

A man in a dark suit and white shirt is shown in profile, pointing his right index finger at a large digital display. The display shows a complex network diagram with various colored lines (blue, green, red, yellow) and nodes, representing data flow or system architecture. The background is a blurred server room or data center environment.

Internet of Things: Driving Data Center Demand and Performance

Col Inderjeet Singh
Director SGL Ltd

Technology changes fueling innovation

Technology Transitions



Mobility / Video



Cloud



New Breed of Apps



Internet of Things



Big Data & Analytics

Changing Role of IT

Growth &
Productivity
Opportunities

New Business
Models

User Experience
& Expectations

Globalization

Security &
Regulatory
Compliance

Business Implications

It Always Starts with a Business Problem...



Preventative Maintenance

Real-time Quality Detection



Personnel Safety

Remote Monitoring



Asset Tracking & Management

OEE (Overall Equipment Efficiency)



Real-time Quality Detection

Condition-Based Maintenance



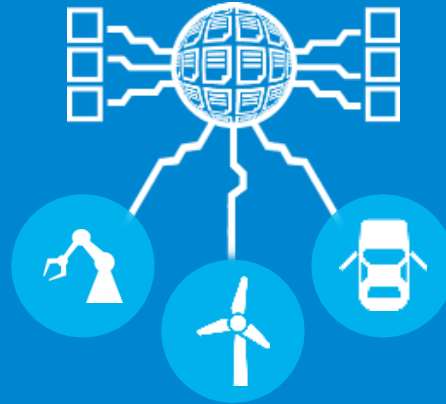
Vision – Internet of Things

Intelligent Devices



Deliver services where
& when needed

Intelligent System of Systems



Share data securely

End to End Analytics



Enable useful information



IoT driving data center demand and performance

Digital TRAFFIC

3.3x Growth of global data center IP traffic over next 5 years

Source : Cisco Cloud Index Report 2015

Internet of THINGS

26.8B connected things by 2020

Source : Gartner, 2016

IoT SECURITY

20% of annual security budgets will be devoted to IoT solutions by 2020

Source : Gartner, 2016

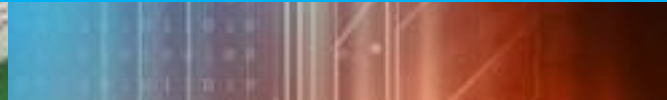
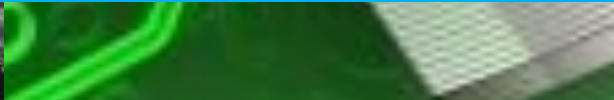
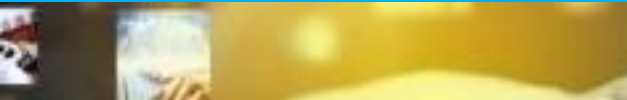
Edge COMPUTING

40% of IoT data will be stored, processed, analyzed and acted upon at the edge

Source : IDC WW IoT Predictions, 2015



IoT driving data center demand and performance



Advanced analytics, artificial intelligence, and machine learning are becoming IoT enablers

Real-time data from integrated sensors or external sources can be used for analytic tasks

Stronger cybersecurity eases IoT concerns

More industrial devices are living on the edge

“Things” have many challenges

- Different Devices & Capabilities
 - Micro
 - Mini
 - Standard
 - Macro
- Many Operating Systems
- Vendors Working to Differentiate
- Security and Data Privacy

Meeting user expectations will be
challenging

Robot cop begins patrolling the streets of Dubai



Robot Cops

25% of the Dubai police force to be robots by 2030



The Robots Can:

- salute
- bow
- speak in multiple languages
- recognize hand gestures from up to 1.5 meters away

The robot police officer has the ability to scan faces from

20 metres

away and bears a touchscreen on its chest which members of the public can use to contact the police

Humanoid robot Sophia has been made a citizen of Saudi Arabia - giving her more rights than local women



