

Infrastructure Matters

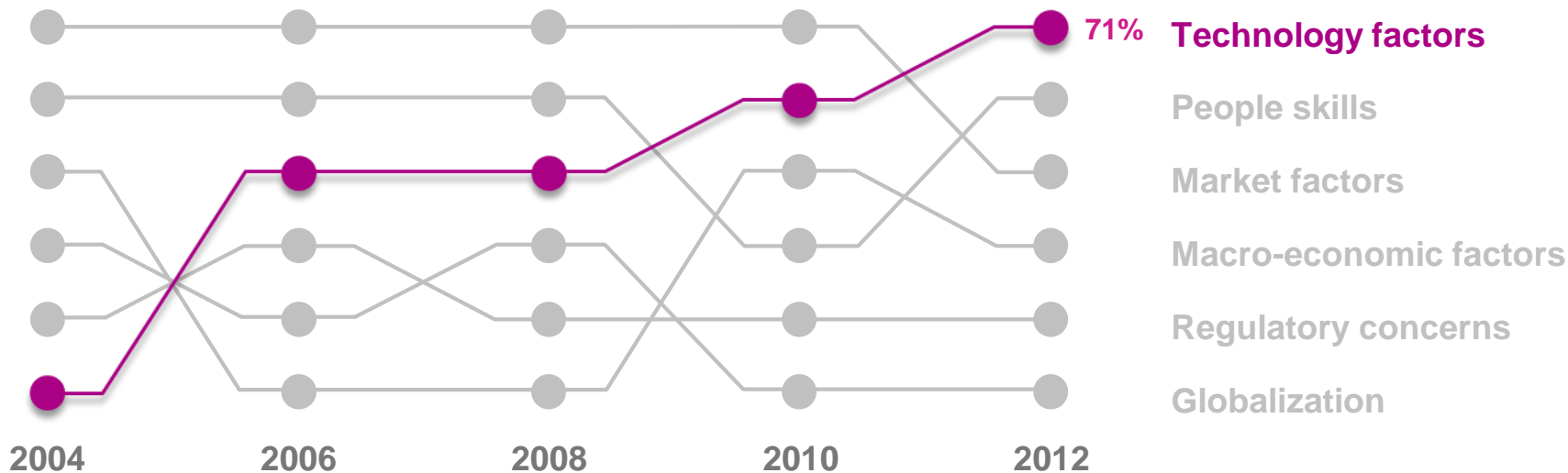
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Global CEO Study 2012: CEOs identify technology as the most important external force impacting their organizations



Technology Impacts on Business

Massive amounts of unstructured data
Rapid product lifecycles

Increasing interactions with customer
Opportunities for greater productivity



Mobile "apps"



