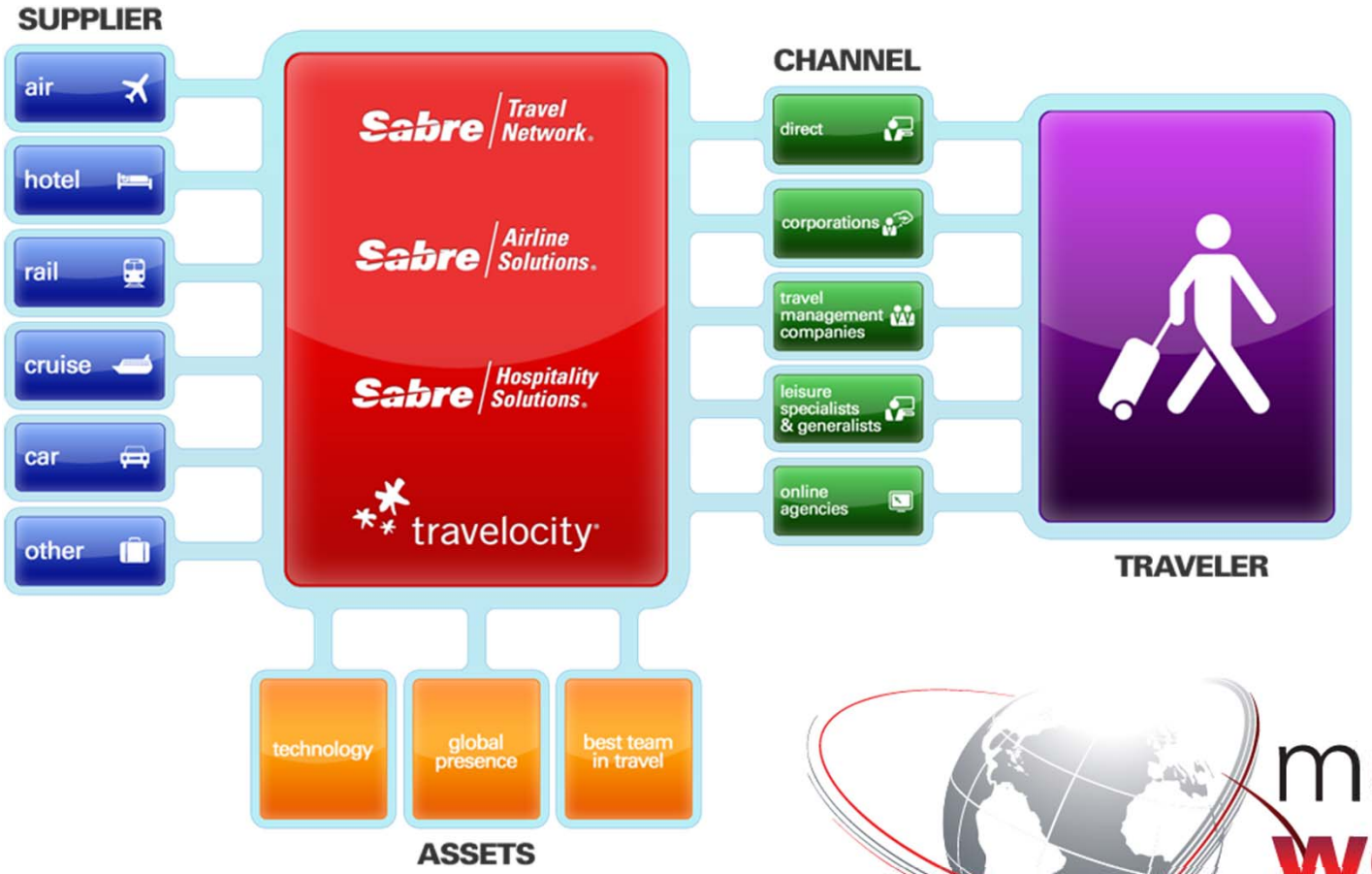
Online travel company

- First online travel agency (OTA)
- 10 global brands
- 8 languages
- 23 international websites
- 30 million+ monthly unique visitors

The **Technology** organization brings together world-class IT talent to develop, deliver, and operate the products and solutions that serve the technology needs of the travel market

CONVERT TO HAND OUT - ADD TO APPENDIX

Confidential

How Sabre Fits Into Travel Industry

Sabre is a global technology company. Our innovative technology is used by more than a billion people around the world to plan, book and get to their destination.