Beyond Ceilometer Metering and Billing

Cloud Analytics opportunity

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Partners in **Innovation**

Usage Polling

- Are you running Ceilometer?
- Are you using only for metering?
- How are you archiving your Ceilometer Data?
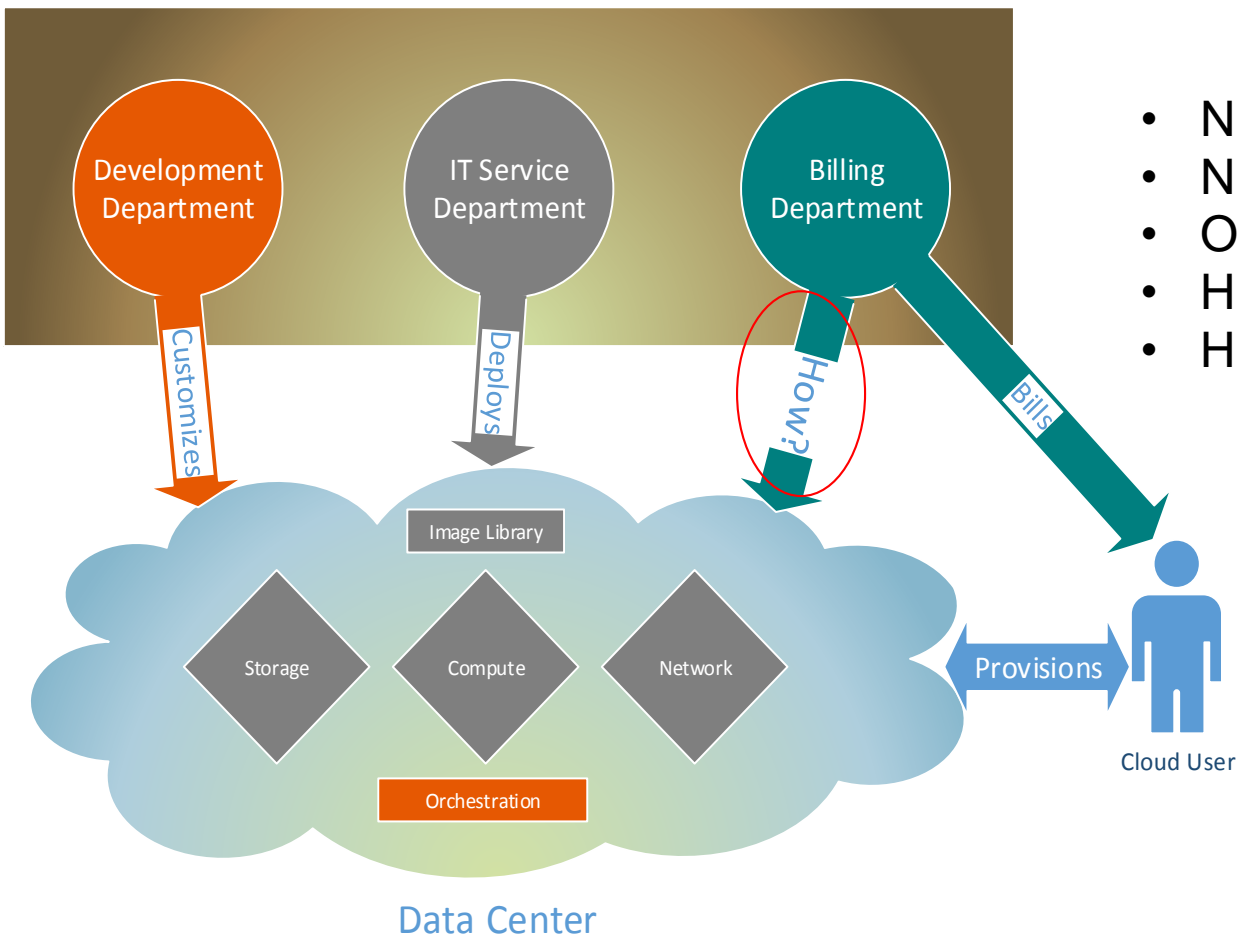- Do you want to use or continue using Ceilometer?