IoT will Require Re-architecting of Data Center

Challenges

- Rapid Application deployment and Scaling
- Security
- Consumer Privacy
- Storage Management
- Networking

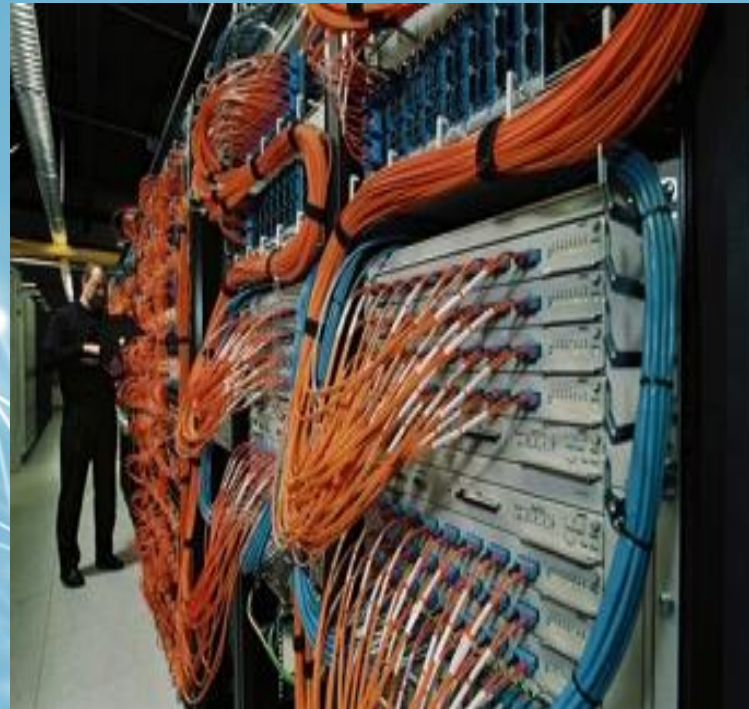
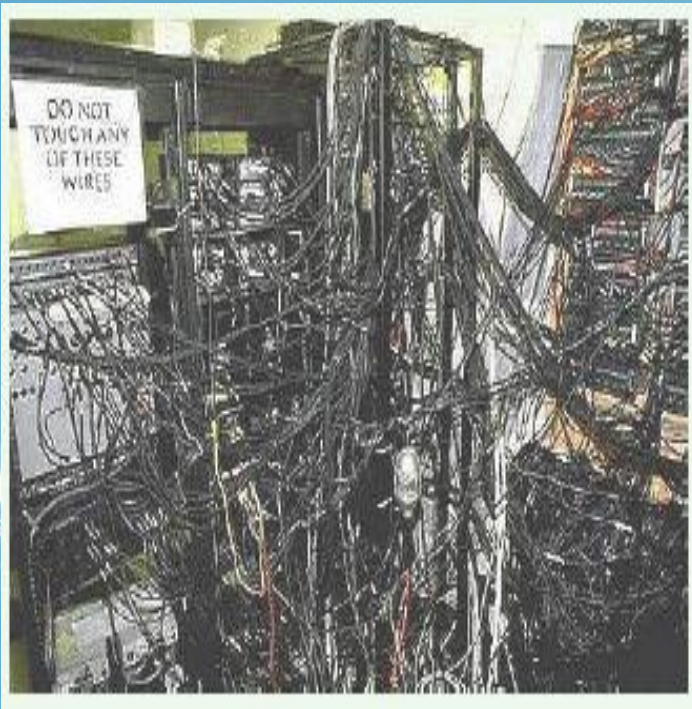