Collaboration



Big Data



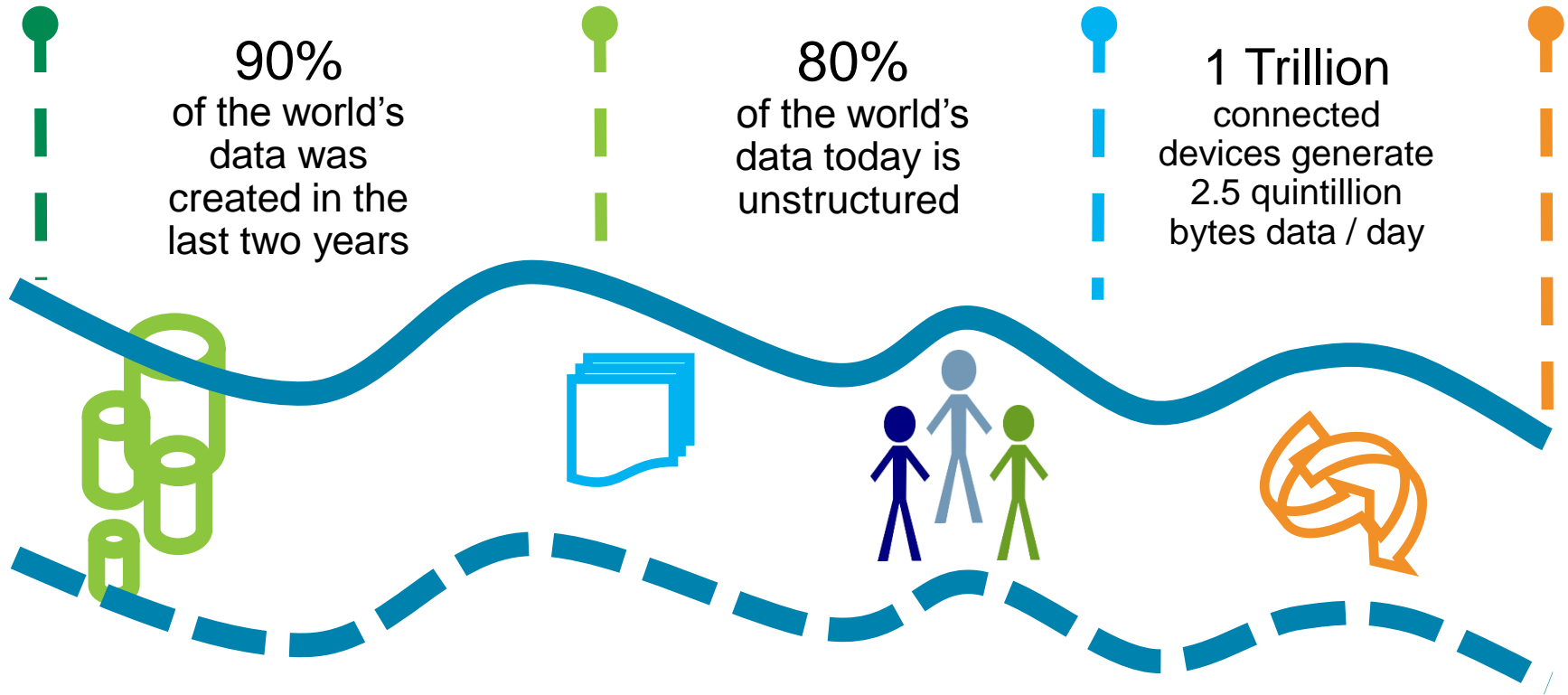
Cloud





Intelligent/
Connected Systems



Data is the New Natural Resource

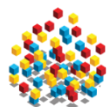


The Cost of the Speed and movement of Data

 <h2>Cloud</h2> <p>Opex represents 75% of the cost of cloud deployments with Capex being only 25%</p>	 <h2>Analytics</h2> <p>Companies effectively leveraging data are outperforming their competition 2.6 times</p>	 <h2>Mobile</h2> <p>85% of Mobile Users expect sites to load faster than desktops #1 issue is slow load times</p>	 <h2>Social</h2> <p>33% of users will look at a different site if load time is slow, over half will unlikely to return</p>
<ul style="list-style-type: none"> • Workloads suited for Cloud • Unpredictable Data • SLA & QOS Guarantees • Unpredictable Capex • Unpredictable Opex • Speed based on experience 	<ul style="list-style-type: none"> • Analytics defined by Speed • Big Data defined by Cost • Unpredictable Data Growth • Analytics predictable Capex • Big Data unpredictable Capex • Need predictable Opex for both • 1-10% Data actually used 	<ul style="list-style-type: none"> • Explosive Data Growth • Direct Benefits to Speed • Predictable Data • Mobile Capex will pay • Predictable Opex 	<ul style="list-style-type: none"> • Explosive Data Growth • In-Direct Benefits to Speed • Unpredictable Data • Unpredictable Capex • Unpredictable Opex



New era of high growth workloads is stressing IT even more



Exploding Data Volumes



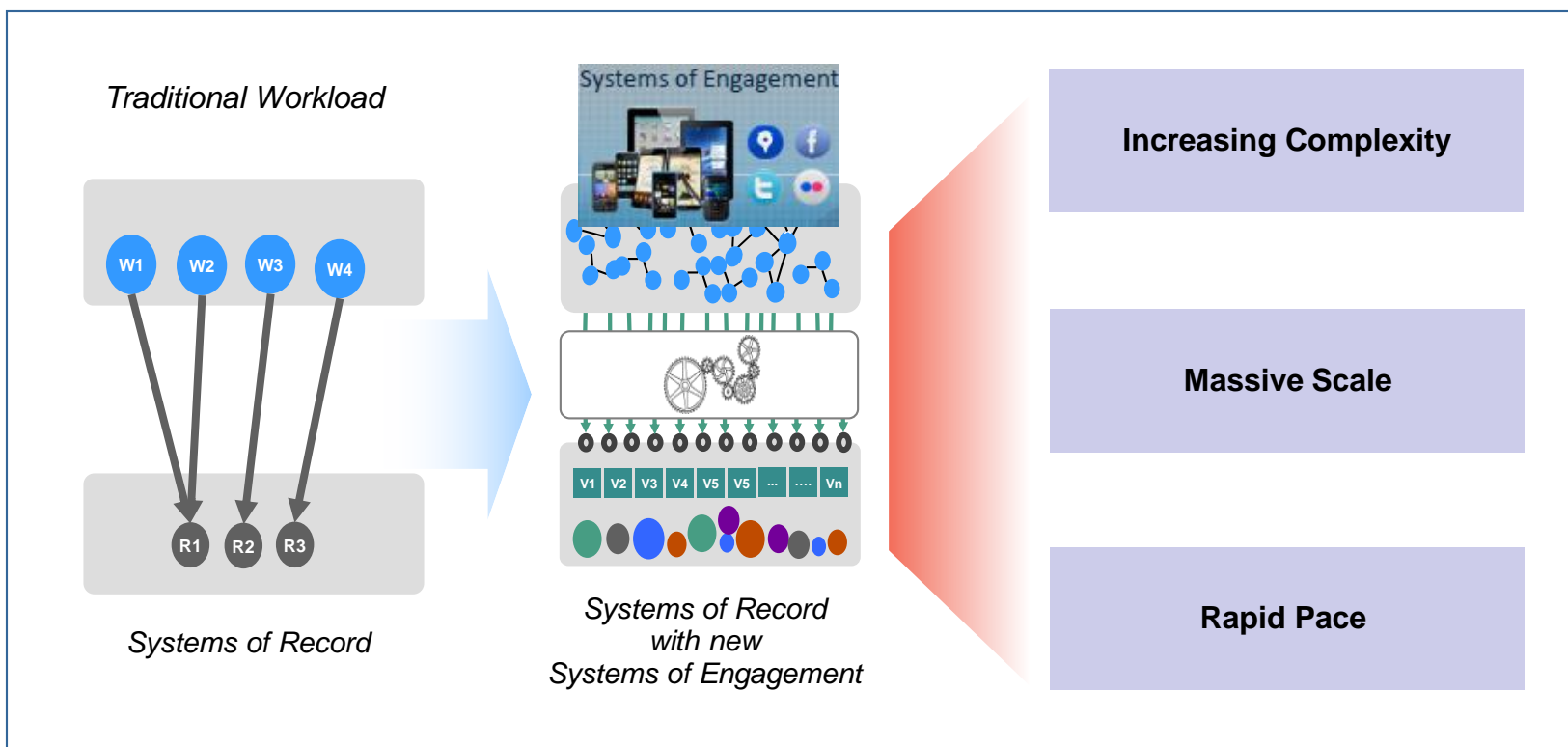
Diverse Data Types



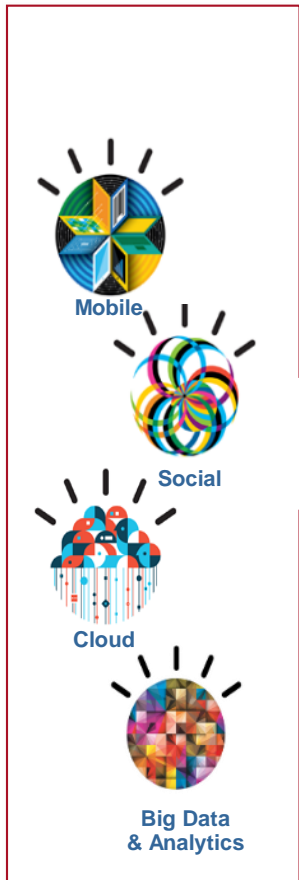
Increasing Value of Information



Mobile & Social Engagement



Cloud, mobile, and social technologies requiring greater efficiency and agility in IT infrastructures



From monolithic applications to **dynamic services**

From static infrastructure to **cloud** services

From programmed systems to **learning** systems

From structured data at rest to unstructured **data in motion**

From stable well-defined workloads to unpredictable **workloads**

From standard devices to a variety of **devices**

From proprietary standards to **open** innovation

From corporate-owned IT to infrastructure **as-a-service**



Efficiency Matters



To lead, organizations must improve the economics of IT through efficiency.

