The IoT Inc Business Meetup Silicon Valley

Meeting 8

April 2015

Bruce Sinclair (Organizer): bruce@iot-inc.com

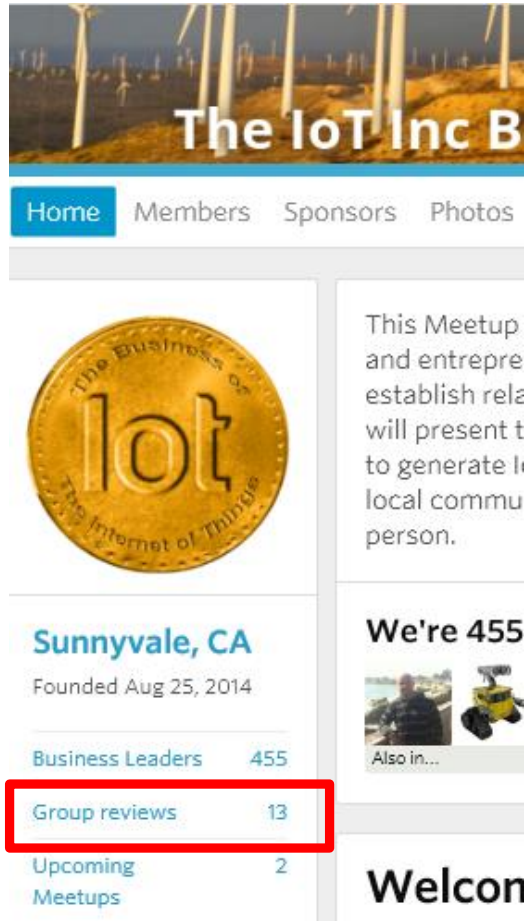
Target of Meetup

For business people selling products and services into IoT

but of course everyone else is welcome: techies, end-users, ...

Focus of presentations and discussions:

Looking for help



Reviews

- Help attract great speakers and members
- If you've been attending for a while and like the group, go to homepage to leave a review

Help for our sponsor

- Need to justify their continued support
- Plug and Play are looking to partner with companies big and small

Become a sponsor

Suggest locations to hold future meetings

Notes

Next Meeting

Bruce Sinclair, President at Iot-Inc

Introduction to the Business of the Internet of Things

Presentation, video and notes for today's meeting will be sent in one week

Join us on April 2 at 6PM (PST)

IoT Meets Big Data

The Opportunities and Challenges

Syed Hoda
ParStream

IoT-Inc. Meetup

IoT Meets Big Data: The Opportunities and Challenges

Syed Hoda
Chief Marketing Officer
@shoda

ParStream
Analytics Built for IoT

The Industry's Leading IoT Analytics Platform Company

- *Massive volumes of data*
- *High-velocity data*
- *Edge analytics*
- *Real-time insights*

Cisco Entrepreneurs in Residence

NOKIA Silicon Valley Open Innovation Challenge 2014

2014 IoT Excellence Award

CIO TOPSTARTUP 2013 #1 Big Data Startup

IIC MEMBER industrial internet CONSORTIUM

www.parstream.com @parstream

Have you heard about this IoT thing?

IoT is top-of-mind with CEO's, CIO's, and VC's

WORLD ECONOMIC FORUM

2015 Tech Predictions

1. **Digital transformation**
2. **Internet of Things**
3. **Convergence of big data with consumer data**
4. Hybrid cloud
5. Collaboration
6. **Predictive analytics will lead big data**
7. **Mobile wearable technology**
8. A Platform and orchestration is needed
9. Networked Economy
10. The end of apps

Gartner SYMPOSIUM ITXPO 2014

Top 10 Strategic Technology Trends for 2015

1. Computing Everywhere
2. **Internet of Things**
3. 3-D Printing
4. **Advance, Pervasive Analytics**
5. Context-Rich Systems
6. **Smart Machines**
7. Cloud Computing
8. Software Defined Infrastructure
9. Web-scale IT
10. Risk-Based Security

TechCrunch

VCs Look To The Future As IoT Investments Soar

In 2014, investors contributed over $300 million in 97 venture rounds for IoT startups

The massive size and growth of IoT

IoT Market Size
(by 2025)

McKinsey&Company

$6.1T

IDC

$7.1T

CISCO

$14.4T

Connected Devices
(by 2020)

Gartner

26B

IDC

32B

CISCO

50B

Data Growth
(2013 vs 2020)

IDC

Total Data

4.4ZB ➡ 44.4ZB

10x

IoT Data

.09ZB ➡ 4.4ZB

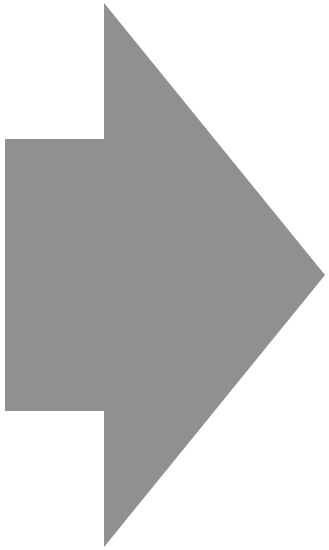
49x

BIG data is outpacing Moore's Law!

The Opportunity

AND

The Challenge



Data Growth
(2013 vs 2020)

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49x

Analytics drives business value in IoT

Gartner®

Analytics have been transformative in wide areas of customer and product service. Sensor enabled industrial analytic applications are the next frontier

July 2014

Forbes

"The value of IoT is in the data. The quicker enterprises can start analyzing their data the more business value they can derive."

June 2014

"Analytics accelerates IoT adoption.