Transformation of Data Center

Server Room

(Centralized)
Conventional Data
Center

Distributed Movable
Data Center



Typical Data Center Architecture

Building

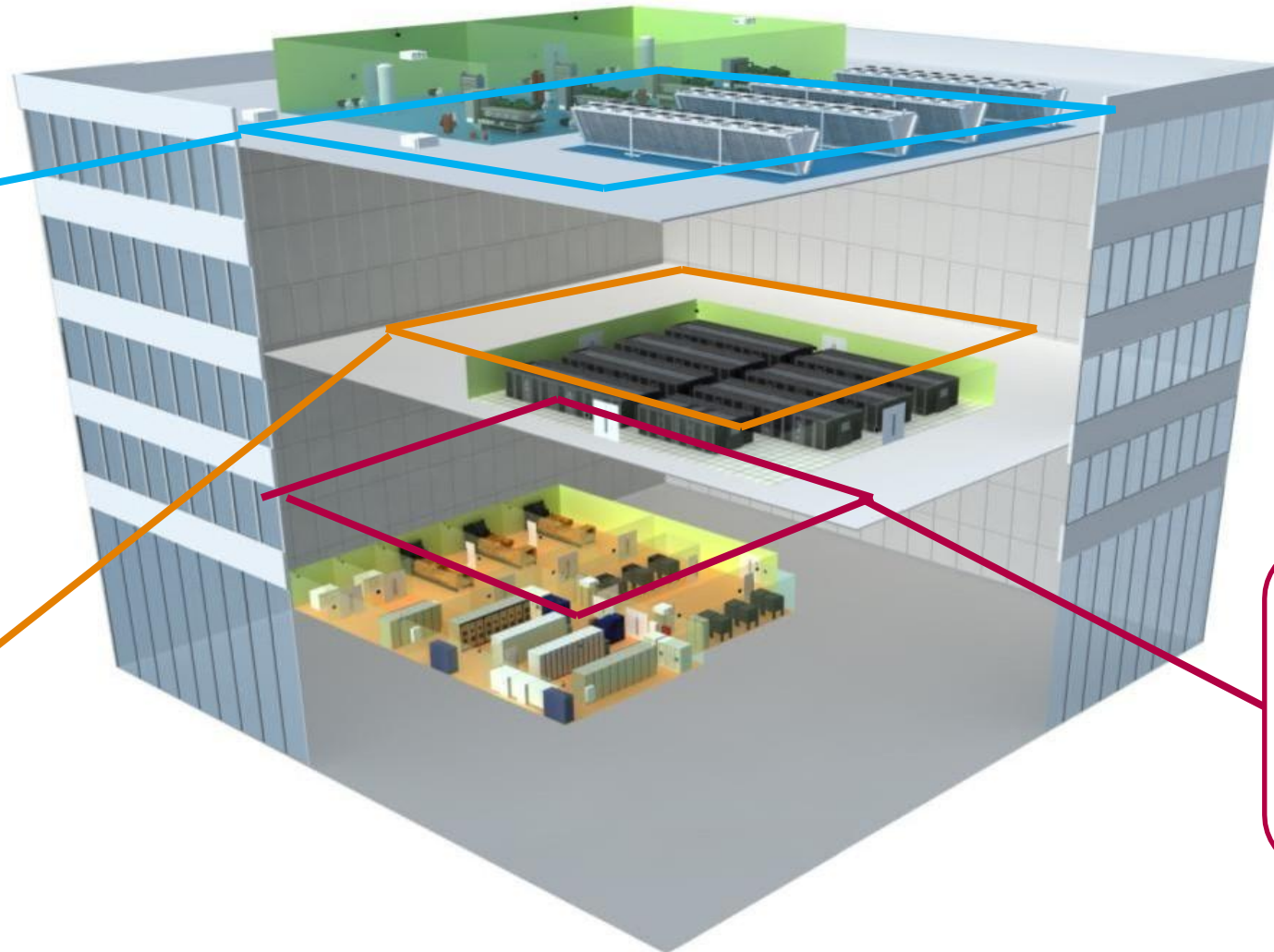
- Chillers
- Economizers
- Pump packages
- Monitoring and Control
- Heat Rejection