New client services can be rapidly developed while operational costs decrease.

Resiliency Matters



As they struggle to become more agile, IT leaders know there can be no compromise on business operations.

Clients experience a rich, interactive experience, increasing revenue and user satisfaction

Responsiveness Matters



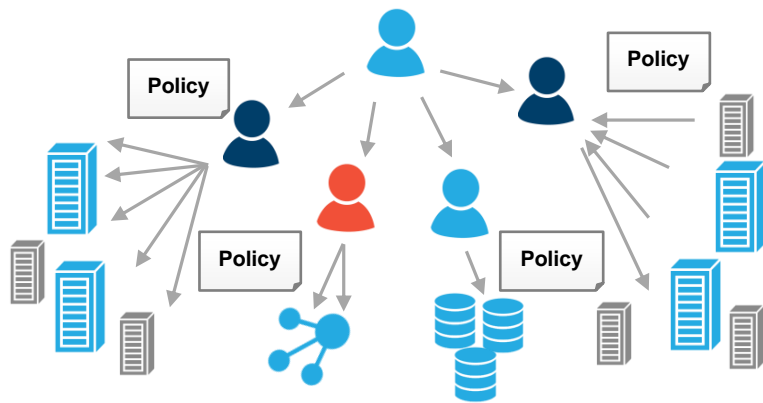
In response, they are looking to cloud to take advantage of advanced technologies and enable new business outcomes.

A cost-competitive, highly responsive solution is quickly brought to the marketplace



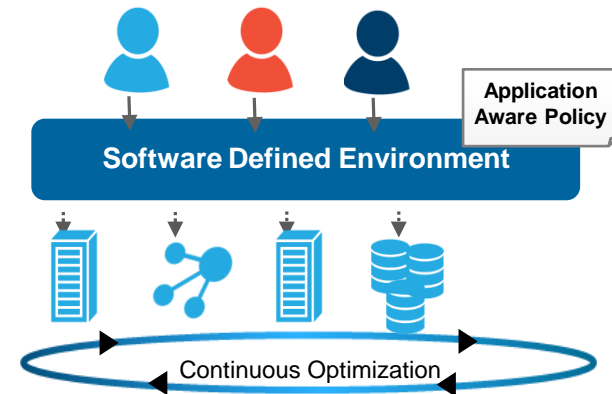
New Era Workloads Demand Next Generation Automation