Goal

Awareness of Ceilometer evolution. Data warehouse source and Analytics

- Initial Intentions
- Initial features
- Evolution
- Current features
- Direction
- Analytics Opportunities
- Challenges
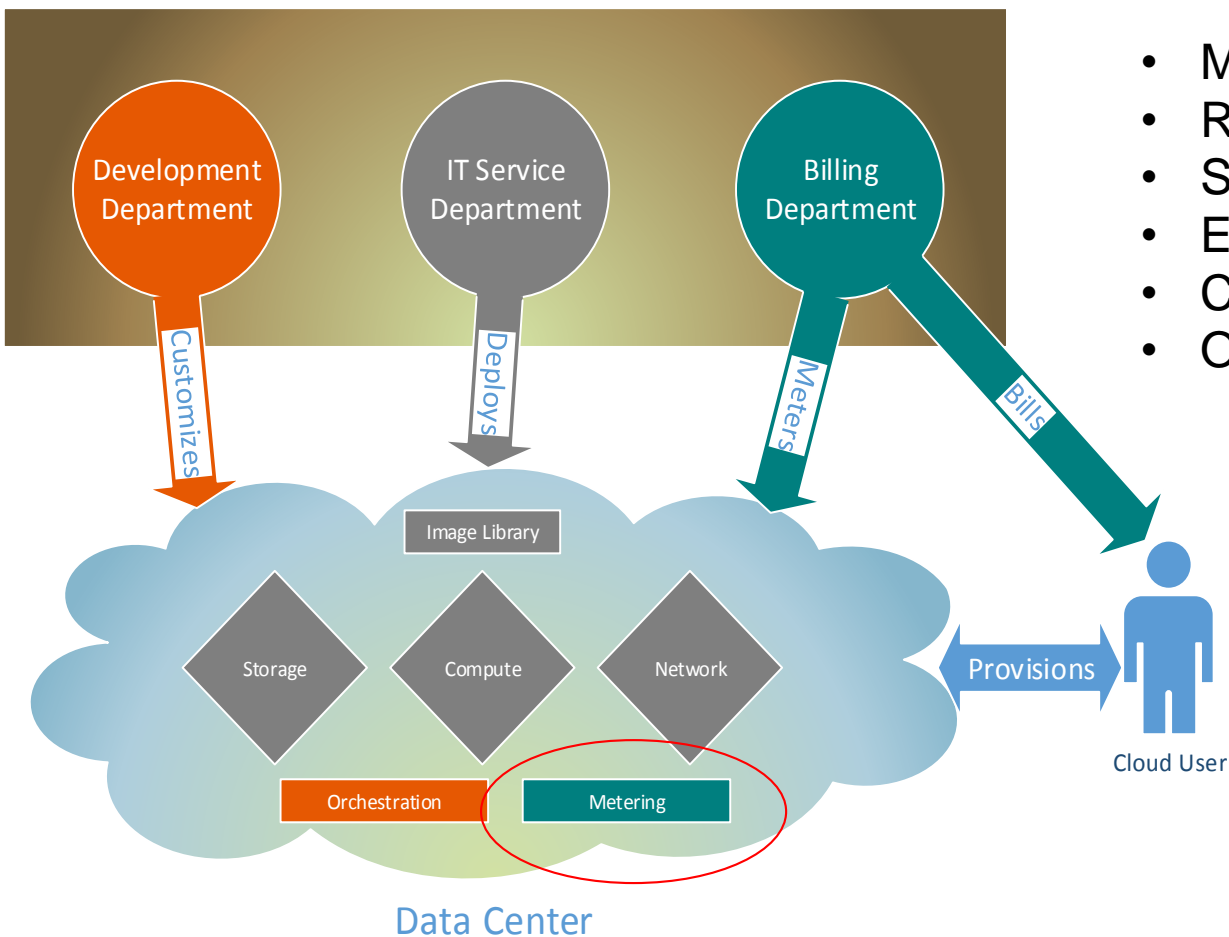- Solutions

Initial Intentions (The Gap)

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Cloud Provider

Development Department

IT Service Department

Billing Department

Customizes

Deploys

How?

Bills

- No data for billing
- Nova scheduler data lacking
- One-off solutions per provider
- Hard to port billing systems
- Hard Interop

Image Library

Storage

Compute

Network

Orchestration

Provisions

Cloud User

Data Center

4

Initial Intentions (Solution)

Cloud Provider

Development Department

IT Service Department

Billing Department

Customizes

Deploys

Meters

Bills

Image Library

Storage

Compute

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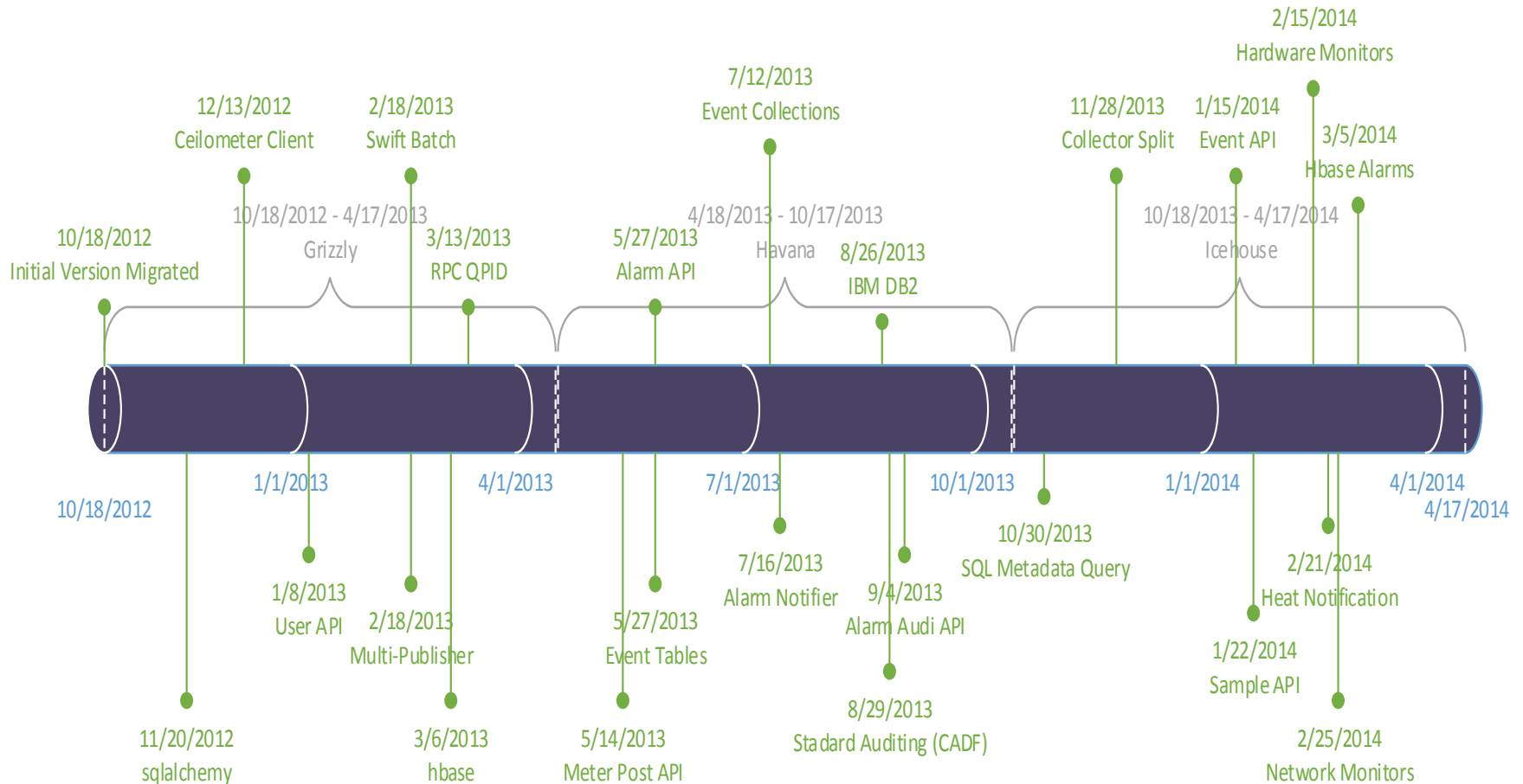
Metering