IT

- IT racks
- Security and Monitoring
- Computer Room Air Conditioner (CRAC)
- Access Floor
- PDU's

Power

- UPS
- Switchgear (MV, LV)
- Busway
- Panel Boards
- Meters



Transformation of Data Center



Movable Data Center



IoT Trends And Technology Driving Innovation

Impact of the IoT on data centers falls into two categories:

Efficiency Improvements

Employ predictive instead of preventative maintenance, which is expected to reduce maintenance costs by 30%.

load increase

IoT traffic is forecast to triple to almost 2.2ZB by 2020. This will require both an expansion of existing data center capacity, as well as a move towards distributed

edge data centers ■

Overcoming legacy Data Center limitations

Workloads
in the past
decade were

**Hardware
Defined**

Static

Manual

Workloads
in the next
decade will be

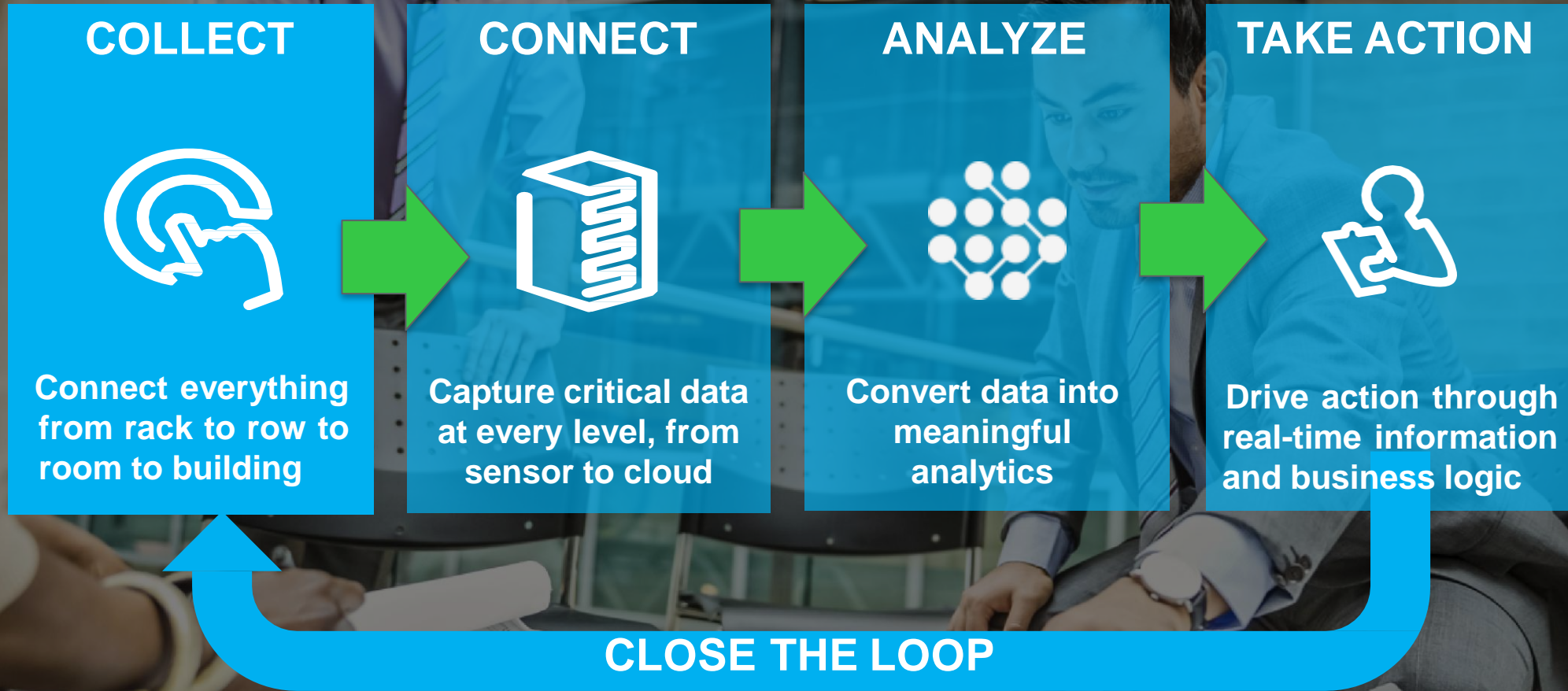
**Software
Defined**

Dynamic

Automated

Maximize the value of data

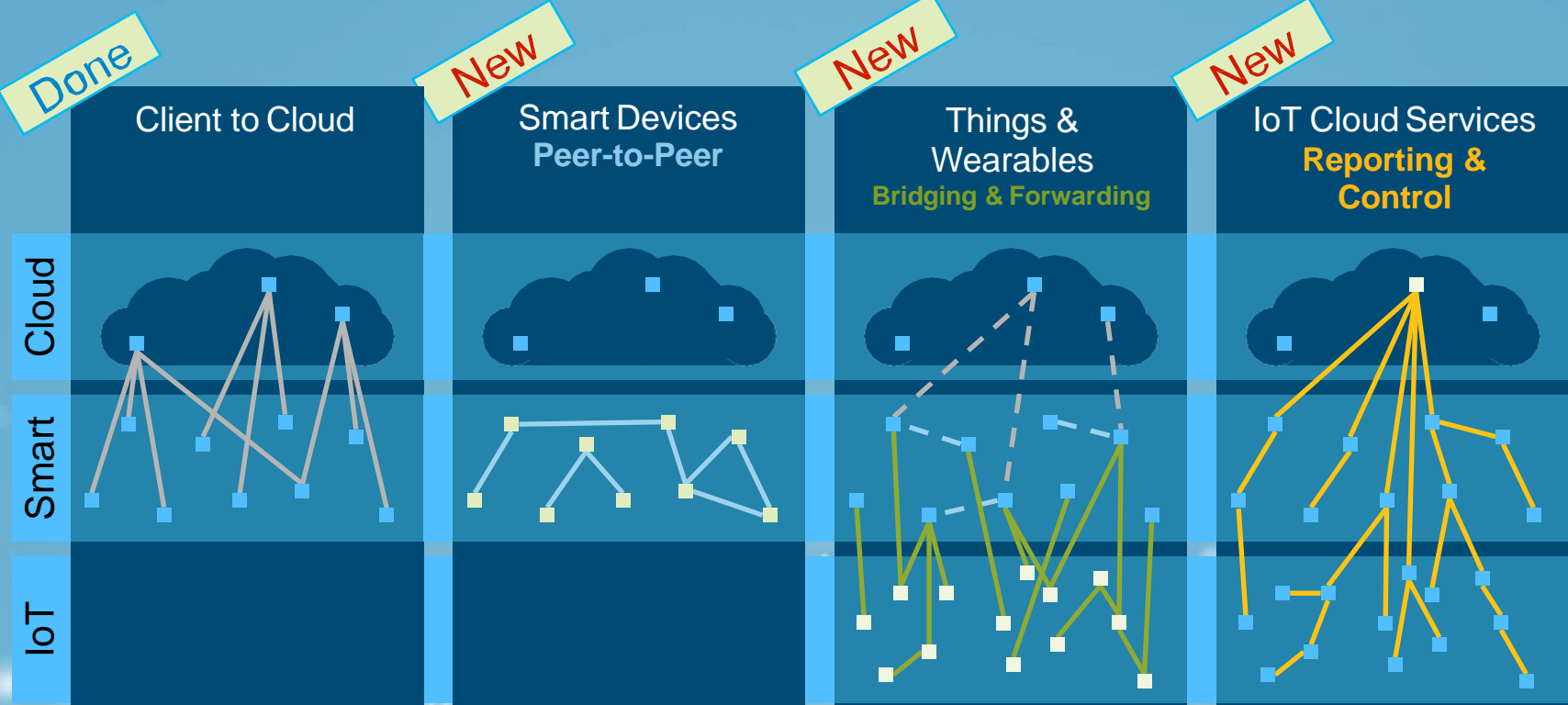
Translating data into actionable intelligence and better business decisions