Before



Static and manual assignment of IT resources

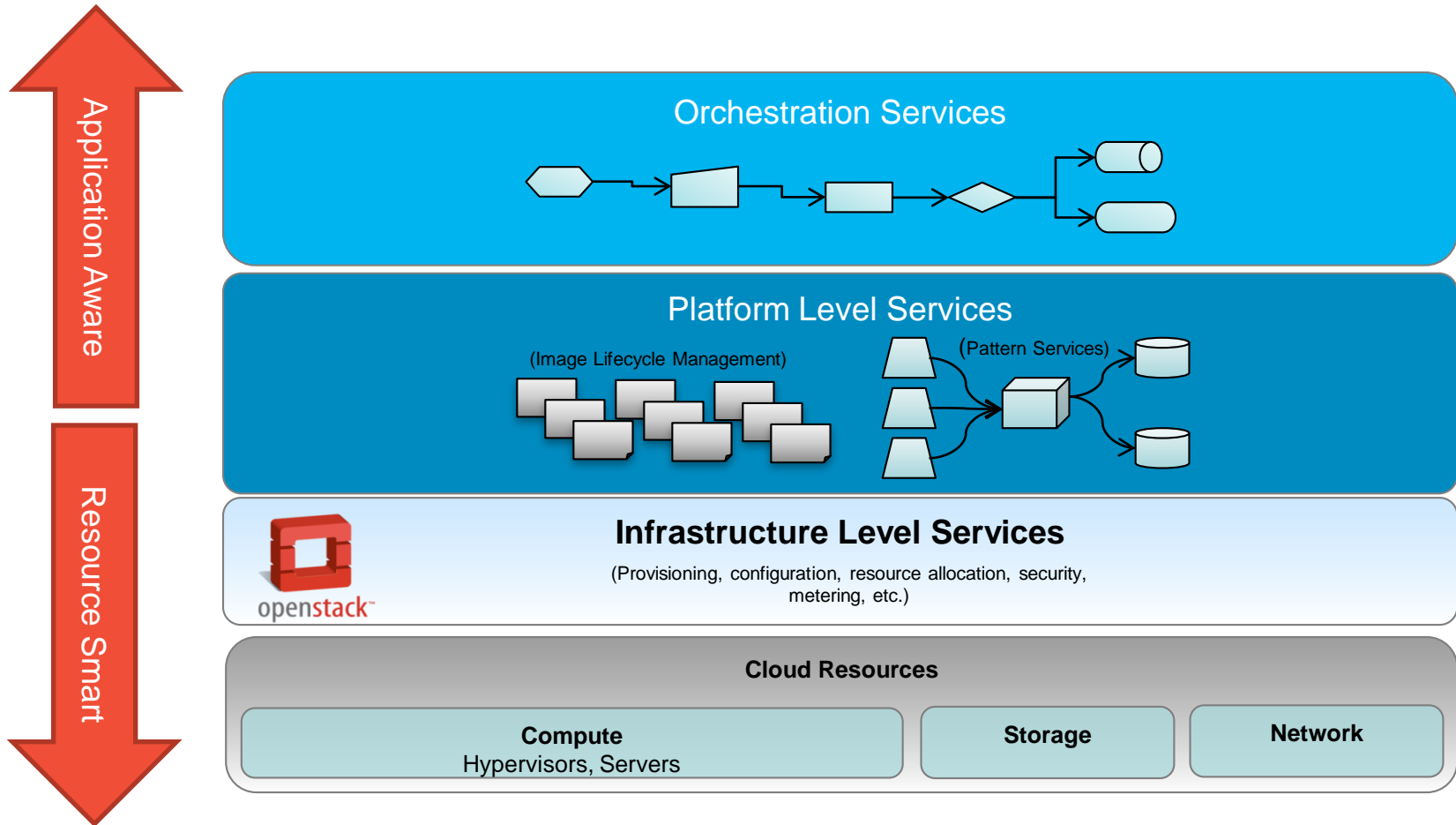
After



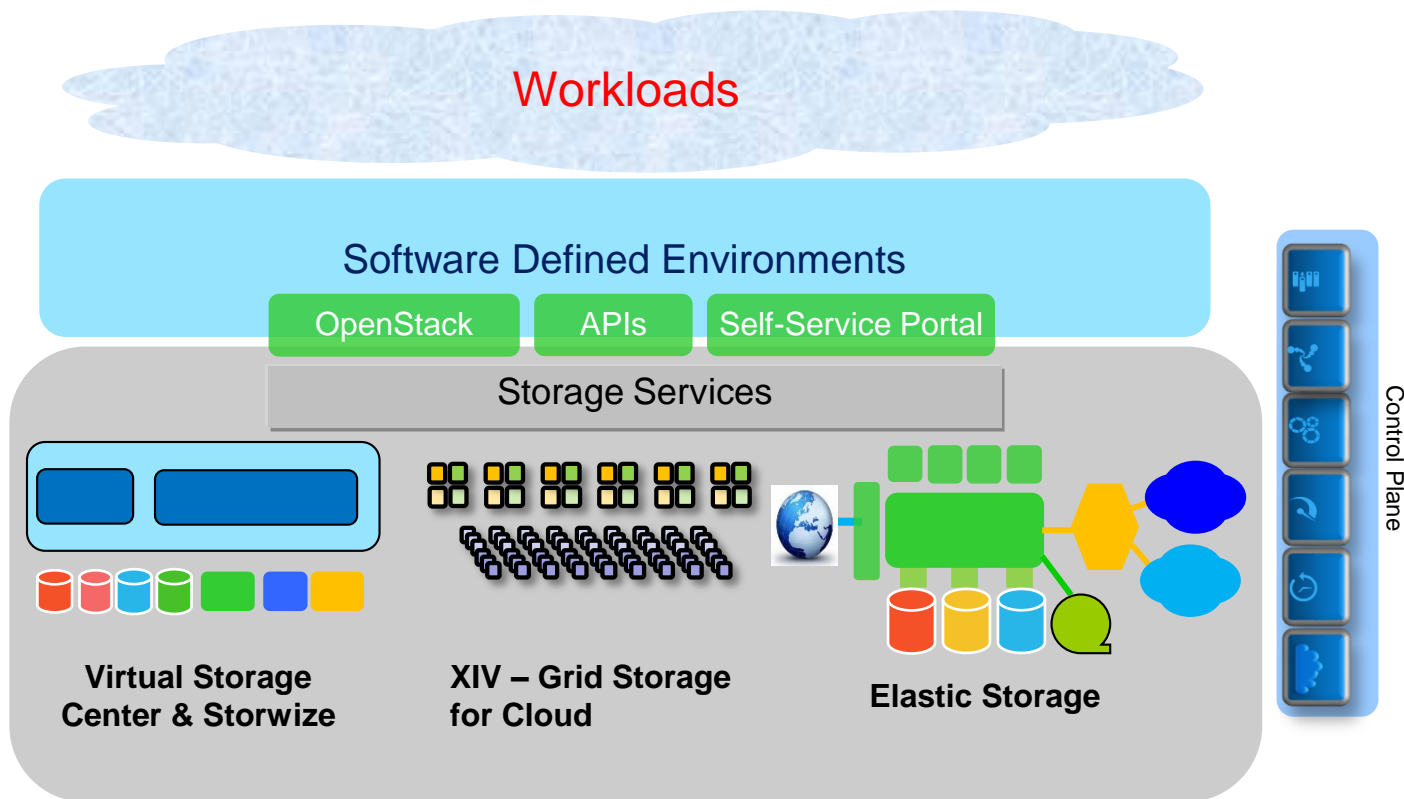
Adaptive approaches to infrastructure automation