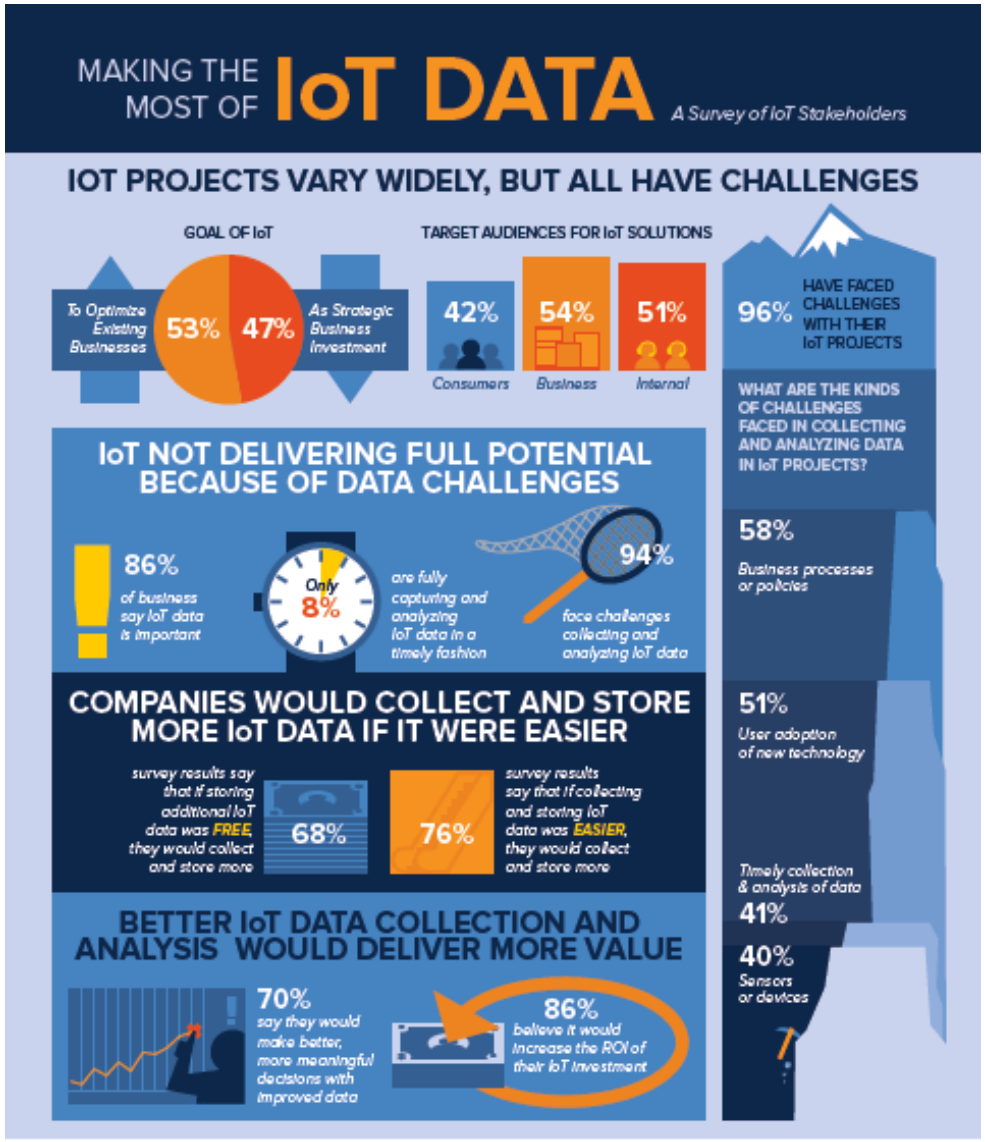
…data analytics is the most important factor to increase the benefits of IoT"

John Chambers, October 2014

Just do it! Right?

Well, not so fast.

Market Pulse: Global IoT/Big Data Survey



- Global/cross-industry survey
- Cross functional participants
- 50/50 mix of business and technology leaders
- Various stages of IoT experience and progress
- Focus on the use and value of data in IoT initiatives

Full report at:

sites.parstream.com/parstream-iot-survey-whitepaper

Only a third have quantifiable success metrics

33% Have quantifiable metrics to track success

38% “Learning and exploring” is the objective

29% Have document goals, but difficult to quantify

96% have faced challenges with their IoT project

58% Business process/policy (e.g. privacy)

51% User adoption of new technology

41% Timely collection and analysis of data

40% Sensors or devices

4% Have not faced challenges

Challenges being faced at all stages of the data collection and analysis process

44% Too much data to analyze effectively

36% Difficult to capture useful data

30% Analysis capabilities are not flexible or aligned

27% Not sure what questions to ask

26% Data is analyzed too slowly to be useful

Only 8% making full use of their IoT data

8% Fully capture and analyze data in a timely fashion

59% Do some analytics, but need to improve

17% Capture and store IoT data, but don’t/can’t analyze it

16% Don’t store IoT data

92% would see benefits by more effectively capturing and storing IoT data

70% Make better, more meaningful decisions

53% Make decisions faster

27% Make more decisions

8% No benefits

Business owners more likely to see ROI increase through faster, more flexible analytics

Business		***Technology***
58%	Significant increase in ROI	**28%**
34%	Slight increase in ROI	**57%**
8%	Minimal Impact on ROI	**15%**

Survey Summary: Three key insights

IoT projects vary widely – but all have challenges

96% Faced project challenges (#1 process, #2 users, #3 data)