Provisions

Cloud User

Data Center

- Metering component Added
- Resource utilization provided
- Standardized solutions
- Easy to port billing systems
- Compatibility
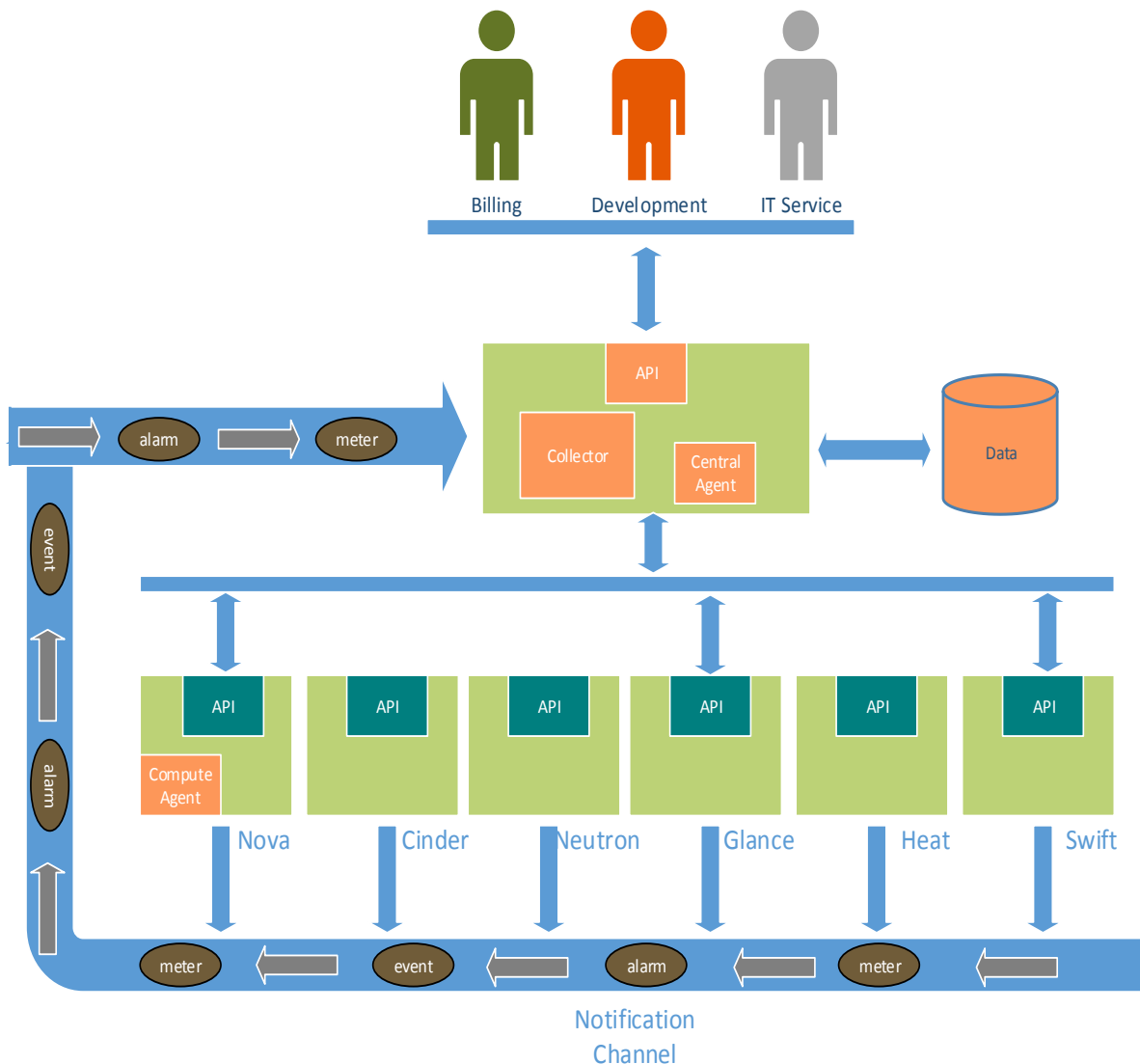- OpenStack Ceilometer was born