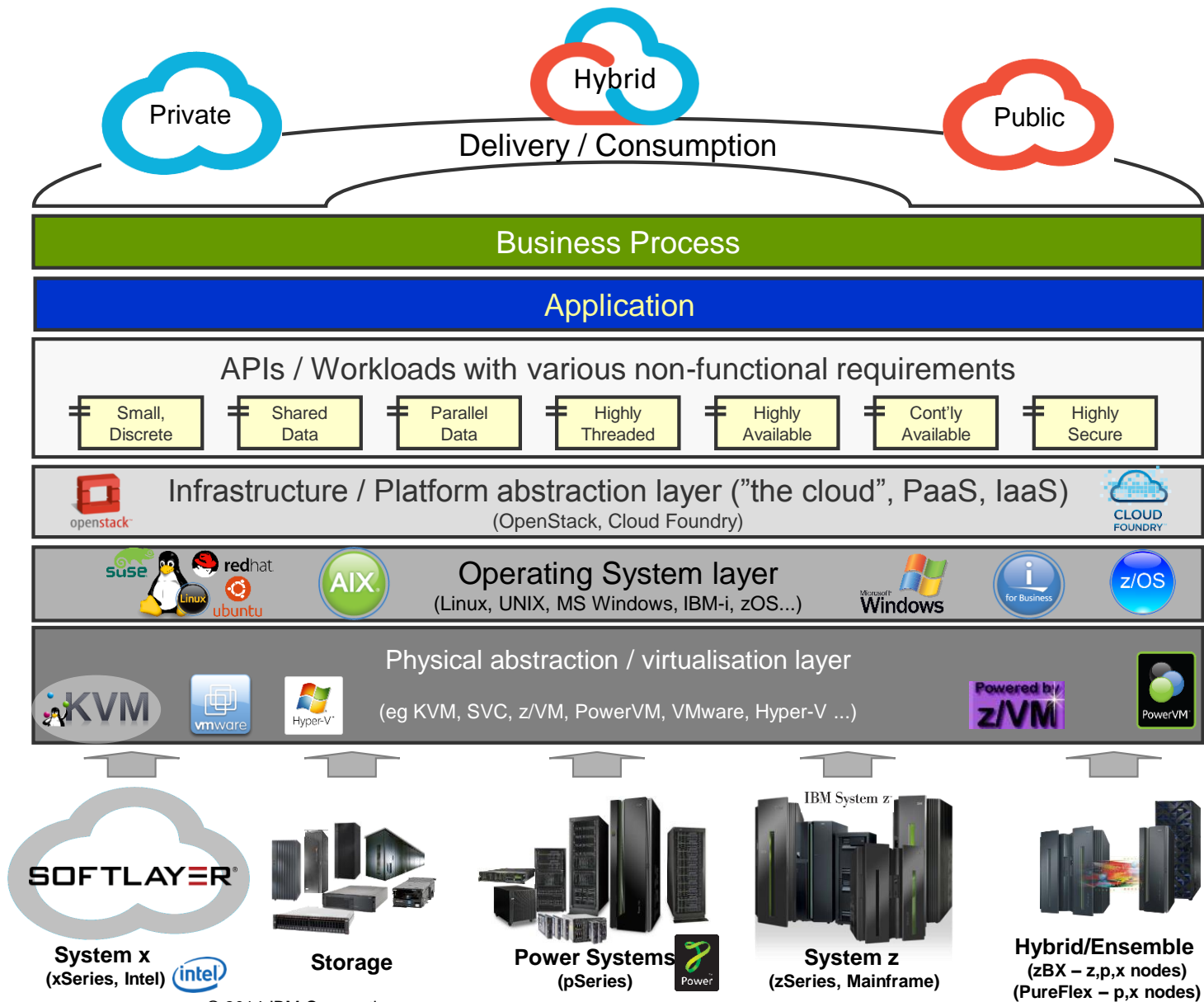


Software Defined Environments



IBM Software Defined Storage Overview





Infrastructure Layers

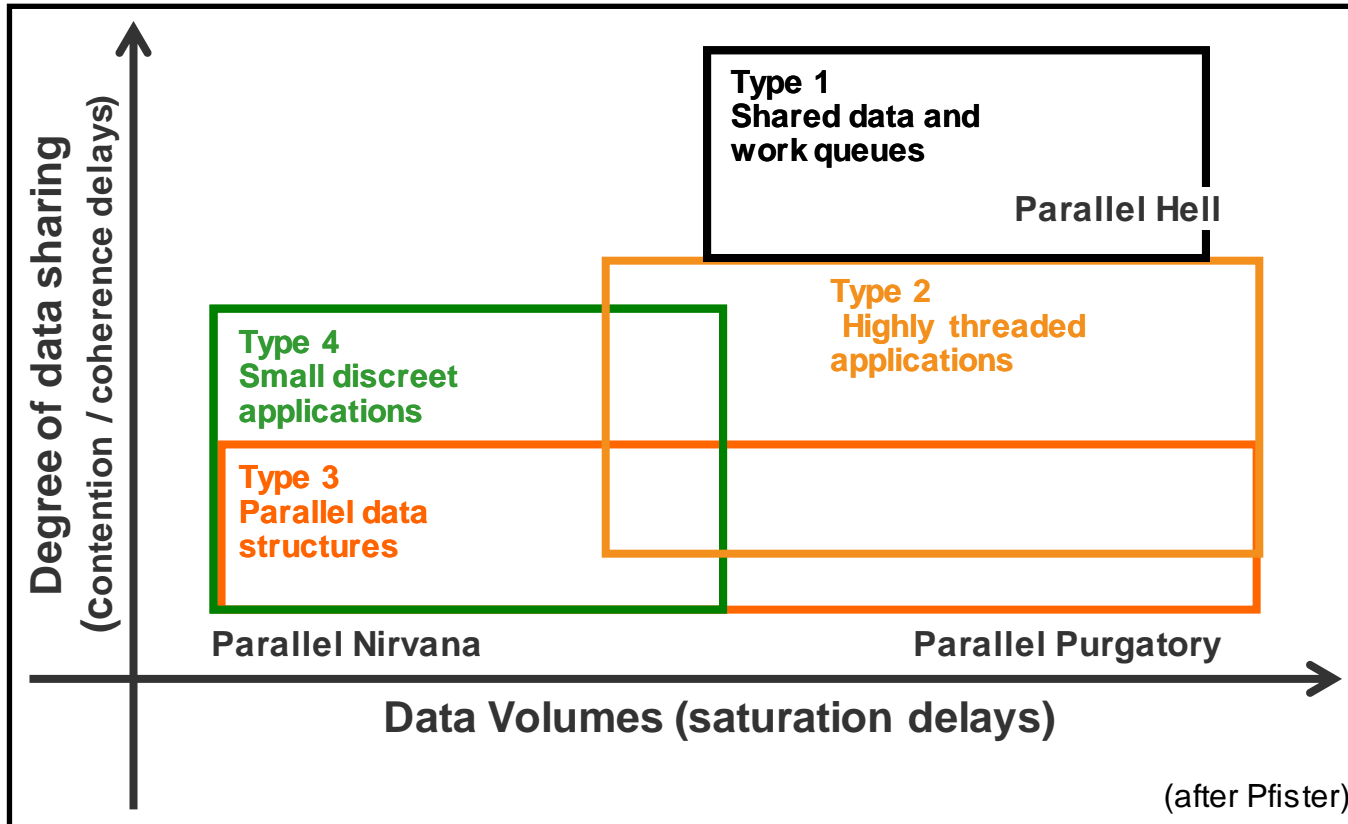
(workload aware Software Defined Environment)