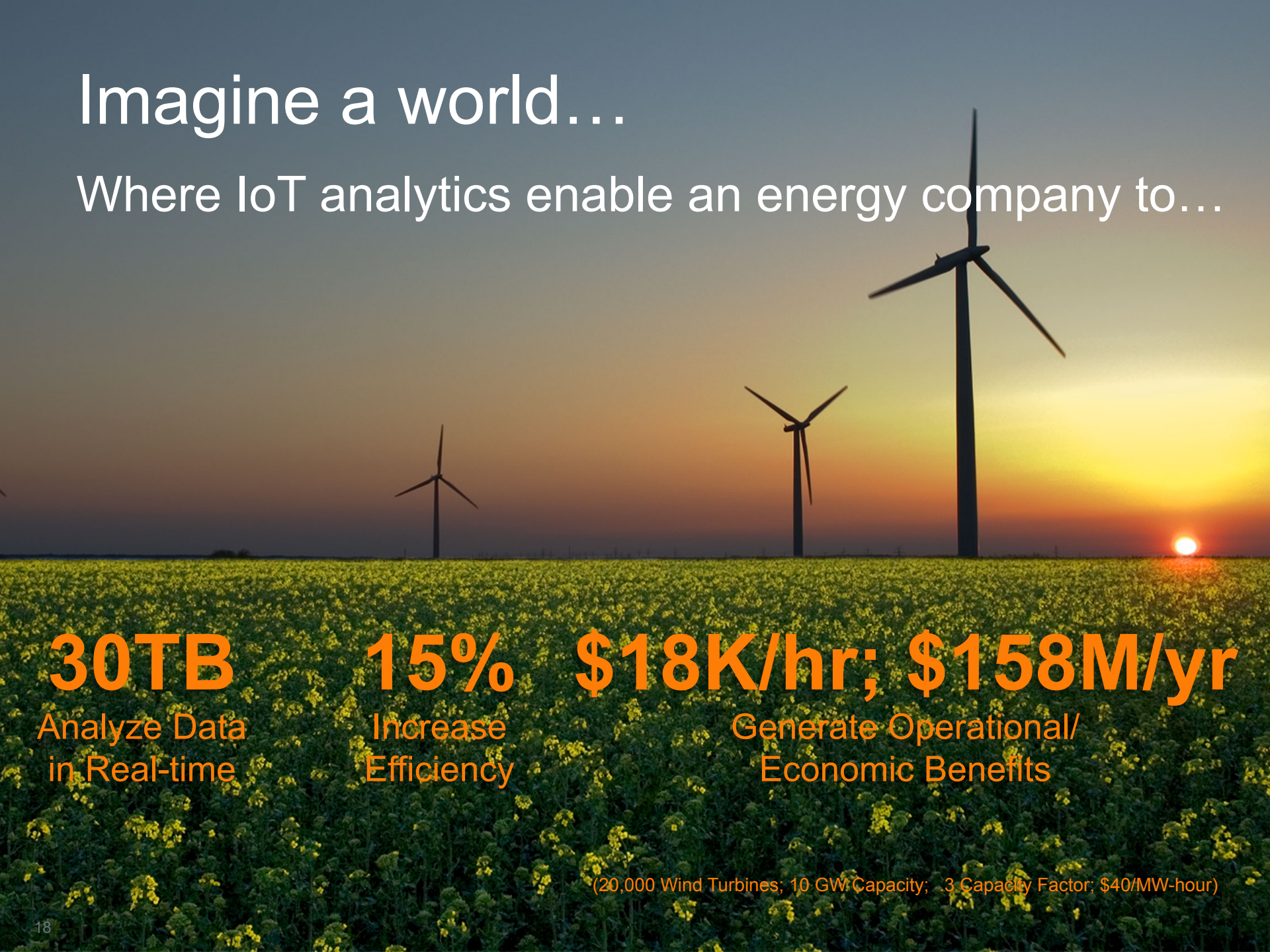
IoT not delivering full potential because of data challenges

8% Fully capture and analyze IoT data in a timely fashion

Better IoT data collection and analysis would deliver more value

86% Would increase the ROI of their IoT investment

Other than that Mrs. Lincoln, how was the play?



Imagine a world…

Where IoT analytics enable an energy company to…

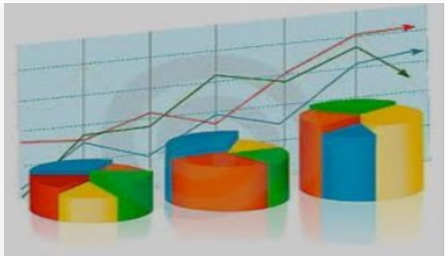
30TB
Analyze Data in Real-time

15%
Increase Efficiency

$18K/hr; $158M/yr
Generate Operational/ Economic Benefits

(20,000 Wind Turbines; 10 GW Capacity; .3 Capacity Factor; $40/MW-hour)

IoT analytics has a set of distinct requirements

Big Data Data is growing faster and bigger because of number of sensors	**10B+ rows** **5TB+**	
Fast Data Data streamed from sensors requires fast ingestion	**1M+ rows per sec**	
Edge Analytics IoT data is mostly generated at the 'Edges' of the network	**100+ Locations**	
Real-Time Insights Use cases require near real time analytics	**<1 sec query response time**	

IoT analytics has a set of distinct requirements.

Big Data Data is growing faster and bigger because of number of sensors	**10B+ rows 5TB+**	**Wind turbine:** 100 turbines x 100M rows per year **Race car:** 400M records / day x 365 days test drive **Telco:** 1.000 cells x 1.000 rows / sec x 1 days - wow **Traffic analysis:** 60M cars x 1 read / min x 365 days **Oil rig:** 1 rig = 8 billion records / day (not verified)
Fast Data Data streamed from sensors requires fast ingestion	**1M+ rows per sec**	**Network monitoring:** 1M rows per sec per cell **Asset monitoring:** 60M cars x 1 reading per minute **Airplane monitoring:** 4 turbines x 3k sensors x 100Hz **Oil exploration:** 10.000 wells x 100 sensors x 1Hz **Oil rig:** 1 drilling rig x 10.000 sensors x avg 100Hz
Edge Analytics IoT data is mostly generated at the 'Edges' of the network	**100+ Locations**	**Manufacturing:** 300.000 plants in US (2012) **Cars / ships / airplanes:** >1 billion world wide **Telco:** 190.000 cell towers in US (2013) **Oil:** 950.000 wells worldwide; 500.000 in US **Mobile advertising**: de-central adserving / monitoring
Real-Time Insights Use cases require near real time analytics	**<1 sec query response time**	**Dashboarding:** real-time visualization, many queries **Network monitoring:** root cause analysis, optimization **Asset monitoring:** conditional monitoring, safety **Security:** anomalie detection, building safety **Traffic:** location aware recommendations

Existing products don't fulfill IoT requirements

Requirements \ Product	ParStream	Columnar Databases HP Vertica, Redshift	Row-based Databases Oracle, Informix...	Value Stores Cassandra, MongoDB	Hadoop Batch Cloudera, Hortonworks	Hadoop Streaming Spark / Shark Storm
BIG DATA Capacity	●	●	–	●	●	●
FAST DATA Import	●	–	–	●	●	●
EDGE Analytics Capability	●	–	–	–	–	–
REAL TIME Insights	●	–	–	–	–	–
INTEGRATED Platform	●	●	●	–	–	–
IoT DATA Storage Structure	●	–	●	●	–	–