Initial Features

Billing Department
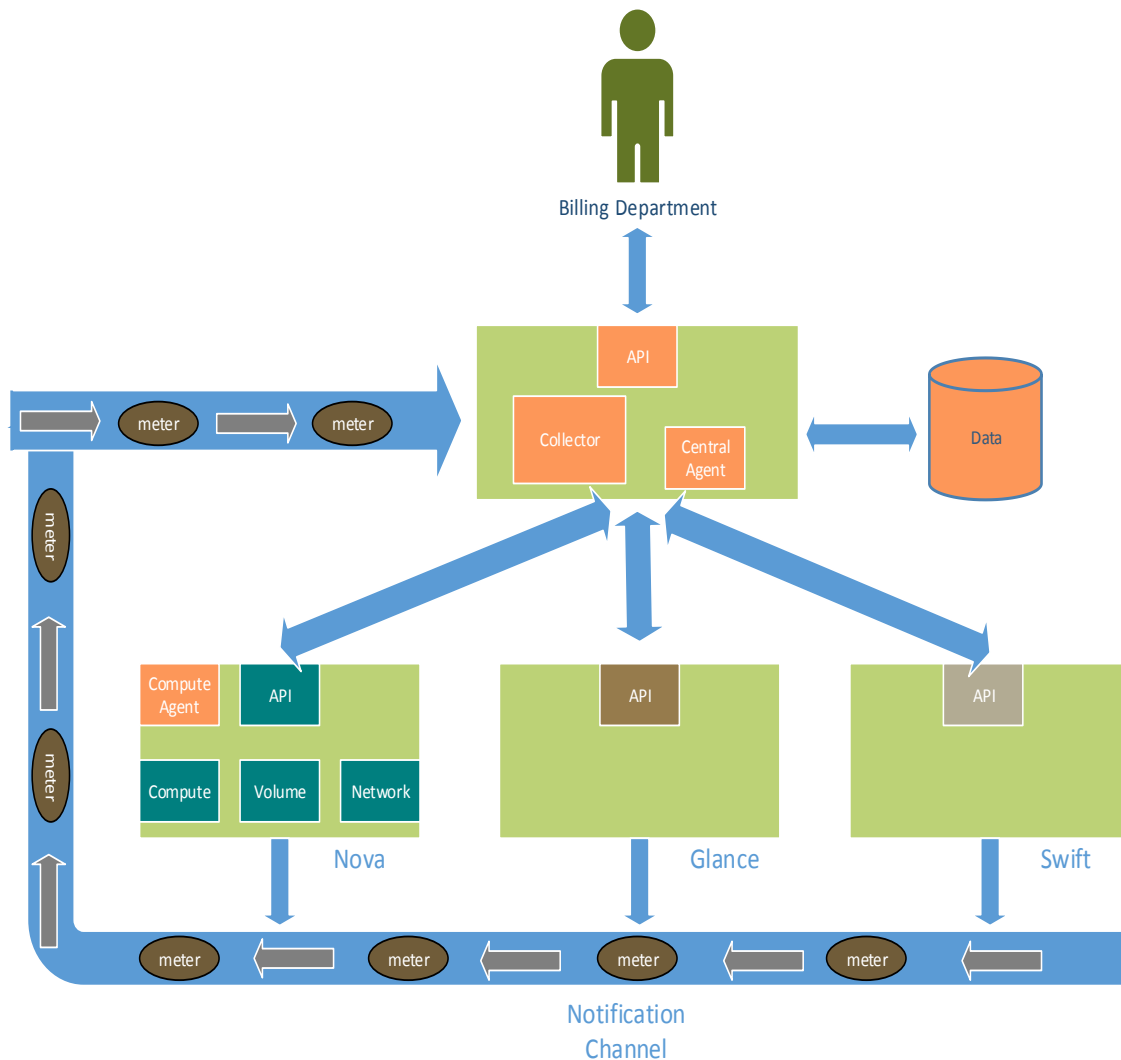
- Meter Samples
- Nova, Glance, Swift
- Agent Driven
- Good enough
- Enabled billing
- Non-SQL store
- Single Actor/Role

API

Collector

Central Agent

Data

meter

meter

meter

meter

Compute Agent

API

Compute

Volume

Network

Nova

API

Glance

API

Swift

meter

meter

meter

meter

Notification Channel

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Evolution

Top labels (above timeline):

- 2/15/2014 — Hardware Monitors
- 12/13/2012 — Ceilometer Client
- 2/18/2013 — Swift Batch
- 7/12/2013 — Event Collections
- 11/28/2013 — Collector Split
- 1/15/2014 — Event API
- 3/5/2014 — Hbase Alarms
- 10/18/2012 - 4/17/2013 — Grizzly
- 10/18/2012 — Initial Version Migrated
- 3/13/2013 — RPC QPID
- 5/27/2013 — Alarm API
- 4/18/2013 - 10/17/2013 — Havana
- 8/26/2013 — IBM DB2
- 10/18/2013 - 4/17/2014 — Icehouse

Timeline axis dates:
10/18/2012 · 1/1/2013 · 4/1/2013 · 7/1/2013 · 10/1/2013 · 1/1/2014 · 4/1/2014 · 4/17/2014

Bottom labels (below timeline):

- 10/18/2012
- 1/8/2013 — User API
- 2/18/2013 — Multi-Publisher
- 5/27/2013 — Event Tables
- 7/16/2013 — Alarm Notifier
- 10/30/2013 — SQL Metadata Query
- 9/4/2013 — Alarm Audi API
- 2/21/2014 — Heat Notification
- 11/20/2012 — sqlalchemy
- 3/6/2013 — hbase
- 5/14/2013 — Meter Post API
- 8/29/2013 — Stadard Auditing (CADF)
- 1/22/2014 — Sample API
- 2/25/2014 — Network Monitors
- PERSISTENT

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Current Features

- Meters, Events and Alarms
- All components including Keystone
- CADF Events for Audit
- SQL and NON-SQL store
- Highly customizable
- Can be used with Heat on auto-scale
- Multiple Actors/Roles

What if you turn on today?