Fit-4-Purpose

match the workload to the physical platform characteristics



Workloads have different characteristics, and that won't change



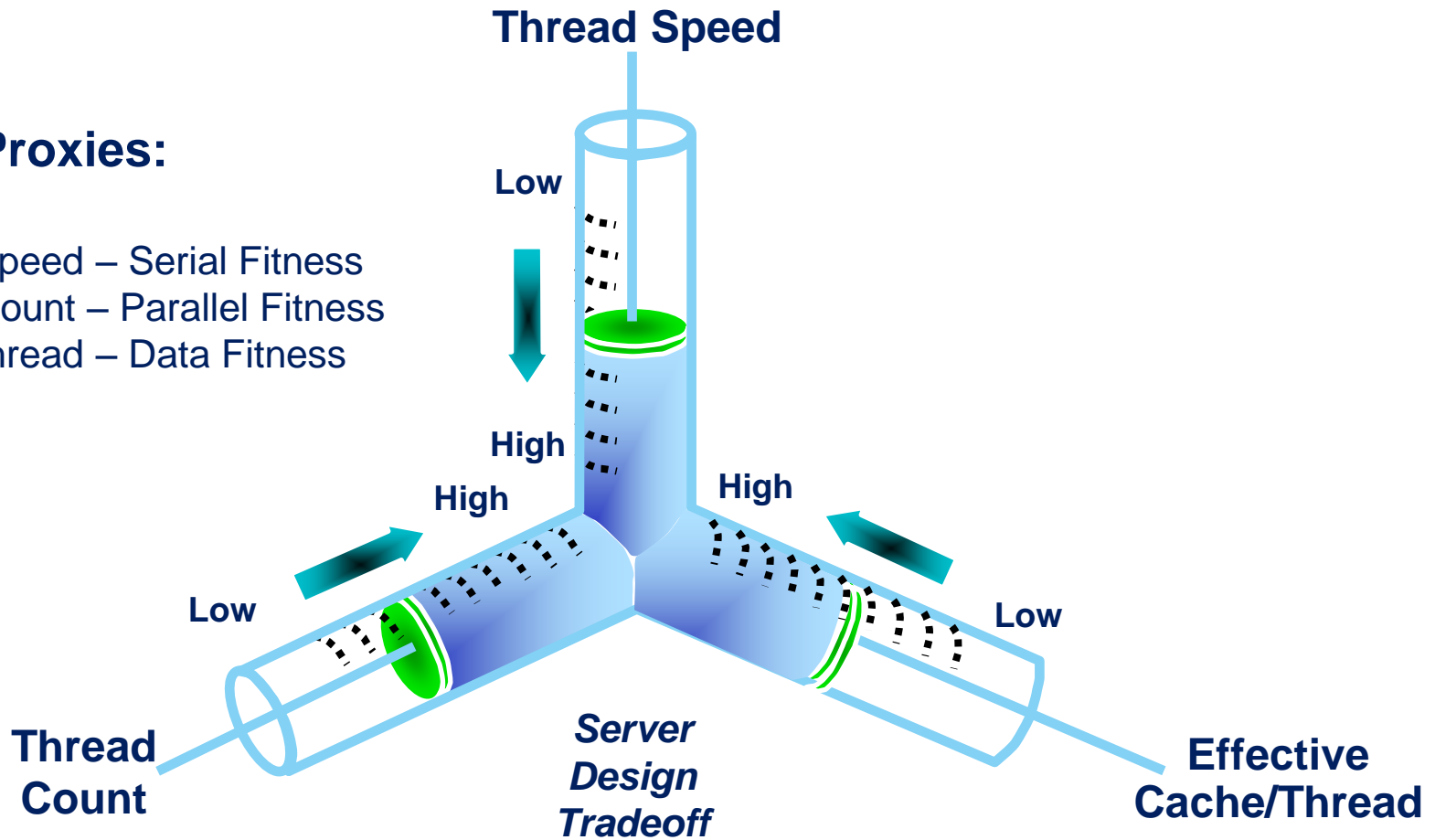
Workload Type



Server design is concerned with compromise and tradeoff

Fitness Proxies:

- Thread Speed – Serial Fitness
- Thread Count – Parallel Fitness
- Cache/Thread – Data Fitness



So what?

Linux (RedHat / Suse / Ubuntu)

KVM Virtualisation



System x
(xSeries, Intel)



Storage



Power Systems
(pSeries)



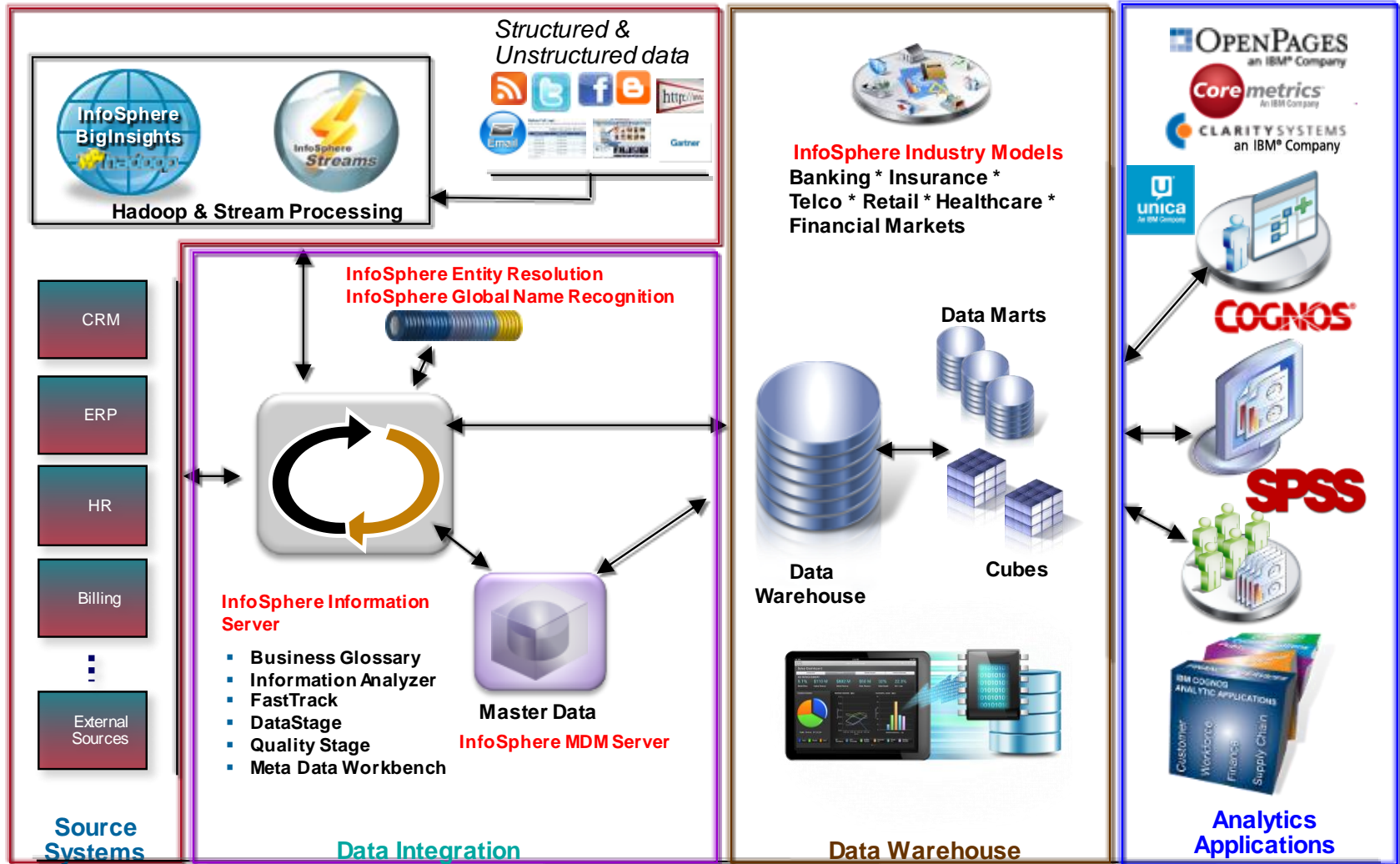
IBM System z
System z
(zSeries, Mainframe)