Open Interconnect Usages



OPEN
INTERCONNECT
CONSORTIUM



Scope of OIC – IoT Comms

OIC to address the challenge of IoT comms



Preparing the Data Center for Internet of Things

- 1 Re-architect the Data Center with Software Defined Infrastructure
- 2 Transform Services Capability with Orchestration Software
- 3 Use Data Analytics to extract Value and Insight

Step 1: Re-architect the Data Center with software defined infrastructure (SDI)

SERVICE ASSURANCE

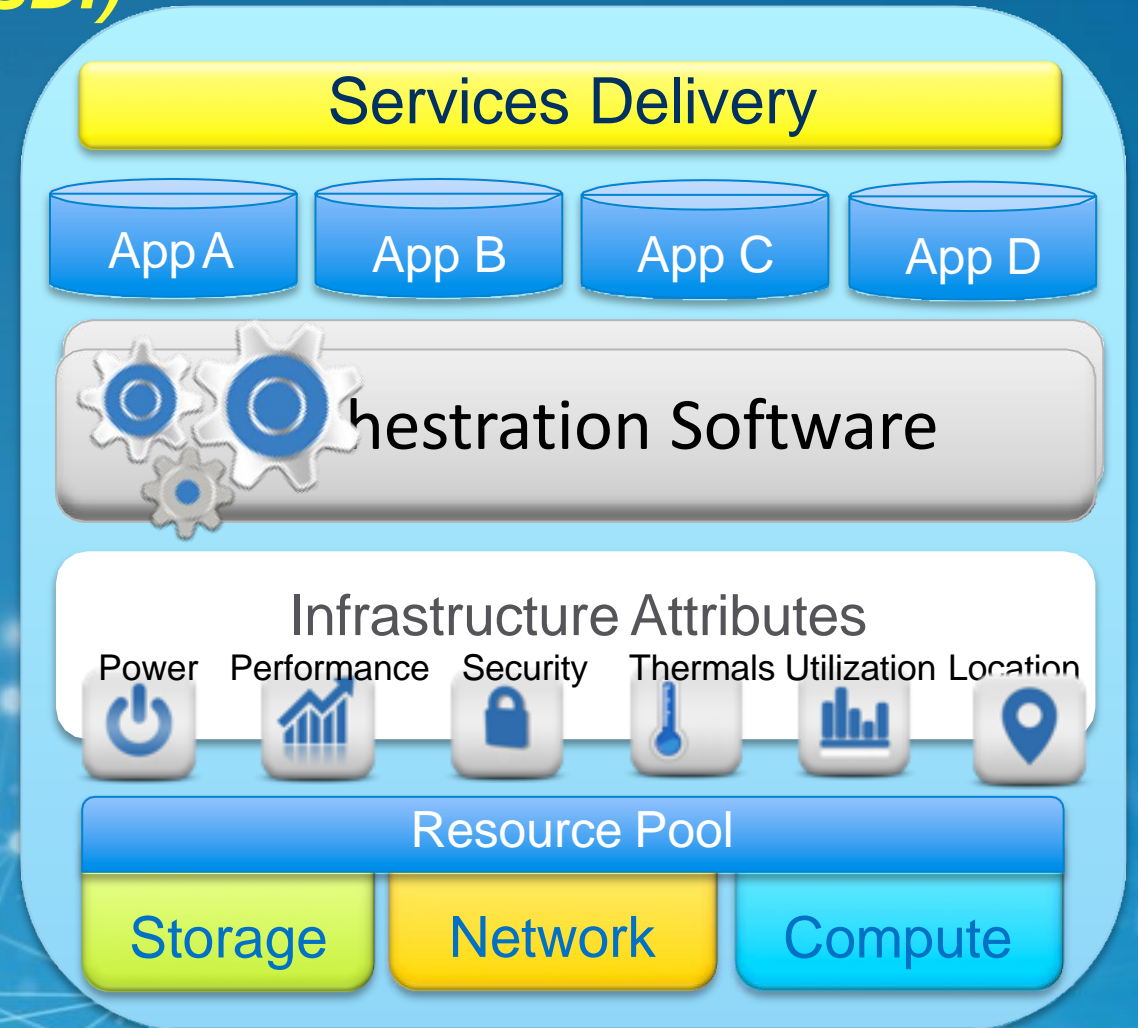
Applications are automatically deployed and maintained