Advantages

- Auditing
- Can measure utilization
- Alarm driven Auto-scaling
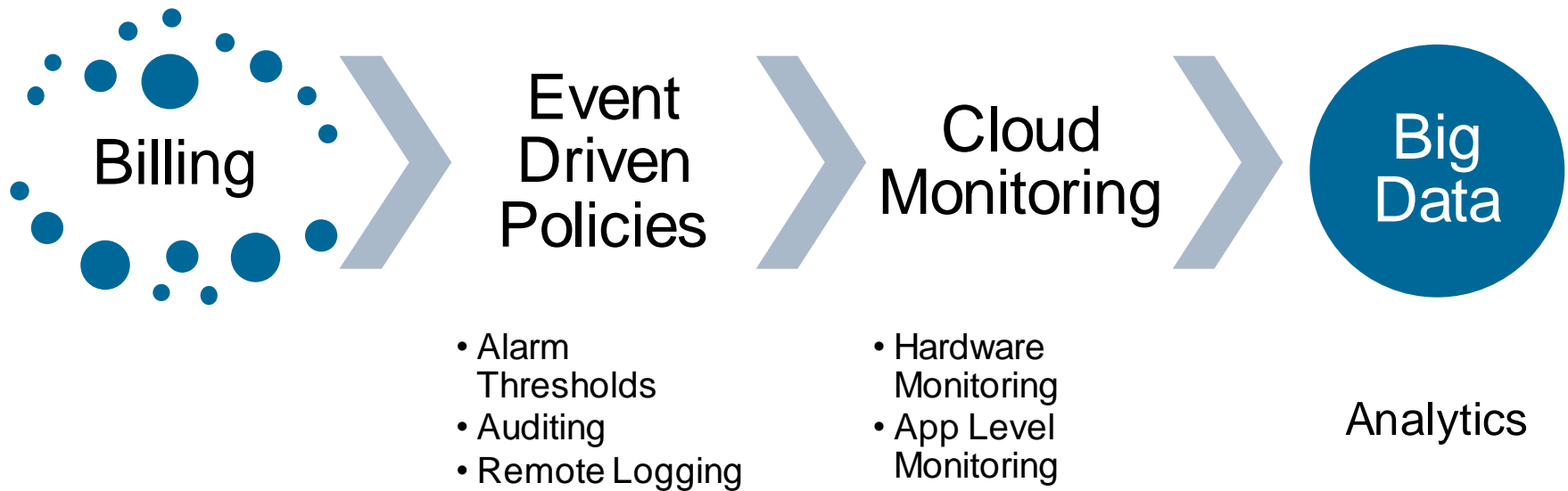- Hardware monitoring
- Data store options
- Analytics Opportunity

Potential Issues

- Additional processing cycles
  - Generation, Transmission and Processing
- Additional Storage
- Additional Configuration Complexity