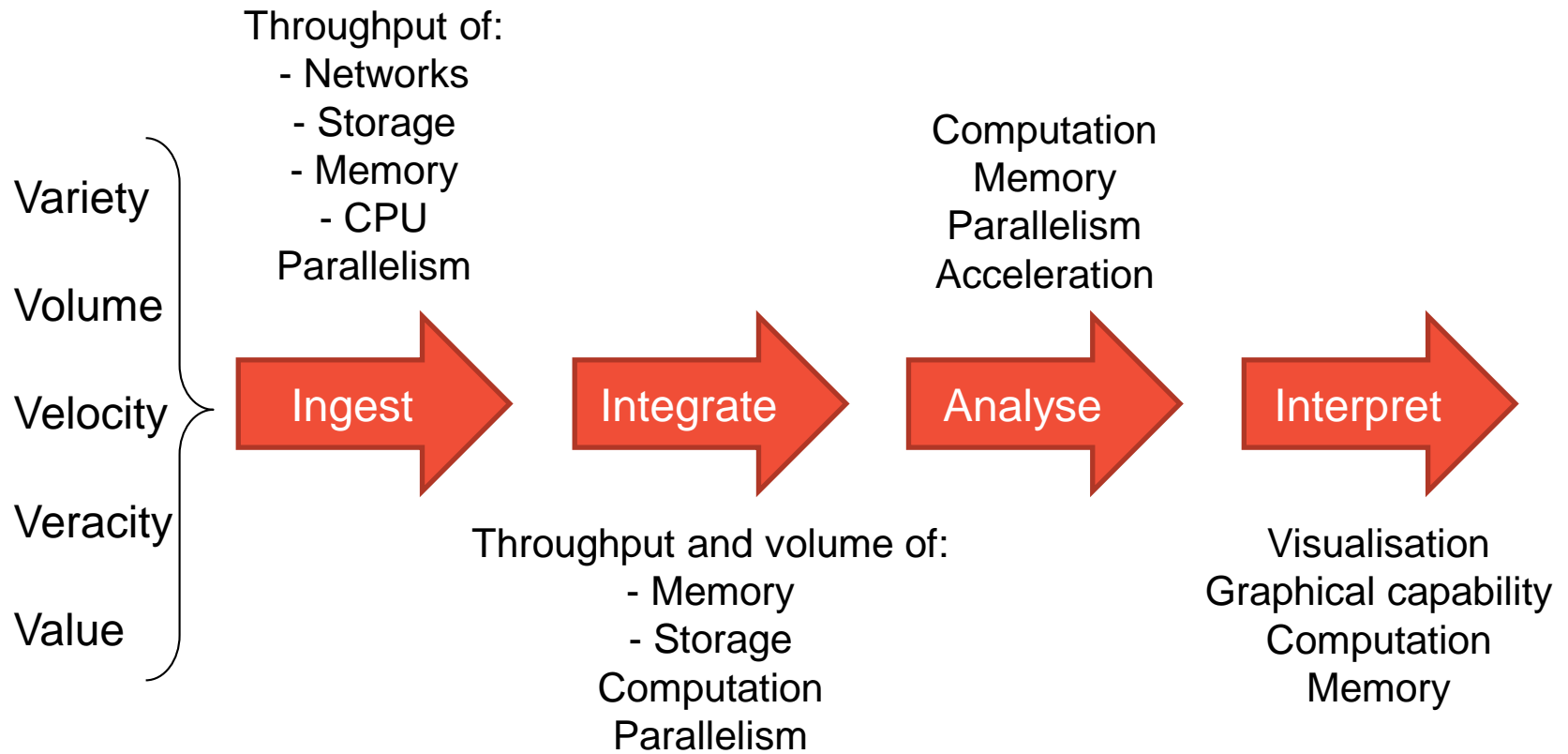
Hybrid/Ensemble
(zBX – z,p,x nodes)
(PureFlex – p,x nodes)



A typical Analytics ecosystem might look like...



And can typically be broken down into a number of key steps



Power8 Servers: Designed for Big Data

- ... from 4 to 196 cores
- ... 4X x86 threads per core
- ... 1TB to 16 TB onboard memory
- ... up to 40 TB of CAPI-attached flash memory
- ... 2,5X I/O bandwidth
- ...