PROVISIONING MANAGEMENT

Orchestration provisions, manages and optimally allocates resources

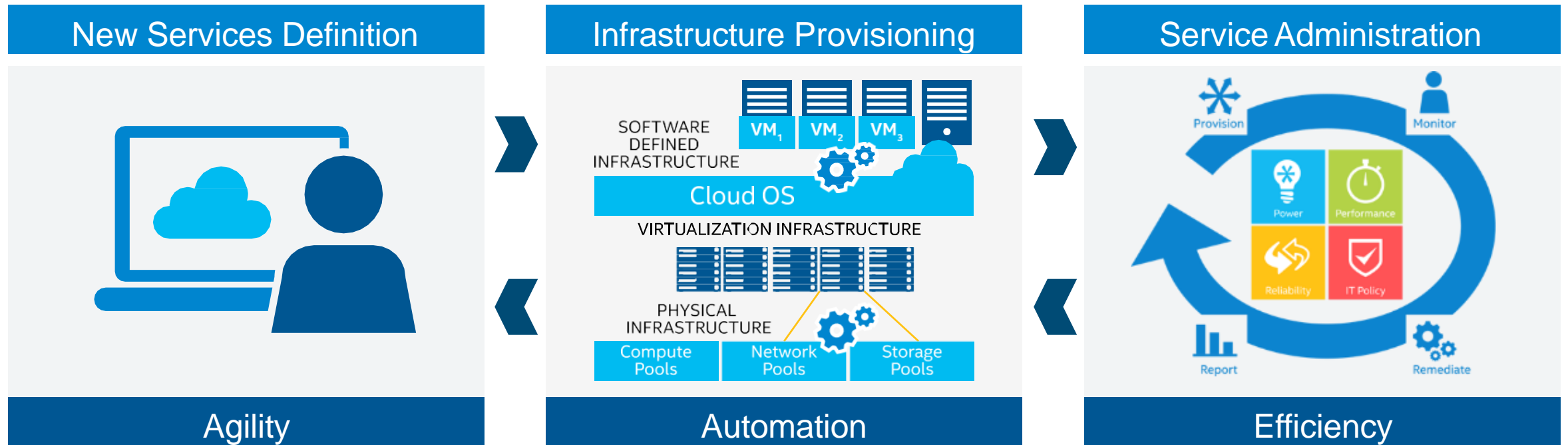
POOLED RESOURCES

Network, Storage and Compute elements are abstracted into resource pools



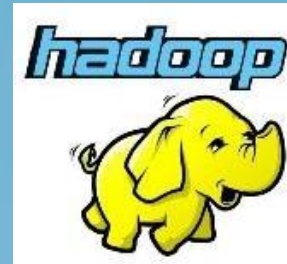
Step 2: Transform Services Capability

Example: OpenStack



- Massively scalable, open cloud computing platform for both public and private clouds
- Controls large pools of compute, storage, and networking resources

Step 3: Use Data Analytics to extract Value and Insight



Analytics In Action



In the Future Analytics will be Pervasive



Thank You

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