Direction
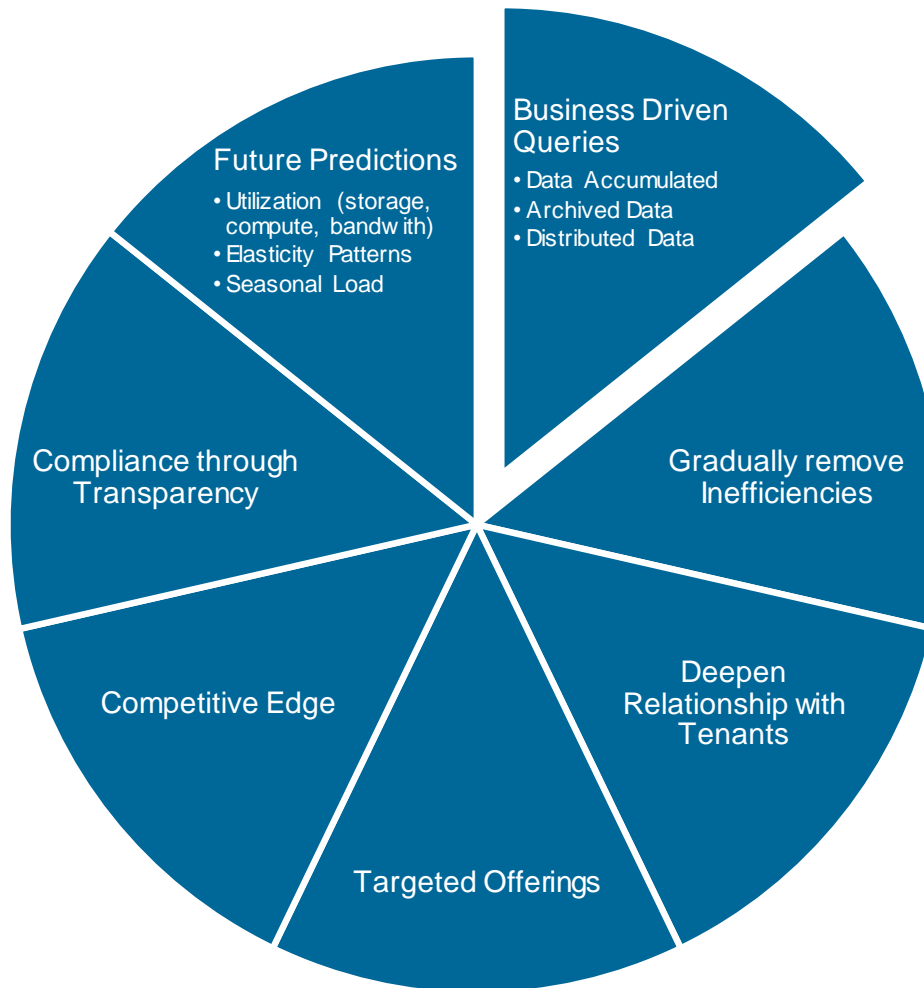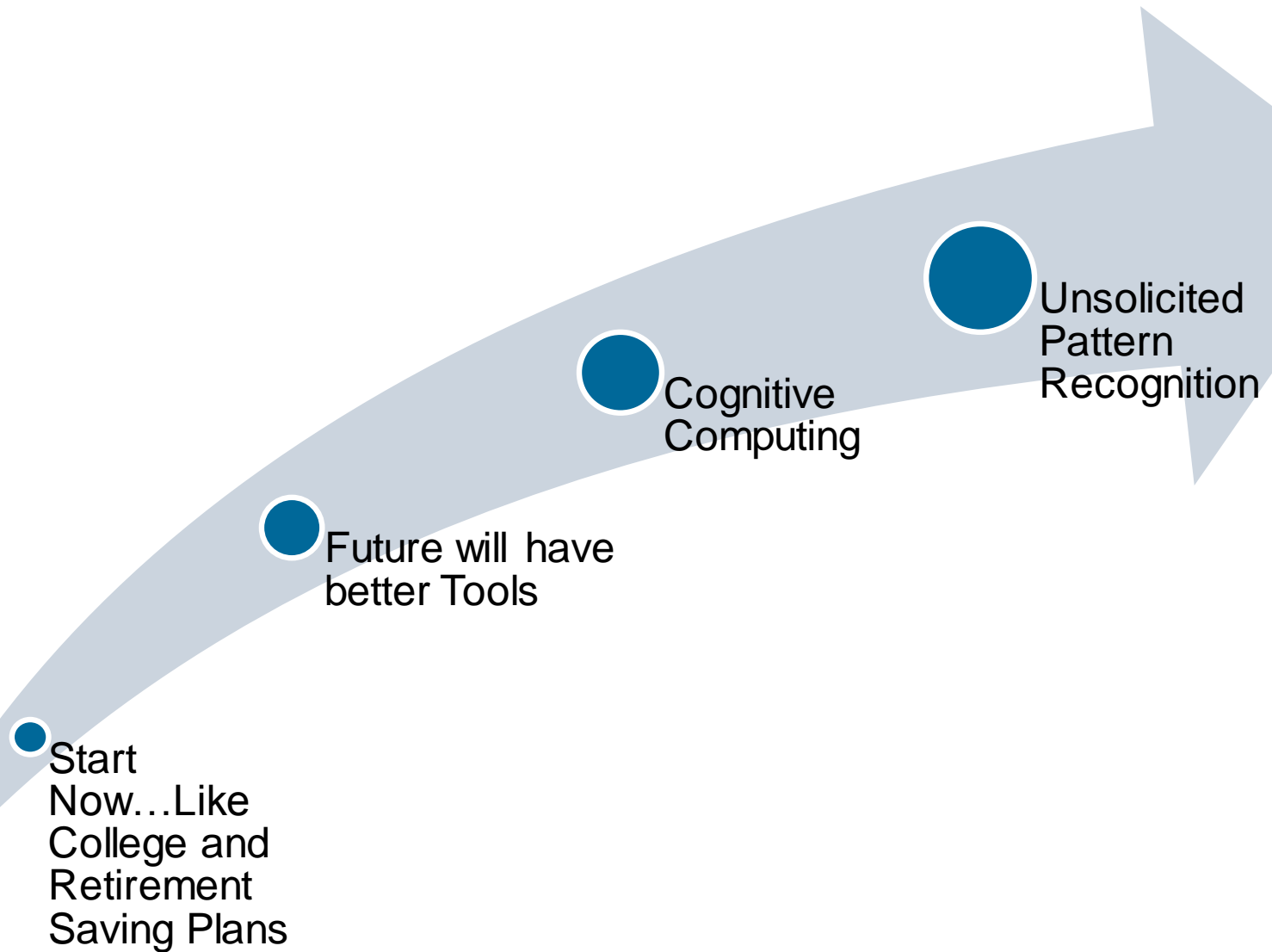
Billing → Event Driven Policies → Cloud Monitoring → Big Data

- Alarm Thresholds
- Auditing
- Remote Logging

- Hardware Monitoring
- App Level Monitoring

Analytics

Analytics Opportunities

Future Predictions
- Utilization (storage, compute, bandwith)
- Elasticity Patterns
- Seasonal Load

Business Driven Queries
- Data Accumulated
- Archived Data
- Distributed Data

Compliance through Transparency

Gradually remove Inefficiencies

Competitive Edge

Deepen Relationship with Tenants

Targeted Offerings

Analytics Opportunities (scenarios)

- Want to know about resource growth
  - How much storage do we buy this year?
  - When will I reach my Compute Threshold?
- Predictions
  - Can I host new technologies?
  - Am I ready for DR
  - Can I lower cost while growing in next 10 years?
- Target Solutions
  - New Image upgrade solution
  - Backup and Recovery
  - Security Solutions
- Inefficiencies
  - Underutilized sections of the cloud?
  - Orphan Resources?
  - Network Bottlenecks?