Power Systems S824 (S824L)

2-socket, 4U
 Up to 24 cores
 1 TB memory
 11 PCIe Gen 3
 AIX, IBM i, Linux
 CAPI support (4)
 PowerVM (Power KVM)
 (NVIDIA GPU)

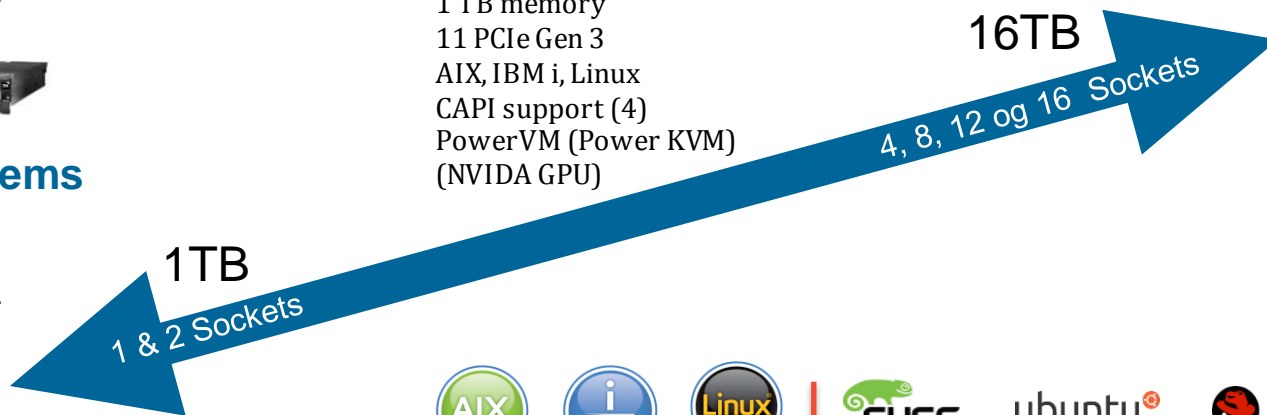


Power Systems E870 og E880



Power Systems S822L

2-socket, 2U
 POWER8 processor
 Up to 24 cores
 1 TB memory
 9 PCI Gen3 slot
 Linux only
 CAPI support (4)
 PowerVM & PowerKVM



PowerVM

PowerKVM

PowerVC

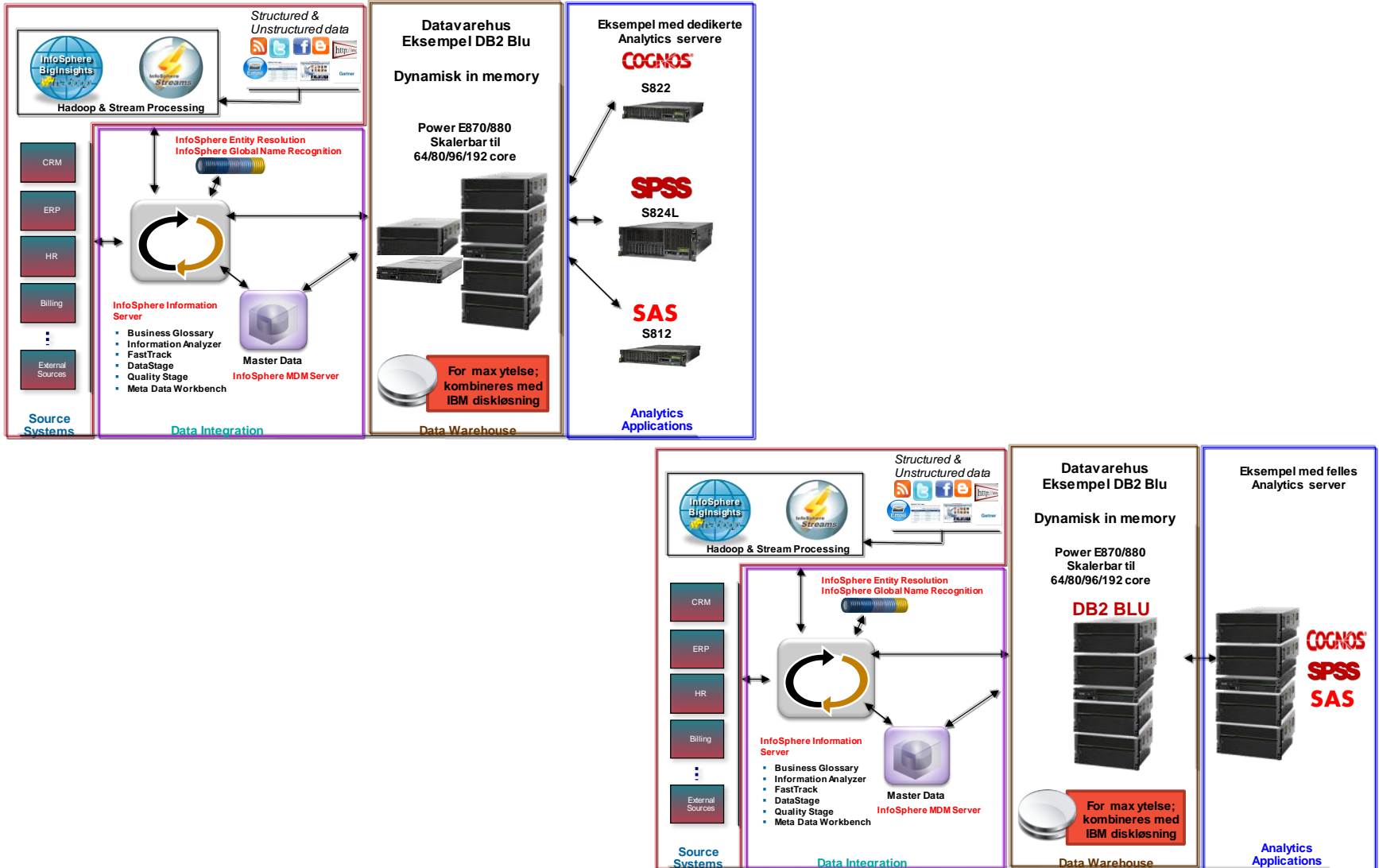
PowerVP

PowerSC

PowerHA



Your infrastructure solutions WILL influence solution quality



IBM – «One size doesn't fit all»