See details in backup

ParStream has the fastest query response times

ParStream

1 second

Sybase IQ

10 seconds

hp VERTICA

22 seconds

SAP HANA

31 seconds

RedShift

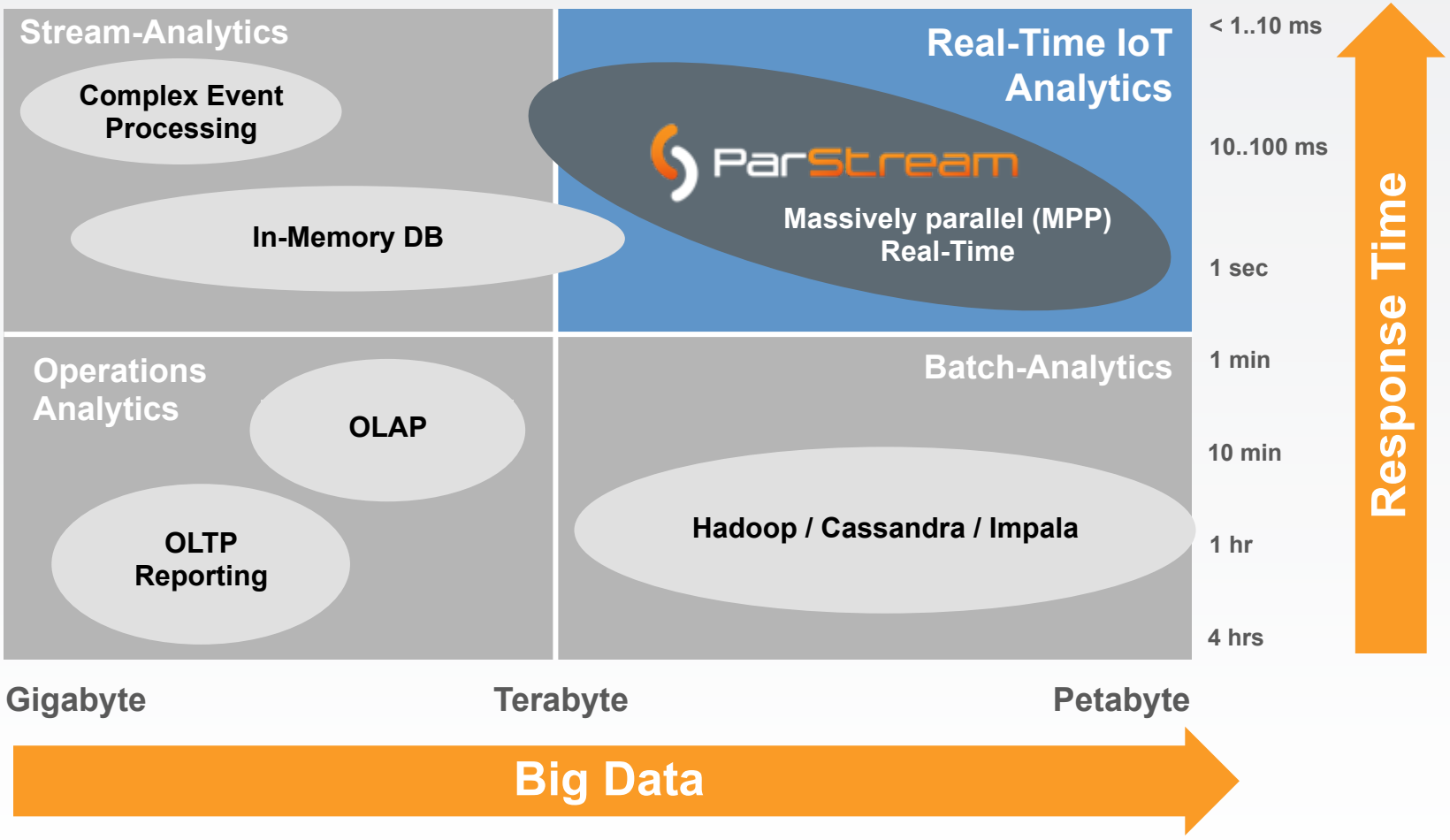
38 seconds

IMPALA

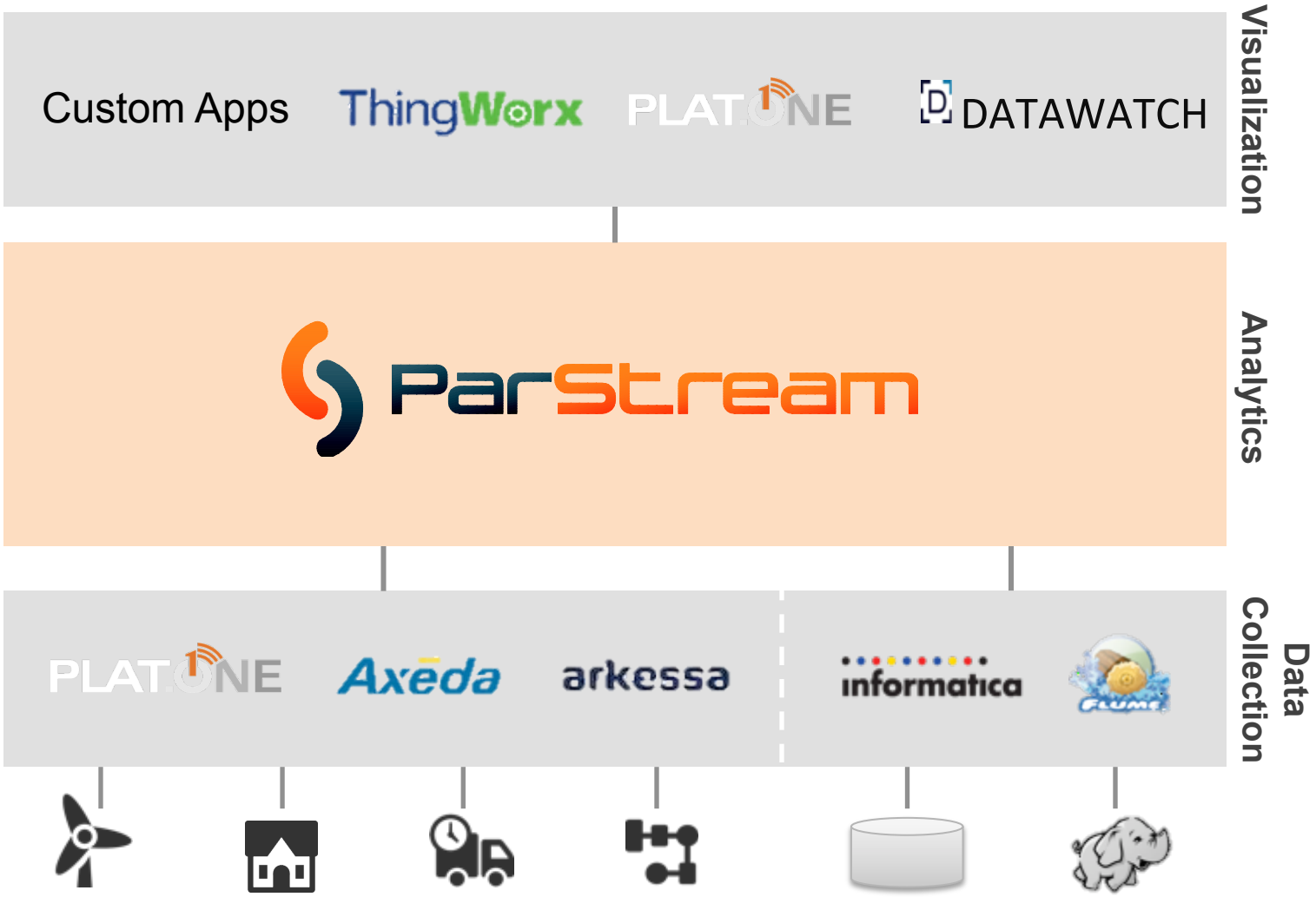
98 seconds

Environment: Single EC2 XL node with 15 GB RAM, 2 TB disk on Amazon AWS.
OTP data set with 150 Million records. Query set based on customer use-cases.

Use-cases should drive technology decisions



ParStream is integrated with leading IoT solutions



Now what?

“Doing” IoT

1. **Who’s in charge here?:** The need for a Chief IoT Officer!
2. **Data = Competitive Advantage:** Analyze more and more often
3. **Follow the money:** Where/how can IoT data monetized?
4. **Use cases drive technology decisions:** Information > IT
5. **Rational experimentation:** IoT 2015 = eBusiness 1999

“Selling” IoT

1. **Follow the money**: Help customers make money or save money!

2. **Agile product roadmaps:** Sense and respond faster!

3. **“Sell” to Business + IT:** IoT has a complex, evolving “org chart”

4. **Whole offer:** Build/buy/partner to create what customers want

5. **The power of platforms:** Metcalf’s Law = Relevance

Thank you!