Analytics (future)

Unsolicited Pattern Recognition

Cognitive Computing

Future will have better Tools

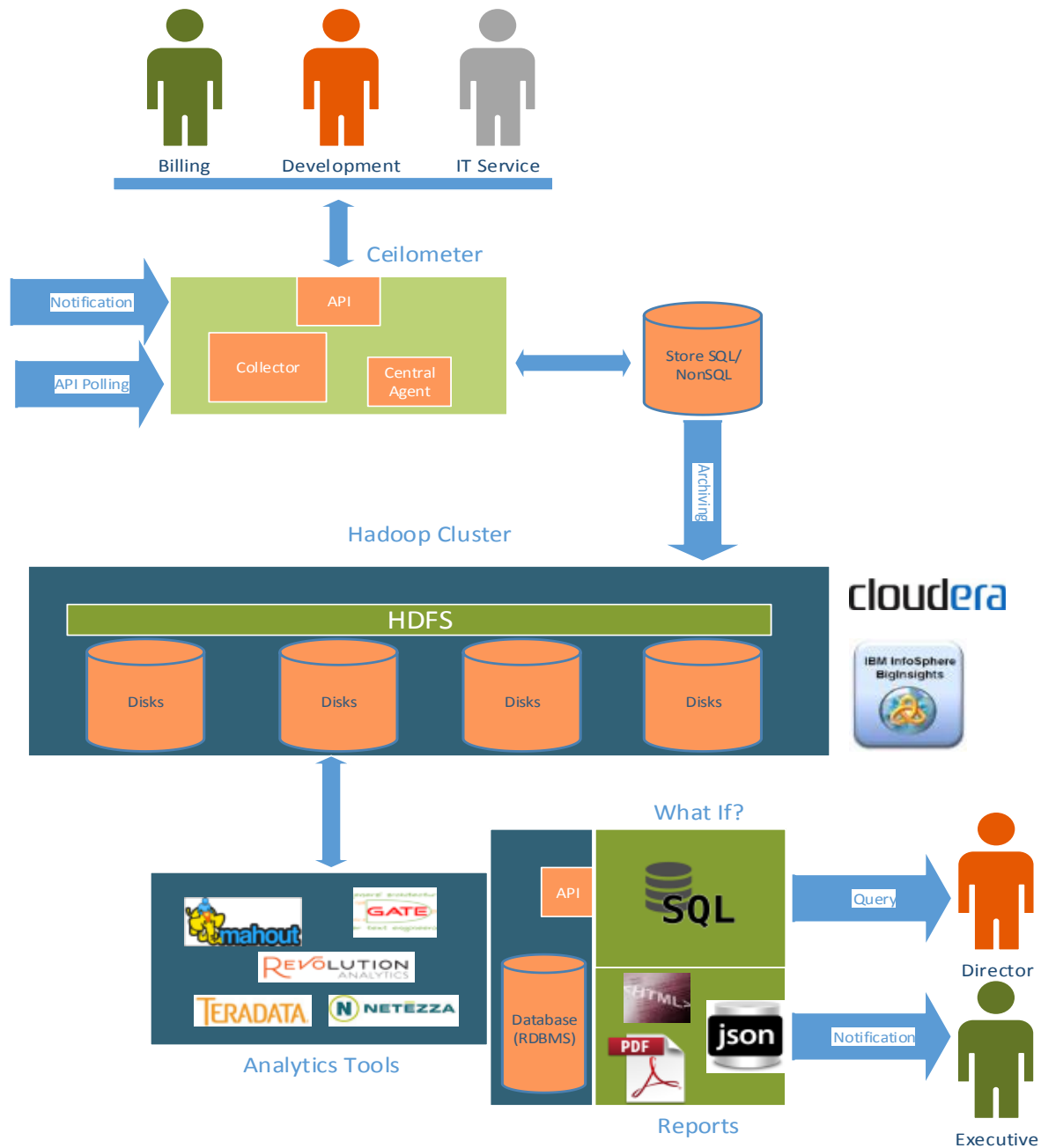Start Now…Like College and Retirement Saving Plans