Syed Hoda
Chief Marketing Officer
@shoda

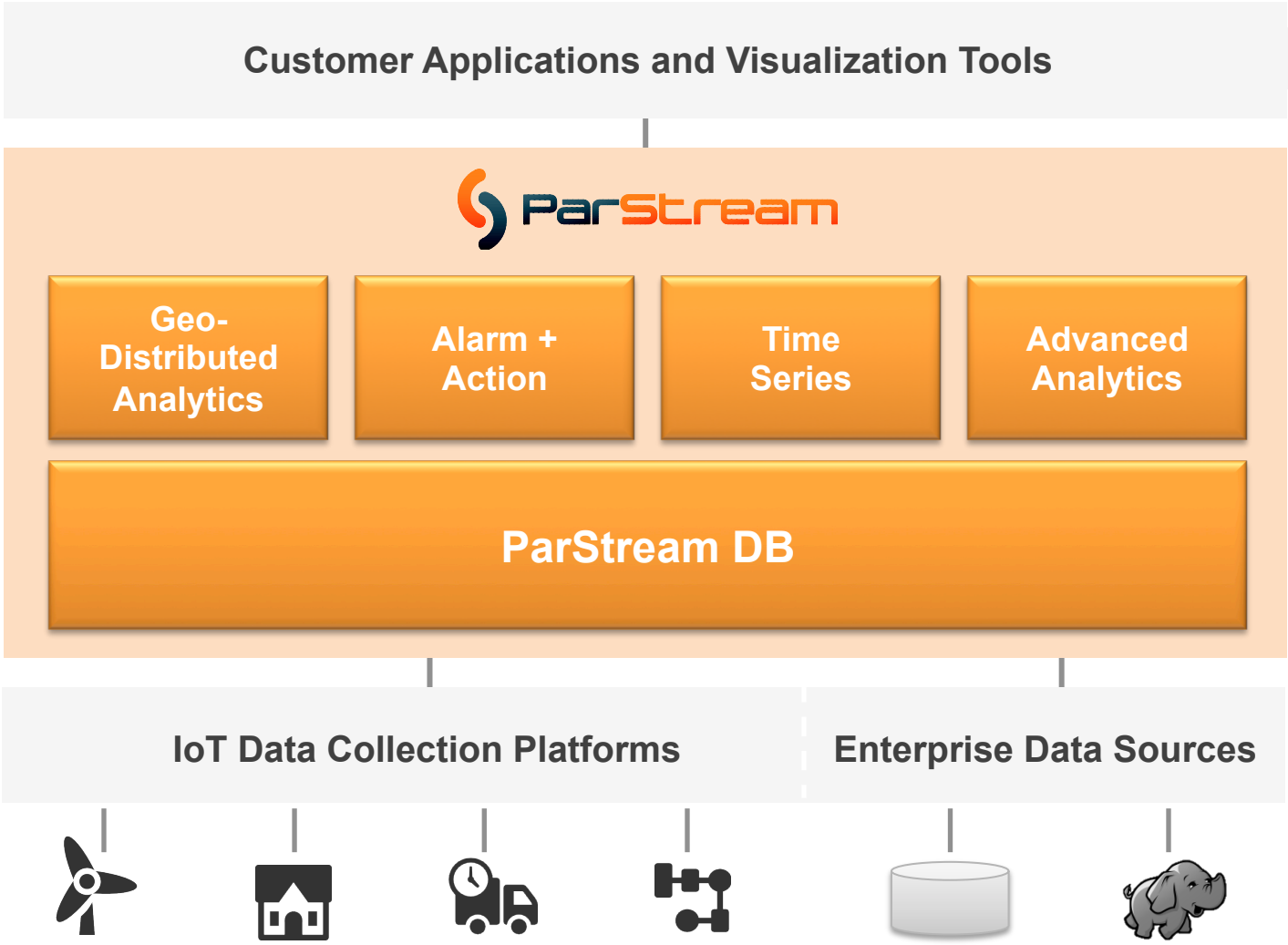
ParStream
Analytics Built for IoT

Backup Slides

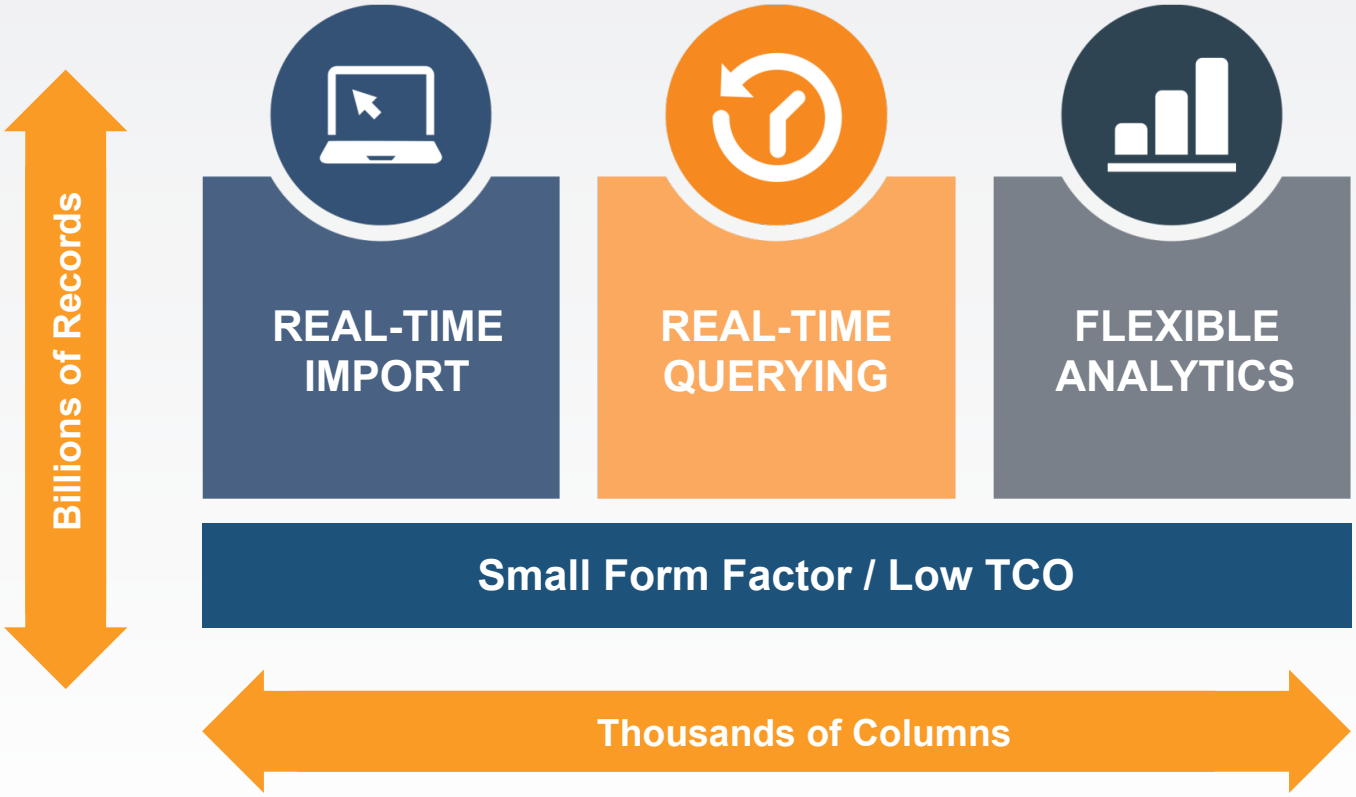
ParStream

Analytics Built for IoT

ParStream is the only solution for IoT analytics requirements



ParStream is uniquely positioned for real-time IoT analytics



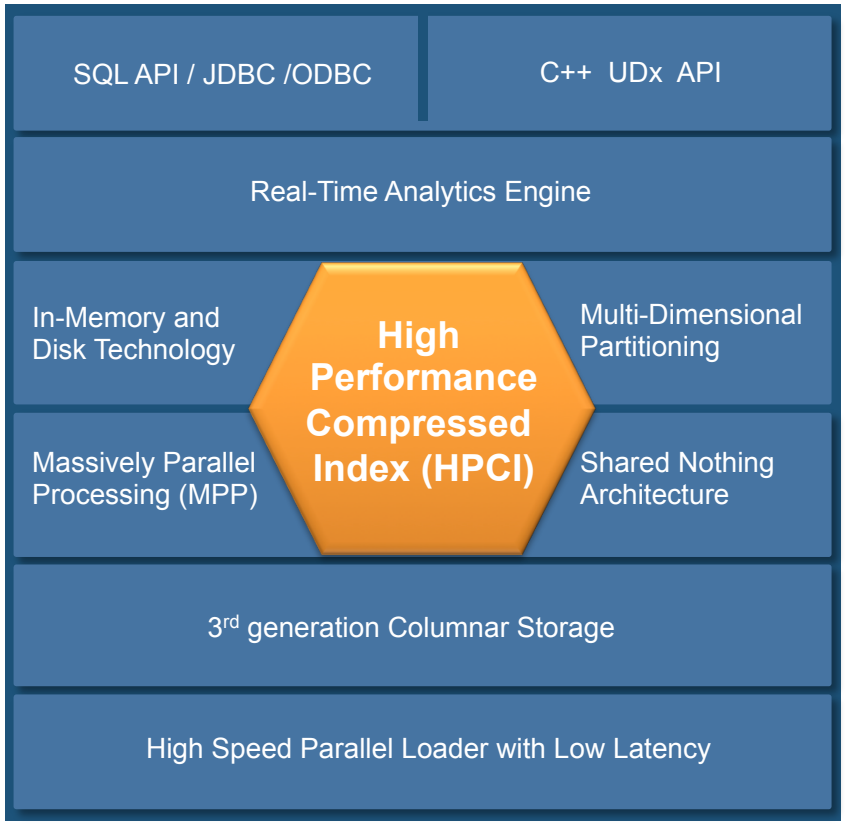
ParStream's patented technology provides a competitive advantage