Challenges
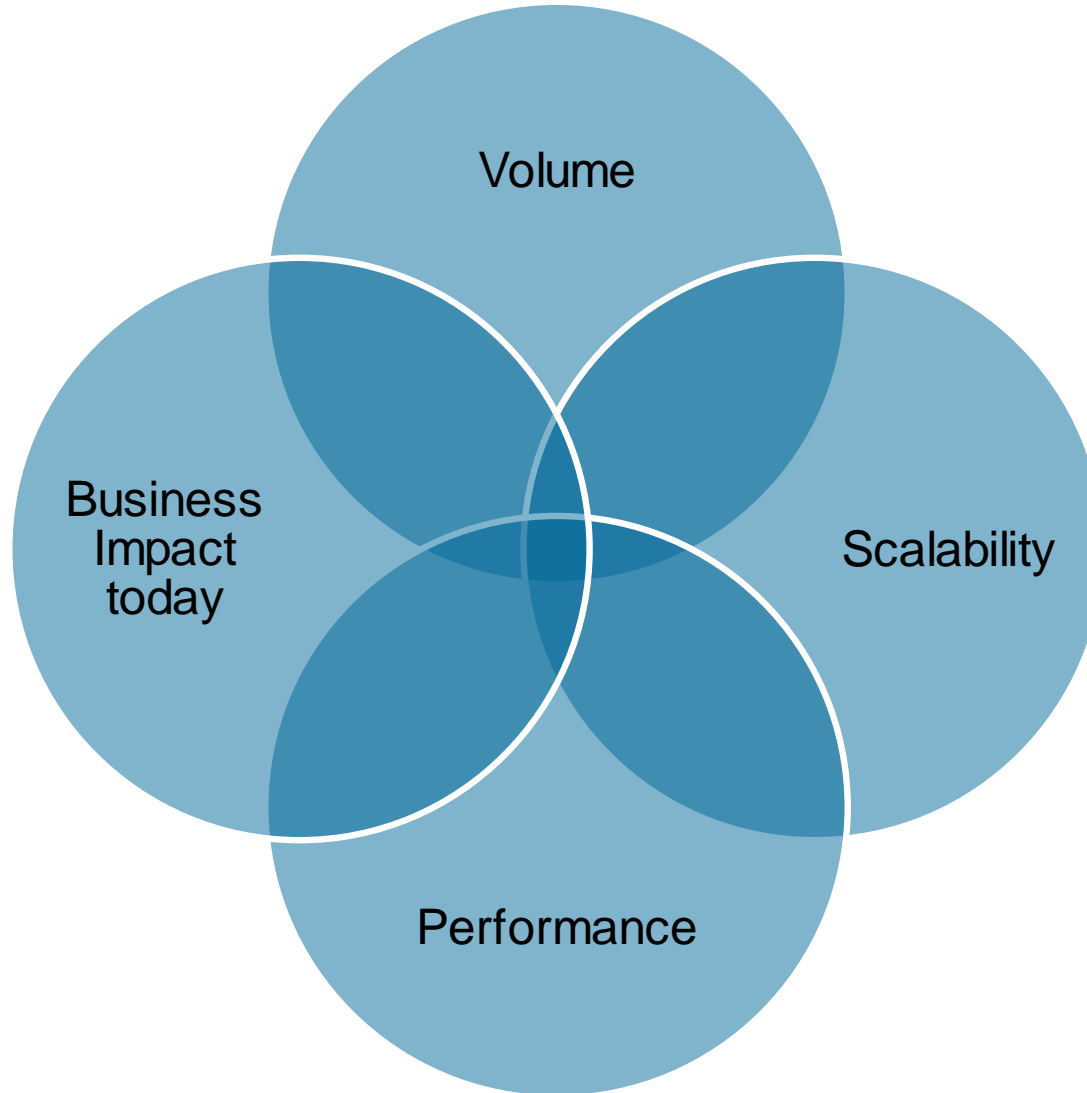
Solution

- Design for min impact to daily operations
  - High Performance
  - Lower Priority Processes and Threads
  - Asynchronous
  - Dedicated Resources
- Archiving Strategy
  - Don't just save the data
  - Save and Distribute in clusters
  - Store consistent with your Data Warehouse method
- Allow for portability
  - Avoid assumption on current analytics tools
  - Analytics will evolve.
- Plan for long term storage
  - More chances for Disaster and Data Lost

Reference Architecture

Billing   Development   IT Service

Ceilometer

Notification

API

Collector   Central Agent

API Polling

Store SQL/ NonSQL

Archiving

Hadoop Cluster

cloudera

HDFS

Disks   Disks   Disks   Disks

IBM InfoSphere BigInsights

What If?

mahout   GATE

REVOLUTION ANALYTICS

TERADATA   NETEZZA

Analytics Tools

API

SQL

Database (RDBMS)

HTML

PDF

json

Query

Director

Notification

Reports

Executive

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Your Perspective

- Did we convince you?

- Why or Why Not?

- Share with community: openstack@lists.openstack.org or openstack-dev@lists.openstack.org use [Ceilometer] tag in subject.

Thank You

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Forward-looking and Cautionary Statements

Certain statements in this Presentation concerning our future growth prospects are forward-looking statements, which involve a number of risks and uncertainties that could cause actual results to differ materially from those in such forward-looking statements. The risks and uncertainties relating to these statements include, but are not limited to, risks and uncertainties regarding fluctuations in earnings, our ability to manage growth, intense competition in IT services including those factors which may affect our cost advantage, our revenues highly dependent on customers located in the United States, wage increases in India, our ability to attract and retain highly skilled professionals, time and cost overruns on fixed-price, fixed-time frame contracts, client concentration, restrictions on immigration, industry segment concentration, our ability to manage our international operations, reduced demand for technology in our key focus areas, disruptions in telecommunication networks or system failures, our ability to successfully complete and integrate potential acquisitions, liability for damages on our service contracts, concentration of major operations of the Company in one city, withdrawal of governmental fiscal incentives, political instability and regional conflicts, legal restrictions on raising capital or acquiring companies outside India, and unauthorized use of our intellectual property and general economic conditions affecting our industry. The Company may, from time to time, make additional written and oral forward-looking statements, including statements contained in the Company's filings with the Stock Exchanges and our reports to shareholders. The Company does not undertake to update any forward-looking statements that may be made from time to time by or on behalf of the Company.