1. **High Performance Compressed Indexes**
   Provide ultra-high query performance

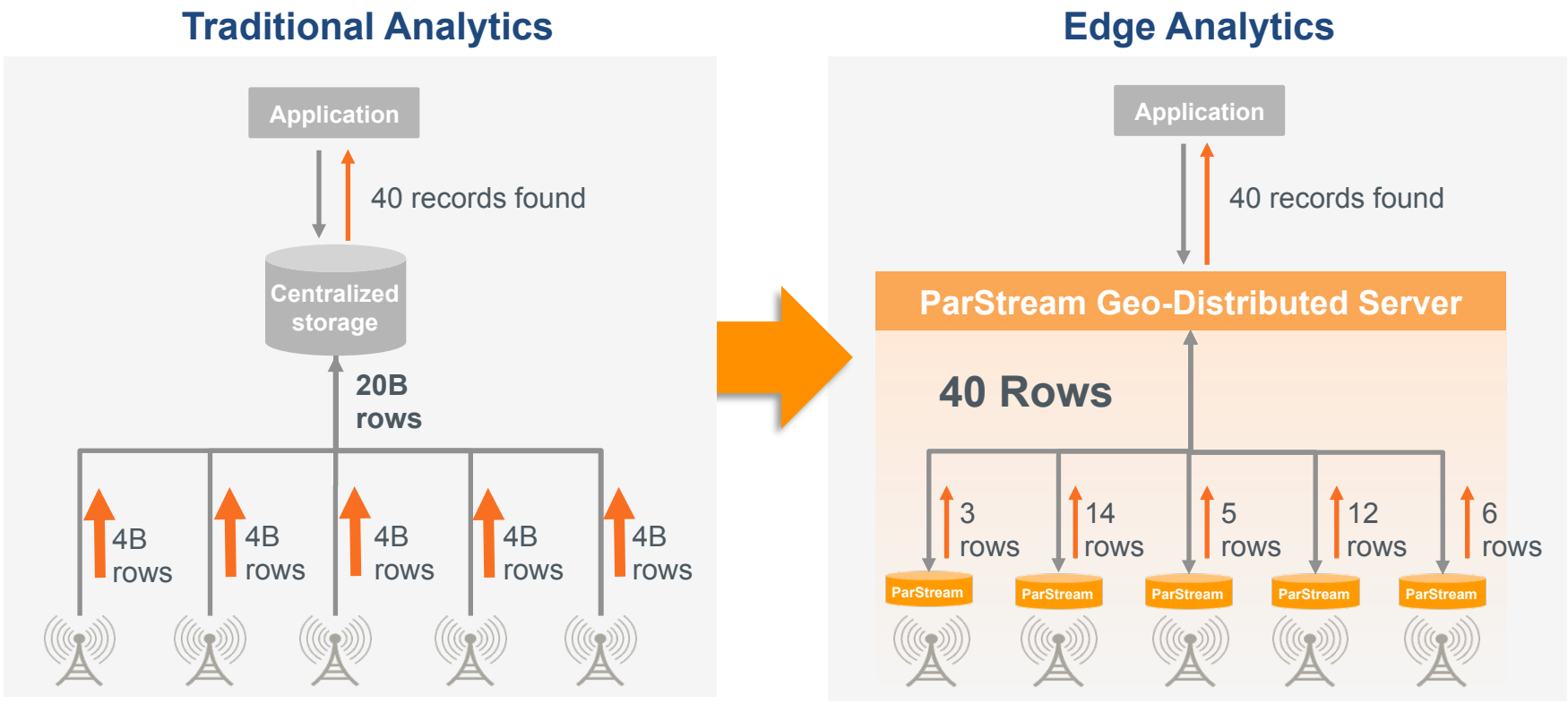
2. **Massive parallel processing**
   Delivers linear scalability and high query throughput

3. **Lockless architecture**
   Enables ultra-fast query and data import performance

4. **Small footprint**
   Enables analytics at the edge with a low TCO



Edge analytics delivers real-time insights by minimizing network traffic



Keith Nosbusch, CEO Rockwell Automation

"**remote monitoring and diagnostics** of physical assets such as liquid natural gas terminals… made possible by **enabling analytics at the source of data**…will **increase speed to insights** and also **alleviate the need to transport massive amounts of data** across the network"

ParStream introduces EdgeAnalyticsBox
The industry's first appliance built for edge analytics/GDA

NETWORKWORLD
New Product of the Week

- Specifically designed to enable edge analytics (Geo-Distributed Analytics).
- Ruggedized for use in real-world edge analytics applications such as oil/drilling sites, cell phone towers, wind farms, etc.
- Pre-loaded and tested with ParStream software.
- Technical Specs: Intel Core i5/i7 processor, 8-16 GB RAM and 64-128GB SSD
- EdgeAnalyticsBox provides customers with the convenience of a one-stop shop for the their edge analytics needs, however, customers can run GDA on any standard hardware with certain processing and storage requirements.

Industry-leading Product Recognition

Cisco Entrepreneurs in Residence

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#1 Big Data Startup

ParStream is the most reliable System in our Data Center

CTO, etracker

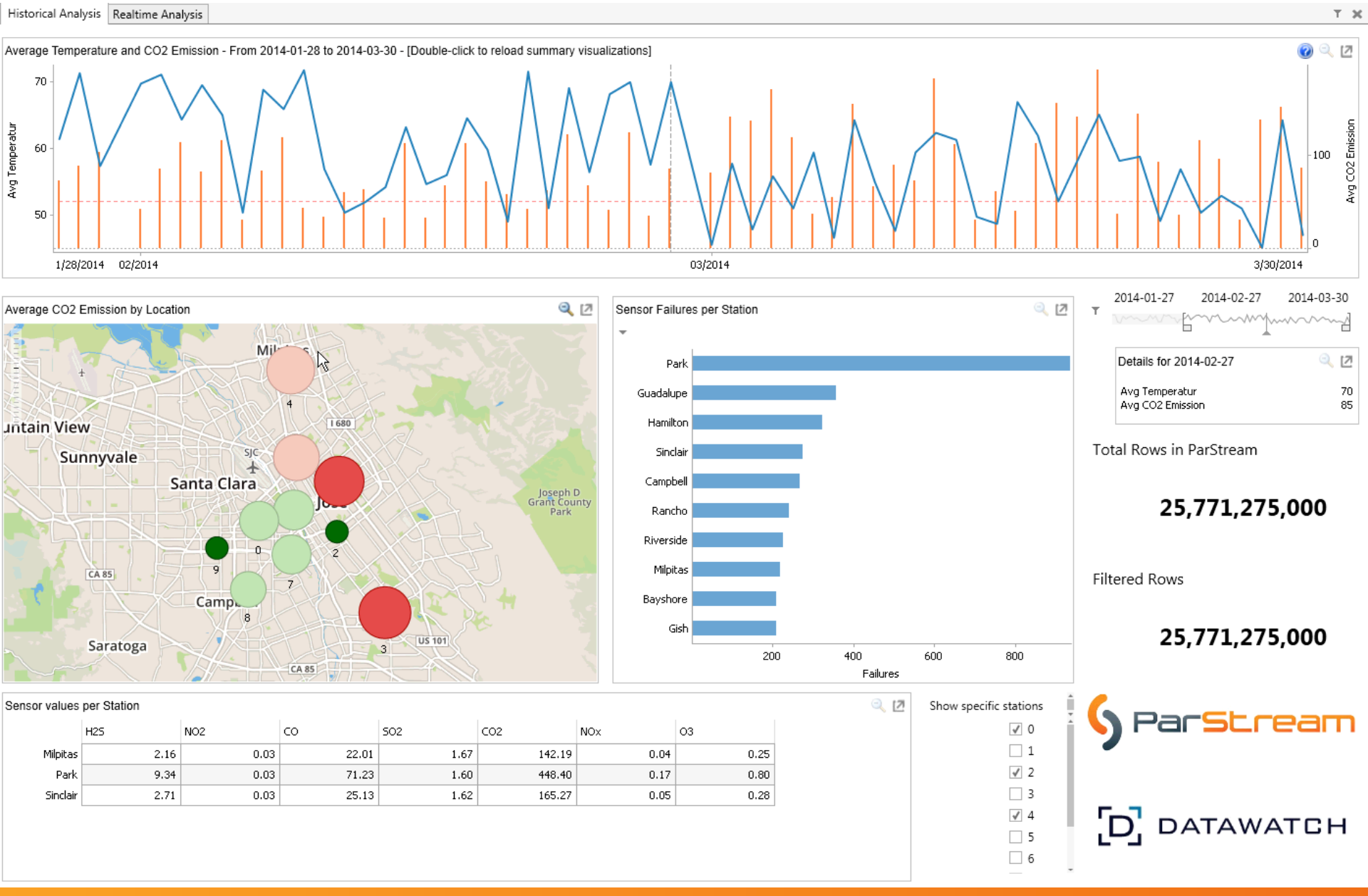
ParStream enabled us to scale internationally - TCO is much lower than with Hadoop

VP Eng, Searchmetrics

"ParStream's ability to analyze terabytes of data with sub-second response time helps us generate significant value."

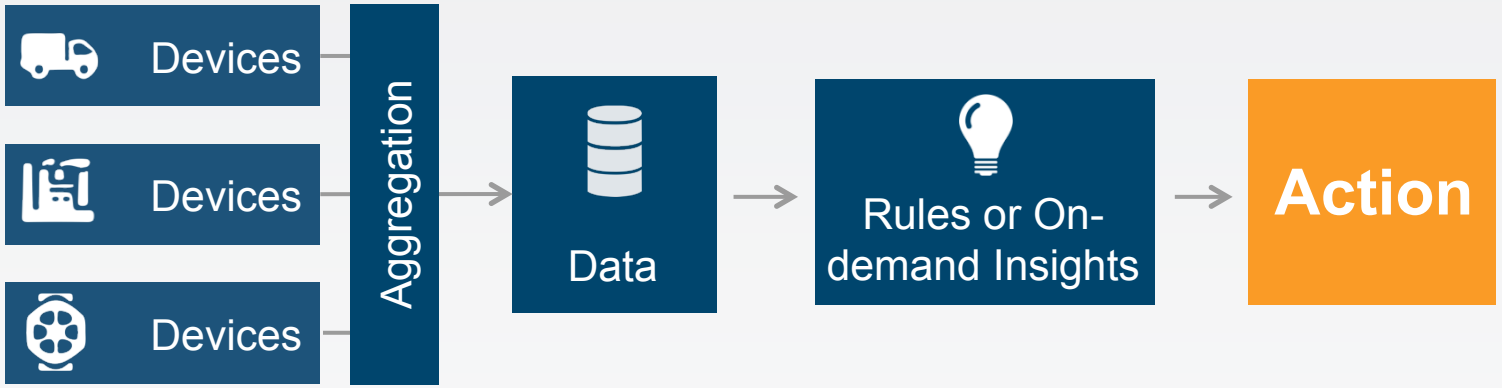
President, Envision Energy

Demo: Sensor Analytics for Real-time Environmental Compliance



	H2S	NO2	CO	SO2	CO2	NOx	O3
Milpitas	2.16	0.03	22.01	1.67	142.19	0.04	0.25
Park	9.34	0.03	71.23	1.60	448.40	0.17	0.80
Sinclair	2.71	0.03	25.13	1.62	165.27	0.05	0.28

The key to generating value from IoT data: Actionable Insights



REAL-TIME DATA INGESTION + IMMEDIATE QUERIES

= ACTIONABLE / TIMELY INSIGHTS